WORLD CONGRESS OF PEDIATRIC CARDIOLOGY AND CARDIAC SURGERY

WCPCCS 2025

9TH WORLD CONGRESS OF PEDIATRIC CARDIOLOGY & CARDIAC SURGERY

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HONG KONG, CHINA

Embracing With All Our Hearts & Moving Forward With Patients

BOOK OF ABSTRACTS

WELCOME MESSAGE

We are delighted to welcome you to Hong Kong, China, for the Ninth World Congress of Paediatric Cardiology and Cardiac Surgery. Hong Kong, the "Pearl of the Orient," is an effervescent city that never sleeps. This is where East meets West, where knowledge sharing and transfer flourish, and where cultural exchanges are fostered. As the world enters a new era after the COVID-19 pandemic, the World Congress is proud to be back in Asia.

The Ninth World Congress 2025 features a scientific programme that can aptly be represented by five "I"s: Interdisciplinary, Interactive, Innovative, Inspiring, and Intense. Leaders in the field from all parts of the world have come together to deliver an exciting programme spanning the full spectrum—ranging from clinical to basic subjects, common to rare conditions, disease to health, humanitarian programmes to human footprint, real to unreal, and traditional core to cutting-edge topics across developing and developed countries.

This year's Congress includes 24 tracks with defined course content, interdisciplinary mingling, interactive workshops, sparking debates, plenary sessions, pre-congress symposia, and oral and poster abstract presentations. Special topics include artificial intelligence and augmented reality, digital health and big data, innovative therapies from genes to cells, personalized paediatric cardiac care, and rare disease.

Once again, welcome to Hong Kong, the most vibrant city in the Greater Bay Area of China. We wish you an inspiring and rewarding Congress!

Prof. Yiu-fai Cheung
Congress Chairman
WCPCCS 2025

Dr. Nicholson Yam
Congress Co-Chairman
WCPCCS 2025

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Category: Acquired Diseases of Coronary Arteries and Heart Layers

1128 - THE MULTICENTER RANDOMIZED OPEN LABEL CLINICAL STUDY OF INITIAL TREATMENT REGIMENS IN THE ACUTE PHASE OF KAWASAKI DISEASE

Fang Liu Liu [1], Weili Yan Yan [2], Lan He He [1], Siyuan Lin Lin [1], Chen Yuan Yuan [1], Xiaohui Liu Liu [1], Yiling Liu Liu [1], Guoying Huang Huang [1]
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Background / Hypothesis:
The multicenter randomized open-label clinical study of initial treatment regimens in the acute phase of Kawasaki disease

Materials and Methods:
In a multicenter randomized open-label trail with blinded outcome evaluation in China patients with acute-phase KD were randomly assigned in a 1:1 ratio to receive either standard treatment [IVIG 2g/kg and aspirin 30mg/kg] (control group) or standard treatment plus prednisolone (2mg/kg tapered over 15 days) (trial group). The primary outcome was incidence of CAL, which were defined as a Z score≧2. The primary analysis was an ITT analysis.

Results:
A total of 3208 children were enrolled between January 2020 and November 2024 in 28 centers across the country, 1604 in the control group and 1604 in the trial group. At one month of illness, CAL was observed in 245 (15.98%) and 210 (13.78%) by echocardiography in the trial group and control group, respectively, with no significant difference in the risk of CAL (RD 0.84 95% CI: -1.37~3.05; P = 0.458). Compared to the control group children in trial group had a lower occurrence of rescue treatment (OR 0.42 95% CI 0.32~0.56; p<0.001) shorter duration of fever (HR 1.17 95% CI 1.03-1.35; p=0.018) and a more pronounced decrease in the CRP level at 72 hours post-treatment compared with the baseline (MD of -5.1 95% CI of -6.5~-3.8; p<0.001). The secondary IVIG usage was significantly lower in the trial group (3.3% vs. 5.2% p<0.001) and the incidence of adverse events between two groups has no difference.

Conclusions:
IVIG plus 2 mg/kg of prednisone in the initial therapy for KD had no improvement in coronary outcomes, however, it significantly reduced rescue treatment and the duration of fever facilitated the decline of inflammatory indicators.

ORAL PRESENTATIONS

Category: Administration and Policy

1177 - CONTINUOUS EVALUATION OF AWARENESS TRANSFORMATION THROUGH PRACTICAL SCHOOL EMERGENCY SIMULATION TRAINING INVOLVING STUDENTS

Akira Kinoshita [1], Takashi Higaki [2], Tomozo Moritani [3], Kosuke Kashiwagi [3], Ryo Tashiro [3], Toyohisa Miyata [3], Toshiyuki Chisaka [3], Masaaki Ohta [3], Mieko Maezawa [3], Daiki Tokumoto [3], Masashi Takahashi [4], Kunio Ohta [5]
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Background:
Preventing sudden cardiac death in schoolchildren is a crucial public health issue. In Ehime Prefecture, team-based school emergency simulation training has been conducted annually, but its long-term impact remains under-evaluated. Previous studies assessed changes in teachers' and students' knowledge and awareness, highlighting the need for further longitudinal analysis.

Objective:
We evaluated the effectiveness of school emergency simulations by assessing changes in knowledge and awareness before and after training over multiple years. The study also aimed to identify key factors contributing to an improved emergency response system in schools.

Methods:
At Middle School A, teachers and students participated in annual emergency simulations and lectures for three years. Surveys using Google Forms were conducted before and after each session to assess changes in knowledge, confidence, and emergency response attitudes. Additionally, qualitative observations of student-teacher interactions were recorded to evaluate leadership development.

Results:
Post-training, students demonstrated a significant increase ($P<0.05$) in confidence retrieving the nearest AED. Knowledge improvements were observed, including increased awareness that school cardiac arrests remain a concern. Over time, senior students actively guided juniors, enhancing teamwork and responsibility in emergencies. Continuous simulations contributed to school-wide emergency preparedness. Teachers showed no immediate knowledge gains; however, prolonged training may foster awareness shifts and leadership improvement.

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Discussion:
Pre- and post-surveys confirmed that practical emergency simulations reinforced students' knowledge and promoted interstudent support, enhancing emergency readiness. Teachers may initially appear to progress slowly, as they already possess a certain level of foundational knowledge. However, prolonged training can lead to shifts in awareness and improvements in leadership. With proper training and intervention, teachers have come to believe that 100% survival rates can be achieved in witnessed out-of-hospital cardiac arrests.

Conclusion:
Collaborative school emergency simulations effectively enhanced emergency response capabilities. Continuous research and methodological improvements are essential. Awareness of this initiative has encouraged other regions to implement similar programs, demonstrating its broader impact on school safety.

ORAL PRESENTATIONS

Category: Administration and Policy

1214 - HUMANITARIAN PROGRAMS FOR CONGENITAL HEART SURGERY IN CHINA A COST EFFECTIVENESS ANALYSIS FROM THE NATIONAL CENTER FOR CARDIOVASCULAR DISEASES

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Background / Hypothesis:
Despite significant progress in reducing global under-five mortality, congenital heart disease (CHD) remains a leading cause of childhood deaths, with over 90% of affected children lacking access to adequate cardiac care due to high treatment costs. While health insurance partially alleviates financial burdens, out-of-pocket expenses remain prohibitive, particularly for complex cases requiring specialized care. Humanitarian programs have emerged as a critical support mechanism, yet its cost-effectiveness and alignment with patient receive little investigation. This study evaluates the impact of humanitarian programs on CHD treatment in the largest CHD center of China, hypothesizing that such aid significantly improves accessibility and cost-effectiveness.

Materials and Methods:
A retrospective analysis was conducted on 2,759 CHD patients who underwent CHD surgery at Fuwai Hospital (2012–2022) and received financial aid from non-governmental organizations (NGOs). Data included baseline characteristics, surgical complexity (classified as mild, moderate, or complex CHD), hospitalization costs, NGO funding proportions, and disability-adjusted life years (DALYs) averted. Cost-effectiveness was calculated as funding expenditure per DALY averted, with adjustments for natural disease history and surgical outcomes. Statistical analyses employed χ^2 and Kruskal-Wallis tests.

Results:
Humanitarian programs covered a median of 31% of hospitalization costs (¥41,256/USD 6,122 per patient), averting 40.82 DALYs per patient at a cost of ¥952.19 ($141.27) per DALY. Neonates and complex CHD cases showed higher DALYs averted (59.44 and 50.29, respectively) but lower funding proportions (24% and 32%). Single-ventricle physiology and patients with prior surgeries exhibited relative lower cost-effectiveness (¥1,627.30 and ¥1,349.08 per DALY). Unexpected reinterventions correlated with higher mortality (9.6% vs. 1%) and reduced funding support (19%).

Conclusions:
Charitable funding effectively reduces financial barriers for CHD treatment in China, demonstrating strong cost-effectiveness. However, coverage remains limited (6–9% of eligible patients), with disparities for high-risk groups (neonates, complex CHD). Funding models should evolve to incorporate surgical complexity and patient age, ensuring equitable support.

ORAL PRESENTATIONS

Category: Administration and Policy

1706 - EMPOWERING HEART GLOBALLY AN INNOVATIVE APPROACH TO CREDENTIALING AND CAPACITY BUILDING IN PEDIATRIC CARDIOLOGY USING EMERGING TECHNOLOGIES

Babar Hasan [1], Shazia Mohsin [1], Shubhika Srivastava [2], Sandra Mattos [3], Sandra Staveski [4], Colin Mcmahon [5], John Lawrenson [6], Brijesh Kottayil [7], Fenny Shidhika [8], Bistra Zheleva [9], Wyman Lai [10]

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Introduction:
Paediatric and Congenital heart disease (PCHD) remains a major global health challenge, especially in low- and middle-income countries (LMICs). Empowering Heart Globally (EHG) is an international organisation dedicated to addressing these inequities through comprehensive capacity building, workforce training and certification, leveraging cutting-edge educational technologies.

Methods:
EHG was formed at the WCPCCS 2023 meeting in Washington, USA. A group of experts (n~40) representing ~15 global PCHD programs, met remotely for an hour/month and also participated in a 2 days (4 hours/day) symposium to develop the EHGs strategic plan. Sub-committees(survey, curriculum, certification/credentialing and nursing education) to further develop a roadmap of implementation, were formed. EHG's strategy is the innovative application of artificial intelligence (AI) and extended reality (XR) technologies and a hybrid model combining virtual and in-person training to deliver an accessible, adaptable and scalable modular curriculum tailored to healthcare professionals across the PCHD care continuum within diverse health care environments. The credentialing and certification processes will be structured around the Miller Pyramid of assessing competency and harmonized with national and international certifying and credentialing entities to ensure a globally scalable process.

Results:
Digital quizzes and AI-driven adaptive assessments will evaluate foundational knowledge (Knows and Knows how). For competence demonstration ("Shows How"), immersive XR simulations may provide realistic virtual procedural training under supervised, controlled scenarios. Performance integration ("Does"), may need evaluation through in-situ assessments employing XR-supported clinical scenarios along with structured procedural logbooks, confirming effective translation of practical skills into real-world clinical practice. Quality

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Improvement (QI) sciences will guide implementation and help track and benchmarking clinical outcomes, ensuring a continuous, learning environment.

Conclusion: Through rigorous certification standards, EHG strives to establish a robust framework for healthcare workers, significantly enhancing global PCHD workforce capacity. QI-driven tracking will ensure the program's long-term sustainability and measurable impact on both trainee competency and patient outcomes globally.

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Category: Administration and Policy

2030 - STRENGTHENING ADMINISTRATION AND POLICY FRAMEWORK FOR EQUITABLE PEDIATRIC CARDIAC CARE IN KENYA LESSONS FROM A PATIENT LED APPROACH

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Background / Hypothesis:
Children born with Congenital and rheumatic heart diseases (CHDs and RHDs) in Africa, particularly in Kenya, face various health challenges like devastating health care access gaps due to weak policy prioritization and fragmented administrative systems. We hypothesize that strategic administrative reforms and inclusive policy advocacy, particularly when driven by Patient-Led Organizations, can significantly improve care access and best possible outcomes.

Materials and Methods:
This study draws from administrative and policy reviews, patient data, and stakeholder interviews conducted by the Kenya Mended Hearts Patients Association (KMHPA), a grassroots, Patient-Led Organization. It evaluates Kenya's Pediatric Cardiac care policies, the MOH and SHA (formerly NHIF) Health Financing Mechanisms, Patient referral systems, and the role of civil society in influencing systemic reforms. The study also reviews the impact of media advocacy and community mobilization on awareness and demand for cardiac care.

Results:
Findings indicate that despite political commitment to Universal Health Coverage, pediatric cardiac services remain underfunded, lowly prioritized and poorly integrated. SHA policies often exclude children needing staged or urgent surgeries, both Open and Closed surgeries within short intervals. However, administrative collaboration between civil society, healthcare facilities, and policymakers has led to improved patient navigation, increased surgery referrals, and renewed advocacy for a national pediatric cardiac care strategy. Patient-led campaigns have amplified the voices of affected families, putting pressure on institutions to act.

Conclusions:
Addressing CHD and RHD in Kenya requires urgent policy shifts and administrative innovation. Empowering Patient-Led Organizations to co-create solutions with health authorities can bridge critical service gaps. A continental framework inspired by such grassroots models could catalyze more equitable cardiac care systems across Africa for better health outcomes.

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Category: Adult Congenital Heart Disease

1193 - LONG TERM DURABILITY OF SURGICAL AND TRANSCATHETER BIOPROSTHETIC PULMONARY VALVES

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Background:
Pulmonary valve replacement (PVR) is performed in approximately one in five patients with congenital heart disease and is one of the most common reinterventions in this population. However, the degeneration of bioprosthetic pulmonary valves (BPVs) remains a limitation. Long-term BPV durability has predominantly been examined as time to replacement, yet significant BPV deterioration may occur prior to replacement, leaving a gap in knowledge regarding time to dysfunction. The aim of this study was to evaluate BPV durability as time to dysfunction and failure, identify risk factors for reduced durability, and assess the impact on mortality.

Methods:
Bioprosthetic valve dysfunction was divided into 1) structural valve deterioration (SVD) as moderate (pulmonary stenosis >3 m/s = PG≥36 mmHg or > mild pulmonary regurgitation) and severe SVD (>4 m/s = PG >64 mmHg or severe pulmonary regurgitation), 2) non-structural valve deterioration (NSVD) defined as patient-prosthesis mismatch (PPM), and 3) infective endocarditis (IE). Bioprosthetic valve failure (BVF) was defined as redo PVR. BPV durability was estimated using the Aalen-Johansen estimator. Cox regression models were used to identify risk factors and assess mortality.

Results:
A total of 439 patients undergoing 680 PVRs between 1976 and 2021 were included in this study and 6244 echocardiographies were reviewed. Median follow-up was 14 years (IQR:21-8). Median time to moderate SVD was 6 years (IQR:1-16), to severe SVD 21 years (IQR: 17-NA), and to BVF 17 years (IQR: 15-18). NSVD was encountered in 41% of BPV. Cumulative incidence of IE was 17% after 25 years. Younger age at PVR and PPM were risk factors for SVD and BVF. SVD had no significant impact on mortality.

Conclusions:
BPV exhibit early but prolonged moderate dysfunction before severe dysfunction. Younger age and PPM were associated with reduced durability. SVD was not associated with mortality.

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Category: Adult Congenital Heart Disease

2024 - NON INVASIVE PREDICTION OF DIASTOLIC DYSFUNCTION IN ADULTS WITH FONTAN CIRCULATION THE FPEF SCORE

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Background / Hypothesis:
In contrast to acquired heart disease, non-invasive scoring systems for predicting diastolic dysfunction are lacking in adults post-Fontan palliation. This study aimed to identify predictors of diastolic dysfunction and develop a scoring system for non-invasive diagnosis and risk stratification in this population.

Materials and Methods:
We analyzed 91 adults post-Fontan undergoing exercise cardiac catheterization. Diastolic dysfunction was defined as a pulmonary artery wedge pressure (PAWP) ≥12 mmHg at rest or >20 mmHg during exercise. Unadjusted logistic regression identified candidate predictors, which were refined using stepwise regression and validated with a machine learning method.

Results:
Age at catheterization was 32.2±8.7 years; 44% were female. Resting and exercise PAWP were 9.3±3.6 mmHg and 19.8±6.9 mmHg, respectively. Diastolic dysfunction was observed in 48.4%. Significant predictors included spleen size >13 mm, peak exercise oxygen consumption <50% predicted, aspartate aminotransferase (AST) ≥30 U/L, and history of atrial arrhythmias, forming the Filling Pressure Estimation in Fontan – Spleen size, Cardiopulmonary performance, Rhythm abnormalities, Enzyme AST (FPEF-SCoRE). The score demonstrated strong predictive performance for diastolic dysfunction (AUROC 0.86, 95% CI 0.79–0.94) and exhibited progressive haemodynamic derangement across the three risk categories (Table 1). Furthermore, the score was independently associated with incident death or transplantation (HR 1.55, 95% CI 1.09-2.16; p=0.02), and death, transplantation or hospitalization for heart failure or atrial arrhythmia (HR 1.62, 95% CI 1.25-2.10; p<0.001). The 2-year death and transplant-free survival for the low (0-2), intermediate (3-4) and high-risk (5-6) scores were 92.3%, 93.3% and 74.0%, respectively (log-rank p=0.02).

Conclusions:
The FPEF-SCoRE provides a simple, non-invasive tool for identifying diastolic dysfunction and predicting outcomes in adults post-Fontan, supporting its use in clinical decision-making and risk stratification.

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Category: Adult Congenital Heart Disease

2223 - PULMONARY HYPERTENSION IN PATIENTS WITH A SYSTEMIC RIGHT VENTRICLE (BIVENTRICULAR CIRCULATION)

William Wilson [1], Nael Aldweib [2], Jamil Aboulhosn [3], Petra Antonova [4], David Baker [5], Payam Dehghani [6], Susan Fernandes [7], Salil Gindi [8], Frank Han [9], Clare O'donnell [10], Carla Rodriguez-monserrate [11], David Celermajer [5], Flavia Fusco [12], Anitha John [13], Joshua Wong [14], Elizabeth Yeung [15], Berard Sarubbi [12], Stephen Pylypchuk [16], Sangeeta Shah [17], Joseph Kay [18], Jonathon Cramer [19], Timothy Cotts [20], Tripti Guta [21], Luke Burchill [14], Paul Khairy [22], Mikael Dellborg [23], Isabelle Vonder Muhll [16], Adam Lubert [24], Jolien Roos-hesselink [25], Alexander Opotowsky [24], Alexandra Van Dissel [26], Jasmine Grewal [27], Anthony Magalski [28], Pastora Gallego [29], Fred Rodriguez [30], Marissa Kuo [30], Robert Kauling [25], Christopher Dezorzi [28], Eric Krieger [31], Shelby Kutty [32], Jeremy Nicolarsen [33], Craig Broberg [2]

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Background / Hypothesis:
Little is known regarding pulmonary hypertension in adults with a systemic right ventricle. We evaluated the prevalence and mechanism of pulmonary hypertension (PH) in patients with transposition of great arteries with atrial switch repair (dTGA-AS) and congenitally corrected transposition of great arteries (CCTGA)

Materials and Methods:
This is a retrospective cohort study undertaken by the Alliance for Adult Research in Congenital Cardiology. Adults with dTGA-AS or CCTGA who had undergone invasive haemodynamic assessment were included. Exclusion criteria were single ventricle anatomy, Rastelli or arterial switch operation.

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PH was defined by a mean pulmonary artery pressure (mPAP>20mmHg) and subtypes were defined according to 2022 ESC guidelines (pre-capillary if PCWP<=15mmHg and PVR>2WU, isolated post capillary (IpcPH) if PCWP>15mmHg and PVR<=2 and combined pre and post capillary PH (CpcPH) if PCWP>15mmHg and PVR>2WU. The primary combined clinical endpoint was death, transplantation or need for mechanical circulatory support.

Results:
261 patients were studied (dTGA-AS, n=161 and CCTGA, n=100). Pulmonary hypertension was present in dTGA-AS in 65% (39+-8 years) and CCTGA 69% (42+-14 years), p=0.74. PH subtype was pre-capillary in 24%, IpcPH 25%, CpcPH 51% with no difference between dTGA-AS and CCTGA. The relationship between PCWP and mPAP was largely similar between two groups but there existed greater variability in PCWP once mPAP was >50mmHg in the dTGA group (higher incidence of severe pre-capillary PH with normal PCWP in dTGA-AS group). Incidence of the primary endpoint was similar in both groups (24 v 29%, p=0.39) but occurred at a younger age in dTGA-AS (41+-7 years) compared to CCTGA (47+-14 years, p<0.001). The strongest predictors of the primary endpoint were elevated PVR (in particular in dTGA-AS subgroup) and lower aortic pulsatility index (in CCTGA subgroup).

Conclusions:
PH is common in patients with a systemic RV undergoing catheterisation and most commonly the combined pre and post capillary subtype.

ORAL PRESENTATIONS

Category: Adult Congenital Heart Disease

2300 - SUPERIOR RESPONSE IN AEROBIC CAPACITY AND LOWER LIMB STRENGTH TO 6 MONTH EXERCISE PROGRAM IN FONTAN PATIENTS WITH SYSTEMIC LEFT VENTRICLE OVER PATIENTS WITH RIGHT VENTRICLE MORPHOLOGY

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Background / Hypothesis:
In single ventricle Fontan patients transpulmonary blood flow is dependent on systemic venous pressure, pulmonary vascular resistance and end diastolic pressure. Reduced cardiopulmonary function (CPF) is a common outcome of single ventricular hemodynamics even those Fontan patients with "ideal palliation outcome". Improving physical performance with an individualized exercise program can improve patients' quality of life and prognosis. We studied whether a 6-month exercise program improves CPF in Fontan patients and if the response is dependent on ventricular morphology.

Materials and Methods:
28 pediatric stable Fontan patients with right (HLHS n17) or left (LV n12) dominant ventricle morphology, and normal peripheral oxygen saturation were included. The patients were asked a questionnaire about their daily physical activity and screentime and then underwent tests for CPF, body composition and muscle strength. Each patient received a self-guided exercise program with daily step goal and home workout focusing on improvement of lower limb muscular fitness After a 6-month period, patients repeated the tests. The study patients were devided according to systemic ventricle morphology, and in addition, those with systemic RV were further divided according to coronary flow being antegrade (HLHS-A n9) or retrograde (HLHS-R n8). Statistical differences between groups were determined using one-way ANOVA Mann-Whitney U test.

Results:
(Table1.) All patients completed the 6-month intervention period without complications. At baseline, the LV group outperformed both HLHS groups in CPF (VO_2max p=0.043). After intervention, significant improvements in VO_2max were observed in the LV group (p=0.0098), along with increased anaerobic threshold (p=0.0059) and maximal workload (p=0.003) in HLHS-A and LV. Muscle strength measured as squat performance improved in all patients (p<0.02), and standing broad jump in HLHS-A and LV groups (p=0.019 and p=0.017, respectively). No significant changes were observed in FVC or FEV_1 Z-scores. Self-reported weekly hours of strenuous exercise indicated strong adherence in the HLHS-A group.

ORAL PRESENTATIONS

Category: Ambulatory Cardiology and Telemedicine

2062 - REMOTE PEDIATRIC CARDIAC MONITORING ENHANCING RECOVERY SAFETY AND RESOURCE UTILIZATION THROUGH AN INNOVATIVE HOME BASED CARE MODEL

Tal Tirosh Wagner [1], Noga Meiboom [2], Rotem Rassi [2], Margarita Chanell [2], Nagah Zaid [2], Boris Fizdel [3], Galia Barkai [3], David Mishali [4], Uriel Katz [1]
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Background:
The home environment has been shown to significantly improve recovery outcomes in children. The COVID-19 pandemic, combined with technological advancements and the drive for fast-track pediatric cardiac surgery, promoted the development of a remote Pediatric Home Cardiac Monitoring model. This approach provides comprehensive post-discharge care while preserving the benefits of recovery in a familiar home setting.
Before discharge, parents receive detailed training on essential monitoring appliances, including a mobile cardiac monitor (Mindray®), digital babyscale (Beurer®), and video visit procedures (via WhatsApp or TytoCare®). They are also given emergency response guidelines and access to dedicated 24/7 medical support hotline.
Following discharge, children are remotely supervised with daily virtual assessments conducted by a Pediatric Cardiologist and a Pediatric Cardiac ICU nurse. Additional on-demand consultations are available as needed.
The objective of this study is to assess the quality, safety, and effectiveness of remote monitoring and its impact on clinical outcomes in children recovering from cardiac surgery.

Materials and Methods:
The study included children discharged after cardiac hospitalization whose parents consented to participate. Remote monitoring continued until the child's next physical clinic visit. Parents completed a six-question survey assessing satisfaction with care quality, ease of equipment use, support provided, and willingness to recommend the program. Responses were rated on a 5-point Likert scale.

Results:
Over a 29-month period, 155 families were invited; 138 participated (89.0%), and 78 (56.5% of participants) completed the survey. Demographic & clinical characteristics and survey responses are presented in Tables 1 and 2, respectively.
Early identification led to readmission in 10 cases (7.2%) for events such as fever, wound infection, and reduced intake. Eight additional cases (5.7%) of potential readmission were prevented through timely remote interventions.

Conclusion:
This model provides and improves continuity and quality of care, enhances recovery, reduces readmissions, and optimizes hospital resource use by safely transitioning patients to home-based monitoring.

ORAL PRESENTATIONS

Category: Ambulatory Cardiology and Telemedicine

2218 - A SINGLE CENTRE EXPERIENCE OF HYPOXIC CHALLENGE TESTING IN CONGENITAL HEART DISEASE.

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Background / Hypothesis:
Patients with congenital heart disease (CHD) often have lower baseline saturations and as such raise concerns as to how they will tolerate flights. A hypoxic challenge test (HCT) simulates the drop in inspired oxygen during a flight in a non-invasive way easily applicable to paediatric patients.

Materials and Methods:
All patients that underwent HCT in a body plethysmography device in our centre over the last 9 years. A total of 103 patients were grouped into 6 categories: Biventricular (unrepaired or repaired), Univentricular (unrepaired, Stage 1 or 2 palliation, Fontan palliation) and one and a half ventricle repair. A failed test was defined as a >10% drop from baseline saturations, that did not improve with a maximum of 4L nasal cannula oxygen. Patients who dropped in the hypoxic environment were re-tested in 1 – 4L /min inspired oxygen.

Results:
103 patients underwent HCT, 83% had single ventricle physiology at various stages of palliation. Patients were a mean age of 5.3years (range 1.8 months-20.7 years). Mean weight 18.9kg (range 3.1-82.2kg). Mean baseline saturations were 84% (range 70-98%) with mean lowest saturations during HCT of 78% (range of 66-91%). Only 3 patients failed the test by default secondary to not tolerating nasal cannula oxygen. 13 patients required oxygen to pass HCT ranging between 1-4L/min. Within this subcategory there was heterogeneity in diagnosis, age, weight, and baseline saturations with no predictive factors.

Conclusions:
HCT successfully identifies a small cohort of patients that will require supplemental oxygen to safely travel by air. Given the importance of quality of life in this patient group this simple test can provide reassurance to parents to allow safe travel, with most not requiring oxygen, which can be complex to arrange. Baseline saturations and underlying cardiac diagnosis were not predictive for failing test or requiring supplemental oxygen.

ORAL PRESENTATIONS

Category: Ambulatory Cardiology and Telemedicine

2368 - TELE ECHOCARDIOGRAPHY USING SMART GLASSES – THE NEW GAME CHANGER IN TELEMEDICINE FOR PEDIATRIC CARDIOLOGY

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Background / Hypothesis:
Tele-echocardiography of congenital heart defects via live-data transmission offers the possibility of rapid diagnosis and therapy planning, especially in the care of critically ill newborns.
First data on tele-echocardiography could show, that guidance by a pediatric cardiologist (PC) using smart glasses could optimize the performance of echocardiography of structural normal cardiac anatomy. This study aimed to evaluate the feasibility of diagnosing congenital heart defects under Smart Glass guidance.

Materials and Methods:
The current study is a prospective monocentric, single- blinded pilot study. Ten PC were enrolled to diagnose six different congenital heart defects on a validated neonatal echocardiography simulator (EchocomNeo, Echocom GmbH). They were divided into two groups: The first group (group I) as „bedside echocardiography“ and the second group (group II) as “Google Glass guided”. In the first group, five of the PC performed the six examinations themselves. In group II, five medical students with experiences in adult echocardiography performed the six examinations and were guided by the other five PC with Google Glass.
In both groups, the PC diagnosed the congenital heart defects. Another cardiologist, blinded to the two groups, subsequently evaluated the diagnoses according to a predetermined scoring system (with a maximum of 15 points). The study took place at the Leipzig Heart Center, Department of Pediatric Cardiology, from June 2024 to November 2024.

Results:
In total 60 examinations (6 cases for each PC in both groups) were performed. Two cases had to be excluded for technical reasons. Thus, in total 58 cases were analyzed. A correct diagnosis with Smart Glass guidance (group II) was feasible with an average score of 87% of the maximum point score. There were no significant differences between the groups for diagnosis scoring system, p=0.94.

Conclusion:
Smart glasses enable pediatric cardiologists to guide unexperienced echocardiographers to correctly diagnose congenital heart defects on a neonatal echocardiography simulator.

ORAL PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1120 - RIGHT VENTRICULAR REMODELING PHENOTYPES IN HYPOPLASTIC LEFT HEART SYNDROME IMPLICATIONS FOR RISK STRATIFICATION AND EARLY INTERVENTION

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Background/Hypothesis:
Right ventricular (RV) dysfunction is a major determinant of morbidity and mortality in patients with congenital heart disease. Current risk stratification primarily relies on systolic function and tricuspid regurgitation (TR) severity. However, we hypothesized that RV remodeling precedes functional decline and occurs in heterogeneous patterns with distinct prognostic implications. This study aimed to identify and characterize these phenotypes and to assess their clinical implications for risk stratification and intervention timing.

Materials and Methods:
This was a retrospective cohort study conducted at a single tertiary center. We used unsupervised hierarchical clustering to identify RV remodeling phenotypes: Phenotype 0 (Hypertrophy-Only, N=135), Phenotype 1 (Severe Dysfunction with TR, N=80), Phenotype 2 (Isolated TR-Driven Remodeling, N=52), and Phenotype 3 (Dilation Without TR, N=60).

Results:
The Markov Chain transition probabilities suggest that RV dysfunction does not follow a single linear trajectory and progression rates to severe dysfunction varied significantly across phenotypes. Most patients remained in their initial phenotype. However, Phenotype 3 (RV dilation without TR) had a 22.2% chance of progressing to severe dysfunction—higher than other phenotypes. Phenotype 1 (Severe dysfunction with TR) showed only a 6.1% chance of improvement, reinforcing its role as an end-stage state.

Conclusions:
In this cohort study, distinct RV remodeling phenotypes were identified. Notably, a phenotype characterized by RV dilation without significant TR (Phenotype 3) exhibited rapid progression, suggesting that reliance on TR severity alone may underestimate risk in certain patients. These findings suggest that incorporating RV remodeling phenotypes into risk stratification may improve early identification of high-risk patients and inform timely intervention strategies in congenital heart disease.

ORAL PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1352 - ARTIFICIAL INTELLIGENCE SUPPORTED SEGMENTATION OF CARDIAC ANATOMY IN OPEN HEART SURGERY VIDEOS

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Background / Hypothesis:
Deep learning-based segmentation of anatomical structures holds significant potential to support surgical decision-making, reduce intraoperative errors, and serve as a foundation for computer vision systems that enable autonomous or semi-autonomous surgical assistant robots. Such systems could act as intelligent surgical assistants, comparable to nurses or doctors. However, the lack of publicly available datasets for open-heart surgery segmentation has constrained progress in this domain.

Materials and Methods:
This study introduces a pipeline for efficient and scalable generation of high-quality segmentation data from pediatric open-heart surgery videos. It combines a YOLO-based object detector with a fine-tuned Segment Anything Model 2 (SAM2), wrapped in a custom graphical user interface that enables fast, user-guided refinement of masks across video sequences. The pipeline supports iterative fine-tuning of both models using the generated data, progressively improving segmentation quality and accelerating dataset creation over time.

The SAM 2 model, originally limited in tracking cardiac structures on anything but the simplest and shortest videos, was iteratively fine-tuned to robustly segment and track five key cardiac structures—the right atrium, right ventricle, aorta, pulmonary artery, and vena cava—over longer video durations.

The pipeline was applied to video recordings from 20 pediatric open-heart surgeries at Skåne University Hospital, Sweden. The result is a new dataset containing 150 annotated 10-second video clips. Model performance was evaluated using the standard metrics: Dice, sigmoid focal loss, and mAP50.

Results:
The fine-tuned SAM2 model achieved a Dice score of 97% and a sigmoid focal loss of 0.05. The YOLO model reached a mean Average Precision (mAP50) of 90%.

Conclusions:
This work provides a validated AI-assisted segmentation pipeline and a unique dataset for open-heart surgery. It enables accurate and efficient identification of key cardiac structures and lays essential groundwork for real-time AI support and autonomous robotic assistance in the operating room.

ORAL PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1530 - THE GROWNVALVE METHOD A PERSONALIZED REGENERATIVE HEART VALVE

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Background/Hypothesis:
The GrOwnValve method constitutes the worldwide first approach to utilize living autologous pericardium to produce and implant a personalized heart valve replacement in a 2-hour point-of-care solution in the operating room. This method aims to overcome the limitations of current heart valve replacements which either require lifelong medication or fail due to calcification. More importantly, traditional artificial valves do not grow, posing significant challenges for children requiring repeated surgeries.

Materials and Methods:
Here we present the results of the research and development process of the autologous heart valve. We present in silico, in vitro and in vivo data of preclinical trials that led to approval for a clinical study. In addition, the verification and validation plan for the endogenous heart valve is described. A total of 5 medical devices were developed and combined in a modular system. This Procedure Pack is manufactured individually for the treatment of each patient: 3D imaging data (MRI/CT) is used to produce a patient-specific mould by rapid prototyping. After being harvested minimally invasively, the patient's pericardium is moulded and cross-linked in a novel collagen fixation formula which keeps the cells alive, sutured into a stent, crimped and folded into a delivery system for transfemoral deployment.

Results:
Preliminary results indicate the feasibility of creating a functional, patient-specific pulmonary valve from autologous tissue implanted by minimally invasive transcatheter technology.
The implants showed signs of regeneration which is crucial for pediatric patients with valve defects.

Conclusions:
The GrOwnValve method shows promise as a durable and adaptable custom-made solution for valve replacement. This approach has the potential for game-changing advancements in heart valve therapy, particularly for children who require valves that regenerate and grow with them. Clinical multi-center studies will be needed to assess long-term outcomes and expand the treatment to a larger pediatric population.

ORAL PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

2354 - POST OPERATIVE PERFUSION INDEX AND OUTCOME IN HIGH RISK PEDIATRIC CARDIAC SURGERY

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Riley Hospital For Children, Pediatric Critical Care, Indianapolis-United States [1] Riley Hospital For Children, Pediatric Cardiology, Indianapolis-United States [2]

Background / Hypothesis:
Children undergoing high-risk congenital heart surgeries, particularly those classified as STAT categories 4 and 5, face significant postoperative morbidity and mortality, largely due to early systemic circulatory failure. Timely identification of impaired perfusion is critical, yet current modalities—such as lactate levels, central venous oxygen saturations, and near-infrared spectroscopy—are either invasive or limited in predictive value. Peripheral perfusion index (PI), a continuous, non-invasive measure derived from pulse oximetry, has shown promise in adult critical care but remains underexplored in pediatric cardiac surgery.

Materials and Methods:
This single-center retrospective cohort study analyzed 223 pediatric patients who underwent STAT 4 or 5 surgeries between January 2021 and December 2024. Using high-resolution vital sign data from the Etiometry platform, we examined PI trends over the first 24 postoperative hours and assessed their association with in-hospital mortality and secondary outcomes.

Results:
Non-survivors demonstrated significantly lower PI values at all timepoints. On multivariate analysis, lower median PI during the first 6 hours postoperatively was independently associated with increased odds of in-hospital mortality (aOR: 0.52, p = 0.047). An abnormal PI (<0.7) in this early period was linked with a threefold increase in mortality risk. PI was also inversely associated with key secondary outcomes, including 30-day mortality, dialysis, neurologic complications, low cardiac output syndrome, ECMO use, and cardiac arrest. Additionally, higher PI correlated with shorter ICU and hospital stays.

Conclusions:
Our findings suggest that peripheral perfusion index is a valuable early biomarker of adverse outcomes in pediatric patients undergoing complex cardiac surgery. Its continuous, non-invasive nature offers practical advantages over traditional measures. Future multicenter studies are warranted to validate PI as a routine monitoring tool and integrate it into postoperative care algorithms aimed at improving outcomes in this vulnerable population.

ORAL PRESENTATIONS

Category: Basic Science

1053 - IPSC CMS DERIVED EVS PREVENT MITOCHONDRIAL ABNORMALITIES AND CARDIAC DYSFUNCTION IN SPEG DEFICIENT DCM

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Background / Hypothesis:
Dilated cardiomyopathy (DCM) is a genetically related and early-onset disease with high mortality and no specific treatment. Our previous studies found that during heart development, Speg deficiency leads to down-regulation of total and phosphorylated PGC-1α and mitochondrial abnormalities in heart. Therefore, whether PGC-1α-enriched exosomes (EVs) transplantation in utero could rescue mitochondrial abnormalities and heart failure remains to be addressed.

Materials / Methods:
Conditional Speg knockout mice, induced pluripotent stem cell-derived cardiomyocytes (iPSC-CMs), in utero cardiac micro-injection, proteomics, ultracentrifugation, seahorse assay, co-immunoprecipitation, western blotting and so on were used in this project.

Results:
First, we found that cardiac specific knockout of Speg (Spegf/f; NKX2.5-Cre) in vivo resulted in cardiac dysfunction, corresponding with dilated cardiomyopathy and death. Meanwhile, we detected the down-regulation of oxidative phosphorylation pathway and PGC-1α signaling in Speg silencing cardiomyocytes by proteomics. Then, the immature cristae and lacking ATP production of mitochondria were characterized in vivo and in vitro. Interestingly, since iPSC-CMs-derived EVs carried a high level of total and phosphorylated PGC-1α were identified. We further proved transplanting EVs into embryonic hearts in utero improved mitochondrial structure and function, enhanced cardiac ejection fraction, and rescued survival rate of Spegf/f;NKX2.5-Cre mice. Our studies also demonstrated that Speg, as a kinase, interacted and partially co-localized with PGC-1α in the sarcomeric region.

Conclusions:
Speg deficiency decreased PGC-1α and its phosphorylation which led to mitochondrial abnormalities and cardiac dysfunction. EVs transplantation delivered PGC-1α and promoted mitochondrial maturation, thus rescued heart failure of Speg-deficient DCM. This project addressed a novel pathogenesis of dilated cardiomyopathy and provided important translational medicine insights for the prevention and treatment of this disease.

ORAL PRESENTATIONS

Category: Basic Science

1219 - OUTFLOW TRACT DEFECTS IN THE LRP1 MUTANT MICE ARE ASSOCIATED WITH DYSREGULATED NON CANONICAL WNT SIGNALING AND ALTERED ENERGY METABOLISM

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Background / Hypothesis:
We demonstrated cardiac neural crest cell (CNCC) targeted Lrp1 conditional knockout mice exhibit double outlet right ventricle (DORV) and atrioventricular septal defect (AVSD) with its cardiac defect recapitulated in mutant mice harboring a Lrp1 missense mutation. To Investigate the cellular and molecular basis for how Lrp1 deficiency in CNCC can lead to outflow tract (OFT) defects, we conducted molecular profiling of the Wnt1+/cre: Lrp1f/f mutant embryos.

Materials and Methods:
3D reconstructions of the outflow tract (OFT) were created from the 2D serial image stack collected via Episcopic confocal microscopy for quantifying endocardial and OFT cushions. Cell proliferation and apoptosis were assessed with PH3 and TUNEL immunostaining. 10X Genomics single-cell RNA sequencing (scRNASeq) V3.1 kit was used to analyze the pooled OFT from Wnt1+/cre: Lrp1f/f mutant and littermate control embryos.

Results:
A significant reduction was observed in the OFT volume in the Wnt1+/cre: Lrp1f/f embryos at E10.5-E11.5. This was associated with reduced cell proliferation and increased apoptosis. Unsupervised clustering of the OFT scRNAseq data obtained from E11.5 OFT showed fewer cells in the mesenchymal and vascular smooth muscle cell clusters in Wnt1+/cre: Lrp1f/f mutants, indicating a disturbance in CNCC deployment. Dysregulation in energy metabolism was also noted with changes in IGF signaling and mitochondrial gene expression. A decrease in Wnt5a/Wnt11 expression was noted in the vascular smooth muscle cell lineage in Wnt1+/cre: Lrp1f/f mutants. Analysis of downstream signaling showed p44/42 MAPK signaling, instead of increasing, was decreased in Lrp1 mutant heart. This suggests loss of downstream non-canonical mediated signaling in the Lrp1 mutant heart.

Conclusions:
We showed OFT volume reduction in the Lrp1 deficient mice is accompanied by dysregulated non-canonical WNT signaling pathways. We propose the disruption of non-canonical signaling together with dysregulated energy metabolism in the OFT may underlie the DORV phenotype in Lrp1 mutant mice.

ORAL PRESENTATIONS

Category: Basic Science

2457 - MINIATURIZED PEDIATRIC LIVING MYOCARDIAL SLICES AS A NOVEL MODEL FOR CONGENITAL HEART DISEASE RESEARCH

Yannick Taverne [1], Ziyu Zhou [1], Natasja De Groot [2], Beatrijs Bartelds [3], Ad Bogers [1]
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Background / Hypothesis:
Within congenital heart disease (CHD), traditional in-vitro and animal models often fall short in replicating the intricate cardiac structure and function. The recent development of living myocardial slices (LMS) marked a significant advancement in cardiac research. However, widespread use is hampered by tissue availability and size restrictions within the pediatric population. In this study, we 1) establish the feasibility of generating pediatric mini-LMS, 2) characterize their biomechanical properties per disease etiology and 3) examine the age effect on their biomechanical profiles.

Materials and Methods:
Right ventricular tissue was obtained from patients undergoing CHD surgical repairs (ventricular septal defect, tetralogy of Fallot (TOF) and right ventricular outflow tract obstruction). Our established protocols were adopted to produce mini-LMS of 300 µm thick and cultured in custom-made biomimetic cultivation chambers, under electrical stimulation and fixed preload, providing continuous biomechanical feedback.

Results:
A total of 107 mini-LMS from 20 congenital patients (age 3m-55y) were successfully generated from small myocardial tissue specimens (2–3 mm^3) and could remain in culture for up to 2 weeks. 3 groups were made: TOF (N=54), volume overload (N=30) and functional pressure overload (N=23) (Table1). Volume loaded LMS generated the highest contractile force with the shortest contraction duration and steepest contraction and relaxation proxies (dF/dt). The most distinct contractile pattern was seen in the TOF where force generation is around 1/3rd of the volume loaded group with longer contraction duration and longer time to relax. The contractile properties were not affected by age throughout the 3 groups.

Conclusions:
Here we present the first successful biomimetic culture of congenital mini-LMS (2–3 mm^3) where distinct contractile patterns per disease phenotype are present that are unaffected by age. This platform allows for detailed investigations into structural and functional remodeling in CHD, providing a translational bridge between in vitro experimentation and the clinical

ORAL PRESENTATIONS

Category: Basic Science

2572 - SETD1B VARIANTS PREDISPOSE TO CONGENITAL HEART DISEASES

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Children's Hospital Of Fudan University, Shanghai Key Laboratory Of Birth Defects, Shanghai-China [1]

Background / Hypothesis:
Epigenetic regulation in cardiogenesis has been valued. Reports on the involvement of SETD1B, a member of SET/MLL methyltransferase family that regulates H3K4me3 signal, in the regulation of cardiogenesis are limited. We hypothesized that SETD1B might be associated with the pathogenesis of valve deformity.

Materials and Methods:
Children presenting with valve deformity at the Children's Hospital of Fudan University were enrolled in this study. WES and targeted sequencing was performed after extracting Genomic DNA from peripheral blood samples of the patients and their parents. SETD1B-Overexpression HUVEC cell lines were created by lentivirus infection. Plasmids carrying the patient's pathogenic mutation were constructed. Western Blot, Immunofluorescence Staining, RT-qPCR and Coimmunoprecipitation were performed to investigate the pathogenic mechanism of these mutation sites on SETD1B. RNA-seq, CUT&Tag-seq and ATAC-seq were conducted to explore the underlying regulatory mechanisms.

Results:
A total of 7 missense mutations predicted to be deleterious on SETD1B were found in patients of our research group. Cycloheximide tracking assay showed that mutation site p.V736I may lead to the decrease of SETD1B protein level by affecting protein stability. Then we hypothesized that the mutation might affect the interaction of SETD1B with the COMPASS complex. Co-IP and immunofluorescence colocalization showed that p.V736I might affect the interaction between SETD1B and RBBP5. Domain deletion assay illustrated IDR including the mutation site might be an unreported region of RBBP5 and SETD1B interaction. The expression of SETD1B was upregulated in the TGFβ-induced endothelial-mesenchymal transition(EndMT) model while SETD1B-OE cell line also showed a mesenchymal pattern, suggested that SETD1B was a new positive regulator of EndMT. Conjoint analysis of CUT&Tag-seq ATAC-seq and RNA-seq showed that SOX9 was the downsteam regulated by SETD1B.

Conclusions:
Our findings indicate that SETD1B may play a critical role in EndMT by regulating SOX9 and genetic variations in SETD1B may be associated with the pathogenesis of valve deformity.

ORAL PRESENTATIONS

Category: Cardiac Anaesthaesia

1119 - DETERMINING PERSONALIZED BLOOD PRESSURE TARGETS DURING NEONATAL CARDIAC SURGERY WITH CEREBRAL AUTOREGULATION MONITORING USING TRANSCRANIAL DOPPLER

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Background and Hypothesis:
Brain injury after neonatal cardiac surgery is common, likely caused by hypoxic-ischemic injury due to inadequate perfusion. Monitoring cerebral autoregulation (CA) delineates arterial blood pressure (ABP) limits for compromised cerebral perfusion. These limits of CA can serve as individualized ABP targets to maintain adequate cerebral perfusion. This study aims to evaluate CA estimation using transcranial Doppler (TCD) to establish patient-specific ABP targets.

Materials and Methods:
We monitored ABP and continuously measured cerebral blood flow velocity with TCD during neonatal cardiac surgeries with cardiopulmonary bypass in a prospective cohort study (Wilhelmina Children's Hospital Utrecht, The Netherlands; ClinicalTrials.gov NCT04713605). Eligible infants were term (age <42 days) or preterm (>32 weeks GA, corrected age <42 days) undergoing (semi-)elective surgery with arterial cannula placement. Exclusion criteria included grade III-IV intracranial haemorrhage, emergency surgery, or lack of parental consent. The mean velocity index (Mx) was calculated every 5 minutes as the Pearson's correlation coefficient between ABP and cerebral blood flow velocity. Impaired CA was defined as Mx > 0.45. Mx was plotted against mean ABP in 5 mmHg bins to determine the lower limit of autoregulation (LLA), optimal ABP (ABPopt), and upper limit of autoregulation (ULA).

Results:
The mean gestational age was 38.4 weeks (SD = 0.8), with a mean age at surgery of 6.7 days (SD = 2.0), and a mean birth weight of 3398 grams (SD = 338). The mean monitoring duration was 200.8 minutes (SD = 48.6). The mean LLA was 29.4 mmHg (SD = 6.4), mean ABPopt was 42.0 (SD = 7.0) mmHg, and mean ULA was 49.5 (SD = 4.9). The mean duration with impaired CA was 34.1 minutes (SD = 22.1).

Conclusions:
TCD-based CA calculations provide new insights for optimal ABP management in neonates during cardiac surgery. Limits were noticeably narrower than expected.

ORAL PRESENTATIONS

Category: Cardiac Anaesthaesia

1371 - CEREBRAL CRITICAL CLOSING PRESSURE DURING NEONATAL CARDIAC SURGERY A COMPARISON OF THE 2 POINT FIRST HARMONIC AND IMPEDANCE METHOD.

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Background / Hypothesis:
Patient-specific arterial blood pressure (ABP) targets during neonatal critical congenital heart disease (CHD) surgery, based on cerebral autoregulatory limits and cerebral critical closing pressure (CrCP), may improve cerebral perfusion and reduce complications. In this pilot study we aim to assess three methods to determine CrCP in neonates undergoing CHD surgery, a population with distinct haemodynamic challenges. We hypothesised that the physiology-based impedance method was the most accurate in determining CrCP compared to the two-point (2P) and first harmonic (1H) method.

Materials and Methods:
Ten neonates undergoing (semi-)elective CHD surgery were selected from a prospective study (Wilhelmina Children's Hospital Utrecht, The Netherlands; ClinicalTrials.gov NCT04713605). Inclusion: neonates <42 days old, gestational age > 32 weeks, excluding Grade III-IV intracranial haemorrhage. Patient characteristics, and 10-minute epochs of invasive ABP, electrocardiogram, and cerebral blood flow velocity (CBFV) from transcranial Doppler were collected from the pre- and post-cardiopulmonary bypass (CPB) period. CrCP was calculated with 2P, 1H, and impedance methods. The number of negative (unphysiological) values was compared. Observed CrCP (OCrCP) values (scored independently by three authors) were derived from CBFV-ABP plots where CBFV reached zero. Methods were compared to OCrCP using regression, correlation, and Bland-Altman plots.

Results:
The impedance method showed 0.0% negative values versus 17.7% (1H) and 17.0% (2P). It correlated best with OCrCP (0.92 versus 0.86 for 1H and 2P) and showed the smallest bias, while both other methods showed proportional bias. Impedance CrCP was 26.8 mmHg (IQR 8.5) pre-CPB and 28.1 mmHg (IQR, 6.4) post-CPB.

Conclusions:
The impedance method is the most accurate for CrCP determination in neonatal CHD surgery. The impedance CrCP might be close to the mean ABP, supporting its role as a key perfusion characteristic. Intersubject variability of the CrCP highlights the need for individualised ABP targets to optimise cerebral perfusion and reduce neurological injury.

ORAL PRESENTATIONS

Category: Cardiac Anaesthaesia

2087 - A PRELIMINARY INVESTIGATION INTO THE CORRELATION BETWEEN INDEXED OXYGEN DELIVERY AND POSTOPERATIVE ACUTE KIDNEY INJURY USING SUSTAINED TOTAL ALL REGIONAL PERFUSION FOR THE NORWOOD OPERATION

Alexandra Markunas [1], Lerin Eason [1], Kathryn Radulovacki [1], Katrina Hon [1], Travis Siffring [1], Natalia Diaz-rodriguez [1], Edmund Jooste [1], Warwick Ames [1], Benjamin Andrew [1], *Michael Greenberg* [1]
Duke University School Of Medicine, Department Of Anesthesiology, Durham-United States [1]

Background / Hypothesis:
Nadir indexed delivery of oxygen (DO2i) appears predictive of AKI in the pediatric population during cardiopulmonary bypass (1). This is the first analysis exploring the relationship between acute kidney injury (AKI) and both average DO2i and average DO2i time-dose response (DO2i-TDR) in patients undergoing the Norwood operation using Sustained Total All-Regional (STAR) perfusion (2). We hypothesized average DO2i and average DO2i-TDR would correlate with relative change in serum creatinine (sCr).

Materials and Methods:
We identified 35 patients undergoing the Norwood procedure using STAR perfusion from 9/2023-1/2025. Preoperative and maximum 48-hour postoperative creatinine values were recorded. Perfusion data was gathered using VIPER, including DO2i, and DO2i -TDR using nadir threshold of 340 mL/min/(m squared). Primary outcome was maximum relative increase in sCr from baseline. Kidney Disease: Investigating Global Outcomes (KDIGO) creatinine criteria delineated AKI (3). Analyses included Bayesian generalized additive models with thin plate splines to allow for evaluation of non-linear relationships, alongside univariable Bayesian linear models.

Results:
AKI occurred in 14 patients (40%) within the first 48 postoperative hours. Patients with AKI had similar average DO2i (predicted difference +7, 95% credible interval [-53, 66]) and average DO2i-TDR values (predicted difference +93, 95% credible interval [-375, 562]) compared to those without AKI. At low values, average DO2i was associated with increased predicted maximum relative increase in sCr. Predicted maximum relative increase in sCr gradually grew over the range of average DO2i-TDR, with some evidence for inflection at higher values.

Conclusions:
We identified possible associations between maximum relative change in sCr values and both low values of average DO2i and highly elevated average DO2i-TDR within 48 hours post-op in a STAR cohort. These metrics may serve as potential indicators of renal injury risk in this population.

References:
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ORAL PRESENTATIONS

Category: Cardiac Intensive Care

1063 - THE USEFULNESS OF SST2 AS A PREDICTOR OF PROGNOSIS IN CHILDREN ADMITTED TO THE PEDIATRIC CARDIAC INTENSIVE CARE UNIT

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Introduction
Soluble suppression of tumorigenicity 2 (sST2) is an emerging biomarker for assessing heart failure and myocardial injury. This study evaluates the predictive value of sST2 in pediatric cardiac disease severity.

Methods
We analyzed 41 pediatric patients with congenital or acquired heart disease who underwent sST2 testing in the pediatric cardiac intensive care unit (PCICU) of a tertiary hospital between March 2021 and February 2023. Patients were categorized based on heart failure (HF) presence, and outcomes were compared according to sST2 levels. The correlation between NTproBNP and sST2 for HF was also assessed.

Results
The study included 41 children (21 males, 20 females) with a mean age of 2.6 years. Patients with sST2 >47.8 ng/ml had worse HF prognosis. The high sST2 group had significantly elevated sST2 levels [85.0 (52.5-125.3) vs. 27.2 (19.5-41.1) ng/ml, $P < 0.001$]. The high group showed increased ECMO (42.1% vs. 4.5%, $P = 0.004$) and CRRT use (21.1% vs. 0.0%, $P = 0.025$). HF occurred more frequently in the high group (63.2% vs. 45.5%, $P = 0.047$), along with arrhythmic events (31.6% vs. 4.5%, $P = 0.023$). Hospitalization duration was longer in the high group, though ICU stay, mortality, and heart transplantation rates were similar. sST2 correlated better with HF than NTproBNP, with the strongest predictive value seen in combination (AUC: NTproBNP 0.612, sST2 0.657, sST2+NTproBNP 0.691).

Conclusions
sST2 is a useful biomarker for predicting disease severity and prognosis in pediatric heart disease. Its predictive performance improves when combined with NTproBNP for heart failure assessment.

ORAL PRESENTATIONS

Category: Cardiac Intensive Care

1609 - RISK FACTORS ASSOCIATED WITH AND PREDICTIVE OF AORTOPULMONARY SHUNT OCCLUSION IN INFANTS WITH SINGLE VENTRICLE CONGENITAL HEART DISEASE

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Background:
Patients with single ventricle (SV) congenital heart disease (CHD) who require placement of a surgical aortopulmonary shunt to provide pulmonary blood flow are at risk of thrombosis, which can result in significant morbidity and mortality. Rates of shunt occlusion and risk factors for its development have not been described in the current surgical era, hence, we sought to describe them in our single-center cohort of SV infants.

Methods:
Single-center review of local Pediatric Critical Care Consortium (PC4) and Sickbay physiologic data (Medical Informatics Corp, Houston, TX) of infants with SV CHD who underwent modified Blalock Taussig Thomas shunt (mBTTS) or Norwood-mBTTS at Texas Children's Hospital from 1/1/2015-12/31/2023. Shunt occlusion defined as sudden hypoxemia (decrease ≥25%) requiring either heparin bolus, cardiopulmonary resuscitation or extracorporeal membrane oxygenation. Preoperative, operative and postoperative variables defined by PC4 analyzed using multivariable logistic regression and XGBoost machine learning to identify risk factors associated with and predictive of shunt occlusion.

Results:
One-hundred-fifty-seven patients underwent mBTTS placement (77 patients, 49% Norwood-mBTTS). Fourteen (9%) patients experienced shunt occlusion 17 times. Median age and weight at surgery were 8.3 days (IQR 6.3-16.0) and 3.3 kg (IQR 2.9-3.8), respectively. Median time to shunt occlusion was 6.3 days (IQR 2.2-14.7). Patients with preoperative cardiac arrest (OR 20.5), longer CPBT (OR 1.1) and total anomalous pulmonary venous return (TAPVR) repair (OR 30.0) had increased odds of shunt occlusion ($p<.005$). Machine learning models predicting shunt occlusion showed a best AUC of 0.867 when incorporating these and 9 additional variables (nitric oxide use, chylothorax, cross clamp and circulatory arrest use, open sternum, age, shunt size and ratio to weight, chromosomal disorder).

Conclusions:
Shunted SV patients with preoperative cardiac arrest, TAPVR repair and longer CPBT have an increased risk of aortopulmonary shunt occlusion. Care paradigms aimed at preventing this complication in higher risk profile groups should be considered.

ORAL PRESENTATIONS

Category: Cardiac Intensive Care

1872 - DISCHARGE WITHIN 60 HOURS AFTER ATRIAL SEPTAL DEFECT SURGERY; IS IT SAFE

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Background / Hypothesis:
Atrial septal defect (ASD) accounts for approximately 10% of all congenital heart defects. Studies have shown that transcatheter procedures reduces hospital stays, infection rates, complications and costs, however, information on early discharge after surgical ASD closure is limited.
European society of cardiology defines early discharge after intervention as less than 3 days. A study in the journal of cardiac surgery defined shorter hospital stay after cardiac as less than 3 days.
The objective is to study the safety of early discharge (<3 days) after surgical ASD closure, by assessing hospital readmissions, post-discharge complications, and early extubation rates (on table and within 8 hours in ICU).

Materials and Methods:
This is a retrospective cohort case series conducted from May 2023 till December 2024 at the Department of the Cardiothoracic Sciences, SIUT, Karachi, Pakistan.

Inclusion criteria: Patients with ASD secundum and sinus venosus.
Exclusion criteria: Patients with ASD primum, associated with other cardiac lesions, unroofed coronary sinus, scimitar syndrome, pulmonary hypertension, other co-morbidities

Results:
Out of 294 cardiac surgeries, 34 ASD repairs met inclusion criteria (30 secundum ASDs 4 sinus venosus). Patient ages ranged from 2 years to 32 years, with 22 females and 12 males. With 32 extubated on-table, Bypass times ranged from 26 to 126 minutes; cross-clamp times, 9 to 73 minutes. Early discharge occurred in 91%: 1 within 24 hours, 20 within 2 days (60%), and 10 within 3 days. Complications according to IQIC criteria occurred in 4 (11%) including 1 re-intubation, 2 SSI, one mortality due to WPW syndrome.

Conclusions:
The ideal duration of hospital stay after ASD repair remains unclear, but early discharge appears safe as shown in our study. Early discharge can reduce bed utilization and allow patients to return to a comfortable environment. However, further research and structured follow-up care protocols are necessary to ensure patients' safety.

ORAL PRESENTATIONS

Category: Cardiac Intensive Care

2376 - PREDICTORS OF WEANING AND EXTUBATION FAILURE IN PEDIATRIC CARDIAC SURGERY THE ROLE OF DIAPHRAGMATIC FUNCTION AND LUNG ULTRASOUND SCORE

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Background / Hypothesis
Failed weaning and extubation in pediatric cardiac surgery patients can lead to cardiorespiratory compromise, prolonged mechanical ventilation (MV), extended ICU/hospital stays, and increased mortality. This study aimed to identify thresholds for diastolic function, diaphragmatic movement, and lung ultrasound score (LUS) as predictors of weaning failure, to support future algorithm development for ventilatory outcomes.

Materials and Methods:
Children under 18 years who underwent cardiac surgery were evaluated postoperatively at three stages: SIMV/PSV mode (M1), CPAP (M2), and while breathing spontaneously (M3). Parameters related to cardiac, diaphragmatic, and lung function were collected. Outcomes were defined as weaning and/or extubation failure.

Results:
Adverse outcomes were associated with younger age (1 [0–7] vs. 11 [4–36] months; p=0.021) and lower weight (3 [3–4] vs. 7 [4–11] kg; p=0.005). No sex differences were noted. Diaphragmatic excursion was significantly reduced in the weaning failure group, especially at M2 and M3. LUS was higher in adverse outcome groups at M1 and M3. Higher LUS correlated with longer MV duration (β=1.7; p=0.009). Right diaphragmatic expiration at M1 and M3 was independently associated with prolonged ICU stay.

Conclusions:
Younger age, lower body weight, reduced diaphragmatic excursion, and elevated LUS were strong predictors of weaning/extubation failure and prolonged ICU/MV duration. These parameters may help develop predictive tools to guide safe and timely weaning in pediatric cardiac surgery patients.

ORAL PRESENTATIONS

Category: Cardiac Morphology in Extended Reality

1396 - UNTWISTING MORPHOLOGICAL UNDERSTANDING OF 'TWISTED HEARTS' WITH VIRTUAL REALITY

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Background:
Twisted hearts (Criss-Cross Hearts 'CCH', Topsy Turvy Hearts 'TTH' and Supero-inferior ventricles 'SIV') are rare spatial abnormalities resulting from varying degrees of rotation/ twisting/tilting of heart. Morphological complexities make imaging and surgical planning difficult. Embryogenetic basis & anatomical spectrum are incompletely understood. Novel 3D-Virtual-Reality (3DVR) tools can offer radical immersive insight.
We aimed to study morphological spectrum and 'atrioventricular twisting' in twisted hearts using 3DVR and graphic tools.

Methods:
14 consecutive twisted-hearts (11 CCH, 1 TTH, 3 SIV) were prospectively studied; 10 non-CHD and 5 CCTGA hearts were anatomical controls.
'Digital twins' were created from CT/MRI data using 3D-modelling software (Elucis, Vea Simulations). Morphology was analyzed and digitally dissected in immersive 3DVR. AV-valve-plane-intersection-angles (AVVPIA) were determined using 3D-design tools (3Matic).

Results:
VR enabled deeply immersive morphological assessment. AV-discordance was noted in 5/11 CCH. Large inlet VSD was present predominantly. Among CCH - ventriculoarterial connections were concordant in 1, discordant in 1, DORV in 9; arteries were d-malposed (6), l-malposed (4) and side-by-side (1). Morphological RV was superior irrespective of AV-concordance, with curved ventricular septum and inlet VSD; additional muscular VSD in one case.
All SIV cases had AV-concordance, superior RV, DORV, inlet VSD, uptilted apex. TTH showed extreme (>90) cardiac rotation, shifting great artery origins towards bottom-posterior aspect; aortopulmonary window was singular intracardiac defect.
AV-valve inflow-planes were nearly parallel in controls - mean AVVPIA 13.5±4.2 in non-CHD hearts and 18.9±6.3 in CCTGA. Despite extreme rotation, they remained nearly parallel in TTH (21.80) while SIV hearts showed crossing planes (mean 37± 9). Crossing AV inflows was defining feature of CCH (mean 56±2) - more in AV-concordant (mean 67±12, clockwise twist), than AV-discordant hearts (mean 34±20, counterclockwise twist).

Conclusion:
Immersive 3DVR provided unique morphological insight into twisted hearts and novel means to objectively study twisting/rotation, aiding treatment planning.

ORAL PRESENTATIONS

Category: Cardiac Morphology in Extended Reality

2481 - VISUALISING THE CONDUCTION SYSTEM IN TETRALOGY OF FALLOT USING HIERARCHICAL PHASE CONTRAST TOMOGRAPHY TO INFORM SAFER SURGICAL STRATEGIES

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Background / Hypothesis:
Right bundle branch (RBB) block and postoperative arrhythmias are common after surgical repair of Tetralogy of Fallot (TOF). A potential cause is iatrogenic disruption of the atrioventricular conduction axis, either through direct injury during ventricular septal defect (VSD) closure or by damaging surrounding tissue, creating arrhythmogenic changes. We hypothesised that high-resolution ex-vivo imaging could reveal anatomical variations that could guide safer suture placement during VSD repair.

Materials and Methods:
Eighteen paediatric hearts (11 TOF—3 repaired, 8 unrepaired—and 7 age-matched controls) were imaged at beamline BM18, ESRF, using Hierarchical Phase-Contrast Tomography (HiP-CT). Manual segmentation of the atrioventricular conduction system was performed in Amira 2023.2 and VGStudioMax 2024.4. Morphology and position of the penetrating bundle and right bundle branch were analysed using Neuroglancer and custom Python pipelines. 3D visualisation was performed in Amira, VGStudioMax, and Virtual Reality.

Results:
TOF hearts displayed a heterogeneous, less compact conduction system, frequently draping over both septal sides, resembling a fetal phenotype compared with controls. The RBB often branched late and, in half the cases, lacked association with typical surgical landmarks such as the medial papillary muscle. Native TOF hearts had a significantly smaller RBB cross-sectional area (0.05 ± 0.20 mm^2) than controls (0.50 ± 0.20 mm^2, $p = 0.0045$, NS), whereas repaired TOF hearts (0.20 ± 0.10 mm^2) were closer to controls. High-risk zones included the septal crest and the posterior-inferior margin to the upward curvature of the VSD. A small 'safe zone' was identified between this curvature and its intersection with the aortic valve, beneath the inferior limb of the septomarginal trabeculation.

Conclusions:
This first paediatric congenital HiP-CT series in TOF reveals a vulnerable, morphologically variable conduction phenotype with direct surgical relevance. These findings could inform conduction-sparing VSD repair strategies, improve arrhythmia prevention, and enhance outcomes in congenital heart disease.

ORAL PRESENTATIONS

Category: Cardiac Nursing

1112 - THE USE OF KAIZEN BY NURSES FOR PREPARING AIRWAY TROLLEY IN A PEDIATRIC CARDIAC INTENSIVE CARE UNIT

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Background / Hypothesis:
The readiness of essential equipment like airway trolleys is critical in pediatric cardiac intensive care units (PCICUs). Kaizen, a Lean management principle, has been increasingly applied in healthcare to enhance efficiency and patient care. This study investigates the transformative impact of Kaizen principles on airway trolley preparation in a 10-bedded PCICU. The underlying hypothesis of this initiative posits that employing Kaizen principles, which are synonymous with continuous improvement and waste reduction, will lead to a more efficient and organized process for airway trolley preparation in our PCICU. This, in turn, is expected to enhance patient care, reduce the frequency of errors, minimize waste, optimize response times during emergencies, and improve overall nursing satisfaction

Materials and Methods:
A 12-month prospective observational study was conducted between 1st January 2024 to 31st December 2024. Kaizen was introduced in the system on 1st July 2024. Pre- Kaizen and post-Kaizen data were compared to evaluate its impact on response times, preparation efficiency, error reduction, resource utilization, and nursing satisfaction.

Results:
We demonstrated a significant reduction in response times during pediatric cardiac emergencies, from 4.82 to 2.14 minutes, post-Kaizen ($p < 0.001$). Time spent on airway trolley preparation decreased significantly from 12.5 to 7.3 minutes ($p < 0.001$). The frequency of errors in preparation plummeted from 4.2 to 1.1 errors per month. Waste reduction was achieved through streamlined processes, with nurses reporting a 30% reduction in preparation time. Nursing staff expressed heightened confidence and preparedness during high-stress situations.

Conclusions:
The application of Kaizen principles significantly optimized airway trolley preparation processes, highlighting their potential for broader healthcare applications.

ORAL PRESENTATIONS

Category: Cardiac Nursing

1134 - IMPACT OF A TRANSITION PROGRAM ON TRANSITION READINESS IN ADOLESCENTS WITH CONGENITAL HEART DISEASE RESULTS FROM A RANDOMIZED CONTROLLED TRIAL

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Background / Hypothesis:
The transition from pediatric to adult care for adolescents with congenital heart disease (CHD) is critical, often leading to decreased disease control and care gaps. Transition programs aim to facilitate this process, but their effectiveness remains uncertain. This study investigates the impact of a structured, person-centered transition program on transition readiness in adolescents with CHD.

Materials and Methods:
This secondary analysis utilized data from the STEPSTONES randomized controlled trial (RCT), conducted as a multi-center study in Sweden from 2017 to 2021. The trial employed an RCT with individual randomization at two CHD centers. Participants aged 16years with CHD were randomized to either the intervention or control group, with all participants receiving usual care. Transition readiness was assessed using the Readiness for Transition Questionnaire (RTQ) at baseline (age 16), 17 years, and 18.5 years. Sociodemographic and clinical data were also collected. Statistical analyses were performed using Fisher's nonparametric permutation test in SAS version 9.4, with all significance tests being two-sided at a 5% significance level.

Results:
The study included 114 participants in the full-analysis set (n=54 intervention group, n=60 control group). There were no significant differences in sex, CHD complexity, comorbidities, CHD medication, and living situation at baseline. The intervention group demonstrated significantly higher overall transition readiness scores compared to the control group at 18.5 years (p= .0095).

Conclusions:
The findings suggest that a structured, person-centered transition program improves transition readiness in adolescents with CHD, potentially leading to better disease management and continuity of care. Implementing such programs in clinical practice may mitigate the risks associated with the transition to adult care for this vulnerable population.

ORAL PRESENTATIONS

Category: Cardiac Nursing

1956 - BUILDING CAPACITY IN PAEDIATRIC CARDIAC AND MEDICAL SURGICAL CRITICAL CARE UNITS AN INNOVATIVE NEW GRADUATE NURSE RESIDENCY PROGRAM

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Background / Hypothesis:
The impact of Covid-19 pandemic on healthcare resources, high acuity and complexity of patient care needs, and stressful working conditions have led to challenges in recruiting/ retaining nurses in paediatric critical care units (CCUs). This prompted a need to explore the new graduate nursing market. The Critical Care New Graduate Nurse Residency Program offers a unique and innovative pathway to attract early career nurses with interest in paediatric critical care. Grounded in a competency-based scaffolded experiential learning approach, the program is designed to equip new graduate nurses with the knowledge, skills, and confidence required for success in pediatric critical care. The objective was to design, implement and evaluate a Critical Care New Graduate Nurse Residency Program.

Materials and Methods:
This structured year-long program integrates didactic education, high-fidelity simulation, preceptor-led clinical immersion, and mentorship. The curriculum is designed to build competency in critical care foundations, advanced assessment and technical skills, critical thinking, along with clinical judgement.

The program was developed and piloted in collaboration with 8 inpatient units and 2 critical care units. A dynamic curriculum was developed using a blended learning approach. The program evaluation used both qualitative and quantitative methods, focusing on effectiveness and graduates' experiences.

Results:
Since its launch in September 2022, the program has welcomed 100 new graduate nurses, with 82% transitioning to the critical care unit and an organizational retention rate of 94%. Evaluation data demonstrates positive outcomes in nurse confidence, knowledge acquisition and retention, emphasizing program's effectiveness in bridging the gap between academic preparation and clinical practice. Qualitative feedback from focus groups reinforces these findings, highlighting the scaffolded approach effectively prepares new graduates for critical care.

Conclusions:
Recruitment/retention in critical care nursing continue to be challenging in today's environment. A standardized competency-based development program can effectively support new graduate nurses as they transition safely into critical care roles helping them

ORAL PRESENTATIONS

Category: Cardiac Surgery

1105 - LONG TERM OUTCOMES OF SYSTEMIC RIGHT VENTRICLE IN BIVENTRICULAR CIRCULATION A COMPARATIVE STUDY

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Background / Hypothesis:
Systemic right ventricle (SRV) failure poses a significant clinical challenge. Given the physiological similarities between two biventricular circulation conditions—transposition of the great arteries (TGA) post-atrial switch and congenitally corrected TGA (ccTGA)—this study explores differences in disease progression.

Materials and Methods:
A retrospective review was conducted on 100 patients with SRV and biventricular circulation treated at Siriraj Hospital between 1979 and 2022. Patients were categorized into two groups: (1) TGA post-atrial switch (n=54) and (2) ccTGA (n=46). Clinical outcomes and mortality were compared.

Results:
All TGA patients underwent an atrial switch procedure: Senning (7.4%) or Mustard (92.6%). The median follow-up was 24.56 years (IQR 19.54) for TGA and 18.35 years (IQR 28.52) for ccTGA. No significant differences were found in arrhythmia incidence (p=0.16) or implantable cardioverter-defibrillator use (p=0.13). Severe tricuspid regurgitation (TR) occurred in 3 (5.5%) TGA patients and 7 (15.2%) ccTGA patients (p=0.18). Moreover, freedom from TR replacement at 30 years was 91.4% in ccTGA and 80.7% in TGA (p=0.42). Right ventricular dysfunction was more prevalent in TGA than ccTGA (38.9% vs. 19.6%, p=0.036). Freedom from SRV failure at 10, 25, and 40 years was 94.1%, 88%, and 53.1% in TGA, compared to 97.1%, 89.6%, and 55.8% in ccTGA (p<0.05). The 25- and 40-year survival rates were 96.7% and 86.8% in TGA, and 89.3% and 62.5% in ccTGA (p=0.49).

Conclusions:
Our study highlights distinct outcome differences in SRV patients with biventricular circulation. TGA patients exhibited a higher prevalence of systemic right ventricular failure. However, the incidence of tricuspid valve regurgitation, need for valve replacement, arrhythmia, and overall survival rates were comparable between groups.

ORAL PRESENTATIONS

Category: Cardiac Surgery

1161 - THE SERVICE OF CONGENITAL HEART SURGERY IN LITHUANIA DURING THE GLOBAL CORONAVIRUS PANDEMIC

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Background:
Congenital heart surgery is an extremely specific and complex medical specialty. Specialists of this field offer crucial medical help for people with congenital heart disease which is the most common form of all congenital anomalies. According to the literature, recent coronavirus disease 2019 pandemic posed significant challenges in maintaining the service of congenital heart surgery worldwide. In Lithuania, a European country with a population of approximately 2,9 million people, this service is provided in only one hospital. During the pandemic, this hospital experienced extreme deviations from its regular workload, as it was the main institution for the sickest coronavirus patients. Various restrictions related to the pandemic crisis further limited access to regular healthcare. Despite these challenges, the service of congenital heart surgery had to be maintained throughout the whole pandemic event.

Materials and Methods:
To evaluate the pandemic effect on the service of congenital heart surgery in Lithuania during the coronavirus pandemic, the activity (number of admissions, surgeries in general and by type) and short-term outcomes of a single national center of congenital heart surgery during the entire length of the pandemic event was retrospectively analysed and compared to a matched pre-pandemic cohort.

Results:
The number of inpatient admissions and surgical procedures was similar in both groups. During the pandemic, significantly lower median patient age and increased number of urgent cases was observed. Also, the median stay in the hospital was significantly longer in the pandemic group. No difference in early postoperative mortality was found between the groups.

Conclusions:
In Lithuania, it was possible to maintain accessibility and quality of congenital heart surgery service for patients of all ages during the whole period of coronavirus disease 2019 pandemic. It was achieved despite the presence of various crisis related restrictions and the challenges of working in the main pandemic hospital.

ORAL PRESENTATIONS

Category: Cardiac Surgery

1196 - MANAGEMENT OF AORTIC ARCH HYPOPLASIIA WITH INTRACARDIAC DEFECTS IN INFANTS SINGLE STAGE VERSUS TWO STAGE REPAIR

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Background / Hypothesis:
The optimal treatment strategy for infants with hypoplastic aortic arch is controversial. The results of single-stage and two-stage repair for infants with hypoplastic aortic arch with intracardiac defect have improved. The aim of this study was to evaluate our 10 years experience with different surgical approaches

Materials and Methods:
A retrospective study enrolled 445 consecutive patients who underwent aortic arch repair in infancy from 2014 to 2023. There were 284 (63.8%) males and 161(36.2%) females. The mean age of the patients was 2.3±0.8 months. The mean weight was 4.8±1.9 kg. 286 patients had associated intracardiac anomaly. These patients were divided into two groups: Group 1 (148 patients) underwent single-stage total repair in addition to arch repair, and Group 2 (138 patients) underwent pulmonary artery banding concomitant to arch repair

Results:
The overall hospital mortality was 4.2%: 2.4% (4 patients) in Group 1and 5.8% (8 patients) in Group 2 ($p < 0.05$). Follow-up period ranged from 1 month to 9.4 years (mean 2.8 ± 2.5 years). Restenosis at the site of aortic arch repair was identified in 14 cases (9.4%) in Group 1 and in 16 cases (11.5%) in Group 2. The most determining factors for restenosis were related to hypoplastic proximal aortic arch and body weight less than 2.5 kg. Mean interval from primary arch repair to reintervention for recurrent aortic obstruction was 8.4±1.2 months. Independent risk factors for reintervention because of restenosis, were a hypoplastic proximal aortic arch ($P = 0.002$) and a body weight less than 2.5 kg ($P = 0.004$) at primary repair. Freedom from reintervention was 87.5% in Group 1 versus 50.2% in Group 2 ($p < 0.0001$)

Conclusions:
Our experience has confirmed better results with single-stage repair of aortic arch hypoplasia with intracardiac defects in infants, which had lower mortality, and lower need for reintervention

ORAL PRESENTATIONS

Category: Cardiac Surgery

1241 - RISK FACTORS AND TYPES OF INTERVENTIONS POST TETRALOGY OF FALLOT SURGICAL REPAIR

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Background / Hypothesis:
Reinterventions after tetralogy of Fallot repair (TOF) remains a common clinical problem. The objective
of this study was to evaluate types of reintervention after TOF repair and identify the risk factors for reinterventions.

Materials and Methods:
This retrospective study was conducted from 2010 to 2022 and included 171 patients with complete TOF
repair. Patients were grouped according to the occurrence of reintervention into two groups: patients who did not
have reintervention (n = 138) and those who required reintervention (n = 33).

Results:
Median follow-up was 36 (13–67) months. The first reintervention was required in 33 patients. Freedom from the first reintervention at 1, 3, 5, and 7 years was 91%, 85%, 81%, and 76%, respectively. Surgical reintervention was required in 12 patients and transcatheter intervention in 21 patients. Second reinterventions were required in 11 patients; 4 had surgery, and 7 had a transcatheter intervention. Third reinterventions were performed on two patients; one had surgery, and one had a transcatheter intervention. The most common interventions were performed at the level of pulmonary arteries (n = 17), followed by the pulmonary valve and the right ventricular outflow tract (n =15). The risk of reintervention was associated with the low weight (HR: 0.65 (95% CI: 0.48–0.88); P = 0.005) and small LPA diameter (HR: 0.36 (95% CI: 0.21–0.60); P < 0.001) at the time of the primary intervention and the nonuse of the transannular patch (HR: 0.27 (95% CI: 0.08–0.85); P = 0.026)

Conclusions:
The risk of reintervention is high after tetralogy of Fallot repair. In our experience, the smaller the left pulmonary artery and weight at the repair time increased the risk of reintervention. Using a transannular patch in our series was associated with a lower risk of reintervention.

ORAL PRESENTATIONS

Category: Cardiac Surgery

1256 - IMPACT OF ADJUSTABLE PULMONARY ARTERY BAND ON OUTCOMES OF ANOMALOUS LEFT CORONARY ARTERY FROM PULMONARY ARTERY REPAIR

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Background:
ALCAPA is a rare congenital anomaly resulting in myocardial ischemia, global left ventricular(LV) dysfunction, and mitral regurgitation(MR). Surgical placement of a pulmonary artery band(PAB) at ALCAPA repair may assist with recovery of patients with severe LV dysfunction (EF<25%). The purpose of this review was to assess the outcomes of these patients.

Methods:
We performed a retrospective analysis of cases presenting to our center between 2007 and 2024. Baseline and follow-up data were collected from records, ventricular function was assessed by standardized transthoracic echo.

Results:
Twenty-five patients underwent ALCAPA repair at median age of 4months. Surgery was performed by direct coronary reimplantation in all patients. Since 2017, we used an adjustable PAB in five patients with severe LV dysfunction(<25% EF). Two patients with EF<25% from the non-PAB group were supported by extracorporeal membrane oxygenation(ECMO) with median duration of 3.5 ECMO days. In patients with EF<25% that received PAB, none needed ECMO or transplant. The mean duration of postoperative follow-up was 7.4+4.5years. There were no early or late deaths, and two patients, both from non-PAB group required reoperation: MV repair with coronary artery augmentation(n=1) and a heart transplant(n=1). Figure shows comparisons between patients with and without PAB and EF<25% compared to patient without PAB and EF>25%.

Conclusions:
Surgical repair of ALCAPA has excellent outcomes with no mortality and low reintervention rates. There is marked improvement of MR grade, return to normal LV function, and no mortality during a 10-year period in the group with EF>25%. Patients with a PAB who present with EF<25% demonstrate a trajectory towards improvement. Temporary adjustable PAB may be beneficial in patients with severe dysfunction as evidenced by no need for ECMO or transplantation in the PAB group despite severe dysfunction.

ORAL PRESENTATIONS

Category: Cardiac Surgery

1269 - PROPOSING GUIDELINES AND EVALUATION OF TWO STAGE ARTERIAL SWITCH AS A TREATMENT STRATEGY IN THE MANAGEMENT OF DELAYED PRESENTATION OF TRANSPOSITION OF THE GREAT ARTERIES WITH A REGRESSED LEFT VENTRICLE.

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Background / Hypothesis:
Arterial switch operation (ASO) is the ideal treatment in transposition of the great arteries with intact ventricular septum (TGA/IVS). Two stage ASO is one form of treatment in TGA presenting late. The guideline on how to train LV is not clear in literature

Materials and Methods:
From 2010 to 2024, 55 patients with TGA-IVS presented late and were not suitable for immediate ASO due to left ventricle (LV) regression. As no extracorporeal membrane oxygenation (ECMO) program exists, the patients were selected for a two stage ASO. PA band (PAB) and or a modified Blalock-Taussig (BT) shunt was done as an initial Stage I. Serial echocardiography was used to assess the growth of LV posterior wall. A stage II ASO was done a few weeks later. Retrospective review of patient charts was done. Statistical analyses were performed with the statistical package SPSS for Windows (Version 13.0, SPSS, Chicago).

Results:
55 patients underwent Stage I. 35 patients underwent isolated PAB, 17 patients underwent PAB and BTS and in 3 patients PDA stenting was done. Stage I had an in hospital mortality of 21%, while the interval mortality was 11.6%. The mean interval between the two stages was 3 ± 1 weeks. 38 patients have undergone a successful Stage II ASO. Stage II mortality was zero. All patients had remarkably rapid recoveries and short hospital (6± 2 days) stay.

Conclusions:
Early experience indicates that two-stage arterial switch is an acceptable treatment option. Patients who survived Stage I and the interval period have excellent results with Stage II. We recommend to pressure load only by PAB and if atrial communication is small then Balloon atrial septostomy (BAS), and then PAB, and in older patients, PDA stent to volume load. Avoid BTS in large ASD. Prospective studies are required to strengthen our proposition.

ORAL PRESENTATIONS

Category: Cardiac Surgery

1270 - ANOMALOUS ORIGIN OF LEFT CORONARY ARTERY FROM THE PULMONARY ARTERY EXPERIENCE AND MODIFICATIONS

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Background / Hypothesis:
Anomalous origin of the left main coronary artery from the main pulmonary artery (ALCAPA) is a rare congenital abnormality, affecting 1 in 300,000 live births and accounting for 0.25%–0.5% of all CHD. If left untreated, up to 90% of pediatric patients with this syndrome die within the 1st year of life. Survival to adulthood is rare.
Symptoms are due to “coronary steal” phenomenon, in which a left-to-right shunt from the RCA to LCA leads to abnormal left ventricular perfusion, sub-endocardial ischemia leading to infarction and left ventricular dysfunction. Diagnosis is an indication of SURGERY.

Materials and Methods:
Retrospective review of patients with echo diagnosis of ALCAPA, from December 2005 to December 2024 a total of 25 patients. We made some recent changes in perfusion strategy from 2012 and found change in outcomes of this treatment strategy in this cohort of patients. In pre 2010 era there was high mortality, due to low cardiac output and arrhythmias. We then changed the perfusion strategy by simultaneously cannulating aorta and MPA and perfusing MPA along with aorta after snaring branch PA for 15 min with LV vent in LA. We let the heart beat empty with LCA being perfused, to protect the myocardium.

Results:
The mean age was 4 months(2-11months)and mean weight was 4.18 kg(2.6-6 kg). The mean Pre-op EF was 20% (15-25%), and pre-op MR was mild in 7 and moderate in 5. The surgery was LCA translocation in 22, Takeuchi in 2 and use of pericardial tube in 1 patient.
Mortality after change in perfusion strategy was significantly low.

Conclusions:
Early experience indicates that in a developing country like Pakistan, where an ECMO program does not exist, surgery for ALCAPA was very high risk with poor outcome. Modification in perfusion strategy with myocardial protection has definitely improved outcome. Further prospective studies are required to prove efficacy.

ORAL PRESENTATIONS

Category: Cardiac Surgery

1299 - MIDTERM OUTCOMES OF HANDMADE PERICARDIAL VALVED CONDUITS FOR CARDIAC SURGERY IN CONGENITAL HEART DISEASE A VIABLE COST EFFECTIVE ALTERNATIVE IN RESOURCE LIMITED SETTINGS

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Background / Hypothesis:
The availability and affordability of conduits have been a significant challenge for congenital heart surgery in low-resource settings. This study presents the intermediate-term outcomes of low-cost hand-made conduits at our institution.

Materials and Methods:
A retrospective review of our surgical database and hospital information system (2016-2023) was done. Handmade conduits (cost: 30% of commercial conduits) were prepared in the operating room prior to surgery, using bovine pericardium for the conduit body tailored to the exact required diameter, with 0.1mm PTFE valve leaflets.

Results:
185 patients were operated using handmade conduits [median age: 1.58 years (0.75–6.92), weight: 8.40 kg (6.30–17.03); conduit diameter 15 mm (13–20); cardiopulmonary bypass time 191.5 min (160–238) and aortic cross-clamp time 106.5 min (73.8–145)]. 17.3% (32/185) had a syndromic association. Postoperative outcomes included mortality of 3.8 % (7/185), ICU stay of 72 hours (44–120), ventilation duration of 19 hours (7–39), and hospital stay of 15 days (IQR: 11–20). Endocarditis occurred in 5 (2.7%) patients (Late in 3, Early in 2). The median follow-up duration was 29.5 months (14–59.5). The peak conduit gradient on follow-up was 40 mmHg (IQR: 22.8–63.8); 70 (43.8%) had a conduit gradient of < 40 mmHg on follow-up, 36 (22.5%) had a gradient between 40-60 mmHg, and 37 (23.1%) had a gradient > 60 mmHg. Aneurysm of the conduit was observed in 3.7% (6/160) of patients. Some conduit regurgitation was noted in 56% and was severe in 7.2%.
Reinterventions included 22 transcatheter procedures [18 balloon, 4 stents; 24 months (12.2-34.7)]; 29 had conduit replacements (37 months (21-65)]. Freedom from reintervention/ reoperation was 27% (95% CI: 14-52) at 80 months(Table 1).

Conclusions:
Preliminary experience with handmade pericardial valved conduit suggests acceptable early and midterm outcomes. This is a reasonable low-cost alternative to commercially available conduits, thus making it particularly attractive in low-resource settings.

ORAL PRESENTATIONS

Category: Cardiac Surgery

1378 - A CARDIAC SIMULATOR "PED UT HEART" TO SUPPORT DECISION MAKING FOR SURGICAL PROCEDURES IN COMPLEX CONGENITAL HEART DISEASE CLINICAL STUDY RESULTS AND CLINICAL TRIAL DESIGN

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Background:
To support surgical decision making in complex congenital heart disease (CHD), a novel computer-based cardiac simulator called "ped UT-Heart" has been developed in which a patient-specific finite element model simulates cardiac functions and predicts hemodynamics of different virtual surgeries. In this study, we validated the accuracy, usefulness, and safety of the "ped UT-Heart" simulation system.

Materials and Methods:
A single-arm, prospective, multicenter clinical trial (jRCTs052210139) was conducted in 16 patients with complex CAD. The primary endpoint was an overall rating of essential or very useful on a 5-point Likert scale. In the clinical trial, four patients were excluded due to delayed surgery, and the remaining 12 patients (median age, 2y8m) were assessed for usefulness.

Results:
Pre and post-operative simulation data showed good correlation with patient catheter data. There were no adverse events related to the simulation system. Nine of the twelve patients (75%) were rated as essential or very useful, and the lower limit of the 95% CI was 42.8%, indicating that the results met the primary endpoint.

Conclusions:
The results indicate that the "ped UT-Heart" is a safe, reliable, and useful cardiac simulator for decision support in complex CHD surgical procedures. We now plan to conduct a single-arm, prospective, multi-center, physician-led clinical trial of the ped UT-Heart in 20 patients with complex CHD to obtain regulatory approval for the device. The primary endpoint is the same as in the above-mentioned clinical trial. We also plan to verify the reproducibility of the "ped UT-Heart" system. This verification will range from segmenting the heart from MSCT images to completing the computational model with an appropriate parameter set.

ORAL PRESENTATIONS

Category: Cardiac Surgery

1520 - A 60 YEAR EXPERIENCE WITH EBSTEIN`S ANOMALY EVOLUTION OF SURGICAL TECHNIQUES IN A SINGLE INSTITUTION

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Background / Hypothesis:
Over the past decades, surgical techniques have evolved significantly, improving patient outcomes. This study aims to describe the evolution of surgical approaches for Ebstein anomaly. Currently, for many leading cardiac centers Cone procedure is a method of choice for surgical treatment.

Materials and Methods:
From 1965 to 2025, at the Ukrainian Cardiac Center surgical treatments were performed in 408 patients with Ebstein anomaly. Two periods were identified: conventional repair (1965-2011 yy.) and Cone procedure (2012-2025 yy.). Our study focuses on the outcomes of Cone procedure as a preferred surgical option for Ebstein anomaly at our institution.

Results:
The conventional group included 351 patients who underwent tricuspid valve replacement (156 cases, including 8 cylindrical bioprostheses) or various valve repair techniques (Carpentier – 96, Danielson – 47, Hetzer – 39, De Vega – 7, Alfieri – 4, Reed – 1, Hardy – 1). The mean age in this group was 15.1 ± 8.1 years. The Cone reconstruction group consisted of 57 patients with a mean age of 6.9 ± 3.4 years.

Hospital mortality in the conventional group was 11.4% (40/351), compared to 0% in the Cone group. The average follow-up duration was 14.5 ± 4.8 years in the conventional group and 4.3 ± 2.4 years in the Cone group.
In the Cone group, early reoperation was required in 1 patient (2.1%). At follow-up, mild or no tricuspid regurgitation was observed in 41 patients (72%), moderate regurgitation - in 11 patients (19%), and severe regurgitation – in 5 patients (9%). Late reoperations were performed in 5 patients (9%): 3 different TV plasties and 2 TV replacements.

Conclusions:
Cone procedure for Ebstein anomaly in the modern era is the operation of choice at our institution. Low operative risks and low rate of valve incompetence were observed. Cone procedure may be more attractive surgical approach particularly for growing patients.

ORAL PRESENTATIONS

Category: Cardiac Surgery

1527 - CONE RECONSTRUCTION OF EBSTEIN'S ANOMALY WITH PULMONARY ATRESIA IN NEONATES SINGLE CENTER EXPERIENCE

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Background:
Surgical treatment of neonates with Ebstein anomaly (EA) in combination with pulmonary atresia (PA) is rare. The presence of severe dysplasia and regurgitation on the tricuspid valve, as well as the ductus-dependent blood flow, determine the need for early intervention after birth. Up to now, there is no clear strategy to treat this disease in neonates.

Materials and Methods:
Since 2016, four neonates with severe EA and PA have undergone urgent surgery with single-stage strategy. Two girls and two boys were the full-term newborns, median weight was 2,8 kg (2,3-3,2 kg); median age 9,2 days (2-16 days). The surgery was performed under cardiopulmonary bypass and cardioplegic ischemia lasting for 143-222 and 89-120 min, respectively. The principle of cone reconstruction was applied with mobilization of leaflets and reattachment to the normal tricuspid annulus. The atrialized right ventricle was not plicated and bidirectional cavopulmonary shunt was not used. In two patients, venous homografts (8 and 9 mm) were used as RV-PA conduit; in one patient, pulmonary bicuspidized homograft (10 mm) was used; in other patient, we could separate the completely fused flaps of the valve. After the surgery, all the patients were administered with infused epinephrine. The period of prolonged open chest was 3,7 days.

Results:
All cases were characterized with good function of the TV and absence of blood flow acceleration in the pulmonary artery. Unfortunately, one girl was died in the early postoperative period (on postsurgery day 47) against the background infection. Other patients were discharged from the hospital with favorable outcomes. At present, they are followed-up and need no repeated valvular correction.
Cone reconstruction of the tricuspid valve is an acceptable surgical strategy in patients with severe neonatal Ebstein anomaly and pulmonary atresia. This surgical strategy is complicated, but allows for biventricular hemodynamics and demonstrates good long-term results.

ORAL PRESENTATIONS

Category: Cardiac Surgery

1687 - TRANSVERSE SINUS APPROACH WITH PULMONARY VEIN DISSECTION FOR TOTAL ANOMALOUS PULMONARY VENOUS CONNECTION REPAIR A 28 YEAR EXPERIENCE

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Background / Hypothesis:
Total Anomalous Pulmonary Venous Connection(TAPVC) is a rare congenital heart defect requiring surgical correction. However, pulmonary vein(PV) stenosis is a significant complication after TAPVC repair. We report a long-term experience using the transverse sinus approach combined with extensive pulmonary vein(PV) dissection for TAPVC repair.

Materials and Methods:
A retrospective review was conducted on 88 patients who underwent TAPVC repair via the transverse sinus approach and PV dissection from 1997 to 2024. Median operation age and body weight were 14.5 days and 3.2kg, respectively. 15.9%(14 out of 88) of the patients had single-ventricle anatomy.

Results:
Patients were monitored for a median duration of 12.2 years, resulting in an overall survival rate of 90% at 5 years and 83% at 15 years. Compared to the bi-ventricle group, the single-ventricle group had a significantly higher early mortality(42.9% vs 2.7%), late mortality(14.3% vs 2.8%), and reoperation for PV stenosis(28.6% vs 4.2%). In the bi-ventricle group, there were 3 re-operations for PV stenosis, 2 of which resulted in late mortality. Freedom from significant PV stenosis was 95.8% at 10 and 15 years. Risk factors associated with the development of PV stenosis after repair included infracardiac/mixed type of TAPVC, presence of stenosis on discharge echocardiography, and younger age at operation.

Conclusions:
The transverse sinus approach combined with PV dissection demonstrates favorable long-term outcomes, especially in bi-ventricle patients. Single-ventricle anatomy presents a difficult challenge with higher mortality risk and PV stenosis rate. In the bi-ventricle group, infracardiac/mixed type of TAPVC, presence of stenosis on discharge echocardiography, and younger age at operation were associated with developing PV stenosis after repair.

ORAL PRESENTATIONS

Category: Cardiac Surgery

1690 - 22 YEAR EXPERIENCE IN THE SENNING OPERATION IN UKRAINE LONG TERM FOLLOW UP OF RIGHT VENTRICLE FUNCTION AND QUALITY OF LIFE.

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Background / Hypothesis:
The Senning operation which was an initial correction for the transposition of great arteries is still actual even in the era of the arterial switch operation. It's very important to evaluate function of systemic right ventricle (RV) by echocardiography to detect and prevent RV failure. The aim of this study was to analyze 22-year experience of Senning operation in single institution and make quantitative postoperative assessment of systemic RV function.

Materials and Methods:
Since 1992 to 2024 132 patients with D-TGA underwent the Senning operation in our institution, which were palliated at birth with the Rashkind procedure, 3 of them underwent systemic-to-pulmonary shunts. The interatrial septum was reconstructed with autopericardial baffle, the systemic and pulmonary venous baffles were constructed with autogenous atrial tissue. Early mortality occurred in 15 patients (11.3%).

Results:
We made a review of 86 patients with mean age 17,7 + 9, 25 years. The length of follow-up ranges from 5,4 to 31,5 years (mean 16, 8 ± 8.4 years). All patients were assessed by the complex echocardiographic method of RV function evaluation, which consisted of Tissue Doppler velocities: peak systolic velocity (Sm), peak early diastolic velocity (Em), peak late diastolic velocity (Am), the Em/Am ratio.
All parameters of RV systolic function (RVEF, Sm) were significantly decreased ($p < 0, 01$). Parameters of RV diastolic function (Em, Am, Em/Am ratio) were not affected. No one of our patients has any symptoms of RV failure. There are no late deaths. But one of the patients has a bradicardia and needs a pace–maker implantation. 113 patients (85.6%) are in NYHA Class I.

Conclusions:
The Senning operation can be safely performed in early infancy, especially in cases of late primary diagnostic. It provides excellent echocardiographic, symptomatic and clinical outcomes during late follow-up with small decrease of RV systolic function.

ORAL PRESENTATIONS

Category: Cardiac Surgery

1699 - OUTFLOW TRACT ROTATION FOR COMPLEX TRANSPOSITION OF THE GREAT ARTERIES

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Background:
Rastelli or Bex-Nikaidoh procedures are commonly used surgical techniques for transposition of the great arteries (TGA) with ventricular septal defect (VSD) and pulmonary valve stenosis (PS). Complications include right and left ventricular outflow tract obstruction and the need for further pulmonary conduit replacement. Modification of the outflow tract rotation (OTR) technique, using the two semilunar native valves, has been used at our center in selected cases. We aim to report our results using this procedure.

Methods:
We retrospectively reviewed all patients that underwent OTR at our center, performed by the same surgeon, and described their characteristics and outcome.

Results:
28 patients with TGA/VSD/PS or double outlet right ventricle (DORV)/TGA/VSD/PS underwent OTR between 12.2016 and 12.2024, at a median age of 2.5 years (range 4 days-14 years) and median weight of 10.2 kg (range 3.8-50kg). Pulmonary valve could be preserved in 23 cases, 3 patients underwent monocusp pulmonary valve plasty and 2 patient pulmonary valved conduit implantation. Median CPB time was 199 minutes (range 150-330) and X-clamp time 154 minutes (range 128-254). There was no mortality. There were 3 reoperations (2 for mitral and 1 for aortic severe regurgitation) and 1 complete AV block. Median hospital stay was 13 days (range 4-72).

Conclusions:
When the pulmonary valve is not suitable for arterial switch but acceptable in the pulmonary position, OTR is the most physiological option and should be considered. We believe that this procedure provides a free and straight LVOT, wall growth potential of the pulmonary annulus, and eliminates the need for conduit replacement. OTR is a safe and reproducible technique when performed by expert hands with excellent short- and mid-term outcomes. The long-term outcomes warrant further research.

ORAL PRESENTATIONS

Category: Cardiac Surgery

1763 - PAEDIATRIC PERSONALISED EXTERNAL AORTIC ROOT SUPPORT (PEARS) IN AUSTRALIA – IS IT TIME TO RETHINK AORTIC ROOT SURGERY IN CHILDREN

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Background / Hypothesis:
Personalised external aortic root support (PEARS) is used in adults to support the dilated aortic root as an alternative to root replacement with good outcomes. Paediatric patients with congenital aortopathies and native or neo-aortic dilatation after repaired congenital heart defects can also benefit from PEARS as it preserves the native aorta and aortic valve and avoids anticoagulation. This study aimed to evaluate the outcomes of PEARS in paediatric population in Australia.

Materials and Methods:
Every patient under 18 years who underwent a PEARS procedure in Australia at either Queensland Children's Hospital (Brisbane), Royal Children's Hospital (Melbourne), or Perth Children's Hospital between 2019 and 2025 were retrospectively reviewed. The PEARS prosthesis was implanted when the dimensions of the aortic root and ascending aorta reached adult size.

Results:
21 patients underwent a PEARS procedure during the study period. Median age and weight were 15.7 (IQR 12.3, 16.1) years and 59.4 (IQR 35.7, 82.2) kg, respectively. Indications were Marfan syndrome (n=10), Ehlers-Danlos syndrome (n=3), neo-aortic aneurysmal dilatation after arterial switch operation (n=3), post-Ross procedure (n=1) and combined Ross-PEARS procedure (n=4). There was no mortality or injury to a coronary artery. There was no on-table conversion to aortic root replacement. Cardiopulmonary bypass was used in 5 patients (all redo sternotomies; 3 post-arterial switch operation). There was 1 perioperative stroke. Median duration of follow-up was 38.4 (IQR 26.9, 40.5) months. One patient with preoperative moderate eccentric aortic regurgitation required an aortic valve replacement 1.8 years later. The 5-year freedom from re-operation was 92.8%. There has been no progression in the size of aortic root or aortic valve regurgitation in any patient on follow up echocardiograms and magnetic resonance imaging.

Conclusions:
PEARS should be considered as an alternative to aortic root replacement in the paediatric population. It can be performed safely with good early and mid-term outcomes.

ORAL PRESENTATIONS

Category: Cardiac Surgery

1784 - SURGICAL OUTCOMES OF PERSISTENT FIFTH AORTIC ARCH WITH COARCTATION

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Background / Hypothesis:
Persistent fifth aortic arch (PFAA) is an extremely rare anomaly. The goal of this study was to assess the surgical outcomes of PFAA with coarctation
Materials and Methods:
This study was a retrospective review of 39 patients with PFAA coarctation or atresia who underwent coarctation repair from 2009 to 2021. Six procedures are applied to repair coarctation. The patient characteristics and surgical outcomes were analyzed.

Results:
The age at repair was 2.6 months (range, 5.0 days-7.6 years). Of the 39 patients, 3 (7.7%) were diagnosed with interruption of both the fifth and fourth aortic arch, 35 (89.7%) were diagnosed with PFAA coarctation with interruption of the aortic arch, and 1 (2.6%) was diagnosed with both fifth and fourth arch coarctation. The diagnostic accuracy rate of echocardiography was 51.2%. No patients died after surgery. Recoarctation occurred in 8 patients (20.5%), and 5 of them received a second intervention. Compared with patients who underwent anastomosis of the ascending aorta and descending aorta (DAO), patients who underwent anastomosis of the fifth arch and DAO had a higher recoarctation incidence (X2=5.645; P=0.018). Operative access by lateral thoracotomy (hazard ratio [HR], 0.144; 95% confidence interval [CI], 0.036-0.586; P=0.007) and age less than 28 days (HR, 5.001; 95% CI, 1.233-20.284; P=0.024) were risk factors for recoarctation.

Conclusions:
PFAA with coarctation has favorable early- and midterm surgical outcomes. The fifth arch is an unfavorable choice for arch advancement, probably because of its histological characteristics. Individualized repair is necessary due to the variety of surgical methods.

ORAL PRESENTATIONS

Category: Cardiac Surgery

1861 - DRAMATIC REDUCTION IN BLOOD PRODUCT USE IN PEDIATRIC CARDIAC SURGERY IS FEASIBLE AND SAFE

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Background / Hypothesis:
Transfusion of blood products is believed to be unavoidable during congenital cardiac surgery despite requiring substantial resources. We hypothesize that surgical blood product use can be safely reduced with a systematic approach.

Materials and Methods:
Phased interventions were implemented consisting of optimizing cardiopulmonary bypass strategies, meticulous hemostasis and judicious blood transfusion practices with systematic transfusion thresholds for all surgical patients. We compared baseline data with three intervention periods and assessed differences in blood product exposure, outcomes and overall use of blood products.

Results:
Between the pre-intervention baseline (October 2020-May 2021) and the last intervention period (December 2023-February 2025; n=1248 for study period), there was a significant increase in transfusion-free surgical hospitalizations (15% in baseline vs. 51% in the last intervention period, $p<0.01$). Significant reductions in blood exposure were seen for all blood products and across all age groups ($p<0.05$ for all comparisons). In patients that received blood products, there was a significant decrease in total volume of all blood products transfused (baseline: 111mL/kg/hospitalization, last intervention: 22mL/kg/hospitalization, $p<0.01$). In multivariate models, surgical hospitalizations in the last intervention period were associated with an 87% lower odds of any blood exposure (Odds Ratio 0.13, 95% Confidence Interval (CI) 0.08 – 0.23) and a 76mL/kg lower volume of blood product administration (95%CI 66mL/kg – 86mL/kg). There was no difference in surgical outcomes. At an institutional level, there was an estimated reduction of red blood cell volume use by 65 liters per year (60% reduction) and a reduction of 120 liters/year (65% reduction) for all blood products used.

Conclusions:
Implementation of a blood conservation program safely resulted in a decreased blood exposure for all patients without impacting outcomes. This resulted in a dramatic reduction in total blood product use and may benefit settings with limited blood availability.

ORAL PRESENTATIONS

Category: Cardiac Surgery

2044 - MIDTERM OUTCOMES OF CABG FOR KAWASAKI DISEASE IN CHILDREN A MULTICENTER RETROSPECTIVE STUDY IN CHINA

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Background / Hypothesis:
Although coronary artery bypass grafting (CABG) is the preferred choice when Kawasaki disease (KD) seriously affecting the coronary artery, there are still no related large cohort studies from China. We aim to provide Chinese experience for the patients who underwent CABG from KD-related coronary artery disease, especially with an emphasize on the management of giant coronary artery aneurysms (GCAA) via a multicenter study.

Materials and Methods:
Between March 2010 and August 2024, we reviewed 45 KD patients with CABG in 5 main centers. Patients were divided into GCAA (n=30) and non-giant coronary artery aneurysm (N-GCAA) (n=15) groups. Primary outcomes included major adverse cardiovascular events (MACE), graft patency and myocardial ischemia.

Results:
The overall early mortality was 2.2% (1/45). During 56.52±47.03 months' follow-up, no death or MACE occurred in all groups. 6.8% (3/44) of the patients developed graft occlusion, and 29.3% (12/44) had persistent myocardial ischemia. GCCA group presented with worse preoperative cardiac function and more postoperative electrocardiogram abnormalities.
For patients with CAA diameters >15 mm or z-scores >15, CABG with aneurysm downsizing reconstruction provided higher LVEF at 1 (P=0.035) and 6 (P=0.037) months postoperatively, comparing to that of the patients with CABG alone. CAA diameter (P = 0.014) and preoperative LVEF (P = 0.026) were independent variables of persistent myocardial ischemia.

Conclusions:
CABG is safe and effective in children with KD-related coronary artery disease. When CAA diameters >15 mm or z-scores >15, simultaneous aneurysm downsizing reconstruction could be a feasible option with better outcome.

ORAL PRESENTATIONS

Category: Cardiac Surgery

2312 - IMPACT OF HEMODYNAMICS IN PATIENTS WITH FONTAN COMPLETION BEFORE WEIGHING 10 KG MORE THAN 10 YEARS FOLLOW UP

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Background :
Although the Fontan procedure is now being performed in younger patients, the influence of the early timing of Fontan on midterm to long-term results remains unclear. We investigated whether the timing of Fontan completion affects subsequent hemodynamics in patients with functional single ventricle followed for more than 10 years.

Materials and Methods:
Between January 1997 and December 2014, 254 patients with functional single ventricle underwent extracardiac total cavopulmonary connection (TCPC) at a single institution. The survivors routinely underwent postoperative catheterization at 1 year and then every 5 years after TCPC and were divided into group A (weight < 10 kg; n=118) and group B (weight > 10 kg; n=136), and retrospectively reviewed.

Results:
Mean follow-up was 17.2±5.9 years. Mean weight at Fontan operation were 8.7±0.8 kg for group A versus 18.5±11.8 kg for group B, respectively ($p < 0.001$). There were 3 hospital deaths (group A, n= 1; group B, n =2) and 5 late deaths (group A, n =3; group B, n = 2). No TCPC was taken down. There were no thromboembolic events in either group. The end-diastolic volume of ventricle (eDV) (% of normal) and end-diastolic pressure of ventricle (eDP)was significantly lower in group A compared with group B at 10 years after TCPC. Ventricular ejection fraction and cardiac index at 10 years were similar in both groups.

Conclusions:
TCPC can be performed earlier with good Long-term results. Earlier unloading of a univentricular heart by means of TCPC might be advantageous for preservation of future ventricular function.

ORAL PRESENTATIONS

Category: Cardiac Surgery

2345 - INTERMEDIATE OUTCOMES OF THE SENNING OPERATION FROM AN EMERGING ECONOMY

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Background / Hypothesis:
Determination of risk factors and rates of reoperation, systemic ventricular dysfunction, late death and arrhythmias following Senning procedure

Materials and Methods:
Sixty-nine patients underwent the modified Senning operation between August 2009 and now. This included 46 Transposition and 23 Corrected-Transposition of the Great Arteries. Median follow-up time was 7.5 years(0.6-14.6 years. Patients were evaluated by serial transthoracic echocardiography and electrocardiography. Systemic ventricular function was assessed by tricuspid annular plane systolic excursion on echocardiography.

Results:
Early and late mortality were 4.3%(3/69) and 1.4%(1/69),respectively. Three patients were reoperated for pulmonary venous baffle stenosis and 1 patient was reoperated for left ventricular outflow tract obstruction. All three patients with baffle stenosis underwent takedown of the Senning and underwent arterial switch.

Overall survival rate was 95.7%,95.7%,94.4%, and 92% at 1,2,5, and 10 years, respectively. Sinus rhythm was maintained in 92%,89.9%,89.9%, and 89.9%. Three patients in the Corrected Transposition group required pacemaker implantation for complete heart block following surgery.

Freedom from supraventricular tachycardia, atrial arrhythmia, bundle branch block or ventricular tachycardia was 91.5%,88%,83.3%,and 75.4%, respectively. These parameters were similar for both morphologies. Systemic ventricular ejection fraction greater than 40% was noted among 98.5%,97.1%,91.3% and 88.4% with simple transposition, and 91.3%,91.3%,69.5% and 69.5% with corrected transposition. This difference in systemic ventricular function was statistically significant, however difference in survival between either groups was not statistically significant.

Risk factors for systemic ventricular dysfunction were intramural coronary artery($p < 0.001$), subpulmonic VSD($p=0.004$) and pre-operative QRS-interval > 0.2 s($p=0.01$).

Conclusions:
The modified Senning procedure results in good long-term survival in patients with both Transposition and Correction Transposition of the Great Arteries. Overall outcome does not differ between either groups. Although baffle stenosis is rare, it may preserve and prepare the systemic ventricle to handle systemic vascular resistance, wherein such patients can be considered for anatomical correction. Atrial arrhythmias remain the perpetual risk over outcomes nonetheless.

ORAL PRESENTATIONS

Category: Cardiac Surgery

2401 - THE FATE OF AORTIC VALVE AFTER SURGICAL REPAIR FOR DISCRETE MEMBRANOUS SUBAORTIC STENOSIS IN PEDIATRIC PATIENTS

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Background / Hypothesis:
This study aimed to evaluate the long-term outcomes of aortic valve (AV) function and identify predictors of significant aortic regurgitation (SAR) and left ventricular outflow tract obstruction (LVOTO) recurrence following surgical repair of discrete membranous subaortic stenosis (DMSS) in pediatric patients and to develop a scoring model for long-term management.

Materials and Methods:
This single-center, retrospective cohort study analyzed 219 pediatric patients who underwent surgical repair for DMSS between 2008 and 2022. The primary endpoint was the composite of SAR and LVOTO recurrence, assessed during a median follow-up of 7.0 years. Multivariable Cox regression analysis was employed to develop a predictive model, validated using bootstrap resampling and calibration plots. A nomogram and risk-stratification model were constructed based on significant predictors.

Results:
SAR occurred in 10.0% of patients, while LVOTO recurrence was observed in 9.59%. The composite endpoint was experienced by 16.9%, with freedom rates from the endpoint at 1-, 2-, 5-, and 10-years being 99.5%, 97.7%, 93.4%, and 74.9%, respectively. The final model included discrete membrane accumulation on the AV, preoperative aortic regurgitation (AR) ≥grade 3, peeling from AV, bypass time >75 minutes, and postoperative AR ≥grade 2. The model predicted the outcome with a C-index of 0.814 on the test set and exhibited a significant ability in stratification of patients into low-risk, and high-risk groups ($P < 0.001$).

Conclusions:
This study highlights key risk factors for SAR and LVOTO recurrence after DMSS surgery in pediatric patients and provides a robust risk-stratification model for clinical decision-making.

ORAL PRESENTATIONS

Category: Cardiac Surgery

2549 - IMPACT OF ANTENATAL VS POSTNATAL DIAGNOSIS OF TRANSPOSITION OF GREAT ARTERIES

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Abstract
Although antenatal detection rates of Transposition of the great arteries (TGA) have improved in recent years, research on whether prenatal diagnosis leads to better outcomes has produced mixed results, especially for more complex forms of TGA and long-term complications.

This retrospective study reviewed 208 TGA cases managed at Southampton General Hospital from 2010–2023. Of these, 149 (71.6%) had simple TGA and 59 (28.4%) had complex TGA. Antenatal diagnosis occurred in 88/149 (59.1%) simple cases and 33/59 (55.9%) complex cases. Antenatally diagnosed patients were far more likely to be born in a cardiac centre (100% simple, 93.8% complex) than postnatally diagnosed patients (36.1% simple, 53.8% complex). In simple TGA, antenatal diagnosis was associated with lower pre-operative inotrope scores (29.8 vs 87.7), earlier balloon atrial septostomy (mean 1.6 vs 3.2 days), earlier arterial switch surgery (11.4 vs 23.5 days), and fewer post-operative seizures (1.1% vs 13.6%). In complex TGA, antenatal diagnosis was linked to earlier surgery and more frequent delivery in cardiac centres, but there were few statistically significant differences in metabolic, operative, or end-organ outcomes. Mortality at both 30 days and 12 months showed no significant difference between antenatal and postnatal groups for either simple or complex TGA.

Sub-analysis by time period showed that antenatal detection increased from 43.9% (2010–2016) to 77.6% (2017–2023) in simple TGA and from 43.3% to 69.0% in complex TGA, with outcome patterns remaining broadly similar. Overall, antenatal diagnosis improves several perioperative measures in simple TGA, but benefits in complex TGA remain less clear.

ORAL PRESENTATIONS

Category: Cardiac Surgery

2574 - THE IMPACT OF ECONOMIC FACTORS ON TREATMENT DECISIONS FOR PEDIATRIC CONGENITAL HEART DISEASE IN THE SICHUAN REGION OF CHINA A SINGLE CENTER RETROSPECTIVE ANALYSIS OVER TWO DECADES

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Background / Hypothesis:
To explore the influence of economic factors in Sichuan region on the surgical decision-making of children with CHD.

Materials and Methods:
A retrospective analysis was conducted on a cohort of 6,821 children (3,137 boys and 3,684 girls) who were admitted to Chengdu Cardiovascular Hospital between 2003 and 2022. Of these cases, 5,764 underwent surgical intervention, while 1,057 families opted to discontinue treatment. Among the total cohort, 1,354 cases (19.85%) were diagnosed with complex congenital heart disease (CHD). The study compared demographic and clinical characteristics between the two groups, including gender, age, type of CHD, distance from Chengdu, and per capita annual income. Additionally, differences before and after the inclusion of CHD in the New Rural Cooperative Medical Scheme in 2011 were analyzed.

Results:
The difference in per capita annual income between the treatment group and the non-treatment group was marginally significant (29,245 ± 7,853 vs. 29,772 ± 8,233 yuan, $P = 0.054$). The operation rate showed a statistically significant increase after 2011 ($P < 0.05$). Among cases of complex congenital heart disease (CHD), the likelihood of treatment abandonment increased with greater geographical distance from Chengdu ($P < 0.05$). For simple CHD, individuals who discontinued treatment were significantly younger (6.08 ± 4.93 years, $P < 0.05$).

Conclusions:
Economic factors and geographical distance collectively influence decisions regarding surgical interventions. The establishment of policy guarantees can substantially enhance the rate of treatment uptake.

ORAL PRESENTATIONS

Category: Cardiogenetics

1987 - GENETIC VARIANTS IN TETRALOGY OF FALLOT IMPLICATIONS FOR PRENATAL COUNSELING AND CLINICAL MANAGEMENT A SYSTEMATIC REVIEW AND META ANALYSIS

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Background :
Genetic factors play a critical role in tetralogy of Fallot (TOF), but comprehensive data on detection rates, penetrance, and clinical outcomes of genetic variants remain limited. This meta-analysis evaluates the clinical utility of genetic testing in TOF.

Methods:
We systematically searched PubMed, EMBASE, and Web of Science (up to February 2025). Statistical analyses included pooled detection rates, penetrance estimates, and mortality risk using Review Manager 5.4 and STATA 18.0. To address heterogeneity, funnel plot, Egger's test, sensitivity analysis, regression analysis, and subgroup analysis were explicitly applied.

Results:
Among 82 studies, the highest genetic detection rates were observed for JAG1 (7%, OR = 32.14, 95% CI,12.10-85.41, $p1\times10^{-5}$) and 22q11.2 deletions (7%, OR = 28.25, 95% CI, 7.61-104.84, $p1\times10^{-5}$), followed by GATA4 (4%, OR = 11.31, 95% CI, 5.79-22.10, $p1\times10^{-5}$). A sex-stratified analysis revealed higher male variant detection rates (OR=1.19, 95% CI, 0.46-3.09, p=0.72). The overall penetrance of pathogenic variants was 29% (95% CI, 2%–43%), with higher rates in 22q11.2 deletion carriers (39%, 95% CI, 33%–46%) and family-based studies (36%, 95% CI, 19%–68%). Mortality in TOF patients reached 33% (95% CI, 20%–55%), with elevated risks in 22q11.2 deletion carriers (OR=4.95, 95% CI, 2.52–9.70, $p1\times10^{-5}$) and those with comorbid malformations (OR=2.11, 95% CI, 1.43–3.13, $p=2\times10^{-4}$). The recurrence risk in siblings was 2% (95% CI, 1%–12%).

Conclusions:
Despite the challenges, this systematic review and meta-analysis of TOF provides valuable insights. It establishes a foundation for genetic testing in TOF. The potential of optimized screening and counseling to reduce the disease burden and significantly improve patient prognosis is promising, offering encouragement and motivation for the future of patient care.

ORAL PRESENTATIONS

Category: Catheterization

1368 - TRANSCATHETER PATENT DUCTUS ARTERIOSUS DEVICE CLOSURE IN THE PREMATURE AND LOW BIRTH WEIGHT INFANT THE FIRST AUSTRALIAN EXPERIENCE

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Background / Hypothesis:
In premature and low birth weight (LBW) neonates, haemodynamically significant patent ductus arteriosus (hsPDA) is associated with morbidity and mortality. Historically treated by surgical ligation, hsPDA is increasingly treated by transcatheter device closure (TCDC).

Materials and Methods:
A single-centre retrospective cohort study of all patients <37 weeks' gestation and < 2.5kg taken to the catheter laboratory for intended TCDC between June 2014 and December 2024. The primary outcome was successful device placement. Secondary outcomes included adverse events, admission times and 7-day survival. Univariate analysis examined predictors of successful device placement.

Results:
Forty-two patients were identified. Median birth weight was 0.87kg (IQR 0.7-1.1kg). Median intervention weight was 1.3kg (IQR 1.0-1.9kg). Median gestational age (GA) was 26.8 weeks (IQR 25.1–28.1). Median corrected GA at intervention was 32 weeks (IQR 29.8-35.9). Thirty-nine had preceding medical management with non-steroidal anti-inflammatory drugs.

Thirty-six (85.7%) had successful device placement, 24 (57%) with an Amplatzer Piccolo Occluder, 12 (29%) with a Medtronic Micro Vascular Plug. Four had unfavourable PDA anatomy requiring surgical closure. One patient experienced device release failure. One sustained intra-operative tricuspid valve damage precluding device closure. There was exclusively femoral vein access in 39. The median discharge time from intensive care post TCDC was 31-hours (IQR 26.0-93.0 hours). Seven-day survival was 100%.

There were two major procedure-related adverse events: one tricuspid valve injury with resultant tricuspid regurgitation, and one post-ligation syndrome necessitating 36-hours of inotropes. Two required re-intervention: left pulmonary artery stent angioplasty; and aortic stent angioplasty (140- and 23-days post TCDC respectively). Two had short segment iliac vein thrombosis.

Weight and corrected GA at intervention were not associated with successful device placement.

Conclusions:
TCDC is safe and effective for hsPDA in preterm and LBW infants. Aortic obstruction, LPA obstruction and tricuspid valve injury are recognised complications.

ORAL PRESENTATIONS

Category: Catheterization

1380 - IMPACT OF TRANSCATHETER ATRIAL SEPTAL DEFECT CLOSURE IN SMALL PATIENTS UNDER 10KG OF BODY WEIGHT

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Background / Hypothesis:
Transcatheter closure of secundum atrial septal defect (TCASD) is nowadays the first-line therapy and the establishment of the technique and device development enable TCASD to be performed in small infants. / TCASD in small infants has positive impact on clinical outcome.

Materials and Methods:
Retrospective, single-center study of 17 patients who underwent TCASD under 10kg of body weight at the treatment.

Results:
Five boys and 12 girls were enrolled in the study. All patients had right ventricular dilatation and eight had failure to thrive of under -2SD of body weight, five had pulmonary hypertension, and four showed progressive enlargement of the defect size (some patients have several findings). The median value and the range of baseline characteristics of the patients were 19 (9 to 34) months of age, 8.7(7.1 to 9.7) kg of body weight, 75 (70 to 85) cm of height, 12.8 (6.9 to 21.0) mm of defect diameter, 31(27.3 to 37.2) mm of atrial length, 2.3(1.6 to 3.3) of Qp/Qs ratio, 22 (16 to 39) mmHg of mean pulmonary arterial pressure. As a concomitant disease, seven patients were born as low body weight infants, four had persistent left superior vena cava, three had Down's syndrome, and one had Kabuki syndrome. In all but one case with device impingement to the aorta, successful device implantation was performed by a median of a single attempt (1 to 5) with a median 15 (8 to 18) mm waist diameter device. Periprocedural complications occurred in four cases, one venous sheath entrapment, one bacteremia treated with antibiotics, and two mild thrombocytopenia. The median Z-score of the body weight of patients significantly increased from -1.8 SD to -1.3 SD at six months after the TCASD.

Conclusions:
TCASD in small body weight infants can also be performed safely and helps catch up on somatic growth.

ORAL PRESENTATIONS

Category: Catheterization

1393 - BRANCH PULMONARY ARTERY GROWTH AFTER STENTING OF THE RIGHT VENTRICULAR OUTFLOW TRACT IN TETRALOGY OF FALLOT

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Introduction :
Right ventricular outflow tract stenting (RVOTS) enables interim palliation in Tetralogy of Fallot (TOF). There is limited data on branch pulmonary artery (PA) growth following RVOTS. We reviewed our institutional database to examine the effect of RVOTS on branch PA sizes and their outcomes.

Methods:
RVOTS was performed following standard technique. Since 2021, a conscious effort was made to spare the pulmonary valve (PV) whenever feasible. PA annulus and branch PA sizes were serially monitored by echocardiography.

Results:
59 patients, (age 4.5[1.75-24] months, weight 5.31 [3.33-9kg], were included (Time period:2012-2025). Commonest indications included cyanotic spell (64%) and hypoplastic branch PAs (31%). Median PV annulus size was 5.1mm (4.0-7.7); Z score -3.8(-5.1 – -2.6) and MPA 4.35mm (3.34 -5.7); Z score -4.9(-7.0 – [-3.1]). At median follow-up of 8(25-102) months, branch PAs grew in all, albeit at different paces. RPA z-scores improved from a baseline of -2.48(-5.05- [-0.85]) to -1.55(-3.07-0.46) and LPA z-scores from -2.5(-4.38 – [-0.78]) to-1.08(-2.41-0.63) in hypoplastic PA group over 1-year period (p value<0.001). Pulmonary valve was spared in 57% of patients in the cyanotic spell group and 24% of hypoplastic PA group. 29(49%) patients underwent corrective surgery at a median age of 22(9-41) months with median age from RVOTS being 9 (6-14) months, requirement of trans-annular patch (TAP) was 45% (13/29) and conduit, 31% (9/29). RVOTS placed across the valve resulted in 100% requirement of TAP (p<0.001). Overall valve sparing ICR was feasible in 24% (7/29) and in 54% (7/13); when the stent was placed below the valve.

Conclusion:
In addition to effective palliation, RVOT stenting promotes growth of branch pulmonary arteries even in those with inherently hypoplastic branch PAs. It is possible to effectively palliate selected patients without stenting across the pulmonary valve thereby potentially enabling valve sparing ICR.

ORAL PRESENTATIONS

Category: Catheterization

1892 - BRANCH PULMONARY ARTERY STENOSIS AT TIME OF CAVO PULMONARY SHUNT THE ROLE OF INTRA OPERATIVE ANGIOGRAPHY

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Background / Hypothesis:
Residual branch pulmonary artery (PA) stenosis post-Norwood at the time of cavo-pulmonary shunt (CP) is common. Completion angiography may aid earlier detection and treatment.

Materials and Methods:
A retrospective single centre review of the incidence of branch PA stenting in patients undergoing a CP shunt and the influence of intra-operative angiography. At our institution angiography is performed whilst the patient is still on cardio-pulmonary bypass (CPB). Patients were stratified into 4 groups: A:no stenting, B:intra-operative stenting, C:post-operative stenting in the same admission and D:post-operative stenting in a subsequent admission. The choice of shunt at Norwood and need for surgical PA plasty were examined.

Results:
Between 10/7/2013 and 13/11/2024, 89 patients met inclusion criteria of which 20.2% (N=18/89) had intra-operative completion angiography. Groups A, B, C and D had 50, 16, 6 and 17 patient respectively. The rate of branch pulmonary artery stenting in whole cohort at was 43.8% (N=39/89) at a mean follow-up of 6.6 years. There was a significant difference in the incidence of inpatient branch PA stenting between those that did (88.9%, N=16/18) and did not (8.5%, N=6/71) have intra-operative angiography ($p<0.001$). There was a significant difference in the hospital length of stay between those in group A (median:10.5 days;IQR: 8-20.5) and group C (median:31 days; IQR: 22-42.25) ($p<0.05$). There was also a significant reduction in the days of pleural drainage between group A (median:4.0 days; IQR:3.00-4.00) and group C (median:5.50 days; IQR:5.00-6.75)($p<0.05$). The CPB times were higher for group B (median:102.5mins; IQR:90.75-119) than group A (median:65mins; IQR:53.25, 88.00) (adjusted $p<0.01$).

Conclusions:
Intra-operative angiography and stenting may reduce the need for additional procedures during the same or subsequent admissions. Residual branch PA lesions that required intervention in the same hospital admission resulted in increased length of stay and duration of drainage.

ORAL PRESENTATIONS

Category: Catheterization

1997 - SYSTEMATIC REVIEW AND META ANALYSIS COMPARING TRANSCATHETER PDA STENTING RIGHT VENTRICULAR OUTFLOW TRACT STENTING AND SURGICAL SHUNT IN INITIAL MANAGEMENT OF DUCT DEPENDENT CYANOTIC CONGENITAL HEART DISEASE

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Background and Hypothesis:
The initial palliation for most duct-dependent cyanotic congenital heart disease is the establishment of a reliable pulmonary blood flow. Traditionally, this was achieved by a surgical systemic-to-pulmonary shunt (such as the modified Blalock-Taussig-Thomas shunt). More recently, less-invasive transcatheter options are emerging, such as ductus arteriosus stenting (DS) or right ventricular outflow tract stenting (RVOTS). This study presents a systematic review and meta-analysis comparing the outcomes of these 3 strategies (surgical or mBTT shunt, DS, and RVOTS) with the aim of providing evidence-based insights to guide clinical decision-making.

Materials and Methods:
A comprehensive literature search was conducted across MEDLINE, EMBASE, and the Cochrane Library for publications between 2003 and 2023 which compared at least two of these treatment options. References of published systematic reviews were screened. Outcomes considered were mortality, re-intervention rate, procedural complications, time to second stage surgery, and length of stay. Network meta-analysis was conducted to compare all three treatment options simultaneously.

Results:
20 publications were selected for analysis from an initial 337 publications. DS and RVOTS were superior to surgical shunts for mortality and early re-intervention rate. DS demonstrated the lowest rate of procedural complications, outperforming both RVOTS and surgical shunting. Additionally, hospital length of stay was significantly shorter for patients undergoing DS or RVOTS compared to those receiving a surgical shunt. Surgical shunt was associated with lower overall re-intervention rates and the lowest intra-procedural mortality. There was no significant difference in time to second-stage surgery between DS and surgical shunt.

Conclusions:
Transcatheter approaches such as DS and RVOTS represent viable, safe, and increasingly attractive alternatives to the traditional systemic-to-pulmonary shunt for the initial management of duct-dependent cyanotic congenital heart disease. These transcatheter strategies may offer significant clinical advantages, including lower mortality, fewer procedural complications, and shorter hospital stay, supporting their growing role in contemporary paediatric cardiac care.

ORAL PRESENTATIONS

Category: Catheterization

2293 - PREDICTORS OF THE OUTCOME FOR PDA STENTING IN DUCT DEPENDENT PULMONARY CIRCULATION

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Background / Hypothesis:
Percutaneous patent ductus arteriosus (PDA) stenting is a therapeutic modality in patients with duct-dependent pulmonary circulation with reported success rates from 80–100%. The current study aims to assess the outcome and the indicators of success for PDA stenting in different ductal morphologies using various approaches.

Materials and Methods:
A prospective cohort study from a single tertiary center presented from January 2018 to December 2019 that included 96 consecutive infants with ductal-dependent pulmonary circulation and palliated with PDA stenting. Patients were divided according to PDA origin into 4 groups: Group 1: PDA from proximal descending aorta, Group 2: from undersurface of aortic arch, Group 3: opposite the subclavian artery, Group 4: opposite the innominate/ brachiocephalic artery

Results:
The median age of patients was 22 days and median weight was 3 kg. The procedure was successful in 78 patients (81.25%). PDA was tortuous in 70 out of 96 patients. Femoral artery was the preferred approach in Group 1 (63/67), while axillary artery access was preferred in the other groups (6/11 in Group 2, 11/17 in Group 3, 1/1 in Group 4, P <0.0001). The main cause of procedural failure was inadequate parked coronary wire inside one of the branch of pulmonary arteries (14 cases; 77.7%), while 2 cases (11.1%) were complicated by acute stent thrombosis, and another 2 cases with stent dislodgment. Other procedural complications comprised femoral artery thrombosis in 7 cases (7.2%). Patients with straight PDA, younger age at procedure and who had larger PDA at pulmonary end had higher odds for success (OR = 8.01, 2.94, 7.40, CI = 1.011–63.68, 0.960–0.99, 1.172–7.40,respectively, P = 0.048, 0.031,0.022 respectively).

Conclusions:
The approach for PDA stenting and hence the outcome is markedly determined by the PDA origin and morphology. Patients with straight PDA, younger age at procedure and those who had relatively larger PDA at the pulmonary end had better opportunity for successful procedure.

ORAL PRESENTATIONS

Category: Echocardiography

2350 - INNOVATION IN TRANSTHORACIC ECHOCARDIOGRAPHY LEARNING THROUGH A VIRTUAL REALITY BASED EDUCATIONAL TOOL

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Background / Hypothesis:
Transthoracic echocardiography (TTE) is an essential imaging modality requiring both anatomical knowledge and psychomotor skills for optimal image acquisition and interpretation. Traditional training methods are limited by patient availability and procedural complexity. We hypothesize that a virtual reality (VR) application designed for immersive simulation can enhance anatomical understanding and procedural orientation in TTE, serving as an effective supplementary tool for medical education.

Materials and Methods:
A multidisciplinary team at Virtual Medical Learning developed a VR application compatible with standalone headsets (e.g., Oculus Quest 2/3). The tool guides learners through five standard transthoracic views: parasternal long axis, parasternal short axis, apical four-chamber, subcostal four-chamber, and subcostal inferior vena cava. Each view integrates: (1) a visual guide for probe positioning and orientation; (2) a simulated two-dimensional ultrasound image; (3) an interactive 3D heart model showing real-time ultrasound beam intersections; (4) anatomical illustrations; and (5) gamified learning features such as feedback and achievement tracking. This descriptive report presents the instructional design and clinical framework of the tool.

Results:
The tool was successfully deployed as a stand-alone educational module. It allows learners to visualize cardiac anatomy dynamically, correlate probe movement with 2D ultrasound outputs, and practice standard views repetitively in a risk-free environment. The use of gamification supports user engagement and reinforces key learning objectives, including spatial recognition and probe-handling skills.

Conclusions:
This VR application provides an accessible, immersive simulation environment for TTE training. While not a replacement for hands-on patient training, it serves as a complementary tool that enhances foundational learning in echocardiography. Future studies are needed to evaluate its impact on objective learning outcomes and clinical performance.

ORAL PRESENTATIONS

Category: Electrophysiology

1156 - ELECTROMAGNETIC INTERFERENCE OF TABLET DEVICES WITH ABDOMINAL PACEMAKERS

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Background:
Electromagnetic interference (EMI) between tablet devices (tablets) and cardiac implantable electronic devices (CIEDs) has been reported in pediatric patients. However, EMI between tablets and abdominal CIEDs in adults has not yet been clarified.

Methods:
This study aimed to measure the magnetic flux density of widely available tablets, determine the distances that could trigger EMI, and clarify the frequency of EMI occurrence in abdominal CIEDs. The subjects included 17 tablet models. A demonstration CRT-D was used as the representative CIED.
A magnetic flux density meter was employed to measure the maximum magnetic flux density of the tablets. Additionally, the maximum distances at which EMI occurred with the CIED were recorded.
A simulated patient with a CIED taped to the abdomen operated a tablet for 10 minutes, while the number of EMI occurrences and their total duration were recorded.

Results:
Measurements of 17 tablet models showed a maximum magnetic flux density of 638 ± 372 Gauss (G) (average ± standard deviation), with a range from 160 G (minimum) to 1240 G (maximum). EMI occurred at a distance from the CIED of 4.0 ± 2.0 cm, with a maximum distance of 7 cm.
In simulations using 7 models, where a simulated patient operated the tablets for 10 minutes with a CIED attached to the abdomen, EMI was observed in all models. Extended EMI lasting over 10 seconds occurred 6 ± 2 times, with a total duration of 357.2 ± 134.1 seconds. Using an 8 cm cushion between the CIED and the abdomen successfully prevented EMI during the same tablet operation.

Conclusions:
EMI can occur when tablets are in close proximity to abdominal CIEDs. Ex vivo measurements revealed EMI in all tested tablets, and observations with simulated patients confirmed that tablets could induce EMI. Maintaining a safe distance between tablets and CIEDs is suggested as the most effective method to prevent EMI.

ORAL PRESENTATIONS

Category: Electrophysiology

1273 - SMALL PATIENTS SIGNIFICANT FINDINGS ELECTROPATHOLOGY OF BACHMANN'S BUNDLE IN PEDIATRIC PATIENTS

Natasja De Groot [1], Lixia Dai [1], Nawin Ramdat Misier [1], Hoang Nguyen [2], Wouter Van Leeuwen [3], Pieter Vd Woestijne [3], Yannick Taverne [3], Mathijs Van Schie [1]
Erasmus University Medical Center, Cardiology, Rotterdam-The Netherlands [1] University Of Texas Southwestern Medical Center, Pediatric Cardiology, Dallas-United States [2] Erasmus University Medical Center, Cardiothoracic Surgery, Rotterdam-The Netherlands [3]

Background: Bachmann's Bundle (BB) may potentially play a role in the earlier onset and faster progression of atrial fibrillation (AF) in adult congenital heart disease (CHD) patients. It is unknown whether electropathology already exists at BB in pediatric CHD patients and whether it is related to aging.
Objective: To investigate BB electrophysiology in pediatric CHD patients and assess the impact of age on BB electropathology.

Materials and Methods:
Intraoperative, unipolar high resolution (electrode diameter: 0.45mm) and density (inter electrode distance 2mm) mapping of BB mapping was conducted in 55 patients (0.2-17.5years). Electrophysiological properties were quantified and related to age. Unipolar potentials were annotated for construction of activation maps to classify propagation patterns, identify areas of conduction block (inter electrode conduction times>12ms/2mm). In addition potential voltages, low-voltage areas (LVAs) and potential morphology were analysed.

Results:
Right-to-left activation across BB occurred in 96.4% patients. Potential voltage was on average 7.2±3.0 mV and LVAs occurred in 85.4% patients. Median local conduction velocity (CV) was 96.6 (72.9-121.0) cm/s and conduction block (CB) occurred in 56.4% patients. Most potentials were single and short-double potentials; long-double and fractionated potentials were recorded in respectively 49.1% and 72.7% patients. Age was weakly correlated with potential voltages ($r=0.312$, $p=0.020$) and moderately with local CV ($r=0.439$, $p<0.001$), but not with potential morphology or CB.

Conclusions:
Conduction disorders, LVAs, abnormal potential morphology are present at BB in pediatric CHD patients, independent of age. BB electropathology early in life may explain the increased AF susceptibility in adulthood.

ORAL PRESENTATIONS

Category: Electrophysiology

1316 - LONG TERM EXPERIENCE WITH INTRATHORACIC CARDIOVERTER DEFIBRILLATOR SYSTEMS USING EPICARDIAL AND PLEURAL ELECTRODES IN PEDIATRIC PATIENTS

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University Hospital Tuebingen, Department Of Thoracic And Cardiovascular Surgery, Tuebingen-Germany [1] University Hospital Tuebingen, Department Of Paediatric Cardiology, Pulmology And Paediatric Intensive Care Medicine, Tuebingen-Germany [2]

Background / Hypothesis:
Intrathoracic implantable cardioverter defibrillators (ICD) in young children have proven to be an effective therapy for life-threating ventricular arrhythmias. Limited vascular access, patient size and expected growing are the remaining challenges.

Materials and Methods:
We report on 3 pediatric patients without previous cardiac surgery, who underwent the implantation of a double-chamber ICD with supradiaphragmatic placement of the device in our center. In 2 cases the follow-up time exceeded 10 years.

Results:
Mean age at implantation was 5,5 years (range 7 months – 10 years) and mean follow-up time was 7,1 years (range 1 – 10 years). There was no infection, device defect, dislocation nor inappropriate shock noted. In every case at least 1 episode of cardiac arrhythmia was successfully terminated by the ICD. 2 patients underwent scheduled and uneventful device replacement due to low battery level.

Conclusions:
Epicardial implantation of an ICD with intrathoracic placement of the ICD device can effectively treat cardiac arrhythmias over a long period of time. The durability of implanted coils exceeds the battery life of the defibrillator.

ORAL PRESENTATIONS

Category: Electrophysiology

1668 - PREOPERATIVE INTRACELLULAR CALCIUM HANDLING PROTEIN EXPRESSION AS A PREDICTOR OF POSTOPERATIVE JUNCTIONAL RHYTHM

Dustin Nash [1], Christopher Mancuso [2], Benjamin Frank [1], Ludmila Khailova [1], Lily Sajbel [1], Matthew Stone [3], Kathryn Collins [1], Jennifer Silva [1], Johannes Von Alvensleben [1], Jesse Davidson [1]

Children's Hospital Colorado, Pediatrics, Aurora-United States [1] University Of Colorado, Pediatrics, Aurora-United States [2] Children's Hospital Colorado, Surgery, Aurora-United States [3]

Background / Hypothesis:
Junctional Ectopic Tachycardia (JET) is a postoperative arrhythmia in congenital heart disease (CHD) with substantial morbidity and mortality. Recent animal data suggest dysregulated intracellular calcium (Ca2+) contributes to JET pathogenesis, so we hypothesized that preoperative serum levels of key Ca2+ -handling proteins (CHPs) would predict postoperative accelerated junctional rhythm (AJR)/JET.

Materials and Methods:
Preoperative serum was collected under anesthesia (prior to incision) from 36 patients undergoing surgical repair of Tetralogy of Fallot or Tetralogy Type Double Outlet Right ventricle. Preselected CHPs from the Olink Explore HT panel included calsequestrin-2 (CASQ2), a sarcoplasmic reticulum Ca2+ buffer; plasma membrane calcium-transporting ATPase 3 (PMCA3), a Ca2+ extrusion pump; and fibroblast growth factor 12 (FGF12. AJR/JET was defined by >1:1 ventricular-atrial conduction confirmed by atrial electrogram.

Results:
Thirty-six patients were analyzed, including six with JET/AJR. Compared with controls, JET/AJR patients had significantly lower median preoperative levels of CASQ2 and FGF12, but higher PMCA3. While individual proteins showed fair classification accuracy (AUC), combining CASQ2 and PMCA3 yielded excellent discriminatory power.

Conclusions:
• Preoperative dysregulation of CHPs is strongly associated with postoperative AJR/JET and could be targets for mechanistic exploration and therapeutic development.
• Integrating CHP measurement into preoperative risk assessments could improve risk stratification and guide targeted perioperative monitoring or prophylaxis.
• Further validation in larger diverse cohorts may serve to optimize early detection and reduce morbidity and mortality.

ORAL PRESENTATIONS

Category: Electrophysiology

2001 - IMPACT OF ELECTRODE SIZE ON UNIPOLAR AND OMNIPOLAR VOLTAGE MAPPING IN PEDIATRIC AND ADULT ATRIA DOES SIZE MATTER

Mathijs Van Schie [1], Paul Knops [1], Manouk Linderhof [1], Nawin Ramdat Misier [1], Vehpi Yildirim [1], Yannick Taverne [2], Natasja De Groot [1]
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Background / Hypothesis:
Voltage mapping is frequently used during electrophysiological studies to identify arrhythmogenic substrates underlying arrhythmias in both pediatric and adult patients with congenital heart disease. In daily clinic, bipolar electrograms are most commonly used, although omnipolar electrograms can be used to overcome directional influences affecting the bipolar peak-to-peak voltage. Unipolar electrograms are also directional independent, although they are influenced by the amount of cardiac tissue underneath the recording electrodes. It remains, however, unknown whether these types of electrograms are also influenced by the different cardiac sizes in pediatric and adult patients.

Materials and Methods:
Intraoperative bi-atrial epicardial mapping (interelectrode distance 2 mm) was performed in 59 pediatric and 65 adult patients (2.8 [1.0-6.4] vs 44 [35-55] years). Unipolar electrograms were recorded from which omnipolar electrograms were constructed using two orthogonal electrode pairs. On average 5,231±2,229 unipolar and 15,574±7,633 omnipolar potentials were included from the pediatric patients compared to 8,762±2,903 unipolar and 28,647±9,532 omnipolar potentials from adults.

Results:
In adults, bi-atrial unipolar voltages were larger than omnipolar voltages (5.5 [4.7-6.6] vs 4.9 [4.0-6.5] mV, $P<0.001$), while in pediatrics omnipolar voltages were larger than unipolar voltages (5.3 [4.2-6.6] vs 6.8 [5.5-8.4] mV, $P<0.001$). In both groups, median unipolar voltages were linearly correlated with median omnipolar voltages (adults: $R2=0.981$, pediatrics: $R2=0.953$). Unipolar voltages were comparable between pediatrics and adults ($P=0.418$), while omnipolar voltages were larger in pediatrics compared to adult patients ($P<0.001$). For the entire population, there was a strong inverse exponential relationship between age and the difference of omnipolar and unipolar voltages ($R2=0.874$).

Conclusions:
The smaller cardiac size relative to the interelectrode distance in pediatrics most likely influenced the omnipolar potential voltages, resulting in larger voltages as compared to adult patients. Usage of this technique for voltage mapping should therefore be with caution and specific pediatric voltage cut-offs should be considered.

ORAL PRESENTATIONS

Category: Foetal Cardiology

1423 - CLINICAL AND ECONOMIC IMPLICATIONS OF PRENATAL CARDIAC DIAGNOSIS – A NATIONAL STUDY

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Royal Hospital For Children, Department Of Paediatric Cardiology, Glasgow-United Kingdom [2]

Background / Hypothesis:
Prenatal diagnosis of congenital heart disease (CHD) is known to improve postnatal morbidity and mortality. In addition, there is increasing evidence that prenatal diagnosis reduces preoperative brain injury and improves development of the brain microstructure. In some countries there are increasing economic pressures affecting healthcare equity and provision, but minimal published evidence examining the financial benefits of prenatal cardiac diagnosis. In Scotland the paediatric cardiology service comprises a single tertiary centre for all inpatient management. Due to geography, many patients travel significant distances by road, air or sea for fetal/paediatric cardiac diagnosis and management.

Materials and Methods:
A 10-year, retrospective review of all neonates, referred to the Scottish National Paediatric Cardiology service with a pre or postnatal diagnosis of critical CHD. Critical CHD was defined as lesions requiring medical or surgical intervention within the first 24 hours of life to prevent death. Prenatal diagnosis of critical CHD made by a fetal cardiologist, allows planned delivery in the tertiary centre between 39-40weeks gestation. Alternatively, neonates with postnatal suspicion of critical CHD were retrieved to the cardiac centre by the Scottish Specialist Transport & Retrieval (ScotSTAR) by road or air transport.

Results:
There were 211 prenatal and 151 postnatal diagnoses of critical CHD. Median gestation at delivery 39 weeks in both cohorts. Prenatal diagnosis prevented 156 critical care transfers, by air or road, with an estimated saving of £600k. Emergency transfer costs following postnatal diagnosis were estimated at £900k. Time to prostaglandin after delivery (hours): prenatal median 0.5; postnatal median 35.5. Time to first postnatal echocardiogram (hours): prenatal 0.167-279 (median 3); 2-391 hours (median 45.75).

Conclusions:
Prenatal diagnosis of critical CHD reduces the financial costs to healthcare providers, particularly for remote and rural patients, by reducing emergency transports and retrievals. In addition, the time to specialist review and initiation of lifesaving management is reduced.

ORAL PRESENTATIONS

Category: Foetal Cardiology

1589 - PROSPECTIVE EVALUATION OF FETAL CARDIAC MRI FOR THE PREDICTION OF NEONATAL COARCTATION OF THE AORTA

Tomas Woodgate [1], Milou Van Poppel [1], Thomas Day [1], Owen Miller [2], John Simpson [2], Vita Zidere [2], Reza Razavi [1], Trisha Vigneswaran [2], Kuberan Pushparajah [1], David Lloyd [1]
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Background / Hypothesis:
The prenatal diagnosis of coarctation of the aorta (CoA) is complicated by a high false positive (FP) rate. We have previously shown that fetal cardiac MRI may help provide a more objective prenatal risk of CoA, using a logistic regression model derived from proximal displacement of the aortic isthmus and ascending aorta flow. In this study we prospectively evaluate the performance of this model in consecutive cases of suspected CoA.

Materials and Methods:
All fetuses referred for fetal cardiac MRI for suspected CoA without major additional lesions between February 2023 and February 2025 were included. Proximal displacement of the aortic isthmus was measured on 3D black-blood imaging data, pre-processed using motion-corrected slice-to-volume registration. Ascending aorta flow was obtained from Doppler ultrasound-gated phase contrast data. Postnatal risk (%) of CoA was calculated and archived in the patient notes during pregnancy. Following delivery, cases were classified as either CoA (surgery <28 days) or FP. The prenatal probabilistic model was then evaluated using ROC-curve analysis and Brier score.

Results:
Of 89 fetuses, 27 (30%) developed CoA requiring neonatal surgery and 62 (70%) were FP cases. Median risk was 88% in the CoA group, and 6% in the FP group. The area-under-curve was 0.942. The Brier score was 0.10, suggesting good model calibration with a small average deviation between predicted and observed outcomes. Using a cut-off of 50% to generate a binary outcome (CoA/no CoA) gave sensitivity 74% and specificity 87%. Optimising sensitivity to 100% (to avoid false negatives) could be achieved using a cut-off of 18%, at the cost of reducing specificity to 76%.

Conclusions:
Our current CoA prediction model performs well prospectively, with a high AUC-ROC and low Brier score. Future work should focus on external reproducibility and the optimal integration of prenatal CoA risk scores into clinical practice.

ORAL PRESENTATIONS

Category: Foetal Cardiology

2036 - CHARACTERIZING THE FETOPLACENTAL RESPONSE TO ACUTE MATERNAL HYPEROXYGENATION IN CASES OF SUSPECTED COARCTATION OF THE AORTA USING FETAL CARDIAC MAGNETIC RESONANCE IMAGING

Milou Van Poppel [1], Johannes Steinweg [1], Tomas Woodgate [1], Vita Zidere [2], Thomas Day [2], Reza Razavi [1], John Simpson [2], Trisha Vigneswaran [2], Kuberan Pushparajah [1], David Lloyd [1]
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Background / Hypothesis:
This study aimed to characterize the fetoplacental response to acute maternal hyperoxygenation (AMH) in fetuses with suspected coarctation of the aorta (CoA), using fetal cardiac MRI.

Materials and Methods:
Pregnant women carrying fetuses with suspected CoA were prospectively recruited from a tertiary fetal cardiology center as part of the Fetal Imaging with Maternal Hyperoxygenation study. MRI included phase contrast flow measurements and oxygen-sensitive T2* MRI sequences to assess placental and fetal brain oxygenation. Results were analyzed on a groupwise basis and comparing true CoA cases (requiring surgical CoA repair <28 days of age) to false positives.

Results:
Fetal MRI with AMH was performed in 20 pregnancies (mean gestation 33.0± 1.3 weeks), 5 with CoA and 15 false positives. In both groups AMH significantly increased placental T2* signal but had no effect on cerebral T2*. Increased pulmonary blood flow with AMH was associated with reduced right to left shunting at the foramen ovale ($r = -0.74$, $p < 0.001$), but not increased ascending aortic flow (QAAo, $r = 0.36$, $p = 0.177$). AMH did increase anterograde flow at the aortic isthmus (median +133%, IQR +43% to +346%; $p < 0.001$); however, this was associated with a reduction in superior vena cava flow (QSVC; median -28% from baseline; IQR -41% to 0%; $p < 0.001$) and not to changes in QAAo. No differences in baseline or AMH values distinguished true and false positive cases in this pilot study. Table 1 demonstrates AMH response of the total cohort.

Conclusions:
Acute maternal hyperoxygenation leads to a significant reduction in cerebral blood flow in fetuses with suspected coarctation, which is the primary driver of changes in flow at the aortic isthmus. Future studies should consider the effects of maternal oxygen on the entirety of fetoplacental circulation, particularly where chronic maternal hyperoxygenation administration is being considered.

ORAL PRESENTATIONS

Category: Foetal Cardiology

2137 - FETAL CARDIOMYOPATHY THE ROLE OF PHENOTYPE GENETICS AND OUTCOMES.

Dr Olga Panagiotopoulou [1], Dr Cecila Marcolin [2], Sophie Shepherd [2], Dr Vita Zidere [3], Prof John M Simpson [3], Prof Juan Kaski [4], Dr Trisha V Vigneswaran (joint Senior Author) [3], Dr Victoria Jowett (joint Senior Author) [1]
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Background / Hypothesis:
Cardiomyopathies (CM) are an important cause of heart failure and transplant in infancy, but limited data exist on their prenatal presentation and prognosis. This study aimed to characterize the echocardiographic features, phenotypic classification, and outcomes of CM diagnosed in fetal life.

Materials and Methods:
We performed a 10-year retrospective review of fetuses diagnosed with CM at two tertiary cardiac centres in London, UK (Great Ormond Street Hospital and Evelina London Children's Hospital). Cases were classified into hypertrophic (HCM), dilated (DCM), non-compaction (NCCM), or mixed phenotypes.

Results:
Fifty fetuses were identified with a median gestational age at diagnosis of 26 weeks (range: 14-36). The reasons for referral were suspected congenital heart disease (CHD) or arrhythmia (n=19;38%)family history of CHD or CM (n=6;14%), increased nuchal translucency (n=6; 12%), signs suggestive of CM 15/50 (30%) and pericardial effusion/hydrops (n=4). Phenotypic distribution included HCM in 23/50 (46%), DCM 15/50 (30%), mixed in 8/50 (18%), and NCCM in 4/50 (8%). Biventricular involvement was present in 36 (72%) and severe ventricular dysfunction in 20 (40%). Genetic testing was undertaken in 32/50 (64%); a genetic aetiology was confirmed in 23/32 (72%), including 4/23 (17%) with a metabolic disorder. Hydrops occurred in 12/50 (24%) and extracardiac sonographic findings were seen in 15/50 (30%), over half of which were associated with a genetic condition. Pregnancy outcomes included termination in 8/50 (16%) and intrauterine death in 11(24%). There were 31/50 (62%) liveborns with 5 neonatal deaths, 3 infant deaths and 21 were alive (42%) at last follow-up (mean age: 5 years). Neither cardiomyopathy phenotype nor genetic abnormality predicted survival in this cohort.

Conclusions:
There is low survival following prenatal diagnosis of cardiomyopathy regardless of phenotype in this contemporary cohort. Genetic testing identified mutations in almost three-quarters of cases and should be offered as part of prenatal counselling and management.

ORAL PRESENTATIONS

Category: Foetal Cardiology

2564 - SAFETY AND EFFECTIVENESS OF EARLY FETAL BALLOON AORTIC VALVULOPLASTY PROCEDURES

Agnieszka Grzyb [1], Daria Motyl [2], Adam Kolesnik [3], Beata Rebizant [4], Robert Brawura-biskupski-samaha [4], Joanna Dangel [1]
Centre Of Postgraduate Medical Education, Department Of Perinatal Cardiology And Congenital Anomalies, Warsaw-Poland [1] Ultrasound Clinic Agatowa, -, Warsaw-Poland [2] The Children's Memorial Health Institute, Cardiovascular Interventions Laboratory, Warsaw-Poland [3] Centre Of Postgraduate Medical Education, Department Of Obstetrics, Perinatology, And Neonatology, Warsaw-Poland [4]

Background / Hypothesis:
Fetal balloon aortic valvuloplasty (fBAV) for critical aortic stenosis (CAS) aims to prevent the progression of heart failure and/or left ventricular hypoplasia. Although the criteria for treatment are not uniform, the prevailing view is that interventions should be performed after 24 weeks of pregnancy to mitigate the risk of periprocedural fetal death.
This study analyzed the results and complications of early fBAV procedures performed at a reference center from 2011 to 2024.

Materials and Methods:
A retrospective analysis of data from CAS patients who underwent fBAV up to 23+0 weeks of gestation. The evaluation included inclusion criteria, the course and complications of the procedures, and postnatal outcomes.

Results:
From 2011 to 2024, fBAV was performed in 24 fetuses with CAS aged from 20+0 to 23+0 weeks of gestation (median 22+2). The time from diagnosis to intervention was 1-28 days (median five). All procedures were technically successful. Two patients required a repeated procedure, and two needed additional implantation of an atrial septal stent later in pregnancy. Immediately post-procedure, pericardial effusion had to be evacuated in 16 fetuses (67%), six (25%) developed bradycardia requiring treatment, and three (12.5%) exhibited transient left ventricular thrombosis. Four intrauterine deaths were recorded (three periprocedural – 12.5%), all in fetuses with significantly impaired left ventricular function, one was directly related to device malfunction. Of the 20 live births (at median 39 weeks), four patients (20%) underwent biventricular treatment (all survived), 15 (75%) – univentricular or hybrid palliation (10 survived); one patient received comfort care.

Conclusions:
Aortic valvuloplasty procedures in early pregnancy are possible and, when performed by an experienced team, are not associated with a significantly higher risk compared to later pregnancy. The chance of biventricular treatment depends on the initial morphological and hemodynamic parameters. Further research is needed to optimize the selection of patients undergoing prenatal cardiac interventions.

ORAL PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1209 - SAFETY AND IMMUNOGENICITY OF VARICELLA VACCINE IN PEDIATRIC HEART TRANSPLANT RECIPIENTS

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Background / Hypothesis:
Live vaccines have traditionally been contraindicated in heart transplant (HTx) recipients due to safety concerns and potential lack of immunogenicity. Evidence and a consensus guideline now support vaccination in select groups of pediatric transplant recipients but HTx recipients remain excluded. We report our experience of varicella zoster virus (VZV) vaccination detailing the safety profile and serologic response.

Materials and Methods:
Retrospective cohort study of HTx recipients who received VZV vaccination as part of a newly implemented clinical protocol involving a 2-dose VZV vaccine schedule, pre-vaccination counselling, virtual follow-up, and follow-up serologies. Medical records were reviewed for demographics, immunosuppressive therapy, immunologic markers and adverse events.

Results:
38 patients received VZV vaccine while on immunosuppressive therapy with Tacrolimus alone (17/38, 45%), in combination with MMF (19/38, 50%) or sirolimus (1/38, 3%), or sirolimus/MMF (1/38, 3%). 30 patients have received 2 doses at a median of 6.4 months apart. 11/14 (79%) patients who had serology checked after 1 dose showed seroconversion. Serology after 2 doses was positive in 26/27 (96.3%) with persistence in 22/26 (85%) at a median duration of 18.9 months. The overall seroconversion rate was 32/33 (97%) at a median follow-up of 16.9 months. Only 1 patient did not seroconvert after 2 doses.

13 (34%) patients reported mild adverse events (mild localized rash, 10; local site reaction, 3). None developed systemic symptoms or varicella.

19 (50%) patients had immune markers below the minimum immune criteria from the consensus guidelines of whom only 4 reported mild adverse events.

Conclusions:
Varicella vaccine can be safely administered with excellent seroconversion rates and mild adverse events in pediatric heart transplant recipients. These findings support development of guidelines towards liberalizing current restrictive recommendations for varicella vaccination. Further studies are required to explore persistence of seroprotection and optimal vaccination regimes.

ORAL PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1220 - VARICIGUAT A NOVEL THERAPY IN PEDIATRIC HEART FAILURE

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Background / Hypothesis:
Vericiguat is a novel soluble guanylate cyclase (sGC) agonist which is used for the treatment of heart failure with reduced ejection fraction (HFrEF). It is FDA approved in adults with reduced ejection fraction but its utility in pediatric population is still under evaluation.

Materials and Methods:
Here we describe three children, who presented with cardiac failure and despite supportive treatment, continued to have poor cardiac function. Tab varicigiuat was added as an add on drug and showed promising results.

Results:
First case was a one month old 14 days old girl, presenting with LRTI followed by severe LV dysfunction. Child was intubated and managed with IV inotropes. In view of poor cardiac output, tab varicigiuat was added along with other cardiac medications. Cardiac function improved and IV inotropes were tapered off.

Second case is a 17 year old post op case of TGA, presented with congestive heart failure. He was managed initially with supportive medications but in view of low cardiac output, he was started on tab varicigiuat. His cardiac function improved later and was discharged on oral medications.

Third case was a 4 year old, case of dilated cardiomyopathy with congestive cardiac failure with IV diuretic and inotrope requirement. She was given tab varicigiuat as she developed toxicity to digoxin. She improved well after adding varicigiuat and was discharged on oral medications.

Conclusions:
Vericiguat is currently used as add on drug in adults with HFrEF along with ACEIs, ARNIs, beta-blockers, MRAs, and the SGLT-2 inhibitors dapagliflozin and empagliflozin. Its use in pediatric age group is yet to be studied.

Our study has showed improvement in cardiac function and reduction in use of IV inotropes after adding varicigiuat. No episodes of hypotension or dizziness was noted in these three children.

ORAL PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2313 - THE IMPACT OF A SPECIALIZED CARE TEAM ON VAD OUTCOMES FOR PATIENTS WITH A BIDIRECTIONAL GLENN

Humera Ahmed [1], Jonathan Edelson [1], Kimberly Lin [1], Carol Wittlieb-weber [1], Jonathan Edwards [1], Anila Chaudhary [1], Constantine Mavroudis [2], Joseph Rossano [1], Katsuhide Maeda [3], Matthew O'connor [1]
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Background / Hypothesis:
Patients with a bidirectional Glenn (BDG) remain challenging to support with a ventricular assist device (VAD) due to small size, aortopulmonary collaterals, valvar regurgitation, and dichotomous venous return. The creation of a specialized surgical and medical team may improve outcomes.

Materials and Methods:
This retrospective case series describes a single institutional experience with VAD support for pediatric BDG from 6/2012-5/2024, comparing outcomes before and after creation of a specialized VAD team with a dedicated surgeon in 2021.

Results:
Before 2021, 5 patients underwent VAD placement at a median age of 2.7 (IQR 2.7, 2.9) years and 10.9 (IQR 10.3,12.1) kilograms; one was on ECMO at VAD. Concomitant Fontan completion occurred in 2 patients. Two were supported with a Berlin and 2 with HeartWare; one died in the operating room after failed attempts at support with multiple devices (Berlin, HeartWare, Centrimag). None of these 5 patients survived; median survival was 1 day (range 0-12). After 2021, 4 patients underwent VAD placement at a median age of 2.1 (IQR 1.4, 2.7) years and 10.1 (IQR 8.8,11.7) kilograms. For all, the BDG was left intact and a Hemashield graft was placed in the ascending aorta and connected to a Berlin cannula. Atrial cannulation was used for 1 patient due to an abdominal pacemaker generator; the remainder underwent ventricular cannulation. The initial device for all was a Centrimag; 3/4 transiently required an oxygenator; none required ECMO. Two patients experienced stroke at 2- and 4-months post-VAD; one occurred in the setting of hypercoagulability and systemic infection. Over a total of 472 days of VAD support, 2 patients survived to heart transplant (9 and 225 days post-implantation), and 2 remain alive (43 and 198 days) on VAD.

Conclusions:
The implementation of a dedicated care team has significantly improved outcomes at our institution in this high-risk cohort.

ORAL PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2490 - ECMO AFTER MECHANICAL VALVE REPLACEMENT IN CHILDREN 10 YEARS EXPERICNE IN A UK TERTIARY CENTRE

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Background / Hypothesis:
ECMO support following mechanical valve implantation in children is rare and potentially associated with poor outcomes. We reviewed our experience with this complex patient group, focusing on perfusion strategies during ECMO support

Materials and Methods:
We retrospectively reviewed our database between 2015-2025. We identified 10 patients with mechanical valves implanted in the mitral (5), aortic (1), truncal (1), tricuspid (1) and common atrioventricular valve (2) positions. Continuous variables were summarised using medians with interquartile range, while categorical data were presented with frequencies and percentages. Survival analysis was conducted using Kaplan-Meier curves, with Cox regression models identifying predictors of mortality. A Sankey diagram was used to visualise the patient pathway from surgery to outcome.

Results:
The median age and weight was 30 months (10, 145) and 11 kg (7, 55), respectively. Intraoperative ECMO was required by 50% of patients due to failure to wean from cardiopulmonary bypass, for respiratory failure (20%) or LV dysfunction (30%). Thirty percent were initiated post-operatively following ECPR. All patients were successfully weaned, with 40% requiring multiple attempts and 40% needing a surgical reintervention before decannulation.

Protocol to prevent blood stasis and thrombosis was implemented with LA venting, inotropes, lower-flows, and cardiac pacing to encourage LV ejection, coupled with heparin monitoring to maintain an anti-Xa level of 0.5-0.7. While no further thrombosis occurred, this strategy led to bleeding in 90% of patients, requiring chest exploration and significant blood product usage. Two cerebral events were noted. Overall hospital mortality was 40%, with 5-year survival of 47% (15-74). Causes of death were heart failure in three patients and sepsis in two; all three patients on the univentricular pathway died.

Conclusion:
Mortality in children with prosthetic valves requiring ECMO is high. Our findings emphasise the high-risk nature of this population, particularly with univentricular physiology. Challanging is balancing anticoagulation to prevent valve thrombosis.

ORAL PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2567 - THE PREVALENCE OF HEART FAILURE WITH PRESERVED EJECTION FRACTION AMONG ADULT PATIENTS WITH CONGENITAL HEART DISEASE

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Background / Hypothesis:
Heart failure with preserved ejection fraction (HFpEF) is increasingly recognised in the general population, but the prevalence among adults with congenital heart disease (ACHD) is not well described. The study aimed to determine the prevalence, characteristics and hospitalisation burden of HFpEF among ACHD patients.

Materials and Methods:
Using the electronic medical files, we conducted a retrospective, multicentre cohort study including 4,507 ACHD patients with biventricular heart and systemic left ventricle followed at the ACHD centres in Eastern Denmark. HFpEF was defined as preserved left ventricular ejection fraction (LVEF≥50%) with diuretics use, combined with elevated N-terminal pro-B-type natriuretic peptide and/or echocardiographic signs of HFpEF.

Results:
Among 4,507 ACHD patients, 86% had a preserved LVEF. HFpEF was identified in 13%, with high prevalence across all ACHD severities (13%, 12% and 18% in mild, moderate and severe). Compared to patients with normal LV function, HFpEF patients were older (median age: 60 [interquartile range(IQR) 47-70] vs. 41[IQR 29-56] years, p<0.001), had more comorbidities (age-adjusted odds ratio(aOR) for diabetes: 15.60 [95% confidence interval(CI):12.39-19.70], obesity: 1.48 [95%CI:1.17-1.87], and atrial fibrillation 4.58 [95%CI:2.22-9.88]), and experienced almost five-fold higher rate of cardiovascular hospitalisation (IRR:4.6[95%CI:4.2-5.1], p<0.0001). Despite this, only 4.0% had a heart failure diagnosis, and 5.8% treated with an SGLT2 inhibitor.

Conclusions:
HFpEF is highly prevalent among ACHD patients, regardless of severity. It is associated with an increased burden of risk factors and cardiovascular hospitalisations. Despite this, only a minority received SGLT2-inhibitors. These findings emphasise the need for increased awareness of HFpEF in the ACHD population.

ORAL PRESENTATIONS

Category: Multimodality Imaging

1446 - CARDIAC MAGNETIC RESONANCE FOR REJECTION SCREENING IN PEDIATRIC AND ADULT HEART TRANSPLANT RECIPIENTS HISTOLOGICAL CLINICAL AND CELL FREE DNA VALIDATION

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Background / Hypothesis:
Detection of acute rejection is critical for graft survival after heart transplantation. This study evaluates the feasibility of cardiac magnetic resonance (CMR) as a promising non-invasive method for rejection screening, validating it against endomyocardial biopsy (EMB), donor-derived cell-free DNA (dd-cfDNA), and clinical status.

Materials and Methods:
In this blinded prospective study (NCT04311346), we analyzed CMR data from 244 scans of 58 pediatric and adult heart transplant recipients, 1-24 months post-transplant. Rejection was defined by the presence of ≥ 2/3 or 1/2 abnormal parameters: EMB findings (grade ≥ 2R acute cellular rejection or grade ≥ 1 antibody-mediated rejection), symptoms or ultrasound findings indicating clinical rejection, and elevated dd-cfDNA levels (> 0.20%).

Results:
From 244 CMR studies, 13 cases of acute rejection were identified. During episodes of acute rejection, T1 values increased significantly compared to rejection-free studies in both children and adults. ROC curve analysis indicated optimal rejection detection using a T1 cutoff of 1092 ms across ≥11 segments in children (Philips Ingenia 1.5T) and 1065 ms across ≥12 segments in adults (Siemens AvantoFit 1.5T). At these thresholds, sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were 100%, 93%, 71%, and 100% in children, and 88%, 97%, 58%, and 99% in adults, respectively. The global mean T1 model of the left ventricle showed comparable accuracy. Adding T2 values did not improve diagnostic performance.

Conclusions:
With modern immunosuppressive therapy, the incidence of rejection is low. Given the significant limitations and risks associated with EMB, including procedural complications and challenges in interpretation, alternative non-invasive methods are increasingly important. In this national 3 y cohort, CMR showed excellent accuracy in detecting rejection in both children and adults. In the future, rejection monitoring is expected to rely more heavily on CMR and dd-cfDNA, substantially reducing the need for invasive EMB procedures.

ORAL PRESENTATIONS

Category: Multimodality Imaging

1483 - CHALLENGING THE GOLD STANDARD FERUMOXYTOL ENHANCED 5D WHOLE HEART MRI OUTPERFORMS TRADITIONAL 2D CINE MRI IN VENTRICULAR VOLUME MEASUREMENTS

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Background / Hypothesis:
Two-dimensional (2D) cine MRI is the current gold standard for assessing ventricular volumes and function in patients with congenital heart disease (CHD). However, this technique is prone to errors due to inconsistent breath-holds, improper selection of basal ventricular slices, dynamic changes in the basal plane during systole, and poor image quality in patients with arrhythmias or inability to breath-hold. Ferumoxytol-enhanced free-running five-dimensional whole-heart MRI (5D FE-MRI) is a promising alternative that mitigates these issues through continuous, high-resolution, motion-resolved imaging. We hypothesized that 5D FE-MRI would yield more precise measurements of ventricular volumes than conventional 2D cine MRI in patients with repaired CHD.

Materials and Methods:
We compared ventricular volume measurements in 50 patients undergoing 5D FE-MRI with 50 weight- and height-matched patients assessed with conventional 2D cine MRI. All patients had surgically repaired CHD without residual shunts or valve insufficiencies. With 5D FE-MRI, dedicated short-axis stacks were obtained separately for each ventricle. Accuracy was evaluated by assessing left (LVSV) and right ventricular stroke volume (RVSV) agreement via Bland-Altman analysis, with predefined acceptable limits of agreement set at ±10%.

Results:
Both techniques demonstrated minimal mean bias between LVSV and RVSV: 0.95 mL (1.8%) for 5D FE-MRI and 1.19 mL (1.9%) for 2D cine MRI. However, 5D FE-MRI exhibited significantly narrower limits of agreement (-3.21% to 6.82%) compared to 2D cine MRI (-10.9% to 14.71%), which exceeded the predefined acceptable range.

Conclusions:
Ferumoxytol-enhanced free-running 5D whole-heart MRI provides more precise ventricular volume measurements than conventional 2D cine MRI, addressing key limitations of the current gold standard. These findings support its potential to become the new reference method for evaluating ventricular size and function in CHD patients.

ORAL PRESENTATIONS

Category: Multimodality Imaging

1636 - THE RIGHT VENTRICULAR OUTFLOW TRACT STEALS THE HEART'S ENERGY AND LIMITS EXERCISE CAPACITY IN REPAIRED TETRALOGY OF FALLOT 4D FLOW INSIGHTS FROM THE TREK STUDY

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Background:
In patients with repaired tetralogy of Fallot (rTOF), right ventricular (RV) dilation and pulmonary insufficiency are well recognized, but their energetic underpinnings remain poorly defined. We hypothesized that abnormal kinetic energy (KE) dynamics in the RV outflow tract (RVOT) reflect inefficient myocardial work and contribute to reduced exercise capacity.

Methods:
From the Tetralogy of Fallot 4D flow Registry of Energetics and Kinetics (TREK) multi-center study, we retrospectively analyzed 4D flow MRI data from rTOF patients and healthy controls imaged between 2019–2024. KE was quantified in three RV segments (inflow, body, RVOT) during systole and diastole, along with segmental ejection fractions (EF). RVOT peak energy quotient (RVOT-EQ) was defined as the ratio of peak diastolic to peak systolic KE. Segmental KE values were correlated with exercise performance (percent-predicted VO_2 max). Multivariable linear regression included age, RVOT-EQ, RVOT EF, surgical type, and RV end-diastolic volume index (RVEDVi).

Results:
Among 183 rTOF patients (mean age 22 ± 11 years; RVEDVi 126 ± 36 mL/m^2; RVEF 50 ± 7%, regurgitant fraction 25±16%; 124 transannular, 19 infundibular, 39 conduit repairs), RVOT KE was disproportionately elevated compared to controls (n = 50) in both systole and diastole, exceeding that of the RV body and inflow (Table 1). RVOT-EQ was also significantly higher in rTOF than in controls. In univariable analysis (n = 89), RVOT-EQ inversely correlated with exercise capacity ($r = -0.37$, $p = 0.0004$), while RVOT EF showed a modest positive correlation ($r = 0.25$, $p = 0.02$). In multivariable analysis, RVOT-EQ remained an independent negative predictor of exercise performance ($p < 0.0001$, Table 2). Conduit-type repair was also associated with lower exercise capacity ($p = 0.026$).

Conclusions:
The RVOT emerges as a key energetic sink in rTOF, independent of RV size and function. Elevated diastolic KE reflect inefficient RVOT dynamics and independently predict lower exercise capacity. These findings from the TREK study support RVOT hemodynamic assessment as a physiologic marker functional outcome.

ORAL PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1433 - LINKING KAWASAKI DISEASE TO MENTAL HEALTH A NATIONWIDE STUDY ON LONG TERM NEUROLOGICAL RISKS

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Background / Hypothesis:
Kawasaki disease (KD) is a childhood systematic vasculitis. Emerging evidence suggests a link between KD and long-term neurological implications. This study examines the association between KD and subsequent neuropsychiatric and neurodevelopmental disorders using national health data from South Korea.

Materials and Methods:
Using the National Health Information Database, we identified KD patients diagnosed between 2002 and 2021 and selected those born between 2008 and 2015. Propensity score matching with a 1:4 ratio was applied to create a control group. The incidence of neuropsychiatric and neurodevelopmental disorders from 2017 to 2021 was analyzed using Cox proportional hazard models, adjusting for age, sex, and urbanicity.
Results: This study included 41,806 KD subjects and 163,829 matched controls. KD was associated with an increased risk of certain neuropsychiatric disorders: anxiety disorder (HR: 1.124, 1.047–1.207), sleep-related disorder (HR: 1.257, 1.094–1.444), movement disorder(HR: 1.227, 1.030–1.461), and any neuropsychiatric disorder (HR: 1.102, 1.053–1.153). For neurodevelopmental disorders, KD patients showed a lower incidence of intellectual disability (HR: 0.747, 0.641–0.871) but an increased risk of tic disorder (HR: 1.148, 1.020–1.292). Male gender and urban residency were associated with higher incidence rates for certain conditions.

Conclusions:
This study demonstrates that KD patients show increased risks for anxiety, sleep-related disorder, movement disorder, and tic disorder, a reduced incidence of intellectual disability, and a higher risk of tic disorder. These findings highlight the need for long-term neurological monitoring in KD patients and provide insights into its potential neurodevelopmental impact.

ORAL PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

2521 - A RANDOMIZED CONTROLLED TRIAL MILD THERAPEUTIC HYPOTHERMIA DURING EXTRACORPOREAL MEMBRANE OXYGENATION IMPROVES NEURODEVELOPMENTAL OUTCOMES IN POSTCARDIOTOMY INFANTS A 5 YEAR FOLLOW UP

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Background / Hypothesis:
To investigate the potential neuroprotective effect of mild therapeutic hypothermia on postoperative neurobehavioral development outcomes in children with congenital heart disease (CHD) who undergo extracorporeal membrane oxygenation (ECMO) support.

Materials and Methods:
In this randomized controlled trial, children requiring ECMO support after CHD surgery between October 2018 and June 2020 were randomly assigned to a mild hypothermia group (n=16) or a normothermia group (n=17). In the hypothermia group, core body temperature was maintained at 34.0 ± 0.5 °C using a temperature-controlled water tank for 48–72 hours. All other aspects of management were consistent between the two groups. Participants underwent regular postoperative follow-up, including cranial magnetic resonance imaging (MRI) and neurodevelopmental assessment using the Griffiths Developmental Scales.

Results:
A total of 33 patients were enrolled, with an overall survival rate of 69.7% (23/33), showing no significant difference in survival between groups. The lowest recorded temperature in the hypothermia group was 34.28 ± 0.53 °C, with a mean duration of hypothermia of 58.00 ± 15.56 hours. No significant hypothermia-related complications were observed. As of June 2025, follow-up rates were 83.33% (10/12) in the hypothermia group and 81.81% (9/11) in the normothermia group. MRI scores were 1.33 ± 1.06 and 1.21 ± 1.15 for the hypothermia and normothermia groups, respectively (P=0.833). Children in the hypothermia group had higher developmental quotient (DQ) scores in four domains: B (personal-social), C (language), D (hand-eye coordination), and E (performance), with statistically significant differences observed in domains C and E (P=0.049 and P=0.012, respectively).In the last follow-up, children in the mild hypothermia group still maintained a developmental advantage in domains B and F.

Conclusions:
Mild therapeutic hypothermia combined with ECMO after CHD surgery did not increase hematologic or circulatory complications. Early postoperative neurodevelopmental outcomes were better in the hypothermia group, particularly in the domains of language and performance.

ORAL PRESENTATIONS

Category: Perfusion

1107 - PROSPECTIVE STUDY OF PLATELET PRESERVING PROPERTIES OF NITRIC OXIDE ON EXTRACORPOREAL MEMBRANE OXYGENATION IN PAEDIATRIC PATIENTS

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Background / Hypothesis:
The extracorporeal membrane oxygenation (ECMO) circuit induces excessive activation of the coagulation system and inflammatory cascade, rendering paediatric patients at increased risk of bleeding and thrombosis, as well as the complications associated with blood product transfusions. This study aimed to investigate the clinical benefits of administering nitric oxide (NO) into ECMO oxygenators for paediatric patients, specifically evaluating NO's platelet protective effect and safety profile.

Materials and Methods:
This study was a prospective cohort study conducted at a single paediatric ECMO centre. The NO study group included 29 patients who received 20 ppm of NO blended into the sweep gas running into the oxygenator throughout the entire ECMO support. Their data was compared to 29 patients from a historical control group, comprising all paediatric patients who received ECMO support without any NO between 2017 and 2018.

Results:
In comparison, the NO group had a higher mean platelet count during the ECMO support period than the control group (101.9 vs. 94.7 x109/L, p = 0.045). The NO group significantly decreased the total platelet transfusion volume compared to the control group (480 vs. 760 ml, p = 0.017). Nonetheless, the platelet transfusion quantified in ml/kg/day did not demonstrate a reduction in the NO group relative to the control group (10.0 vs. 8.9 ml/kg/day, p = 0.053). The total fresh frozen plasma (FFP) transfusion and analysis expressed in ml/kg/day consistently demonstrated a lower demand in the NO group relative to the control group (90 vs. 230 ml, p = <0.01; 1.3 vs. 4.7 ml/kg/day, p = 0.014). The methaemoglobin and nitrogen dioxide level in the NO group remained within the specified safety normal range. The NO group demonstrated a reduced incidence of bleeding (48.2% vs. 72.4%, p = 0.06).

Conclusions:
The administration of NO into the ECMO oxygenator of paediatric patients preserved platelet counts and

ORAL PRESENTATIONS

Category: Perfusion

1666 - WHOLE BODY PERFUSION IMPROVES CEREBRAL PERFUSION AND NEUROLOGICAL OUTCOMES IN NEWBORNS DURING AORTIC ARCH RECONSTRUCTION

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Background / Hypothesis:
Neuroprotection is one of the cornerstones for successful aortic arch reconstruction surgery in newborns and is tightly linked to the outcome. Currently, cerebral perfusion is achieved through the brachiocephalic trunk. We established an additional retrograde perfusion through the femoral artery using an arterial sheath, what we call Whole-body Perfusion (WBP)

Materials and Methods:
Retrospective, single center study, from January 2014 to December 2022. We included a total of 95 consecutive patients who underwent aortic arch reconstruction surgery at our center. In N= 34 patients the perfusion strategy was selective cerebral perfusion through the brachiocephalic trunk, (SCP) in N=61 patients an additional retrograde perfusion through the femoral artery was established (WBP). Primary endpoints were major postoperative complications.

Results:
Patients in the WBP group needed significantly less intraoperative blood-product transfusions (p-value = < 0,01), had lower creatinine values at 24h and 72h postoperatively (p-value = 0.01), and had a higher urine output (p-value < 0.01). The duration of mechanical ventilation was shorter (p-value = 0.02). There was no difference regarding use of ECLS, postoperative bleeding complications, need for renal replacement therapy, multiorgan failure, or 30-day mortality. The rate of neurological complications was lower in the WBP group (3.3% vs 17.6%) (p-value = 0.01). Arterial punction-related complications were low (6.6%).

Conclusions:
WBP was able to provide better cerebral perfusion which translated into less neurological complications

ORAL PRESENTATIONS

Category: Perfusion

1992 - PRELIMINARY EXPLORATION OF THE APPLICATION OF AUTOLOGOUS UMBILICAL CORD BLOOD PRIMED CARDIOPULMONARY BYPASS CIRCUIT IN NEONATAL CONGENITAL HEART DISEASE SURGERY

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Background:
This study aims to explore the clinical value of priming the CPB-circuit with autologous umbilical cord-whole blood (UC-WB) in neonatal congenital heart disease (CHD) surgery. Additionally, the quality stability and microbiological safety of UC-WB stored for up to 35 days are evaluated.

Materials and Methods:
This prospective controlled trial included neonates undergoing CHD surgery at Guangdong-Provincial-People's-Hospital between August2024 and April2025. The experimental group comprised neonates whose CPB-circuits were primed with autologous UC-WB, while the control group used allogeneic-adult-blood-components (AAB). Preoperative baseline characteristics, intraoperative-CPB-and-ACC-times, postoperative ICU stay duration, mechanical-ventilation-time, blood-biochemical-parameters,and echocardiographic-findings were compared. 30 UC-WB samples stored in 14mL CPDA-1 solution at 2–6°C were analyzed. 6samples from each group were tested for complete-blood-count, hemolysis-rate, electrolytes, and microbial-culture after 7,14,21,28,and35days of storage.

Results:
13cases were included in the UC-WB group and 11 in the control group. Preoperative baseline characteristics showed no significant differences($P>0.05$). Postoperative RBC, Hb, and CK levels were comparable($P>0.05$). Perioperative LVEF did not differ between groups. The UC-WB group exhibited lower HCT(29.0±5.13vs.33.4±4.60,$P<0.05$) and Lac levels(4.5[3.8,5.1]vs.2.9[2.7,3.5], $P<0.05$) at surgery completion, but these differences resolved by 6hours postoperatively($P>0.05$). The UC-WB group had higher VISmax within 48hours(20.7±5.23vs.9.9±8.0,$P<0.05$) and longer ICU stays(5.17±1.94vs.2.5±1.3days,$P<0.05$), though total hospitalization and mechanical ventilation durations were comparable($P>0.05$). UC-WB hemolysis-rates and potassium-levels increased with storage time. After 35days, all UC-WB samples exhibited hemolysis-rates<0.8%. 1case of Escherichia coli contamination was detected.

ORAL PRESENTATIONS

Conclusions:
Autologous UC-WB priming significantly reduced AAB demand and exerted minimal impact on postoperative cardiac function recovery, pleural effusion, or metabolic stability. Although younger surgical age in the UC-WB group prolonged ICU stays, pharmacological adjustments mitigated effects on total hospitalization duration. UC-WB stored in CPDA-1 at 4°C for 35days met whole blood quality standards, with controllable microbiological contamination risks. This study provides preliminary evidence supporting the clinical use of autologous UC-WB for CPB priming, though larger-scale validation is warranted.

ORAL PRESENTATIONS

Category: Perfusion

2504 - INFLAMMATORY AND CARDIAC BIOMARKER RESPONSE TO GOAL DIRECTED PAEDIATRIC CARDIOPULMONARY BYPASS

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Background / Hypothesis:
Cardiopulmonary bypass (CPB) can trigger severe inflammatory responses. These are now partly mitigated by goal-directed perfusion (GDP) methods. However, some operations necessitate occasional drops in perfusion which may exacerbate the inflammatory response over and above the CPB effect. Using granular data, we aimed to examine the relationship between GDP lapses and cytokine profiles in the first 24 hours post-CPB. This is a work-in-progress report framing the quest for perfusion-related anti-inflammatory interventions in paediatric practice.

Materials and Methods:
Patients: n=81, median age 203 days, RACHS categories 2-6. Biomarkers: troponin I and 7 cytokines. CPB data recorded automatically every 10 seconds via Quantum workstation (Spectrum medical), with DO2 threshold of adequacy set at 360 ml/min/m2 and cumulative area below threshold collected. Perfusion ratio and O2 extraction ratio included in the analysis. Selective-cerebral perfusion, circulatory arrest and modified-ultrafiltration treated as binary variables. Results at arrival in ICU (Start) and after 24 hrs (Post24) referenced to baseline pre-CPB value. Separate linear mixed-effects models with 14 patient- and perfusion-related variables corrected for repeated measurements and multiple comparisons using false discovery rate (FDR).

Results:
Early mortality was zero (predicted 2.9%). The 8 biomarkers exhibit very different perioperative profiles. All, except IL6Ra, increased significantly from baseline to arrival on ICU with only TNI, IL1β and IL6 remaining significantly high after 24 hours. Exploratory analyses identified significant associations (Table 1b). For specific GDP analysis, significant associations were found for duration of oxygen delivery deficit with higher GM-CSF, and area under DO2i threshold and IL1β.

Conclusions:
Despite judicious GDP management, inflammatory cascades are potent and polymorphic, remaining robust after adjustment for perioperative factors and multiple testing. This is part of a wider omics project involving larger cohorts with the aim of identifying pro-inflammatory genotypes as well as deleterious levels of underperfusion and multidisciplinary methods of mitigating these issues.

ORAL PRESENTATIONS

Category: Pulmonary Hypertension

1137 - FOLLOW UP MEASUREMENTS OF MEAN PULMONARY ARTERIAL PRESSURE (

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Background / Hypothesis:
Cardiac catheterization (HC) remains the gold standard for diagnosis of pulmonary arterial hypertension (PAH) and is recommended to monitor disease severity during follow-up. However, the prognostic significance of invasive hemodynamic parameters in pediatric PAH remains unclear. Given the risks inherent to catheterization, we set out to assess the potential prognostic benefit of HC.

Materials and Methods:
Tracking Outcomes and Practice in Pediatric Pulmonary Hypertension-2 (TOPP-2; NCT02610660) is an international, multi-center registry of incident pediatric PAH patients. Initial diagnostic HC was required for inclusion. Follow-up HC (FUHC) was performed in a subset of patients with no predefined requirements. All catheterizations were assessed for accuracy and consistency by expert TOPP members. Lung transplant-free survival was assessed for candidate hemodynamic parameters.

Results:
Thirty-one participating centers reported 983 individual catheterizations in 494 patients. Of these, 331 subjects met inclusion criteria for this sub-analysis based on PAH etiology (idiopathic (182), heritable (51), drug/toxin-induced (3), or associated with congenital heart disease with incidental shunt (50), repaired shunt (41), or without prolonged initial shunt (4)). 178 of 331 patients (53.8%) had at least one FURHC.
Mean pulmonary artery pressure (MPAP) <40 mmHg at initial RHC indicated improved survival (p=0.052); however, achieving MPAP <40 mmHg at first FURHC was strongly associated with freedom from death/transplant (mean observation time 70.7 vs 68.2 months with 96.5% vs 73.1% event-free; p<0.001). Pulmonary vascular resistance <6.3 WU·m2 at diagnosis and at first FUHC trended toward improved outcome (p=0.128 and 0.056, respectively), while cardiac index >2.5 L/min·m2 and reduction of MPAP without achieving the threshold of 40 mmHg did not predict survival

Conclusions:
In pediatric PAH, achieving MPAP <40 mmHg at first FUHC is a strong predictor of survival. Future analyses should refine threshold values for MPAP and other hemodynamic parameters to enhance risk stratification and inform treatment strategies

ORAL PRESENTATIONS

Category: Pulmonary Hypertension

1815 - RELATIONSHIP BETWEEN INITIAL TREATMENT STRATEGY AND OUTCOMES IN THE INTERNATIONAL TOPP 2 REGISTRY

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Background / Hypothesis:
Pediatric pulmonary arterial hypertension (pPAH) is a severe disease with 72% 5-year transplant-free survival. The global Tracking Outcomes and Practice in Pediatric Pulmonary Hypertension-2 (TOPP-2; NCT02610660) registry was created to assess the treatments and outcomes of incident pPAH patients. This study aims to evaluate treatment strategies employed and their relationship with outcomes in pPAH patients.

Materials and Methods:
Within TOPP-2, 445 subjects with newly-diagnosed, catheterization-confirmed WSPH Group 1 pPAH were enrolled. Treatment regimens were classified as none, MonoCCB (calcium channel blocker monotherapy), Mono, Dual, TripleO (3 medications, enteral/inhaled only), or TripleP (3 medications, including parenteral prostanoid). Baseline treatment strategy was defined as medications received 3 months following diagnosis. Primary clinical outcome was death or lung transplantation.

Results:
Dual therapy was the most common baseline treatment (40.2%), followed by Mono (29.0%), none (11.2%), TripleP (10.8%), MonoCCB (5.4%), and TripleO (3.4%, Table). Phosphodiesterase V inhibitors were the most common class of PAH-targeted therapy (72.4%) followed by endothelin receptor antagonists (59.3%), parenteral prostanoids (16.0%), and enteral/inhaled prostanoids (4.0%). By year 4, 31.8% of Mono patients had escalated therapy and 14% experienced death/transplant, compared to 15.6% escalation and 12.3% death/transplant for Dual patients. Adjusting for functional class and pulmonary vascular resistance at diagnosis, baseline Dual patients had lesser hazard of death/transplant than Mono patients escalating to Dual by year 1 or meeting the outcome before escalating (HR=0.30, 95% CI=0.16-0.56, p<0.001). TripleO/P patients had numerically lower hazard of death/transplant than baseline Dual patients escalating to TripleO/P, but the difference was not statistically significant (HR 0.64, 95% CI=0.34-1.20, p=0.164).

Conclusions:
A wide range of pPAH initial medication strategies were observed in the TOPP-2 registry with many patients requiring treatment intensification during follow-up. Baseline Dual was associated with a survival advantage over baseline Monotherapy with subsequent escalation supporting a more aggressive approach to up-front medical management.

ORAL PRESENTATIONS

Category: Pulmonary Hypertension

1908 - COMPARING METHODS TO EVALUATE PULMONARY VASCULAR RESISTANCE IN LONG STANDING SHUNT LESIONS

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Background:
Evaluating the operability of long-standing shunt lesions in patients with pulmonary hypertension is challenging. The goal of the assessment is to determine whether the increase in pulmonary pressure is primarily due to increased pulmonary blood flow (Qp) or increased pulmonary vascular resistance (PVR). While heart catheterization provides accurate pressure measurements, evaluating Qp typically relies on indirect Fick method, with assumed oxygen consumption, introducing potential bias. MRI has demonstrated the ability to accurately measure blood flow. We aim to compare indexed Qp (Qpi) and PVR (PVRi) assessments between these two techniques.

Materials and Methods:
We retrospectively reviewed all children who underwent a combined heart catheterization and MRI at our center (during the same anesthesia) between May 2022 and March 2025 and compared the differences in hemodynamic values obtained through these methods.

Results:
26 paired catheterization and MRI assessment were conducted in 18 patients aged 5 years (± 3), including 18 on room air and 8 on O2+iNO. Median and range values for mean pulmonary artery pressure (mPAP) was 49 mmHg (29-44), Qpi by Fick 10.7 (5.5-28.8 l/min/m2), Qpi by MRI 12.0 (2.7-17.8) and PVRi by Fick 3.4 WUm2 (1-7.8) and MRI 2.8 (1.3-7.9). Both methods showed low agreement (Figure 1). On room air, Qp/Qs seemed to be underestimated, and RVP/RVS overestimated by catheterization compared to MRI (Figure 2).

Conclusions:
Measurements of Qpi using indirect Fick method and assumed oxygen consumption demonstrated low agreement with MRI flow measurements. The reliability of recommended PVRi thresholds as determinants of operability and the preferred method for calculating PVRi require further research.

ORAL PRESENTATIONS

Category: Rheumatic Heart Disease

1257 - FEASIBILITY AND ACCEPTABILITY OF THE RAPID AI ASSISTED DETECTION AND ANALYSIS OF RHEUMATIC HEART DISEASE (RADAR) TOOL A FIELD STUDY

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Background / Hypothesis:
Early detection of rheumatic heart disease (RHD) remains via echocardiographic (echo) screening by non-experts enables timely intervention, but accurate diagnosis requires specialized expertise often unavailable in these regions. Artificial intelligence (AI) offers a promising solution to enhance diagnostic accuracy and scalability. We have previously shown that AI can accurately detect mild RHD. We deployed the Rapid AI-Assisted Detection and Analysis of Rheumatic Heart Disease (RADAR) tool to assess its feasibility and acceptability among non-expert echo screeners.

Materials and Methods:
In December 2024, we conducted a field evaluation of the RADAR AI tool with five non-experts echo screeners. The AI-assisted device was integrated into the ADUNU echo screening program, where non-experts used it over four days to screen 455 children and adults for RHD. Participants provided structured feedback on usability, workflow integration, and perceived accuracy through a standardized survey.

Results:
Participants reported high acceptability and feasibility of the AI tool, citing ease of use, efficiency, and seamless integration into existing workflows. Pre and post-intervention surveys demonstrated improved satisfaction with the user interface (40% pre and 60% post high satisfaction ratings) and comfortability with device (60% pre and 80% post high satisfaction). Real-time RHD predictions resulted in under two minutes, on average with no major technical challenges, supporting the tool's viability in low-resource settings.

Conclusions:
The RADAR AI tool demonstrated strong feasibility and acceptability for RHD screening by non-experts in Uganda. The next steps include further field validation for widespread deployment. AI-driven echo screening has the potential to bridge diagnostic gaps and scale RHD detection in underserved populations.

ORAL PRESENTATIONS

Category: Rheumatic Heart Disease

1781 - TESTING THE EFFICACY OF A RHEUMATIC HEART DISEASE EDUCATION PROGRAM IN BABATI TANZANIA A CONTROLLED QUASI EXPERIMENTAL STUDY

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Background / Hypothesis:
Rheumatic Heart Disease (RHD) is endemic in Tanzania, affecting between 1.7% – 3.4% of children and young adults. Lack of community awareness and limited knowledge among primary healthcare workers (HCWs) are critical barriers to RHD control. We aimed to test the efficacy of a health education program and school-based awareness campaign in improving knowledge and practice towards Group A Streptococcus (GAS) sore throat, Rheumatic Fever (RF), and RHD among Tanzanian primary HCWs and a high-risk community in Babati, Manyara. Here, we present the effects of the HCW education intervention at 3 months.

Materials and Methods:
A pretest-post-test non-equivalent control group quasi-experimental study design was used. Eight wards within Babati, comprising 40 health centers were evenly split into intervention and control groups from which HCWs were enrolled. The intervention group (n=40) received a 5-day interactive in-class education program covering all aspects of GAS, RF, and RHD prevention and control, as well as training on an RF management algorithm and RHD education flipchart. The control group (n=40) was reminded of existing national guidelines. A paired t-test measured change between group knowledge scores between baseline and 3-months post-intervention.

Results:
Trained HCWs scored significantly higher compared to the control 3-months post-intervention ($p<0.001$). At baseline, HCW knowledge scores were similar between intervention (10.05) and control (9.58) groups; 93% of HCWs in both groups reported never having received formal RF/RHD training. Among HCWs who received training, 88% reported using the RF algorithm, and 90% had used the RHD flipchart at follow-up. Knowledge of anticoagulant prescription improved (53% to 100%) among trained HCWs, while the control remained the same (65%).

Conclusions:
Despite serving a high-risk population, HCWs had low rates of knowledge at baseline, which significantly improved following intervention. Six- and twelve-month follow-up surveys will ascertain long-term knowledge retention and use of tools. Facility-level data will reflect clinical practice impact.

ORAL PRESENTATIONS

Category: Rheumatic Heart Disease

1906 - MIGRATION AND RHD PREVALENCE IN EUROPE A SYSTEMATIC REVIEW AND META ANALYSIS

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Background / Hypothesis:
The rise in migration of people from Rheumatic heart disease (RHD) endemic countries may lead to a resurgence in Europe. Given that RHD is preventable with timely administration of penicillin for asymptomatic at-risk individuals, we sought to quantify RHD prevalence in Europe in order to identify areas, if any, requiring intervention.

Materials and Methods:
We employed an extensive search strategy incorporating keywords “prevalence” and “rheumatic heart disease” to identify screening studies in Europe. Two reviewers independently extracted data and assessed quality; statistical analyses using Stata® software estimated pooled values for prevalence across all included studies. We further performed subgroup analyses based on risk of bias assessment, income status and population characteristics. A narrative summary is provided where meta-analyses was not possible.

Results:
Of 27 studies meeting with the eligibility criteria, five studies report on screening asymptomatic populations, Of these, only one study, conducted in Italy, specifically examined healthy immigrants, reporting a 2.6% [95% CI: 0.81–3.24] prevalence of definite RHD (n=653 participants <26 years old). The combined prevalence across the remaining four studies was 1.67% [95% CI: 0.62–3.17]. A single study in Turkey reported an RHD prevalence of 55.3% among asymptomatic pregnant women newly diagnosed cardiovascular disease. Beyond pregnancy-related cases, echo-confirmed RHD prevalence in ambulatory patients with recurrent tonsillitis and elevated anti-streptolysin O (ASO) titers was 1.96% and 2.94% definite and borderline RHD, respectively.

Conclusions:
Migrant populations may have a higher prevalence of asymptomatic RHD compared with non-migrant populations in Europe; however, reliable data in Europe is scarce hampering our ability to derive at statistically significant conclusions. Nevertheless, we show that RHD definitely hasn’t vanished from the European continent and encourage research efforts have to increase drastically to adapt to changing migration patterns and the challenges this neglected disease brings to Europe.

ORAL PRESENTATIONS

Category: Rheumatic Heart Disease

1958 - NOVEL IMAGING FINDINGS IN ACUTE RHEUMATIC FEVER – A 3D ECHOCARDIOGRAPHY AND CARDIAC MAGNETIC RESONANCE STUDY

Shatanik Sarkar [1], Sivasubramanian Ramakrishnan [2], Saurabh Gupta [2], Sanjeev Kumar [3]
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Background / Hypothesis:
Latest modification of Jones criteria in 2015 for diagnosis of Acute Rheumatic Fever (ARF) acknowledges the role of 2D Echocardiography, which still has limitations in recognizing myocarditis and detailed anatomy of cardiac valves.

Materials and Methods:
Present study was conducted at the Department of Cardiology of a tertiary care hospital of India to prospectively examine the Cardiac MRI and 3D Echocardiography findings of ARF and also to compare the features with those of Rheumatic Heart Disease (RHD). Patients fulfilling Modified Jones Criteria during the study period were included in the study group as cases of ARF and patients with established RHD without active carditis were included in the control group. All the patients from both the groups were subjected to 2D and 3D Echocardiography followed by Cardiac MRI with contrast. Patients with ARF were re-evaluated for mitral valve thickness after completion of their treatment.

Results:
15 patients were enrolled in each group. Mitral Regurgitation was the most common lesion in both the groups. Thickness of mitral valve leaflets were more in ARF patients compared to RHD, with difference in AML thickness being statistically significant ($p = 0.006$). Furthermore, in patients with ARF, thickness of MV leaflets reduced after proper immunosuppressive therapy. On 3D Echocardiography, commonest mechanism of MR was hypermobility of AML (Carpentier's type II) in both the groups with A2 scallop being the commonest one involved. Nodules over AML were more readily seen in ARF patients (60%) by 3D Echocardiography. Cardiac MRI showed significantly more EGE in ARF patients than patients with RHD ($p = 0.013$). Native T1 mapping value also showed significant rise in ARF patients compared to RHD patients ($p = 0.024$).

Conclusion:
Newer modalities like 3D Echocardiography and Cardiac MRI can add to the existing ones in solving the ever-existing dilemma in diagnosis of ARF.

ORAL PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1568 - RISK ADJUSTMENT FOR CONGENITAL HEART SURGERY UPDATING RACHS 1 FOR THE LOW AND MIDDLE INCOME CONTEXT

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Background / Hypothesis:
The Risk Adjustment for Congenital Heart Surgery (RACHS-1) method, developed in 2004 using expert consensus, stratifies congenital heart surgeries into six risk categories to access mortality. It incorporates patient factors such as age, prematurity, and presence of major non-cardiac anomalies and has been widely used to evaluate institutional performance. However, RACHS-1 was designed using data from high-income countries (HICs) and may not fully capture risk factors unique to low-and-middle-income countries (LMICs). To address this gap, the International Quality Improvement Collaborative for Congenital Heart Disease (IQIC) convened a globally representative panel to develop RACHS-LMIC, a modified risk adjustment model based on 99,554 cases and 4,548 mortalities from the IQIC database.

Materials and Methods:
The RACHS-LMIC model is being refined through expert consensus, incorporating additional risk variables relevant to LMICs. Key areas of focus include risk-factors concerning neonates, those experiencing social deprivation, and those presenting late to treatment, which impact surgical outcomes for CHD in resource-limited settings. Additionally, RACHS-1 procedural categorizations are being reassessed to account for increased risk associated with LMIC-specific challenges, such as infrastructure limitations and delayed access to care.

Results:
By incorporating LMIC-specific risk factors and adjusting procedural risk categories to better reflect the challenges and limitations faced in low-resource settings, the RACHS-LMIC model will enable more precise mortality and risk assessment within LMIC countries.

Conclusions:
RACHS-LMIC aims to improve risk stratification and mortality assessment for congenital heart surgery in LMICs, thereby supporting targeted quality improvement initiatives and guiding interventions to address unique challenges in resource-limited settings.

ORAL PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

2237 - ASSESSING IMPROVEMENT IN PEDIATRIC HEART FAILURE OUTCOMES THROUGH NUTRITIONAL SUPPLEMENTATION A YEAR OF EXPERIENCE IN PAKISTAN

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Background / Hypothesis
Pediatric patients with myocarditis and dilated cardiomyopathy (DCM) in low-resource settings often present with coexisting protein-calorie malnutrition (PCM), which further compromises cardiac function. We hypothesized that structured nutritional rehabilitation, including high-protein dietary interventions and caregiver counseling, would lead to measurable improvement in left ventricular ejection fraction (EF), clinical outcomes, and hospital readmissions.

Materials and Methods
This retrospective observational study was conducted at the Pediatric Cardiology Department of Lady Reading Hospital, a tertiary care facility in Khyber Pakhtunkhwa, Pakistan. Over a 12-month period, 1,560 pediatric patients were referred to our dedicated Nutritional Rehabilitation Unit. Of these, 1,404 had underlying cardiac dysfunction, including myocarditis (n=780) and DCM (n=624). Nutritional status was assessed using Z-scores and anthropometry. Among cardiac patients, 940 (66.9%) were diagnosed with PCM. All patients received individualized dietary plans; 468 patients received Ready-to-Use Therapeutic Food (RUTF). Caregivers were counseled weekly, and follow-up was conducted at regular intervals. Baseline and 1-year echocardiographic EF values were compared.

Results
Out of 1,404 patients with cardiac dysfunction, 1,221 (87%) showed significant clinical improvement following nutritional therapy. Mean EF improved from 32.5% ± 6.8% at baseline to 44.3% ± 8.1% at 1-year follow-up ($p<0.001$). Patients who received RUTF had faster symptomatic recovery and greater EF improvement compared to those on standard diets. Mortality rate was reduced to 2.8% (n=44) over one year. Readmission rates also declined from 12% in the first quarter to 4% by the fourth quarter. PCM was more prevalent in patients with myocarditis compared to those with DCM (71.8% vs 60.2%).

Conclusions
Early identification and structured nutritional rehabilitation in pediatric patients with cardiac dysfunction significantly improves cardiac function, reduces mortality, and minimizes hospital readmissions. Nutritional support should be a key component in the management of pediatric heart failure, especially in resource-constrained settings.

LIGHTNING POSTER PRESENTATIONS

LIGHTNING POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1108 - DEVELOPMENT AND VALIDATION OF A NOMOGRAM FOR PREDICTING INTRAVENOUS IMMUNOGLOBULIN RESPONSIVE CORONARY PROGRESSION IN KAWASAKI DISEASE

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Background / Hypothesis:
Coronary artery lesions (CALs) in Kawasaki disease (KD) patients have long been a critical clinical concern. While extensive research has focused on predicting intravenous immunoglobulin (IVIG) resistance and optimizing therapeutic strategies, this retrospective study identified a distinct clinical subgroup characterized by IVIG responsiveness (defined as sustained defervescence without recurrence within 36 hours post-IVIG therapy) yet exhibiting persistent progression of coronary artery lesions (CALs), termed IVIG-responsive coronary progression (IRCP). Early intervention in this subgroup is crucial for prognosis improvement; however, validated predictive tools are currently lacking. This study aimed to develop and validate a clinically applicable Nomogram for IRCP prediction.

Materials and Methods:
We systematically investigated risk factors for IRCP in KD patients meeting the American Heart Association diagnostic criteria. Predictor selection was performed via LASSO regression followed by multivariable logistic regression modeling. Internal validation was conducted through bootstrapping method (resampling =1000). Receiver operating characteristic (ROC) curves were constructed to calculate the area under the curve (AUC), while calibration curves, decision curve analysis (DCA), and clinical impact curves (CIC) were sequentially generated to evaluate the model's discriminative capacity, calibration accuracy, and clinical net benefit.
Results:

Seven independent predictors were identified and incorporated into the Nomogram: age (OR=1.20, 95%CI:1.03-1.39, P=0.018), treatment duration (OR=1.26, 95%CI:1.14-1.41, P<0.001), CRP (OR=1.02, 95%CI:1.01-1.03, P<0.001), ESR(OR=1.01, 95%CI:1.0-1.02, P=0.011), Na (OR=0.88, 95%CI:0.79-0.97, P=0.017), PT (OR=1.40, 95%CI:1.14-1.79, P=0.003), and TT (OR=1.21, 95%CI:1.01-1.48, P=0.051). The model demonstrated robust discrimination (AUC: 0.85, 95% CI: 0.799–0.896) and and calibration (Hosmer-Lemeshow test P=0.156). Calibration curves showed excellent agreement between predicted and observed probabilities. DCA and CIC analyses confirmed clinical utility.To enhance clinical practicability, we engineered a web-based calculator platform (accessible at http://127.0.0.1:3274/) with real-time predictive analytics capabilities.

Conclusions:
This study developed a validated Nomogram incorporating seven pretreatment variables to predict IRCP risk in KD patients, providing a clinically actionable tool for early targeted intervention.

LIGHTNING POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2144 - EFFICACY AND SAFETY OF DIRECT ORAL ANTICOAGULANTS IN CHILDREN REQUIRING LONG TERM ANTICOAGULATION IN KAWASAKI DISEASE A SYSTEMATIC REVIEW

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Background / Hypothesis
Kawasaki disease (KD) is a childhood vasculitis with potential complications of coronary artery aneurysms (CAA), predisposing to thrombosis and long-term cardiac morbidity. Anticoagulation is recommended for high-risk patients with giant aneurysms. Current agents -- low-molecular-weight heparin (LMWH) and warfarin are challenging in children. The objective of this systematic review is to evaluate the efficacy and safety of direct oral anticoagulants (DOACs) as an alternative.

Materials and Methods
A systematic review was conducted from PubMed, Embase, Cochrane Library and Clinicaltrials.gov from initiation to April 2025, assessing DOACs in children. Inclusion criteria followed the PICO framework: Pediatric KD patients receiving DOACs (dabigatran, rivaroxaban, apixaban, or edoxaban), compared with standard anticoagulants (warfarin or LMWH), and reporting safety and efficacy outcomes.

Results
There were 82 patients with giant CAAs, including 62 patients on DOACs. Incidence of major or clinically relevant non-major(CRNM) bleeding based on the whole cohort on DOACs was 1.8 [95% CI: 0.24 to 7.23] per 100 patient-years, and incidence of all bleeding events was 19.0 [95% CI: 11.83 to 31.85] per 100 patient-years. There were no new thromboembolic events except in one patient who suffered a myocardial infarction while on warfarin, then continued to develop multiple myocardial infarctions despite switching from warfarin to DOAC.

Conclusions
DOACs demonstrated non-inferior safety profiles compared to conventional agents, with favorable administration characteristics and reduced need for laboratory surveillance. Heterogeneity in study design, small sample sizes, and limited long-term follow-up are limitations of this review. Nonetheless, DOACs appear to be promising alternative to traditional anticoagulants in pediatric KD patients. Large-scale randomized trials with longer follow-up will be useful to confirm this and guide clinical practice.

LIGHTNING POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2338 - SHOULD WE USE TROPONIN AS A CARDIAC MARKER IN NEWBORNS INSIGHTS FROM CORD BLOOD HS CTNT LEVELS IN HEALTHY NEWBORNS

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Background / Hypothesis:
High-sensitivity cardiac troponin T (hs-cTnT) is a well-established biomarker for myocardial injury in adults, but its applicability in pediatric populations, particularly newborns, remains uncertain. This study investigates hs-cTnT levels in cord blood of healthy newborns and explores associations with perinatal factors.

Materials and Methods:
A prospective study was conducted on 184 healthy newborns, with hs-cTnT measured in cord blood. Perinatal data, including delivery mode, labor duration, and maternal factors, were analyzed. Statistical correlations and linear regression models assessed relationships between hs-cTnT and clinical variables.

Results:
Median hs-cTnT levels (39.0 ng/L, IQR=23.6) exceeded adult reference thresholds (>14 ng/L). No sex-based differences were observed. Elevated hs-cTnT correlated with prolonged second-stage labor (P=0.02) and Pitocin use (P=0.04), while lower levels were associated with gestational age (P<0.001) and gravidity (P=0.03). Spontaneous vaginal delivery showed significantly lower hs-cTnT than operative deliveries (P=0.02).

Conclusions:
Newborns exhibit physiologically higher hs-cTnT levels than adults, likely reflecting perinatal stress and hemodynamic adaptation during transition to extrauterine life. The lack of established pediatric reference values complicates clinical interpretation. While hs-cTnT may indicate cardiac strain during labor, its diagnostic utility in newborns requires further validation through outcome-correlated studies. Current evidence does not support routine use of hs-cTnT as a standalone cardiac marker in children, emphasizing:

LIGHTNING POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1116 - CHANGES IN TRANSCUTANEOUS OXYGEN SATURATION WITH POSTURE CHANGES IN FONTAN CIRCULATION INCIDENCE AND INFLUENCING FACTORS

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Background / Hypothesis:
Platypnea-Orthodeoxia Syndrome in Fontan circulation has been reported to occur due to right-to-left shunt or ventilation-perfusion mismatch. However, the frequency of occurrence and risk factors remain inadequately investigated.To investigate the incidence of absolute differences in transcutaneous oxygen saturation between sitting and lying positions (ΔSpO2) in Fontan circulation and to identify factors influencing these changes.

Materials and Methods:
We evaluated 94 patients with Fontan circulation (Group F) and 69 patients who underwent two-ventricle repair (Group B) from April to December 2024 were evaluated. ΔSpO2 was compared between two groups. Additionally, in Group F, the relationship between ΔSpO2 and patient characteristics, as well as hemodynamics was analyzed. Data were presented as median [IQR].

Results:
TheΔSpO2 (%) was 2 [0-3] in Group F and 0 [0-0] in Group B ($p<0.05$). In Group F, ΔSpO2 ≧3% and ≧6% were observed in 34 (36%) and 8 (8.5%) respectively. Three patterns of ΔSpO2 changes in the lying position were identified: increase, no change, and decrease. In Group F, comparisons between patients withΔSpO2 ≧3% and those with ΔSpO2 <3% revealed significant differences in the following parameters: age (years); 21.1 [18.4-27.4] vs. 16.8 [11.3-25.0] ($p=0.005$), years since Fontan surgery; 19.1 [16.3-23.9] vs. 14.1 [8.0-21.2] ($p=0.004$), arterial blood oxygen saturation (%); 93.5 [92.9-95.0] vs. 95.0 [94.0-96.0] ($p=0.039$), systemic ventricular end-systolic pressure (mmHg); 106.5 [99.3-115.0] vs. 96.0 [85.0-107.0] ($p=0.04$), maximum and minimum SpO2 (%) during exercise testing, median; 92 [83-99] vs. 95 [79-100] ($p=0.006$) and 88 [73-94] vs. 91 [72-99] ($p=0.005$).

Conclusions:
In Fontan circulation, compared to two-ventricle circulation, ΔSpO2 changes are more pronounced and observed in one-third of patients. These changes are associated with age and the duration since Fontan procedure. This may reflect the progression of ventilation-perfusion mismatch due to aging and the development of systemic venous collaterals due to prolonged exposure to Fontan circulation.

LIGHTNING POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2023 - NON INVASIVE EVALUATION OF VENTRICULAR FILLING PRESSURE AND PULMONARY VASCULAR RESERVE IN ADULTS WITH FONTAN CIRCULATION

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Background / Hypothesis:
Exercise cardiac catheterisation is the gold standard for diagnosing diastolic dysfunction (DD) and impaired pulmonary reserve in patients with Fontan circulation. The diagnostic value of non-invasive parameters is unclear.

Materials and Methods:
Patients who underwent simultaneous exercise haemodynamic evaluation and peripheral venous pressure (PVP) measurement were included. Echocardiographic surrogates for ventricular filling pressure were compared to invasive measures. DD was defined invasively as either resting pulmonary artery wedge pressure (PAWP) ≥12 mmHg or exercise PAWP >20 mmHg.

Results:
Twenty-nine patients were included. Age at catheterisation was 34±9 years. Echocardiographic and PVP measurements grouped according to the presence of diastolic dysfunction are shown in Table 1. Both AVV systole-to-diastole duration ratio (S/D) and resting PVP were significant predictors of resting PAWP (S/D: β 0.71 per 0.1 S/D, 95% CI: 0.16–1.25; p=0.01; PVP: β 0.68 per mmHg, 95% CI: 0.41–0.96; p<0.001). By contrast, resting PVP was a predictor of DD, whereas S/D was not. Based on these data, we proposed a two-tier assessment algorithm with the first tier considering resting PVP ≤15 mmHg and S/D ≤1.1, and second tier considering exercise PVP ≤25 mmHg in those with one elevated resting parameter. This algorithm showed positive predictive value of 88%, a negative predictive value of 90%, a sensitivity of 78%, and a specificity of 95%. Exercise PVP adjusted for peak oxygen consumption also predicted invasively measured exercise pulmonary vascular resistance index (β 0.36 WU.m2 per mmHg/100 mL/min, 95% CI 0.08-0.64; p=0.01).

Conclusions:
This study presents a simple, non-invasive approach for evaluating diastolic function and pulmonary vascular reserve in patients with a Fontan circulation.

LIGHTNING POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1540 - FIRST IN HUMAN CLINICAL STUDY OF A NOVEL AUTOLOGOUS LIVING HEART VALVE (GECT DZHK28)

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Background/Hypothesis:
The GrOwnValve method is an innovative approach to replacing dysfunctional heart valves, using autologous material, specifically the patient's living pericardial tissue to produce a custom-made, tissue-engineered heart valve. The method aims to overcome the shortcomings of current commercial heart valve replacements due to immune-mediated degeneration or the patient requiring lifelong platelet inhibition. The challenge is particularly apparent with children, for whom our method allows the making of a valve that regenerates and may grow with the patient, thus avoiding repeated surgeries.

Materials and Methods:
The GECT-DZHK28 study evaluated the safety and short-term efficacy of GrOwnValve in 5 patients with congenital pulmonary valve defects. The valves were made from the patients' own pericardial tissue and customized using 3D imaging data (MRI/CT): After in-silico reconstruction of the diseased valve and 3D printing of a personalized mould, the harvested tissue was shaped and crosslinked. The resulting patient-specific valve was then sutured into a stent and implanted using a minimally invasive catheter technique. Patients have been followed up in short intervals for a total of more than three months after the procedure.

Results:
All five patients underwent the GrOwnValve implantation successfully. The valves have been demonstrating excellent function, their opening behavior remaining optimal without transvalvular gradient. All valves showed good closure with no or only trivial regurgitation below the threashold set by international standards for valve certification. No serious safety issues have been identified during the follow-up period.

Conclusions:
The GrOwnValve method proved successful in implanting functional, patient-specific, customized, living pulmonary valves. Results from the three-month follow-up period have proven the valves' excellent functionality, so our method could be a long-term solution for patients, especially children, who need a valve that regenerates and eventually grows with them. A multi-center study will be initiated to assess long-term outcomes in larger patient groups.

LIGHTNING POSTER PRESENTATIONS

Category: Cardiac Surgery

1183 - AUTOLOGOUS PERICARDIAL RECONSTRUCTION OF AORTIC VALVE IN CHILDREN THE OZAKI TECHNIQUE EXPERIENCE

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Background/Hypothesis
Pediatric aortic valve disease requires solutions that accommodate growth while avoiding prosthesis-related complications. The Ozaki technique of autologous pericardial reconstruction offers potential advantages including optimal hemodynamics, no need for anticoagulant therapy, and preservation of native pulmonary valve architecture. This study evaluates its early and midterm outcomes in consecutive pediatric patients.

Materials and Methods
From March 2021 to November 2024, 25 consecutive children (median age 8 years [IQR 7-12]; 68% male) underwent Ozaki neocuspidization at our institution. The cohort included isolated aortic regurgitation (44%, ≥severe), mixed lesions (48%; mean peak gradient 44.0±12.0 mmHg, ≥moderate regurgitation), and predominant stenosis (8%, mean peak gradient 80.0±10.0 mmHg). Over half (56%) had prior balloon valvuloplasty, while 16% had previous congenital heart surgery. All patients underwent standardized postoperative care with serial echocardiographic follow-up (mean 18.3±8.55 months).

Results
The procedure demonstrated excellent perioperative safety with mean aortic cross-clamp time of 129.8±29.78 minutes and cardiopulmonary bypass duration of 163.0±40.22 minutes. Early postoperative assessment revealed significant hemodynamic improvement, with mean peak gradients decreasing to 13.3±5.67 mmHg and only trivial or no regurgitation in all cases. No conduction abnormalities requiring pacemaker implantation occurred. During follow-up, these outcomes remained stable with mean peak gradients of 18.0±7.30 mmHg, persistent freedom from significant (>mild) regurgitation, and 100% freedom from both reoperation and mortality. The technique proved particularly effective for regurgitation-predominant disease, achieving complete resolution of severe insufficiency while maintaining physiological gradients.

Conclusions
This experience confirms the Ozaki technique provides outstanding early and midterm outcomes in children, delivering near-physiological hemodynamics without prosthetic limitations. The perfect midterm results including complete elimination of significant regurgitation and freedom from reintervention suggest that it should be considered as first-line option for pediatric aortic valve disease, particularly in regurgitation-predominant cases. While these results are encouraging, extended follow-up remains essential to evaluate long-term durability during somatic growth.

LIGHTNING POSTER PRESENTATIONS

Category: Cardiac Surgery

1235 - DIFFERENT MORPHOLOGIES DIFFERENT GOALS CAN WE PREDICT BIVENTRICULAR CIRCULATION IN PULMONARY ATRESIA WITH INTACT VENTRICULAR SEPTUM

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Mehmet Akif Ersoy Thoracic And Cardiovascular Surgery Training Research Hospital, Pediatric Cardiology Department, Istanbul-Türkiye [1] Mehmet Akif Ersoy Thoracic And Cardiovascular Surgery Training Research Hospital, Pediatric Cardiac Surgery Department, Istanbul-Türkiye [2]

Introduction:
Pulmonary atresia with intact ventricular septum (PA/IVS) poses challenges in predicting long-term circulatory outcomes due to variable right ventricular(RV) hypoplasia. This study aimed to identify neonatal predictors of biventricular physiology, and to present associated RV morphologies and coronary anomalies.

Methods:
We retrospectively reviewed medical records of 78 patients diagnosed with PA/IVS and managed at our center between June 2010-December 2023.
RESULTS: Majority of patients were male(n=49, M/F:1.7), with a median age of 3 days (range:1–52 days) at diagnosis. Based on initial assessments, RV was classified as monopartite in 37 patients, tripartite in 21, and bipartite in 20. Abnormal coronary connections were detected in 11 of 69 patients who underwent detailed RV and aortic root angiography(3 minor fistulas, 6 major fistulas, 1 with RV-dependent coronary circulation, and 1 anomalous origin of the right coronary artery from the left coronary sinus).Among patients with muscular-type atresia (n=15), all but one had a monopartite RV; average tricuspid valve(TV) annulus diameter in this group was 5.1±1.5mm(range:4–9mm). Excluding 20 patients who died(14 within first 3 months after diagnosis and 6 thereafter), follow-up analysis(median:4.4 yrs) showed that 28 patients(48%) achieved single ventricle repair, 9(16%) underwent 1.5 ventricle repair, and 21(36%) achieved biventricular repair. Based on ROC analysis, following cut-off values were identified as predictive for biventricular repair: TV annulus>8.6 mm, TV z-score>−2.02 (per Peterson system). Multivariate analysis using variables with low collinearity showed that each 1-point increase in TV z-score was associated with a 2.4-fold increase in likelihood of achieving biventricular repair.During follow-up, 13 patients were identified whose initially predicted circulation type differed from their final outcome(Figure1).

Conclusion:
In this patient group with very different morphology and “circulatory endpoints”, measurements such as TV annulus measurement and z score, TV/MV annulus ratio have predictive value for the development of the RV and the possibility of reaching biventricular circulation.

LIGHTNING POSTER PRESENTATIONS

Category: Cardiac Surgery

1320 - A SIMPLE AND A VERY EFFECTIVE STRATEGY IN AVOIDING HEART BLOCK IN ATRIOVENTRICULAR SEPTAL DEFECT COMPLETE REPAIR

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Background / Hypothesis:
Atrioventricular septal defect complete repair is a complex surgical procedure which requires closure of the interatrial and interventricular communication, creating two non stenotic non regurgitant atrioventricular valves ,and avoidance of injury of AV node and bundle of His.

Materials and Methods:
Since 2018 194 patients underwent complete repair in our centre , 118 patients underwent repair by the usual technique of sewing superficially the ASD patch to the base of the left AV valve tissue in the region of triangle of Koch, 76 patients underwent repair by the modified technique which is following the right atrial wall and suturing the ASD patch to the bottom of the coronary sinus away from the AV node before transitioning the patch to the primum ASD margin and thus maintain the coronary sinus drainage to the right side.

Results:
From the 118 patients who underwent the standard repair 18 of them developed complete heart block postoperatively a required permanent pacemaker insertion, from the 76 patients who underwent the repair using the modified technique none of them developed complete heart block postoperatively.

Conclusions:
Repairing atrioventricular septal defect using the modified technique in closing the ASD is a very simple and very effective way in protecting the AV node and preventing complete heart block postoperatively.

LIGHTNING POSTER PRESENTATIONS

Category: Cardiac Surgery

1523 - SURGICAL CORRECTION OF THE CRITICAL CONGENITAL HEART DEFECTS IMMEDIATE AFTER BIRTH

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Background / Hypothesis:
Significant progress of fetal cardiac imaging allowed to develop surgical correction of critical congenital heart defects (CHD) immediate after birth. Since 2009, we performed over 300 consecutive neonatal surgeries in the first hours of life. Based on our experience, we initiated an innovative approach with birth in the operating room for immediate cardiac surgery. Autologous umbilical cord blood (UCB) was used instead of donor blood.

Materials and Methods:
We report two neonatal patients managed with our novel approach. Both patients were prenatally diagnosed. The operating room set for delivery was staffed by maternal–fetal, cardiac and neonatal intensive care teams. After elective cesarean section, patients were immediately carried to the adjacent operating room for cardiac surgery.

Results:
The first patient, weighing 3.36 kg, was diagnosed with D-transposition of the great arteries and underwent an arterial switch operation. The cardio-pulmonary bypass (CPB) was established in 46 minutes after delivery. The second patient, weighing 3.5 kg, had critical aortic stenosis with severe left ventricle dysfunction and underwent surgical aortic valve valvuloplasty. The CPB was established in 34 minutes after delivery. The use of autologous UCB allowed to avoid donor blood transfusion intraoperatively in both patients.
The first patient required mechanical ventilation for 8 days and was discharged after 44 days. The second patient required mechanical ventilation for 2 days and was discharged after 15 days. In both patients, no intra- and postoperative complications were observed.

Conclusions:
We hypothesize that our approach may improve outcomes and minimize hemodynamic instability, hypoxemia, and heart failure in preoperative period in patients with critical congenital heart defects. Further investigation is needed to confirm this hypothesis.

LIGHTNING POSTER PRESENTATIONS

Category: Cardiac Surgery

1731 - LONG TERM FOLLOW UP OF PERIVENTRICULAR VENTRICULAR SEPTAL DEFECT CLOSURE IN PATIENTS LESS THAN 1 YEAR OF AGE

Alexey Voitov [1], Natalia Nichai [1], Oxana Malakhova [1], Ilia Soynov [1], Alexander Bogachev [2]
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Background / Hypothesis:
The aim of our study was to present and share our experience long-term outcome of in perventricular device closure of ventricular septal defects in patients less than 1 year old

Materials and Methods:
From 2012–2024, 166 patients less than 1 year old with VSD's were operated through lower minithoracotomy device closure under the guidance of transoesophageal echocardiography (TOE). The median age at operation was 8.0 ± 2.5 months and the mean body weight was 7.9 ± 3.4 kg; The Qp/Qs ratio was 1.9 ± 0.4. The VSD size ranged from 3 to 9 mm; the mean diameter was 5.7 ± 1.6 mm; 27.4% (14) of defects were subaortic, 66.7% (34) perimembranous and 5.9% (3) were muscular.

Results:
The procedural success rate was 96.2% and there were 4 patients who were converted to open-heart surgery (3.8%) during procedures. The operation time 'skin to skin' was 55.9 ± 41.0 (40) min; 48.8% of cases were less than 40 min. Intensive care unit stay was 16.5 ± 9.4 (18) h. Of the total, 14.2 % (15) of patients had residual shunt of not more than 2 mm. Two patients were reoperated in the early postoperative period. Length of hospital stay was 5.6 ± 3.2 days. The mean follow-up was 8.7 years. 11 patients were reoperated in follow up period: 4 patients with significant residual shuns, 5 patients with late complete AV block, 1 patients with LVOT obstruction and 1 patient with RVOT obstruction.

Conclusions:
However, off-pump periventricular device closure of ventricular septal defects (perimembranous and subaortic) under echocardiography guidance has been attractive alternative for conventional repair conclusion, much attention should be paid to the development of serious complications, such as LVOT and RVOT obstruction, late complete AV block and significant residual shunts.

LIGHTNING POSTER PRESENTATIONS

Category: Cardiac Surgery

1946 - EXIT TO OPEN ATRIAL SEPTECTOMY WITH INFLOW OCCLUSION A CONTROLLED APPROACH TO HYPOPLASTIC LEFT HEART SYNDROME WITH INTACT ATRIAL SEPTUM

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Background:
Hypoplastic left heart syndrome with intact atrial septum (HLHS/IAS) continues to represent one of the highest mortality rates among congenital cardiac patients. No consistent management protocol for these newborns and centers differ in their approach. Available strategies include fetal interventions, or postnatal transcatheter, surgical and/or hybrid atrial septostomy/septectomy. We present a different algorithm that utilizes an Ex-utero, Intrapartum Treatment (EXIT) for an off pump open atrial septectomy followed by rapid sequence stage I Norwood palliation.

Patient:
A 29-year-old gravida 1, para 1 woman had an abnormal fetal echocardiogram at 28 weeks gestation showing a fetus with HLHS/IAS. A multidisciplinary team (maternal fetal medicine, neonatologists, pediatric cardiologists, pediatric cardiac surgeons, obstetric anesthesiologists, pediatric cardiac anesthesiologists, cardiovascular perfusionists, and intensivists) discussion of all available options led to considering an EXIT-to-open atrial septectomy as our preferred approach.

Results:
An elective cesarean section was performed at 38-weeks' gestation. The fetus was partially delivered, and the feto-placental circulation was maintained. Transthoracic echocardiogram confirmed HLHS/IAS. Sternotomy was then performed, and under bicaval inflow occlusion, the right atrium was opened, and the thick interatrial septum was resected to allow unrestrictive atrial communication. The total caval occlusion time was 90 seconds. Delivery was then completed, and it was followed by rapid stage I Norwood in 24 hours. The postoeprative course was uneventful and the neonate was extubated on the fourth postoperative and he was discharged two weeks later. He continues to do well during his follow-up with the plan to proceed with stage II palliation at 6 months of age.

Conclusions:
This case represents the first successful EXIT-to-open atrial septectomy-to-rapid stage I Norwood palliation for HLHS/IAS. The EXIT approach creates a controlled environment for atrial septectomy, and avoidance of cardiopulmonary bypass minimizes risks and may contribute to the success of the procedure. This approach is worth considering.

LIGHTNING POSTER PRESENTATIONS

Category: Cardiac Surgery

2153 - 8 YEAR EXPERIENCE WITH LYMPHATIC DECOMPRESSION CONCOMITANT TO FONTAN KREUTZER PROCEDURE

Daniel Klinger [1], Benjamin Chiostri [1], Santiago Sendoya [2], Mariana Lopez Daneri [2], Agustin Chozas [3], Augusto Gutierrez [4], Rafael Fraire [5], Silvio Torres [5], Christian Kreutzer [1]
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Background / Hypothesis:
To present our experience with the lymphatic decompression surgery the setting of planned Fontan Kreutzer completion

Materials and Methods:
Since January 2017, pre Fontan Kreutzer clinical evaluation included before Fontan/Kreutzer completion T2-weighted magnetic resonance imaging (MRI) lymphangiography. Thoracic lymphatic abnormalities were categorized using a scale of I to IV according to progression of severity. Patients with severe lymphatic abnormalities (types III and IV) underwent an extracardiac Fontan/Kreutzer with lymphatic decompression via innominate vein turn down to left or right atrial appendage (group A). Those with mild abnormalities (type I or II) received a classic extracardiac fenestrated Fontan Kreutzer procedure (group B)

Results:
Forty-four patients were enrolled. MRI showed type III or IV in thirteen patients (29.5%) (group A). In this group undergoing the lymphatic decompression, four patients required a PTFE conduit dunked in the atrial cavity, to allow the anastomosis, and four patients needed another concomitant procedure(30.7%). Patients with types I and II underwent a fenestrated extracardiac Fontan/Kreutzer procedure without lymphatic decompression (group B, n = 31). In this group B, four needed concomitant procedures(12,9 %). Preoperatively, there were no differences in age, weight, ventricular dominance, superior vena cava pressure, or need for concomitant procedures at FK completion. There were no differences in procedural times between the groups, nor were differences in mortalities and Fontan/Kreutzer takedowns. There were no statistically significant differences in early and late morbidity and mortality between the two groups with the exception of total volume of effusions output postoperatively, markedly reduced in group A. At last follow up, there were no difference between groups in survival and arterial oxygen saturation, but one patient in group A required Left Jugular vein ligation for progressive cyanosis. The four patients that received a PTFE conduit as part of the innominate vein turn down presented progressive

LIGHTNING POSTER PRESENTATIONS

Category: Cardiac Surgery

2276 - EARLY OUTCOME OF A NEO PULMONARY VALVE FASHIONED FROM RIGHT ATRIAL APPENDAGE IN CONGENITAL HEART SURGERY SINGLE CENTRE EXPERIENCE.

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Background / Hypothesis:
The prevention of pulmonary insufficiency (PI) is a crucial part of repair of different cardiac pathologies including tetralogy of Fallot either native or redo cases and truncus arteriosus. Many techniques have been introduced to construct valves from different materials. We utilized the right atrial appendage (RAA) to construct the neo-pulmonary valve. This approach aims to address the challenges of postoperative pulmonary regurgitation and promotes long-term growth, particularly in resource-limited settings.

Materials and Methods:
Between February 2024 and march 2025, we used the RAA for fashioning of a neo-pulmonary valve in 54 pediatric patients with native tetralogy of Fallot (TOF) (n = 30) their mean age and wight were 25 month and 10 kg, redo TOF with free PI (n = 18) their mean age and wight were 8 years and 22.7 kg and Truncus arteriosus type 1 (n = 6) their mean age and wight were 2.2 month and 3.55 kg.

Results:
80% of cases with native TOF had no or trivial PI (n=24), the remaining 20% had mild to moderate PI. All cases with redo TOF and truncus arteriosus repair had trivial to mild PI, No significant pressure gradient across the neo-pulmonary valve in all cases. There are 2 mortalities not related to surgical technique. The postoperative hospital stay was lower than expected.

Conclusions:
Early results showed that neopulmonary valve reconstruction using the RAA tissue may provide a reasonable alternative to prevent PI after pediatric cardiac surgery.

LIGHTNING POSTER PRESENTATIONS

Category: Cardiogenetics

1569 - ASSOCIATION OF GENETIC VARIANTS WITH OUTCOMES IN PATIENTS WITH PEDIATRIC DILATED CARDIOMYOPATHY

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Background / Hypothesis:
Pediatric dilated cardiomyopathy (DCM) progress to heart failure, death, or transplantation within 2 years of diagnosis. Clinical correlation between genetic testing and outcomes remains unclear. Our objective was to provide genotype associations with life-threatening cardiac outcomes in our pediatric DCM population (transplantation, ventricular assist devices implantation or death).

Materials and Methods:
Retrospective cohort study at a pediatric tertiary referral center in Riyadh (KSA) of all referred pediatric patients (<14 years, pediatric age at KSA) with DCM during period 2018 - March 2025. Clinical inclusion was determined using echocardiographic criteria for DCM established by the PCMR (Pediatric Cardiomyopathy Registry), exclusion criteria included genetic syndrome with extracardiac manifestations (including neuromuscular diseases); congenital heart defects or iatrogenic exposure (chemotherapy). Genetic variants were detecting by whole exome sequencing (WES).

Results:
We identified 105 children with DCM during this period. Of those, 76(73%) were tested with negative WES in 23 patients. Mean age of diagnosis was at 3.7 years. One or more pathogenic/likely pathogenic variants were present in 39/53 (73.5%) with 14 inconclusive results, 58% (23/39) of variants occurred in sarcomeric genes (main genes MYH7 25%, NEXN, TNT, MYBPC), DSP was the most frequent non-sarcomeric gene (31%).
Patients with +ve tests had more life-threatening cardiac outcomes 30/53 (56.6%) comparing with –ve gene: 7/23 (30.4%). Patients with positive genes diverge within the first-30 months with severe adverse outcomes. Early detection of the genetic sequence that led to this divergence, followed by close monitoring with serial Echo and early clinical intervention, would be critical in the prevention of early deaths, heart transplantation, device implantation, and clinical deterioration (Log rank test: Chi2(1)= 4.87,p = 0.0273) (Figure-1)

Conclusions:
Genotype and cardiac outcomes are associated, with high risk and rapid progression of the disease depending on the underlying affected gene, reinforcing genetic test should be considered in all children with idiopathic DCM.

LIGHTNING POSTER PRESENTATIONS

Category: Cardiogenetics

1734 - MIND THE GAP DEATH TO DIAGNOSIS

Gabbie Scarfe [1], Claire Lawley [1], Christian Turner [1], Jonathan Skinner [1], *Hiroko Asakai* [1], Karen Robinson [1]
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Background / Hypothesis:
Sudden cardiac death (SCD) of a presumed healthy individual is a tragic event. The heritable nature of possible causes, including channelopathies and cardiomyopathies may mean that there are additional family members, including children, at risk. While cardiac screening in first-degree relatives is imperative, practical barriers are known to exist.
Aim: evaluate the current clinical screening pathway and identify needs for children with a family history of SCD.

Materials and Methods:
Retrospective single-centre medical record review of children seen by the arrhythmia service 2021-2024 (inclusive) with SCD in a first-degree relative

Results:
Fifty-nine children from thirty families were identified. The decedent was the parent (n=19, 63%) ,sibling (n= 11, 37%) and most likely male (n=23, 77%) with median age 33 years (mean 26 years) and 28% aged <18 years. Death occurred during a daily activity (n=12, 40%), asleep (n=10, 33%), playing sport (n=6, 20%) or unknown (n=2, 7%). The cause of death was most likely unascertained (n=14, 47%)

The average time of death to first cardiac assessment was 3.2 years (range 3m – 8 yrs, IQR 40). Where there was a relevant genetic result in the decedent, cascade testing identified seven children from three families who had inherited this, five with clinical long QT syndrome (LQTS) and two with normal findings in the setting of a LMNA variant. One child had a clinical finding of LQTS without genetic variant. At last follow-up, most children remained under some form of ongoing screening. Mode of referral for screening was variable, including self-referral in some instances, and under review of other medical conditions.

Conclusions:
Time delays and an historic lack of streamlined pathways impact clinical screening of paediatric first-degree relatives after SCD. Improved referral processes and collaboration between forensics, adult and paediatric teams is vital. A designated coordinator role could facilitate this process for families.

LIGHTNING POSTER PRESENTATIONS

Category: Cardiogenetics

2146 - NEXN MEDIATES F ACTIN POLYMERIZATION VIA FMNL3 IN ENDOTHELIAL CELLS

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Background / Hypothesis:
Coronary artery fistula (CAFs), an abnormal communication between a coronary artery and cardiac chambers or other vessels, could lead to significant cardiac dysfunction. However, the molecular mechanisms underlying CAFs remain unknown. Here, we investigated the potential involvement of NEXN, an F-actin binding protein, in CAF pathogenesis.

Materials and Methods:
NEXN-overexpressing 293T cells and NEXN-knockdown human umbilical vein endothelial cells (HUVECs) were generated to evaluate its functional role in vitro. RNA sequencing was used to identify NEXN-regulated pathways in cardiac metabolism. Cellular phenotypes of the control and NEXN-depleted cells were characterized by immunofluorescence. To assess in vivo angiogenic effects, nexn knockdown zebrafish were generated using morpholino (MO). Potential biochemical interactions were analyzed via immunofluorescence, coimmunoprecipitation and Western blot.

Results:
Overexpression of NEXN variant from CAF child (NM_144573:c.G298T;p.G100X) in 293T cells resulted in significantly decreased NEXN expression. In zebrafish, nexn knockdown reduced sprouting and formation in intersomitic vessels (ISV) and dorsal longitudinal anastomosing vessels (DLAV). In vitro, NEXN knockdown reduced HUVECs' migration and tube formation, indicating impaired endothelial cell function. NEXN depletion disrupted actin cytoskeletal organization, decreased actin polymerization, and reduced F/G-actin ratio. Consistently, RNA sequencing revealed that angiogenesis-related biological processes were enriched in downregulated differentially expressed genes in NEXN knockdown cells. By immunofluorescence and Western blot, NEXN was found to colocalize with FMNL3 (a formin-family angiogenic regulator) in filopodia without altering FMNL3 expression. Alphafold3 and coimmunoprecipitation results showed that NEXN interacts with FMNL3 through actin-binding domain (ABD) and IGcam domain.

Conclusions:
Our findings reveal a novel role of NEXN in mediating F-actin polymerization through FMNL3 in endothelial cells, where it maintains filopodial actin integrity. NEXN inactivation may disrupt vascular morphogenesis, providing a potential mechanism for coronary artery anomalies.

LIGHTNING POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1760 - LETHAL ARTERIOPATHY SYNDROME ASSOCIATED WITH IDENTICAL HOMOZYGOUS D203A MUTATION OF EFEMP2 GENE IN A UNIQUE PATIENT COHORT FROM COASTAL INDIA.

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Background / Hypothesis:

We recently described autosomal recessive lethal arteriopathy syndrome associated with homozygous D203A mutation of EFEMP2 gene in 22 infants from a unique population cohort from northern coastal (Malabar) region of Kerala, India (Kapanaayil et al. doi: 10.1186/1750-1172-7-61). Currently classified as Autosomal Recessive Cutis Laxa Type 1B, this is one of most severe and lethal arteriopathies reported.
We present 20-year update on the phenotypic spectrum, cardiovascular features and outcomes of this rare disorder.

Methods:
Prospective longitudinal study of genetically proven cases with homozygous D203A mutation of EFEMP2 gene evaluated at a tertiary center in Kerala, from 2005-2024.

Results:
61 (35 males, 26 female) homozygous mutants were studied. 58/61 belonged to Malabar Mappila community; parents were heterozygous. Median age presentation was 2 months; 20% presented within first month. Respiratory distress, cardiac murmurs were commonest presenting features. 3/60 presented and died within first three days of life.
Phenotype included cutis laxa (63.49%), long philtrum (25.81%), arachnodactyly (25.81%), hernia (20.97%), sagging cheeks (19.35%), joint laxity (17.74%), hypertelorism (16.13%), visible arterial pulsations (12.90%), hypotonia (11.29%), and hooded eyes (11.11%).
Cardiac imaging showed severe Aortopathy with dilatation, elongation and tortuousity of Aorta and its branches; isthmic narrowing noted in 56/60 patients. Involvement of pulmonary arteries, cerebral arteries and abdominal vessels were noted in most.
Severe manifestations & young age precluded surgery in most. 56/60 died at median age 13 months. Surgical repair was done for four patients in whom Aortopathy was relatively localised to ascending aorta and arch. 3/4 were operated after 4 years age - oldest at 13years. Youngest age at surgery is 2 months (currently surviving at 5 months age).

Conclusions:
We describe a distinct highly lethal Aortopathy syndrome, distinct from other known inherited disorders. Our ongoing anthroplogical, molecular genetic & zebra fish studies are likely to shed more light on this disorder in coming days.

LIGHTNING POSTER PRESENTATIONS

Category: Catheterization

1309 - TWO YEAR CLINICAL OUTCOMES OF INITIAL IMPLEMENTATION OF HARMONY™ TRANSCATHETER PULMONARY VALVE IMPLANTATION (TPVI) AT EHIME UNIVERSITY

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Introduction:
The Harmony transcatheter pulmonary valve implantation (TPVI) device was first approved in Japan in August 2021, following its approval in the United States. Domestic use began in March 2023, with Ehime University being one of the 13 initial centers. This report outlines the clinical course and outcomes of the cases treated.

Methods:
The study included 16 cases of patients post-repair of tetralogy of Fallot (TOF) with pulmonary regurgitation (PR), meeting the proper use guidelines. The cases were evaluated by fit analysis and a third-party screening committee. All patients underwent TPV25 implantation. The patients' ages ranged from 18 to 75 years, including 11 males and 5 females, with NYHA functional class ranging from 1 to 3. Five patients had a history of heart failure hospitalization. One case had Ebstein's anomaly, another had a residual ASD with right-to-left shunting, one case had a Polysplenia, two cases had IVC obstruction, and one case had a desire for pregnancy. Follow-up duration ranged from 1 week to 2 years after the procedure.

Results and Discussion:
Pulmonary regurgitation was dramatically reduced, with no further regurgitation observed during follow-up. Clinical symptoms improved, and in the residual ASD case, right-to-left shunting disappeared. Cardiac dimensions such as CTR and RVEDV showed reduction post-procedure, with all but two cases showing RVEDV reduction by one week and all cases showing reduction by six months. RV ejection fraction (RVEF) decreased initially but showed improvement by six months to one year. However, two cases did not show improvement, suggesting the need for further investigation into optimal timing for treatment. LVEDVI increased following the procedure, and left ventricular function improved over time.

Conclusion:
The clinical course of the first 15 cases was favorable. Further accumulation of cases is essential to clarify the characteristics of the Harmony valve, its effect on right heart function, left heart function, and post-operative challenges.

LIGHTNING POSTER PRESENTATIONS

Category: Catheterization

2125 - CLINICAL IMPLICATIONS OF LEAFLET THROMBOSIS AND CALCIFICATION AFTER PERCUTANEOUS PULMONARY VALVE IMPLANTATION WITH THE PULSTA VALVE MID TERM FOLLOW UP RESULTS

Woo Young Park [1], Yoon Seong Lee [2], Gi Beom Kim [1], Sang Yun Lee [1], Mi Kyoung Song [1], Seung Min Baek [1], Eun Jung Bae [1], *Dongjin Lim* [1]
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Background / Hypothesis:
Hypo-attenuated leaflet thickening (HALT) is a subclinical computed tomography (CT) finding associated with leaflet thrombosis in bioprosthetic valves. Its incidence and risk factors following percutaneous pulmonary valve implantation (PPVI) remain unclear. This study aimed to assess the incidence of HALT after PPVI and to identify associated clinical and procedural risk factors.

Materials and Methods:
We retrospectively reviewed patients who underwent PPVI with the Pulsta valve between January 2016 and December 2024 and received at least one follow-up cardiac CT by January 2025. Patients were categorized based on the presence or absence of HALT. Clinical, echocardiographic, and procedural variables were compared. Logistic regression analysis was performed to identify risk factors for HALT.

Results:
Among 70 patients (76 CT images), HALT was detected in 36.8(28/76)% at a median of 3.1 years post-PPVI. Among these cases, HALT severity was ≤25% in 20 cases, 25–50% in 5 cases, and 50–75% in 3 cases, with no cases exceeding 75%. Leaflet calcification was rare (2.6%). Most patients (82.9%) received aspirin monotherapy for 12 months; only 17.1% received dual antiplatelet therapy followed by extended aspirin for 3 years. Although antithrombotic regimen was not statistically associated with HALT, the incidence was numerically lower in the prolonged therapy group despite significantly longer follow-up. Multivariate analysis identified implantation of a larger valve (32 mm) as an independent risk factor for HALT (odds ratio 7.180; 95% confidence interval 1.054–48.891; p = 0.044).

Conclusions:
HALT was frequently observed after PPVI, particularly in patients treated with short-duration aspirin monotherapy and those receiving larger valve sizes. These findings highlight the need for individualized antithrombotic strategies and routine imaging surveillance following PPVI. Further studies are warranted to optimize post-procedural management including the duration of antithrombotic prophylaxis.

LIGHTNING POSTER PRESENTATIONS

Category: Echocardiography

1206 - NATURAL WAVE VELOCITY AS A MARKER OF FIBROSIS IN A REVERSIBLE RIGHT VENTRICULAR PRESSURE OVERLOAD MODEL

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Background/Hypothesis:
Right ventricular (RV) pressure overload, commonly observed in conditions such as tetralogy of Fallot or pulmonary hypertension drives adverse RV remodeling. Identifying irreversible remodeling processes and determining optimal timing for therapeutic interventions remain critical clinical challenges in congenital heart diseases. This study aimed to assess natural wave velocity (NWV) as a marker of RV myocardial stiffness in a rat model of RV pressure overload and to explore its potential for reversibility following pressure unloading.

Materials and Methods:
Twenty rats underwent PAB, and six sham-operated rats served as controls. After 3 weeks, half of the PAB rats were debanded to simulate pressure unloading, while the other half remained banded until 6 weeks. Conventional echocardiography and ultrafast ultrasound were performed preoperatively, early post operatively, at 3 weeks and at 6 weeks. All animals underwent terminal analysis at 6 weeks with histological analysis.

Results:
NWV increased shortly after PAB and continued to rise with sustained pressure overload. Following PAB reversal, NWV remained elevated despite normalization of conventional echocardiographic morphological and functional parameters. Notably, NWV stopped increasing after debanding, whereas it continued to rise in the kept banded group. A strong correlation was observed between RV NWV and histological fibrosis content ($R=0.78$, $p<0.001$).

Conclusions:
NWV outperformed other functional and morphological parameters in detecting fibrosis-related changes in pressure-overload conditions. Early identification of elevated NWV may guide timely interventions, potentially preventing irreversible RV damage and optimizing patient outcomes.

LIGHTNING POSTER PRESENTATIONS

Category: Electrophysiology

2050 - NON PERSISTENT VENTRICULAR PREEXCITATION IN CHILDREN WITH WOLFF PARKINSON WHITE SYNDROME RESULTS FROM A MULTICENTER AMBISPECTIVE REGISTRY

Carolina A Escudero [1], Cheyenne Beach [2], Iqbal El-assaad [3], Reina B Tan [4], Brynn E Dechert-crooks [5], Charles C Anderson [6], Gaurav Arora [7], Peter F Aziz [8], Andrew D Blaufox [9], Ahmad S Chaouki [10], Christopher C Erickson [11], David Gamboa [12], Christopher M Janson [13], Prince K Kannankeril [14], Naomi J Kertesz [15], Ian H Law [16], Lindsey E Malloy-walton [17], Shubhayan Sanatani [17], Jayaprakash Shenthar [18], Elizabeth A Stephenson [19], Ronn E Tanel [20], Nicholas H Von Bergen [21], Susan P Etheridge [22], Mary C Niu [23]

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Background:
Patients with Wolff-Parkinson-White (WPW) syndrome can display persistent (PPx) or non-persistent (intermittent) ventricular preexcitation (NPx) on non-invasive testing. We assessed differences in clinical and electrophysiology study (EPS) characteristics between children with PPx and NPx.

Methods:
We analyzed patient data from a multicenter ambispective WPW registry. Patients were included if 1-21 years old at WPW presentation or EPS, with categorization as NPx or PPx. NPx was defined as loss of ventricular preexcitation on ECG, Holter, or telemetry, or abrupt loss on exercise testing. Clinical and EPS characteristics were compared between groups. Rapidly-conducting accessory pathways (RC-APs) were defined by effective refractory period (APERP), shortest preexcited R-R interval (SPERRI) during preexcited atrial fibrillation at EPS, or shortest preexcited paced cycle length (SPPCL) ≤250ms at baseline EPS. LTEs were defined as sudden death (SD), aborted SD, or clinical preexcited atrial fibrillation with SPERRI ≤250ms or hemodynamic instability.

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Results:
1108/1302 patients met inclusion criteria: 864 PPx (78%) and 244 NPx (22%). PPx patients were older at presentation (11.6±5.3 vs 10.4±5.8 yrs, p<0.01) with no differences between groups in sex, race, or ethnicity. NPx patients more frequently had fetal SVT (8 vs 3%, p<0.01), presented with SVT (32 vs 22%, p<0.01), and required antiarrhythmics at presentation (19 vs 13%, p=0.01). NPx patients were less likely to undergo EPS (87 vs 92%, p=0.02) or invasive risk stratification (83 vs 92%, p<0.01). Mean APERP (304±53 vs 331±84ms), SPERRI (318±106 vs 377±160ms), and SPPCL (305±69 vs 356±106ms) were lower (p<0.01) in the PPx group, with RC-APs in 27% with PPx and 17% (p=0.01) with NPx. LTEs occurred in 15 (1.8%) with PPx and 2 (0.8%) with NPx (p=0.39).

Conclusions:
Patients with NPx presented younger and more often with SVT, and were less likely to undergo EPS. Patients with NPx had a lower, but clinically relevant, rate of RC-APs.

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Category: Electrophysiology

2052 - ISOPROTERENOL EFFECT IN THE EVALUATION OF PEDIATRIC WOLFF PARKINSON WHITE SYNDROME RESULTS FROM A MULTICENTER AMBISPECTIVE REGISTRY

Reina Bianca Tan [1], Mary C. Niu [2], Cheyenne Beach [3], Iqbal El-assaad [4], Brynn E. Dechert-crooks [5], Charles C. Anderson [6], Gaurav Arora [7], Peter F. Aziz [4], Andrew D. Blaufox [8], Ahmad S. Chaouki [9], Christopher C. Erickson [10], David Gamboa [11], Christopher M. Janson [12], Prince J. Kannankeril [13], Naomi J. Kertesz [14], Ian H. Law [15], Lindsey E. Malloy-walton [16], Shubhayan Sanatani [17], Jayaprakash Shenthar [18], Elizabeth A. Stephenson [19], Ronn E. Tanel [20], Nicholas H. Von Bergen [21], Susan P. Etheridge [22], Carolina A. Escudero [23]

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Background / Hypothesis:
Electrophysiology study (EPS) is the gold standard for Wolff–Parkinson–White (WPW) risk stratification. The impact of isoproterenol (ISO) on accessory pathway (AP) risk stratification is unclear. Our objective is to assess the effect of ISO on AP risk stratification in children.

Materials and Methods:
WPW subjects ≤21 years were grouped by ISO use during EPS. Clinical and EPS characteristics including life-threatening events (LTEs), AP effective refractory period (APERP), shortest preexcited R-R interval (SPERRI),and shortest preexcited paced cycle length (SPPCL) were compared. High-risk (HR) APs were defined as APERP,SPERRI, or SPPCL ≤250ms. LTEs included sudden death (SD), aborted SD, or clinical preexcited atrial fibrillation (AF) with SPERRI ≤250ms or hemodynamic instability.

Results:
Among 1030 patients, ISO was used in 583 (56.6%).ISO group was older at EPS (13.5 vs 12.9 yrs, p=0.038). There were 17 (1.7%) with LTE with no difference between groups (10 (1.7%) ISO vs 7 (1.6%) non-ISO). The mean ISO dose was 0.043 mcg/kg/min, increasing HR by a mean of 45.6±23.9 bpm. Risk stratification was performed in 937(91%), with 521 (55.6%) assessed at baseline only, 401(42.8%) at baseline and with ISO, and 15 (1.3%) with ISO only.

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HR-APs were more frequent at baseline in the non-ISO group (29.3% vs. 22.0%, p=0.011). HR-APs were more common with ISO (65.4 vs24.8%, p <0.001). Among those receiving ISO, 32.4% remained low-risk, 22.5% remained high-risk, 45.6%changed from low- to high-risk, and 2.1% changed from high- to low-risk. HR APs were significantly more frequent at baseline in patients with life-threatening events (LTE) than in those without LTE(70.6% vs. 24.5%, p<0.001), however this difference was not observed with ISO (75.0% vs. 65.6%, p=0.72).

Conclusion:
ISO significantly alters AP conduction in children, reclassifying nearly half of low-risk APs as high-risk, thereby increasing the number of patients who meet the criteria for ablation. ISO does not significantlyimprove the detection of

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Category: Electrophysiology

2054 - CLINICAL AND ELECTROPHYSIOLOGICAL CHARACTERISTICS OF PEDIATRIC WOLFF PARKINSON WHITE INSIGHTS FROM A MULTICENTER AMBISPECTIVE REGISTRY

Mary Niu [1], Brynn Dechert-crooks [2], Cheyenne Beach [3], Iqbal El-assaad [4], Reina Tan [5], Charles Anderson [6], Gaurav Arora [7], Peter Aziz [4], Andrew Blaufox [8], Ahmad Chaouki [9], Christopher Erickson [10], David Gamboa [11], Christopher Janson [12], Prince Kannankeril [13], Naomi Kertesz [14], Ian Law [15], Lindsey Malloy-walton [16], Shubhayan Sanatani [17], Jayaprakash Shenthar [18], Elizabeth Stephenson [19], Ronn Tanel [20], Nicholas Von Bergen [21], Susan Etheridge [22], Carolina Escudero [23]
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Background / Hypothesis:
Wolff-Parkinson-White (WPW) syndrome exhibits variable presentations and outcomes in pediatric patients. Understanding clinical and electrophysiology (EP) characteristics is essential for optimizing risk stratification and management. This study evaluated presentation, clinical course, and EP study (EPS) findings in pediatric WPW patients, focusing on life-threatening events (LTEs) and age-related differences.

Materials and Methods:
We analyzed a multicenter ambispective registry from 2017–2024 of WPW pts <21 years (y). High-risk accessory pathways (HR-APs) were defined as an accessory pathway effective refractory period (APERP), shortest preexcited R-R interval (SPERRI) during atrial fibrillation (AF), or shortest preexcited paced cycle length (SPPCL) ≤250 ms. Outcomes included clinical presentation and course, EPS findings, and LTEs (sudden death [SD], aborted SD, or clinical preexcited AF with SPERRI ≤250 ms or hemodynamic instability).

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Results:
Of 1,302 patients enrolled, 7.5% had congenital heart disease (CHD), and 23% had non-persistent preexcitation (Table 1). Younger age was associated with increased ED visits, hospitalizations, and antiarrhythmic use ($p < 0.001$). Among those who underwent EPS (n = 1,066; 83%), HR-APs were more common in younger pts ($p < 0.001$). AV block was rare, occurring in <1% of attempted ablations.

LTEs occurred in 22 patients (1.7%) and were the sentinel symptom in 60% of cases (Table 2). A higher proportion of LTE patients had HR-APs and multiple APs compared to non-LTE pts ($p < 0.001$ for both). No significant differences in sex, age group, CHD, or non-persistent preexcitation were observed between LTE and non-LTE patients.

Conclusions:
The clinical course of WPW varies by age, with younger patients requiring greater healthcare utilization. LTEs though rare, often arise during routine activities, are associated with HR-APs and multiple APs, and may occur despite non-persistent preexcitation. These findings underscore the importance of proactive risk assessment and management in all pediatric WPW pts, regardless of preexcitation persistence.

LIGHTNING POSTER PRESENTATIONS

Category: Electrophysiology

2058 - WPW RECURRENCE AFTER ABLATION IN PEDIATRICS RESULTS OF A MULTICENTER AMBISPECTIVE REGISTRY

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Background / Hypothesis:
Recurrence risk after catheter ablation for Wolff-Parkinson-White (WPW) is 5-12%; previous estimates are based on single center data and variable follow-up duration. We describe recurrence risk after WPW ablation and examine factors associated with recurrence using a multicenter registry.

Materials and Methods:
We identified pediatric patients with acutely successful accessory pathway (AP) ablation and ≥ 1 follow-up visit. Recurrence was defined as presence of pre-excitation at follow-up or need for > 1 procedure for the same AP location. Demographic, clinical, and electrophysiology study (EPS) characteristics of APs that recurred were compared to those of APs that did not. Univariate and multivariate analyses were performed.

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Results:
Of 315 patients with acutely successful first-time ablations and follow-up data, 53 (16.8%) had recurrence: 15 underwent repeat procedures and 38 had pre-excitation at follow-up but no repeat procedure. Recurrence was associated with congenital heart disease (CHD, 15.1% CHD among recurrences vs. 4.6% CHD among non-recurrences, p=0.004), specifically Ebstein anomaly (11.3% vs 0.8%, p=<0.001), and female sex (62% vs. 45%, p=0.03). Age at presentation and ablation, race, ethnicity, presentation reason, ventricular dysfunction, intermittent pre-excitation, documented SVT, anti-arrhythmic required, and complication rates were similar between groups. EPS variables including SPERRI/APERP ≤ 250 ms, SVT induction rates, or presence of multiple APs were similar. Use of standard radiofrequency (RF, 81% vs. 89%, p=0.10), cryoablation (17% vs. 11%, p=0.23) and irrigated RF (6% vs. 4%, p=0.47) was also similar. Mean follow-up duration was longer in those with recurrence compared to those without (30 vs. 19 months, p<0.001). In multivariate analysis, recurrence was associated with Ebstein anomaly (OR 7.6, 95% CI [1.3-45], p=0.02) and follow-up duration (OR 1.02, 95% CI [1.004-1.04], p=0.02).

Conclusions:
WPW recurrence following a first-time EPS in children was 16.8%. Though potentially affected by follow-up periods, Ebstein anomaly was the only variable independently associated with recurrence.

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Category: Foetal Cardiology

1751 - FETAL EFFECTIVE FORAMEN OVALE TO SEPTAL LENGTH RATIO RESTRICTIVE FORAMEN OVALE AND THICK ATRIAL SEPTUM PREDICTS THE NEED FOR URGENT NEONATAL INTERVENTION IN TRANSPOSITION OF THE GREAT ARTERIES

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Background / Hypothesis:
Antenatal identification of neonates with transposition of the great arteries with intact ventricular septum (TGA/IVS) requiring urgent postnatal intervention is critical to minimise morbidity and mortality. Isolating effective fetal parameters has been challenging. Our study investigates fetal echocardiographic variables that predict the need for urgent balloon atrial septostomy (BAS, <4 hours of life).

Materials and Methods:
This single-centre retrospective study investigates fetal echocardiographic parameters and postnatal outcomes of children antenatally diagnosed with TGA/IVS between 2008 and 2022. Images were reviewed blinded to postnatal outcomes. The potential foramen ovale (FO, region between rigid portions of atrial septum), the 'effective' FO (EFO, distance between the foraminal flap and true atrial septum), atrial septal length (SL), septal thickness, atrial shunt direction, oscillation of the foraminal flap between left and right atria, and restrictive FO appearance on colour Doppler were assessed. Logistic regression and classification trees were developed.

Results:
50/89 patients (56%) required urgent BAS. Urgent BAS was required (positive response) in patients with restrictive FO (n=1) and in 8/9 patients with thickened atrial septum. No statistical model found atrial shunt bidirectionality significant. After excluding thick septum or restrictive FO, logistic regression found that odds of requiring an urgent BAS halves with every 0.10 increase in the EFO:SL ratio (OR=0.554, 95% CI=0.375-0.745). A classification tree (false negative penalty 3:1) identified an EFO:SL ratio of <0.41 has a true positive rate (correctly classified urgent BAS required) of 80% and EFO:SL within [0.53-0.6] has a true negative rate (correctly classified urgent BAS not required) of 86%. EFO:SL ratio of <0.33 has a true positive rate of 89% (classification tree false positive penalty 3:1).

Conclusions:
Increased septal thickness, a restrictive FO and EFO:SL ratio of less than 0.33 are strongly predictive of the need for urgent BAS in antenatally diagnosed TGA/IVS.

LIGHTNING POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1643 - HARNESSING NOVEL CELL FREE DNAS FOR PRECISION MONITORING IN KOREAN PEDIATRIC HEART TRANSPLANTATION A PROOF OF CONCEPT STUDY

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Background / Hypothesis:
Pediatric heart transplantation is critical for children with end-stage heart failure, but allograft rejection poses a significant challenge. Traditional monitoring through invasive endomyocardial biopsies (EMB) is risky and distressing. Circulating cell-free DNA (cfDNA) has emerged as a non-invasive biomarker for rejection, but existing methods may lack precision, especially at lower rejection thresholds. We hypothesize that novel donor-specific cfDNA (dscfDNA) markers can reliably indicate rejection grade in Korean pediatric heart transplant recipients, particularly with lower detection thresholds.

Materials and Methods:
Blood samples were collected from pediatric heart transplant recipients following IRB approval (SNUH H-2405-175-1541). Plasma and whole blood were processed within 4 hours and stored at -80°C. Genomic DNA (gDNA) and matching cfDNA were extracted. Longitudinal samples were taken to assess rejection trends. A total of 8 patients with 20 DNA samples were analyzed. Whole-genome sequencing at 30x coverage was performed on the Illumina platform to identify dscfDNA markers.

Results:
200 novel dscfDNA markers were identified, enriched in grade 2 rejection compared to grade 0, with 51% in intergenic regions and 49% in intronic regions. The dscfDNA fraction was about 50 times higher in grade 2 than grade 0, showing statistical significance. Fisher's Exact test confirmed a strong association between dscfDNA fraction and rejection grade. Longitudinal samples collected after therapeutic intervention showed a significant decrease in dscfDNA levels. Under current conditions, ROC analysis yielded an AUC of 1.00, indicating perfect sensitivity.

Conclusions:
This study identified 200 novel dscfDNA markers distinguishing rejection grades in pediatric heart transplantation. The findings underscore dscfDNA's potential as a reliable biomarker for rejection monitoring. Further validation with a larger dataset is needed to confirm these results.

LIGHTNING POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2112 - DIALYSIS AFTER HEART TRANSPLANT WHO GETS IT AND ASSOCIATED OUTCOMES

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Background / Hypothesis:
Acute kidney injury (AKI) after pediatric heart transplant is common, occurring in 40-75% percent of patients. AKI, especially when associated with need for dialysis, carries a high risk for morbidity and mortality. Data on which patients are most likely to have AKI after pediatric heart transplant is extremely limited, only reported in single center studies. We sought to identify incidence of dialysis and patient characteristics, comorbidities, and outcomes when dialysis was needed around pediatric heart transplant.

Materials and Methods:
The Pediatric Health Information System (PHIS) database was queried for pediatric patients admitted to an intensive care unit (ICU) for heart transplant from 2018-2021. Demographic and clinical data from the hospitalization was analyzed. A subset of patients admitted for heart transplant with heart transplant occurring on day 0 of admission were also assessed to assess associations with post-operative dialysis.

Results:
In all, 1,427 heart transplant admissions were identified. 625 (44.5%) had AKI. 71 (4.9%) required dialysis. Mortality during admission for all was 4.7%, with 4% mortality for those not requiring dialysis and 18.3% mortality for those requiring dialysis. Admissions with mortality were more likely to have AKI, have shock, use dialysis, and use extracorporeal membrane oxygenation (ECMO).

In 235 patients admitted on the day of heart transplant, 22 (9.3%) required dialysis. Mortality during admission was 3.8% in those without dialysis and 40.9% of patients requiring dialysis. Dialysis was associated with an underlying cardiomyopathy, infection, rejection, AKI, acute hepatic failure, and fluid overload.

Conclusions:
AKI is common after pediatric heart transplant. AKI associated with dialysis is associated with increased mortality. Postoperative need for dialysis is associated with increased mortality and adverse transplant outcomes.

LIGHTNING POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2194 - TRANSFORMING OUTCOMES IN PEDIATRIC DILATED CARDIOMYOPATHY MITRAL VALVE REPAIR IN FUNCTIONAL MITRAL REGURGITATION AS A PROMISING BRIDGE TO HEART TRANSPLANT

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Background / Hypothesis:
Functional mitral regurgitation(MR) secondary to pediatric dilated cardiomyopathy(DCM) remains a clinical challenge, often progressing to end-stage heart failure. While heart transplantation is definitive therapy, donor scarcity necessitates interim strategies. Our study explores the role of mitral valve repair(MVR) or replacement as a bridge to transplant or potential alternative.

Materials and Methods:
Retrospective cohort analysis at our single tertiary care center, King Faisal Specialist Hospital and Research Centre, Riyadh of pediatric patients (≤14 years, per Saudi definition) with DCM who underwent surgical intervention for moderate-to-severe functional MR between 2011 and 2024. Patients with metabolic or connective tissue disorders were excluded. We analyzed medical records for clinical presentation, echocardiographic parameters, natriuretic peptide levels (NT-proBNP), surgical outcomes, and follow-up data.

Results:
Nine patients (aged 1–13 years; mean 4 years) were included. All were listed for heart transplantation preoperatively. Median LVEF was 32%; LVEDD Z-scores ranged from +4 to +11.9(median: +7.8), and LVESD Z-scores from +4.5 to +14.8(median: +10.9). Two patients required mechanical valve prostheses. Two deaths occurred within two months post-surgery due to infection. The remaining seven demonstrated clinical and echocardiographic improvement, with a mean follow-up of four years.
Six patients improved with LVEF ranging from 40–52%(median: 46.5%), while one maintained an LVEF <30%. MR severity reduced from severe to mild in all but one case(moderate). LV dimensions improved: mean LVEDD Z-score decreased from +8.1 to +2.7; LVESD Z-score from +9 to +5.4. Functional class improved from NYHA III–IV to Class I. NT-proBNP decreased from a mean of 17,030 pg/mL pre-surgery to 292 pg/mL postoperatively.

Conclusions:
MVR or replacement can offer meaningful clinical, echocardiographic, and biochemical improvement in selected pediatric patients with DCM and severe functional MR. This strategy may delay or even obviate the need for transplantation in carefully chosen cases, providing a viable bridge or destination therapy in resource-limited transplant settings.

LIGHTNING POSTER PRESENTATIONS

Category: Multimodality Imaging

1886 - COMPARISON OF AORTIC ANATOMICAL MEASUREMENTS IN ANGIOGRAPHY COMPUTED TOMOGRAPHY AND THREE DIMENSIONAL RECONSTRUCTIONS USING VIRTUAL REALITY

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Background / Hypothesis:
Computed tomography (CT) is a standard imaging modality for evaluating coarctation of aorta (CoA). Three-dimensional reconstructions using virtual reality (VR), based on CT or MRI studies, are gaining popularity in the imaging of congenital heart defects. Precision and clinical utility of these reconstructions remain uncertain. The aim of this study was to assess the accuracy of aortic anatomical measurements obtained from angiography, CT, and VR reconstructions.

Materials and Methods:
This study included all patients with CoA who underwent sequential elective angio-CT followed by cardiac catheterization with aortography within a six-month interval between 2016 and 2024. A total of 39 patients (median age: 10 years, IQR 7.2–16; median weight: 49 kg, IQR 25–68) were enrolled, with 46 pairs of CT+aortography studies performed. Aortic diameter was measured at sinotubular junction (STJ), proximal (PA) and distal aortic arch (DA), and at aortic isthmus narrowing (CoA) in angio-CT, aortography (the largest diameter - systolic), and VR reconstructions. Each measurement was performed twice and independently by two investigators.

Results:
Differences between VR vs. CT measurements were: +0.34±0.4 mm at STJ (+7.4%), -0.13±0.3 mm at PA (-5.3%), -0.56±0.9 mm at DA (-6.6%), and -0.29±0.6 mm at CoA (-10%). Differences between angiography vs. CT measurements were: +0.29±0.5 mm at PA (+9.3%), +0.73±0.6 mm at DA (+10.3%), and +0.02±0.5 mm at CoA (+13.2%). Differences between angiography vs. VR measurements were: +0.62±1.0 mm at PA (+4.7%), +0.23±0.5 mm at DA (+7.9%), and -0.54±0.6 mm at CoA (-19%). All differences were statistically insignificant (p>0.05).

Conclusions:
Aortic measurements in VR reconstructions were highly comparable to those obtained in CT. VR showed slight tendency to underestimate aortic dimensions compared to reference CT, particularly at the isthmus. CT exhibited a tendency to underestimate aortic dimensions compared to angiography. VR may serve as a complementary imaging modality, particularly in the planning of interventional treatment for CoA.

LIGHTNING POSTER PRESENTATIONS

Category: Multimodality Imaging

2317 - CORONARY ARTERY REMODELING AFTER PERCUTANEOUS CLOSURE OF FISTULAE IN CHILDREN

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Background / Hypothesis:
Congenital coronary artery fistulae (CCAF) are rare anomalies associated with myocardial ischemia, volume overload, and potential endocarditis. Percutaneous closure has emerged as the preferred treatment in children. However, post-closure coronary artery remodeling and late complications remain insufficiently characterized.

Materials and Methods:
We conducted a retrospective study of 49 pediatric patients with CCAF who underwent percutaneous closure from June 2008 to June 2022 at Children's Hospital 1, Vietnam. Pre-intervention imaging included transthoracic echocardiography (TTE, n=49), coronary computed tomography angiography (CCTA, n=34), and invasive coronary angiography (ICA, n=49). Post-procedural CCTA was performed in 21 patients at a median of 41.2 months (interquartile range: 25.5–52 months) after closure. The median coronary artery diameter before intervention was 8.6 mm, and the median Z-score was 18.1. Remodeling, thrombotic events, and residual shunts were evaluated.

Results:
Most fistulae originated from the right coronary artery (62%). Following closure, coronary artery diameters decreased modestly but remained enlarged (7–8 mm). Z-scores decreased significantly but did not normalize; at >5 years, the median Z-score was approximately 10. CCTA revealed persistent coronary dilation (median diameter 11.0 mm), coronary aneurysms in 25%, thrombus formation within the coronary artery in 9.5%, thrombus formation between occlusion devices in 38.1%, and residual shunts in 9.5% of cases. Among 18 patients with paired pre- and post-closure CCTA, no statistically significant change in coronary dimensions was observed.

Conclusions:
Percutaneous closure of congenital coronary artery fistulae effectively abolishes abnormal shunting in most cases but frequently leaves persistent coronary dilation and carries risks of thrombus formation and residual shunting. Long-term imaging surveillance, including delayed CCTA, is essential to detect late vascular complications and optimize clinical outcomes.

LIGHTNING POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1938 - PREOPERATIVE HEMODYNAMICS AND BRAIN INJURY IN TRANSPOSITION OF THE GREAT ARTERIES

Devin Chetan [1], Thiviya Selvanathan [2], Fu-tsuen Lee [1], Hanan Smaili [1], Jessie Mei Lim [1], Davide Marini [1], Helen Branson [3], Vann Chau [1], Steven Miller [2], Mike Seed [1]
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Background:
Despite improvements in surgical and neurodevelopmental (ND) outcomes in patients with transposition of the great arteries (TGA) since the widespread adoption of early arterial switch operation, perinatal brain injury remains common.

Methods:
Pre-operative brain MRI was performed in TGA patients at The Hospital for Sick Children between 2014-2023. MRI was undertaken without sedation on a 1.5T Scanner. Brain injury was classified as stroke, white matter injury, or hypoxic ischemic injury (HII). Hemodynamic assessment was performed during the same MRI visit using cine phase contrast MRI of the major vessels, allowing quantification of systemic (Qs) and pulmonary blood flow (Qp). Spearman's correlation was used to assess relationships between hemodynamic parameters.

Results:
Neuroimaging was obtained in 225/302 (74.5%) neonates with TGA, of whom 48/225 (21.3%) underwent CMR. Brain injury included arterial ischemic stroke (9.8%), moderate-severe white matter injury (8.4%), and HII (2.7%). Significant correlations were observed between PDA size and flow, and PDA flow and oxygen saturations. An inverse relationship was observed between Qp and Qs. Hypoxic ischemic brain injuries occurred early due to a restrictive atrial septum or later, following pulmonary overcirculation.

Conclusions:
Although no clear association was found with brain injury, this study provides evidence that high PDA flow, QpQs, and oxygen saturations are related to lower cerebral blood flow and may predispose infants with TGA to WMI and HII. These findings suggest that to preserve cerebral blood flow, pre-operative transposition patients who remain hypoxemic after balloon atrial septostomy may be better served by earlier arterial switch operation rather than attempting to increase PDA size with prostaglandins. While HII resulting from a restrictive atrial septum is a recognized cause of perinatal brain injury in TGA, our findings suggest HII secondary to pulmonary overcirculation is also an important form of injury and may be preventable through judicious use of prostaglandin and timely surgical repair.

LIGHTNING POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

2045 - NEURO DEVELOPMENTAL OUTCOMES ONE YEAR AFTER INFANT HEART SURGERY– A MULTI CENTRE PROSPECTIVE COHORT STUDY FROM INDIA

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Background / Hypothesis:
This prospective multi-centre hospital-based cohort study from five pediatric cardiac centres across India sought to determine prevalence and predictors of motor and mental neurodevelopmental delay using the developmental assessment scale for Indian Infants (DASII) twelve months after infant cardiac surgery.

Materials and Methods:
Infants were recruited at admission for heart surgery. Overall prevalence of motor and mental neurodevelopmental delay, as well as delay stratified for 14 clusters as per DASII, was reported. Multivariate logistic regression analysis was used to report adjusted odds ratios for predictors of motor and mental developmental delay.

Results:
Of 1958 recruited infants, 1375 (74.4%) were eligible for follow up assessment at 12 months after surgery; 111 (6%) expired in hospital or during follow-up (n=77; 6%); 215 (16.6%) were lost to follow up. Of 1083 remaining infants, 149 (13.8%) had motor and 107 (9.9%) had mental developmental delay. In cluster-based analysis, maximum delay was seen for body-control among motor clusters (n=363, 33.5%) and social interaction and imitative behaviour (n=443, 40.9%) among mental clusters. Significant associations for motor delay included syndromic association (OR 29.4., 95% CI 14.9, 57.7), preoperative sepsis (OR 2.0, 95% CI 1.1-3.7), mechanical ventilation duration (OR 1.003, 95% CI 1.001 – 1.005) and hospital stay (OR 1.016, 95% CI 1.001-1.031). The corresponding association for mental delay were syndromic association (OR 35.7, 95% CI 18.3, 69.8), pre-operative sepsis (OR 2.8, 95% CI 1.5, 5.4), birth weight (OR 0.558, 95% CI 0.340, 0.916) and duration of ICU stay in hours (OR 1.002, 95% CI 1.001, 1.003).

Conclusions:
Approximately 17% children experience neurodevelopmental delay after infant heart surgery that is associated with birth-weight, syndromic-status, pre-operative sepsis and postoperative recovery. Deficiencies in multiple sub-domains highlights the need for comprehensive neurodevelopmental assessment. The increasing population of survivors of infant heart surgery will require significant resources for assessment, follow up and appropriate interventions.

POSTER PRESENTATIONS

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1006 - CLINICAL CHARACTERISTICS OF CERVICAL LYMPHADENOPATHY IN KAWASAKI DISEASE AND THE GENERATION OF RELATED CERVICAL COMPLICATIONS A RETROSPECTIVE COHORT STUDY

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The Second Affiliated Hospital And Yuying Children's Hospital, Institute Of Cardiovascular Development And Translational Medicine, Wenzhou-China [1]

Background / Hypothesis:
Cervical lymphadenopathy (CL) is a notable yet underexplored feature of Kawasaki Disease (KD), particularly in its early stage. This study investigated the clinical and imaging characteristics of CL in KD, particularly KD that initially present with fever and cervical lymphadenopathy (LKD), its differentiation from BCL, and its association with systemic and cervical complications.

Materials and Methods:
In this study 681 KD patients and 101 BCL patients hospitalized at the Yuying Children's Hospital affiliated with Wenzhou Medical University from January 1, 2021, to October 1, 2023 were enrolled. Among the KD patients, 403 had cervical lymphadenopathy, with 86 presenting only with fever and cervical lymphadenopathy on admission (LKD group), 317 showing typical features of cervical lymphadenopathy (Other KD group), and 243 without cervical lymphadenopathy. Demographic, clinical, laboratory, and imaging data across these groups were compared to identify distinguishing characteristics and potential complications.

Results:
Patients with cervical lymphadenopathy in Kawasaki Disease had higher systemic and hepatic inflammatory markers compared to BCL patients, were more likely to experience pyuria, hepatosplenomegaly, and pulmonary imaging abnormalities. The presence of enlarged cervical lymph nodes in KD was associated with elevated neutrophil counts and markers of liver damage, alongside a higher incidence of IVIG resistance and KDSS compared to KD patients without lymphadenopathy. Moreover, LKD patients showed a higher tendency for cervical complications, with ultrasound findings of bilateral multifocal lymphadenopathy predominantly in the Level II region, showing no liquefaction and fewer abscess formations.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1011 - SERUM INTERLEUKIN 6 AND VENTRICULAR TACHYCARDIA AS PREDICTORS OF MORTALITY IN CHILDREN WITH FULMINANT MYOCARDITIS

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Background / Hypothesis:
Fulminant myocarditis (FM) is still associated with a high mortality in children. This study aims to provide clinical indicators that will enable early identification of children with FM at high risk of death and predict the mortality.

Materials and Methods:
Forty children diagnosed with FM from January 2014 to March 2024 at our Hospital were retrospectively analyzed. Baseline demographic characteristics and relevant clinical data including basic vital signs, clinical presentation and clinical findings were collected at admission and follow-up. Univariate logistic regression analysis and receiver operating characteristic (ROC) curves were used to screen for factors with clinical predictive value.

Results:
A total of 40 children with FM were included in this study and were divided into survival group (n=34) and death group (n=6). The most common clinical symptom was circulatory disorders (n=28, 70%). There were significant differences between the two groups in creatine kinase (CK) (P =0.031), serum interleukin-6 (IL-6) (P < 0.001), left ventricular end-systolic diameters (LVDs) (P = 0.041) and ventricular tachycardia (VT) (P = 0.019). The binary logistic regression analysis of serum IL-6, and VT showed that IL-6 [OR:1.094; 95%CI: (1.027-1.166); P=0.006], and VT [OR:10.455; 95%CI: (1.087-100.595); P=0.042] were independently associated with mortality. The results of ROC curve analysis showed that serum IL-6 [AUC: 0.975; 95%CI: (0.894-1)], VT [AUC: 0.755; 95%CI: (0.541-0.868)], with a cut-off value of IL-6 of 24.60pg/ml, a sensitivity of 100%, a specificity of 97.1%, and a Yoden index of 0.971, suggesting that high levels of serum IL-6 (>24.60pg/ml) and electrocardiogram (ECG) manifesting as VT have a predictive value for mortality, in which serum IL-6 has a very high accuracy.

Conclusions:
Serum IL-6 levels and VT manifestations on ECG at admission enable accurate early identification of children with FM at high mortality risk.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1025 - THROMBELASTOGRAM ARE ASSOCIATED WITH CORONARY ARTERY ANEURYSM IN KAWASAKI DISEASE PATIENTS

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Background / Hypothesis:
Kawasaki disease (KD) is a common children's disease, which easily involves coronary artery and develops coronary artery aneurysm (CAA). The purpose was to investigate the relationship between thromboelastography MA and CAA and confirm whether thromboelastography MA was a predictor for CAA in KD patients.

Materials and Methods:
A total of 243 consecutive KD patients were included in this study. Differences analysis compared baseline characteristics and subsequent multivariate logistic regression analysis to identify independent risk factors for CAA in KD patients.

Results:
Of the 243 KD patients, there were 107 females and 136 males, with a median age of 23 months. Difference analysis showed that the R, K, α, gender, WBC, HB, PLT and NLR were not significantly different, but the MA, age, IVIG resistance, CRP and albumin were significantly different between the KD CAA and the KD NCAA group. Subsequent multivariate logistic regression analysis showed age (OR 0.988; 95% CI, 0.977 - 0.999; P = 0.039), albumin (OR 0.902; 95% CI, 0.852 - 0.956; P <0.001) and MA (OR 1.846; 95% CI, 1.069 - 3.187; P = 0.028) were independently associated with CAA in KD patients.

Conclusions:
Thromboelastography MA was closely related to CAA and may be a predictor of CAA in KD patients.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1047 - CD14+ MONOCYTES THE IMMUNE COMMUNICATION HUB IN EARLY VASCULITIS SYMPTOMS OF KAWASAKI DISEASE

Sirui Song [1], Liqin Chen [1], Yuanyuan Zhou [1], Yanbing Xu [2], Guang Li [2], Libing Shen [3], Tingting Xiao [4], Min Huang [4]
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Background / Hypothesis:
Kawasaki Disease (KD) is an acute systemic vasculitis syndrome predominantly affecting children, with a propensity to induce coronary artery lesions. Aberrant immune activation and cytokines cascade reactions are involved in its pathogenesis. The aim of this study is to investigate the changes in immune cell communication during the course of KD and to identify potential biomarkers.

Materials and Methods:
The study enrolled seven pediatric patients diagnosed with Kawasaki Disease (KD) between December 2019 and December 2021. Single-cell RNA sequencing (scRNA-seq) technology was utilized to analyze peripheral blood mononuclear cells (PBMCs). Bioinformatics methods including quality control, dimensionality reduction, cell annotation, differential expression analysis, cell communication analysis, and co-expression network analysis were employed for data processing and analysis.

Results:
This study utilized single-cell sequencing technology to uncover the dynamics of immune cell communication during the course of KD, revealing a significant increase in the number of CD14+ monocytes in the early stages of vasculitis, which play a central role in cell-cell communication. SELPLG was identified as a particularly crucial gene in the signal transduction among immune cells. The study also observed various cellular communication patterns of vasculitis at different time points and identified co-expression modules related to ribosomal function, cell proliferation, and immune responses in CD19+ B cells, CD4+ T cells, CD8+ T cells, CD14+ monocytes, and CD16+ monocytes. Notably, the expression of the ITK gene in CD16+ monocytes stood out. Furthermore, MHC-I genes were the most active molecules involved in signal transduction, and the expression of CD40 genes increased with the prolongation of vasculitis duration.

Conclusions:CD14+ monocytes play a pivotal role in cellular communication during the activation process of KD vasculitis, with SELPLG and ITK as important communication signal genes. These findings provide a novel perspective for the discovery of biomarkers, prediction of disease progression and the targeted treatment strategies of KD.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1060 - SCREENING THE KEY BIOMARKERS OF INTRAVENOUS IMMUNOGLOBULIN UNRESPONSIVE FOR KAWASAKI DISEASE BASED ON SINGLE CELL SEQUENCING TECHNOLOGY

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Background / Hypothesis:
To screen the related biological indicators of intravenous immunoglobulin (IVIG) unresponsive in Kawasaki disease by single cell sequencing and explore the changes of immune cells.

Materials and Methods:
Four children diagnosed with Kawasaki disease were selected from Shanghai Children's Hospital from December 2022 to August 2023.Peripheral venous blood at acute stage and after the temperature had stabilized was collected, PBMC was extracted, and the changes of immune cell were analyzed by single cell sequencing. The basic clinical characteristics of KD patients and SCS data analysis results were compared. The Gene Ontology (GO) database was used to analyze the enrichment results of B cells and the expression of differentially expressed genes (DEGs) in the acute phase and convalescent phase of IVIG sensitive group and IVIG unresponsive group.

Results:
There were three males and one female in 4 KD patients, aged 2.1 to 5.5 years. The duration of fever days when IVIG used was 5 days in two cases, 6 days in one case, and 4 days in one case. One case was unresponsive to IVIG treatment, and three cases were sensitive to IVIG treatment. The IVIG unresponsive patient had Coronary artery lesions (CAL), and coronary artery was not dilated in three IVIG sensitive patients. Gene enrichment results showed that DEGs related to immune activation pathways and immunoglobulin receptor expression in B cells were downregulated in IVIG sensitive patients after IVIG treatment, including immune response regulatory cell surface receptor signaling pathways, immune response activation signaling pathways, and antigen receptor-mediated signaling pathways. In contrast, DEGs in IVIG unresponsive patients showed no association with B cell activation pathways and immunoglobulin receptor expression pathways after treatment.

Conclusions:
It is suggested that the change of B cell number and DEGs is related to the effect of IVIG therapy.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1068 - ASSOCIATION OF TLRS SIGNALING PATHWAY HYPOMETHYLATION AND CD14 RS2569190 POLYMORPHISM WITH KAWASAKI DISEASE AND IVIG RESPONSIVENESS

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Background / Hypothesis:
Kawasaki disease (KD) is the most common acquired heart disease that occurs in children. The activation of the immune system is a crucial characteristic in the progression of KD, while the TLRs signaling pathway plays a pivotal role in the immunopathogenesis of KD. Additionally, DNA methylation has been recognized as a significant functional contributor to the pathological processes associated with KD.

Materials and Methods:
A total of 317 samples were used in this study, including 157 KD patients and 160 healthy controls. The association of DNA methylation status of 12 genes in the TLRs signaling pathway with the risk of KD development and Intravenous immunoglobulin (IVIG) responsiveness was tested via targeted bisulfite sequencing. Four SNPs (IL-1β rs16944, TNF-α rs361525, TNF-α rs1800629, and CD14 rs2569190) that are located at 5' flanking region were genotyped.

Results:
The methylation levels of the promoter regions of IL-1β, TNF-α, IL-6, TLR2, TLR4, IRF3, and CD14 were significantly lower in KD patients compared to healthy controls. No correlation was observed between methylation status and IVIG responsiveness. Additionally, carriers of the C allele of rs2569190 exhibited a greater likelihood of responding to IVIG therapy.

Conclusions:
Hypomethylation of gene promoters within the TLRs signaling pathway is associated with the development of KD. The CD14 rs2569190 polymorphism is involved in the mechanism of IVIG resistance in KD.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1092 - PEDIATRIC INFECTIVE ENDOCARDITIS IN SINGLE CENTER

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Background / Hypothesis:
Infective endocarditis (IE) is a rare disease in children, and it can result in significant morbidity and mortality. Congenital heart diseases (CHD) and intracardiac patch, bioprosthetic mechanic valve or intracardiac devices constitute the main risk factories. In this study, we aimed to present clinical, diagnostic and microbiological features of the patients who followed in our center.

Materials and Methods:
We retrospectively analyzed data of 24 episodes in 20 patients diagnosed with definite IE according to the modified Duke criteria between 2019 and 2024.

Results:
The median age of all patients at the time of diagnosis was 15 years (range: 4 months to 18 years). While 17 patients (85%) had CHD, 3 of our patients had no IE risk factors. The most common CHD were ventricular septal defect (25%), bicuspid aortic valve (25%) and Fallot tetralogy (20%). IE developed after surgery or transcatheter valve implantation in 16 of our patients with CHD. The development of IE varied between 1 month and 5 years postoperatively, with an average of 12±2 months. The need for surgical intervention after IE was determined as 41.5%. Candida species (25%), Staphylococcus aureus (15%), coagulase-negative Staphylococci (15%) and Burkholderia cepacia (10%) were the most frequently isolated agents. In 4 patients with Candida, abscess development and dehiscence of infected tissues made intervention difficult and resulted in mortality.. IE-related complications developed in 30% of the patients and the mortality rate was 25%.

Conclusions:
One should be careful about IE in the first postoperative year. Considering the devastating effects of Candida-related IE, which has increased in frequency in the literature and in our study, it should not be too late to start antifungal agents, as it may take days for cultures to become positive.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1148 - CLOT TO CLARITY TISSUE TYPE PLASMINOGEN ACTIVATOR`S ROLE IN POST COVID POLYSEROSITIS TREATMENT IN CHILDREN. A CASE REPORT

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Background / Hypothesis:
SARS-CoV-2 infection can lead to systemic disorders, notably Multisystem Inflammatory Syndrome in Children (MIS-C). However, pericardial clots are rare in MIS-C.

Case Presentation:
A 22-month-old, 10kg child presented with hydropericardium and cardiac tamponade, following recent ARVI and rotavirus infections. X-ray and cardiac ultrasound showed massive hydropericardium with echogenic inclusions and pleural effusion.
Pericardiocentesis was performed in Cath Lab. A 5Fr pericardial catheter was inserted for pericardiocentesis and 80 ml of hemolyzed blood was evacuated. Hemodynamic status improved, but echogenic inclusions remained, according to cardiac ultrasound data.
Laboratory tests were performed: QuantiFERON test (negative), Ig G to Covid19 (positive with high titers), Ig M to Covid19 (negative). A diagnosis of post-COVID polyserositis was established.
3 days of oral prednisolone showed no positive effect. IV prednisolone effectively stopped pericardial and pleural fluid accumulation. However, clots remained in the pericardial cavity. The decision was made to administer tPA intrapericardially.
In the intensive care unit, the patient intrapericardially received 4 mg of tPA in 20 mL of saline. The pericardial catheter was clamped for 4 hours. Ultrasound monitoring was performed every hour. After 4 hours, according to cardiac ultrasound data – a significant amount of fluid in the pericardial cavity, coagulogram unchanged, clot volume significantly reduced. Through the pericardial catheter 75ml of purulent effusion was evacuated. After tPA was re-administered, 100ml of purulent fluid was evacuated 4 hours later. ECHO data showed no clots.

Results:
Ultrasound control – no fluid, no clots. During local fibrinolysis, no hemodynamic disturbances occurred, blood coagulogram did not change, no bleeding or other side effects occurred. After fibrinolysis – hemodynamic status was stable, no effusion recurrences occurred, no surgical interventions were required. At the time of examination, 3 months post-procedure, there were no recurrences.

Conclusions:
Intrapericardial fibrinolytics offer a safe, potentially effective treatment for pericardial fibrin clots and may avoid pericardiectomy.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1158 - RISK FACTORS FOR CORONARY ARTERY LESIONS IN KAWASAKI DISEASE AT DIFFERENT AGES AND ESTABLISHMENT OF PREDICTIVE MODELS

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Background / Hypothesis:
Coronary artery lesions (CAL)are the most important complications of Kawasaki disease (KD). This study analyzed risk factors for CAL in patients with KD and their prognoses at different ages, established prediction models for CAL in patients with KD.

Materials and Methods:
Patients diagnosed with KD were enrolled in this study. KD cases were stratified according to age (<1 year,1–5 years, and >5 years) and classified into the CAL and non-CAL groups. Cox regression analyses were used to determine the independent risk factors. Prediction models were established using regression analysis and machine-learning algorithms.

Results:
In total, 3049 patients were studied. Except for fever duration, the risk factors for CAL vary with age. For patients under 1 year old, intravenous immunoglobulin resistance and high levels of N-terminal pro-brain natriuretic peptide were risk factors. In the 1–5 years age group, risk factors included increased platelet count, C-reactive protein, and interleukin-6, reduced serum albumin, male sex, no oral changes and no enlarged lymph nodes. Age group over 5 years, elevated C-reactive protein, male sex, and no oral changes were risk factors. The severity of CAL and fever duration were the main factors affecting reductions. The random forest prediction model showed the best efficacy with an area under the receiver operating characteristic curve of 0.756.

Conclusions:
Risk factors for CAL varied with age. The incidence of CAL was high in age group under 1 year, but there was no significant difference in long term follow-up prognoses.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1169 - THE ROLE OF M1 M2 MACROPHAGE POLARIZATION IN KAWASAKI DISEASE

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Background
It is believed that aberrant monocyte and macrophage activation in the acute stage of Kawasaki disease (KD) is closely linked to the development of vasculitis. However, there has been no reported study on the status of M1 and M2 macrophages in serum in KD.

Methods:
We obtained peripheral venous blood samples from 25 KD patients, 20 healthy controls, and 17 febrile controls. The KD patients were divided into two groups: 10 with coronary artery lesions (CALs) and 15 without. Flow cytometry was utilized to determine the number of CD80+ M1 macrophages, CD206+ M2 macrophages, and CD80+ CD206+ macrophages in peripheral blood mononuclear cells (PBMCs).

Results:
This study found that the number of CD80+ M1 macrophages in the peripheral blood of KD patients was significantly increased, while the number of CD206+ M2 macrophages and CD80+ CD206+ macrophages were down-regulated compared with the febrile and control groups. At the same time, we discovered that the number of CD80+ M1 macrophages reduced significantly after intravenous immunoglobulin (IVIG) treatment, whereas the number of CD206+ M2 macrophages and CD80+ CD206+ macrophages increased significantly compared to before treatment. Moreover, the number of CD206+ M2 macrophages significantly decreased in KD patients with CALs compared with KD patients without CALs.

Conclusions:
This study found that KD patients have a definite imbalance of M1/M2 macrophages, which can be reversed with IVIG treatment. Moreover, the M2 polarization of macrophages may play a central role in the development of CALs.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1170 - ASSOCIATION BETWEEN THYMOSIN β4 AND CORONARY ARTERIAL LESIONS IN CHILDREN WITH KAWASAKI DISEASE

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Background:
Kawasaki disease (KD), an acute systemic vasculitis mainly affecting children, is a leading cause of acquired heart disease in developed countries. Its pathogenesis is unclear. Thymosin β4 (Tβ4) has roles in cardiovascular protection and repair by modulating inflammation, angiogenesis, and endothelial function. This study explores Tβ4's involvement in KD pathogenesis, especially its link to inflammation and coronary artery lesions (CALs).

Methods:
Children diagnosed with KD at the Children's Hospital of Chongqing Medical University from 2023 - 2024 were included. Diagnosis followed American Heart Association guidelines. The KD group was divided into KD - CALs and KD - NCALs groups by coronary artery z - scores. Serum Tβ4 levels were measured by ELISA, and correlations between Tβ4 levels and clinical/laboratory parameters were analyzed.

Results:
90 KD patients and 55 healthy children were studied. KD group had lower serum Tβ4 levels than the healthy group ($P < 0.05$). Among KD patients, KD - CALs group had lower Tβ4 levels than KD - NCALs group ($P < 0.05$). After IVIG treatment, Tβ4 levels in KD patients increased ($P < 0.05$). In the KD group, Tβ4 levels correlated positively with RBC and Hb, and negatively with TT, PCT, IL-2, IL-12p70, IFN-α, IL-4, IL-10, TNF-α, and IL-1β. In the KD-CALs group, Tβ4 correlated negatively with TT, IL - 4, TNF - α, and IL - 1β.

Conclusions:
Tβ4 appears to play a role in the pathogenesis of KD, particularly in the development of CALs. Its potential protective effects against coronary artery damage suggest that Tβ4 may serve as a promising therapeutic target for preventing or mitigating vascular complications in KD.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1176 - DYNAMIC CHANGES OF SERUM MATRIX METALLOPROTEINASES AND TISSUE INHIBITORS IN KAWASAKI DISEASE IMPLICATIONS FOR CORONARY ARTERY LESION PERSISTENCE

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Background / Hypothesis:
The mechanism of coronary artery lesions (CALs) persistence in Kawasaki disease (KD) remains unclear. The study aimed to investigate the serum dynamic changes of matrix metalloproteinases (MPPs) and tissue inhibitors (TIMPs) in children with CALs caused by KD, and explore their correlation with short-term CAL outcomes.

Materials and Methods:
This is a nested case-control study. A total of 114 KD children with CALs completed the 3-month follow-up in discovery set and validation set. Children with CALs persisted after 3 months were enrolled as the CALs persistence group. The CALs regression group consisted of children with CALs regressed who were matched with each CALs persisted case by gender and age at a ratio of 2:1. In the discovery set, serum MMPs and TIMPs were measured using a Quantibody® Human MMP Array in febrile (before IVIG infusion) and defervescence phase (afebrile 48-72 hours after initial treatment). Differential proteins between groups were identified by absolute logFC > 0.263 and adjust P value < 0.05. The findings were then validated in the independent validation set.

Results:
There were 14 (12.3%) KD children with CALs that persisted for 3 months in our cohort. In the febrile phase, there were no differences in MMPs and TIMPs between CALs regression group and CALs regression group (P0.05). After treatment, MMP8 and MMP9 decreased in both groups, while TIMP1 was lower in CALs persistence group (P0.05). Further validation study showed the same changes.

Conclusions:
MMPs and TIMPs have dynamic changes in children with CALs caused by KD. A low-level of TIMP1 after treatment may be related to CALs persistence, offering novel insights into the underlying mechanism.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1194 - IVIG RESISTANCE IN KAWASAKI DISEASE CLINICAL AND LABORATORY RISK FACTORS AND THE POTENTIAL ROLE OF ADMINISTRATION TIMING

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Background / Hypothesis:
Intravenous immunoglobulin (IVIG) resistance is associated with coronary artery abnormalities in Kawasaki disease (KD) and requires additional therapy. The purpose was to determine independent risk factors for IVIG resistance, investigate the response to IVIG treatment at different time points and determine whether the time option of IVIG treatment altered IVIG resistance.

Materials and Methods:
The clinical data of 6264 KD patients in southwest China were analyzed retrospectively. According to the response to IVIG treatment, the patients were divided into IVIG response group and IVIG resistance group. Multiple logistic regression model was used to identify independent risk factors for IVIG resistance and trend chi-square test was used to examine the effect of IVIG timing on IVIG resistance.

Results:
Multivariate analysis showed that IVIG time, WBC, PLT, HB, ALT and Na were independently associated with IVIG resistance and IVIG time was a key variable for IVIG resistance. In addition, these data suggested that the rate of IVIG resistance was the lowest when treated with IVIG on the seventh and eighth day of initial fever.

Conclusions: IVIG timing is a key factor in IVIG resistance. Our data suggest a lower resistance rate when IVIG is administered on the seventh and eighth day of initial fever. However, the clinical implications of delaying treatment are uncertain, and early IVIG administration remains essential to prevent cardiovascular complications. Further research is needed to validate these findings and to guide clinical practice.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1210 - A MACHINE LEARNING ALGORITHM FOR PREDICTING CORONARY ARTERY ANEURYSMS IN CHILDREN WITH KAWASAKI DISEASE A MULTICENTER STUDY BASED ON THE POPULATION OF SOUTHWEST CHINA

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Background / Hypothesis: To develop a predictive model for Kawasaki disease (KD)-related coronary artery aneurysms (CAA) using machine learning (ML) algorithms, leveraging clinical/laboratory data, aiming to enhance early identification and improve long-term cardiovascular outcomes.

Materials and Methods: Clinical data from 6,018 KD patients across five pediatric hospitals in Southwest China were analyzed. The dataset from Children's Hospital of Chongqing Medical University was split into training (70%) and internal validation (30%) cohorts. Variables were screened via lasso regression, and six ML algorithms (Lasso regression, K-nearest neighbors, Support Vector Machine, Random Forest, Extreme Gradient Boosting, Multilayer Perceptron) were applied. Model performance was evaluated internally and externally using four other hospital datasets, with metrics including AUROC, accuracy, specificity, and F1 scores.

Results: After initial variable selection (37 to 18 variables), the Random Forest model demonstrated the best performance in internal validation (AUROC: 0.810, PR: 0.798). External validation revealed moderate performance (AUROC: 0.639–0.687, PR: 0.389–0.490), with good internal calibration but slight deviations in external cohorts. Decision curve analysis, however, showed consistent clinical net benefit across datasets, highlighting practical utility despite calibration drift.

Conclusions: The Random Forest model outperformed others in predicting KD-related CAA. Regional-specific model development is recommended to enhance CAA identification capabilities.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1242 - MACHINE LEARNING ANALYSIS OF CYTOKINE PROFILES IN PEDIATRIC FULMINANT MYOCARDITIS

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Background / Hypothesis:
Fulminant myocarditis (FM) is a life-threatening condition characterized by malignant arrhythmias and cardiogenic shock, requiring early therapeutic intervention. Although clinical features have been used for prognosis, integrating cytokine profiles may improve early diagnosis and risk stratification. We hypothesized that a machine learning approach incorporating clinical data and cytokine profiles could identify key predictors of mortality in pediatric FM.

Materials and Methods:
This study analyzed pediatric FM cases admitted to Aichi Children's Health and Medical Center and Fujita Health University from January 2012 to December 2022. FM was defined as acute myocarditis requiring mechanical circulatory support. Acute myocarditis was diagnosed based on endomyocardial biopsy or clinical signs of acute heart failure with elevated high-sensitivity troponin T. Clinical variables and serum cytokine levels at admission were analyzed using Partial Least Squares Discriminant Analysis with Leave-One-Out Cross-Validation. Variable Importance in Projection (VIP) scores were calculated, and variables with VIP >1.0 were considered associated with mortality.

Results:
The study included 21 patients with FM. There were 14 patients in the survival group and 7 patients in the mortality group. The machine learning model achieved 86% predictive accuracy with an area under the ROC curve of 0.92. VIP scores identified 20 cytokines, including TNF-α, IL-8, IL-6, IL-15, and PDGF-AA, and laboratory markers such as pH, lactate, and CK-MB as factors significantly associated with mortality. Notably, left ventricular ejection fraction, troponin T, sex, and age were not associated with mortality.
ConclusionsOur results suggest that cytokines, particularly TNF-α, may play crucial roles in pediatric FM prognosis. These findings warrant further research into anti-cytokine therapies for pediatric FM.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1296 - ACUTE SCROTUM IN A PATIENT WITH REFRACTORY KAWASAKI DISEASE A CASE REPORT

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Background:
Kawasaki disease (KD) is a medium artery vasculitis that predominantly affects children under age 5. The etiology of KD is unknown and coronary heart disease is a major complication of KD. Acute scrotum is a rare complication of acute KD, and not as well recognized as other manifestations of the disease.

Case description:
We report a 5-yesr-old boy with acute scrotum in the acute phase of KD. He was treated with intravenous immunoglobulin (total 2 g/kg) and aspirin (50 mg/kg/day). After the IVIG infusion, he fail to become afebrile. So he recieved infliximab for treatment of KD. The treatment was effectivein resolving his fever and other clinical syptoms. but 2days after starting treatment he experienced scrotal swelling. Scrotal ultrasound were used in the diagnosis of acute scrotum. After 2-week follow up, his symptoms resolved and remained well-appearing with no refractory Kawasaki symproms.

Results:
Acute scrotum is a rare complication in KD, less well recognized than other disease manifestations. An understanding of genitourinary symptoms in Kawasaki disease can help timely diagnosis and treatment of the disease.

Conclusions:
Careful further clinical observaton may elucidate the true incidence of this extracardiac symproms, thereby clarifying the diagnostic value of this possible complication in acute KD.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1307 - HISTOPATHOLOGICAL CHARACTERISTICS OF RUPTURED CORONARY ARTERY ANEURYSM IN KAWASAKI DISEASE. A COMPARATIVE AUTOPSY STUDY

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Background:
Although coronary artery aneurysms (CAAs) are a well-known complication of Kawasaki disease (KD), aneurysm rupture is rare. However, autopsy statistics indicate that approximately 10% of KD-related deaths are due to cardiac tamponade resulting from aneurysm rupture. In this study, we conducted a histopathological analysis of 12 autopsy cases involving ruptured CAAs and compared them with non-ruptured cases.
Subjects and Methods: We examined 12 autopsy cases of acute-phase KD patients who died due to ruptured CAAs. Age, sex, time from disease onset to aneurysm rupture, clinical history, and histological findings of the coronary arteries were reviewed.

Results:
Of the 12 cases, 10 were male and 2 were female. Six patients were under 1 year of age at death, and six were 1 year or older. The interval from disease onset to rupture ranged from 10 to 30 days. The rupture site was the left coronary artery (LCA) in 9 cases and the right coronary artery (RCA) in 3 cases. IVIG therapy was not administered in 8 cases (all of whom died before 1990), whereas 4 cases (all died after 1990) received IVIG. Steroid therapy was given in 9 cases. Histologically, ruptured cases demonstrated earlier arterial wall damage attributable to severe inflammation, prolonged inflammatory cell infiltration, and reduced adventitial fibrotic response compared to non-ruptured cases.

Conclusion:
yok CAA rupture in KD tends to occur more frequently in males, infants under one year of age, and in the LCA. Histological risk factors include early-onset severe inflammation, sustained inflammatory activity, and delayed tissue repair. Previously reported rupture cases from the literature will also be discussed.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1337 - EFFICACY AND SAFETY OF GLUCOCORTICOIDS THERAPY FOR PRIMARY TREATMENT WITH KAWASAKI DISEASE A PROSPECTIVE RANDOMIZED CONTROLLED STUDY

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Background / Hypothesis:
To investigate the efficacy and safety of glucocorticoids plus IVIG as an initial treatment in Kawasaki disease.

Materials and Methods:
We conducted a prospective open-label,randomized ,controlled trial .A total of 140 patients with Kawasaki disease were enrolled in this prospective trial from January 2021 to December 2023, they were randomly assigned (1:1) into two groups:patients in the IVIG group(n=70) received standard therapy while patients in the IVIG+GC group(n=70) received standard therapy plus prednisolone 2 mg/kg per day.The medical history,laboratory data and echocardiography outcomes were compared through t test and $\chi 2$ test in two groups.

Results:
The IVIG group had significantly higher serum amyloid A levels after 3 days treatment in the IVIG group compared to the IVIG+GC group[5.17(2.50,27.66)] mg/L vs[3.62(2.50,7.12)] mg/L,($P< 0.05$).The IVIG group had significantly higher Interleukin-6 levels after 3 days treatment in the IVIG group compared to the IVIG+GC group, [3.92(2.51,7.45)] pg/mL vs [2.50(2.00,6.20)] pg/mL,($P<0.05$). The incidence of coronary artery abnormalities was significant lower in the IVIG+GC group than in the IVIG group at week 4[(4 cases (5.9%) vs 11cases(16.9%),($P<0.05$)].
8 (11.4%) of 70 patients did not respond to primary treatment in IVIG group,1 (1.4%)of 70 patients did not respond to primary treatment in IVIG+GC group,There was significant difference($P<0.05$).Patients in the IVIG+GC group had more normal body temperature than the IVIG group after 24 hours treatment [69/70(98.6%) vs 62/7088.6%,($2=4.275$, $P=0.039$)].

Conclusions:
Primary glucocorticoids can decrease the levels of inflammatory factors such as IL-6 and SAA . Addition of glucocorticoids to the standard therapy might decrease the incidence of coronary artery abnormalities in KD patient.Primary glucocorticoids can shorten the duration of fever and reduce the non-response rate of IVIG.It is a safe and effective treatment for patients with Kawasaki disease.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1407 - EVALUATING THE SAFETY OF SELECTIVE USE OF INPATIENT ECHOCARDIOGRAM FOR PATIENTS ONLY WITH RISK FACTORS FOR CORONARY ARTERY ANEURYSM IN KAWASAKI DISEASE

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Background
Prevention and identification of coronary artery aneurysm (CAA) is a core goal of managing Kawasaki Disease (KD). The American Heart Association recommends all patients with KD undergo echocardiography at diagnosis, 2 and 6 weeks. This may be impractical in settings with lower resources. We evaluated the safety of an alternative approach, which prioritises inpatient echocardiography only for patients with risk factors for CAA, while low risk cases have echocardiography at outpatient follow-up.

Materials and Methods
We retrospectively reviewed all probable and confirmed cases of KD in Auckland over 5-years (2017-2021). Clinical records, laboratory and echocardiography data were reviewed. Echocardiography data included timing of initial echocardiogram in relation to KD diagnosis, presence of risk factors for CAA, coronary artery dimensions and z scores and presence of other abnormalities.

Results
One hundred and sixty cases had a total of 303 echocardiograms. Twenty-seven (16.9%) developed CAA; one had a giant aneurysm. There were no thromboses, rupture nor deaths. CAA was more common in children <1 year and with non-response to first dose of intravenous immunoglobulin (IVIg). Forty-seven cases had risk factors for CAA, including 33 with non-response to IVIg and 8 cases treated after day 10 of fever. Inpatient echocardiogram occurred for 31/47 of high-risk cases and 10 had CAA (32%). In the 16 high-risk cases who did not have inpatient echocardiography, no CAA were found at follow-up. Of those who were deemed low risk for CAA (n=113) and had their first echocardiogram as an outpatient, 2 cases had CAA, which were small and uncomplicated.

Conclusions
Our data suggests that it may be safe to perform selective inpatient echocardiography for patients with risk factors for CAA in KD. This has implications for clinicians practicing in lower resource settings. This also highlights the importance of raising awareness of risk factors for CAA in KD among clinicians.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1410 - PRACTICAL ASPECTS IN INTERPRETING NT PROBNP LEVELS IN DIAGNOSING KAWASAKI DISEASE

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Background:
Since its initial description by Dr. Tomisaku Kawasaki in 1967[1], the diagnosis of Kawasaki disease (KD) has primarily relied on clinical features. Recent guidelines [2,3] highlight elevated NT-ProBNP as a significant laboratory marker for KD. This study aimed to complement on the existing guideline by evaluating the practicality of using NT-ProBNP levels in diagnosing KD. We hypothesize that significantly elevated NT-ProBNP levels are associated with KD but there exists overlap with other febrile illnesses at intermediate levels.

Materials and Methods:
A single-center retrospective study was conducted at Prince of Wales Hospital, Hong Kong, from May 2022 to December 2024. Patients aged 0–18 years with NT-ProBNP levels measured during suspected KD were included, excluding those subsequently diagnosed with Multisystem Inflammatory Syndrome in Children (MIS-C). NT-ProBNP levels were normalized using the N/U ratio, defined as the NT-ProBNP level divided by the upper limit (97.5th centile) for age and gender, based on the LIFE Child Study[4]. The Mann-Whitney U test assessed statistical differences between KD and other febrile illnesses.

Results:
The cohort (n=30) included 57% males with a mean age of 4.1 years. KD was diagnosed in 17 patients, with a median N/U ratio of 3.93 (IQR 2.50–8.55). This cohort was statistically significantly higher than the 13-patient cohort diagnosed with alternative febrile illnesses with a median N/U ratio 0.59 (IQR 0.22–1.50, $p < 0.001$). While extreme N/U ratios effectively distinguished KD from alternatives, intermediate values near 1–2 times the upper limit posed diagnostic challenges.

Conclusion:
NT-ProBNP is valuable in diagnosing KD, particularly in atypical cases where clinical features are inconclusive. We propose an algorithm (Figure 1) incorporating age- and gender-adjusted N/U ratios to aid KD diagnosis.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1460 - BLUNT CARDIAC INJURY IN CHILDREN A TALE OF TWO CASES

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Background / Hypothesis:
Blunt cardiac injury (BCI) in pediatric patients is a rare but potentially life-threatening condition that presents diagnostic and management challenges. We report two cases of BCI in children with different presentations and outcomes

Cases:

Case 1:
An 8-year-old male presented with tachycardia 10 days after sustaining blunt chest trauma. The patient was diagnosed with ventricular tachycardia, which proved refractory to high-dose amiodarone therapy. Successful cardioversion was ultimately achieved, converting the rhythm to normal sinus rhythm. Subsequent cardiac magnetic resonance imaging (MRI) revealed a late gadolinium enhancement (LGE) pattern in the right ventricular outflow tract (RVOT) and the right ventricular side of the basal interventricular septum.

Case 2:
A 9-year-old female presented with a 4-month history of progressive dyspnoea. Her medical history was significant for a fall from a bicycle two years prior. Chest X-ray revealed massive cardiomegaly. Echocardiography showed a large right atrial pseudoaneurysm, which was subsequently confirmed by computed tomography (CT). The patient underwent successful surgical excision of the aneurysm.

Discussion:
These cases highlight the spectrum of BCI in children, ranging from myocardial contusion to cardiac rupture. They underscore the importance of maintaining a high index of suspicion, even when initial presentations may be subtle. The cases also demonstrate the value of serial clinical assessments, cardiac biomarkers, and timely imaging in diagnosing and managing pediatric BCI

Conclusions:
Blunt cardiac injury in children can present with varying degrees of severity and clinical manifestations. Prompt recognition and appropriate management, which may range from conservative treatment to emergency surgery, are crucial for favourable outcomes

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1477 - INCIDENTAL FINDINGS OF CORONARY ARTERY DILATION IN CHILDREN IS IT RELATED TO COVID 19 INFECTION

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Background / Hypothesis:
Coronary artery dilatation has been noted in Kawasaki disease and the multisystem inflammatory syndrome in children (MIS-C) linked to coronavirus disease 2019. However, coronary artery dilatation in pediatric patients who have mild or no symptoms after contracting COVID-19 has not adequately been described in literature.
In this study, we describe incidental findings of coronary artery dilatation in children who presented to us with few or no symptoms.

Materials and Methods:
It is a prospective study done in pediatric patients from January, 2022 to December 2024, coming in out-patient department of Ziauddin University Karachi, Pakistan with non-specific complains of chest pain, palpitation and no previous clear history of exposure to COVID-19. Clinical features, Echocardiography findings, complications and follow-up changes were assessed.

Results:
The total number of patients enrolled was 51. Median age was 7.01 ± 3.38 years, 66.7% were males and, 33.3% females. 89.4 % patients were COVID antibody positive, out of which only 8.1% had previous COVID-19 infection. Non-specific symptoms were reported in 28 (54.9%), Chest pain in 11 (21.5%) and palpitation in 8 (15.6%). Mean Z score of coronary artery dilation was 3.88. 37 (72.5%) of patients had improved follow-up coronary artery Z-scores. Mean duration of follow-up was 6.9 months. However, 6 (11.76%) had thin-out inter-ventricular septum on presentation, which remained same in follow-up, depicting previous injury due to ischemia, necessitating evaluation of coronary arteries in any patient who complained of chest pain, palpitation or has a history of COVID-19 exposure.

Conclusions:
High index of suspicion must be there in patients presenting with mild or no symptoms and COVID-19 exposure. This study emphasize evaluation of coronary arteries in routine echocardiography, so as to timely identify and intervene to prevent complications. A large scale multicenter study is required to assess the incidence and impact of coronary artery dilation in pediatric age

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1497 - MYOCARDIAL ISCHEMIA IN CHILDREN WITH CORONARY ARTERY LESION AFTER KAWASAKI DISEASE A RETROSPECTIVE COHORT STUDY OF 55 CASES

Lan Ye Ye [1], Chen Chu Chu [1], Lan He He [1], Quming Zhao Zhao [1], Lu Zhao Zhao [1], Feng Wang Wang [1], Yixiang Lin Lin [1], Shuna Sun Sun [1], Guoyin Huang Huang [1], Fang Liu Liu [1]
Children, Pediatric Hesrt Center, Shanghai-China [1]

Background / Hypothesis:
To analyze the clinical characteristics of pediatric patients with coronary artery lesions (CAL) after Kawasaki disease (KD) who developed myocardial infarction (MI)

Materials and Methods:
This retrospective cohort study included KD patients with CAL who developed MI and were admitted to our center from January 2017 to March 2025. Clinical data were collected, including baseline characteristics, KD and CAL information, clinical symptoms at MI onset, laboratory and imaging findings, MI treatment, and clinical outcomes.

Results:
total of 55 patients were included (Male/Female, 48/7). The median (range) was 4.5 years (4 months-13.5 years) for age, and 0.9 years (9 days-10.3 years) for duration from KD onset to MI. Only15 patients (27%) received standard initial treatment within 10 days of KD onset with intravenous immunoglobulin 2 g/kg. Out of all 55 cases, only 4 cases (7%) received standard antithrombotic treatment before MI onset.At MI onset, 42 patients presented with different clinical symptoms,12 patients were asymptomatic and were found to have silent MI on followup.Of the 36 patients with acute MI, 9 received successful cardiopulmonary resuscitation, 7 received intravenous thrombolysis, and 1 underwent percutaneous coronary balloon angioplasty. All of these patients received dual antiplatelet drugs and lowmolecularweight heparin at therapeutic doses following MI treatment. the followup time was 860 (14, 3270) d. Fortytwo patients showed improvement including 28 patients who received successful coronary artery bypass graft (CABG) treatment, 3 patient experienced disease progression or no change, 2 patient died, and 8 were lost to followup.

Conclusions:
MI in children with CAL after KD often occurs within 1 year after the onset of KD. MI can present with atypical clinical symptoms in children. CABG is the main treatment option in children severe CAL after KD who developed MI.

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Category: Acquired Diseases of Coronary Arteries and Heart Layers

1505 - STENT INSERTION FOR RESTENOSIS AFTER CORONARY ARTERY BYPASS GRAFTING IN KAWASAKI DISEASE

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Background / Hypothesis:
The prognosis of giant coronary artery aneurysms (GCAAs) following Kawasaki disease (KD) remains particularly concerning due to the elevated risk of coronary artery stenosis, thrombosis, and myocardial infarction. Revascularization techniques, including percutaneous coronary intervention (PCI) and coronary artery bypass grafting (CABG), have been documented as treatment options for coronary artery stenosis in KD patients. However, there is limited literature addressing the management of restenosis following CABG in pediatric populations.

Materials and Methods:
Herein, we present a case involving a 14-year-old male who underwent multiple coronary artery bypass grafting (CABG) procedures due to complete occlusion of the right coronary artery (RCA) and the left anterior descending coronary artery (LAD), secondary to Kawasaki Disease (KD). Three years post-CABG, severe restenosis at the anastomotic site was observed and effectively managed through stent implantation.

Results:
At six months following PCI, no evidence of RCA restenosis or perfusion defects was observed.

Conclusions:
Restenosis at the anastomotic sites may occur following CABG, and stent graft implantation can be considered as a potential treatment option for post-surgical lesions.

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1551 - MYOCARDIAL ISCHEMIA IN KAWASAKI DISEASE THE ROLE OF CORONARY ARTERY ANEURYSMS WITH NO TO MILD STENOSIS

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Children, Heart Center, Shanghai-China [1] Children, Nuclear Medicine Department, Shanghai-China [2]

Background:
The relationship between no-to-mild stenosis (<50%) coronary artery aneurysm (CAA) and myocardial ischemia (MI) in patients after Kawasaki disease (KD) remains unclear.

Methods:
We collected clinical data and coronary artery angiography results of 171 patients who developed no-to-mild stenosis CAA after KD between July 2019 and March 2025. MI was assessed using multiple non-invasive imaging techniques. Univariate and multivariate logistic regression analyses were conducted to examined the association between anatomical features of CAA and MI. Kaplan-Meier survival analysis was conducted to estimate the cumulative risk of MI.

Results:
Among the 171 patients, 95 (55.6%) were diagnosed with MI, while 76 (44.4%) were not. The mean age at KD diagnosis was 4.03 ± 2.80 years for group MI and 3.11 ± 2.53 years for group non-MI. Univariable analysis revealed that several characteristics of the largest CAA, including Z-score, internal diameter, length, and ellipsoid area, were significantly associated with an increased risk of MI. However, the diameter-to-length ratio was negatively correlated with MI. Multivariable analysis confirmed that the Z-score significantly increase the risk of MI (OR:1.43, 95%CI=1.04-1.96, P=0.03), whereas the diameter-to-length ratio showed a negative correlation (OR:0.88, 95%CI=0.69-1.12, P=0.004). The cumulative risks of MI at 6 months, 1 year, 3 years, and 5 years were: 16.4%, 20.0%, 36.5% and 48.7%, respectively. Stratification by Z-score and internal diameter revealed that patients with a Z-score ≥ 10 and internal diameter ≥ 8 mm had a significantly higher cumulative risk of MI. Likewise, a diameter-to-length ratio ≥ 0.5 was significantly associated with an increased cumulative risk of MI.

Conclusions:
This study identifies key anatomical features of no-to-mild stenosis CAA, including Z-score and diameter-to-length ratio, as significant predictors of MI in patients after KD. These findings underscore the importance of monitoring CAA characteristics for more effective long-term management in these patients.

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Category: Acquired Diseases of Coronary Arteries and Heart Layers

1558 - CLINICAL USE OF RIVAROXABAN IN CHINESE CHILDREN WITH GIANT CORONARY ARTERY ANEURYSMS AFTER KAWASAKI DISEASE A PILOT COHORT STUDY

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Background / Hypothesis:
Rivaroxaban is a potential substitute for long-term warfarin in children with Kawasaki disease (KD) complicated with giant coronary artery aneurysm (GCAA). However, little data are available in patients of Chinese ancestry.

Materials and Methods:
This pilot cohort study was conducted in the Children's Hospital of Fudan University from January 2023 to March 2025. Participants were followed for at least 6 months. Clinical outcomes included objectively documented GCAA thrombosis and bleeding events. Bleeding severity was classified as major, clinically relevant non-major (CRNM), patient-important bleeding no intervention (PIBNI), and minor events.

Results:
Hospitalized patients aged 1 month to 18 years were included. In stage one, six participants were recruited from January to April 2023. The median (range) was 289.5 (110- 367) days for treatment duration. No GCAA thrombosis or major bleeding occurred; however, four cases of CRNM (epistaxis and subepidermal hematoma) and two minor events were observed, leading to six dose adjustments across four participants. Based on the population pharmacokinetic (PopPK) model simulation, an ancestry-optimized, 15 mg-equivalent, age- and bodyweight-adjusted rivaroxaban dosing regimen for patients with GCAA after KD was proposed. In stage two, 33 participants were recruited from January to March 2025, including four participants from stage one. These participants started rivaroxaban following the optimized dosing regimen. The median was 246 (198- 411) days for treatment duration. No GCAA thrombosis or major bleeding occurred; one CRNM (epistaxis requiring intervention) and two PIBNIs were documented. Two participants required further dose adjustments to achieve appropriate rivaroxaban-calibrated anti-factor Xa activity. External validation of the PopPK model simulation confirmed the proposed dosing regimen and robustness of model extrapolation.

Conclusions:
This cohort study investigated the appropriateness of an optimized, 15 mg-equivalent, age- and bodyweight-adjusted rivaroxaban dosing regimen for Chinese patients with KD and GCAA receiving dual antithrombotic therapy. Our findings suggest favorable effectiveness, safety and feasibility in this patient group.

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1669 - A CASE REPORT ON SUBACUTE MYOCARDITIS WITH RECURRENT RELAPSING DRESS

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Introduction:
Drug reaction with eosinophilia and systemic symptoms (DRESS) is an idiosyncratic and potentially fatal reaction to medications. Cardiac involvement is reported as rare but associated with high mortality (45-50%). Minocycline, commonly used for acne vulgaris, is one of the most reported inciting medications.
We report a case of a previously healthy teenager who presented with subacute on chronic myocarditis a year after initial diagnosis of DRESS with renal and hepatic involvement; despite being on multiple immunomodulator and immunosuppressant therapies, stressing importance of high index of suspicion for diagnosis and vigilance in managing these patients.

Case Presentation:
A 16-year-old male presented in an outside emergency room with abdominal pain, chronic fatigue and early satiety. An abdominal CTA incidentally noted cardiomegaly and was ultimately found to have biventricular systolic dysfunction. Medical history was significant for DRESS with renal and hepatic involvement diagnosed 1 year prior, related to minocycline use for acne, and has history of recurrent relapses with steroid tapering despite trials of mycophenolate mofetil and azathioprine. Cardiac MRI was consistent with subacute on chronic myocarditis and continued to have significant ventricular dysfunction despite administration of inotropic agents, IVIG and pulse steroid. Tofacitinib was then started, in conjunction with a planned prolonged oral steroid taper with improvement of ventricular function after 5 days. Inotropic agents were weaned and transitioned to guideline directed oral medical therapy for heart failure. Biventricular function normalized 3 months after start of tofacitinib and optimal oral heart failure medications with no relapse for a year without use of steroids.

Conclusions:
This case highlights the importance of having a high index of suspicion for cardiac manifestation of DRESS. Tofacitinib is an effective agent to consider in patients with relapses on steroid taper. Prompt recognition and treatment can prevent devastating outcomes in this small patient population.

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1686 - AN EXTREMELY RARE CASE OF RIGHT VENTRICULAR MYXOMA IN A YOUNG MALE

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Background / Hypothesis:
Myxomas are the most prevalent benign cardiac tumors. Usually, these originate from either the left or the right atria. Right ventricular myxomas are extremely rare. The clinical presentation depends on the size, location, and the effect of the mass on right ventricular (RV) inflow and outflow.

Materials and Methods:
We present the case of a 17-year-old male with right ventricular myxoma who presented with severe dyspnea and palpitation.

Results:
There was no history of fever or hypercoagulability. Screening echocardiography revealed a 17 x 20 mm mass in RV cavity with the stalk attached to the chordae of the posterior tricuspid leaflet causing moderate to severe tricuspid regurgitation and right ventricular dysfunction (TAPSE: 13 mm). The possibility of a primary cardiac tumor was raised. The patient was optimized with Metoprolol and Furosemide. The RV mass with its attachment to the anterior papillary muscle was excised. Tricuspid valve was repaired by commissuroplasty. The diagnosis of myxoma was confirmed by Histopathology. The postoperative period was uneventful and he was discharged on the 7th postoperative day.

Conclusions:
Early echocardiography is essential to rule out cardiac cause of dyspnea. Primary RV masses are rare but should be a consideration in the correct clinical setting. Timely surgical resection decreases the chances of irreversible hemodynamic alteration.

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1693 - CANDIDA INFECTIVE ENDOCARDITIS AMONG PEDIATRIC AGE GROUP SINGLE CENTER EXPERIENCE

Mohammad Allugmani [1], Hatem Alahmadi [2], Saeed Alghamdi [1], Adnan Aselan [1], Mohammad Altuwirqi [3], Hussam Aljohani [4], Abdulrahman Alamoodi [5], Ibraheem Alhejaily [4], Ammar Kadi [4], Rafif Alahmadi [4], Shaimaa Neyaz [4], *Mohammed Mujahed* [4]
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Background / Hypothesis:
Although infective endocarditis (IE) is rare in childhood, it has high morbidity and mortality rate. The infectious organisms include: bacterial, viral, and fungal. Candida infective endocarditis is considered more rare than bacterial. In this study we aimed to focus on clinical presentation, echocardiographic findings, and microbiology of patients diagnosed as definite/possible infective endocarditis with candida applying modified Duke criteria.

Materials and Methods:
this is a retrospective observational study underwent in Maternal and Children Hospital at King Salman Medical City in Madinah.
we reviewed recordings of patients were diagnosed with definite/possible IE with candida applying modified Duke criteria in hospital system with exclusion of any organism other than Candida. Study included duration between January 2022 and January 2025.

Results:
Total number of patients who were diagnosed with definite/possible IE was 51. Mean of age at time of presentation was 7.69 months(range: 0 month to 81 months). Mean of weight was 2.38 kilograms (Kg) (range: 500 grams to 23 kg). Percentage of clinical presentation include: dyspnea 73.17% (the most common clinical presentation), fever Approximately 16.28%, poor feeding 68.29%, lethargy 48.78%, , and sweating while feeding 15.91%. Echocardiographic findings include: mass versus vegetation in 8 patients (16%), locations include: inferior vena cava and right atrial junction 3 (38%), right atrium 4 (50%), tricuspid valve 1 (13%). Other findings include: the most common is tricuspid regurgitation 26(56.52%), ventricular septal defect (VSD) 11 (23.91%), atrial septal defect (ASD) 8 (17.39%). the most common type of candida organism is candida albicans 15 (27.78%) followed by candida parapsilosis 11 (20.37%).

Conclusion:
A study of 51 patients with infective endocarditis (IE) revealed common clinical presentations such as dyspnea (73.17%) and poor feeding (68.29%). Candida albicans (27.78%) was the most common pathogen. Tricuspid regurgitation and VSD were prevalent echocardiographic findings.

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1753 - QUANTIFYING CORONARY RECOVERY POTENTIAL IN KAWASAKI DISEASE THROUGH PRECISION Z SCORE STRATIFICATION A CHINESE POPULATION STUDY

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Background / Hypothesis:
Coronary artery diameter measured by echocardiography has been widely applied in Kawasaki disease (KD). Our objective was to summarize the outcomes of children with KD and coronary artery (CA) dilatation by observing the Z-score variation during the acute presentation and mid-term follow-up, and assess the associated clinical factors leading to CA dilatation.

Materials and Methods:
A retrospective study of 530 children diagnosed with KD and coronary dilatation was performed from April 2018 to April 2021. Patients were divided into four groups based on CA Z-score from the American Heart Association guideline. A Z-score <2 was considered to have CA normalization. The duration, location and branch numbers of CA normalization were analyzed.

Results:
Of the whole cohort, 141 cases (26.6%) were in the Coronary Dilatation Group, and the average recovery duration of which ws 1.3±2.3 months; 277 cases (52.2%) were in the Small Coronary Aneurysm Group, whereby 93.1% normalized with a recovery period of 3.4±5.0 months; 91 cases (17.2%) were in the Medium Coronary Aneurysm Group with 5 cases complicated with thrombosis, whereby 50.5% normalized with an recovery cycle of 8.2±6.2 months; and 21 cases (4.0%) were in the Giant Coronary Aneurysm Group with 4 cases complicated by thrombosis and 3 cases by coronary occlusion, and no patient had CA normalization. According to ROC analysis, a Z-score of 4.23 was the lowest threshold for CA aneurysm non-normalization with a of AUC=0.94, p=0.01. The main causes of CA dilatation were IVIG resistance (12.1%, 64/530), more than 10 days fever (7.9%, 42/530), and age >5 years old (7.4%, 39/530).

Conclusions:
Positive correlation between greater coronary Z-score, location of dilatation, and increased number of dilated coronary arteries at acute presentation with decreased prevalence of coronary artery normalization at follow-up was observed. Giant coronary aneurysm did not coexist with CA normalization. IVIG-resistance is still the leading cause of

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1807 - PROGNOSIS AND INFLUENCING FACTORS OF KAWASAKI DISEASE INDUCED CORONARY ANEURYSMS IN CHILDREN

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Background / Hypothesis:
Kawasaki disease (KD) is a leading cause of acquired coronary artery aneurysms (CAAs) in children. The outcomes of CAAs vary, with some regressing while others persist or progress, potentially leading to severe cardiovascular complications. This study aimed to evaluate the natural progression of CAAs in KD patients and identify key influencing factors.

Materials and Methods:
A total of 117 KD CAA cases at our department were retrospectively collected. Clinical data, including demographics, aneurysm size, and laboratory index were analyzed. Prognosis was categorized as regression, persistence, or progression based on serial echocardiography. Multivariate logistic regression identified predictors of CAA regression.

Results:
There are 82, 28, and 7 cases of small, medium, and giant CAAs, respectively. Over a follow-up of 3 months, 79.3% of small CAAs regressed, while 32.1% of medium and 0% of giant aneurysms regressed. During the follow-up from 6 monthw to 2 years, 2 cases with medium CAA and 3 with giant CAA developed coronary thrombosis. Factors associated with regression included serum albumin concentration, fibrinogen, NT-Pro-BNP, TNF-, IL-6, and aneurysm size ($p<0.05$), furthermore, the aneurysm size was the independent risk factor (OR=4.136, $p<0.05$).

Conclusions:
The prognosis of KD induced CAAs depends on aneurysm size. Smaller aneurysm size correlate with better outcomes.

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1848 - THE MID TERM PROGNOSIS OF CHILDREN WITH KAWASAKI DISEASE WHO HAD CORONARY ARTERY ANEURYSMS AT ONE MONTH OF ILLNESS

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Background / Hypothesis:
To explore cumulative risk and relevant factors for the cardiovascular complications in Chinese Kawasaki disease (KD) patients with coronary artery aneurysms (CAAs) at one month of illness.

Materials and Methods:
This single-center retrospective cohort study included 572 KD patients with CAA (Z score≥2.5) hospitalized in Children's hospital of Fudan University from 2012 to 2023. The time-dependent occurrence of coronary events (CE), major adverse cardiovascular events (MACE) and CAA regression was estimated by Kaplan-Meier method. Cox proportional hazard models were performed to identify influencing factors.

Results:
Of 572 children, the 3-year cumulative incidences of CE, MACE, and CAA regression was 35.72%, 7.23%, and 39.80%, respectively. Among 334 children with giant CAAs, corresponding 3-year cumulative incidences were 56.12%, 12.23% and 10.65% respectively. Multivariate Cox regression showed that corticosteroids (HR 0.02, 95%CI 0.01-0.07), antiplatelet agents (HR 0.31, 95%CI 0.23-0.42), warfarin (HR 0.47, 95%CI 0.31-0.73), IVIG non-response (HR 3.38, 95%CI 2.15-5.31), bilateral first CAA (HR 2.18, 95%CI 1.02-4.66) and initial Z scores (HR 1.05, 95%CI 1.02-1.08) were associated with CE. For those with maximum CAA internal diameter < 8mm, the 3-year cumulative incidences of CE, MACE and CAA regression were 35.65%, 3.32% and 21.86%. No CAA regression was observed among those with diameter ≥ 8mm. Grouped by Z scores, the 3-year cumulative incidence of CE was 37.66% for Z score ≥10 to <20, 87.10% for Z score ≥20 to <30, and 84.46% for Z score ≥30 to <40. All children with Z score ≥40 experienced CE within 1 year (0.3-9.9 months post-onset). No CAA regression was observed in children with Z scores ≥20 within 3 years of illness.

Conclusions:
CAA at diagnosis, bilateral CAA, severe coronary artery lesions at one month of illness, and coronary artery Z score ≥10 with internal diameter ≥8 mm are associated with poor long-term prognosis in KD children with coronary artery sequelae.

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1879 - COMPARISON OF TROPONIN T AND TROPONIN I LEVELS IN MYOCARDITIS PATIENTS AND EVALUATION WITH CARDIAC MRI

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Background / Hypothesis:
Troponin T and Troponin I are biomarkers used to assess myocardial damage. Since they are found specifically in myocardial cells, they enter the bloodstream during conditions such as cardiac ischemia (myocardial ischemia) and help in clinical diagnosis. In our study, we compared simultaneous Troponin I and Troponin T levels in patients diagnosed with myocarditis-myopericarditis and evaluated them with cardiac MRI imaging results.

Materials and Methods:
This is a prospective study including patients who presented with elevated troponin levels at the Marmara University Pediatric Cardiology Department between 2021 and 2024. Patients were assessed using laboratory parameters, ECG, and transthoracic echocardiography, leading to a diagnosis of myocarditis-myopericarditis. Blood samples for both Troponin T and Troponin I were collected simultaneously within the first three days of diagnosis. Cardiac MRI imaging was performed on patients where deemed necessary and applicable.

Results:
A total of 75 patients (74.6% male) diagnosed with myocarditis were included in the study. The mean age was 12.7±4.6 years. A statistically significant positive correlation was found between simultaneously measured Troponin-T and Troponin-I levels (Spearman's correlation p:0.000). The mean Troponin-T level was 219±299 ng/dL, while the mean Troponin-I level was 1480±2612 ng/dL (Figure). When Troponin-I was considered the gold standard for diagnosing myocarditis, Troponin-T showed a sensitivity of 97.2%. Cardiac MRI was performed on 29 patients, and pathological contrast enhancement and late gadolinium uptake consistent with myocarditis were observed in 24 patients.Among these 24 patients, the mean Troponin-T level was 172±248 ng/dL, and the mean Troponin-I level was 942±1673 ng/dL.

Conclusions:
In the diagnosis of myocarditis, alongside Troponin-I, Troponin-T is also highly specific(97%). Although cardiac MRI was selectively performed on patients with more severe clinical conditions, pathological contrast retention on cardiac MRI was detected at higher Troponin-I levels compared to Troponin-T levels.More studies are needed to determine a specific troponin threshold for recommending cardiac MRI.

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1896 - CHRONIC CONSTRICTIVE PERICARDITIS DUE TO TUBERCULOSIS IN A YOUNG MEDICAL STUDENT

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Um6ss - Huick, Cardiovascular Surgery, Casablanca-Morocco [1] Um6ss - Huick, Cardiology, Casablanca-Morocco [2]

Background:
Chronic constrictive pericarditis (CCP) is a serious condition characterized by a thickened, fibrotic pericardium that constricts the heart and impairs filling. Tuberculosis remains a leading cause of CCP in endemic regions.

Case Presentation:
We report the case of a 22-year-old medical student who presented with a two-month history of chronic dry cough, fever, asthenia, and weight loss, followed by progressive anasarca, including pericarditis, ascites, pleurisy, and lower limb edema. Transthoracic echocardiography (TTE) revealed findings consistent with CCP, which was confirmed by cardiac catheterization (CC). A thoracic computed tomography (CT) scan further demonstrated a thickened pericardium.
Given the suspicion of tuberculous pericarditis, the patient was started on antituberculosis therapy (ATT) with rifampicin, isoniazid, pyrazinamide, and ethambutol, along with adjunctive corticosteroids. After a week of medical treatment, he underwent pericardiectomy. His postoperative course was uneventful. Histopathological analysis of the excised pericardium revealed epithelioid and giant-cell granulomatous pericarditis, suggestive of tuberculosis, which was confirmed by polymerase chain reaction (PCR) testing.

Conclusion:
This case highlights the diagnostic and therapeutic challenges of tuberculous pericarditis. We describe the surgical procedure and discuss the diagnostic approach and timing of intervention based on current guidelines.

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1914 - ECHOCARDIOGRAPHIC AND CARDIOVASCULAR MAGNETIC RESONANCE CHARACTERISTICS IN CHILDREN WITH MYOCARDITIS

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Medical University Of Warsaw, Pediatric Cardiology, Warsaw-Poland [1] Medical University Of Warsaw, Pediatric Radiology, Warsaw-Poland [2]

Background / Hypothesis:
The aim of the study was to assess the relationship between echocardiography, Troponin I (TnI) serum concentration and cardiovascular magnetic resonance (CMR) in diagnosis of myocarditis in pediatric patients.

Materials and Methods:
Study group consisted of 28 children aged 8-17 years, mean 14,11±2,87 years, who were admitted to cardiology department due to a sharp chest pain. Echo-2D and cardiac magnetic resonance (CMR) were performed.

Results:
In 25 patients in whom CMR confirmed acute myocarditis,TnI serum concentration was elevated 33,8 ng/ml – 23808 ng/ml, mean 6533,87 ± 7218,6 ng/ml (normal <19,0 ng/ml). Echocardiography revealed: left ventricular diastolic diameter within normal limits in all patients, left ventricular ejection fraction (EF) from 43% to 75%, mean 56,58±8,81% . EF was preserved in 14 and mildly impaired in 9 patients. In CMR myocardial edema and late gadolinium enhancement (LGE) regions were detected in subendocardial layers, in 1-17 segments, mean number of segments with LGE 5,6 ± 3,2; mean number of segments with edema 6,9 ± 4,4. EF in CMR was 54% to 73%, mean 62,60±4,53%. There were no significant correlations (Pearson correlation coefficient –r) between EF (ECHO) and: EF(CMR) (r=0,035, p=0,87), TnI (r=0,074, p=0,724), number of segments with LGE (r=-0,211, p= 0,312), number of segments with edema (r=0,125, p=0,553). There were also no significant correlations between TnI and: EF LV (CMR) (r =0,055, p=0,796), number of segments with LGE (r=-0,188, p=0,367) and number of segments with edema (r=0,128, p=0,541.

Conclusion:
Echocardiographic results and serum TnI levels do not reflect the extent of inflammatory changes on CMR in children with myocarditis.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1965 - CARDIOVASCULAR RISK ASSESSMENT OF NEWBORNS IN NIGERIA USING THE ATHEROGENIC INDEX OF PLASMA AND ITS ASSOCIATIONS WITH GESTATIONAL AGE AND BIRTH WEIGHT A CROSS SECTIONAL HOSPITAL BASED STUDY

Obinna Obaji [1], Uche Adizua [2], Ndubuisi Chukwudi [3], Daberechi Adiele [4], Justus Onu [5]
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Background / Hypothesis:
There is a rise in the prevalence of atherosclerotic cardiovascular disease, and its onset from childhood is widely studied. Atherogenic Index of Plasma (AIP), a lipid ratio that is understudied in newborns, is a sensitive marker for atherosclerosis. In many earlier studies in non-African settings in which atherogenic risks were assessed using other lipid ratios, prematurity and low birth weight were associated with higher atherogenic risks. But this study aimed to determine atherogenic risk prevalence among newborns utilizing AIP, and its association with gestational age and birth weight in a Nigerian tertiary hospital.

Materials and Methods:
The lipid profiles of consecutively recruited newborns were determined. The AIP was calculated as the logarithm to base ten (Log10) of the ratio of molar concentrations of triglyceride (TG) to high–density lipoprotein cholesterol (HDL-C). The atherogenic risk was operationalized thus using AIP: high >0.24; medium 0.1–0.24, and low/no risk <0.1. Using Pearson's correlation, the relationship between AIP values, gestational age, and birth weight was analyzed.

Results:
The mean AIP of the 167 newborns studied was -0.35±0.34. This falls within the global reference range. Three (1.8%), ten (6.0%), and 154 (92.2%) newborns were respectively in the high, medium, and low/no atherogenic risk categories. Hence, 13 (7.8%) newborns had a medium to high atherogenic risk. AIP only had a moderately significant positive relationship with gestational age (rho = 0.35, p <0.001).

Conclusions:
The atherogenic risk prevalence of 7.8% was found among newborns in this study. Unlike some earlier studies that assessed atherogenicity using other lipid ratios, in this study, AIP had no significant association with birth weight, but correlated positively with gestational age, though it was lowest in late preterms. Longitudinal studies are necessary to elucidate these findings.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

1994 - A COMPARATIVE ANALYSIS ON THE CLINICAL PROFILE LABORATORY PROFILE TREATMENT AND OUTCOME OF KAWASAKI DISEASE VS MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN (MIS C) AMONG PEDIATRIC PATIENTS IN A TERTIARY HOSPITAL – A RETROSPECTIVE COHORT STUDY

Isabelle Kristel J. Nicdao [1], Robert Dennis J. Garcia [1]
Makati Medical Center, Pediatrics, Makati City-Philippines [1]

Background:
Kawasaki Disease and Multi-system Inflammatory Syndrome in Children are two related conditions that primarily affect pediatric patients. The overlap in clinical symptoms, physical findings, and laboratory results between MIS-C and KD complicates diagnosis and treatment. Early recognition of distinguishing clinical, laboratory, and echocardiographic findings is crucial for timely diagnosis and appropriate treatment, which can mitigate the risk of cardiovascular, gastrointestinal, and neurological complications.

Design:
A retrospective, analytic, cohort study was done to differentiate the clinical profiles, laboratory profile, treatments, and outcomes of pediatric patients aged less than 19 years old, admitted with a diagnosis of KD, admitted from January 2016 to December 2019 (pre COVID-19 pandemic), and MIS-C cases admitted from January 2020 to December 2023, in a private, urban, tertiary hospital.

Results:
The study included 87 patients, with 60 categorized in the KD group (13 diagnosed with complete KD and 47 with incomplete KD) and 27 in the MIS-C group. MIS-C patients were more likely to be older ($p = 0.023$),present with GI and respiratory symptoms ($p=<0.001$),have lower WBC, ANC($p < 0.001$, $p = 0.002$), and lymphocyte counts,and experience more complications such as myocarditis (14.8%), hypotension (18.5%), shock (14.8%),and pneumonia (40.7%). Key features of KD, including conjunctival injection, rash,oral changes,and cervical lymphadenopathy ($p=<0.001$),elevated CRP, ESR, and AST/ALT ratios, ($p=<0.001$, $p=0.003$ and $p=0.034$),were more frequently observed in KD patients. Combination therapy involving IVIG, methylprednisolone, and acetylsalicylic acid was common in MIS-C patients(48.15%),compared to Kawasaki disease patients, who mainly received IVIG and acetylsalicylic acid alone($p < 0.001$.

Conclusions:
This retrospective study underscores clear differences in demographics, clinical manifestations, and basic laboratory findings, such as CBC, which can aid physicians in making early diagnoses and initiating timely treatment. Additionally, these results may open new avenues for research focused on developing more precise diagnostic criteria that effectively distinguish between KD and MIS-C based on these parameters.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2008 - UTILITY OF COMPLETE BLOOD COUNT DERIVED INFLAMMATORY MARKERS FOR PREDICTING IVIG RESISTANCE IN INFANT KAWASAKI DISEASE

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Background / Hypothesis: :
Kawasaki disease (KD) in infants presents unique challenges with higher rates of intravenous immunoglobulin (IVIG) resistance and coronary complications. This study aimed to evaluate the predictive value of complete blood count-derived inflammatory markers including neutrophil-to-lymphocyte ratio (NLR), monocyte-to-lymphocyte ratio (MLR), and pan-immune inflammation value (PIV) for IVIG resistance in infants under 12 months with KD.

Materials and Methods:
We retrospectively analyzed 261 infants diagnosed with KD between January 2014 and December 2024. The predictive values of inflammatory markers were evaluated using receiver operating characteristic curve analysis. Logistic regression analysis was performed to identify independent predictors of IVIG resistance.

Results:
Among the study population, 67 patients (25.7%) showed IVIG resistance. MLR showed the highest predictive performance (AUC 0.776, 95% CI: 0.706-0.845), followed by NLR (AUC 0.738, 95% CI: 0.670-0.806) and PIV (AUC 0.734, 95% CI: 0.658-0.811). In multivariate analysis, MLR >0.21 (OR 3.45, 95% CI: 1.66-7.14), PIV >726.68 (OR 2.30, 95% CI: 1.14-4.67), and elevated total bilirubin (OR 1.96, 95% CI: 1.02-3.79) were independent predictors of IVIG resistance. Coronary artery lesions were significantly more frequent in IVIG-resistant patients (16.4% vs 5.2%, p=0.007).

Conclusions:
MLR is the strongest predictor of IVIG resistance in infant KD, suggesting its potential utility as a simple and cost-effective screening tool for risk stratification in this high-risk population.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2013 - RISK FACTORS FOR NON RESPONSE TO INITIAL INTRAVENOUS IMMUNOGLOBULIN PLUS METHYLPREDNISOLONE THERAPY IN CHILDREN WITH KAWASAKI DISEASE

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Capital Center For Children's Health, Capital Medical University, Cardiovascular Medicine, Beijing-China [1]

Background / Hypothesis:
Intravenous immunoglobulin (IVIG) plus corticosteroids is recommended as the initial intensified therapy for high-risk IVIG-resistant Kawasaki disease (KD) patients. However, some patients still require additional rescue therapy despite this treatment. This study aimed to identify risk factors associated with non-response to initial IVIG plus methylprednisolone (mPSL) therapy in high-risk refractory KD patients.

Materials and Methods:
High-risk IVIG-resistant KD patients were assessed by both the Yang score and Kobayashi score before treatment between January 2020 and June 2024. All selected patients received IVIG plus methylprednisolone. Patients were divided into resistance group and response group after treatment. Propensity score matching (PSM) was performed at a 1:4 ratio, matching by age and sex. Logistic regression analysis identified independent risk factors associated with IVIG plus methylprednisolone resistance.

Results:
Of 1511 KD patients, 150 patients with high-risk IVIG-resistance, 13 were resistant to initial IVIG plus methylprednisolone, while 137 responded. Total bilirubin (TBil) (OR 1.024, 95% CI: 1.003 - 1.048 P=0.031) and the Yang score (OR 1.575, 95% CI: 1.204-2.190, P=0.002) were independent risk factors for resistance. Interleukin-6 (IL-6) was also a potential risk factor (OR 1.002, 95% CI: 1.000 - 1.005, P=0.054). The area under the ROC curve (AUC) for TBil (≥20μmol/L) was 0.745 (95% CI: 0.602 - 0.888), with a sensitivity of 84.6% and specificity of 71.2%. The AUC for the Yang score (≥12) was 0.745 (95% CI: 0.583 - 0.906) with both sensitivity and specificity at 76.9%.

Conclusions:
TBil (≥20μmol/L), Yang score (≥12), and elevated IL-6 levels are independent risk factors for resistance to IVIG plus methylprednisolone. These findings provide valuable insights for pediatricians in selecting individualized treatment strategies for high-risk refractory KD patients.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2015 - SINGLE CELL RNA SEQUENCING UNCOVERS MOLECULAR MECHANISMS OF INTRAVENOUS IMMUNOGLOBULIN PLUS METHYLPREDNISOLONE IN KAWASAKI DISEASE ATTENUATED MONOCYTE DRIVEN INFlAMMATION AND IMPROVED NK CELL CYTOTOXICITY

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Capital Center For Children's Health, Capital Medical University, Cardiovascular Medicine, Beijing-China [1]

Background / Hypothesis:
Intravenous immunoglobulin (IVIG) plus methylprednisolone as initial intensive therapy or additional therapy in Kawasaki disease (KD) has been used in clinical practice. However, its molecular and cellular mechanism is unclear.

Materials and Methods:
We performed single-cell analysis on 14 peripheral blood mononuclear cell (PBMC) samples obtained from 7 KD patients who received either IVIG monotherapy or IVIG plus methylprednisolone therapy. This encompassed 4 samples from KD patients collected before and after IVIG treatment, as well as 3 samples from KD patients before and after IVIG plus methylprednisolone therapy.

Results:
Both IVIG monotherapy and IVIG plus methylprednisolone therapy can increase lymphocyte counts (e.g. CD4+T, CD8+T, and gdT cells) to address lymphopenia. They can also decrease monocyte counts and repress the expression of S100A12, NLRP3, and genes associated with immune-cell migration in monocytes. IVIG combined with methylprednisolone downregulates more monocyte-driven inflammatory pathways than IVIG alone. Additionally, this combination uniquely enhances NK cell cytotoxicity by modulating receptor homeostasis, while significantly upregulating interferonrelated genes in CD4+ T cells, CD8+ T cells, and B cells, particularly type I interferons.

Conclusions:
The combination of IVIG with methylprednisolone attenuated monocyte-driven inflammation and improved NK cell cytotoxicity which might provide clues for pediatricians to consider treatment options for children with KD. Whether the monocyte-driven hyperinflammatory state and NK cell function can be indicators for the clinical choice of IVIG with methylprednisolone therapy in KD needs further investigation.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2064 - OUTCOMES OF PEDIATRIC CANDIDA INFECTIVE ENDOCARDITIS A SPECIES SPECIFIC ANALYSIS FROM A SINGLE CENTER STUDY

Hatem Alahmadi [1], Mohammad Allugmani [2], Ammar Kadi [3], Ibraheam Alhejaily [3], Rafif Alahmadi [3], Shaimaa Neyaz [3], *Mohammed Mujahed* [3]
Ministry Of Health, Pediatric Infectious Diseases, Almadinah-Saudi Arabia [1] Ministry Of Health, Pediatric Cardiology, Almadinah-Saudi Arabia [2] Ministry Of Health, General Pediatric, Almadinah-Saudi Arabia [3]

Background / Hypothesis:
Pediatric infective endocarditis caused by Candida species is a rare but serious disease. Outcomes may vary depending on the specific Candida species involved, yet species-specific outcome data in children are still limited. This study aims to evaluate the outcomes of Candida infective endocarditis in pediatric patients, with a focus on vegetation formation, cardiac complications, and mortality across different Candida species.

Materials and Methods:
We conducted a retrospective review of pediatric patients diagnosed with Candida infective endocarditis at a single center. Data were collected from electronic medical records for cases identified between January 2022 and January 2025. Patients were grouped according to the Candida species isolated from positive blood cultures, and clinical outcomes were compared across species.

Results:
A total of 50 pediatric patients with Candida infective endocarditis were identified. The most commonly isolated species were Candida albicans (n=12, 24%) and Candida parapsilosis (n=14, 28%). Additionally, 22 cases (44%) involved undefined Candida species, and there was one case each of Candida glabrata (n=1, 2%) and Candida tropicalis (n=1, 2%). Vegetation was observed in C. glabrata (n=1, 100%), C. albicans (n=4, 33%), C. parapsilosis (n=2, 14%), and undefined Candida species (n=4, 18%). Cardiac complications occurred predominantly in C. albicans—heart failure (n=1, 8%) and heart block (n=1, 8%)—and in C. tropicalis—heart failure (n=1, 100%). Mortality was highest in C. tropicalis (n=1, 100%) and C. glabrata (n=1, 100%), followed by C. parapsilosis (n=5, 36%) and C. albicans (n=4, 33%). Undefined Candida species were associated with mortality in 4 cases (n=4, 18%).

Conclusions:
Candida albicans and Candida parapsilosis were the most common species in pediatric endocarditis, with outcomes varying by species. Mortality and complications were highest in rare species. Early identification is crucial. Future multicenter, prospective studies with larger sample sizes are needed to validate these findings and better define species-specific outcomes.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2080 - PLASMA EXOSOMAL DERIVED SERPINA1 AND GNAI2 DOWNREGULATION AS POTENTIAL DIAGNOSTIC BIOMARKERS OF KAWASAKI DISEASE WITH CORONARY ARTERY ANEURYSMS

Yang Zheng [1], Baoling Bai [2], Zhimiao Wei [1], Mingming Zhang [1], Qin Zhang [2], *Xiaohui Li* [1]
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Background:
Kawasaki Disease (KD) with coronary artery aneurysms (CAAs) is currently the primary cause of childhood acquired heart disease with unclear pathogenesis. The aim of this study was to explore the exosomal candidate proteins for identifying KD with CAAs in early stage.

Methods:
We employed mass spectrometry to quantify the exosomal protein expression profiles in KD patients. Total 60 subjects were included, with 40 subjects in 5 groups for bioinformatics analyses and 20 subjects in 5 groups for verification. The KD patients were further stratified into groups of KD without CAAs, KD with small and medium CAAs, and KD with giant CAAs. To elucidate the functional roles of the differentially expressed proteins (DEPs), we conducted comprehensive bioinformatics analyses. Additionally, Western blotting (WB) was performed to validate the expression levels of selected DEPs.

Results:
Total 104 DEPs were expressed in KD patients compared with healthy controls and febrile controls. Trend analysis of thses DEPs revealed 54 significantly changed DEPs associated with increased disease severity. SERPINA1 and GNAI2 were selected among those DEPs above, and they were significantly decreased in KD patients with CAAs compared with those without CAAs by WB verification. There were 91 DEPs specific to KD patients with CAAs, associated with neutrophil extracellular trap information and complement related pathways, while 16 DEPs specifically expressed in those without CAAs, associated with viral infection and immunity pathways. For DEPs among different severity of CAAs, 102 DEPs were specific to KD patients with small and medium CAAs, associated with complement related pathways and platelet activation pathways, whereas 34 DEPs were specific to those with giant CAAs, associated with cell function pathways.

Conclusion:
This study provides plasmatic exosomal protein profiles in KD patients with CAAs, suggesting that SERPINA1 and GNIA2 might serve as novel potential diagnostic biomarkers for KD with CAAs.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2094 - ANALYSIS OF CHARACTERISTICS AND OUTCOMES OF KAWASAKI DISEASE WITH TREATMENT INITIATED WITHIN 5 DAYS OF ONSET

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Yantai Yuhuangding Hospital, Pediatrics, Yantai-China [1]

Objective:
To investigate the characteristics and outcomes of Kawasaki disease (KD) diagnosed and treated within 5 days of onset.

Methods:
A total of 329 children with confirmed KD hospitalized in two hospitals in Yantai from January 2022 to December 2023 were selected as the study subjects. They were divided into two groups based on the timing of treatment initiation: the early treatment group (initiated within 5 days of onset, experimental group) and the late treatment group (initiated after 5 days of onset, control group). The general characteristics, clinical manifestations, laboratory tests, echocardiographic findings before treatment, and treatment outcomes were compared between the two groups.

Results:
Before treatment, the proportion of extremity erythema was significantly higher in the experimental group than in the control group (73.84% vs. 49.04%); there was no significant difference in the rate of coronary artery lesions (CALs). The experimental group had higher levels of N%, CRP, ESR, PCT, GGT, AST, ALT, D-dimer, IL-6, IL-8, and IL-10 but lower levels of PLT and Na compared to the control group. After treatment, the time for body temperature to normalize (1 hour) and CRP to normalize (5 days) was longer in the experimental group than in the control group (0 hours and 4 days, respectively), but the total duration of fever (5 days) and CRP elevation (10.00 days) was shorter than in the control group (7 days and 12 days, respectively). At the 1-month follow-up echocardiography, there was no statistically significant difference in CALs rates between the two groups.

Conclusion:
Children with KD treated within 5 days of onset exhibited a higher incidence of extremity erythema, more severe inflammatory responses, and greater organ damage. Early treatment can shorten the total duration of fever and CRP elevation and effectively prevent CALs.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2095 - CONSTRUCTION OF A PREDICTIVE MODEL FOR INTRAVENOUS IMMUNOGLOBULIN NON RESPONSE IN KAWASAKI DISEASE UNDER NEW CIRCUMSTANCES

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Objective:
In the context of evolving Kawasaki disease diagnosis and treatment paradigms during the post-pandemic era, this study aims to develop a predictive model for intravenous immunoglobulin (IVIG) non-response to enhance early clinical identification and guide precision treatment decisions.

Methods:
Utilizing a multicenter retrospective cohort study, clinical data from 604 Kawasaki disease patients across two tertiary hospitals in Yantai (January 2022–January 2025) were analyzed. Statistically significant variables were identified through differential analysis, followed by feature selection via LASSO regression and Boruta algorithm. Multiple models were compared to select the optimal predictive model. SHAP interpretability analysis and Nomogram visualization were employed to assess variable contributions. Model performance was evaluated using AUC, sensitivity, specificity, accuracy, calibration curves, Hosmer-Lemeshow goodness-of-fit test, decision curve analysis (DCA), and clinical impact curve (CIC).

Results:
Five variables—CRP, CALs, L%, ALT, and dNLR—were selected to construct the IVIG non-response prediction model. Logistic regression (LR) emerged as the optimal model after multi-model comparison, with an LR equation established and visualized via SHAP analysis and Nomogram. The new model demonstrated AUCs of 0.802 (training set) and 0.793 (validation set), sensitivities of 0.691 and 0.669, specificities of 0.821 and 0.812, and accuracies of 0.794 and 0.783, respectively.The Brier scores for the training set and test set were 0.121 and 0.172, respectively. The Hosmer-Lemeshow goodness-of-fit test showed a statistic of χ^2=2.733 (P=0.95).DCA revealed superior net benefit within the 10%–78% risk threshold range compared to extreme strategies. CIC analysis showed high alignment between predicted and actual high-risk cases at a >20% probability threshold, with a cost-benefit ratio of 1.5:5 (77% true-positive vs. 23% false-positive rates).

Conclusion:
The prediction model for IVIG non-response under new circumstances incorporates variables including CRP, L%, CALs, ALT, and dNLR. The new model demonstrates high AUC, sensitivity, specificity, and accuracy, exhibiting good fitting performance and clinical decision-making value.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2104 - IDENTIFICATION OF NOVEL METABOLISM RELATED BIOMARKERS OF KAWASAKI DISEASE BY INTEGRATING SINGLE CELL RNA SEQUENCING ANALYSIS AND MACHINE LEARNING ALGORITHMS

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Background:
The bile acid metabolism (BAM) and fatty acid metabolism (FAM) have been implicated in Kawasaki disease (KD). However, its precise mechanisms remain unclear. Identifying signature cells and genes related to BAM and FAM could offer deeper understanding of their involvement in the pathogenesis of KD.

Materials and Methods:
We analyzed the public single-cell RNA sequencing (scRNA-seq) dataset GSE1687323 to characterize the immune cell landscape in KD. Gene sets related to BAM and FAM were collected from the GSEA database and previous literature. We analyzed the cellular heterogeneity of BAM and FAM at the single-cell level using R packages. Through differential expressed genes (DEG) analysis, high-dimensional Weighted Correlation Network Analysis (hdWGCNA) and machine learning algorithms, we identified signature genes associated with both BAM and FAM. The cellular expression patterns of signature genes were further validated using our own scRNA-seq dataset. Finally, qRT–PCR was performed to validate the expression levels of signature genes in KD, and Receiver Operating Characteristic (ROC) curve analysis was conducted to evaluate their diagnostic potential.

Results:
Elevated BAM and FAM were observed in monocytes and natural killer (NK) cells of KD patients. VIM, ITGB2 and CLIC1 were identified and validated as signature me-tabolism-related genes in monocytes and NK cells in KD. qRT-PCR results also validated the bioinformatic analysis. Moreover, these genes demonstrated significant di-agnostic potential. Finally, these genes demonstrated significant diagnostic value for KD: with area under the curve (AUC) values exceeding 0.9 in the training bulk RNA-seq data while the AUC value surpassing 0.85 in the validation dataset.

Conclusion:
This study successfully identified and validated VIM and CLIC1 in monocytes, as well as ITGB2 in NK cells, as novel metabolism-related genes in KD. These findings suggest that BAM and FAM may play crucial roles in KD pathogenesis. Furthermore, these signature genes hold promising potential as diagnostic biomarkers for KD.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2106 - THE MID TO LONG TERM SAFETY AND EFFECTS OF ATORVASTATIN THERAPY IN CHILDREN WITH SEVERE CORONARY ARTERY LESIONS AFTER KAWASAKI DISEASE

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Children's Hospital Of Fudan University, Heart Center, Shanghai-China [1]

Background / Hypothesis:
Statins are found to have pleiotropic effects in coronary artery diseases and have been widely used in adults. In recent years, statins have been considered to be used in Kawasaki disease (KD) patients complicated with severe coronary artery lesions (CALs). However, their safety and effects are still uncertain in KD children.

Materials and Methods:
We conducted a self-comparative observational study of atorvastatin in KD children with CALs in a national children's medical center of Chinese mainland. Before and after the atorvastatin treatment, laboratory data including the lipids profiles, high-sensitivity C-reactive protein, transaminase, blood glucose, creatinine and creatine phosphokinase, physical development, symptomatic adverse effects, coronary related clinical events and evaluation examinations including echocardiographic data were recorded during follow up.

Results:
32 KD children (6.3±2.8 years, range 2.2~11.7 years) with severe CALs were recruited. They were treated with atorvastatin and followed up for 3.05±1.5 years (range 2 month~5 years). Most of the patients tolerated well in both clinical symptoms and laboratory indicators, except one boy experiencing obviously increased transaminase and recovering completely after discontinuing atorvastatin. The patients' physical developments were not affected. After atorvastatin, the patients' lipids profiles reduced significantly which limited the increase of the dose. The average doses at beginning and the last follow-up had no change (0.20±0.06 and 0.17±0.05mg/kg/day separately). The coronary related examinations follow-up showed some improvements in part of patients and remaining stable in most patients.

Conclusions:
In mid to long term follow-up, atorvastatin treatment was safe in Chinese KD children with severe CALs. During treatment most patients remained stable and part of patients appeared to have some improvements in coronary artery conditions. Due to the limitation of blood lipids level, the safe dose of atorvastatin was low in our study on Chinese children.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2117 - OUTCOMES OF KAWASAKI DISEASE WITH GIANT CORONARY ARTERY ANEURYSMS INSIGHTS FROM A LARGE ASIAN COHORT

Yuanzheng Zheng [1], Quming Zhao [1], Chen Chu [1], Lu Zhao [1], Feng Wang [1], Lan He [1], Shuna Sun [1], Yixiang Lin [1], Guoying Huang [1], Fang Liu [1], Xuecun Liang [1]
National Children's Medical Center Children's Hospital Of Fudan University, Cardiovascular Center, Shanghai-China [1]

Background / Hypothesis:
Giant coronary artery aneurysms, as life-threatening vascular complications of Kawasaki disease, present significant clinical challenges due to their association with potentially catastrophic outcomes, including thrombosis and myocardial infarction. This study aimed to investigate the long-term prognosis of patients with GCAAs secondary to Kawasaki disease and to identify predictive factors associated with coronary artery remodeling and recovery.

Materials and Methods:
This study encompassed all patients diagnosed with GCAAs at our institution between January 2018 and December 2023. Comprehensive clinical data, including demographic characteristics, acute-phase treatment strategies, surgical and catheter-based interventions, and follow-up status, were systematically collected from our institutional database for analysis.

Results:
A total of 295 patients were identified. Over a median follow-up period of 27 months (ranging from 1 to 170 months), 18 patients (6%) experienced complete regression of GCAAs without stenosis or obstruction, while 77 patients (26%) showed improvement, and the remaining 200 patients (68%) exhibited persistent coronary aneurysms with a high incidence of stenosis. Myocardial infarction occurred in 24 patients, including one patients died following a second acute myocardial infarction. Additionally, 33 patients had undergone coronary artery bypass grafting.

Conclusions:
Patients with Kawasaki disease complicated with GCAAs frequently experience major cardiovascular events. Nevertheless, with timely and appropriate medical intervention, a subset of these patients may achieve complete restoration of coronary artery morphology. Moreover, even in cases where a major cardiovascular event has occurred, catheter-based and surgical interventions can substantially enhance clinical outcomes.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2151 - THE FUNCTION AND MECHANISM OF CRIP2 IN KAWASAKI DISEASE INDUCED CORONARY ARTERY ENDOTHELIUM INJURY

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Background / Hypothesis:
The immune system of KD (Kawasaki disease) patient is rapidly activated and the immune cells accumulated in coronary artery walls can cause coronary artery endothelial cell injury and scar formation, which may lead to myocardial ischemia or myocardial infarction in severe cases. CRIP2 (cysteine-rich intestinal protein 2) is expressed in the early development stage of vascular and is able to regulate vascularization and cardiac injury repairment. However, whether CRIP2 can regulate coronary artery injury or not in KD has not been clear.

Materials and Methods:
In this project, we used the circulating endothelial cells HCAEC (human coronary artery endothelial cell HCAEC) treated with serum and KD mouse model to elaborate the function of CRIP2 in coronary artery endothelial cell injury. We overexpressed or decreased CRIP2 both in HCAEC and mouse vessel to further prove it mechanism behind it. Flow cytometry Western Blot Masson Hematoxylin-Eosin staining Angiogenesis assay Immunofluorescence Elisa Transfection AAV injection EDU assay and so on were used.

Results:
We have found that the expression of CRIP2 was obviously reduced in HCAEC which was treated with serum from KD patients. The overexpression of CRIP2 in HCAEC repressed the expression of inflammatory factor cell proliferation and angiopoiesis. The similar results were also found in KD mouse coronary artery and aorta. Furthermore, the activity of NF-κB and STAT1 was significantly decreased. CoIP result showed CRIP2 can bind to NF-κB and STAT1 to regulate downstream gene expression.

Conclusions:
We support that the decreased expression of CRIP2 in HCAEC/KD mouse vessel can activate NF-κB and STAT1, leading to severe immune response and angiogenesis dysregulation, which finally cause coronary artery endothelial cell injury in KD.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2161 - NOVEL IDENTIFICATION OF LOW DENSITY NEUTROPHILS IN KAWASAKI DISEASE AND THEIR DYNAMIC IMMUNE PHENOTYPES REVEALED BY SINGLE CELL RNA SEQUENCING

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Background / Hypothesis:
Kawasaki disease (KD) is characterized by immune dysregulation and widespread vascular endothelial injury, yet its etiology remains unclear. Although neutrophils play a critical role in the acute phase, the phenotypic and functional heterogeneity of circulating low-density neutrophils (LDNs) in KD is not well understood.

Materials and Methods:
We performed single-cell RNA sequencing (scRNA-seq) on peripheral blood mononuclear layer cells from KD patients in both acute and convalescent phases, as well as age-matched febrile and healthy controls. An optimized analytical pipeline was developed to enhance LDN detection. Bioinformatic analyses were used to identify LDN subpopulations and investigate their functional characteristics and differentiation trajectories.

Results:
Nine major cell types were identified, with LDNs showing the most significant intergroup variation (P = 0.015). LDNs were most abundant in acute KD, followed by febrile controls and convalescent KD, and were undetectable in healthy controls. Six transcriptionally distinct LDN subpopulations (LDN1-LDN6) were defined. LDN2, enriched in acute KD, highly expressed proinflammatory genes (MMP9, S100A12, PADI4) and was associated with reactive oxygen species metabolism and cytokine signaling. LDN3 and LDN5 predominated during convalescence, suggesting roles in immune regulation and tissue repair. LDN1, elevated in febrile controls, expressed interferon-stimulated genes (IFIT3, IFIT2, ISG15), indicating antiviral responses. Pseudotime analysis revealed three LDN differentiation states with distinct developmental trajectories in KD and febrile conditions.

Conclusions:
This study presents the first single-cell evidence of low-density neutrophils in Kawasaki disease and uncovers their dynamic and heterogeneous immune phenotypes. These findings provide novel insights into KD pathogenesis and highlight potential targets for future immunomodulatory therapies.

POSTER PRESENTATIONS

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2181 - CLINICAL CHARACTERISTICS OF KD CHILDREN UNDER 1 YEAR OF AGE

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Objective :
To analyze the clinical characteristics of children with Kawasaki disease (KD) under 1 year old, so as to provide theoretical basis for early identification and reduction of the incidence of CALs.

Methods :
A total of 501 children with KD admitted to Yantai Yuhuangding Hospital from January 2022 to January 2025 were enrolled in this study. According to age, the patients were divided into < 1 year old group (126 cases) and≥1 year old group (375 cases). Detailed collection of the medical records of the children patients was conducted, covering demographic information, clinical characteristics, treatment outcomes and other indicators. Through difference analysis , the differences in clinical features between two groups of KD children were compared.

Results :
(1) In terms of clinical features, the < 1 year old group had a significantly lower duration of fever, incidence of bulbar conjunctival hyperemia, and incidence of changes in lips and oral cavity than the ≥1 year old group. The incidence of iKD and hand-foot swelling in the < 1 year old group were significantly higher than those in the ≥1 year old group , the difference was statistically significant.
(2) In terms of treatment and outcome, compared with the ≥1 year old group, the < 1 year old group had a significantly higher incidence rate of CALs than the ≥1 year old group. The non-response rate of IVIG showed an increasing trend, but the difference was not statistically significant.

Conclusion :
In the <1-year-old group of KD patients, the incidence of bulbar conjunctival congestion, lip and oral changes was lower, while the incidence of iKD was higher, suggesting that the clinical features in this age group are more atypical, increasing the difficulty of early recognition.

POSTER PRESENTATIONS

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2183 - RISK FACTORS FOR CORONARY ARTERY LESIONS IN CHILDREN WITH KD UNDER 1 YEAR OF AGE

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Background / Hypothesis:
To explore the risk factors of Coronary Artery Lesions (CALs) at this age stage, so as to provide theoretical basis for early identification and reduction of the incidence of CALs.

Materials and Methods:
According to the presence or absence of CALs, the < 1 year old group was divided into CALs group (26 cases) and non-cALS group (100 cases). Univariate analysis, correlation analysis, Logistic regression analysis and construction of individual and combined ROC curves were used to explore the risk factors for CALs in <1-year-old KD children.

Results:
Risk factor analysis of CALs showed that NPAR and iKD were important risk factors for CALs in KD patients under 1 year old. When NPAR alone was used to predict CALs in KD patients under 1 year old, the AUC of NPAR was 0.613, with a 95%CIof 0.45 to 0.746. The AUC of NPAR combined with iKD was 0.732, with a 95%CI of 0.580 to 0.849.In terms of sensitivity and specificity, NPAR had the lowest sensitivity and the highest specificity, which were 0.308 and 0.917 respectively. NPAR combined with iKD had the lowest sensitivity and the highest specificity, which were 0.615 and 0.854 respectively. The predictive value of NPAR alone for CALs in children under 1 year old with KD was relatively low. However, the combination of NPAR and iKD had a certain predictive value for CALs in children under 1 year old with KD.

Conclusions:
In KD patients aged 1 year, the clinical manifestations are mostly atypical, and the incidence of iKD in the CALs group is significantly higher. NPAR and iKD are important risk factors for the occurrence of CALs in KD patients aged less than 1 year. The use of NPAR alone and the combination of NPAR and iKD can provide a reference basis for the early clinical prediction of CALs

POSTER PRESENTATIONS

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2197 - DATA DRIVEN ANALYSIS IDENTIFIES CYTOKINE DEFINED MOLECULAR SUBTYPES OF KAWASAKI DISEASE WITH DISTINCT CLINICAL PHENOTYPES

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Background / Hypothesis:
Kawasaki disease (KD) is the leading cause of acquired pediatric heart disease, characterized by systemic vasculitis and coronary artery complications. The marked clinical heterogeneity suggests distinct biological subtypes, necessitating molecular classification to guide personalized management.

Materials and Methods:
Plasma protein profiling was conducted using Olink Target 96 panels on 158 acute KD patients (April 2020 to January 2024). Molecular subtypes were identified through unsupervised clustering analysis and further characterized by: (1) comprehensive clinical evaluation, (2) single-cell RNA sequencing of immune cells (9 samples), and (3) whole-genome sequencing (12 samples). Plasma levels of intercellular adhesion molecule-1 and vascular cell adhesion molecule-1 were measured using enzyme-linked immunosorbent assays.

Results:
Three KD subtypes were identified with distinct clinical profiles. The IL-6/IL-10/IFN-γ-High subtype (37%) showed severe inflammation (CRP 2750±420 ng/mL), multiorgan involvement (ProBNP 801.9 pg/mL, ALT 53.0 U/L, DD dimer 1.46 mg/L), and endothelial activation, with high IVIG resistance (26%) and coronary risk (11%). This subtype exhibited impaired monocyte function despite elevated IL-10 ($p<0.01$). The CXCL5-High (33%) and Cytokine-Normal (30%) subtypes demonstrated intermediate and minimal inflammation, respectively. Genetic analysis revealed a MAPK3K7 variant specific to the severe subtype.

Conclusions:
Three molecular subtypes of KD were identified, with the IL-6/IL-10/IFN-γ-High subtype characterized by systemic inflammation, multi-organ involvement, significantly elevated IVIG resistance rates, and a high incidence of coronary artery lesions. These findings may enable precise prediction of adverse outcomes and provide a biological rationale for subtype-specific therapeutic strategies.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2236 - PERCUTANEOUS CLOSURE OF LEFT VENTRICULAR PSEUDOANEURYSM SECONDARY TO INFECTIVE ENDOCARDITIS IN A PEDIATRIC PATIENT A NOVEL TRANSCATHETER APPROACH IN A HIGH RISK SETTING

Saadia Ilyas [1], Zaland Ahmed Yousafzai [1]
Lady Reading Hospital, Peads Cardiology, Peshawar-Pakistan [1]

Background / Hypothesis:
Left ventricular (LV) pseudoaneurysm is a rare but potentially fatal sequela of infective endocarditis in pediatric patients. Traditional surgical repair carries significant risks, particularly in unstable or malnourished children. We hypothesize that transcatheter closure provides a viable and less invasive alternative with favorable outcomes.

Materials and Methods:
An 8-year-old malnourished girl with methicillin-resistant Staphylococcus aureus infective endocarditis presented with persistent fever, abdominal pain, and elevated inflammatory markers. Echocardiography and cardiac MRI revealed a large LV pseudoaneurysm with a narrow neck. Multidisciplinary consensus favored percutaneous intervention due to the patient's critical status. A transcatheter approach was employed via femoral access, and an Amplatzer vascular plug was deployed to occlude the pseudoaneurysm.

Results:
Successful device placement was confirmed with complete occlusion of flow on angiography. The patient remained hemodynamically stable, with significant clinical and biochemical improvement post-procedure. Follow-up echocardiography at one and three months showed no residual leak, and the patient resumed normal activity with dual antiplatelet therapy.

Conclusions:
Percutaneous closure of LV pseudoaneurysm represents a safe, feasible, and effective alternative to surgery in pediatric patients with infective endocarditis, particularly in those with high operative risk. This case underscores the expanding role of minimally invasive techniques in structural heart disease management in children.

POSTER PRESENTATIONS

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2238 - DIPHTHERIA ASSOCIATED MYOCARDITIS CLINICAL PROFILES AND MORTALITY TRENDS IN A TERTIARY CARE HOSPITAL IN PAKISTAN

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Lady Reading Hospital, Peads Cardiology, Peshawar-Pakistan [1]

Background:
Corynebacterium diphtheriae infection, causing diphtheria, is a public health concern, particularly in developing nations like Pakistan. Despite immunization efforts, recent outbreaks since 2022 have emphasized the continuing threat. This study focuses on describing the clinical characteristics of children with diphtheria-induced myocarditis and exploring the association between early cardiac abnormalities, future fatality rates, and contributing factors.

Methods:
A one-year cross-sectional study was undertaken at Lady Reading Hospital MTI Peshawar, encompassing 73 pediatric patients diagnosed with diphtheria-associated myocarditis. Data, including demographic characteristics, cardiac enzymes, and serial ECG and echocardiography data, were gathered from the health management information system (HMIS). Institutional Ethical Committee approval was obtained, and informed consent was waived due to its retrospective nature.

Results:
Gender distribution within the study was balanced, with 35 males (47.9%) and 38 females (52.1%). ECG data revealed various prevalence rates: 27.4% for rhythm abnormalities, 20% for conduction abnormalities, 6.8% for ischemia alterations, and 20.5% for normal findings. Treatment measures included anti-diphtheria serum (ADS) in 87.7% and temporary pacemaker placement (TPM) in 13.7% of patients. Echo findings indicated a variety of cardiac dysfunctions: 53.4% with no dysfunction, 9.6% mild malfunction, 6.8% with moderate dysfunction, and 30.1% with severe dysfunction. The categorization of creatine kinase (CK), lactate dehydrogenase (LDH), and troponin I (Trop I) gave insights into the biochemical aspects.

Conclusion:
This study gives a full insight into the clinical symptoms of diphtheria-induced myocarditis in children. The findings can help establish a foundation for ongoing study into potential gender-related trends in clinical outcomes, contributing to improved care and preventative methods.

POSTER PRESENTATIONS

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2251 - CLINICAL PRESENTATION DIAGNOSIS TREATMENT AND OUTCOMES OF MYOCARDITIS IN CHILDREN A TERTIARY CARE HOSPITAL EXPERIENCE

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Pic, Peads Cardiology, Peshawar-Pakistan [1] Lady Reading Hospital, Peads Cardiology, Peshawar-Pakistan [2]

Background:
Clinical presentation, diagnosis, and treatment of myocarditis in children can be highly challenging, and results can vary greatly. y. Though treatment approaches, such as immunosuppressive therapy, are still debatable, diagnostic methods such as cardiac MRI and biomarkers show promise in improving diagnostic accuracy. The purpose of this study is to describe the spectrum of pediatric acute myocarditis, assess existing therapy approaches, and develop regional guidelines based on the experience of a tertiary care institution.

Methods:
Children diagnosed with acute myocarditis over a six-month period were included in this retrospective and descriptive hospital-based study. Data on demographics, clinical presentations, diagnostic tests, treatments, and results were gathered and examined. Descriptive statistics, non-parametric tests for categorical variables, and Spearman's correlation tests for continuous data were used in the statistical analysis, with a significance level of $p < 0.05$.

Results:
Of the 99 patients included, the mean age was 2.37 years, with majority male (n = 54, 54.55%). Clinical symptoms typically included shortness of breath (n = 998, 99.0%), vomiting (n = 63, 63.6%), and chest pain (n = 6, 6.1%). High levels of troponin I (n = 70, 70.7%), cardiomegaly on a chest X-ray (n = 97, 97.0%), and different degrees of ventricular dysfunction were found in the laboratory and in imaging studies. Methylprednisolone (n = 84, 84.8%) and IV immunoglobulin (n = 54, 54.5%) were the most often used treatment modalities, and there were no appreciable differences in the two treatment groups' outcomes. A weak negative association (Spearman's rho = -0.211, p = 0.036) was found in the correlation study between the administration of methylprednisolone and length of stay (LOS)

Conclusion:
This research offers a significant understanding of the clinical manifestation, treatment, and complications of acute myocarditis in children Methylprednisolone shortens pediatric myocarditis stay; further studies needed for validation.

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2259 - PROFILE OF PEDIATRIC INFECTIVE ENDOCARDITIS FROM A TERTIARY CARE CENTRE IN INDIA

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Background / Hypothesis:
Infective endocarditis (IE) in children is rare but associated with high morbidity and mortality. Early diagnosis and targeted therapy is vital for optimal outcome. This study aims to describe the profile and outcomes of IE cases treated in a tertiary care centre in India

Materials and Methods:
This retrospective observational study included 46 children under the age of 18yrs diagnosed with IE over a 7-year period (2017-2025). Data collected included clinical history echocardiographic parameters, laboratory markers, treatment given and short term outcome

Results:
46 children were included (72% male) with an average age of 7.8yrs (0.1-16). 50% were native valve endocarditis with 15% (n=7) occurring in structurally normal hearts and 35%(n=16) having structural heart disease . Rest 50% (n=23) were post op cases with TOF pulmonary atresia being the most common diagnosis with 30% (n=15) having an RV- PA conduit with a mean duration of 3.8yrs (0.3-7.5) from surgical insertion. Dental caries was seen in only with 36% (n=17) with almost all patients presenting with fever (98%). There was an average delay of 21 days (4-60) from onset of fever till diagnosis. 70% (n=32) had blood culture positivity with MSSA (n=10) followed by Streptococcus (n=7) being the commonest organisms. There were 7 (15%) GNB sepsis and 4 (8%) fungal sepsis. Blood investigations showed an average WBC count of 14,400 cells/Ml mean CRP of 46mg/l and ESR of 52mm/hr. Systemic embolization occurred in 30% (n=14) with surgical intervention required in 56% cases (n=26) and 3 children expired(6%).

Conclusions:
IE still continues to be a significant cause of morbidity in children. Although native valve endocarditis is still common, congenital heart disease and post op status with conduits pose a significant risk. Delay in diagnosis and suboptimal treatment can prove detrimental in children with IE.

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2284 - TOCILIZUMAB MAY BE A POSSIBLE OPTION FOR ANTI INFLAMMATORY TREATMENT IN EXTREMELY REFRACTORY KAWASAKI DISEASE COMPLICATED WITH PROGRESSIVE CORONARY ARTERY ANEURYSMS

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Background / Hypothesis:
Patients of refractory Kawasaki disease (KD) have a high risk of developing coronary artery aneurysms (CAAs) and the treatment choice of these patients is difficult and various. Tocilizumab is an anti-interleukin-6 receptor monoclonal antibody, but it has not been recommended in KD because of its potential role in accelerating the formation of CAAs.

Materials and Methods:
In the past years, 4 extremely-refractory KD children received treatments of Tocilizumab in our center, including 3 boys (Case 1~3: 6 months, 8 years and 11years old) and 1 girl (Case 4: 3 years old). All of them have been treated with 2~4 high doses of IVIG, multiple methylprednisolone pulse, Infliximab or Etanercept, and cyclosporine or cyclophosphamide. But their inflammations were still not be controlled and they all developed medium to giant CAAs which were still progressing. In the absence of other options, Tocilizumab was administrated at the time of 1.2~3 months (Case 1~3) and 9 months (Case 4) separately after KD onset.

Results:
After the first dose of Tocilizumab treatment, all the 4 patients' inflammations were controlled soon which reflected in the recovery of both temperature and inflammatory markers. They all received total 6 doses of Tocilizumab by once every 4 weeks, except Case 2 who received total 8 doses. Continuous echocardiography follow-up showed that their CAAs did not continue to progress, and even improved in Case 3 (right coronary artery: from medium CAA to slight dilation). During the Tocilizumab treatment, Case 2 developed severe eosinophilia and atopic dermatitis, which significantly improved after discontinuing. No significant side effects were found in other patients.

Conclusions:
In these 4 patients, Tocilizumab were effective and seemed to have positive effects on improvements of CAAs. This clinical practice suggested that in extremely-refractory KD with progressive CAAs, Tocilizumab could be a possible option of treatment.

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2364 - IMPLEMENTATION OF A SIMPLIFIED ACUTE RHEUMATIC FEVER DIAGNOSTIC ALGORITHM BY FRONTLINE HEALTHCARE PROVIDERS IN UGANDA.

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Uganda Heart Istitute, Paediatric Cardiology, Kampala-Uganda [1] Uganda Heart Institute, Cardiology, Kampala-Uganda [2] Uganda Heart Institue, Paediatric Cardiology, Kampala-Uganda [3]

Background / Hypothesis:

Introduction
Early diagnosis of Acute rheumatic fever (ARF) is critical to ensure timely initiation of Benzathine Penicillin (BPG) that prevents progression to RHD. However, in RHD endemic regions, very few children receive a diagnosis of ARF. This is largely due to a lack of diagnostics for ARF. There is an urgent need for simplified strategies to support detection of ARF at the primary health care level.
Objective
To test the use of a simplified ARF diagnostic algorithm by frontline health care providers in Wakiso District, Uganda.

Materials and Methods:
Study Design: We conducted a mixed methods study over a period of 6 months at 4 Health Center IVs (HCIVs) in Wakiso district, Central Uganda. The quantitative portion measured the proportion of patient encounters in which the healthcare providers used the algorithm correctly while the qualitative component involved in-depth interviews with the health care providers to assess their experience using the algorithm.

Results:
Healthcare providers correctly applied the algorithm in 62% of patient encounters presenting with symptoms suggestive of ARF. Providers reported that the tool enhanced their confidence and ability to diagnose and manage suspected ARF cases. However, challenges remained. The algorithm did not include BPG dosing guidance, which limited treatment decisions. Additionally, systemic barriers such as complex referral processes and the high transport costs to the Uganda Heart Institute hindered patient follow up and confirmation of diagnosis.

Conclusions:
Simplified diagnostic algorithms can support earlier detection of ARF at the primary care level, but limitations remain. Incorporating treatment guidance and improving referral pathways are essential next steps. Ultimately decentralizing RHD services may offer greater impact in improving access to timely ARF diagnosis and care.

POSTER PRESENTATIONS

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2419 - AMPHIREGULIN PROMOTES PROLIFERATION AND MIGRATION OF THE DAMAGED ENDOTHELIAL CELLS IN KAWASAKI DISEASE CELL MODELS

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Children's Hospital, Zhejiang University School Of Medicine, Department Of Cardiology, Hangzhou-China [1]

Background / Hypothesis:
Amphiregulin (Areg), a member of epidermal growth factor family, plays a critical role in tissue repair, inflammation and immunity. Macrophage is an important source of Areg, as well as one of the important immune cells activated in Kawasaki disease (KD). However, Areg has not been studied in KD until now. Therefore, we aim to explore the expression of Areg in KD and the role of Areg on injured endothelial cells in an KD cell model.

Materials and Methods:
The serum of KD patients, as well as LCWE-induced KD mouse model, were measured by ELISA. RAW264.7 cells were stimulated with LCWE, and the supernatant was collected. Then, MCAECs were treated with LCWE-induced RAW264.7 cells conditioned medium (RAW-CM) to simulate inflammatory damage in KD endothelial cells.

Results:
Our study showed that the serum level of Areg increased in LCWE-induced mouse model. In vitro, LCWE increased the expression and secretion of Areg in RAW264.7 macrophages, an effect that was inhibited by ADAM-17 blockade. The conditioned medium (CM) from LCWE-stimulated RAW264.7 cells (RAW-CM) enhanced the proliferative capacity of endothelial cells, an effect that was partially inhibited by Areg antibodies. Recombinant Areg promoted the proliferation and migration of damaged endothelial cells, effects that were dependent on the activation of the AKT and ERK signaling pathways.

Conclusions:
This study demonstrates that serum Areg level increased in LCWE-induced KD mouse model, and Areg promoted proliferation and migration abilities of injured endothelial cells. Our work suggest that Areg may be one of the reasons for the repair of injured endothelial cells in LCWE model vasculitis.

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2427 - DELAYED ONSET GIANT CORONARY ANEURYSM IN 3 YEARS OLD WITH KAWASAKI DISEASE A RARE CASE PRESENTATION

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Background / Hypothesis:
Kawasaki disease(KD)is an acute febrile vasculitis that primarily affects children under 5 years of age. It is leading cause of acquired heart disease in children.Delayed treatment or intravenous immunoglobulin resistance can result in coronary aneurysm (CAA), These aneurysms typically form within the first month of illness. including giant aneurysms, which carry a high risk of complications.

Materials and Methods:
the patient in this study was diagnosed at Pediatric Benghazi Hospital, laboratory investigations and echo cardiogram were performed to confirm the diagnosis.
On follow up echo cardiogram and catheterization were performed at Benghazi National Heart Center. GE S5 and HDU GE E95 echo machiens and Philips bi-plane cath lab. were used.

Results:
3 years old boy initially was admitted to Pediatric Benghazi Hospital with the following criteria of Kawasaki disease: fever for more than 5 days, mucus membrane changes, non purulent conjunctivitis.and unilateral cervical lyphadenopathy. He received intravenous immunoglobulin on day 10 of illness, serial echocardiogram were performed for him the result showed normal coronary arteries.
3 years later the patient was referred to Benghazi National Heart Center for further evaluation, we found Giant aneurysms in both left and right coronary arteries by echo cardiogram and confirmed by cardiac catheterization. Aspirin was restarted and commenced on warfarin. on follow up the coronary arteries were decreased in sizes,but the Z score was more than 10.

Conclusions:
Prompt recognition and aggressive treatment for Kawasaki disease are crucial, but complications can still occur, Multidisciplinary care is vital for children with giant CAAs due to Kawasaki.This patient highlighted the need for early detection and treatment of Kawasaki disease and long life follow up

POSTER PRESENTATIONS

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2447 - THE CGAS STING STAT TLR4 ACTIVATION TRIAD MONOCYTE DRIVES ENDOTHELIAL CXCL10 SURGE IN KAWASAKI VASCULAR INJURY

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Children's Hospital, Zhejiang University School Of Medicine, Department Of Cardiology, Hangzhuo-China [1]

Background / Hypothesis:
Kawasaki disease (KD), the leading cause of acquired heart disease in children, triggers coronary artery aneurysms in approximately 25 % of untreated cases.Serum CXCL10 is markedly elevated during the acute phase of KD, and its expression is tightly linked to aneurysm formation. However, the cellular origin of CXCL10 and the mechanisms in KD remain undefined. Here, we dissect the unexplored role of CXCL10 in orchestrating monocyte-endothelial crosstalk and identify the master signaling triad controlling its production.

Materials and Methods:
$CD14^+$ monocytes were isolated from peripheral blood mononuclear cells of children with Kawasaki disease using immunomagnetic beads and co-cultured with endothelial cells. CXCL10 levels in serum and cell-culture supernatants were quantified by ELISA. Endothelial gene expression of IL-6, ICAM-1 and IFIT1 was measured by qPCR, while phosphorylated proteins including p-TBK1, p-STAT3 and p-p65 were assessed by Western blotting. The role of CXCL10 in CAWS-induced KD animal model was further validated in knockout mice and by transcriptomic sequencing.

Results:
Serum CXCL10 levels are markedly elevated in children with KD, whereas CXCL10 secretion by PBMCs is minimal. Monocytes can trigger robust CXCL10 release from endothelial cells by activating the cGAS-STING, JAK1-STAT3, and TLR4 signaling pathways. In the CAWS-induced mouse model of KD, CXCL10 expression is significantly upregulated in the aortic tissue, accompanied by increased macrophage infiltration.

Conclusions:
This study demonstrates that endothelial cells are a critical source of CXCL10 in Kawasaki-disease vascular lesions and that their CXCL10 release is orchestrated by monocytes, which synergistically activate the cGAS–STING, STAT3, and NF-κB signaling tri-axis. This signaling axis drives increased coronary inflammation, and CXCL10 deficiency markedly attenuates vascular injury, highlighting its potential as a therapeutic target.

POSTER PRESENTATIONS

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2462 - CLINICAL LABORATORY AND ECHOCARDIOGRAPHIC PARAMETERS SUGGESTIVE OF MULTI SYSTEM INFLAMMATORY SYNDROME IN CHILDREN AT A TERTIARY HOSPITAL IN SOUTH AFRICA

Vijay Mammen [1], Kebashni Thandrayen [2], Ahmad Alharm [1], Thuso David [1], Mohamed Monareng [1], Phophi Raphulu [1], Warona Sethomo [1], Antoinette Cilliers [1]
Chris Hani Baragwanath Academic Hospital, University Of The Witwatersrand, Division Of Paediatric Cardiology, Department Of Paediatrics, Johannesburg-South Africa [1] Chris Hani Baragwanath Academic Hospital, University Of The Witwatersrand, Division Of Paediatric Endocrinology, Department Of Paediatrics, Johannesburg-South Africa [2]

Background/Hypothesis:
Worldwide studies have described features and outcomes of multisystem inflammatory syndrome in children (MISC) to assist with the diagnosis and guide medical management, with few studies emanating from Africa.

Materials and Methods:
The paediatric cardiology database identified all patients referred with suspected MISC at Chris Hani Baragwanath Academic Hospital (CHBAH), from 1 March 2020 until 31 December 2021. Patients were classified as 'MISC likely' or 'MISC unlikely' based on the 2020 Centers for Disease Control and Prevention (CDC) criteria for MISC.

Results:
A total of 101 patients were analysed, with 60 in the 'MISC likely' group and 41 patients in the 'MISC unlikely' group. The significant clinical features differentiating between the 'MISC likely' and the 'MISC unlikely' groups were the presence of documented fever (p=0.018) and eye changes (p<0.001). Patients with a positive COVID antibody test that were referred for suspected MISC were most likely to present with MISC (p< 0.001). Laboratory parameters suggesting a greater likelihood of patients having MISC was a high troponin T (p=0.018) and a high Creactive protein (CRP) (p=0.019). The main echocardiographic feature associated with a MISC diagnosis was left ventricular (LV) dysfunction at presentation (p=0.023). In the adjusted logistic regression analyses, the contributory findings associated with a greater risk of having MISC were fever and LV dysfunction (OR 6.52 (95% CI 2.31 18.45); p<0.001 and 6.70 (95% confidence interval (CI) 1.61 28.59); p =0.009, respectively).

Conclusion:
Clinical features such as documented fever and eye changes together with a positive COVID antibody test suggest that patients had MISC in our setting. Laboratory findings of elevated CRP and troponin T in patients with suspected MISC assisted with the diagnosis.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2474 - SERUM ENDOCAN AS A DUAL FUNCTION BIOMARKER IN KAWASAKI DISEASE EARLY DIAGNOSTIC POTENTIAL AND PREDICTION OF CORONARY ARTERIAL ANEURYSMS

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Background / Hypothesis:
Kawasaki disease (KD), an acute vasculitis of unclear etiology, is an important contributor to childhood-acquired heart disease due to coronary arterial aneurysms (CAAs). Current diagnosis lacks specific biomarkers, risking delayed treatment. Endocan, a proteoglycan implicated in vascular inflammation, may address this gap. This study evaluates serum endocan in acute KD for its utility in early KD diagnosis and CAA risk prediction.

Materials and Methods:
This prospective cohort study enrolled 79 KD patients and 48 healthy controls. The KD group was further divided into KD with CAA (KD-CAA) and KD non-CAA (KD-NCAA) subgroups. Serum endocan levels were quantified via enzyme-linked immunosorbent assay. Clinical parameters including inflammatory markers were systematically analyzed using SPSS and GraphPad Prism.

Results:
Serum endocan levels were significantly elevated in KD patients compared to HCs (1764.99 ± 442.04 vs. 931.73 [815.57–1138.72] pg/ml, $P < 0.001$), with higher concentrations in KD-CAA versus KD-NCAA (1962.43 ± 321.48 vs. 1702.46 ± 458.54 pg/ml, $P = 0.024$). Endocan demonstrated diagnostic accuracy for KD (AUC = 0.915, 95% CI: 0.863–0.968; sensitivity 88.6%, specificity 85.4%) and predictive value for KD-CAA (AUC = 0.675, 95% CI: 0.548–0.801; sensitivity 73.7%, specificity 58.3%). Positive correlations were observed with white blood cell count ($r = 0.244$, $P = 0.033$), while inverse correlations emerged with prothrombin time ($r = -0.316$, $P = 0.006$).

Conclusions:
Serum endocan shows promise as a dual biomarker for KD diagnosis and KD-CAA risk prediction.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2475 - THE UTILITY OF SERUM SESN2 LEVELS IN THE EARLY DIAGNOSIS OF KAWASAKI DISEASE AND PREDICTION OF CORONARY ARTERY LESIONS

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Background / Hypothesis:
Kawasaki disease (KD) is a pediatric vasculitis whose primary threat, coronary artery lesions (CAL), is difficult to predict due to a lack of reliable biomarkers. Sestrin2 (SESN2), a stress-protective protein, has shown potential in other cardiovascular diseases. This study aimed to evaluate the diagnostic and predictive value of serum SESN2 in KD.

Materials and Methods:
This prospective study enrolled 72 children with KD (23 with CAL, 49 without [NCAL]) and 38 healthy controls (HC). Serum SESN2 levels were measured by ELISA before intravenous immunoglobulin (IVIG) treatment and analyzed alongside clinical and inflammatory markers. ROC curve analysis was used to assess diagnostic and predictive efficacy.

Results:
Serum SESN2 levels were significantly higher in the KD group than in the HC group (median 5.17 vs. 3.49 ng/ml, P=0.001). Within the KD cohort, the CAL subgroup had significantly higher SESN2 levels than the NCAL subgroup (6.26 vs. 4.51 ng/ml, P=0.014). SESN2 levels positively correlated with inflammatory markers (CRP, IL-6, IL-8, IL-10) and coronary artery Z-scores, and increased with the severity of coronary damage. Post-IVIG treatment, levels decreased significantly. The area under the ROC curve (AUC) for SESN2 was 0.697 for distinguishing KD from HC and 0.684 for predicting CAL.

Conclusion:
Serum SESN2 is a promising biomarker for Kawasaki disease. Elevated levels may aid in diagnosis and reflect the severity of systemic inflammation and coronary artery lesions.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2518 - INFLAMMATORY REACTION IN THE ACUTE PHASE OF KAWASAKI DISEASE MAY BETTER PREDICT CHRONIC CARDIAC DYSFUNCTION THAN CORONARY ARTERY LESIONS

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Background / Hypothesis:
Kawasaki disease (KD) is a pediatric acute vasculitis affecting the coronary arteries and cardiac tissues. Research has been conducted on the assessment of acute cardiac function in KD; however, chronic cardiac dysfunction remains understudied, particularly in terms of coronary artery lesion (CAL) grading and acute-phase inffammatory markers. This study aimed to assess the effect of CAL grading on chronic cardiac function in KD patients, and explore the association between CAL grading and acute-phase inffammatory markers.

Materials and Methods:
A prospective study was conducted on 25 children with giant coronary aneurysms (GCAs) and gender-, height-, and weight-matched subgroups. Chronic cardiac function and infammatory markers were assessed using echocardiography and laboratory tests.

Results:
The KD group showed significantly impaired left ventricular function compared to the healthy control group, including reduced global longitudinal strain (19.94%±3.42% vs. 21.27%±1.69%,P=0.001) and circumferential strain (20.85%±4.01% vs. 23.14%±5.37%, P=0.002). Most systolic/diastolic parameters demonstrated similar statistical signiffcance (KD vs. healthy control group, all $P<0.05$). Notably, no association was found between CAL severity gradation and cardiac dysfunction ($P>0.05$ across CAL subgroups). Surprisingly, a considerable proportion of patients with GCAs (61.11%) and medium-sized coronary artery aneurysms (69.57%) had normalized cardiac function. Acute-phase C-reactive protein levels emerged as a predictor for chronic cardiac dysfunction (cut-off value: 127.79 mg/L).

Conclusions:
Chronic cardiac dysfunction in KD patients is affected by CAL grading and acute-phase inflammatory markers. Integrating inflammatory indicators into CAL risk stratification could enhance clinical management strategies. Further research with larger cohorts needs to be conducted to validate these fndings and establish longitudinal monitoring protocols.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2520 - POTENTIAL PREDICTIVE VALUE OF MYOCARDIAL STRAIN AND STRAIN RATE FOR LATE GADOLINIUM ENHANCEMENT IN CHILDREN WITH A HISTORY OF KAWASAKI DISEASE

Nanjun Zhang [1], Bowen Li [1], Yimin Hua [1], Kaiyu Zhou [1], Chuan Wang [1]
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Background / Hypothesis:
Kawasaki disease (KD) is an acute pediatric vasculitis with significant implications for coronary arteries and myocardium, potentially leading to long-term myocardial fibrosis. With the advancements in speckle tracking echocardiography (STE), ultrasound parameters have been shown to be reliable in the early detection of structural and functional myocardial abnormalities, thus mitigating some limitations of cardiac magnetic resonance imaging (MRI). Despite its gold standard status for assessing myocardial ffbrosis, the application of cardiac magnetic resonance (CMR) with late gadolinium enhancement(LGE) in pediatrics is restricted. Therefore, this study aimed to investigate the correlation between myocardial strain parameters and LGE in children with KD.

Materials and Methods:
We prospectively recruited 100 children with KD and 25 healthy control (HC) children. Left ventricular (LV) function and LGE in the children were evaluated concurrently using echocardiography and CMR.

Results:
Of the 55 KD children (11 LGE-positive, 44 LGE-negative) and 22 HCs, LGE positivity was higher among those with giant coronary aneurysms (GCAs) and medium coronary aneurysms (MCAs).LGE-positive patients exhibited signiffcantly reduced LV global longitudinal strain (GLS) and strain rates, including 4-chamber GLS [mid-myocardial layer (Mid): 16.82%±5.50% vs. 20.45%±2.43%, subepicardial myocardial layer (Subepi): 14.71%±4.76% vs. 17.67%±2.18%, subendocardial myocardial layer (Subendo): 19.33%±6.49% vs. 23.74%±2.84%] and 4-chamber early diastolic strain rate (SRe: 1.92±0.73 vs. 2.33±0.46 s–1), compared to LGE-negative patients and HCs.

Conclusions:
In the chronic phase, patients with KD may be at risk of myocardial ffbrosis, underscoring the importance of evaluating myocardial function and LGE. Our study indicates that STE could be a valuable tool for assessing focal ffbrosis in children with chronic-phase KD. However, due to limitations such as a small sample size, high dropout rate of CMR, and differences in LGE distribution, future studies with larger sample sizes are needed to validate these ffndings and their predictive efffcacy.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2538 - PROGNOSTIC MODEL FOR REGRESSION OF CORONARY ARTERY ANEURYSMS IN KAWASAKI DISEASE EVIDENCE FROM A THREE YEAR FOLLOW UP STUDY IN SOUTHWEST CHINA

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Background / Hypothesis:
Coronary artery aneurysm (CAA) is a serious cardiac complication of Kawasaki disease (KD), yet few models predict long-term outcomes in these patients. This study aimed to develop and validate a prognostic model for CAA regression in KD.

Materials and Methods:
We retrospectively analyzed demographic and laboratory data from KD patients with CAA treated at the First Affiliated Hospital of Guangxi Medical University between 2012 and 2022, with follow-up until 2025. Cox regression identified predictors of CAA regression at one, two, and three years. Model performance was assessed using receiver operating characteristic (ROC) curves, calibration plots, and decision curve analysis.

Results:
Among 658 patients (male:female ratio 2.6:1), 557 diagnosed from January 2012 to July 2021 were randomly split into training (n = 390) and testing (n = 167) cohorts. The temporal external validation cohort comprised 101 cases diagnosed between August 2021 and July 2022. Independent predictors were age at diagnosis (HR = 0.994, 95% CI 0.990–0.998), coronary artery dilation (vs. small CAA: medium CAA HR = 0.398, 95% CI 0.299–0.530; giant CAA HR = 0.058, 95% CI 0.027–0.125), platelet count (HR = 0.999, 95% CI 0.998–1.000), and fibrinogen (HR = 1.143, 95% CI 1.042–1.255). The model's AUCs for predicting regression at one, two, and three years were 0.854, 0.919, and 0.910 in the training set; 0.844, 0.910, and 0.913 in the testing set; and 0.763, 0.886, and 0.986 in the external validation cohort.

Conclusions:
We developed and validated a prognostic model for CAA regression in KD patients, demonstrating strong discrimination, calibration, and clinical utility. This tool may assist clinicians in individualized risk assessment and follow-up planning.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2573 - SERUM TENASCIN C AND OSTEOPONTIN IN MIS C PREDICTING CARDIAC INVOLVEMENT AND DISEASE PROGRESSION

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Background / Hypothesis:
Multisystem Inflammatory Syndrome in Children (MIS-C), a severe complication following COVID-19, presents with systemic inflammation and frequent cardiac involvement. This study aimed to evaluate serum Tenascin-C (TNC) and Osteopontin (OPN) levels in MIS-C, investigating their potential roles in predicting disease severity, cardiac involvement, and guiding clinical management.

Materials and Methods:
A total of 56 MIS-C patients and 20 healthy controls were enrolled. Patients were categorized as mild–moderate or severe MIS-C, and as with or without cardiac involvement. Demographic data, anthropometric measurements, and clinical symptoms were recorded. Laboratory tests included hemogram, biochemical, coagulation, and cardiac markers. Serum TNC and OPN levels were measured. All patients underwent electrocardiography (ECG) and echocardiography (ECHO)

Results:
Dermatologic and cardiac involvement were more frequent in the severe MIS-C group ($p<0.05$). Severe cases showed higher rates of thrombocytopenia and lymphopenia, elevated AST, procalcitonin, and lipase, lower sodium levels, and more frequent hyponatremia and hypoalbuminemia ($p<0.05$). NT-proBNP and troponin levels were significantly higher in severe cases and in those with cardiac involvement ($p<0.05$). While TNC and OPN levels were elevated in MIS-C compared to controls, and in those with cardiac involvement compared to those without, these differences were not statistically significant ($p>0.05$). However, TNC levels were significantly higher in severe MIS-C compared to mild–moderate cases ($p<0.05$). ROC analysis identified a TNC cutoff of 1290.37 ng/L, predicting severe cases with 61.5% sensitivity and 76.7% specificity.

Conclusions:
Serum TNC levels were significantly associated with MIS-C severity, suggesting potential utility as a prognostic biomarker. Although OPN did not show significant predictive value, TNC measurement could support early risk stratification and guide management strategies. Further studies are warranted to validate these findings.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2578 - TAKAYASU ARTERITIS PRESENTING AS ACUTE MYOCARDIAL INFARCTION A CASE REPORT

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Background / Hypothesis:
Takayasu arteritis (TAK) is a chronic granulomatous vasculitis that may involve the aorta, its major branches, and rarely the coronary arteries. Bilateral coronary ostial stenosis secondary to TAK is exceptionally rare and life-threatening.

Materials and Methods:
We report an 11-year-old boy with TAK-induced bilateral coronary ostial stenosis causing acute myocardial infarction (AMI). Retrospective data collection included demographics, clinical features, electrocardiography (ECG), laboratory studies, procedural records, and 3-month follow-up assessments.

Results:
The previously healthy boy presented with a 3-week history of exertional chest pain and syncope. Physical examination was unremarkable. Investigations revealed elevated CRP, ESR, and cardiac enzymes. ECG during chest pain showed diffuse ST-segment abnormalities that resolved spontaneously. Echocardiography demonstrated aortic intimal thickening, moderate aortic regurgitation, and bilateral coronary ostial stenosis with increased flow velocity. Computed tomography angiography (CTA) confirmed diffuse intimal thickening of the ascending aorta, bilateral coronary ostial stenoses, and wall thickening in the left carotid and brachiocephalic arteries. Despite intravenous methylprednisolone pulse therapy, metoprolol, isosorbide mononitrate, and atorvastatin, vascular lesions progressed. On the 10th day of admission, emotional stress triggered syncope with tachycardia (130-140 bpm), diffuse ECG ST-segment changes, and rising cardiac enzymes. After MDT discussion, VA-ECMO-supported coronary angiography was performed, revealing critical stenoses (90% in left main coronary artery proximal segment; 90% in right coronary ostium). IVUS-guided balloon angioplasty (cutting balloon and drug-coated balloon) was performed, achieving left coronary minimal diameter of 3.5 mm. Subsequent maintenance therapy with tocilizumab resulted in clinical remission. At 3-month follow-up, the patient remained syncope-free with normalized inflammatory markers and cardiac enzymes. Echocardiography and coronary CTA showed normalized coronary flow velocities and reduced aortic intimal thickening.

Conclusions:
AMI during acute-phase TAK poses great therapeutic challenges. Echocardiography may serve as a screening tool for assessing coronary involvement. VA-ECMO-supported percutaneous coronary intervention represents a viable rescue strategy for life-threatening coronary stenosis in active TAK.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2605 - DEVELOPMENT AND VALIDATION OF AN INTERPRETABLE PREDICTION MODEL FOR IVIG RESISTANT KAWASAKI DISEASE A MULTICENTER PROSPECTIVE COHORT STUDY

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Background / Hypothesis:
The early identification and prediction of intravenous immunoglobulin (IVIG)-resistant Kawasaki disease (KD) patients remain essential for mitigating the incidence of coronary artery complications. This research aimed to construct and validate an interpretable prediction model for IVIG-resistant KD using machine learning (ML) approaches and convert it into an intuitive software application, explore the pathogenic contributors to IVIG-resistant in KD.

Materials and Methods:
A multicenter design study aimed at constructing and validating predictive models. The derivation cohort consisted of 3,023 KD patients admitted to Children's Hospital of Soochow University between January 2020 and December 2024, utilized for training and internal validation of the models. For external validation, a dataset comprising 1,626 KD patients from the Anhui Provincial Children's Hospital, the Affiliated Xuzhou Children's Hospital of Xuzhou Medical University, and Jiangsu Province (Suqian) Hospital, admitted between January 2020 and December 2024, was employed. Utilizing 33 clinical variables readily obtainable or assessable within 24 h of KD patient admission, twelve ML algorithms were applied to develop predictive models. Their discriminative capacities were evaluated based on the area under the receiver operating characteristic curve (AUC). SHapley Additive exPlanations (SHAP) were subsequently used to assess feature importance and interpret the final model.

Results:
Among the twelve ML algorithms, the extra trees (ET) model exhibited superior discriminative capacity. Upon dimensionality reduction based on the ranked importance of features, an interpretable ET model incorporating eight variables was finalized. These findings suggest that the model provides effective predictive performance for IVIG-resistant KD. Furthermore, the model has been implemented as an accessible web-based application, enhancing its feasibility in clinical settings.

Conclusions:
The interpretation of machine learning techniques by adopting the SHAP method has potential value in helping to start preventive intervention for children with IVIG-resistant KD patients at an early stage, providing strong support for clinical practice.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2606 - PRELIMINARY STUDY ON THE ROLE OF NEUTROPHILS IN CORONARY ARTERY LESIONS OF KAWASAKI DISEASE

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Background / Hypothesis:
Kawasaki disease (KD), a childhood immune-mediated vasculitis, causes coronary artery aneurysms and is the leading cause of acquired pediatric heart disease. Activated neutrophils drive acute-phase pathology, yet their mechanisms remain unclear. This study explores neutrophil heterogeneity and its role in vascular injury.

Materials and Methods:
Single-cell RNA sequencing of KD leukocytes identified coronary injury-associated neutrophil clusters. Validation used flow cytometry, ELISA, and knockout mice CD177, GSDMD, S100a9. CAWS-induced KD mice received interventions Ly6G antibodies, NET/GSDMD/S100a9–TLR4 inhibitors. Coronary inflammation was analyzed via histopathology and flow cytometry. Cardiac neutrophils underwent single-cell sequencing, and in vitro studies examined neutrophil-VSMC interactions.

Results:
$CD177^+$ neutrophils exhibited proinflammatory immaturity, while $CD74^+$ subsets showed antigen-presenting traits. Their dynamics correlated with coronary lesions (CAL) and IVIG resistance. CD177 knockout or NET inhibition reduced coronary inflammation, elastic fiber degradation, and VSMC transformation in mice. S100a9 emerged as a key mediator linking neutrophil dysregulation to vascular injury. GSDMD upregulation in $CD177^+$ cells promoted NETosis; its inhibition or neutrophil-specific knockout attenuated NET deposition and VSMC remodeling. The CD177-GSDMD-NETosis-S100a9 axis was central to VSMC pathology.

Conclusions:
This study defines neutrophil heterogeneity in KD, highlighting $CD177^+$ subsets driving CAL and IVIG resistance via GSDMD-mediated NETosis and S100a9 release. These findings provide a molecular framework for targeting neutrophil-driven vascular injury, advancing diagnostic and therapeutic strategies.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2609 - VALUE OF DYNAMIC CHANGES IN INFLAMMATORY BIOMARKERS FOR PREDICTING INTRAVENOUS IMMUNOGLOBULIN RESISTANCE IN CHILDREN WITH KAWASAKI DISEASE

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Background / Hypothesis:
This study assessed the predictive value of dynamic laboratory parameter changes before and after intravenous immunoglobulin (IVIG) treatment for IVIG resistance in children with Kawasaki disease (KD).

Materials and Methods:
Children with KD were stratified based on the occurrence of IVIG resistance. Logistic regression analyses were conducted to identify independent risk factors. The predictive performance of variables and their fractional changes (FC) was evaluated through receiver operating characteristic (ROC) curve analysis. Nonlinear associations between predictors and outcomes were examined via restricted cubic spline (RCS) analysis.

Results:
The Soochow cohort analyzed 1,796 children, with IVIG resistance observed in 140 cases (7.8%). 636 children from the Anhui cohort were included in external validation. Multivariate regression analysis identified pre-treatment CLR and Hb, post-treatment CLR, LMR, NLR, Hb, and FCs in WBC, Hb, NE%, and NE count as significant independent predictors of IVIG resistance ($P < 0.05$). ROC analysis demonstrated that WBC(FC) and NE count(FC) were the strongest predictors of IVIG resistance, with AUCs of 0.7677 and 0.7818, respectively, outperforming other parameters. The combined AUC of FC was 0.8307 in the Soochow cohort and 0.8564 in the validation cohort. RCS analysis revealed significant nonlinear relationships between predictors and IVIG resistance.

Conclusions:
Fractional changes in WBC and NE count were established as robust predictors of IVIG resistance in KD. Future efforts should focus on developing predictive models with thresholds and dynamic risk assessments at various time points to enhance the accuracy of IVIG resistance prediction. Clinicians should closely monitor children with IVIG resistance risk factors and reassess the risk after first treatment.

POSTER PRESENTATIONS

Category: Acquired Diseases of Coronary Arteries and Heart Layers

2614 - AN INTERPRETABLE MACHINE LEARNING BASED ONLINE TOOL FOR EARLY PREDICTION OF CORONARY ARTERY DAMAGE RISK IN KAWASAKI DISEASE DEVELOPMENT AND EXTERNAL VALIDATION

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Background / Hypothesis:
Kawasaki disease (KD) is a leading cause of acquired heart disease in children, potentially causing severe complications like coronary artery aneurysms (CAAs), which result in long-term cardiovascular problems. Early detection of medium-to-giant coronary artery aneurysms (MGCAA) is critical, as they are linked to higher morbidity and mortality. Although intravenous immunoglobulin (IVIG) is the standard treatment, 10-20% of patients show IVIG resistance, increasing their risk of complications. Current MGCAA prediction models are limited by the lack of real-time assessment and advanced machine learning (ML) integration.

Materials and Methods:
This retrospective study analyzed data from 443 KD patients treated at Fuzhou University Affiliated Provincial Hospital from 2012 to 2024. Eleven ML algorithms were assessed using cross-validation. Feature selection was performed via recursive feature elimination (RFE), and model interpretability was ensured using SHapley Additive exPlanations (SHAP). Model performance was evaluated using AUC, sensitivity, specificity, and other metrics. External validation was conducted with 2,334 KD patients from Suzhou, and an online prediction tool was developed.

Results:
The RF ranger algorithm outperformed others, with an AUC of 0.70, sensitivity of 0.84, and specificity of 0.38. The final model included six features: hemoglobin (Hb), time to diagnosis, mucosal changes, skin rash, triglycerides (TG), and neutrophil percentage (NEU). External validation showed an AUC of 0.75, sensitivity of 0.49, and specificity of 0.89. A web-based prediction tool was created for clinical use. (available at: https://milailai.shinyapps.io/CALsPredictor/)

Conclusions:
We developed and validated an interpretable ML model for early MGCAA risk prediction in KD patients, demonstrating strong performance in both internal and external validations. The online tool supports real-time, individualized risk assessments, facilitating earlier identification and timely intervention.

POSTER PRESENTATIONS

Category: Administration and Policy

1661 - HOW TO SAVE AUSTRALIANS FROM EARLY HEART ATTACKS UNIVERSAL CHILD PARENT SCREENING FOR FAMILIAL HYPERCHOLESTEROLAEMIA (FH)

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Background / Hypothesis:
Familial hypercholesterolemia is a common, inherited and preventable cause of heart attacks and premature atherosclerotic cardiovascular disease, affecting 1:250 Australians. Cardiovascular disease remains the leading cause of death in Australia and costs more than any other condition. Health economic analyses demonstrate that population screening for FH is cost-saving to Governments.

Materials and Methods:
Experts across clinical medicine, healthcare systems and government agencies collaborated on developing and proposing a universal child-parent screening program for Australia. Both a genomics-first and biochemical-testing based approach were considered, with economic modelling and implementation principles used to determine the pros and cons of multiple strategies. Care pathways developed using community collaboration, together with advocacy from FH Australia, enabled the development of targeted education and health promotion for FH.

Results:
A universal genomics-first child-parent screening program has been proposed as the preferred model to complement established cascade screening programs and support the cost-efficient and timely diagnosis of Australians with FH. Enrolment in risk-management and cascade screening pathways, together with implementation planning and government assessment, is currently being undertaken to provide a platform for consideration. We will discuss the results of implementation trials, which informed the development of the proposal, and the key results that guided the final proposal.

Conclusions:
Universal child-parent FH screening can provide a complementary approach to a national genomic screening framework for addressing high-risk child and adult-onset conditions.
FH provides a unique opportunity to address the principles and implementation lessons for healthcare systems to address undiagnosed and untreated genetic risk, taking a preventative health-promotion and precision health approach whilst maintaining core-ethical principles.

POSTER PRESENTATIONS

Category: Administration and Policy

1672 - CARDIOMETABOLIC RISK SCREENING AND MANAGEMENT IN SCHOOL AGE CHILDREN A REAL WORLD IMPLEMENTATION STUDY

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Background / Hypothesis:
Cardiometabolic risk (CMR) in children and adolescents remains insidious but causing severe health consequences. With China's pediatric obesity rate steadily increasing, 6% of school-aged children already exhibit ≥2 CMR components including prehypertension, prediabetes, and dyslipidemia. Developing effective early screening protocols within school health systems is crucial for curbing disease progression and preventing adult cardiovascular events.

Materials and Methods:
This real-world implementation study established a multi-tiered collaborative framework integrating tertiary hospitals, community health centers, schools, and families embeded in regular Shanghai annual student health surveillance system. We incorporated waist-to-height ratio (WHtR) with national reference values into routine school physical examinations for initial screening. High-risk individuals underwent confirmatory assessments at community centers, including standardized anthropometry, blood pressure examination, blood biochemistry, and FibroScan® examinations. An innovative digitally-enabled closed-loop system was developed, encompassing "physical monitoring → WHtR screening (non-invasive) → laboratory confirmation (partial invasive) → stratified interventions → outcome feedback".

Results:
In one year, the program covered 26633 students across two districts. Primary screening identified 10088 (37.9%) high-risk individuals. Among 750 suspect CMR students, the new strategy revealed 48.0% of children exhibited ≥1 CMR abnormality (prehypertension: 105(13.7%), dysglycemia: 120(16%) for IFG and 60(8.5%) for IGT, dyslipidemia: 218(29.1%), non-alcoholic fatty liver disease: 170(22.0%). The family-school joint two lifestyle intervention trials achieved one in six confirmed CMR students participation rate, demonstrating strong adherence.

Conclusions:
This WHtR-based stratified CMR management model has been successfully validated within Shanghai's school health infrastructure. The program demonstrates the feasibility of multi-sector collaboration for large-scale screening, the effectiveness of WHtR as a cost-effective primary screening tool, the practicality of digital integration for closed-loop management, and high acceptability among stakeholders. This implementation study provides a scalable blueprint for pediatric CMR management in resource-limited settings. This implementation study provides a scalable blueprint for pediatric CMR management in resource-limited settings.

POSTER PRESENTATIONS

Category: Administration and Policy

1673 - OSCILLOMETRIC BLOOD PRESSURE PERCENTILES BY AGE AND HEIGHT FOR NON OVERWEIGHT CHINESE CHILDREN AND ADOLESCENTS ANALYSIS OF A NATIONWIDE CHILD AND ADOLESCENT CARDIOVASCULAR HEALTH STUDY

Yi Zhang [1], Yalan Dou [2], Xiaotian Chen [2], Wennan He [2], Yuanchen He [2], Weili Yan [2]
Children, Clinical Epdemiology, Shanghai-China [1] Children, Linical Epdemiology, Shanghai-China [2]

Background / Hypothesis:
Hypertension is a major public health issue in China, and elevated blood pressure (BP) in children and adolescents may lead to future hypertension. While oscillometric BP monitors are recommended for clinical screening and cardiovascular management, current standards rely on mercury sphygmomanometer-based references, lacking China-specific oscillometric BP reference ranges for children and adolescents. This study aimed to establish age-, gender-, and height-specific oscillometric BP reference percentiles for Chinese children and adolescents.

Materials and Methods:
We obtained a reference sample of non-overweight children and adolescents aged 6-17 years from a nationwide population-based cross-sectional study conducted in schools across six Chinese cities (Beijing, Jinan, Changchun, Shanghai, Chongqing, and Chengdu). Standardized blood pressure measurements were obtained using a validated oscillometric device (HEM-7012, OMRON). Gender-specific systolic (SBP) and diastolic (DBP) blood pressure percentiles were calculated using generalized additive models for location, scale, and shape (GAMLSS), accounting for both height and age. The derived values were compared with existing Chinese, US, and German reference standards.

Results:
The 50th, 90th, and 95th percentiles of SBP and DBP for 15,159 boys and 15,345 girls were presented according to age and height percentiles. These observations were generally higher than current Chinese recommendations and also higher than American academy of pediatrics references in under 13 years old children, both of which were developed based on mercury sphygmomanometer measurements. however, the derived percentiles were close to German oscillometric references for non-overweight children and adolescents.

Conclusions:
This study provides the first national height-specific oscillometric BP reference tables for Chinese children and adolescents aged 6-17 years. The findings support the use of oscillometric sphygmomanometers for blood pressure management and hypertension screening in pediatric populations.

POSTER PRESENTATIONS

Category: Administration and Policy

1711 - EVIDENCE BASED PRACTICE GUIDELINE FOR SCREENING OBESITY RELATED CARDIOMETABOLIC RISK USING WAIST TO HEIGHT RATIO IN CHINESE SCHOOL AGED CHILDREN AND ADOLESCENTS

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Background / Hypothesis:
Childhood obesity and associated cardiometabolic risks (CMR) pose significant public health challenges globally. In China, the prevalence of overweight and obesity among children aged 6–17 years has surged, escalating risks for diabetes, dyslipidemia, and hypertension. Existing CMR screening methods relying on invasive blood tests are costly and impractical for large-scale implementation. This guideline addresses the urgent need for a non-invasive, accurate, and cost-effective screening tool. This guideline aims to establish evidence-based recommendations for waist-to-height ratio (WHtR) as a primary screening tool for obesity-related CMR in Chinese school-aged children and adolescents.

Materials and Methods:
A systematic review and meta-analysis of 73 diagnostic accuracy studies (n = 141,818) were conducted following WHO guideline development standards. Relevant literature was sourced from PubMed, Embase, the Cochrane Library, and Chinese databases. Key data extraction focused on WHtR's diagnostic performance—sensitivity, specificity, and area under the receiver operating characteristic curve (AUC-ROC)—for identifying children with ≥3 CMR components, including central obesity, dyslipidemia, impaired fasting glucose, and elevated blood pressure. Study quality was assessed using the QUADAS-2 tool, and the evidence was graded according to the GRADE criteria.

Results:
The meta-analysis demonstrated strong diagnostic accuracy for WHtR in detecting ≥3 CMR components, with a pooled AUC-ROC of 0.91 (95% CI: 0.88–0.93), sensitivity of 0.86 (95% CI: 0.79–0.91), and specificity of 0.82 (95% CI: 0.77–0.87). Subgroup analyses confirmed the robustness of WHtR across different genders and ethnic groups. Age- and sex-specific WHtR cutoffs were established: boys ≤12 years (0.487), boys >12 years (0.468), and girls (0.456).

Conclusions:
This guideline strongly recommends the integration of WHtR into China's national student health monitoring system. WHtR provides a validated, non-invasive approach for early CMR detection, facilitating timely interventions to reduce long-term cardiovascular risks. Periodic updates to WHtR thresholds are advised to accommodate evolving population health trends.

POSTER PRESENTATIONS

Category: Administration and Policy

1747 - LEGAL CASES IN PEDIATRIC MEDICINE AND CARDIOLOGY IN SINGAPORE – A 10 – YEAR REVIEW

Jonathan Choo [1], Danielle Choo [2]
Kk Women's And Children's Hospital, Cardiology, Singapore-Singapore [1] National University Of Singapore, Student, Singapore-Singapore [2]

Background / Hypothesis:

Practitioners in Pediatrics and Cardiology have been increasingly concerned about the risk of litigation for medical malpractice.

Materials and Methods:
LAWNET is an extensive database of legal cases in Singapore. The database was searched with the terms "Pediatrics", "Paediatrics", "Pediatrician", "Paediatrician", "Cardiology" and "Cardiologist" selecting cases from 31 March 2015 to 31 March 2025. Primary sources were identified. The cases were categorized into issues with respect to consent, diagnosis, and treatment. The cases were also categorized into cases involving single practitioners and those involving multidisciplinary teams. The outcome of whether litigation had been successful against the practitioner was also recorded. All cases had been closed at the time of analysis. Cases that had been settled out of court by mediation were not captured.

Results:
During the above 10-year period, there had been 1 case involving a cardiologist who had allegedly not obtained adequate informed consent prior to percutaneous coronary intervention [2017] SGHC 260, 1 case involving a pediatrician who failed to diagnose Kawasaki Disease [2017] SGHC 139. The ruling against the cardiologist in the first case was subsequently reversed at an appellate court. There had been no cases involving multidisciplinary team management in Cardiology and Pediatric Medicine that had surfaced in court. There was a case in which there had been alleged negligence on the part of a general medicine multidisciplinary team for failure to diagnose myocardial infarction [2022] SGHC 259. This claim was not successful.

Conclusions:
In the context of Pediatrics and Cardiology, it is rare to have medical malpractice cases surface in courts of law. In the review of cases from Singapore, issues with informed consent and diagnosis were brought to court. An awareness of the fundamental issues raised will allow practitioners to be particularly careful in the management of these aspects of patient interaction and care.

POSTER PRESENTATIONS

Category: Administration and Policy

1911 - ESTIMATING THE GLOBAL ECONOMIC IMPACT OF CONGENITAL HEART DISEASE A VALUE OF LOST WELFARE APPROACH

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Background / Hypothesis:
Congenital heart disease (CHD) is the most common congenital anomaly, affecting approximately one in every 100 live births. Despite global progress in reducing neonatal, infant, and child mortality in recent decades, access to pediatric and congenital cardiac care remains limited. Over 90% of children with CHD cannot access the care they need, resulting in nearly 200,000 preventable deaths due to CHD each year. In this study, a value-of-lost-welfare (VLW) approach is applied to estimate the economic impact of CHD around the world.

Materials and Methods:
The VLW was used to quantify total economic welfare losses for each country by calculating the value of statistical life year (VSLY) relative to the identified CHD burden with undiscounted future life expectancy. Data on the disability-adjusted life-years of CHD were obtained from the Global Burden of Disease Results Tool for 2021. Based on the literature, 49% of the burden was estimated to be surgical. Sensitivity analyses were performed with 5% discount rates for expected life years and varying VSLs between 100% and 200% to account for different VSLYs for children relative to adults.

Results:

Conclusions:
The global economic burden due to CHD is enormous, costing countries billions in potential economic welfare losses. Global political prioritization of CHD is critical to prevent further unnecessary child deaths due to this unpreventable and common condition.

POSTER PRESENTATIONS

Category: Administration and Policy

2076 - IMPLEMENTING A CLINICAL GOVERNANCE FRAMEWORK TO IMPROVE SURGICAL OUTCOMES IN PEDIATRIC CARDIAC CARE A LOW RESOURCE SETTING EXPERIENCE

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Pakistan Children's Heart Foundation, Pchf-ulth Child Heart Center, Lahore-Pakistan [1]

Background / Hypothesis:
Pediatric cardiac care in low- and middle-income countries (LMICs) often faces systemic challenges, including variability in clinical protocols, fragmented data systems, and limited quality oversight. In 2023, the PCHF-ULTH Child Heart Center—a dedicated pediatric cardiac surgery unit established in January 2018 within a teaching hospital in Lahore, Pakistan—introduced a clinical governance framework to enhance care quality, improve surgical safety, and reduce preventable mortality.

Materials and Methods:
A structured clinical governance model was implemented in January 2023. Components included daily interdisciplinary safety huddles, monthly mortality and morbidity (M&M) reviews, standardized perioperative protocols, participation in the International Quality Improvement Collaborative (IQIC), and a non-punitive incident reporting system. Outcomes were compared between two periods: pre-governance (2018–2022; 844 surgeries) and post-governance (2023–2025; 693 surgeries). Performance metrics included postoperative mortality, infection control compliance, ICU stay duration, and data quality.

Results:
Postoperative mortality increased from 3.08% to 4.47%, attributed to a shift toward higher-complexity cases post-2023. Infection control compliance improved by an estimated 40% based on audit scores and reduced surgical site infections. Average ICU stay decreased by 0.8 days. IQIC data completeness improved to over 95%, and benchmark indicators began aligning with international medians. Qualitative feedback indicated improved team communication, enhanced adherence to protocols, and greater family engagement.

Conclusions:
A structured clinical governance framework can support safe expansion of pediatric cardiac programs in LMICs, even under resource constraints. Despite increasing surgical complexity, outcome stability and system-level improvements demonstrate the effectiveness of governance-driven interventions. These findings support the scalability of clinical governance frameworks in similar settings seeking to strengthen patient safety and institutional accountability.

POSTER PRESENTATIONS

Category: Administration and Policy

2140 - ANALYSIS OF THE THERAPEUTIC EFFECT OF PRENATAL AND POSTPARTUM INTEGRATED TREATMENT AND TRANSCATHETER PULMONARY VALVE DILATION AND SHAPING SURGERY ON NEONATAL CRITICAL PULMONARY VALVE STENOSIS

Lieqiang Zhong [1], Junjie Li [1], Yufen Li [1], Shushui Wang [1], Zhiwei Zhang [1]
Cardiology And Pediatrics, Guangdong Provincial People's Hospital, Guangzhou-China [1]

Background / Hypothesis:
Neonatal critical pulmonary valve stenosis (NCPS) poses a serious threat to the life and health of newborns. This article aims to explore the therapeutic effects of integrated prenatal and postpartum treatment, as well as transcatheter pulmonary valve balloon angioplasty (PBPV), on NCPS patients.

Materials and Methods:
Retrospective analysis of clinical data of newborns diagnosed with NCPS and treated with PBPV at Guangdong Provincial People's Hospital from January 2020 to January 2025. Collect information on the age, weight, pre - and post-operative blood oxygen levels, echocardiography, interventional surgery related data, and complications of the neonatus.

Results:
A total of 14 pediatric patients were included in the study, including 8 males and 6 females; 7 cases of integrated prenatal and postpartum care for infants; Age 13-30 (19.8 ± 4.75) days; Weight 3-5.2 (3.49 ± 0.8) kg; The transvalvular pressure gradient of the pulmonary artery valve before dilation was measured by the catheter at the surgical center to be 89.62 ± 25.05mm Hg; The inner diameter of the pulmonary valve annulus is 7.13 ± 1.02mm. The average ratio of the diameter of the dilation balloon to the diameter of the pulmonary valve annulus during the operation was 1.28 ± 0.16. The transvalvular pressure gradient of the pulmonary valve after dilation was 23.85 ± 14.62mmHg, and the interventional radiation time was 15.2 ± 12.7min. The postoperative transcutaneous oxygen saturation (SPO 2) was 96.43 ± 3.46%, and the average discharge time was 2-7 (3.55 ± 1.96) days after surgery. Two cases developed urinary tract infections after surgery. One patient underwent open pulmonary valve angioplasty 19 days after PBPV surgery due to dependence on alprostadil and poor blood oxygen maintenance.

Conclusions:
PBPV is an effective method for treating NCPS. Children with integrated prenatal and postpartum care have a more significant increase in blood oxygen after valve dilation.

POSTER PRESENTATIONS

Category: Administration and Policy

2279 - MEDICAL NEGLIGENCE IN PEDIATRIC CARDIOLOGY AND CONGENITAL CARDIAC SURGERY – A 20 – YEAR REVIEW IN COMMON LAW JURISDICTIONS

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Background:
Practitioners in Pediatric Cardiology have been increasingly concerned about the risk of litigation for medical malpractice. We aim to review the medical negligence cases that have been brought to courts of law over the last 20 years in common law jurisdictions.

Methods:
LAWNET is a database of legal cases established by the Singapore Academy of Law. It includes cases from UK and Malaysia. This database was extensively searched with the terms "Pediatric Cardiology", "Paediatric Cardiology", "Pediatric Cardiologist" and "Paediatric Cardiologist", "Cardiac Surgery", "Congenital Cardiac Surgery", "Paediatric Cardiac Surgery", "Paediatric Cardiac Intervention" and "Congenital Cardiac Surgery" selecting cases from 1 January 2000 to 31 December 2019. Both primary and secondary sources (e.g. law reports) were identified. Cases involving acquired cardiac disease presenting in adult life were excluded in the final analysis. The cases were categorized by jurisdiction and whether the primary issue of negligence was one of diagnosis, advise or treatment. The outcome of whether litigation had been successful against the practitioner was also recorded.

Results:
During the above 20-year period, there had been 1 case of medical malpractice from 2000 to 2009 and 3 cases from 2010 to 2019. Over the 20-year period, there was 2 cases from the United Kingdom, 2 cases from Singapore and no recorded cases from Malaysia. 2 were issues of medical diagnosis, 1 case was a treatment -related issue and there had been 1 case of inadequate consent in the retention of organs.

Conclusion:
In the context of Pediatric Cardiology and Congenital Cardiac Surgery, it is very uncommon to have medical malpractice cases reach the courts in Common Law Jurisdictions. There were more cases surfacing in courts in recent years as compared to the past. The overall low numbers may reflect successful attempts at mediation and settlement out of court in the studied jurisdictions.

POSTER PRESENTATIONS

Category: Administration and Policy

2502 - UNSUSTAINABLE AND OVERWORKED UNPACKING THE CHALLENGES FACED BY PEDIATRIC CARDIOLOGISTS AND CARDIAC SURGEONS IN KOREA

Soo In Jeong [1], Gi Beom Kim [2], Sung Hye Kim [3], Jae Yoon Na [4], Hong Ju Shin [5], Sin Weon Yun [6], Lucy Youngmin Eun [7], Sang Yun Lee [8], Chang-ha Lee [9], Kwang Ho Choi [10], Seul Gi Cha [11], Mi Young Han [12]

Ajou University Hospital, Pediatrics, Suwon-South Korea [1] Seoul National University Children's Hospital, Pedaitrics, Seoul-South Korea [2] Cha Bundang Medical Center, Pediatrics, Seoul-South Korea [3] Hanyang University College Of Medicine, Pediatrics, Seoul-South Korea [4] Danwon Hospital, Thoracic And Cardiovascular Surgery, Ansan-South Korea [5] Chung-ang University Hospital, Pediatrics, Seoul-South Korea [6] Yonsei University Gangnam Severance Hospital, Pediatrics, Seoul-South Korea [7] Seoul National University Children's Hospita, Pediatrics, Seoul-South Korea [8] Bucheon Sejong Hospital, Thoracic And Cardiovascular Surgery, Bucheon-South Korea [9] Pusan National University Yangsan Hospital, Thoracic And Cardiovascular Surgery, Pusan-South Korea [10] Asan Medical Center, Pediatrics, Seoul-South Korea [11] Kyung Hee University Hospital, Pediatrics, Seoul-South Korea [12]

Background:
Pediatric cardiologists (PCs) and pediatric cardiac surgeons (PedCSs) in Korea face worsening workforce shortages due to declining birth rates, low interest among trainees, and increasing burnout. This study surveyed the working conditions, job satisfaction, and burnout among active Korean pediatric cardiac specialists.

Methods:
In June 2023, the Korean Pediatric Heart Society sent a structured questionnaire to 149 members (115 PCs, 34 PedCSs).
Results 122 responses (96 PCs, 26 PedCSs) were analyzed (response rate: 81.9%). Among respondents, 79.2% of PCs and 80.8% of PedCSs worked over 51 hours per week, and most faced monthly emergency callbacks. Regional disparities were significant: 48.2% of PCs in the Seoul Metropolitan Area (SMA) performed over 51 catheterizations annually compared to 7.1% in other regions. Similarly, 62.5% of SMA-based PedCSs performed over 30 surgeries annually versus 20% elsewhere. Legal challenges were reported by 66.7% of PCs and 84.6% of PedCSs. Burnout was reported by 64.0% of PCs and 61.6% of PedCSs. Multivariable analysis showed that experiencing ≥6 emergency callbacks per month (aOR 7.91), occupational dissatisfaction (aOR 2.57), and dissatisfaction with the work environment (aOR 2.74) were independent predictors of burnout. Weekly working hours were not significant after adjustment.

Conclusion:
Burnout among Korean pediatric cardiac specialists is driven by high workloads, frequent emergency calls, legal risk, and regional disparities in case volume. Sustained efforts, including regular surveys and policy-level interventions, are needed to ensure the future sustainability of pediatric cardiac care in Korea.

POSTER PRESENTATIONS

Category: Administration and Policy

2616 - TEAM BASED MODE OF REGIONALIZED CARE FOR CONGENITAL HEART DISEASE IN A RESOURCE LIMITED SETTING

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Shanghai Children's Medical Center, Heart Center, Shanghai-China [1]

Background / Hypothesis:
Regionalization has been proposed as a method to improve outcomes for patients with congenital heart disease (CHD), but the ideal model of regionalization remains controversial. The purpose of this study was to describe recent experience with a team-based regionalized care of CHD patients in a resource-limited setting and compare it to earlier outcomes.

Materials and Methods:
Shanghai Children's Medical Center (SCMC) is a high-volume, advanced pediatric cardiac hospital performing > 3000 congenital heart surgeries annually in China. Since 2022, SCMC has established a partnership with local healthcare workers to provide tertiary care for patients with CHD in an under-developed area (Guizhou) in China by assigning a specialist cardiac team to the local hospital. The primary composite endpoints were mortality within 1 year of the index diagnosis of CHD or treatment delay. Treatment delay was defined as time interval of more than 3 months after the initial clinicians' recommendation for surgery.

Results:
Number of patients in the pre-regionalization phase (January, 2013-July, 2022) was 3062 and in the post-regionalization phases (August, 2022-August, 2024) was 848. Patients in the post-regionalization phase were more likely to be younger (median age of 11.2 [IQR, 4.2-42.5] months, vs. 35.6 [IQR, 12.3-74.6] months; P<0.001) and have high-complexity cardiac lesions (Risk Adjustment for Congenital Heart Surgery-2 [RACHS-2] score ≥ 3; 43.8% vs. 18.8%; P<0.001). A significantly lower rate of the primary endpoint was observed in the post- than pre-regionalization group (24.6% vs. 7.3%, P<0.001; Figure). Lower levels of household income (HR= 4.22, 95% CI, 3.32-5.36; P<0.001) and family education (HR= 1.44, 95% CI, 1.15-1.80; P=0.001) were strongly associated with treatment delay in the pre-regionalization phase, but these two risk factors were mitigated after implementation of the regionalized care.

Conclusions:
For pediatric CHD population with disadvantaged sociodemographic status, a team-based regionalization program appears to be effective and feasible to improve clinical outcomes

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1038 - SILENT THREAT WHEN PERIPARTUM CARDIOMYOPATHY CONCEALS A HEMODYNAMICALLY SIGNIFICANT PATENT DUCTUS ARTERIOSUS.

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Makati Medical Center, Achd, Makati City-Philippines [1] Makati Medical Center, Pediatric Cardiology, Makati City-Philippines [2]

Introduction:
Peripartum cardiomyopathy is defined by the Working group on PPCM of the European Society of Cardiology as an idiopathic cardiomyopathy presenting as heart failure secondary to left ventricular systolic dysfunction towards the end of pregnancy or in months following delivery, where no other cause of heart failure is found. A persistent patent ductus arteriosus can be clinically silent for years in adults until an inciting event shifts the homeostasis.

Case:
F.L, a 40 year old female just had her firstborn when she noted recurrent rotatory dizziness, nausea, and palpitations accompanied by exertional dyspnea. She would soon develop 2-pillow orthopnea, bipedal edema, and progressive decrease in activity due to fatigue. She was diagnosed to have peripartum cardiomyopathy and started on heart failure medications including a diuretic. Despite her treatment regimen, her symptoms would recur with a sudden onset of shortness of breath and easy fatigability on ambulating. 12 lead ECG would reveal atrial tachycardia. Her NT-proBNP was elevated at 1,751 pg/mL and a troponin I of 0.18. A repeat transthoracic echocardiogram would show mosaic flow with a left-to-right shunt in the posterior aspect of the main pulmonary artery consistent with a patent ductus arteriosus (Qp:Qs = 2:1). Mean pulmonary artery pressure was was calculated at 45 mmHg. Calculated Qp:Qs from right heart catheterization was 1.44. Device closure was successfully done.

Discussion:
The American Heart Association guideline for management of adult patients with hemodynamically significant patent ductus arteriosus (HSPDA) suggests closure of the PDA when the PVR was more than of the systemic. Nonetheless, Despite falling in the gray area, the patient was still a candidate for closure as she had recurrent admissions for heart failure.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1058 - ARTERIAL SWITCH OPERATION FOR TRANSPOSITION OF THE GREAT VESSELS – WHAT ABOUT THE CORONARY ARTERIES

Rachel Lim [1], Jeffrey Lefkovits [2], Samuel Menahem [3]
University Of Melbourne, Department Of Medical Education, Melbourne-Australia [1] Royal Melbourne Hospital, Department Of Cardiology, Melbourne-Australia [2] Monash University, Department Of Paediatrics, Melbourne-Australia [3]

Background / Hypothesis:
Transposition of the great arteries (TGA) is a common cause of cyanosis in the newborn. Currently, TGA corrected by an arterial switch operation (ASO) has excellent outcomes. Of importance are the medium and long-term coronary artery complications following ASO, an increasingly relevant issue as the adult population ages and is exposed to co-morbidities and ischaemic changes of later years. This study aims to explore the prevalence, clinical presentation, investigation and management of medium and long-term coronary artery complications following ASO.

Materials and Methods:
A scoping review was undertaken following the Arksey and O'Malley framework and the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews checklist. Two databases were systematically searched (Medline and Embase) and the selection criteria yielded 73 articles.

Results:
These studies showed the relative infrequency of coronary artery complications following ASO with a prevalence of 3% to 11%. There were difficulties detecting such complications clinically as many affected patients were asymptomatic or presented with atypical chest pain. Recommendations varied as to their investigation and management. Multimodal imaging to detect coronary artery complications was often necessary, with computer tomography (CT) coronary angiography and/or direct coronary angiography the mainstay gold standard modalities. Patients who required coronary artery intervention mostly underwent percutaneous coronary interventions, though coronary artery bypass surgery was required in some.

Conclusions:
There is still an ongoing need for evidence-based guidelines and recommendations both for the investigation and management of coronary artery complications as the population of successful ASO adult patients continues to grow and age.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1074 - PATIENT EXPERIENCE INFORMING SERVICE ENHANCEMENT IN ADULT CONGENITAL HEART (ACHD) PATIENTS EXPERIENCING MENOPAUSE

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Great Ormond Street Hospital, Cardiology, London-United Kingdom [1]

Background / Hypothesis:
Progress in medical and surgical treatment means the survival of congenital heart disease (CHD) patients has improved and more survive to adulthood. ACHD patients outnumber paediatric populations and require specialist care to ensure women live well during their 'second transition', perimenopause and menopause.

Methods:
We identified women aged forty nine to sixty one from follow up cardiology clinics and invited them to a patient experience session.
Together with the patients, and supported by clinical nurse specialists and psychologists we mapped the health services our patients interact with, asking the women to identify positive and negative aspects of care in relation to menopause symptoms and service provision.
Using the service map patients teased out key themes and collaboratively developed service enhancement proposals. They then voted, weighting their 'exemplar service' ideas

Results:
Four co developed ideas received the greatest weight as impactful for improving experience for women with congenital heart disease experiencing menopause
•access to ACHD menopause expert advice for clinicians and patients
•digital patient 'passport' supporting enhanced self care
•access to combined gynaecology and ACHD nurse-led clinics
•new guidance for GPs from ACHD Cardiologists in prescribing ACHD HRT and in symptom management

Conclusions:
Women born with congenital heart disease are for the first time living to an age where a lifetime of follow up care from ACHD services should include advice and support in managing menopause symptoms and treatment. Patients termed this phase in their care a 'second transition'. Clinical services need to adapt and expand to support women to live well. Menopause symptoms may mirror cardiac symptoms, causing anxiety, and a need to seek urgent care. Hormone Replacement Therapy (HRT) treatment may not be prescribed due to lack of information available to GPs. Patients' lived experience supports service enhancements by ensuring care reflects the needs of this

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1088 - CARE OF CONGENITAL HEART DISEASE IN AN ADULT CARDIAC SURGERY SERVICE.V

Alejandra Peña Juarez [1], David Ramirez Cedillo [2], Jaime Gilberto Lopez Taylor [3], Carlos Alberto Jimenez Fernandez [4], Italo Masini Aguilera [3], Halina Olmos Sanchez [5], Cynthia Ramirez Frias [3], Alondra Contreras Godinez [3], Miguel Angel Medina Andrade [6], Maria Alejandra Minakata Quiroga [7], Miriam Aidee Castellanos Enciso [8]
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Background / Hypothesis:
Background. Congenital heart disease (CHD) is the main malformation at birth and their diagnosis and treatment is considered one of the main triumphs of current medicine. Pediatric cardiology has not only evolved in the diagnosis but also in the treatment of these patients, so survival is currently much greater reaching adult stages.

Objective:
Determine the demographic, clinical and management characteristics of patients with adult CHD who required surgical repair at our institution.
Materials and Methods:Objective: determine the demographic, clinical and management characteristics of patients with adult CHD who required surgical repair at our institution.

Results:
A total of 400 patients were included. Demographic characteristics: slight predominance of males with 53% and mean age of 35 years. The main heart disease was bivalve aorta with 40% followed by ASD with 18%, only 2% had a history of cardiac surgery in the pediatric stage (Table 1). Characteristics of surgical procedures, complications and hospital stay. The mean CPB was 155 minutes and aortic clamping 122 minutes. The most commonly used cardioplegia solution was custodial in 98% of cases. The estimated mean bleeding was 231ml. Regarding the type of surgical procedure, 8% underwent minimally invasive cardiac surgery. Of the postoperative complications, the most common was bleeding in 9.3%, followed by severe paravalvular leak in 2%. The mean hospital stay was 7 days, with a hospital survival rate of 90.6%. Table 2

Conclusions:
The data obtained in the study indicate that there is still a late diagnosis of CHD, which is why it is necessary to modify public care policies at the national level for its adequate management.

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Category: Adult Congenital Heart Disease

1173 - MENTAL WELLNESS SCREENING IN ADULTS WITH CONGENITAL HEART DISEASE – PRELIMINARY RESULTS FROM A NATIONAL CENTRE

Chee Lan Lim [1], Aidila Ismail [1], Madel Hidalgo [1], *Lee Phong Teck* [1], Limin Yan [1], Jie Sheng Foo [1], Ju Le Tan [1]
National Heart Centre Singapore, Cardiology, Singapore-Singapore [1]

Background / Hypothesis:
Adults with congenital heart disease (ACHD) face lifelong physical, mental, and psychological challenges. In western cohorts, approximately 33% and 25% of ACHD patients suffer from anxiety and depression, respectively. These conditions impact quality of life, medication compliance, and health-seeking behaviour. The aim of our study was to evaluate the prevalence of anxiety and depression among ACHD patients in Singapore. We also aim to compare the severity of anxiety and depression between patients with mild-moderate and severe complexity ACHD lesions.

Materials and Methods:
This cross-sectional study included patients who attended Adult Congenital Heart Disease (ACHD) Clinic at National Heart Centre Singapore between May 2024 to March 2025. Patients were invited to complete the General Anxiety Disorder-7 (GAD-7) and Patient Health Questionnaire (PHQ-9) self-assessments. We compared the severity of anxiety and depression between patients with mild-moderate and severe complexity ACHD lesions. Statistical analysis was performed using independent and simple t-test, p value of <0.05 was considered statistically significant.

Results:
One hundred and two patients participated in the study. There were 36 patients with mild-moderate, and 66 patients with severe complexity ACHD lesions, with no significant differences in age and gender. The median age was 31 years old and predominantly males (64%). Approximately 33% and 31% of patients suffered at least mild levels of anxiety or depression, respectively. Notably, 13% of our cohort suffered from moderate-severe anxiety while 10% had moderate-severe depression. There were no significant differences in anxiety (p=0.20) and depression (p=0.57) levels between mild-moderate and severe complexity groups.

Conclusions:
In our local cohort, approximately one-third of ACHD patients have anxiety and depression. CHD complexity does not significantly affect anxiety or depression levels. Mental wellness screening should be part of routine clinical care for ACHD patients.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1215 - LIVER STIFFNESS A USEFUL TOOL IN THE LONGITUDINAL FOLLOW UP OF PATIENTS WITH FONTAN CIRCULATION.

Chloe Vincent [1], Iriart Xavier [1], Jean Baptiste Hiriart [2], Juliette Foucher [2], Julie Chabaneix [1], Olivier Villemain [3], Pascal Amedro [3], Jean Benoit Thambo [3], Zakaria Jalal [3]
Bordeaux University Hospital (chu), Department Of Pediatric And Adult Congenital Cardiology, Bordeaux-France [1] Bordeaux University Hospital (chu), Department Of Hepatology And Gastroenterology, Bordeaux-France [2] Bordeaux University Hospital (chu), Department Of Pediatric And Adult Congenital Cardiology, Ihu Liryc, Electrophysiology And Heart Modeling Institute, Bordeaux-France [3]

Background / Hypothesis:
Congestive hepatopathy usually develops slowly without obvious clinical features after a Fontan operation (FO). Liver stiffness (LS) was shown to be correlated with the level of hepatic congestion.
To assess the usefulness of LS (assessed by transient elastography (TE)), as a potential surrogate of delayed complications occurrence in patients with FO.

Materials and Methods:
We prospectively integrated systematic LS measurements (LSM) in our cohort of Fontan patients between 2012 and 2024. LS was performed annually and in case of FO associated cardiac (arrhythmias, heart failure, surgical or catheter interventions) and/orsubdiaphragmatic (FO associated liver disease (FALD), protein-losing enteropathy (PLE)) complications.

Results:
Seventy-eight patients (30±11.1 years-old; 15±5.7 years post-FO) were included. Of them, 58 (74%) had at least two LSM. Mean delay between first and last LSM was 3.27±1.9 years. Mean LS at baseline was 15,2± 6,9kPa.LS values were not correlated with patient's age (p=0.14), time since Fontan(p=0.13) or size of TCPC conduit (p=0.6). During follow-up, 43 patients (55%) developed complications (cardiac (48%), subdiaphragmatic (51%)). LS was significantly higher in patient with complications compared to asymptomatic (17.8±7.3 vs 12± 5 kPa, $p < 0.0001$).

Conclusions:
LSM using TE is an excellent tool for the non-invasive follow-up of a patient with FC.Indeed, a higher value of LS is associated with the occurrence of complications.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1222 - INCREASING BURDEN OF HOSPITAL ADMISSIONS IN ADULT CONGENITAL HEART DISEASE PATIENTS RECOGNISING THE IMPORTANCE OF BOTH CARDIAC AND NON CARDIAC NEEDS

Lachlan A. H. Dodds [1], Adithya Shastry [2], Phillip S. Naimo [2], Juliet Ward [2], William M. Wilson [2], Leeanne E. Grigg [2], Katherine M. English [2], Melissa G. Y. Lee [2]
The University Of Melbourne, Melbourne Medical School, Melbourne-Australia [1] The Royal Melbourne Hospital, Cardiology, Melbourne-Australia [2]

Background/Hypothesis:
The ACHD population is rapidly expanding/ageing. We aimed to examine trends in hospital presentations to a large Australian ACHD centre.

Materials and Methods:
Retrospective cohort study of patients followed in our ACHD clinic with an acute/elective presentation to our tertiary hospital over a 4-year period (1/8/2020-31/7/2024). Comparisons were made between the first (2020/2021) and last year (2023/2024).

Results:
A total of 582 patients (male: 49%, 286/582) had 1818 acute presentations and 468 patients (male: 50%) had 842 elective admissions over the 4-year period with a rapid increase over time [acute: 202 vs 286 patients (+42%), 373 vs 527 presentations (+41%); electives: 125 vs 199 patients (+59%), 166 vs 265 admissions (+60%); in the 2020/2021 vs 2023/2024 year, respectively]. The proportion of ACHD clinic patients with an acute presentation or elective admission significantly increased over time [inpatient: 5.7% (202/3507) vs 6.9% (286/4130), p=0.04; 3.6% (125/3507) vs 4.8% (199/4130), p=0.007] while median age at presentation remained stable (34 vs 35 years, p=0.8). Of the 1818 acute presentations, 53% (956/1818) were to Emergency with 54% (516/956) proceeding to admission, and 47% (862/1818) were inter-hospital transfers/direct admissions. Of 1377 total inpatient admissions, 66% (912/1377) were cardiac and 34% (465/1377) non-cardiac with a rapid increase over time [188 vs 265 cardiac (+41%), 91 vs 151 non-cardiac (+66%)]. While most elective admissions were cardiac (72%, 607/842), there was an 82% increase in the number of elective non-cardiac admissions over time (46 vs 84).

Conclusions:
Demand for hospital care in the ACHD population is rapidly growing. While most admissions are cardiac, there was a substantial increase in non-cardiac admissions, highlighting the importance of caring for ACHD patients in a tertiary ACHD centre with specialist multidisciplinary team input. Further research is warranted to determine the training/resources required to accommodate cardiac and non-cardiac needs of this rapidly growing/ageing population.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1224 - IMPACT OF PREGNANCY ON THE CLINICAL EVOLUTION OF PATIENTS WITH UNIVENTRICULAR PHYSIOLOGY AND FONTAN SURGERY

Eduardo Jose Ribeiro Viana Junior [1], *Vítor Doria Ricardo* [1], Carolina Beatriz Amaral [1], Tatiane Yukari Takahashi [1], Walkiria Samuel Avila [1], Maria Angélica Binotto [1], Matheus Henrique De Freitas Moreira [1]
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Background / Hypothesis:
The increased survival of patients undergoing Fontan circulation has led to a growing number of women reaching reproductive age. However, pregnancy in these women is considered high-risk (WHO III and IV), with uncertain outcomes. The scarcity of data on maternal and fetal outcomes in Fontan patients motivated this study.

Materials and Methods:
This retrospective, observational study included Fontan patients with confirmed pregnancies from 2012 to 2024. They were monitored every 15–21 days during pregnancy and followed up to 12 months postpartum. Antithrombotic therapy (aspirin, warfarin, or low-molecular-weight heparin) was individualized based on thrombotic risk. Hospitalization was required in cases of cardiac instability or obstetric indications.

Results:
We analyzed 24 pregnancies (22 patients). The mean age at Fontan surgery was 10.8 years, and at first pregnancy, 24.9 years. Tricuspid atresia was the most prevalent defect, and 91.7% had extracardiac conduit circulation. Before pregnancy, 79.2% were in NYHA class I, 69.6% had preserved ventricular function, and mean oxygen saturation was 92.9%. Prior events included thromboembolism (25%) and arrhythmias (16.7%). Cesarean section was performed in 68.7% of cases. Complications included spontaneous abortion (25%), postpartum hemorrhage (19%), preterm birth (50%), and low birth weight (80%). No maternal deaths occurred, but 54% experienced clinical deterioration within one year postpartum. Arrhythmias were associated with preterm births ($p = 0.040$), and preexisting ventricular dysfunction correlated with worsened maternal outcomes ($p = 0.017$).

Conclusions:
Pregnancy in patients with Fontan circulation was associated with both immediate and long-term clinical deterioration compared to the pre-pregnancy condition. Preexisting cardiac arrhythmia was linked to a higher incidence of preterm births, while ventricular dysfunction was associated with a decline in maternal outcomes over the 12 months following delivery.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1230 - AN OVERVIEW OF THE 80 000 PERSON AUSTRALIAN AND NEW ZEALAND CONGENITAL HEART DISEASE REGISTRY

Calum Nicholson [1], *Tanya Badal* [1], Geoff Strange [1], Julian Ayer [2], Leeanne Grigg [3], Michael Cheung [4], Ryan Maxwell [5], Robert Justo [6], Patrick Disney [7], Gavin Wheaton [8], Deane Yim [9], Clare O'donnell [10], David Celermajer [11]
Heart Research Institute, Clinical Research Group, Sydney-Australia [1] Sydney Children's Hospital Network, Westmead, Cardiology, Sydney-Australia [2] Royal Melbourne Hospital, Cardiology, Melbourne-Australia [3] Royal Children's Hospital, Cardiology, Melbourne-Australia [4] The Prince Charles Hospital, Cardiology, Brisbane-Australia [5] Queensland Children's Hospital, Cardiology, Brisbane-Australia [6] Royal Adelaide Hospital, Cardiology, Adelaide-Australia [7] Women's And Children's Hospital, Cardiology, Adelaide-Australia [8] Perth Children's Hospital, Cardiology, Perth-Australia [9] Starship Hospital, Cardiology, Auckland-New Zealand [10] Royal Prince Alfred Hospital, Cardiology, Sydney-Australia [11]

Background / Hypothesis:
Here we present an overview of the demographic data from the Australian and New Zealand Congenital Heart Disease Registry, with an initial geographic description.

Materials and Methods:
We collected a battery of data from EMR and Cardiology databases from 11 centres around Australian and New Zealand. Diagnosis and procedure codes were standardised to the European Paediatric Congenital Cardiology Code (EPCC) and were used to determine complexity based on the ESC's 2020 guidelines. EPCC's were used to select patients with Structural CHD. Addresses were matched to measures of geographic remoteness, driving distance to the nearest hospital, then compared to the total Australian population.

Results:
There were 81,349 people with Structural CHD, 13,949 from adult hospitals, 67,400 from paediatric hospitals (76,655 were still alive). Of these, 60,247 were from Australia and 8,634 from New Zealand. There were, 20,466 children (0-12 years), 11,610 teenagers (13-18 years), 33,632 young adults (19-40 years), and 10,759 aged over 40 years (36,895 males, 35,443 females), with mild, moderate and severe CHD in 23,694, 29,040, and 13,491 people respectively. The most common diagnoses were Ventricular Septal Defect (23%), Atrial Septal Defect (10%), Aortic Valve Disorders (9%), Coarctation of the Aorta (8%), and Persistent Arterial Duct (7%). The proportion of people with CHD living in major cities was similar to the general Australian population (72% vs 73%). Most (96%) people were living within a 1-hour drive of a hospital with an emergency department (both those with CHD and Australian population).

Conclusions:
The completion of our minimum dataset represents a significant milestone, as the largest CHD dataset globally. Initial geographical analysis shows little difference between the CHD and overall Australian population. Further exploration of these data will provide vital information for patients, families, health care providers and planners.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1252 - COARCTATION OF THE AORTA IN FATHER AND SON TWO HEARTS ONE CONDITION

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Background:
Coarctation of aorta(CoA)is a relatively common defect. However, it is rarely reported to occur frequently in the same family, especially in an adult when his son was diagnosed and treated prior.

Case description:
A 34-year-old man went for a check-up as his doctor requested when his son has regularly checked-up after CoA corrected at children hospital. The son has no residual coarctation after 4 years of surgery and a bicuspid valve with raphe at the right coronary cusp and non-coronary cusp without stenosis or regurgitation. 1 year recently, the father has noted hypertension and using 3 kinds of antihypertensive medications, but his blood pressure undertreatment is around 160-180 mmHg. However, he still works normally and without any symptoms. Up to this point, we recognized his blood pressure in the upper limbs significantly higher than lower limbs. We suspected a case of adult CoA. The chest X-ray showed bilateral rib notching, without cardiomegaly, and echocardiography revealed the severe CoA with a “sawtooth” pattern with diastolic runoff on continuous-wave Doppler and 85/36 mmHg in pressure gradient. Moreover, the moderate regurgitation of the bicuspid aortic valve with the raphe was between the right and left coronary cusp and dilated aortic root and ascending aorta. His left ventricle was thickened in ECG criteria and echocardiography but had good function. After discussion, we decided to choose a 16x48 Be-Graft stent for CoA. After 2 days of procedure, he can be safely discharged. Now, his blood pressure is 130/80mmHg in the upper limbs, equal to the lower limbs. The echocardiography showed good flow and 25/12 mmHg in pressure gradient at the aortic stent.

Conclusions:
CoA accounts for 0.1% of cases of secondary hypertension and is a treatable cause. Two hearts are with bicuspid valve and coA; however, the father discovered coA 25 years after his son was treated.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1260 - UNUSUAL CASE OF COMPLETE LEFT PULMONARY ARTERY BRANCH STENOSIS IN TAKAYASU ARTERITIS CLINICAL CHALLENGES AND HEMODYNAMIC IMPLICATIONS.

Luis Felipe Castillo Aguilar [1], Paola González Pacheco [1], Fernando Armando Suárez Díaz [2], Kelvyn Guillermo Espinal De La Rosa [2], *Irma Ixtaxochitl Hernández Moctezuma* [1], José Antonio García Montes [2]
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National Institute Of Cardiology Ignacio Chavez, Interventional Pediatric Cardiology, Mexico City-Mexico [2]

Background / Hypothesis:
Takayasu arteritis is a chronic granulomatous vasculitis that primarily affects the aorta and its main branches, causing stenosis, occlusion, or vascular dilation. It is a rare disease, and its clinical manifestation varies depending on the affected arterial territory.

Materials and Methods:
A case report describing an unusual presentation of Takayasu arteritis.

Results:
A 37-year-old female patient who presents with worsening functional class and progressive dyspnea. She is evaluated by pediatric cardiology due to suspected congenital heart disease, where findings suggest right heart failure with severe systemic venous congestion.

An echocardiogram and cardiac and pulmonary angiography-MRI are performed, revealing stenosis of both the right and left branches of the pulmonary artery.

Based on clinical presentation and imaging studies, she is diagnosed with Takayasu arteritis. After the diagnosis, a CT angiography is performed for a detailed evaluation of the pulmonary branches, confirming stenosis in both branches.

Despite targeted treatment, the patient develops abdominal pain, dyspnea, and hemoptysis. A follow-up echocardiogram shows a reduced left ventricular ejection fraction (LVEF) of 37% and pericardial effusion. Given the patient's poor clinical progression, a nuclear scan is performed to rule out aortic dissection.

To restore pulmonary branch function, an interventional procedure is carried out, revealing hypoplasia of the left pulmonary artery branch with complete absence of blood flow to the left lung. As a result, only angioplasty of the right branch is performed, with suboptimal stent expansion.

After the procedure, the patient shows good clinical improvement and is discharged home with the need for future reintervention on the pulmonary branches.

Conclusions:
Takayasu arteritis can affect the pulmonary arteries, causing severe stenosis. The absence of flow to the left lung is rare and impacts hemodynamics, increasing right ventricular failure and

overload. It is important to diagnose and treat promptly for a favorable outcome.
Category: Adult Congenital Heart Disease

1318 - MINIMALLY INVASIVE REDO SURGERY IN ADULT PATIENT AFTER ARTERIAL SWITCH OPERATION

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Background / Hypothesis:
A full resternotomy has been the standard approach for reoperation in adult patients after surgery for congenital heart disease in the past.

Materials and Methods:
We describe a case report of 29-years old male patient with neo-aortic valve insufficiency and aneurysm of the neo-aorta after surgical correction of a transposition of the great arteries in the first month of life. The procedure was conducted abroad and the patient presented at our institution as a refugee without past medical records.

Results:
A preoperative CT scan raised the suspicion of massive adhesions between the right ventricle and the sternum. The patient was cannulated via subclavian artery and femoral vein and a partial upper resternotomy was performed. An aortic root replacement with mechanical conduit was performed in mild hypothermia (34 °C). Surgery time was 328 minutes, bypass time was 164 minutes, cross-clamp time was 103 minutes. The patient was discharged on 15th postoperative day and was free of complications on the follow-up after 6 months.

Conclusions:
Minimally invasive redo surgery is possible after careful planning in adult patients after neonatal correction of congenital heart disease.

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Category: Adult Congenital Heart Disease

1353 - A DESCRIPTIVE REVIEW OF THE ADULT FONTAN POPULATION IN A SINGLE CENTER IN SINGAPORE

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Background:
There are a few Asian Registries of the adult Fontan population. National Heart Centre Singapore (NHCS) sees the largest cohort of adult congenital heart disease (ACHD) patients in our country with 4300 ACHD patients on active follow up. Forty eight (48) patients (1%) were identified to have undergone Fontan palliation. We performed a descriptive review of this population.

Method:
National Heart Centre Singapore maintains a registry of most adult ACHD patients who can provide informed consent since 2022. 36 of the 48 adult Fontan patients are part of this Registry.

Results:
The median age is 31 years with a majority (86%) between 21 and 39 years old. Malay representation is elevated compared to the general population in Singapore. 58% of the Fontan population are of ideal weight. The median duration of follow-up was 8.4 years, with the longest follow-up of 24 years.
Surgical approach reflects modern practice with utilization of extra cardiac conduits in 67% (24) of the patients. The left ventricle is the dominant systemic ventricle in about 70% of the patients. This is consistent with typical patterns in Fontan cohorts.

Common cardiac complications include heart failure (44%), pulmonary hypertension (11%) and atrial arrhythmias (7.7%). However, not all patients are on guideline-directed medical therapy for heart failure, partly due to limited evidence for use in systemic RV dysfunction. Most (92%) of the patients have an oxygen saturation above 90%. Only 2 (5.6%) patients had unplanned hospital admissions within the past year. None were referred for advanced heart failure therapies due to non-candidacy. There are no mortalities within these 3 years.

Conclusion:
The adult Fontan population remains a unique cohort within the ACHD population which benefits from multidisciplinary expertise and dedicated follow-up.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1376 - IMPACT OF A NURSING LED TRANSITION CLINIC ON TRANSITION READINESS AND CHD KNOWLEDGE IN ADOLESCENTS WITH CHD

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Background:
Most patients with congenital heart disease (CHD) survive to adulthood and will require transfer of their care from pediatric to adult CHD services. Formal transition programs can aid in preparing adolescents for this. We aim to examine the impact of a nursing led transition clinic on the transition readiness and CHD knowledge in adolescents with CHD.

Materials and Methods:
536 patients with CHD aged 14-18 years old were seen in a dedicated nursing led transition clinic. Prior to the visit, patients completed the Transition Q questionnaire and a CHD knowledge questionnaire. 118 patients returned for a second clinic visit and completed both questionnaires for a second time.

Results:
Patients were categorized according to CHD severity: Simple (n=33), moderate (n=310), and great complexity (n=193). Transition readiness scores [median 14 (IQR 11-17) vs 16 (13-19), p=0.004] and CHD knowledge scores [60 (44-74) vs 68 (50-820, p=0.005] both improved significantly at the second clinic visit. Patients with simple CHD had significantly higher transition readiness scores than those with moderate [median 17 (IQR 15-20) vs 14 (11-17), p< 0.001) or complex CHD [17 (15-20) vs 15 (11-17), p< 0.001]. Fontan patients scores were not significantly different compared to non-Fontan patients [14 (11-18) vs 14 (11-17, p=057] or other non-Fontan with complex CHD [15 (12-17) vs 14 (11-17), p=0.57]. Patients with complex CHD had significantly higher CHD knowledge scores than those with moderate and simple CHD [58 (44-72) vs 52 (37-72) vs 50 (30-66), p=0.05]. Fontan patients had significantly higher scores than non-Fontan patients [63 (54-73) vs 52 (39-71), p=0.001].

Conclusion:
Formal transition clinic improves transition readiness and CHD knowledge in adolescents with CHD. Fontan physiology does not affect transition readiness but does result in improved CHD knowledge.

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Category: Adult Congenital Heart Disease

1390 - TRANSCATHETER VENTRICULAR SEPTAL DEFECT CLOSURE IN POST INFECTIVE ENDOCARDITIS PATIENT

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Background / Hypothesis:
Transcatheter closure of ventricular septal defect (VSD) has gained favour as a method of closure in selected types of VSD. Closure is recommended in VSD patients with past infective endocarditis (IE).

Materials and Methods:
We report on a case of a 45-year-old lady with moderate sized perimembranous VSD and recurrent IE who underwent transcatheter VSD occlusion. The procedure was done under general anaesthesia, VSD was profiled and closed under transoesophageal echocardiogram and fluoroscopy guidance. Konar-MF VSD occluder (MFO) device 9/7 was implanted using antegrade approach. The procedure was uneventful, and she was discharged home with oral aspirin. The patient returned within a week with symptoms of palpitations and the electrocardiogram (ECG) revealed junctional rhythm with ventricular rate of 50 to 90 bpm.

Results:
Steroids were initiated upon detection of junctional rhythm. However, as the patient was symptomatic, it was decided for early surgical removal of device and surgical closure of VSD. A temporary pacemaker was inserted perioperatively. Junctional rhythm resolved after device removal, and she remains in sinus rhythm 2 years post operatively. There was no residual VSD.

Conclusions:
Transcatheter VSD closure is not without complications. In our patient, device related conduction disturbance occurred. The presence of recurrent IE, in which itself poses higher risk for arrhythmias, should be anticipated in this subset of patients. Moreover, oversizing should be avoided, and device selection is important.

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Category: Adult Congenital Heart Disease

1430 - INTER AMERICAN PROJECT FOR THE DEVELOPMENT OF ADULT CONGENITAL HEART DISEASE UNITS

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Inter-american Society Of Cardiology -siac, On Behalf Of Pediatric Cardiology Council And Achd Chapter, Rionegro-Colombia [1] Inter-american Society Of Cardiology -siac, Pediatric Cardiology Council, Buenos Aires-Argentina [2] Inter-american Society Of Cardiology -siac, Achd Chapter, Buenos Aires-Argentina [3]

Background / Hypothesis:
Congenital heart disease (CHD) has a prevalence of 8–13 cases per 1000 live births in Latinamerican and Caribbean countries. Nowadays more than 90% suvival and reach adulthood. Estimate adults with CHD (ACHD) living in South America at 2020 were 1.8 millions and 677,000 in Central America and the Caribbean countries. ACHD mortality is seven times higher in developing than in developed countries (20% vs. 3%, respectively).
ACHD patients must be centralized in special units, known as adult congenital heart disease units (ACHD units). There are a few ACHD units in our region.

Materials and Methods:
The ACHD Chapter and the Pediatric Cardiology Council of Inter-American Society of Cardiology (SIAC) created a project for interaction between hospitals, known as “The Pathways of ROCK”. based on four principles:

R: Recognize
O: Organize
C: Centralize
K: Knowledge

Members of ACHD chapter were contacted by email.
One-hour virtual meetings were planned
Two hospitals were invited to each meeting.
An instructional manual was provided
Presentations were allowed in Spanish, English, and Portuguese.
Flyer was created and distributed through SIAC’s communication channels
Meetings were recorded, each presenter provided a summary in PDF format.

Results:
From February 2024 to December 2024
21 hospitals from 12 countries participated
Complexity levels:
52% Level III: developed ACHD Unit
Argentina: 4
Colombia: 3
Chile, Brazil, Mexico, and the Dominican Republic: 1 each.
14% Level II: developing ACHD Unit
33% Level I: structuring ACHD Unit

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Average number of ACHDs in follow-up was 1,000 - 3,000.
60% medium- and high-complexity defects
40% simple defects
Less than 10% of centers have a transition program.
An ACHD travel directory has been created

Conclusions:
The number of ACHD units remains low (<1 per 10 million inhabitants).
Countries with better ACHD care: México, Colombia, Argentina, Brazil, Chile
Limitations: missing countries (Nicaragua, Panama, El Salvador, Cuba, Haiti, Venezuela, Ecuador, Bolivia)

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1440 - UNDERSTANDING CAUSES OF FAILED TRANSITION IN CHILDREN WITH CONGENITAL HEART DISEASE

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Heart Research Institute, Clinical Research Group, Sydney-Australia [1] The University Of Sydney, Faculty Of Medicine And Health, Sydney-Australia [2]

Background / Hypothesis:
To explore the barriers and facilitators of transition from paediatric to adult care for patients with Congenital Heart Disease (CHD). Previous research has shown low transition rates from paediatric to adult care are a key contributing factor to poor adherence for ongoing expert care in the CHD population.

Materials and Methods:
Participants were invited to complete an expression of interest for this study, purposive sampling was used to recruit a diverse sample of CHD patients. Semi-structured online interviews were completed; participants were asked to reflect on their childhood transition experience. Interviews were audio recorded, transcribed and coded using framework analysis.

Results:
43 interviews were completed (age range: 20 to 54 years). 4 main themes were identified: i) facilitators and barriers to good transition, (ii) impact on family and wider support network, (iii) psychosocial needs of the patient, and (iv) the role of evolving independence. Facilitators included education about condition, proactive handover of care and clear information about what to expect. Barriers included lack of empowerment for patients to manage their ongoing treatment and lack of empathy from their clinician for their holistic experience of having CHD. Family impacts were highlighted such as handling the changing parental role and the need for reassurance for both patient and caregivers. Psychosocial needs included focus from clinician on mental health of participants. The role of evolving independence and assessment of participants maturity and ability to manage their transition and ongoing care was emphasised.

Conclusions:
Study findings suggest a need to improve processes and communication to facilitate a more holistic model of care for CHD patients. This includes planned coordination of transition, clear information and support for mental health and overall wellbeing of CHD patients and their caregivers. This could improve rates of successful transition and better long-term health outcomes for individuals with CHD.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1452 - "LONG TERM OUTCOMES OF 'ONE AND A HALF' VENTRICULAR REPAIR IN AOTEAROA NEW ZEALAND"

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Background:
We reviewed New Zealand's experience with 'one-and-a-half' ventricular repair for hypoplastic right ventricle over the last 30 years. The aim was to document the clinical pathway and outcome for this group including surgical and interventional procedures, incidence of major complications and late mortality. Functional outcome, including objective exercise data, was collected as was outcome in relation to growth and function of the right ventricle.

Materials and Methods:
Thirty nine patients were identified, from 1992, for whom a strategy of 'one-and-a-half' ventricular repair was pursued for congenital heart disease associated with right ventricular hypoplasia. Patients over the age of 8 years were included, to assess medium to long term outcome. Median follow up was 14.6 years post Glenn. Patients for whom this strategy was pursued due to RV dysfunction or Ebstein's anomaly were excluded.
Functional status as well as data from most recent echocardiogram, CPET, MRI and invasive haemodynamic data were reviewed.

Results:
There were no deaths in follow up. No patients have undergone cardiac transplantation. Thirty seven (95%) were able to achieve complete septation. Two patients have been left with an open atrial communication due to unfavourable haemodynamics. One patient was converted to a biventricular repair.
At most recent review the majority are NYHA class I. Five patients have experienced a major complication from either surgical or catheter intervention, with one requiring a Glenn takedown and revision. Only two patients required treatment for arrhythmia during follow up. Exercise testing data demonstrate considerable variability in achievement against predicted VO2. Right ventricular growth, in the context of heterogeneity of right ventricular outflow anatomy, has been also been variable.

Conclusions:
Outcomes in this cohort demonstrate good long-term survival and functional status after one-and-a-half ventricular repair. Review of late follow up provides some reassurance of the validity of this approach.

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Category: Adult Congenital Heart Disease

1456 - INCIDENCE AND PREDICTORS OF MITRAL REGURGITATION DETERIORATION FOLLOWING ATRIAL SEPTAL DEFECT CLOSURE IN ADULTS A SYSTEMATIC REVIEW AND META ANALYSIS

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Background / Hypothesis:
Mitral regurgitation (MR) deterioration is a recognized complication following atrial septal defect (ASD) closure in adult patients. However, reported incidence rates and predictors of MR vary across studies.

Materials and Methods:
We conducted a systematic review and meta-analysis to quantify the incidence of MR aggravation post-ASD closure and to identify clinical predictors. The primary outcome was ≥1-grade increase in MR severity post-procedure. Random-effects meta-analysis (DerSimonian-Laird method) was applied to estimate pooled incidence and effect sizes. Heterogeneity and robustness were assessed using I^2 statistics and sensitivity analysis. Predictors of MR aggravation were synthesized narratively due to study-level variation.

Results:
Seven eligible studies were included, with a total of 1284 patients undergoing surgical or transcatheter ASD closure. The mean age was 51 years, and 66% were female. The pooled follow-up duration was 33.6 months, totaling 3598 person-years of observation. The pooled incidence of post-procedural MR deterioration was 12.0% (95% CI: 7.4%–18.8%), with high heterogeneity (I^2 = 89.7%). Sensitivity analysis confirmed the robustness of this estimate. Subgroup analyses revealed similar rates across surgical and transcatheter closure groups. Meta-regression showed no significant association with age or closure type. Narrative synthesis identified consistent multivariable predictors of MR deterioration, including pre-existing MR (OR 2.49–2.87, $p < 0.01$), left atrial dilation >40mm (OR 2.87, $p = 0.04$) and atrial fibrillation (OR 5.24–17.55, $p < 0.01$).

Conclusions:
MR deterioration occurs in approximately 1 in 8 adult patients following ASD closure, with pre-existing MR, left atrial dilation and atrial fibrillation identified as consistent risk factors. These findings support the importance of comprehensive preoperative mitral valve assessment in adult ASD patients, particularly those with atrial remodeling or arrhythmias.

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Category: Adult Congenital Heart Disease

1491 - A 34 YEAR OLD WOMAN OF D TRANSPOSITION OF THE GREAT ARTERIES WAS PREGNANT REPORT OF A CASE

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Background / Hypothesis:
D-transposition of the great arteries is one of the most common cyanotic congenital heart diseases and may result in pulmonary hypertension. Patients with it has poor life expectancy.

Materials and Methods:
A 34-year-old woman was referred to her primary care physician for 20+6 weeks of gestation, and had cyanosis with exercise intolerance for 28 years. On physical examination, severe cyanosis on lips, upper limbs and fingertips was present with oxygen saturation of 70%. Her New York Heart Association (NYHA) class was third degree. A chest radiography showed dilation of pulmonary artery segment, the thickened hilar vascular shadow and chest-to-heart ratio was 0.56(Figure 1). The electrocardiogram showed frequent premature ventricular beats and right bundle branch block. The transthoracic echocardiogram showed an abnormal connection of the ventricles and great arteries, so that the aorta arose from the morphological right ventricle and the pulmonary artery arose from the morphological left ventricle with non-restricted ventricular septal defect(diameter:34mm) and atrial septal defect (diameter: 6.3mm), bidirectional flow shunt in heart. There was mild tricuspid regurgitation and moderate pulmonary regurgitation. According to transvalvular pressure difference of 83 mmHg, estimated systolic pulmonary artery pressure was about 91mmHg (Figure 2). No pericardial effusion was seen. Computed tomographic (CT) angiography of the chest revealed D-transposition of the great arteries (Figure 3) and pulmonary arteries' dilation was significant, with the huge main pulmonary artery measuring 58mm (Figure 4) and the left lower lobe artery measuring 55mm in diameter (Figure 5).Figure 6 showed the image of three-dimensional reconstruction of pulmonary arteries.

Results:
According to the guideline and medical discussion, termination of the pregnancy was recommended. After improving her cardiac function, the patient had been performed the cesarean section at 22 weeks of gestation and discharge in a week.

Conclusions:
Transposition of D-great arteries in adult women has poor cardiac-pulmonary function and pregnancy remains strongly contraindicated.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1496 - FREQUENCY AND PATTERN OF ADULT CONGENITAL HEART DISEASE IN A TERTIARY CARE CARDIAC HOSPITAL REASONS ASSOCIATED WITH DELAYED DIAGNOSIS

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Nicvd, Peads Cardiology, Karachi-Pakistan [1] Nicvd, Peads, Karachi-Pakistan [2]

Background / Hypothesis:
To determine the distribution pattern and possible reasons of delayed diagnosis of CHDs in adult population presenting to a tertiary care hospital.

Materials and Methods:
Department of Pediatric Cardiology, National Institute of Cardiovascular Diseases (NICVD) Karachi Methodology: Patients of both genders aged 18 years and above with CHD confirmed by echocardiographic examination were included. Age, gender, weight, height, provincial affiliation, marital status, number of children (if any), duration of disease and NYHA classification were noted on a preprinted Performa. Patterns of CHD types and reasons behind delayed CHD diagnosis (if noted) were recorded

Results:
In a total of 129 adult patients with CHD, 68 (52.7%) were male. The mean age was calculated to be 25.8±9.8 years. The mean age at the time of diagnosis was 12.4±14.8 years. There were 91 (70.5%) CHD cases who were found to have delayed diagnosis and there was no significant gender-wise difference with respect to delayed diagnosis among CHD cases (p=0.552). Delayed referral, delayed diagnosis by the doctor, delayed consultation and social factors were the most frequent reasons behind delayed diagnosis of CHD reported in 39 (42.9%), 21 (23.1%), 22 (24.2%) and 9 (9.9%) cases. Ventricular septal defect (VSD) was the most frequently observed CHD noted in 38 (29.5%) cases while tetralogy of fallot was the 2nd most common CHD seen in 32 (24.8%) cases.

Conclusions:
Ventricular septal defect and tetralogy of fallot were found to be the most frequent types of CHD among adult CHD patients. Delayed diagnosis of CHD was reported in 70.5% cases. Delayed referral, delayed diagnosis by the doctor, delayed consultation and social factors were the most frequent reasons behind delayed diagnosis of CHD. Delayed diagnosis was related to complication of dysfunction in 69 cases.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1498 - EFFICACY OF THE COMBINATION THERAPY WITH CARDIAC RESYNCHRONIZATION THERAPY AND FANTASTIC FOUR IN A PATIENT WITH DOUBLE OUTLET VENTRICLE AFTER FONTAN OPERATION.

Haruka Nishino [1], Yoichiro Ishii [1], Takuya Fujisaki [1], Masayoshi Mori [1], Kumiyo Matsuo [1], Dai Asada [1], Tomomitsu Kabnaya [1], Sanae Tsumura [1], Hisaaki Aoki [1]
Osaka Women's And Children's Hospital, Pediatric Cardiology, Izumi-Japan [1]

Background / Hypothesis:
The prognosis for heart failure (HF) after Fontan surgery is poor. The standard medical therapy consisted of the Fantastic Four according to various recent guidelines. There are few reports on the efficacy of cardiac resynchronization therapy (CRT) in patients with congenital heart disease (CHD). We report a Fontan patient with severe HF who improved after treatment with the Fantastic Four and CRT.

Case:
An 18-year-old male with a DORV underwent a Fontan operation at the age of 3 years. He developed bradycardia due to complete atrioventricular block and underwent pacemaker implantation at the age of 9 years. Leads were placed in the right atrial appendage and the inferior wall of the right ventricle (RV). A backup ventricular lead was placed at the apex of the RV anterior wall. The ventricular lead was changed to the RV anterior wall apex due to an increase in pacing threshold at the time of pacemaker generator replacement at 16 years of age. Three months later, he developed generalized fatigue. Echocardiography showed biventricular dyssynchrony, worsening atrioventricular regurgitation, and a worsening ejection fraction of 29%. Although the original ventricular lead was reconnected, his cardiac condition did not improve. However, cardiac function improved with the introduction of Fantastic Four medications followed by CRT, which was performed using a new left ventricular lead and the original RV lead. After the procedure, his activity level improved and echocardiography showed improved ventricular synchrony and EF increased to 46%.

Conclusions:
We experienced a case of a Fontan patient whose cardiac function improved after pharmacotherapy with Fantastic four and CRT. Multidisciplinary treatment with drug therapy and CRT is effective in severe CHD.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1500 - CLINICAL FEATURES OF NONCOMPACTION CARDIOMYOPATHY ACROSS AGE GROUPS A RETROSPECTIVE STUDY OF 415 PATIENTS

Shuo Chen [1], Ziqin Zhou [1], Min Qiu [1], Ruyue Zhang [1], Jimei Chen [1]
Guangdong Provincial People's Hospital, Guangdong Cardiovascular Institute, Guangzhou-China [1]

Background / Hypothesis:
Noncompaction cardiomyopathy (NCM) is a rare inherited cardiac disorder associated with adverse cardiovascular outcomes, including heart failure, arrhythmias, and sudden cardiac death. Currently, the clinical manifestations of NCM lack comprehensive characterization across different age groups in large-scale studies. This investigation aims to systematically analyze the clinical characteristics of NCM patients across various age demographics.

Materials and Methods:
A retrospective analysis was conducted on 415 NCM patients treated at the Guangdong Institute of Cardiovascular Disease from January 2013 to January 2023. We comprehensively collected and analyzed clinical data, including presenting symptoms, arrhythmiapatterns, echocardiographic parameters, and cardiac magnetic resonance imaging (CMR) findings.

Results:
The study cohort (N=415) was stratified into three age groups: infants(0-1years, n=169), children/adolescents(1-18years, n=149), and adults (>18years, n=97). Heart failure was the predominant clinical manifestation across the entire cohort, affecting 112 patients (27%). Notably, heart failure was most prevalent in adult patients (54.6%, n=53), while cardiac murmur was the primary presenting symptom in both infant and child/adolescent groups (19.5%, n=33 and 17.4%, n=26,respectively). Across all age groups, NCM patients with concurrent mitral regurgitation (MR) demonstrated significantly reduced left ventricular ejection fraction (LVEF) and fractional shortening(FS) compared to those without valvular disease ($p<0.05$). Additionally, left ventricular end-systolicdiameter (LVESD) and end-diastolic diameter (LVEDD) were significantly increased in patients with MR($p<0.05$). A significant correlation was observed between both LVESD and LVEDD measurements and MR area in NCM patients($p<0.05$).

Conclusions:
NCM patients with concomitant MR consistently exhibited left ventricular dilatation and systolic dysfunction across all age groups. Significant age-related variations were observed in clinical presentations, arrhythmia patterns, and the prevalence of congenital and valvular heart disease. Understanding these age-specific clinical characteristics is crucial for accurate diagnosis, optimal therapeutic management, and future research directions in NCM.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1503 - ADVANCE CARE PLANNING OF AN AUSTRALIAN COHORT OF ADULTS WITH CONGENITAL HEART DISEASE

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Background / Hypothesis:
Adults with congenital heart disease (ACHD) now survive well into adulthood though their overall long-term survival remains below that of the general population. Although advance care planning (ACP) has been endorsed by clinical guidelines, it is infrequently discussed in an outpatient setting.

Materials and Methods:
184 consecutive adult patients with congenital heart disease, recruited from a suburban cardiology practice in Melbourne, completed a questionnaire regarding their perceptions on future and advance care planning as part of the international multi-centre study (APPROACH-IS II).

Results:
There were 88 males and 96 females. Their mean age was 29.4 +/- 8.94 years. The mean score for future health concern was 5.83 +/- 2.55 which was significantly associated with NYHA Class ($p<0.001$) - the average score increasing with increasing NYHA Class. Forty five percent of participants were aware of the processes around advance care directives/plans, but only 4% had documented their wishes. There was no association between documentation and the concern regarding future health or NYHA class. While most patients, 69%, agreed that ACP should occur when patients are well, only 51% had discussed their future health with clinicians. Of those who have not had these discussions, 53% wished to do so while 47% either did not want to or were undecided. 8% and 24% of patients were uncomfortable discussing their future health and death respectively. No information was available as to how the clinicians viewed ACP.

Conclusions:
There is limited understanding and uptake of ACP among our ACHD patients. Although most understand the value of ACP early in their clinical course, only a minority have taken up that option and documented their end-of-life care wishes.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1507 - NOVEL TRANSTHORACIC PULMONARY VALVE IMPLANTATION USING SELF-EXPANDING SALUS VALVE A PROSPECTIVE STUDY OF SAFETY AND MID-TERM OUTCOMES

Shuo Chen [1], Ziqin Zhou [1], Miao Tian [1], Jiazichao Tu [1], Jimei Chen [1]
Guangdong Provincial People's Hospital, Guangdong Cardiovascular Institute, Guangzhou-China [1]

Background / Hypothesis:
Transcatheter pulmonary valve replacement (TPVR) has emerged as avaluable treatment for severe pulmonary regurgitation (PR). The Salus valve (Balance Medical Technology Co.Ltd., Beijing, China) represents a novel self-expanding valve stent designed for deployment through a transthoracic approach with a small subxiphoid incision. The objective of this study was to evaluate the medium-term safety and efficacy of Salus valve stents in this patient population.

Materials and Methods:
This prospective cohort study enrolled patients who underwent transthoracic pulmonary valve stenting at Guang-dong Provincial People's Hospital from September 2021 to September 2024. Inclusion criteria included moderate-to-severe PR following RVOT reconstruction, age≥14 years, and specific clinical/imaging parameters. Primary endpoints were pulmonary regurgitation fraction<20%, freedom from reintervention at 12 months, and major adverse events (MAE). MAE were defined as death, reintervention, recurrent severe PR, worsening heart failure, cardiac arrest, new severe ventricular arrhythmias, and third-degree AV block.

Results:
Among 38 patients (mean age 24.08±8.12 years), all procedures were successfully completed, although intraoperative valve displacement occurred in three cases. During a median follow-up period of 24 months, significant improvements were observed in right ventricular volumes: Right Ventricular End-Diastolic Volume Index (RVEDVI) decreased from 141.45 to 109.98mL/m2 and Right Ventricular End-Systolic Volume Index (RVESVI) decreased from 74.27 to 56.62mL/m2 (both p<0.01). No mortality or need for reintervention was observed during the follow-up period. The estimated freedom from major adverse events at 36 months was 87.2%.

Conclusions:
The Salus valve demonstrated safety and efficacy for severe PR treatment through its transthoracic approach, which offers unique advantages in terms of direct access and immediate complication management. Longer follow-up is needed to assess long-term durability.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1564 - BALLOON PULMONARY VALVULOPLASTY (BPV) AS A PALLIATIVE STRATEGY IN ADOLESCENTS AND ADULT CCHD PATIENTS.

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Background / Hypothesis:
LMICs continue to see a significant burden of late-presenting CCHD patients. These patients have major functional limitations as well as multi-system derangements from long-standing hypoxia. Balloon pulmonary valvuloplasty (BPV) is a potentially viable palliative option for selected late-presenting patients who have a severely stenotic pulmonary valve and are unsuitable for definitive surgical repair.

Materials and Methods:
A retrospective chart review of the institutional catheterization database was done. Pre-procedural assessment included echocardiography to determine the nature of obstruction to pulmonary blood flow. BPV was only considered for those with a significant component of valvular pulmonary stenosis. A strategy of stepwise dilation with progressively larger balloon sizes, with monitoring of PA pressures between each dilatation, was adopted.

Results:
From 2012-24, 23 patients [median age 23(IQR18.5-29.5years), 49(44.1-57.7kg), 56.5% males, 2/23 patients Trisomy]; Diagnoses [TOF 11; DORV-6; Single ventricle PS -2; C-TGA- 4] underwent BPV [Fluoroscopy time: 19.36(6-40min), procedure time: 70.88(45-135min), Balloon: Annulus ratio 1 (0.90-1.08)]. Definitive surgery was not feasible due to unfavorable anatomy -65%; logistic/resource challenges (35%). SPO2 improved from 80.14% to 90.18%. Complications included Transient arrhythmias (4/23) and re-perfusion pulmonary edema (1/23), resulting in one death from the latter. At a median follow-up of 43 months (IQR: 22.5-72), there was sustained symptom relief, 72.7%% in functional class I. 3 patients underwent corrective surgery. Repeat procedures (BPV) were needed in 2 patients. There was one death during follow-up, which was due to late Infective endocarditis post-corrective surgery at 51 months post-BPV.

Conclusions:
In a selected subgroup of anatomically suited patients with CCHD with PS, stepwise dilatation of the pulmonary valve enabled palliation through improved oxygenation and alleviated symptoms. BPV is an affordable, accessible, and less resource-intensive palliative option for these patients, particularly in LMIC settings.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1584 - THE ADULT FONTAN CHALLENGE INSIGHTS FROM A CRACOW SINGLE CENTER STUDY

Pawel Skorek [1], Monika Smas-suska [1], Maciej Skubera [1], Agnieszka Sarnecka [1], Beata Rog [1], Natalia Bajorek [1], Natalia Dluzniewska [1], Piotr Weryński [1], Lidia Tomkiewicz-pajak [1]
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Background / Hypothesis:
The Fontan operation (FO) enables survival for patients with single-ventricle heart defects but is associated with multiorgan complications that significantly impact quality of life and long-term prognosis. As medical care advances, the characteristics of the Fontan population evolve, necessitating updated knowledge on long-term complications and treatment efficacy.

This study aims to characterize adult patients with Fontan circulation under our center's care.

Materials and Methods:
We conducted a retrospective cross-sectional analysis of adults who underwent a comprehensive diagnostic evaluation between January 2022 and January 2025.

Results:
A total of 93 patients (39% female, median age 23 years [IQR: 21–28], median time since FO: 20 years [17–25]) were included. Median height was 167 cm [162–176], and mean weight was 63±15 kg. A systemic left ventricle was present in 50%, right in 48%, and unspecified in 2%. Fenestration was observed in 54%. Among participants who completed a reliable cardiopulmonary exercise test (83%), mean VO2 max was 24.88±5 ml/kg/min.

Selected laboratory findings included median NT-proBNP 168 pg/ml [106–372] and albumin 44 g/L [41–46]. Renal function, assessed using CKD-EPI equations, showed a median glomerular filtration rate of 92 [78–111] ml/min/1.73m^2 for cystatin C and 120 [105–127] ml/min/1.73m^2 for creatinine. The stool calprotectin concentration was elevated in 56% of the study participants.

Invasive diagnostics were performed in 61% of patients, revealing a median mean pulmonary artery pressure of 10 mmHg [8–13] and an aortic saturation of 93% [92–95]. Liver stiffness above F2 (METAVIR) was detected in 65% via sonoelastography.

Previously underreported respiratory disorders were also examined. All 64 patients who underwent pulmonary function tests had diffusion impairments, with moderate (72%) and severe (9%) dysfunctions.

Conclusions:
The growing number of long-term Fontan survivors poses new challenges in cardiology. Sharing clinical experiences is crucial to optimizing care models and improving patient outcomes.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1612 - CARDIAC SURGERY IN ADULTS WITH CONGENITAL HEART DISEASE A SINGLE CENTER EXPERIENCE

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Background / Hypothesis:
Advances in surgical and medical care of children born with a congenital heart disease (CHD) result with a growing number of adults with CHD. We report our single centre experience with cardiac surgery in adults with congenital heart disease.

Materials and Methods:
The study included adults (aged > years) patients who underwent surgery eighter as the first surgery or as a reoperation for CHD between 2014 and 2022. Clinical characteristics and the incidence of perioperative complications were obtained.

Results:
97 consecutive cases were analysed. 83 (85,6 %) patients required redo surgery. Mean age at the time of the procedure was 32,4 years. 30-days mortality was 3,1 % (n = 3). Mean ICU and hospital stay were 3,4 and 11,2 days respectively. Bleeding requiring reoperation occurred in 5,2 % (n = 5) of patients. The incidence of postoperative arrhythmias requiring permanent cardiac pacing was 8,2 % (n = 8) and neurological complications occurred in 2,1% (n = 2) cases.

Conclusions:
Surgery in adults with CHD can be performed with low perioperative risk and good clinical outcome.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1626 - MID TERM OUTCOME OF PULSTA NEW SELF EXPANDABLE SYSTEM FOR PERCUTANEOUS PULMONARY VALVE IMPLANTATION IN THE NATIVE RIGHT VENTRICULAR OUTFLOW TRACT DYSFUNCTION IN A SINGLE CENTER

Jung Yoon Kim [1], Seong Ho Kim [2], So Ick Jang [2], Ji Seok Bang [2]
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Background / Hypothesis:
PPVI is a good treatment option for RVOT dysfunction. This study reports the clinical use in various morphology of RVOT and mid-term outcome of a novel transcatheter self-expandable pulmonary valve (Pulsta valve, Teawoong Medical Co, South Korea) in native RVOT dysfunction.

Materials and Methods:
A total of 43 patients who underwent PPVI with Pulsta valve in a single center from December 2017 to May 2022 were retrospectively and prospectively enrolled.
Patients' demographics and pre-procedural, intra-procedural, and short and mid-term follow-up data were collected and analyzed

Results:
The most of patients were female (n= 27, 63 %), with a mean age of 27.0 ± 9.1 years (range: 12-61 years) and a mean weight 61.0 ± 14.8 kg (range: 39.6 – 90.5 kg). 38 of 43 Patients showed moderate to severe PR, with a mean PR fraction derived cardiac MRI of 40.7 ± 9.9 % (range: 23.0 - 63.0). The procedure success rate was 97.6 %. Valve sizes used were 26 (n=3), 28 (n=13), 30 (n=7), 32 (n= 15), and 33.5 (n=5). Procedural complications were arrhythmia requiring treatment (n=2), delivery catheter associated complication (n=1), device embolization (n=1). 1-year follow-up cardiac MRI showed a decreased pulmonary regurgitation (PR) fraction (14.5 ± 8.4 %) and that the right ventricular end-diastolic volume index decreased from 153.2 ± 27.7 to 120.3 ± 20.6 mL/m2, the right ventricular end-systolic volume index decreased from 81.3 ± 24.0 to 62.4 ± 15.6 mL/m2. After PPVI, NYHA functional class of patients improved to class 1 in most of patients overtime. There was no significant PR and PS overtime. There was no mortality, or re-intervention during follow-up. And no patients had more than mild PR and paravalvular leakage.

Conclusion
PULSTA valve provides excellent short and mid-term outcomes in patients with the various morphology of RVOT and special situation in high risk patients.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1631 - DETAILED CHARACTERISATION OF THE BURDEN OF CONGENITAL HEART DISEASE IN OVER 1 600 AUSTRALIAN SUBJECTS

Tanya Badal [1], William Baxter [1], Calum Nicholson [1], Julian Ayer [2], Michael Cheung [3], Leeanne Grigg [4], David Celermajer [5], Geoff Strange [1]
Heart Research Institute, Clinical Research Group, Newtown-Australia [1] Children, Heart Centre For Children, Westmead-Australia [2] Royal Children, Cardiology Department, Melbourne-Australia [3] Royal Melbourne Hospital, , Melbourne-Australia [4] Royal Prince Alfred Hospital, Head Of Cardiology, Camperdown-Australia [5]

Background:
The Australian Study of the Burden and Outcomes of Congenital Heart Disease (CHD) aims to examine patient and carer experiences, psychosocial, physiological, and healthcare status of CHD patients. Here, we present an update on the data collected.

Material and Methods:
A random sample of patients aged ≥5 years was extracted from the Australian and New Zealand CHD Registry (n=81,349), from four main Australian CHD centres (2 adult, 2 paediatric). The sample was stratified by gender (50% male), geographic location (20-25% regional/remote) and categorised into three disease complexity groups (mild, moderate, severe). Adult patients, and child participants together with their carers, were invited to complete surveys addressing physical and mental health, overall quality of life and attend an in-person study visit for physical and neuropsychological assessments.

Results:
Of 2,035 consented participants, 1,695 (83%) completed at least one survey or study visit. Among 939 paediatric participants, 53% were male, with a median age of 11.2 (IQR 8.8-14.2 years), 22% (n=208) were from regional/remote locations with 22% mild, 49% moderate, and 29% severe CHD complexity. In the adult cohort of 1096, 51% participants were male, had a median age of 38.3 (IQR 29.3-48.5 years), and 25% (n=272) were from regional/remote areas. CHD complexity among adults was reported as 23% mild, 52% moderate, and 25 % severe. We present preliminary data from over 15 surveys, totalling 300,000 responses across domains of physical health, mental health, and quality of life. Details of participant study activity completion are summarised in Table 1.

Conclusions:
This multi-site study of over 1,600 CHD patients present the first comprehensive description of the lived experience and care needs of Australians with CHD. Key insights will also include healthcare utilisation, patient and carer wellbeing, and the physical, psychological and cognitive burden of CHD—informing clinical care, targeted interventions and national policy.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1633 - EARLY DETECTION OF OCCULT DIASTOLIC DYSFUNCTION IN A FONTAN CIRCULATION USING A RAPID VOLUME EXPANSION TEST

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Background / Hypothesis:
Diastolic dysfunction (DD) of the single ventricle may act a substantial role in the development of failing Fontan physiology. However, the diagnosis of DD is difficult in the single ventricular physiology. Using traditional echocardiographic indices of diastolic function have not been validated in the Fontan population. This study aimed to assess Fontan patients with occult DD using “ventricular stress test” with rapid volume expansion test in invasive hemodynamic study.

Materials and Methods:
Cardiac catheterization with RVE (NaCl 0.9%; 1L during 5 minutes) test was performed routinely in Fontan patient s between Feb 2019 and June 2022. Pressure (Fontan pressure and VEDP) were measured before and 5 minutes after test. A post-test end diastolic pressure (EDP) threshold of 15 mmHg defined occult DD and pulmonary artery.

Results:
25 Fontan patients (72% male, median age 24.2 (range 12–46) years) were included.
The median Fontan duration was 17.3 (range 4-25) years and dominant right ventricular morphology was present in 40%of patients. Volume expansion increased mean Fontan pressure (15.16 ± 3.4 VS 10.6 ± 2.2 mmHg, p=0.003) and EDP (14.7 ± 4.5 VS 10.6±3.0 mmHg, p<0.001). 13 patients (52%) had occult DD, demonstrating higher baseline EDP (12.8 ± 1.9 VS 8.1 ± 1.6mmHg, p<0.001), higher baseline Fontan pressure (11.8 ± 2.1 VS 9.3 ± 1.6 mmHg, p=0.04) and lower baseline cardiac index (2.2 ± 0.6 VS 2.8±0.7 L/min/m2, p=0.032) compared with patient without DD. Higher baseline EDP, higher Fontan pressure and, lower baseline cardiac index were associated with higher Post-test EDP. All volume challenge was well tolerated.

Conclusions:
Ventricular stress test by RVET is feasible, safe and distinguishes a subgroup of Fontan patients with occult DD. Higher baseline EDP are associated with DD. Further analysis is needed to better understand the mechanism and to better identify difference between pulmonary factor and cardiac factor for adequate tailored therapy

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1638 - RECURRENT SYNCOPE SECONDARY TO VENTRICULAR TACHYCARDIA IN AN ADOLESCENT CASE REPORT AND LITERATURE REVIEW

Itzel Italivi Roca Galina [1], Sheila Vania Sanchez Lopez [9], Israel Garcia Davalos [9], Horacio Marquez Gonzalez [9], Diana Lopez Gallegos [9], Jaime Alfonso Santiago Hernandez [9], Carlos Riera Kinkel [9], Lucelli Yañez Gutierrez [9], David Salazar Lizarraga [9]
Imss, Pediatric Cardiology, Mexico City-Mexico [1]

Background / Hypothesis:
Early diagnosis of polymorphic ventricular tachycardia is crucial in adolescents with recurrent syncope and a family history of sudden death. The placement of the ICD is effective in preventing fatal arrhythmias. Additionally, monitoring with Holter is essential to assess treatment response and patient stability

Materials and Methods:
We present the case of a 17-year-old female without cardiovascular history who begins with syncope and headache since the age of 6. After losing follow-up, she reported recurrent syncope every third day, palpitations, and headaches exacerbated by physical activity since she was 11 years old. She was diagnosed with long QT syndrome type 1 and polymorphic ventricular tachycardia, and a ICD (implantable cardioverter-defibrillator) was placed

Results:
• RX: Bronchovisceral situs solitus, levocardia, levoapex, ICT 0.45, normal pulmonary flow.
• Electrocardiogram: Sinus rhythm, P wave: 60 ms, PR: 140 ms, QRS: 80 ms, QT: 540 ms, QTc (Bazzet): 504 ms, QRS axis: 90°. Schwartz score: 5.5 points.
• Echocardiogram: Structurally normal heart.
• Holter (48 h): Episode of PVT with a ventricular frequency of 333 bpm lasting 1 minute, spontaneously returning to sinus rhythm.

Conclusions:
Polymorphic ventricular tachycardia (PVT) is an inherited disease that affects anatomically normal hearts, characterized by ventricular arrhythmias induced by factors such as physical stress, emotional stress, or catecholamines. Its prevalence is 1-5 cases per 10,000 individuals. PVT is associated with mutations in the RyR2 and CASQ2 genes. It is also frequently found in patients with Andersen-Tawil syndrome and type 4 long QT syndrome. The approach to syncope should include holter electrocardiogram study and stress test in all children

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1640 - LATE ARRHYTHMIAS FOLLOWING FONTAN COMPLETION INSIGHTS FROM A KOREAN MULTICENTER FONTAN REGISTRY OF OVER 1000 EXTRACARDIAC CONDUIT SURGERIES

Kyung-jin Ahn [1], Ja Kyoung Yoon [2], Soo-jin Kim [3], Chan-ha Lee [4], I Seok Kang [2], Jinyoung Song [2], June Huh [2], Eun-jung Bae [5]
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Background / Hypothesis:
Awareness of long-term arrhythmia complications after Fontan surgery is increasing. This study evaluates late arrhythmia prevalence, outcomes, and risk factors in Fontan patients.

Materials and Methods:
We retrospectively analyzed 1,492 Fontan patients from the Korean multicenter registry (1979–2019), categorized into atriopulmonary connection(AP) (n=106), lateral tunnel (LT) (n=234), and extracardiac conduit (ECC) (n=1,143).

Results:
At 20 years post-Fontan, freedom from any arrhythmia, tachyarrhythmia, and bradyarrhythmia was 81.2% (95% CI, 78.3-84.2), 86.0% (95% CI, 83.4-88.7), and 89.8% (95% CI, 87.7-92.1), respectively. ECC Fontan had lower arrhythmia risk than APC or LT (AP: HR 0.25 [0.17-0.36], LT: HR 0.50 [0.35-0.71], $P < 0.001$). Older Fontan age, common atrioventricular valve, and AP Fontan were strong risk factors for tachyarrhythmia (HR 1.09 [1.06-1.11], $P < 0.001$; HR 1.58 [1.09-2.29], $P = 0.016$; HR 4.46[3.12-6.38]), $P < 0.001$). Fontan conversion/arrhythmia surgery (n=53) had a lower recurrence rate than catheter ablation (n= 24, $P < 0.001$). Permanent pacemaker was implanted at median age 11.7 years for sinus node dysfunction (n=64) and high-degree atrioventricular block (n=39). Older Fontan age, left isomerism, Fontan conversion and reoperation after Fontan were identified as risk factors for bradyarrhythmia. Late arrhythmia increased Fontan failure risk ($P < 0.001$) but was not related to mortality.

Conclusions:
Arrhythmia is a major complication in Fontan patients, especially with older Fontan age, non-ECC Fontan, common atrioventricular valve, or left isomerism, increasing Fontan failure risk and requiring treatment.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1645 - IT'S NOT THE HEART WHEN PLASTIC BRONCHITIS IS NOT DUE TO HEART DISEASE

Julie Biller [1]
Medical College Of Wisconsin, Pulmonary, Critical Care Medicine, Milwaukee-United States [1]

Background / Hypothesis:
Plastic bronchitis(PB) complicates up to 4% of individuals with congenital heart disease but can be seen in other health conditions. It is important to consider other causes of PB.

Materials and Methods:
Case study of 64 year old male who presented with plastic bronchitis. He expectorated large casts of the bronchial tree, developed shortness of breath.
He had normal echocardiogram

Results:
Pathology of expecorated casts revealed inflammatory cells including eosinophils.

Conclusions:
When evaluating children and adults who present with plastic bronchitis but do not have typical cardiac lesion associated with its development consideration of other causes is needed. Poorly controlled asthma, allergic bronchopulmonary aspergillosis, viral infections including influenza may cause similar pathology.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1657 - PRENATAL AND MATERNAL CONTRIBUTORS TO CONGENITAL HEART DISEASE RECURRENCE.

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University Of Sydney, Faculty Of Medicine And Health, Sydney-Australia [1] Sally L. Dunwoodie, David S. Winlaw, Eleni Giannoulatou, Natasha Nassar, Edwin P. Kirk, Gavin Chapman, Gillian M. Blue, Gary F. Sholler, Samantha J. L, *, Sydney-Australia [2] Sydney Children's Hospital Network, Heart Centre For Children, Sydney-Australia [3]

Background:
Most Congenital heart disease (CHD) has a multifactorial aetiology with genetic and environmental (fetal-placental-maternal) factors contributing to disease development. However, the contribution of maternal and prenatal factors to CHD recurrence, penetrance and variable expression, is unknown.

Methods:
Data from the New South Wales, Australia, linked CHD cohort, including routinely collected hospital admission and birth data, was collated for mothers with CHD. Chi-square comparative analyses were conducted to identify differences in prenatal and maternal factors in mothers with CHD that resulted in a child with/without CHD. Additional analyses currently underway include sibling analyses and other environmental exposures, including air and water quality.

Results:
From 2001–2019, 1,832 mothers had CHD and gave birth to 3,505 live born children, of which 107 had CHD (3%). Preliminary analyses identified several significant prenatal and maternal factors between pregnancies that resulted in a baby with CHD compared to a baby without CHD, including significantly higher frequencies of hypertension (including maternal and gestational ($p=0.001$), and maternal diabetes (Type 1 and 2; $p=0.01$) in pregnancies with CHD. Twin pregnancies were also significantly increased in pregnancies with CHD ($p=0.03$). No significant differences were noted for prenatal and maternal factors including socioeconomic status, gravidity, smoking, asthma, mental health, viral infections and respiratory infections between pregnancies that resulted in a child with CHD compared to those without.

Conclusions:
While genetic factors are known contributors to CHD recurrence, these novel findings suggest that environmental factors, including prenatal and maternal factors, also play an important role. While additional analyses and validation are required, these preliminary findings hold promise for future recurrence risk reduction through treatment of potentially modifiable factors. This is of particular relevance to the expanding adult CHD population.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1671 - PREGNANCY OUTCOMES IN WOMEN WITH FONTAN CIRCULATION A SYSTEMATIC REVIEW AND META ANALYSIS

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Background / Hypothesis:
Pregnancy is increasingly considered in women with Fontan circulation due to improving long-term survival. However, concerns persist regarding the safety of such pregnancies, particularly the risks of maternal and fetal complications. This study aimed to quantify the incidence of adverse outcomes in this population compared to healthy controls and to assess whether favorable results can be achieved with appropriate clinical management.

Materials and Methods:
We conducted a systematic review and meta-analysis of 10 comparative studies reporting pregnancy outcomes in women with Fontan physiology. Outcomes were classified into five domains: maternal complications, cardiovascular complications, bleeding and thromboembolic events, obstetric complications and delivery, and fetal/neonatal complications. A fixed-effect model was used to calculate pooled odds ratios (ORs) with 95% confidence intervals (CIs).

Results:
The analysis included 266 pregnancies in Fontan patients and 277 in controls. Fontan pregnancies showed significantly increased risks across all domains: maternal complications (OR 2.95, 95% CI: 1.91–4.54), cardiovascular complications (OR 2.78, 95% CI: 1.73–4.47), bleeding and thromboembolic events (OR 4.76, 95% CI: 3.08–7.36), obstetric complications (OR 2.95, 95% CI: 1.94–4.48), and fetal/neonatal complications (OR 2.95, 95% CI: 1.91–4.54). No heterogeneity was observed (I^2 = 0%). Notably, several studies reported successful maternal and neonatal outcomes in well-selected patients receiving multidisciplinary care.

Conclusions:
Pregnancy in women with Fontan circulation presents a substantially increased risk of both maternal and fetal complications. Nevertheless, it should not be regarded as an absolute contraindication. With comprehensive preconception evaluation, close multidisciplinary surveillance, and individualized delivery planning, favorable outcomes can be achieved in appropriately selected patients. These findings emphasize the importance of balanced, evidence-based counseling that acknowledges both the potential risks and the realistic opportunities for pregnancy in this unique population. Ultimately, this perspective supports a shift toward personalized, patient-centered care rather than universal risk avoidance.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1676 - PREDICTIVE UTILITY OF PERFUSION PRESSURE IN LATE POST FONTAN PATIENTS

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Background:
High Fontan pressure is a well-known predictor of poor prognosis in post-Fontan patients; however, cases of Fontan failure with normal Fontan pressure have also been reported. Recently, low systemic pressure has been identified as an independent predictor of mortality. We hypothesized that perfusion pressure is another strong hemodynamic parameter affecting clinical prognosis in post-Fontan patients. This study aimed to identify hemodynamic predictors of heart transplantation or death, other than Fontan pressure, and to evaluate the prognostic value of perfusion pressure in late post-Fontan patients.

Materials and Methods:
This retrospective study included post-Fontan patients who underwent cardiac catheterization at age ≥10 years between 1993 and 2018 at the Children's Hospital of Michigan. Cox proportional hazards models were used to identify significant clinical and catheter-based hemodynamic variables associated with heart transplantation or death. The predictive effect of perfusion pressure on freedom from the primary outcome was evaluated using several multivariate models. The Kaplan-Meier method and log-rank test were used to analyze freedom from the endpoint.

Results:
A total of 79 patients (median age: 15.7 years [range: 10.1–50.2 years]) were included. Among them, the primary endpoint occurred in 10 patients (13%) during a median follow-up of 1.9 years (range: 0.1–18.8 years).Univariate analysis identified several significant hemodynamic predictors, including Fontan pressure, pulmonary/systemic vascular resistance index, pulmonary/systemic flow, systemic arterial oxygen saturation, systemic venous oxygen saturation, systemic vascular resistance index, perfusion pressure, and perfusion pressure <53 mmHg. In multivariable analysis, perfusion pressure <53 mmHg emerged as an independent predictor of heart transplantation or death, along with Fontan pressure.

Conclusion:
Along with Fontan pressure, perfusion pressure was independently associated with the risk of heart transplantation or death in late post-Fontan patients.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1689 - EVALUATION OF BLOOD PRESSURE IN PATIENTS AFTER STENT IMPLANTATION OF COARCTATION OF AORTA IS RESTING BLOOD PRESSURE MEASUREMENT SUFFICIENT

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Background / Hypothesis:
After stent implantation, patients normotensive at routine BP monitoring may have inappropriate response to exercise

Materials and Methods:
Retrospective study. Patients were followed after stent implantation at 1,3,6 and 12 months, then yearly if BP is controlled .ETT was performed in normotensive without and on one antihypertensive at routine BP measurements before discontinuation

Result:
Pre stenting ssystolic BP was 180mmHg(110-240) ,post procedure 140mmHg(100-160) p< 0.002 after 6 to 36 months follow up after stent implantation.
Pre procedure 16(13%) were normotensive without antihypertensive, 31(26%) were taking one,54(45%) were 2,and 19(16%) were taking 3 antihypertensive. Post stenting after 6-12 months 36(30%) without medication ,55(46%) taking one and 24% taking 2 antihypertensive were maintaining normal BP on routine check up.
ETT was performed in 35 out of 55 with one antihypertensive(Group A) before discontinuation and in 28 out of 36 normotensive without antihypertensive(Group B) after 6 months to 3 years of stent implantation.
Group A: 12 out of 35normotensive on one antihypertensive showed exaggerated response on mild exertion.23 had normal response so antihypertensive discontinued. 5 developed hypertension on routine checkup .18 who remained normotensive on routine BP checkup ,had ETT after 3-6 months of discontinuation ,8 showed exaggerated response to exercise. Only 10 patients remained normotensive after 3 years.
Group B: ETT done in 28 out 36 normotensive patients without antihypertensive after 6months to 3years.10 showed exaggerated response ,18 patients remained normotensive. Out of total 63 who had ETT only 28 patients remained normotensive after 3 years.

Conclusion:
ETT is recommended to evaluate the BP as hypertension can not be demonstrated

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1705 - PSYCHOLOGICAL AND PATIENT REPORTED OUTCOMES BEFORE AND DURING THE COVID 19 PANDEMIC A SUBANALYSIS OF SOUTH KOREAN DATA FROM THE APPROACH IS II STUDY

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Background / Hypothesis:
The COVID-19 pandemic has posed significant psychosocial challenges for individuals with chronic health conditions. Adults with congenital heart disease (ACHD) may be particularly vulnerable to emotional distress and disruptions in illness identity. This study examined longitudinal changes in psychological outcomes before and during the COVID-19 pandemic in a Korean ACHD population.

Materials and Methods:
A total of 208 Korean ACHD patients participated in the international APPROACH-IS II study. Participants completed validated self-report measures at two-time points: pre-pandemic (August 2019–February 2020) and peri-pandemic (September 2020–April 2021). Assessed outcomes included mental health, depression, anxiety, illness identity (rejection, engulfment, and enrichment), perceived stigma, social support, empowerment, and quality of life. Pre-post differences were analyzed using multivariable longitudinal regression with generalized estimating equations, adjusting for age, sex, working status, anatomical complexity, NYHA class, social media use, and COVID-19 diagnosis.

Results:
The median age of participants was 29 years (IQR: 22–43), and 50.5% were female. Most had complex congenital anatomy (57.5%) and were classified as NYHA class II (91.3%).
Mental health significantly declined during the pandemic, with a 3.02-point reduction in mental component summary scores ($p = 0.005$). Three illness identity subdomains showed significant changes: rejection increased ($p < 0.001$) and engulfment increased ($p = 0.003$), indicating worsening illness-related psychological integration, while enrichment also increased ($p < 0.001$), suggesting positive reinterpretation of illness in some individuals. Perceived stigma also increased significantly ($p < 0.001$).

Conclusions:
Korean adults with CHD experienced a notable decline in mental health, increased illness identity conflict, and heightened perceptions of stigma during the COVID-19 pandemic. Interestingly, a subset of patients reported increased illness-related enrichment, indicating possible psychological growth. These findings emphasize the need for ongoing psychosocial screening and tailored interventions to support emotional resilience and identity adaptation among ACHD patients

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1735 - IMPACT OF RVOTO REPAIR STRATEGIES IN PATIENTS WITH TETRALOGY OF FALLOT ON CARDIAC MRI PARAMETERS

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Background / Hypothesis:
Treatment strategies for right ventricular outflow tract obstruction (RVOTO) vary between patients with Tetralogy of Fallot. At our center, three methods have been used over the last decades, including transannular patching (TAP), subvalvular patching (SVP) and an annulus-sparing, transpulmonary approach (VS). The aim of our study was to evaluate the effects of those strategies on right ventricular volume, measured by cardiac MRI.

Materials and Methods:
We identified all patients with repaired Tetralogy of Fallot (rTOF) who underwent a cardiac MRI at our institution between 9/1999 and 12/2022. We excluded patients who had undergone a reintervention at the right heart before cardiac MRI. MRI parameters of the right ventricle were standardly assessed, i.e., indexed end-diastolic volume (EDVi ml/m2), indexed end-systolic volume (ESVi ml/m2) and pulmonary regurgitation (PR %). The Kruskal-Wallis test was used to compare mean values between groups.

Results:
A total of 144 patients with a median age of 13 months (range 1–331) at TOF repair and a median age of 20 years (range 6–53) at MRI were included. Overall, TAP was used in 59 (41%), SVP in 45 (31%) and VS in 40 (28%) patients.
In patients with TAP, SVP and VS mean EDVi was 119±35ml/m2, 113±22ml/m2 and 105±23ml/m2; mean ESVi was 54±26ml/m2, 53±14ml/m2 and 49±15 ml/m2; mean PR was 31±12%, 27±13% and 21±15%, respectively.
Comparing the mean values, patients with TAP and SVP showed no differences in EDVi, ESVi and PR. In contrast, the VS group was associated with significantly lower EDVi ($p=.05$) and lower PR ($p<.001$) when compared to the TAP group.

Conclusions:
Transannular and subvalvular patching in patients with Tetralogy of Fallot is associated with increased right ventricular volume and pulmonary regurgitation. These patients may benefit from regular MRI assessments to guide treatment strategies and prevent right ventricular deterioration.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1739 - SOCIAL DETERMINANTS OF HEALTH AND THEIR IMPACT ON TRANSITIONAL CARE IN ADULTS WITH CONGENITAL HEART DISEASE

Horacio Márquez-gonzález [1], Lucelli Yáñez-gutiérrez [2], Jaime Santiago-hernández [3], Carlos Riera-kinkel [4], Maria Fernanda Cruz-varela [5]
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Background / Hypothesis
Congenital heart disease (CHD) is the most common congenital anomaly, and due to improved survival rates, over 85% of patients reach adulthood. However, discontinuity in care during the transition to adult services can lead to adverse outcomes. We hypothesized that unfavorable social determinants of health (SDH) negatively influence access to transitional care and long-term outcomes in adults with CHD.

Materials and Methods
A retrospective cohort study was conducted using electronic health records of adult CHD patients at a tertiary care center in Mexico (UMAE HC CMN SXXI) from 2015–2024. We analyzed 358 patients aged ≥18 years, collecting sociodemographic, clinical, and transitional care data. Variables included sex, syndromic association, CHD complexity, education, occupation, and health insurance. We evaluated the association between SDH and transitional care using chi-square and logistic regression models.

Results
Among 358 patients (median age 32 years; 54% female), only 122 (34%) received structured transitional care. Statistically significant protective factors for receiving transitional care included being employed or in school (OR 1.58, CI 1.26–1.97), having a syndromic diagnosis (OR 0.014, CI 0.006–0.058), complex CHD (OR 0.96, CI 0.93–0.99), and univentricular physiology (OR 0.61, CI 0.45–0.84). Conversely, female patients with prior pregnancies and those older than 35 years were less likely to have received transitional care. No deaths were reported during the study period.

Conclusions
Transitional care in CHD is influenced by social determinants such as employment, education, and syndromic diagnosis. Structured transition programs are urgently needed, especially for vulnerable groups, to ensure continuity of care and optimize outcomes in adult CHD populations.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1740 - MATERNAL AND FETAL OUTCOMES IN WOMEN WITH CONGENITAL HEART DISEASE A SINGLE CENTER EXPERIENCE

Horacio Márquez [1], Lucelli Yáñez-gutiérrez [2], Sheila Sánchez-lópez [2], Carlos Riera-kinkel [3], Diana López-gallegos [4], Israel García-dávalos [4]
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Background / Hypothesis:
Advances in pediatric cardiology and cardiac surgery have allowed more women with congenital heart disease (CHD) to reach childbearing age. However, pregnancy in this population is associated with increased risk of cardiovascular and obstetric complications. We aimed to evaluate maternal and fetal outcomes among pregnant women with CHD managed in a multidisciplinary cardio-obstetric program, and to identify predictors of adverse events.

Materials and Methods:
We conducted a retrospective review of medical records from all pregnant women with CHD seen at our cardio-obstetric clinic between January 2018 and December 2023. Data collected included demographic characteristics, cardiac diagnosis, WHO risk classification, maternal complications (heart failure, arrhythmias, need for cardiac intervention), and fetal outcomes (preterm birth, intrauterine growth restriction [IUGR], and perinatal death). Statistical analysis was performed using chi-square and logistic regression.

Results:
A total of 64 pregnancies in 58 women with CHD were analyzed. The median maternal age was 28 years (IQR 25–32). The most common lesions were repaired Tetralogy of Fallot (21.9%) and atrial septal defect (18.8%). According to the modified WHO risk classification, 12.5% were Class I, 34.4% Class II, 37.5% Class III, and 15.6% Class IV. Maternal complications occurred in 35.9% of pregnancies, including heart failure (17.2%) and supraventricular arrhythmias (10.9%). There were no maternal deaths. Fetal complications occurred in 45.3% of pregnancies, including preterm delivery (26.6%), IUGR (15.6%), and one case of perinatal death. WHO Class III–IV was significantly associated with adverse maternal and fetal outcomes ($p < 0.01$).

Conclusions:
Pregnancy in women with moderate to high-risk CHD carries substantial risk for both mother and fetus. Structured multidisciplinary care and early risk stratification are essential to optimize outcomes. Our findings highlight the importance of specialized cardio-obstetric programs for this vulnerable population.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1741 - TO STUDY DIFFERENCES IN VARIOUS CLINICAL BIOCHEMICAL AND IMAGING PARAMETERS IN PATIENTS WITH EBSTEIN'S ANOMALY REQUIRING SURGERY VERSUS THOSE NOT REQUIRING SURGERY

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Background / Hypothesis:
Current referral is late in the course of disease which adversely impacts post-operative outcomes.Identification of imaging and biochemical predictors for surgical intervention in patients with Ebstein's anomaly may improve outcome.

Materials and Methods:
A total of 49 patients above 5 years were enrolled after written informed consent. Clinical, biochemical and imaging data noted. Transthoracic 2D and 3D echocardiography (morphological and functional) parameters compared with those of cardiac MRI

Results:
The mean age of the patients was 23 years and 55 % were males. The majority (65%) were in NYHA II, only 24% had cyanosis, and 37% had cardiomegaly. Nearly half were Carpentier's B. The apical displacement of STL was comparable between 3D echo and MRI with 4.23 and 4.55 cms respectively with a strong correlation (r value=0.875; p=<0.001). In patients requiring surgery, fRV End-diastolic volume (fRVEDV) was larger with MRI compared to 3D echo 214.64 ml and 180.39 ml. fRV End systolic volume(fRVESV) was larger in the MRI group compared to 3D echo group (120.95 ml and 104.15 ml). fRVEF was 41.53% and 41.29 % in the 3D echo and MRI group respectively. 75.5% of patients had Late Gadolinium Enhancement (LGE) on MRI, and 20 (71%) patients referred for surgery had LGE. BNP levels had a good correlation with cardiomegaly (CTR>0.65) with a correlation coefficient of 0.564; p<0.001).BNP also showed a strong correlation with Carpentier's grade and Celermajer index with correlation coefficients of 0.327 and 0.483 respectively. The independent predictors of the need for surgery in our study included BNP levels (AUC 0.662) and fRVESV (AUC 0.566)

Conclusions:
We found a strong correlation between 3D echo and CMR-derived morphological and functional parameters. BNP had a strong correlation with functional RV volumes.Imaging and biochemical predictors of the need for surgery in Ebstein's anomaly were identified. However, adequately powered larger studies with adequate follow-up needed

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1745 - TEMPORAL TRENDS IN SURGICAL OUTCOMES OF ADULT CONGENITAL HEART DISEASE IN CHINA DURING 2009 2023 A RETROSPECTIVE ANALYSIS FROM GUANGDONG PROVINCIAL PEOPLE'S HOSPITAL

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Background:
Adult congenital heart disease is a rising public health burden in China, but there are no published reports on surgical outcomes for this group. Here, we report risk-stratified outcomes and temporal trends in adult congenital heart surgery at Guangdong Provincial People's Hospital, one of the largest heart centers in China.

Methods:
Adult patients (aged ≥ 18 years) undergoing surgery between 2009 and 2023 were included from local database. Primary procedure in each patient was defined as the procedure with the highest STAT mortality category (standard risk stratification from STS Congenital Heart Surgery Database). Mortality, length of stay (LOS), postoperative complications were assessed across three time periods (2009–2013, 2014–2018, 2019–2023) and stratified by STAT risk categories and age groups.

Results:
A total of 6844 patients (median age: 33.9 years, IQR: 25.7-46.2 years) were included for analysis. During study period, overall 30-day mortality rate was 0.58% and complication rate was 4.4%. Mortality rate improved significantly over time in lower risk patients (STAT category 1–3: 1.03% to 0.36% to 0.00%; P for trend = 0.0013), while a non-significant downward trend was observed in high-risk groups (STAT category 4: 4.44% to 2.40% to 1.61%, P for trend = 0.06). Patients aged ≥60 years had the highest mortality (1.47%) and longest LOS (mean: 28.3 days). Patients with complications experienced a markedly higher mortality (8.4%) and prolonged LOS (mean: 35.3 days). Complication rates were consistently higher in STAT 4 procedures and showed improvement over time across all risk categories.

Conclusions:
Significant improvement in surgical outcomes was observed among adult congenital heart patients at our center over the past 15 years. Stratification by STAT category and age revealed targeted areas of progress, particularly among lower-risk and younger patients. Older patients represent a priority quality improvement target in the future.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1750 - EFFECTS OF OPTIMIZED HEART FAILURE THERAPY IN PATIENTS WITH CONGENITAL HEART DISEASE AND A SYSTEMIC RIGHT VENTRICLE

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Background/Hypothesis:
Congenitally corrected transposition of the great arteries (ccTGA) is a rare and complex congenital heart disease characterized by both atrioventricular and ventriculoarterial discordance. Patients with a systemic right ventricle (RV) are predisposed to heart failure (HF) as they age. Despite increasing adult survival rates, current HF guidelines do not provide specific recommendations for this population. We aimed to describe the clinical profile, imaging findings, and medical treatment in adult patients with ccTGA followed at a national referral center in Mexico.

Materials and Methods:
A retrospective, observational, cross-sectional study was conducted on adult patients with confirmed ccTGA treated between 2017 and 2023. Patients were included if they had echocardiography, cardiac magnetic resonance (CMR), or NT-proBNP measurements. Data collected included demographics, functional status, treatment, and imaging parameters. Right ventricular function was assessed using FAC, TAPSE, strain, and CMR-derived volumes.

Results:
Eleven patients were included (54.5% female; median age 28 years). Most had complex ccTGA (72.7%), with ventricular septal defect being the most frequent associated lesion (75%). All were in NYHA class I-II and receiving at least one HF medication; 90% were on mineralocorticoid receptor antagonists. The mean NT-proBNP was 334 pg/mL. Statistically significant improvements were observed after treatment in CMR parameters: systemic RV ejection fraction, end-diastolic volume, and fractional area change ($p < 0.05$).

Conclusions:
Right ventricular failure is frequent in patients with ccTGA, and medical therapy appears to improve or stabilize cardiac function. Serial imaging and biomarker assessment may aid in guiding therapy and monitoring progression. Although limited by sample size, our findings support the value of early and sustained HF treatment in systemic RV patients.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1831 - AN INNOVATIVE APPROACH TO DEDICATED ACHD CARE IN A TERTIARY CHILDREN'S HOSPITAL EFFECT ON LENGTH OF STAY AND VENTILATION DURATION

Erik Su [1], Marc Anders [1], *Saul Flores* [1], Danny Gil [1], Gayathri Kumar [1], Ranjan Joshi [1], Jeramy Roddy [1], Sebastian Tume [1], Khayri Shalhoub [1], Jamie Cargill [1], Priya Bhat [1], Asma Razavi [1], Hasini Ediweera [1], Edward Hickey [2], Christopher Broda [3], Stephen Dolgner [3], Peter Ermis [3], Wilson Lam [3], Angeline Opina [3], Katherine Salciciollo [3], Tony Pastor [3], Ryan Byrne [3], Vince Gonzalez [3], Aamina Shakir [3], Ashish Ankola [4], Dhaval Parekh [5], Mumbasheer Ahmed [1], Cameron Dezfulian [1]

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Background / Hypothesis:
Adults with congenital heart disease continue to be a growing population globally with unique needs and histories spanning multiple eras in congenital heart care. The Adult Congenital Heart inpatient unit at Texas Children's Hospital combines acute and ICU care all in the same physical space for ACHD patients. This specialized unit is staffed by adult and pediatric trained providers with congenital heart expertise and employs unique protocols to encourage early extubation, patient mobilization, delirium prevention and avoidance of nosocomial complications. We hypothesized time on mechanical ventilation and ICU length of stay (LOS) would be shortened in the era after ACHD patients were cohorted on the inpatient unit.

Materials and Methods:
This was an IRB approved retrospective observational review of ACHD (age 16 an up) admission data from 1 Jan 2017 to the present to 5 Feb 2024 at Texas Children's Hospital, restricted to those receiving mechanical ventilation. We compared those discharged before 12 Jan 2021 (unit opening) to those discharged on that day or after. Age, length of stay to discharge, and duration on mechanical ventilation were compared with Wilcoxon Rank-Sum test for nonparametric continuous data.

Results:
In total 581 ICU encounters were reviewed. Patients discharged before the ACHD unit opened totaled 231 individual and afterwards 350. Patients admitted to the ACHD ICU after the unit opened were older (Median (IQR) 23y(18-37) vs. 18y(17-22.5) $p<0.005$), and had a shorter time on mechanical ventilation (0.71d (0.33-3) vs. 1.14 (0.4-4.74) $p<0.001$). The LOS was not significantly different ((24.15d (8.29-61.28) vs. 20 (6.28-56.61) $p=0.176$)

Conclusions:
Care for the ACHD patient in this continually evolving dedicated physical unit was associated with shorter time on mechanical ventilation, and important parameter in expediting care, encouraging rehabilitation, and overall outcome. Patients were older reflecting that a dedicated ACHD space may encourage referral. LOS was not significantly different.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1832 - IMPACT OF CONGENITAL HEART DISEASE ON SELF REPORTED QUALITY OF LIFE AMONGST ADOLESCENTS A MULTIDIMENSIONAL ASSESSMENT ACROSS SEVERITY LEVELS

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Background / Hypothesis:
Life expectancy for pediatric patients with congenital heart disease (CHD) has improved. With better survival rates, focus has shifted to quality of life and successful transition to adult CHD care.

Materials and Methods:
A total of 536 CHD patients (ages 14-18) attended the Hospital for Sick Children Cardiac Transition Clinic (2020-2024). The Pediatric Quality of Life Inventory 4.0 (PedsQL™) and its Cardiac Module 3.0 (PedsQL™ Cardiac Module) were completed before the first visit. Patients were categorized by CHD severity: simple (n=33), moderate (n=310) and complex (n=193). A subgroup analysis of patients with Fontan physiology was performed.

Results:
The Median PedsQL score was 77 (IQR 67-87), with no significant difference by CHD severity. Total score was inversely proportional to number of prior interventions (r=-0.09, p=0.036). Females had a significantly lower overall score than males [75 (64-87) vs 79 (69-88), p=0.028]. Fontan patients had a lower PedsQL score which almost reached significance [73 (64-84) vs 78 (68-88), p=0.06]. Physical function domain scores are inversely related to CHD severity [simple 91 (78-100) vs moderate 88 (75-97) vs complex 84 (72-94), p=0.03] and in patients with Fontan compared with non-Fontan [81 (72-91) vs 88 (75-97), p=0.003]. In the PedsQL cardiac module, CHD severity or Fontan physiology did not significantly impact total scores. In the domain of Heart Problems and treatment, scores declined with severity [simple 82 (75-93), moderate 79 (68-89), complex 79 (64-89), p=0.05] and in patients with Fontan compared with non-Fontan [71 (61-86) vs 79 (69-89), p=0.025]. Females scored significantly lower in both perceived physical appearance [75 (50-92) vs 83 (67-100), p<0.001] and treatment anxiety [81 (63-100) vs 94 (69-100), p=0.015] compared to males.

Conclusions:
Adolescents with CHD report good QOL. Females and Fontan patients have lower QOL scores, particularly in physical function, treatment anxiety, and physical appearance.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1838 - ANXIETY AND DEPRESSION AFFECTS PATIENT REPORTED QUALITY OF LIFE AND TRANSITION READINESS IN ADOLESCENTS WITH CONGENITAL HEART DISEASE

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Background / Hypothesis:
Adults with CHD experience higher rates of anxiety rates of anxiety and depression which can negatively impact their quality of life. We sought to examine the prevalence of anxiety and depressive symptoms in adolescents with CHD and the impact on quality of life and transition readiness.

Materials and Methods:
106 patients with CHD aged between 14-18 years old were seen in a nursing led transition clinic. The Pediatric Quality of Life Inventory 4.0 (PedsQL™) and it's cardiac module 3.0, PHQ-9 and GAD 7 questionnaires were administered prior to first transition visit. Transition Q questionnaire was also completed. Patients were classified according to CHD severity: simple (n=7), moderate (n=62)and great complexity (n=37).

Results:
29% patients (n=31) reported moderate or greater depressive symptoms and 31% (n=33) moderate or greater symptoms of anxiety. There was no significant difference in reported anxiety or depressive symptoms related to CHD severity or having a Fontan. PedsQL total score [median 59 (IQR 49-77) vs 74 (70-84), p<0.001] and cardiac module scores [62 (49-73) vs 75 (68-84), p<0.001] were significantly lower in patients with moderate/severe depressive symptoms compared with no/minimal symptoms. Similarly, patients with moderate/severe anxiety symptoms had lower PedsQL total score [66 (50-76) vs 74 (68-85), p=0.01] and cardiac module total scores [62 (52-73) vs 76 (68-85), p<0.001]. Transition readiness score was not impacted by moderate/severe depression [14 (12-19) vs 15 (11-18), p=0.57] or anxiety [14 (11-16) vs 15 (12-19), p=0.129] symptoms compared to no/minimal symptoms.

Conclusions:
Anxiety and depressive symptoms are common in adolescents with CHD. Disease severity or Fontan does not impact prevalence of symptoms. Greater than moderate symptoms of anxiety or depression results in lower reported QOL scores but does not impact patients transition readiness.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1857 - PALLIATIVE BALLOON PULMONARY VALVOTOMY IMPROVES IMMEDIATE POST OPERATIVE OUTCOMES IN DEEPLY CYANOTIC PATIENTS WITH TETRALOGY OF FALLOT

Sowmya Kasturi [1], Srinath Reddy Narahari [1]
Sri Padmavathi Children's Heart Centre, Pediatric Cardiology, Tirupathi-India [1]

Background / Hypothesis:
Deeply cyanotic older age patients with Tetralogy of Fallot pose unique problems to the treating team. Long term hypoxia has deleterious effects on myocardium causing prolonged morbidity. Aim of this study is to analyse the effects of palliative balloon pulmonary valvotomy on immediate post operative outcomes in this subset of patients.

Materials and Methods :
The study is a prospective analysis of 42 patients who underwent balloon pulmonary valvotomy prior to complete corrective repair for simple tetralogy of Fallot at Sri Padmavati Children's Heart Centre, Tirupati.The preoperative characteristics along with oxygen saturation measured by pulse oximetry, hemoglobin and hematocrit were studied. These patients underwent corrective ICR in follow up.Post operative outcomes like duration of ventilation,inotropes,hospital stay and ICU stay were studied.These outcomes were compared with a similar group of patients who underwent direct corrective ICR.

Results:
The age group of these patients ranged from young infants to 40 years. The mean saturation measured by pulse oximetry prior to the procedure was 57± 8%.A palliative BPV was performed within 24hours of admission which showed an increase of saturation by 15± 3% in atleast 38(90%) patients. The mean duration between the balloon pulmonary valvotomy and the intracardiac repair was 179± 127days.No immediate or late mortality was noted in this group. This group had statistically significant improved outcomes in terms of morbidity like prolonged ventilation, prolonged ICU stay, total inotrope duration and hospital stay when compared to patients who underwent direct ICR.Low saturation,high hematocrit ,poor preoperative status of the child were associated with prolonged morbidity.

Conclusions:
Older age deeply cyanotic patients with simple TOF constitute a significant number of patients in public sector tertiary paediatric cardiac care. A palliative BPV will significantly improve the preoperative status of these patients thereby improving the post operative outcomes.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1869 - EXTRACARDIAC PERFORMANCE INDICATORS IN UNIVENTRICULAR FONTAN CIRCULATION THE ROLE OF NON INVASIVE EVALUATION OF HAEPATIC STIFFNESS

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Background:
Fontan-Associated Liver Disease (FALD) is a frequent complication in patients with Fontan circulation, yet its relationship with haemodynamic status and exercise capacity remains poorly understood. This study investigates the role of hepatic stiffness in predicting haemodynamic impairment and exercise tolerance in this population.

Materials and Methods:
We enrolled 43 Fontan patients, operated between 1985 and 2018 at a tertiary center. Participants underwent regular cardiac evaluations, including echocardiography, lab tests, and liver imaging, specifically transient elastography (TE) (FibroScan®) for liver stiffness measurement expressed as ElastoPQ [kPa]. Among them, 25 patients (58.1%) had a Cardiopulmonary Exercise Test (CPET), and 20 (46.5%) underwent cardiac catheterisation. Patients were divided into two groups based on the trend of liver stiffness (ElastoPQ increase ≥10 kPa or not between two consecutive controls): "Liver Disease" (LD, n=14) and "Non-Liver Disease" (NLD, n=27).

Results:
The cohort ranged from 13 to 52 years, with a median age of 23 years. The median duration of the Fontan circuit was 15 years. Notably, 41 patients (95.3%) had at least one TE during follow-up. Clinical variables, including NYHA class, ejection fraction, and systemic atrioventricular valve regurgitation showed no significant differences between the NLD and LD group. However, the mean circuit pressure indicated a trend towards higher values in the LD group (p=0.08). Significant differences were observed in end-diastolic pressure (p=0.05) and peak VO2 on CPET (p=0.01), with LD patients showing higher pressure in the systemic ventricle and lower aerobic capacity. Interestingly, the NLD group was older (28.5 years) compared to the LD group (21 years, p=0.04).

Conclusions:
Standard cardiac evaluations may not adequately assess Fontan patients. Increasing trend of hepatic stiffness, non-invasively measured, may predict worsening haemodynamic status and exercise capacity, facilitating early identification and intervention for target lesions within the Fontan circuit.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1884 - HEALTH REPORTED QUALITY OF LIFE IN PATIENTS WITH A SYSTEMIC RIGHT VENTRICLE THE QUALISYSTEMIC STUDY

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Chu Nantes, Pediatric Cardiology, Nantes-France [1] Chu Montpellier, Pediatric Cardiology, Montpellier-France [2] Chu Bordeaux, Pediatric Cardiology, Bordeaux-France [3]

Background:
The systemic right ventricle (SRV) represents one of the most complex congenital heart diseases (CHD), involving two anatomical presentations: D-looped transposition of the great arteries and congenitally corrected transposition of the great arteries. Recent therapeutic advances have attempted to improve prognosis in adults with an SRV, but the impact on health-related quality of life (HRQoL) has not been clearly established.

Methods:
Adult patients aged >18 years with an SRV were prospectively enrolled in a multicentre cross-sectional study with recruitment across 13 CHD centres. Demographic, clinical, biological, and imaging data were analysed to assess HRQoL and its determinants.

Results:
A total of 99 patients (mean age, 38.7±9.2 years; 52% male) were included. Most were symptomatic (NYHA II: 52.2%; NYHA III: 33.7%) with reduced exercise capacity (mean VO_2max=20±6.1 ml/Kg/min, i.e., 62.4%±16.8% of predicted values). HRQoL was moderately impaired with a physical component score of 45.9±8.7 and a mental component score of 46.2±9.5. A lower physical component score was independently associated with a reduced VO_2max, a recent episode of decompensated heart failure, vitamin K antagonist medication, and being unemployed. The use of antiarrhythmic medications, the number of heart-failure related treatments, and being unemployed were independently associated to a lower mental component score, but having undergone interventional cardiac catheterization was associated with a better mental component score.

Conclusions:
HRQoL in adults with SRV is moderately impaired compared to normative data. Cardiopulmonary fitness and clinical factors significantly influence physical and mental components of HRQoL, underscoring the importance of targeted interventions to optimize patient outcomes.

ClinicalTrials.gov ID: NCT03379831

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1902 - SINGLE CENTER SINGLE OPERATOR 22 YEAR EXPERIENCE OF TRANSCATHETER CLOSURE OF SECUNDUM ATRIAL SEPTAL DEFECTS IN A SMALL COUNTRY

Pencho Kratunkov [1], Georgi Georgi Penchev [1], Rumen Marinov [1], Elena Bakardzhieva [1], Ivats Nacev [2], Dimitar Petkov [3]
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Background:
Transcatheter closure of secundum atrial septal defects (ASD-II) has become method of choice for the treatment of ASD-II and different devices have been used. The aim of this study is evaluate the results of transcatheter closure of ASDs performed by a single operator in single center in a small country and to stress on the severe complications and how to avoid them.

Materials and methods:
All patients with ASD-II with significant left-to-right (L-R) shunt in whom transcatheter ASD closure has been attempted from December, 2nd 2002 until March, 31st 2025 were included. Patients with insignificant L-R shunt and patent foramen ovale have been excluded.

Results:
Transcatheter ASD closure has been attempted in 314 patients. Three patients have been sent for surgery because of risk of erosion, multiple ASDs, mediastinal tumor. In another 3 patients the device was retrieved because of instability. All of them underwent successful transcatheter closure several months later. Two patients needed a second device. Thus 310 devices have been implanted in 308 patients during 311 procedures. We have experienced 5 major procedure-related complications: one death (0,32%) of a 69-year old woman and 4 device embolizations (1,28%). Postmortem examination confirmed the diagnosis of intramural esophageal haematoma with compression of the trachea which was already established by computed tomography. All 4 patients with device embolization have been successfully operated.

Analysis of the complications showed that gentle handling of the transesophageal probe is essential to avoid injury to the esophagus in all patients. Device embolization can be minimized with experience and good Echo imaging.

Conclusions:
Transcatheter closure of ASD-II is safe and effective with low morbidity and mortality in experienced hands. Severe complications are rare and can be further minimized and avoided with attention to detail. We should never forget that it is a teamwork and everyone is important.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1941 - FALLING OR "FALD"ING ASLEEP SLEEP DISORDERED BREATHING AND FALD PROGRESSION

Renata Mazurek [1], Aysha Malik [2], Kali Hopkins [1], Thomas Schiano [3], Ali Zaidi [1]
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Background / Hypothesis:
Sleep-disordered breathing (SDB) is associated with Fontan circulation, and can exacerbate hypoxemia in these patients. Hypoxia is also considered a factor in Fontan-associated liver disease (FALD) development. While mechanisms of these Fontan-affiliated conditions remain under study, we considered whether SDB correlates with FALD progression given their often asymptomatic and sub-clinical manifestations.

Materials and Methods:
We identified Fontan patients in a single center referred for sleep study from 2020-2025. All patients underwent clinical evaluation for FALD including liver imaging (MRI/CT). Medical records were also reviewed for congenital catheterization with liver biopsy within a year of polysomnography, echocardiogram, and labs. Regression analysis was applied to observe influence of sleep-related O_2 saturations.

Results:
In the Fontan cohort (N=119), 9 patients were referred and 6 completed polysomnography (n=2 male, age 36±2.5 years, BMI 30.0±1.5 kg/m^2, n=3 lateral tunnel/n=3 extracardiac, time since Fontan 27±1.8 years, n=5 catheterization/liver biopsy). Average baseline saturation was 93% [91-95%]. Polysomnography results varied widely, with average AHI 10.3±5.0/hr [0-25.9/hr] and RDI/AHI 17.5±6.1/hr [2.4-39.5/hr]. Diagnoses ranged from poor sleep efficiency (62.1±9.3% [33.6-94.5%]), hypoventilation/hypoxemia, to obstructive sleep apnea (OSA) (mild to moderate-severe). Lowest saturation averaged 77.5±4.7% [56-89%], without ventricular or AV valve function, or Fontan pressure (12-17mmHg) correlations and with overall non-significant negative BMI correlation (BMI-coefficient, p-value [95% CI]: -0.9974, 0.3565 [-3.6565-1.6617]; without outlier: -0.8132, 0.0418 [-1.5694--0.0569]). Congestive Hepatic Fibrosis Scoring was 2A or 3, related to liver imaging. No significant correlation with FIB-4 and APRI scores was evident controlling for BMI (lowest saturation-coefficient, p-value [95% CI]: 0.0206, 0.0855 [-0.0053-0.0465]; 0.0052, 0.4409 [-0.0133-0.0236]).

Conclusions:
This study highlights variability in SDB among adult Fontan patients, including significant desaturation, emphasizing need for proactive OSA screening and weight management, especially in those with elevated BMI. Longitudinal, larger cohort assessment of FALD and sleep-related desaturations may provide further evidence of factors influencing liver fibrosis progression.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

1993 - THE EFFECT OF CORONARY DOMINANCE ON CLINICAL OUTCOME IN PATIENTS WITH A SYSTEMIC RIGHT VENTRICLE A CROSS SECTIONAL STUDY.

Ella Cockburn [1], Nicholas Davidson [1], Katherine English [1], Philip Naimo [1], Melissa Lee [1], William Wilson [1]
The Royal Melbourne Hospital, Cardiology, Melbourne-Australia [1]

Background / Hypothesis:
Patients with Congenitally Corrected Transposition of the Great Arteries (ccTGA) and those with dextro-Transposition of the Great Arteries (dTGA) who have undergone an atrial switch procedure (either Mustard or Senning) have a morphologic right ventricle in the systemic position (systemic right ventricle (SRV)). Clinical trajectories are varied, and long-term survival is attributed to progressive SRV dysfunction. Insufficient myocardial oxygen delivery has been proposed as a contributing factor. This study investigated whether coronary dominance influences progression to SRV dysfunction.

Materials and Methods:
A cross-sectional study was conducted of patients with ccTGA and dTGA post atrial switch (either Mustard or Senning) known to the Royal Melbourne Hospital Congenital Cardiology Clinic between January 2014 to January 2025. Coronary dominance was determined through previous coronary assessments such as Coronary Angiography or Computed Tomography Coronary Angiograms. Data collected included patient demographics, clinical characteristics and clinical outcomes. The primary outcome measure was SRV dysfunction. Secondary outcomes included hospitalisation for intravenous diuresis, progression to moderate/severe tricuspid regurgitation, New York Heart Association Class, all-cause mortality, and transplant listing.

Results:
Coronary dominance, defined by the vessel supplying the posterior descending artery, was not significantly associated with SRV dysfunction or the secondary outcomes. Only 4/73 included SRV patients were left dominant. Findings suggest that coronary dominance may not reflect the preponderance of coronary blood flow to the SRV myocardium. We have also described significant variability in the coronary morphology, particularly in the ccTGA group.

Conclusions:
This study did not demonstrate a statistically significant relationship between conventional coronary dominance and adverse outcomes in adults with SRV. The variability in coronary anatomy, especially in ccTGA, challenges the utility of traditional definitions of dominance in this context. Larger studies are needed to better understand the role of coronary supply in the long-term prognosis of this population.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease
2011 - PPI IN FONTAN CIRCUIT WITH SSS
Sumanta Shekhar Padhi [1]
Nh Mmi, Cardiology, Raipur-India [1]

Background / Hypothesis:

38 yr /F
Underwent- Fontan surgery with fenestration at the age of 28 for – severe Ebstein anomaly with severe TR and almost non-functioning RV. After about 8yr after the surgery she developed Frequent LOC and Seizure episodes. Despite adequate AED- she continue to have recurrence of the symptoms. On evaluation with Holter was found to have SSS- requiring Pacemaker

Materials and Methods:

Results:

Conclusions:

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2025 - MINIMAL FONTAN PATHWAY DIAMETER IN ADULTS UNDERGOING EXERCISE CATHETERIZATION ASSOCIATION WITH EXERCISE CAPACITY HEMODYNAMICS AND LIVER SCORES

Jacob Cao [1], Alexander Egbe [2], Charles Jain [2], Christopher Francois [3], Patrick Kamath [4], Yves D'udekem [5], David Celermajer [1], Rachael Cordina [1], William Miranda [2]
Royal Prince Alfred Hospital, Cardiology, Sydney-Australia [1] Mayo Clinic, Cardiology, Rochester-United States [2] Mayo Clinic, Radiology, Rochester-United States [3] Mayo Clinic, Gastroenterology And Hepatology, Rochester-United States [4] Children's National Heart Institute, Cardiothoracic Surgery, Washington-United States [5]

Background / Hypothesis:
The Fontan pathway (inferior caval-pulmonary artery [PA] connection) mediates forward flow and mitigates backward pressure, but its optimal size remains uncertain. This study aimed to evaluate the relationship between pathway diameter, hemodynamics, exercise capacity, and liver disease markers.

Materials and Methods:
Retrospective review of 67 adults with extracardiac conduit (EC) or lateral tunnel (LT) Fontan procedures who underwent exercise cardiac catheterization. Minimal pathway diameter was measured via angiography or computed tomography. % predicted peak VO2 was the primary exercise capacity measure. Liver markers included aspartate aminotransferase-to-platelet ratio, Fibrosis-4, and Model for End-Stage Liver Disease excluding INR.

Results:
The mean age at catheterization was 30.4±7.9 years. Minimal pathway diameter was 17.5±6.0 mm, being smaller in patients with EC than LT (14.5±4.0 vs 20.7±6.1 mmHg; p<0.001). Resting and exercise haemodynamic parameters grouped according to minimal pathway diameter <16 mm or ≥16 mm are shown in Table 1. Larger diameter correlated with reduced augmentation of pulmonary and systemic blood flow during exercise (Qp -2.3% per mm, 95% confidence interval [CI] -3.9; -0.7; p=0.005; Qs -2.2% per mm, 95% CI -4.1; -0.2; p=0.03), and lower % predicted peak VO2 (-0.8% per mm, 95% CI -1.4; -0.2; p=0.009), independent of exercise mean PA and PA wedge pressures, and heart rate. The inverse relationship between pathway diameter and % predicted peak VO2 remained when analysis was restricted to EC patients only (-1.7% per mm, 95% CI -2.9;-0.5; p=0.008). No association was observed between pathway diameter and markers of liver disease. Notably, the pressure gradient on the liver imposed by the pathway contributed minimally to inferior vena cava pressure at rest (0% [0-7.1]) and during exercise (6.4% [0.5-14.3]).

Conclusions:
Larger Fontan pathway diameter was paradoxically associated with impaired flow augmentation during exercise, which may have contributed to reduced exercise capacity.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2026 - PASSIVE LEG RAISE DOES NOT UNMASK DIASTOLIC DYSFUNCTION IN ADULTS WITH FONTAN CIRCULATION

Jacob Cao [1], Charles Jain [2], Alexander Egbe [2], Barry Borlaug [2], Yogesh Reddy [2], David Celermajer [1], Rachael Cordina [1], William Miranda [2]
Royal Prince Alfred Hospital, Cardiology, Sydney-Australia [1] Mayo Clinic, Cardiology, Rochester-United States [2]

Background / Hypothesis:
In adults with Fontan circulation, elevated pulmonary artery wedge pressure (PAWP) during exercise indicates worse prognosis. While passive leg raise (PLR) enhances diagnostic accuracy in acquired heart disease, its role in Fontan physiology is unknown.

Materials and Methods:
We evaluated 90 adult Fontan patients undergoing supine exercise catheterisation at Mayo Clinic (2019–2024). Sixty-three had normal resting PAWP (<12 mmHg) and were classified by exercise PAWP: >20 mmHg (occult diastolic dysfunction) vs ≤20 mmHg (normal). Haemodynamic parameters at rest and during PLR were compared, and their ability to predict elevated exercise PAWP was assessed.

Results:
Seventeen patients (27%) had occult diastolic dysfunction. Compared with the normal group, these individuals had higher PAWP at rest (8.7±2.0 vs 7.3±2.2 mmHg; p=0.02) and PAWP during PLR (12.4±2.7 vs 10.2±3.1 mmHg; p=0.01), but the change in PAWP between rest and PLR did not differ (3.7±2.4 vs 2.9±2.2 mmHg; p=0.2). Similarly, change SVC pressure with PLR was not significantly different (3.9±2.6 vs. 3.0±1.8 mmHg; p=0.10). However, the rise in PAWP relative to cardiac output during exercise was significantly greater in the occult group (4.3 [IQR 2.6–8.6] vs 1.8 [IQR 0.9–4.1] mmHg/L/min; p=0.003). While PAWP during PLR predicted occult dysfunction, this was not superior to using PAWP at rest alone (AUC 0.72 vs 0.68; p=0.58). A PAWP during PLR threshold of 10.5 mmHg yielded 82% sensitivity but only 57% specificity for diagnosing occult diastolic dysfunction.

Conclusions:
Unlike in biventricular circulation, PLR does not add incremental diagnostic value beyond resting PAWP in identifying occult diastolic dysfunction in Fontan patients. This reinforces that diagnostic strategies should be physiologically tailored rather than extrapolated from acquired heart disease.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2061 - RIGHT VENTRICLE ASSESSMENT IN TETRALOGY OF FALLOT DIFFICULTIES IN CONTOURING AND POOR REPORTING

Abbey Grbac [1], Phillip Naimo [1], Jeremy Russo [1], William Wilson [1], Katherine English [1], Leeane Grigg [1], Elaine Lui [2], Subodh Joshi [1], Melissa Lee [1]
The Royal Melbourne Hospital, Cardiology, North Fitzroy-Australia [1] The Royal Melbourne Hospital, Radiology, Melbourne-Australia [2]

Background / Hypothesis:
Timing of pulmonary valve intervention (PVI) for pulmonary regurgitation in patients with repaired Tetralogy of Fallot (ToF) is guided by right ventricle (RV) volumetric/function assessment on cardiac magnetic resonance (CMR) indexed to actual body surface area (BSA) . However, different RV contouring techniques and BSA formulas exist with significant variability in reported measurements. We aimed to review the protocols reported in CMR studies of PVI in ToF.

Materials and Methods:
A search of electronic databases (Embase and MEDLINE) was performed to identify studies published between 28/2/10-28/2/25 which assessed adults with repaired ToF before and after PVI using CMR. RV contouring methods and BSA formula were reviewed.

Results:
After screening 610 references, a total of 21 studies met criteria and were included. All studies were of only level III or level IV (lowest) levels of evidence. Most studies (76%, 16/21) did not specify the RV contouring technique used and none defined the RV basal slice. Of the 5 studies describing the RV contouring technique, 4 excluded trabeculations/papillary muscles from the RV volume and 1 included these structures. No studies reported the formula used to calculate actual BSA.

Conclusions:
RV contouring technique and BSA methodology utilised in CMR studies of PVI in ToF is poorly reported. Given the importance of severity thresholds for RV volumes in triggering intervention in clinical practice, clear reporting and standardisation of RV contouring and BSA methodology should be mandatory. Further research into the optimal RV thresholds for PVI based on clear contouring methods is required.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2090 - DIABETES MELLITUS IN ADULTS WITH CONGENITAL HEART DISEASE IN AUSTRALIA

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The Royal Melbourne Hospital, Department Of Cardiology, Melbourne-Australia [1] The Royal Melbourne Hospital, The University Of Melbourne, Department Of Cardiology, Department Of General Medicine, Melbourne-Australia [2] The Royal Melbourne Hospital, Department Of Endocrinology, Melbourne-Australia [3] The Royal Melbourne Hospital, The University Of Melbourne, Murdoch Children's Research Institute, Department Of Cardiology, Department Of Medicine, Heart Research Group, Melbourne-Australia [4]

Background / Hypothesis:
As the adult congenital heart disease (ACHD) population ages, there is increasing recognition of acquired cardiovascular morbidity including diabetes mellitus (DM). This study aimed to describe the clinical profile and outcomes of Australian ACHD patients with DM.

Materials and Methods:
Retrospective audit study of ACHD patients with DM requiring pharmacotherapy with active follow-up in our ACHD clinic. Demographics, cardiovascular risk factors, and outcomes were extracted.

Results:
Of the 3278 patients with active follow-up (median age 33 years [IQR 26-43]), 2.1% (69/3278) had a DM diagnosis. DM patients were a median age of 51 years (IQR 38-57) at latest follow-up and 52% (36/69) were male. The majority (55/69, 80%) had moderate or severe congenital heart disease lesion complexity including 42% (29/69) with conotruncal abnormalities. Median age at DM diagnosis was 43 years (IQR 31-52), with 14% (10/69) diagnosed with type 1 DM, 84% (58/69) with type 2 DM, and 1% (1/69) with other forms. DM treatment included non-insulin glucose-lowering agents in 83% (57/69) and insulin-treated in 36% (25/69) of patients. Concomitant cardiovascular risk factors were prevalent including 54% (37/69) with obesity (BMI ≥30kg/m2), 55% (38/69) receiving antihypertensive agents, 39% (27/69) receiving lipid-lowering agents, and 19% (13/69) with smoking history. After a median follow-up of 7 years (IQR 4-12) since DM diagnosis, 7% (5/69) died and only 49% (34/69) of patients did not develop any cardiovascular morbidity including atrial fibrillation (36%, 25/69), heart failure (17%, 12/69), and ischaemic heart disease (13%, 9/69).

Conclusions:
The prevalence of DM in the Australian ACHD cohort is double that reported in the general Australian population for similar age. Concomitant cardiovascular risk factors and morbidity are common. These findings highlight the need for active screening and management of DM and acquired cardiovascular risk factors to improve long-term outcomes in this young ACHD population.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2105 - PARENTAL CONGENITAL HEART DISEASE AND RISK OF ADVERSE PREGNANCY AND NEONATAL OUTCOMES A RETROSPECTIVE COHORT STUDY FROM TAIWAN

Jieh-neng Wang [1], Yu-jen Wei [1], Min-ling Hsieh [1], Tsung Yu [2], Ta-sheng Chen [3], Fu-wen Liang [4], Pao-lin Kuo [5], Jing-ming Wu [1]
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Background / Hypothesis:
As more individuals with congenital heart disease (CHD) reach reproductive age, understanding the impact of parental CHD on pregnancy and neonatal outcomes has become increasingly important. This study aimed to evaluate whether mothers or fathers with CHD differ from unaffected parents regarding pregnancy characteristics and fetal outcomes.

Materials and Methods:
We conducted a nationwide, population-based cohort study in Taiwan using data from 1,345,316 live births between 2004 and 2011. Parental CHD diagnoses were identified using ICD-9-CM codes. We examined associations between parental CHD and pregnancy outcomes (preterm delivery, gestational diabetes mellitus [GDM], hypertensive disorders, cesarean delivery, hospital stay, maternal mortality) and birth outcomes (low birth weight [LBW], small for gestational age [SGA], neonatal CHD, cyanotic CHD). Multivariable logistic regression models were applied to adjust for potential confounders.

Results:
Mothers with CHD were more likely to experience preterm delivery (adjusted OR 1.81, 95% CI 1.51–2.17) and GDM (adjusted OR 1.21, 95% CI 1.01–1.46) compared to mothers without CHD. Cesarean delivery rates were also higher in mothers with CHD. Maternal CHD was significantly associated with increased risks of LBW and SGA, whereas paternal CHD showed no such associations. However, both maternal and paternal CHD were associated with a higher risk of neonatal CHD in offspring. No significant association was found between parental CHD and neonatal cyanotic CHD or low Apgar scores.

Conclusions:
Maternal CHD is independently associated with adverse pregnancy and birth outcomes, while paternal CHD primarily influences the risk of neonatal CHD. These findings underscore the importance of tailored preconception counseling and perinatal care for individuals with CHD planning to conceive.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2114 - CONTEMPORARY OUTCOMES OF INFECTIVE ENDOCARDITIS IN ADULTS WITH CONGENITAL HEART DISEASE IN AUSTRALIA

Lachlan A.h. Dodds [1], Phillip S. Naimo [2], Stephen Muhi [3], Joe Sasadeusz [3], William M. Wilson [2], Leeanne E. Grigg [2], Katherine M. English [2], Melissa G.y. Lee [2]
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Background:
Adult congenital heart disease (ACHD) patients have an increased risk of infective endocarditis (IE) compared to the general population. We aimed to examine the presentation, management, and outcomes of IE in a large Australian ACHD cohort.

Methods:
Retrospective cohort study of patients followed in our tertiary ACHD clinic with an admission for definitive IE (Duke criteria) over a 4-year period (1 August 2020-31 July 2024).

Results:
Among 670 admitted patients with ACHD, 21 IE episodes occurred in 20 individuals (3.0%) at a median age of 36 years [IQR 30-41]; 70% (14/20) male. Common CHD lesions were tetralogy of Fallot (30%, 6/20) and truncus arteriosus (15%, 3/20). All patients had cardiac prosthetic material. Four patients (18%, 4/20) had a prior history of IE. Diagnostic delay was common, with median 9 days from symptom onset to admission [IQR 5-11]. Initial presentation was often to an external hospital (62%, 13/21 IE episodes), with 19% (4/21) requiring multiple visits prior to transfer. IE was predominantly right-sided (76%, 16/21), involving 15 pulmonary valve implants and conduits (both bioprosthetic and homograft). Blood cultures were positive in 19/21 IE episodes (90%), including Streptococcus mitis (32%, 6/19) and methicillin-susceptible Staphylococcus aureus (26%, 5/19). Surgery was required in 62% (13/21) of IE episodes; ECMO support was required in three IE episodes. In-hospital mortality rate was 10% (2/21 IE episodes). After a median follow-up of 20 months from discharge, one survivor was re-admitted for IE with a different organism at 10 months, and the remainder were well at last follow-up.

Conclusions:
Delayed presentation and diagnosis are challenges to providing care to ACHD patients with IE, which typically affects right-sided prosthetic material. Despite frequent surgery and invasive support, mortality remains significant. Further research is required to determine which factors delay presentation and recognition of IE in these young, high-risk patients.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2116 - OUTCOMES OF HYPOPLASTIC LEFT HEART SYNDROME PATIENTS REACHING ADULTHOOD AFTER FONTAN PALLIATION A MULTICENTER STUDY

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Background / Hypothesis:
The earliest survivors of surgical palliation for hypoplastic left heart syndrome (HLHS) are entering adult life. We aimed to define their clinical status in adulthood and explore predictors of adverse clinical events.

Materials and Methods:
Seven centres contributed data regarding adults with HLHS, defined as a dominant right ventricle (RV) and diminutive left ventricle (LV) with a combination of mitral valve disease and aortic valve disease. Patients with univentricular RV physiology but without hypoplasia of left heart inlet and outlet structures were excluded. All available clinical data were reviewed and Fontan-specific adverse clinical events were recorded.

Results:
A total of 192 adults (69% male, mean age 25.1+-4.2 years) were included (born between 1985 and 2004). Fontan completion (lateral tunnel/extracardiac) occurred at a mean age of 3.1+-1.6 years. Fontan-specific adverse clinical events occurred in 55 adults (29%) during a mean follow-up of 7.1+-4.2 years. Adverse events included: death (n=6, 3%), transplant (n=4, 2%), cardiac transplant listing (n=10, 5%), heart failure admission for intravenous diuretics (n=43, 22%), protein losing enteropathy (n=9, 5%), major thrombotic event (n=16, 8%) and sustained VT (n=2, 1%). With multivariate modelling, baseline independent predictors of adverse events were: oxygen saturations < 92%, peak aerobic capacity < 60% predicted, greater than moderate tricuspid regurgitation and greater than moderate RV dysfunction (C statistic for model 0.88).

Conclusions:
Young adults with Fontan palliation for HLHS have a high adverse clinical event rate. Desaturation, decreased functional capacity, tricuspid regurgitation and RV dysfunction at age 18 years can help identify those at highest risk of developing adverse outcomes in later life.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2121 - RV DYSFUNCTION AND TRICUSPID REGURGITATION IN PATIENTS WITH CONGENITALLY CORRECTED TRANSPOSITION OF THE GREAT ARTERIES

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Royal Melbourne Hospital, Cardiology, Melbourne-Australia [1] Toronto Adult Congenital Heart Disease Program, Cardiology, Toronto-Australia [2]

Background / Hypothesis:
There is a paucity of data describing long-term outcomes in patients with congenitally corrected transposition of the great arteries (CCTGA). The impact of long-term pacing and the relationship between right ventricular (RV) dysfunction and tricuspid regurgitation (TR) is poorly defined.

Materials and Methods:
All patients with CCTGA seen at the Toronto congenital heart centre were included. Longitudinal data from the time of initial adult visit were obtained. The primary endpoint was mechanical circulatory support, heart transplantation or death.

Results:
184 patients (45% female) were included. Mean ages at first adult visit and last review were 27+-12years and 44+-16years (mean follow-up duration 19+-11years).
The primary endpoint occurred in 24%(n=44) at a mean age of 45+-17years. At diagnosis of the primary endpoint, compared to those without, there was a greater proportion of patients with: >=moderate RV dysfunction (89% versus 40%, p<0.001); severe TR (50% v 33%, p=0.04); tricuspid valve prosthesis (39% v 15%, p<0.001); pacemaker in-situ (66% versus 41%, p=0.004).
RV dysfunction at last review was more likely if: male (66 v 44%, p=0.003); complex anatomy (76 v 52%, p<0.001); QRS duration>120ms (59 v 23%, p<0.001); baseline pacemaker in-situ (43 v 17%, p<0.001); baseline >=moderate TR; childhood cardiac surgery (55 v 39%, p=0.03); childhood tricuspid valve surgery (19 v 1%, p<0.001) and LV dysfunction (37 v 9%, p<0.001).
Tricuspid regurgitation occurred earlier than RV dysfunction (>=moderate TR (64%, n=117) occurred at a mean age of 24.1+-15.4 years and >=moderate RV dysfunction (52%, n=95) occurred at a mean age of 33.4+-16.1 years (p<0.001)).

Conclusions:
Adults with CCTGA have a high rate of advanced heart failure. Most patients who experienced the primary endpoint had both >=moderate RV dysfunction and >=moderate TR. TR appeared to occur years earlier than RV dysfunction. Tricuspid regurgitation, previous tricuspid valve surgery and pacemaker implantation were associated with RV dysfunction.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2130 - CIRRHOSIS IN POST OPERATIVE TETRALOGY OF FALLOT – A SHADOW FROM THE PAST.

Nabeel Valappil Faisal [1], Lamk Kadiyani [1], Ankur Handa [1], Niraj Nirmal Pandey [2], Saurabh Kumar Gupta [1], Sivasubramanian Ramakrishnan [1]
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Background / Hypothesis:
Cardiac cirrhosis in patients after surgical repair of Tetralogy of Fallot (TOF) is an uncommon complication that can be due to one of the several complications or sequalae expected after the surgical repair. It is important to find out the underlying cause in such cases so that proper treatment can be done to prevent further progression of the liver dysfunction. In this report we discuss the evaluation of a patient after surgical repair of TOF presenting with cirrhosis

Case Presentation:
A 32-year-old woman with a history of TOF repair at age 20 presented with abdominal discomfort and hematemesis. Physical examination revealed elevated jugular venous pressure, hepatosplenomegaly, and heart murmurs. Imaging showed cardiomegaly and cirrhotic changes in the liver. Transthoracic echocardiography revealed severe pulmonary regurgitation and moderate tricuspid regurgitation without significant chamber dilation or ventricular dysfunction. Despite normal findings on cardiac MRI and CT, cardiac catheterization showed elevated filling pressures and findings consistent with pericardial constriction. The patient was diagnosed with pericardial constriction and is scheduled for total or subtotal pericardiectomy along with pulmonary valve replacement.

Discussion and Conclusions:
Cardiac cirrhosis after TOF repair can be attributed to residual cardiac lesions or pericardial constriction. The latter, while uncommon, can present variably and is difficult to diagnose due to overlapping symptoms with other postoperative complications. In this case, cardiac catheterization was essential in confirming pericardial constriction, a diagnosis that was not apparent through echocardiography, MRI, or CT. The planned surgical intervention aims to alleviate the constriction and address the pulmonary valve regurgitation, potentially improving the patient's clinical outcomes. This case underscores the diagnostic difficulty in identifying pericardial constriction in patients with prior TOF repair and highlights the importance of cardiac catheterization in such complex cases.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2134 - IVABRADINE USE TO IMPROVE EXERCISE CAPACITY IN PATIENTS WITH TRANSPOSITION OF THE GREAT ARTERIES (TGA) POST ATRIAL SWITCH REPAIR

William Wilson [1], Lou Irving [2], Leeanne Grigg [1], Andrew Redington [3], Hilary Harrington [4], Michael Cheung [4]
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Background / Hypothesis:
Heart rate lowering using Ivabradine will improve exercise capacity and quality of life in patients with TGA who have undergone atrial switch repair

Materials and Methods:
This was a single centre, randomized, double-blind, cross-over study. Subjects age >18 years who had undergone an atrial switch repair were included. Exclusion criteria included: inability to exercise, not in sinus rhythm, resting bradycardia (<60bpm), severe hepatic impairment. Subjects were randomized to ivabradine or placebo for four weeks then switched to crossover treatment for four weeks. A cardiopulmonary stress test and quality of life assessment (SF-12, visual analogue score (VAS)) were performed at baseline, 4 weeks and 8 weeks. The primary outcome was a change in exercise capacity (peak VO2). Mean (and standard error of the mean) were calculated then estimates of difference between ivabradine and placebo described (using a mixed model allowing for a random effect of patient and for fixed effects of time and treatment).

Results:
10 patients were included in the analysis (39 patients screened). One patient developed symptomatic bradycardia and one patient experienced phosphenes (transient). Baseline heart rate (65±3 versus 79±5bpm, difference -14.6 (-24,-5), p=0.008) and exercise heart rates (131±7 versus 146±7bpm, difference -15.2 (-24,-6), p=0.008) were lower when taking ivabradine compared to placebo. Peak VO2 (20.4±1.2 versus 19.2±1.2ml/kg/min, difference 1.28 (0.07,2.5), p=0.041)) and oxygen pulse (12.5±1.2 versus 10.7±1.2ml/kg/beat, difference 1.7 (0.9,2.6), p=0.002)) were higher when taking ivabradine compared to placebo. There was no significant difference in quality of life assessments. VAS was 73.5±5.6 with ivabradine versus 62.5±5.6 with placebo (mean difference 11.0 (-1.6, 23.6), p=0.079); 7 patients had a higher VAS when taking ivabradine and 1 had a lower VAS (who also experienced symptomatic bradycardia).

Conclusions:
Ivabradine use in patients with TGA + atrial switch repair lowered heart rate (resting and exercise)and improved exercise capacity compared to placebo.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2159 - A CHALLENGING CASE OF COARCTATION OF AORTA WITH HYPOPLASTIC AORTIC ARCH FOLLOWED UP INTO ADULTHOOD A CASE REPORT. OR MANAGEMENT OF COARCTATION OF AORTA IN THE ADULT CHALLENGING CASE

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Rajavithi Hospital, Institute Of Cardiovascular Disease, Bangkok-Thailand [1] Jigme Dorji Wangchuck National Referral Hospital, Surgery, Thimphu-Bhutan [2]

Background / Hypothesis:
Coarctation of aorta detected early in the childhood is a lifelong condition requiring lifelong follow up. The surgical intervention poses great challenges when the patient has to be taken back for redo surgery as the child grows into adulthood. We present a complex case of coarctation of aorta followed up over a period of 12 years. At the age of 16 years old he presented with uncontrolled hypertension and residual coarctation after a period of loss to follow up. On the second day following the initiation of anti-hypertensives he developed a feature suggestive of acute transverse cord injury with associated acute on chronic renal failure. We decided to urgently take up for extra-anatomical bypass via a median sternotomy. This case highlights the sequalae and the challenges in the management of coarctation of aorta with associated hypoplastic aortic arch.

Materials and Methods:
We followed up a case of coarctation of aorta with hypoplastic arch detected at the age of 4 years in our institute. The hospital records were used to prepare this manuscript after ethical board clearance was obtained from the institute ethical board.

Results:
Post extra-anatomical bypass via median sternotomy, the motor grade of the lower extremities improved from II to V with residual numbness of the feet. The blood pressure was stabilized and controlled. At the end of 3 years follow up the patient remained functional class I with well controlled BP.

Conclusion:
Coarctation of aorta is a challenging condition. When diagnosed during infancy, it will require interventions according to the availability of the resources. Combination of interventional procedures and surgical procedures should be the basis to relieve the afterload. Although there are many methods and technique to relieve the coarctation surgically, the extra-anatomical bypass is feasible with good outcome even in complex cases.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2172 - CONGENITAL INTERVENTIONAL CARDIAC CATHETERISATION AND OUTCOMES IN PATIENTS OLDER THAN 60 YEARS A SINGLE TERTIARY CENTRE EXPERIENCE

Melonie Johns [1], Arvind Balaji [2], Salim Jivanji [2], Damien Cullington [3], Reza Ashrafi [3], Suneil Aggarwal [3], Arul Narayanan [2]
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Background / Hypothesis:
Older adults with congenital heart disease increasingly present with multiple comorbidities prior to undergoing procedures. This study aimed to evaluate the risks associated with congenital cardiac catheterization in patients aged over 60 years at a tertiary centre.

Materials and Methods:
Retrospective review of all congenital interventional cardiac catheterizations performed on patients aged ≥60 years over a 5-year period (April 2020–March 2025). Diagnostic catheterizations were excluded. Primary outcome was 30-day mortality. Secondary outcomes included procedural complications, procedure time, radiation exposure, and length of hospital stay.

Results:
7 (77%) of all ACHD interventional catheter procedures in patients over 18 years involved patients over 60 years of age (mean age 68; range 60–82 years), 56% were female. The majority (87%) had at least one comorbidity, with 12% presenting with four or more; arrhythmias, particularly atrial fibrillation, were most common.

Interatrial septal defect occlusion accounted for 74(96%) of procedures. Most patients 67(87%) were discharged within 24 hours without complications. Only 4 (5%) patients required hospitalization beyond 5 days.

There were no deaths within 30 days post-procedure. 3 (4%) patients had died at the time of submission (mean follow up 2.8yrs). One patient died four months after atrial septal defect closure due to complications from pulmonary arterial hypertension. The other 2 patient deaths were not attributed to their catheter procedure.

2 intra-procedural complications were recorded: oesophageal perforation during transoesophageal echocardiography and external iliac artery dissection in a patient with Turner syndrome (requiring peripheral vascular stenting during the index procedure).

Conclusions:
Transvenous interventional procedures, particularly atrial septal defect closure, are safe in patients over 60 years old with low morbidity and no 30-day mortality, despite the presence of multiple comorbidities. While arrhythmias may persist despite defect closure, prior studies suggest improvements in functional capacity and quality of life. AHA and ESC recommend procedures are performed within specialized ACHD centres.

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Category: Adult Congenital Heart Disease

2191 - PROGNOSTIC VALUE OF RIGHT VENTRICULAR – PULMONARY ARTERIAL COUPLING IN ADULT ATRIAL SEPTAL DEFECT CLOSURE A SYSTEMATIC REVIEW

Eka Utami [1], Maya Qurota A'yun [2]
Rsup Kemenkes Surabaya, Cardiology And Vascular Medicine, Surabaya-Indonesia [1] Rsud Ngudi Waluyo, Cardiology And Vascular Medicine, Blitar-Indonesia [2]

Background / Hypothesis:
Right ventricular (RV) contractility and its response to pulmonary arterial (PA) elastance is referred as RV-PA coupling. Subtle yet harmful progression of right ventricular remodelling role in adult atrial septal defect closure is debatable. This systematic review aims to determine if there is prognostic value of RV-PA coupling after atrial septal defect closure in adult patient.

Materials and Methods:
The author conducted a systematic search in 3 databases, Pubmed, Ebsco, and ScienceDirect using the keywords "RV-PA coupling AND atrial septal defect or ASD and closure ". The inclusion criteria were: 1) study including adult atrial septal defect patients underwent closure; 2) Fulltext in English.

Results:
Two studies from 563 found article were systematically reviewed. A total of 448 adult patients underwent atrial septal defect closure were evaluated. One study with prospective design evaluating association between RV-PA coupling and persistent tricuspid regurgitation after ASD closure. Parameters of RV–PA coupling demonstrated good predictive value (Tricuspid annular S' /PASP: area under the curve = 0.684, p = 0.003; cut-off value: 0.32; |RV GLS|/PASP: area under the curve = 0.789; p < 0.003, cut-off value: 0.46). Another study with retrospective design evaluating residual symptoms after ASD closure found that 6 months after closure not only RV "overwork" (sRVCPI; from 831 ± 346 to 589 ± 234), but also RV-PA "uncoupling" (TAPSE/PASP ratio; from 0.5 ± 0.2 to 0.6 ± 0.3 mm/mmHg) failed to improve in patients with residual symptoms. Moreover, patients with a TAPSE/PASP ratio < 0.66 mm/mmHg had a 7.5-fold higher risk (HR 7.5, 95% CI 1.8–30.5, P < 0.01) of residual symptoms than those with a ratio ≥ 0.66 mm/mmHg.

Conclusions:
In recent study showed that preoperative RV-PA uncoupling was related to impaired quality of life. Hence,concurrent or subsequent TR interventions should be considered in patients with RV–PA uncoupling to reduce RV volume overload.

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Category: Adult Congenital Heart Disease

2196 - ADULT UNIVENTRICULAR CONGENITAL HEART DISEASE ASSOCIATED WITH PULMONARY HYPERTENSION. EXPERIENCE OF AN EXPERT CENTER IN MEXICO

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Abstract:
Innovations in diagnosis and treatment have allowed a significant number of people with congenital heart disease (CHD) to survive to adulthood. This has led to an increase in the adult population with these pathologies, making CHD a major public health problem. We present a review of clinical cases of adult patients with single ventricle cardiac lesion associated with pulmonary hypertension, their pharmacological and surgical treatment.Observational, descriptive and analytical study from 2014 to 2024 of surviving adult patients with congenital heart lesion and pulmonary hypertension.

Results:
9 patients with confirmed diagnosis of PAH by cardiac catheterization. 45% corresponded to a single left ventricle, 35% had a ventricle without morphological characterization (indeterminate) and 20% corresponded to a right ventricle. Eighty-five percent of patients received dual treatment for PAH and only 1 patient required systemic prostanoids. Congenital heart disease patients with a morphologic left ventricle had better CF and risk.Patients with indeterminate and right ventricle presented data of right and left failure (lower ejection fraction, degree of transpulmonary integration and end-diastolic pressure $p<0.001$) Table 1. A septostomy procedure was performed in a patient with progressive mitral stenosis.

Conclusions:
The univentricular heart denotes a wide variety of rare and complex congenital cardiac malformations in which both atria predominantly lead into a functional single ventricle. Although most patients will be treated by a staged surgical approach with a view to definitive Fontan intervention, a minority will not undergo Fontan palliation, either because they maintain reasonably balanced systemic and pulmonary circulations or as a result of unfavorable hemodynamics. However, survival remains very poor in relation to biventricular lesions, including response to transplantation. Multidisciplinary management helps to make the best decisions.

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Category: Adult Congenital Heart Disease

2213 - CLINICAL FEATURES OF CONGENITALLY CORRECTED TRANSPOSITION OF GREAT ARTERIES WITHOUT ASSOCIATED CARDIAC ANOMALIES

Rina Fujiwara [1], Toyohisa Miyata [2], Yu Fujiwara [1], Risa Yamana [1], Kosuke Kashiwagi [2], Ryusuke Watanabe [2], Mieko Maezawa [2], Toshiyuki Chisaka [2], Masaaki Ohta [2], Yusuke Akazawa [3], Shunji Uchita [4], Mariko Eguchi [5], Osamu Yamaguchi [3], Takashi Higaki [5]
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Background:
Congenitally corrected transposition of the great arteries (ccTGA) is often associated with cardiac anomalies such as ventricular septal defect (VSD) and pulmonary stenosis (PS), leading to diagnosis in infancy or early childhood. Without major anomalies, however, ccTGA may be undiagnosed until adulthood, and its clinical features in such cases is not well established .

Objective:
To elucidate the clinical characteristics of ccTGA diagnosed in adulthood without associated major cardiac anomalies.

Materials and Methods:
Two approaches were used:
1. Case Review:
Four adult cases from Ehime Prefecture were retrospectively analyzed for sex, age at diagnosis, symptoms, heart failure status, medical history, associated anomalies, ECG findings, cardio thoracic ratio (CTR), cardiac position, degree of tricuspid regurgitation (TR), and right ventricular ejection fraction (RVEF).
2. Literature Review:
A PubMed search identified 67 adult cases (≥19 years) with available data on symptoms, age at diagnosis, and diagnostic triggers.

Results:
1. In the Ehime cases, two were diagnosed due to heart murmurs, one by ECG screening, and one due to symptoms. One was initially misdiagnosed with hypertrophic cardiomyopathy associated with moderate mitral regurgitation (MR).
2. Among the 67 literature cases, 56 were symptomatic and 29 had associated anomalies. One case was misdiagnosed as idiopathic dilated cardiomyopathy with MR.

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Discussion:
While uncomplicated ccTGA may be detected incidentally during routine screenings in adolescence or early adulthood, many cases remain unrecognized until symptoms arise later in life—even in the absence of other anomalies. Misdiagnosis as cardiomyopathy with MR is not rare.

Conclusion:
Promoting routine cardiovascular screenings in young adults may facilitate earlier detection of ccTGA. Clinicians should consider ccTGA in the differential diagnoses when evaluating patients with suspected cardiomyopathy with MR.

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Category: Adult Congenital Heart Disease

2214 - DO INACTIVE ADULT CONGENITAL HEART DISEASE PATIENTS HAVE DECREASED EXERCISE CAPACITY OR DO LIMITED CAPACITY PATIENTS TEND TO BE INACTIVE

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Background / Hypothesis:
We have reported that physical activity (PA) and sedentary behavior (SB) were significantly correlated with exercise capacity in adult congenital heart disease patients (ACHDs).
This study aimed to investigate the causal relationship between PA and exercise capacity.

Materials and Methods:
We measured PA and SB using a 3-axis accelerometer in 101 patients (age 35±14 years, 51 female) who underwent a cardiopulmonary exercise test. The participants wore the device for 7 days, except during sleep and while performing water-related activities. The time spent in SB (≤1.5 METs), light physical activity (LPA, 1.6–2.9 METs), and moderate to vigorous PA (MVPA, ≥3.0 METs) were calculated according to the estimated METs.
The subjects with the %peak VO2 (%pVO2) <75% were classified into two groups based on the Cardio-muscle panel (y=139.91x^-0.322), which plots the minimum VE/VCO2 (minVE/VCO2) on the y-axis and %pVO2 on the x-axis: The minVE/VCO2 high group believed that reduced cardiac output was the primary cause of their reduced exercise capacity, and the minVE/VCO2 low group believed that diminished skeletal muscle function was the cause.

Results:
Although there was no significant difference in %pVO2 (62.5±9.0 vs. 56.6±14.8 %, p=0.332) or the SB time (575±145 vs. 616±139 min/day, p=0.606) between the groups, the low group had higher MVPA time (47.8±33.3 vs. 23.6±16.3 min/day, p=0.007), the %O2 pulse (73.3±17.5 vs. 58.1±15.1 %, p=0.011), BMI(24.1±4.5 vs. 19.5±2.4, p<0.001), and SpO2(97.6±2.1 vs. 94.2±2.0 %, p=0.037). When multiple regression analysis was performed in the low group, adjusting for gender, age, BMI, and physiological stage, MVPA, LPA, and SB time were significantly related to %pVO2 ($\beta = 0.447$, $p = 0.010$; $\beta = 0.364$, $p = 0.026$; $\beta = -0.374$, $p = 0.016$), respectively.

Conclusions:
Further investigation is needed for ACHD with reduced cardiac output; however, ACHDs with diminished skeletal muscle function may improve exercise capacity by replacing SB with MVPA.

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Category: Adult Congenital Heart Disease

2225 - THE IMPACT OF PULMONARY HYPERTENSION ON THE LONG TERM OUTCOMES IN PATIENTS WITH PULMONARY ATRESIA WITH VENTRICULAR SEPTAL DEFECT

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National Taiwan University Children's Hospital, Department Of Pediatric Cardiology, Taipei-Taiwan [1] National Taiwan University Hospital, Department Of Surgery, Taipei-Taiwan [2]

Background / Hypothesis:
The importance of pulmonary hypertension (PH) on the extreme tetralogy of Fallot (eTOF) was gradually recognized. We sought to evaluate the impact of pulmonary hypertension on the long-term survival in patients with eTOF.

Materials and Methods:
We reviewed our experience of 248 patients with eTOF receiving total repair (with or without major aortopulmonary collateral arteries, MAPCAs) between 1978 and 2022. We examined the patient's records and compared the outcome between those with PH or not.

Results:
Of the 248 patients, the pulmonary hypertension was noted in 31 (12.5%) of patients and positively correlated with presence of MAPCA (70 % vs. 24.7 %, with and without MAPCA, odds ratio 7.11, p=<0.001). The perioperative mortality was 5.2 %, excluding perioperative mortality of 13 patients, the 10- and 20-years survival after total repair was 92.2 % and 83 %. The 10-and 20-years MACE free survival after total repair was 86.1 % and 71.3 %. The presence of PH was significantly associated with MACE free survival (odds ratio 3.50, p= 0.002 by log rank analysis). Patients with PH were also associated with higher NT-proBNP (median, 261.6 vs. 130 pg/mL, p=0.036) and longer QRS duration (median, 156 vs. 146 msec, p=0.040) at latest follow-up.

Conclusions:
The long-term survival of eTOF after total repair was not satisfactory. The presence of PH, which relates to the presence of MAPCA, has negative impact on MACE free survival, and higher NT-proBNP.

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Category: Adult Congenital Heart Disease

2282 - BEYOND THE WAITING ROOM GAPS IN CARE IN CONGENITAL HEART DISEASE FOLLOW UP

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Nemours Children's Health, Cardiology, Wilmington-United States [1] University Of Delaware, Cardiology, Newark-United States [2] Boston Children's Hospital, Cardiology, Boston-United States [3]

Background / Hypothesis:
Lifelong continuity of care is imperative for those with congenital heart disease (CHD). Unfortunately, gaps in care (GIC) are common. Despite recommendations for ongoing care, factors contributing to GIC remain poorly understood, particularly regarding social determinants of health (SDOH). These GIC often lead to adverse health outcomes.

Materials and Methods:
This retrospective cohort study included all patients aged 0-34 years followed at a pediatric subspeciality hospital (primary location Delaware; satellites covering Pennsylvania, New Jersey, Maryland) with CHD who underwent surgery between January 2003 and May 2020 (n=1948). Patients were categorized as simple, moderate, and complex CHD based on 2018 American Heart Association and American College of Cardiology guidelines. Manual chart review was undertaken to determine if a true GIC occurred. Demographic and SDOH such as age, race, ethnicity, sex, language, insurance status, and Child Opportunity Index (COI) based on home address zip code, were analyzed.

Results:
Of the1948 with CHD, ≥3 years between visits was identified in 48% (n=975). Chart review demonstrated 28% (n= 274) had a true GIC while 71.9% (n= 701) had not been seen in ≥3 years, with a justifiable cause (discharge from care, recommended to follow up in > 3 years). Those with justifiable causes, and those seen with less than 3 years between visits created a non-GIC cohort (n=1674). Univariable analysis comparing those with true GIC (n=274), and non-GIC (n=1674) demonstrated age greater than 10.5 years, simple to moderate CHD severity, race/ethnicity, having public insurance, having fewer number of insurances, living outside the state of Delaware, all as being risk factors for GIC.

Conclusions:
GIC continues to be problematic even at a tertiary subspecialty center. These findings emphasize the role SDOH play in continuity of care and highlight the need for targeted strategies to reduce GIC.

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Category: Adult Congenital Heart Disease

2294 - PRIMARY SURGERY FOR ADULT CONGENITAL HEART DISEASE IN A RESOURCE CONSTRAINED SETTING IN BOTSWANA

William Manyilirah [1], Thapelo Namanyane [2], Warona Sethomo [3], Kodancha Rao [3], Thuso David [3]
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Background / Hypothesis:
Botswana is middle income African country with a population of 2.5 million people. It is estimated that between 115 and 200 children are born with heart defects every year in Botswana. Less than 1% of these children receive timely lifesaving surgical interventions, due to the limited requisite infrastructure for the delivery of optimal care for these children. The aim of this study was to describe the spectrum of adult congenital disease presenting for the first surgical intervention at a single hospital in Botswana.

Materials and Methods:
This was a descriptive, cross-section study of all patients, aged above 15 years, who underwent cardiovascular interventions, between January 2017 and December 2024 at Lenmed Health Bokamoso Private Hospital, a 235-bed capacity tertiary hospital located in Gaborone, Botswana.

Results:
Congenital heart interventions constituted only 137 (21.5%) of all cardiac interventions, of which 55 (8.6%) were adult congenital and 82 (12.9%) were paediatric congenital cardiac interventions. The interventions were repairs for ventricular septal defects (14), atrial septal defects (6), tetralogy of Fallot (4), atrioventricular septal defects (3), double outlet right ventricle (3), double chambered right ventricle (3), partial anomalous pulmonary venous return (2), coarctation of aorta (2), patent ductus arteriosus (5), pulmonary stenosis (3), others – mitral, tricuspid, aortic valve, Ebstein (9) and redo adult congenital lesions (redo right ventricular outflow tract obstructions, redo mitral, tricuspid and aortic valve stenoses and regurgitations, residual VSD and ASD shunts (13). Six percent were deemed inoperable due to Eisenmenger complex or severe biventricular dysfunction. Morbidity was 11.6% and mortality 3.9%.

Conclusions:
Despite the high burden of late presentation of congenital heart disease, compounded by the limited requisite infrastructure for complex congenital heart interventions in an African setting, with careful patient selection and patient focused approaches, outcomes at par with international standards can be attained.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2298 - SUCCESSFUL TOTAL ENDOVASCULAR REPAIR OF A GIANT DUCTAL ANEURYSM PRESENTING AS ORTNER'S SYNDROME A CASE REPORT

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Background / Hypothesis:
An aneurysm of the ductus arteriosus is a rare anomaly, especially in adults, arising at the site of an incompletely obliterated aortic end of ductus arteriosus. As it is associated with a high risk of complications such as rupture, infection and thromboembolism, it needs to be repaired through surgical, endovascular or hybrid approach.

Materials and Methods:
We present the case of a 37 year old healthy non-smoker, non- hypertensive male who presented with hoarseness of voice, recurrent cough with documented left vocal cord palsy consistent with Ortner's syndrome. Computed Tomography (CT) showed a giant ductal aneurysm measuring 6cm x 7cm arising from aortic isthmus and left subclavian artery (LSCA) arising from the cranial aspect of aneurysm. Due to high risk of rupture and short LSCA stump, surgical repair and debranching of LSCA were deferred. After confirming patency of right subclavian, vertebral arteries and circle of Willis, he underwent successful endovascular repair with isolation of left subclavian artery using 16 mm vascular plug followed by stent exclusion of aneurysm using 24 mm x16 cm stent graft.

Results:
Successful exclusion of aneurysm and retrograde filling of LSCA through vertebral artery was demonstrated angiographically post procedure and using CT aortogram. There were no complications except for clinically detectable radio-radial delay. Patient's vocal cord palsy and symptoms improved on follow up.

Conclusions:
Ductal aneurysm, though rare and incidental in adults, can be symptomatic when large and are amenable to total endovascular repair.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2299 - EXTRINSIC COMPRESSION OF THE CORONARY ARTERY DUE TO PULMONARY ARTERY DILATION IN AN ADULT PATIENT SURGICAL RESOLUTION

Ericka Yolanda Gutierrez Fernandez [1], *Jorge Luis Cervantes Salazar* [1], Diego Bernardo Ortega Zhindon [1], Ricardo Axel Bustos Alcazar [1], Samantha Toledo Garcia [1], Antonio Benita Bordes [1]
National Institute Of Cardiology Ignacio Chavez, Surgery Cardiothoracic, Mexico-Mexico [1]

Background / Hypothesis:
Myocardial ischemia in the absence of obstructive coronary artery disease represents a diagnostic challenge, especially in adult patients with congenital heart disease. In particular, extrinsic compression of the coronary arteries by adjacent structures is a rare and underdiagnosed cause. We present the case of a patient with an atrial septal defect (ASD) in whom a coronary anomaly was suspected as the cause of acute coronary syndrome, but extrinsic compression related to pulmonary artery dilation was identified.

Materials and Methods:
A 67-year-old male patient with a history of atrial septal defect (ASD) type ostium secundum presented with clinical symptoms consistent with acute coronary syndrome. As part of the initial diagnostic approach, coronary angiography was performed, which did not reveal significant atherosclerotic lesions, although it did show apparent narrowing of the left anterior descending artery. To complement the workup and evaluate possible congenital anomalies, coronary computed tomography angiography was performed, which suggested extrinsic compression of the proximal segment of the left anterior descending artery. Given the persistence of symptoms and the suspicion of extrinsic coronary artery involvement, surgery was decided upon to clarify the etiology and provide definitive treatment.

Results:
During surgery, coronary anomaly was ruled out, and extrinsic compression of the left anterior descending artery secondary to pulmonary artery dilatation was identified. Pulmonary artery posterior wall plasty was performed, along with closure of ASD using a pericardial patch. The patient had a favorable postoperative course. Follow-up coronary angiography revealed no further compression of the affected coronary artery.

Conclusions:
This case underscores the importance of considering extrinsic compression of the coronary arteries as a rare but relevant cause of myocardial ischemia in adult patients with congenital heart defects, such as ASD. The combination of advanced imaging techniques and surgery allowed the underlying cause to be successfully identified and treated, improving the patient's prognosis.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2326 - TREND AND EARLY CLINICAL OUTCOMES AFTER THE ROSS PROCEDURE IN THE UNITED KINGDOM

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University Of Bristol, Cardiothoracic Surgery, Bristol-United Kingdom [1] University Of Bristol, Congenital Cardiac Surgery, Bristol- [2]

Background / Hypothesis:
We aim to report the trend and early clinical outcomes after the Ross procedure in the United Kingdom

Materials and Methods:
All congenital patients who underwent elective/urgent, isolated Ross procedure in the United Kingdom from 2000-2023 (1st quarter) were identified from the National Congenital Heart Disease Audit (NCHDA) dataset. Patients who underwent emergency or concomitant procedures were excluded from the study. The trend, individual surgeon volume (> 5 cases logged) and early clinical outcomes were reported.

Results:
A total of 1251 patients were identified, of which the median age was 13 years (1st IQR, 3rd IQR: 6,20). and 67.2% (n=841) were male. The median number of cases performed annually was 52 (1st IQR, 3rd IQR: 47,61).

Forty-two surgeons have performed more than 5 Ross procedures in the datasets with a median number of 17 cases logged from 2000-2023 (1st Quarter) (1st IQR, 3rd IQR: 8,37), ranging from 6 to 81 cases logged.
The overall in-hospital survival after the Ross procedure is 98.2%, ranging from 92.7% to 100%. There was zero mortality in 10 years out of the 23-year study period.

Preoperative left ventricular function was good in 91% of the cases, and 61.9% of total cases had no previous sternotomy. The median cardiopulmonary bypass time and aortic cross clamp time were 186 minutes (1st IQR, 3rd IQR: 154,225) and 145.4 minutes (1st IQR, 3rd IQR: 116,175), respectively. The median post-operative intubation was 1 day (1st IQR, 3rd IQR: 1,2), and the post-operative destinations were Home in 93.9% (n=1081) of all cases.

Conclusions:
Number of Ross procedure performed in the UK have been static with satisfactory early clinical outcomes.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2327 - MORPHOLOGICAL AND FUNCTIONAL ANALYSIS OF LYMPHATIC VESSELS INFLAMMATORY MARKERS AND QUALITY OF LIFE A COMPARISON BETWEEN FONTAN CIRCULATION PATIENTS AND HEALTHY CONTROLS

Luciana Amato [1], Aida Turquetto [1], Vera Aiello [1], Vera Aiello [1], Vibeke Hjortdal [2], Marcelo Jatene [1]

Incor - Heart Institute Of The Hospital Das Clínicas Of Fmusp, Pediatric Cardiac Surgery, Sao Paulo-Brazil [1] Aarhus University Hospital, Pediatric Cardiac Surgery, Aarhus-Denmark [2]

Background / Hypothesis:
The Fontan procedure is the standard surgical intervention for patients with complex congenital heart defects characterized by a single anatomical or functional ventricle. Despite its hemodynamic benefits, Fontan circulation is associated with several chronic complications, such as lymphatic insufficiency, interstitial edema, and persistent inflammation. This study aimed to investigate chronic inflammatory responses and morphological and functional alterations of the lower limb lymphatic vessels in Fontan patients, compared to healthy individuals. Quality of life (QoL) and physical activity levels were also assessed

Materials and Methods:
This is a cross-sectional, case-control study involving 43 Fontan patients (Fontan Group - FG) and 29 healthy controls (HC). Serum inflammatory markers (IL-6 and IL-10), lymphatic vessel morphology (via skin biopsy and light microscopy), lymphatic function (via near-infrared fluorescence imaging), physical activity (via the short version of the IPAQ), and QoL (via the SF-36 questionnaire) were evaluated.

Results:
Results showed elevated IL-6 levels in FG, particularly among sedentary individuals (p=0.001), those with postoperative follow-up ≥18 years (p=0.033), and patients with complications. Morphologically, lymphatic vessels in FG showed smaller perimeter (p=0.015), diameter (p=0.038), and radius (p=0.002) compared to HC. Functionally, FG patients with complications exhibited reduced contraction frequency and lymphatic pumping pressure. QoL was significantly lower in FG in the domains of Physical Functioning (p=0.001), Role-Physical (p=0.036), and General Health (p=0.022).

Conclusions:
In conclusion, Fontan patients present chronic inflammation and both structural and functional lymphatic alterations, associated with sedentary behavior and reduced quality of life. These findings highlight the vulnerability of this population and reinforce the importance of physical rehabilitation strategies and inflammatory monitoring as integral components of clinical care.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2367 - A RARE CASE OF MAIN PULMONARY ARTERY ANEURYSM ASSOCIATED WITH BICUSPID PULMONARY VALVE

Alifa Sabir [1], Muhammad Azam [1], Wajiha Arshad [1], Muhammad Hassan [1], Mahim Malik [1]
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Background / Hypothesis:
Pulmonary artery aneurysm (PAA) is a rare vascular condition marked by localized dilation of the pulmonary artery involving all three arterial wall layers. It occurs in approximately 1 in 14,000 individuals. A PAA is typically identified on CT when the main pulmonary artery diameter exceeds 29 mm, or >40 mm in some definitions.PAAs have a multifactorial etiology, often linked to congenital heart defects—such as patent ductus arteriosus, septal defects, and pulmonary stenosis. Connective tissue disorders like Marfan syndrome, Ehlers-Danlos syndrome, and cystic medial necrosis also contribute. A notable association exists with absent pulmonary valve syndrome, highlighting a possible role of valve regurgitation in PAA development

Case Report:
-38-year-old male with no comorbidities presented with a 6-month history of chest pain, exertional dyspnea, and orthopnea. Echocardiography revealed a dilated main pulmonary artery (MPA) with a non-coapting pulmonary valve and severe regurgitation. CT angiography confirmed a 57.7 mm MPA aneurysm with normal branch pulmonary arteries.Following multidisciplinary discussion, the patient underwent MPA aneurysm repair and pulmonary valve replacement. Intraoperatively, a dilated MPA and regurgitant valve with an absent anterior leaflet were noted. The aneurysmal anterior MPA wall was resected. The pulmonary valve was replaced with a 25 mm SJM Biocor bioprosthesis, and the anterior MPA was reconstructed with a Hemashield Dacron patch.Postoperative recovery was smooth. The patient was extubated within 6 hours, discharged on post-op day 5, and remains well on follow-up. Histopathology revealed tunica media degeneration and chronic inflammation.

Conclusions:
This case emphasizes the importance of early detection and timely surgical intervention in managing rare conditions like main pulmonary artery aneurysm (MPAA). Despite the absence of typical risk factors, prompt diagnosis through echocardiography and CT angiography led to successful surgical resection and pulmonary valve replacement.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2369 - CATHETER ENTRAPMENT; A RARE COMPLICATION OF TPVR

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Rawalpindi Institute Of Cardiology, Cardiac Surgery, Rawalpindi-Pakistan [1]

Introduction:
Tetralogy of Fallot (ToF) is the most common cyanotic congenital heart disease, often requiring surgical repair in infancy. Pulmonary regurgitation is a frequent postoperative complication, potentially leading to right ventricular dysfunction and necessitating pulmonary valve replacement (PVR). While surgical PVR is the standard, transcatheter PVR (TPVR) offers a less invasive option with shorter hospital stays, though it carries risks. We present a rare complication during TPVR where a pigtail catheter became entrapped in the tricuspid valve, requiring open surgical retrieval and valve replacement.

Case Report:
-19-year-old male with previously repaired Tetralogy of Fallot presented with worsening dyspnea and was diagnosed with severe pulmonary regurgitation. He was scheduled for transcatheter pulmonary valve replacement (TPVR). During catheter advancement through the tricuspid valve (TV), resistance was encountered, and the pigtail catheter became entrapped in the chordae, causing severe tricuspid regurgitation as confirmed by TEE. Multiple retrieval attempts via femoral and jugular access failed, prompting surgical intervention. Management & Outcome:The patient underwent redo sternotomy and surgical pulmonary valve replacement (PVR). On cardiopulmonary bypass, the catheter was successfully retrieved from the tricuspid valve without damage. A bioprosthetic valve was implanted in the pulmonary position, and the pulmonary artery was augmented with a bovine pericardial patch. Postoperative recovery was smooth; the patient was extubated within 6 hours, required minimal inotropic support, and was discharged on postoperative day 5. This case highlights a rare TPVR complication requiring surgical retrieval and emphasizes the importance of multidisciplinary readiness in managing such events.

Conclusions:
Transcatheter pulmonary valve replacement (tPVR) has evolved into a viable alternative to surgical conduit or bioprosthetic valve replacement, due to faster recovery time and reduced length of hospital stay. However, entrapment of delivery system in tricuspid valve is rare and unreported complication, requiring prompt surgical intervention.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease
2420 - TWO AORTA'S AORTA DO IT.
Stephanie Chan [1], Ian Nicholson [1]
Westmead Hospital, Cardiothoracic Surgery, Sydney-Australia [1]

Background / Hypothesis:
Born with a d-transposition of the great arteries, this infant underwent 5 surgeries culminating in a completion Fontana at age seven. She was lost to follow up, but represented aged 19 with progressive shortness of breath and a significant AV gradient with regurgitation.

She was referred for a Nikaidoh Procedure.

Materials and Methods:
Nikaidoh was not possible due to the extent of adhesions from previous surgery. The surgeon elected to contract a neo-aorta in parallel to the native aorta, thereby providing additional outflow area.

Results:
Successful surgery with complete resolution of symptoms

Conclusions:
ACHD cases challenge surgeons to undertake novel procedures peri-operatively due to the heterogeneity and complexity of this patient population.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2424 - PROGRESSION OF PULMONARY SYMPTOMS IN A PATIENT WITH KLINEFELTER SYNDROME AND PULMONARY SLING A CASE REPORT

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Background:
Pulmonary sling is a rare type of vascular ring in which the left pulmonary artery (LPA) originates from the right pulmonary artery (RPA) and passes between the trachea and esophagus, potentially causing tracheal compression and airway obstruction such as stridor. Although commonly diagnosed in childhood, pulmonary sling may remain asymptomatic until adulthood. We report a case of a 27-year-old male with Klinefelter syndrome and pulmonary sling who developed progressive respiratory symptoms in adulthood.

Materials and Methods:
Pulmonary sling was diagnosed at age 5 following an incidental murmur, with confirmation via echocardiogram and cardiac catheterization. Initially asymptomatic, he developed exertional dyspnea and changes in functional class at age 24. Comprehensive diagnostic evaluations, including pulmonary function test (PFT), diffusing capacity of the lung for carbon monoxide (DLCO), cardiopulmonary exercise testing (CPET), bronchoscopy, chest CT, and cardiac MRI, were performed to identify the cause of symptoms, assess the severity of external compression from the pulmonary sling, and evaluate the restrictive lung disease associated with Klinefelter syndrome.

Results:
Chest CT confirmed that the LPA originated from the RPA, with mild tracheal compression. Pulmonary function tests and DLCO showed moderate restrictive pattern without diffusion impairment. Cardiac MRI revealed LPA stenosis with preferential flow to the RPA (RPA:LPA = 75:25). Bronchoscopy demonstrated fixed moderate narrowing of the mid-trachea to the main carina due to external compression. Despite treatment with tiotropium bromide and chest rehabilitation, symptoms persisted at one year follow-up.

Conclusions:
Klinefelter syndrome with asymptomatic pulmonary sling can present with progressive respiratory symptoms. The most likely cause of the patient's symptoms is external airway compression due to the pulmonary sling. It is still unclear whether surgical intervention is necessary. Identifying the cause of respiratory symptoms in patient with pulmonary sling and coexisting respiratory problems is complex and require multi-modality investigations to determine the most comprehensive explanation.

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Category: Adult Congenital Heart Disease

2442 - A COMPUTATIONAL ANALYSIS OF ANNULOPLASTY IN BICUSPID AORTIC VALVE REGURGITATION

Tianyang Yang [1]
Shanghai Fourth Peoples's Hospital, Valve Centre, Shanghai-China [1]

Objective:
To assess the impact of annuloplasty ring size on bicuspid aortic valve (BAV) regurgitation via numerical simulation, identifying an optimal annuloplasty range.

Method:
Patient-specific models were created from CT scans of a BAV regurgitation case pre- and post-annuloplasty. The postoperative model was adjusted to match preoperative dimensions, simulating raphe relaxation and free margin plication. Elastic rings (19–27 mm) were applied to remodel the annulus. Finite element analysis and CFD evaluated hemodynamics at peak systole.

Results:
Smaller rings improved leaflet coaptation (pre-op:139 mm^2; post-op:247–416 mm^2) and reduced leaflet stress. Transvalvular pressure gradient slightly decreased, with minimal aortic wall shear stress changes. However, rings <23 mm caused leaflet root folding (most severe at 19 mm, ring area: 100 mm^2). Excessive downsizing also increased annular stress and adjacent wall shear stress.

Conclusion:
Smaller rings enhance coaptation and reduce leaflet stress but may cause leaflet folding and localized stress if undersized. Personalized simulations could optimize ring selection preoperatively.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2444 - POSTOPERATIVE HEMODYNAMIC CHANGES AND PREDICTORS FOR LOWER PULMONARY ARTERY PRESSURE IN PATIENTS WITH PULMONARY ARTERIAL HYPERTENSION ASSOCIATED WITH ATRIAL SEPTAL DEFECT

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Beijing Anzhen Hospital, Pediatric Cardiology, Beijing-China [1]

Hypothesis:
This study aims to retrospectively analyze the hemodynamic changes and identify predictors for lower postoperative pulmonary artery pressure in patients with ASD and PAH.

Materials and Methods:
Patients who were diagnosed with left-to right shunt ASD-PAH and received defect closure were included in the study. Clinical data before defect closure and at the first follow-up visit after defect closure were retrospectively reviewed. The linear regression model was used to estimate the relationship between each independent variable and postoperative pulmonary arterial pressure (PAP).

Results:
Thirty-three patients were included in the study. The median age at defect closure was 29(IQR 25,34.5) years and 94% of whom were female. The median size of ASD was 28(IQR 24,30) mm. Before defect closure, catheterization showed average mean PAP was 49.61±7.51mmHg and mean PVR was 6.22±2.47 WU; Nineteen patients received transcatheter ASD closure and 14 patients received surgical closure. The median duration between defect closure and first follow-up visit was 12 (IQR 7.3,49.5) months. Overall, exercise tolerance was improved with 6-minute walk distance increasing from 532.41±49.55 to 564.53±48.19 meters (p=0.031). Repeated catheterization showed mPAP decreased to 34.76±14.79 mmHg and PVR decreased to 5.31±4.04 WU. The final three factors were found to be associated with postoperative PAP. In addition to two preoperative clinical indicators (preoperative arterial oxygen saturation and preoperative mean pulmonary artery pressure), postoperative regular targeted drug therapy was also associated with lower postoperative PAP.

Conclusions:
We present a group of patients with ASD- PAH who exceed the current guideline criteria for defect repair. In these patients, PAP and PVR can further decrease after defect repair, and postoperative regular targeted therapy is associated with lower postoperative PAP.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2515 - COMORBIDITIES IN ADULTS WITH DOWN SYNDROME WITH AND WITHOUT CONGENITAL HEART DISEASE

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Ulster University, School Of Medicine, Belfast-United Kingdom [1] Belfast Trust, Paediatric Cardiology Rbhsc, Belfast-United Kingdom [2]

Background / Hypothesis:
Down Syndrome (DS) is the most common chromosomal abnormality with 40,000 people in the United Kingdom currently living with DS. Improving medical treatments have led to improved survival as life expectancy of individuals with DS in America increased from 26-53 years from 1950-2010. This study focuses on comorbidities affecting the adult DS population, with and without congenital heart disease (CHD).

Materials and Methods:
This study used a database of all individuals born with DS in Northern Ireland from the Royal Belfast Hospital for Sick Children. Data on the adult population of DS with and without CHD was utilised, with supplementary information on comorbidities throughout the lifespan obtained from electronic medical records.

Results:
A total of 358 people with DS and CHD and 374 with DS without CHD were included, aged between 16-35 years (mean age 25, SD 5.7) and approximately equal male/female split. A third with CHD have hypothyroidism and 1.1% have hyperthyroidism. 2.2% of those with CHD had type 1 diabetes, 1.1% had type 2 diabetes and 16.8% were born with an additional congenital abnormality. Half (48.6%) with CHD have a dermatology condition such as eczema (11.9%), psoriasis (6.3%), hidradenitis suppurativa (4.7%) and alopecia (4%). A third with CHD have an orthopaedic condition including flat feet (15.6%), scoliosis (15.6%) and subluxation/dislocation of joints (4.7%). No individuals had dementia although the maximum age was 35. The only significant differences between CHD and non CHD groups were coeliac disease (2.4% CHD group vs 7.2% without CHD, p= 0.002) and scoliosis (6.2% CHD group vs 1.8% without CHD, p=0.035).

Conclusions:
Improved survival of individuals with DS has led to a larger adult population with numerous comorbidities. Medical professionals should be aware of the symptoms, diagnosis and treatment as DS comorbidities greatly impact mortality/morbidity. Thus care should encompass guidelines for prevention, age-specific screening and management of

POSTER PRESENTATIONS

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2561 - PAPVD REPAIR IN ADULTS COMPARISON OF MINIMALLY INVASIVE AND CONVENTIONAL TECHNIQUES.

Mustafa Yilmaz [1], Kerim Alper Kocak [1], Safak Alpat [1], Ahmet Aydin [1]
Department Of Cardiovascular Surgery, Hacettepe University School Of Medicine, Ankara-Türkiye [1]

Background / Hypothesis:
Partial anomalous pulmonary venous drainage (PAPVD) in adults requires surgical correction to prevent progressive right heart dilation and pulmonary hypertension. This study compares early and mid-term outcomes of minimally invasive versus conventional PAPVD repair in adults.

Materials and Methods:
From 2012 to 2024, 20 adult patients underwent surgical PAPVD repair. Pre-,intra-and post-operative data were analyzed.

Results:
20 adult patients (mean age 41 ± 16 years; 9 females) underwent surgical PAPVD repair at our institution. Patients were grouped by surgical approach: minimally invasive right mini-thoracotomy (MIA; n=10) or conventional median sternotomy (CMS; n=10). Techniques included Warden procedure, intra-atrial baffle with ASD patch, or direct reimplantation, tailored to anatomy.

There was no early mortality. Mean cardiopulmonary bypass time was longer in MIA (76 ± 12 min) vs. CMS (65 ± 14 min, p=0.04), while cross-clamp times were similar (p=0.23). MIA patients had significantly less postoperative drainage (210 ± 90 mL vs. 410 ± 130 mL, p=0.01) and shorter hospital stay (5.2 ± 1.1 days vs. 7.4 ± 1.6 days, p=0.002). Postoperative atrial arrhythmias occurred in 2 MIA patients (20%) and 2 CMS patients (20%). No patient developed superior vena cava obstruction or pulmonary venous stenosis. At mean follow-up of 3.8 ± 1.9 years, all patients were NYHA class I–II, with normalization of right ventricular dimensions and no late reoperations.

Conclusions:
Both minimally invasive and conventional techniques for PAPVD repair in adults are safe and effective, with excellent mid-term outcomes. Minimally invasive approaches offer advantages in reduced bleeding and faster recovery, at the cost of slightly longer bypass times. Careful patient selection is essential for optimal results.

POSTER PRESENTATIONS

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2580 - MECHANICAL BIOPROSTHETIC AND TRANSCATHETER PULMONARY VALVE REPLACEMENT IS THE MECHANICAL ERA OVER SINGLE CENTER OUTCOMES

Timucin Sabuncu [1], Nazli Melis Coşkun [1], Safak Alpat [1], Hayrettin Hakan Aykan [2], Tevfik Karagoz [2], Murat Guvener [1], Mustafa Yilmaz [1]
Hacettepe University School Of Medicine, Cardiovascular Surgery, Ankara-Türkiye [1] Hacettepe University School Of Medicine, Pediatric Cardiology, Ankara-Türkiye [2]

Background / Hypothesis:
Pulmonary valve replacement (PVR) is frequently required in patients with repaired congenital heart disease, particularly those with right ventricular outflow tract anomalies. Surgical PVR (sPVR) has been the traditional approach, but transcatheter PVR (TPVR) has emerged as a less invasive alternative with shorter recovery times. Concerns remain regarding durability, cost, and patient selection.

Materials and Methods:
This retrospective study included 159 patients who underwent PVR at our center between 2007—when the procedure began to be performed frequently and routinely in our institution—and 2024. Patients were divided into three groups: surgical mechanical PVR (n=60), surgical bioprosthetic PVR (n=50), and TPVR (n=49). Demographic, procedural, hospital stay, and cost data were collected and compared across groups.

Results:
Until 2014, only mechanical valves were implanted surgically; bioprosthetic valves were introduced that year, and TPVR began in 2015. Since 2019, no surgical mechanical PVR has been performed. Mean ages were 16.0, 19.0, and 20.1 years in the mechanical, bioprosthetic, and TPVR groups, respectively. Male predominance was highest in the mechanical group (80%). Mean hospital stay was 15.3 days for mechanical, 13.8 for bioprosthetic, and 4.9 for TPVR. Average costs were 5,482 USD (mechanical), 5,606 USD (bioprosthetic), and 11,098 USD (TPVR). Eight patients previously treated with mechanical valves underwent reoperation with bioprostheses, illustrating a shift in practice. No patient underwent both surgical bioprosthetic and subsequent TPVR.

Conclusions:
Over 17 years, our practice transitioned from exclusive mechanical valve use to predominant bioprosthetic and transcatheter approaches. TPVR offered shorter hospitalization but at nearly double the cost of surgery. While age distribution was similar across groups, procedural trends reflect a clear preference for less invasive and more biocompatible strategies. Long-term follow-up is essential to evaluate durability, outcomes, and cost-effectiveness.

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2583 - PRIMARY FONTAN OPERATION BEYOND CHILDHOOD CHALLENGES AND EARLY OUTCOMES IN ADULTS AT A TERTIARY CARDIAC CENTRE IN NORTHERN INDIA

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Background / Hypothesis:
The Fontan operation is the definitive palliation for patients with single-ventricle physiology. In low- and middle-income countries (LMICs), delayed diagnosis and limited access to staged paediatric cardiac care mean some patients present for Fontan completion in adulthood.

Materials and Methods:
Adults ≥18 years with single-ventricle physiology who underwent extracardiac or lateral tunnel Fontan procedures between January 2021 and June 2025 were reviewed. Data included diagnosis, conduit type/material/size, fenestration, cross-clamp and CPB times, pre/post-operative mean pulmonary artery (PA) pressures, oxygen saturations, ventricular function, AV valve regurgitation grades, NYHA class, pleural effusion, arrhythmias, and survival. Kaplan–Meier analysis estimated overall survival and freedom from prolonged pleural effusion (>10 days)

Results:
Twenty-one adults (median age 20 [IQR 18–24]; 62% male) underwent Fontan: 71% extracardiac using tube grafts (13 PTFE, 2 Gore-Tex) and 29% lateral tunnel using PTFE patches. Mean conduit tube size was 20 ± 3 mm. Fenestration was used in 42% (mean size 4.2 mm). Mean cross-clamp time (where applied) was 35 ± 8 min; mean CPB time was 155 ± 18 min. Mean pre-op PA pressure was 12.7 mmHg, rising post-op to 13.9 mmHg. Mean pre/post oxygen saturation was 82% and 95%. AV valve regurgitation increased from pre-op None/Trivial 52%, Mild 29%, Mod 19% to post-op last follow up to None/Trivial 70%, Mild 20%, Mod 10%. NYHA I–II improved from 29% pre-op to 86% post-op. Pleural effusion >10 days occurred in 33%; 10% developed arrhythmias. Estimated 2-year survival was 95% (95% CI: 83–100); the longest individual follow-up was 5 years

Conclusions:
Primary Fontan operation beyond childhood is feasible in carefully selected adults, with acceptable early survival and functional gains. Conduit choice, AV valve management, and structured follow-up are essential, especially in LMIC contexts

POSTER PRESENTATIONS

Category: Adult Congenital Heart Disease

2615 - AORTIC ROOT REPLACEMENT (ARR) IN REPAIRED TETRALOGY OF FALLOT (TOF) CASE SERIES AND IMPLICATIONS ON MANAGEMENT

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Background:
Aortic root dilation (ARD) and dissection (AoD) later after repair of TOF has been reported but the threshold for prophylactic aortic root replacement (ARR) is yet to be decided. We reported three cases of ARR and suggested the follow-up management.

Cases Description (summarised in the attached table):
Case 1: A male patient had TOF repair at 10 years old(yo). He was found to have significant ARD measuring 65mm, progressive aortic regurgitation(AR), dilated left ventricle(LVIDD 65mm), and severe pulmonary regurgitation(PR) despite being on enalapril. Bentall operation and surgical pulmonary valve replacement(PVR) was performed at 40yo. LV dimension was normalized 1 year after the operation. At age 55, aortic size remained stable, mechanical aortic valve worked well, however, the bioprosthetic pulmonary valve showed significant dysfunction required transcatheter pulmonary valve implantation.

Case 2: A male chef, with TOF repaired at 4yo, had progressive ARD from 4.8cm (29yo) to 5.1cm (32yo) respectively on CMRI. Losartan was started, but he defaulted follow-up. Three years later, echocardiogram showed moderate AR. Computed tomography (CT) confirmed marked ARD (8.8cm) and type A AoD. Bentall operation was urgently performed at age 35. Aortic wall histology showed mild cystic medial degeneration. Aortic size remained stable and mechanical aortic valve worked well 10 years later.

Case 3: A male teacher with TOF repair at 1 years old was found to have progressive ARD: 4.6cm (22yo), 5.0cm (25yo) and 5.7cm (27yo) respectively, and moderate AR (AR fraction 36%). While waiting for Bentall operation and surgical PVR, he developed type A AoD required urgent surgery. Post-operatively cardiac function was satisfactory and both prosthetic valves worked well. But he succumbed 11 months later because of underlying rectal adenocarcinoma.

Conclusion:
Patients after TOF repair may require ARR and deserve regular monitoring. Aortic dissection could develop at aortic root dimension being recommended for prophylactic ARR in degenerative ARD in established guidelines.

POSTER PRESENTATIONS

Category: Ambulatory Cardiology and Telemedicine

1201 - SCREENING OF CARDIOVASCULAR DISEASES IN PEDIATRIC PATIENTS USING A WIRELESS SIX LEAD ECG DEVICE

Lucas Degano Iglesias [1]
Pediatria Dels Pirineu, Paediatric, Tremp-Spain [1]

Background:
Electrocardiographic screening in pediatric populations is often limited by the complexity and discomfort of standard 12-lead ECGs. The KardiaMobile 6L, a portable six-lead wireless device, may offer a simpler and more comfortable alternative for early detection of cardiac anomalies in children.

Objective:
To evaluate the feasibility, comfort, and electrocardiographic accuracy of KardiaMobile 6L in detecting abnormalities in children aged 10 to 12 years, in primary care centers across rural Catalonia.

Methods:

This is a cross-sectional observational study including 384 children from four pediatric primary care centers. After obtaining informed consent, each child underwent a standard 12-lead ECG followed by a 30-second KardiaMobile 6L recording. If abnormalities were detected, an echocardiogram was performed. The study assessed wave and segment morphology, rhythm, and conduction intervals, as well as user satisfaction through surveys completed by caregivers.

Results:
[Pending - Data collection ongoing. This section will include preliminary detection rates of abnormalities, mean duration of registration, and qualitative feedback on comfort and usability.]

Conclusions:
This study aims to demonstrate that the KardiaMobile 6L is a valid, rapid, and well-tolerated tool for pediatric ECG screening, with potential to enhance early diagnosis of arrhythmias and congenital heart defects in primary care settings.

POSTER PRESENTATIONS

Category: Ambulatory Cardiology and Telemedicine

1286 - CONGENITAL HEART DISEASE CAN BE THE CAUSE OF DYSPHAGIA

Regina Vaieretti [1], Juan Pablo Argullo [1]
Sanatorio De Niños, Cardiology Clinic, Rosario-Argentina [1]

Background / Hypothesis:
Vascular rings are anatomical variants of the aortic arch that compress the trachea or the esophagus, or both, causing difficulties in breathing or swallowing. Their incidence is less than 1% of congenital heart diseases. They are more common in males and in early childhood. Signs and symptoms begin in the first months of life; they are characteristic: biphasic or expiratory stridor, cough, recurrent respiratory infections and, more rarely, difficulty in feeding. In the initial evaluation, esophagography and endoscopy are useful, and CT angiography or MR angiography confirm the diagnosis

Materials and Methods:
A 17-year-old patient, with episodes of choking caused by food, with spontaneous resolution. A gastroesophageal series is performed, in which esophageal narrowing is visualized with contrast passage, creating a “sandglass” image. An upper digestive videoendoscopy is performed, where concentric and vascular rings is visualized in the upper third, with normal mucosa. In search of extrinsic causes of esophageal compression, a CT is performed, observing a double aortic arch with atresia of the posterior arch. A diagnosis of vascular ring is made, and corrective surgery.

Results:
Management of such patients is indicated for those who develop symptoms of tracheal or esophageal compression, which usually occurs around puberty. Identifying the dominant arch is important for surgical management, as lateral thoracostomy and ligation is done opposite to the dominant vessel Studies have shown that the prognosis for those who have undergone surgery is excellent

Conclusions:
The incidence of vascular rings is low; they are more frequently presented in early childhood, with signs and symptoms mainly respiratory and, difficulty in feeding. In rare cases, vascular rings remain asymptomatic in childhood and manifest later in adulthood. Timely surgical intervention, tailored to address the dominant arch, is critical for alleviating the compressive symptoms and has demonstrated excellent long-term outcomes

POSTER PRESENTATIONS

Category: Ambulatory Cardiology and Telemedicine

1304 - IMPACT OF GENDER AFFIRMING HORMONE THERAPY ON MYOCARDIAL STRUCTURE AND FUNCTION IN TRANSGENDER YOUTH

Liat Perl [1], Gil Beer [2], Guy Baruch [3], Ehud Rothschild [3], Maor Tzuberi [4], Alexander Lowenthal [2], Gili Yaeger Yarom [2], Asaf Oren [1], *Livia Kapusta* [2]
Tel Aviv Sourasky Medical Center, Pediatric Endocrinology Institute, Tel Aviv-Israel [1] Tel Aviv Sourasky Medical Center, Pediatric Cardiology Institute, Tel Aviv-Israel [2] Tel Aviv Sourasky Medical Center, Internal Medicine, Tel Aviv-Israel [3] Tel Aviv University, Faculty Of Medicine, Tel Aviv-Israel [4]

Background / Hypothesis:
Transgender and gender-diverse (TGD) individuals may experience gender dysphoria, and gender-affirming hormone therapy (GAHT) can be a beneficial treatment option. However, the effects of GAHT on myocardial function are poorly understood. Sex hormones influence cardiac morphology, with estrogens exerting cardioprotective effects and androgens potentially promoting hypertrophy.
We hypothesized that myocardial structure and function, assessed by conventional echocardiography and myocardial strain in TGD adolescents undergoing GAHT, may diverse from their cisgender individuals.

Materials and Methods:
A cross-sectional study conducted at a single tertiary center. TGD adolescents (≤21 years) undergoing GAHT for ≥3 months were compared to age-matched cisgender controls. Echocardiograms were performed following the American Society of Echocardiography guidelines, assessing left ventricular dimensions, wall thickness, mass, ejection fraction and global longitudinal strain. Hormonal levels at the time of echocardiography were retrieved from medical records.

Results:
The study included 20 TGD adolescents (13 males), mean age 17.9±1.8 and 22 age-matched controls. TGD males (natal females receiving testosterone) exhibited lower posterior wall thickness (LVPWd) ($p<0.001$), left ventricular mass index (LVMI) ($p=0.005$), and interventricular septal thickness (IVSd) ($p=0.044$) compared to cisgender males, but were comparable to cisgender females. Left ventricular end-systolic internal diameter (LVIDs) was significantly larger in TGD males than in cisgender females ($p=0.032$) but was comparable to cisgender males. Estradiol correlated positively with ejection fraction ($r=0.820$, $p=0.004$) and negatively with the end-diastolic internal diameter (LVIDd) ($r=-0.643$, $p=0.024$). In TGD females (natal males receiving estrogen), LVMI and LVPWd were significantly lower than in cisgender males ($p=0.002$, $p<0.001$).

Conclusions:
GAHT may alter cardiac morphology in TGD adolescents. In TGD males, left ventricular diameter, but not muscle mass, resembled the affirmed gender, while in TGD females, muscle mass aligned with the affirmed gender. All echocardiographic parameters remained within normal limits, suggesting no overt pathological remodeling. Long-term studies are needed to better understand the cardiovascular effects

POSTER PRESENTATIONS

Category: Ambulatory Cardiology and Telemedicine

1485 - CASE REPORT A RARE SIDE EFFECT OF VISUAL HALLUCINATIONS RELATED TO ANGIOTENSIN-CONVERTING ENZYME INHIBITOR USE IN A 14 YEAR OLD BOY

Olga Samarina [1], Alexander Chuykov [2], Svetlana Teslia [3], Olga Kovtun [4]
Ural State Medical University, Pediatric Cardiology, Ekaterinburg-Russia [1] Aids Healthcare Foundation, Russia Branch, St Petersburg-Russia [2] Ugmk-zdorovie, Pediatric Cardiology, Ekaterinburg-Russia [3] Ural State Medical University, Pediatrics, Ekaterinburg-Russia [4]

Background:
Elevated blood pressure (BP) and primary hypertension occurring in children and adolescents is known to increase the risk of cardiovascular disease in adulthood. Angiotensin-converting enzyme (ACE) inhibitors are indicated for the treatment of hypertension as a first-line pharmacotherapy. Visual hallucinations are a rare adverse effect of ACE inhibitors but have been reported, primarily in elderly persons. Visual hallucinations among children have previously been reported only in one 17-years-old girl on enalapril.

Materials and Methods:
Our case uniquely highlights one important side effect in 14-year-old boy with no prior psychiatric history who developed a vivid visual hallucinations following the administration of ACE inhibitor enalapril.

Case presentation:
A 14-year-old overweight boy with family history of early onset of hypertension was evaluated for high blood pressure. After a series of checks, we excluded secondary causes of disease. Pretreatment BP was 150/85 mm Hg (above the 95th centile). Non-pharmacologic treatment with lifestyle change was unsuccessful and enalapril 7,5 mg daily was started. Our patient experienced a visual hallucination in 5 days after therapy initiation. He reported seeing “a man” who appeared from around the corner wearing round glasses and a raincoat. As soon as patient approached him, the “man” disappeared. 30 minutes later, another “man” appeared, all in black, crawling like a spider and disappeared. His BP was normal this day. Enalapril was then discontinued, and the visual hallucinations resolved. Patient was further consulted by psychiatrist with no pathology identified. The boy and parents were frightened by this event and refused to restart antihypertensive drug therapy for a long time.

Conclusions:
Managing high BP even with 1st line medications might be associated with unusual side effects. Providers should be aware of such side effects, be gentle with patients and their parents and change the medication once such side effects appear.

POSTER PRESENTATIONS

Category: Ambulatory Cardiology and Telemedicine

1605 - INCREASING PATIENT PORTAL ACTIVATION AT A RURAL PEDIATRIC CLINIC USING A QUALITY IMPROVEMENT APPROACH

Salaam Sallaam [1], Crystal Mejia [1], Jema Mateo [1], Pam Hanson [1], Karyn Yonekawa [2]
Seattle Children's Hospital, Pediatrics, Kennewick, Wa-United States [1] Seattle Children's Hospital, University Of Washington School Of Medicine, Pediatrics, Seattle, Wa-United States [2]

Background:
The sign-up process for patient portal (MyChart, Epic) at our regional clinic was inefficient, resulting in a poor adoption rate. Many patients were either not offered the opportunity to sign-up, or did not complete the registration process. This represented a missed opportunity for our patients to engage in their health care. Consequently, we aimed to increase MyChart activation at Seattle Children's Tri-Cities Cardiology Clinic from 34% in Nov 2023, to 65% by September 30th, 2025.

Methods:
Using QI methodology, we identified gaps in the MyChart registration process, staff commitment, workflow, and family awareness. We implemented Plan, Do, Study, Act cycles aimed at offering MyChart enrollment at the time of registration, family counseling, and providing enrollment assistance in clinic. MyChart activation percentage was the primary outcome measure, defined as the proportion of patients who have activated their MyChart account out of all eligible patients seen at our clinic in the prior 12 months. We tracked progress monthly, with the activation percentage extracted from our electronic medical record. Our secondary goal was to improve MyChart utilization by encouraging families to access their after-visit summary through MyChart rather than providing a printed copy.

Results:
MyChart activation percentage increased to 64% by February 2025. Providing real-time enrollment assistance in the clinic had the most impact. Secondarily, we discovered significant resource savings by reducing printed after visit materials. This initiative resulted in an estimated decrease of 364 pages in January 2025, and 294 pages in February 2025 from our baseline estimated monthly usage of 1031 pages.

Conclusions:
Using QI methodology and targeted interventions, we increased MyChart activation by 1.9-fold. Secondarily, we reduced administrative costs by 30% and improved clinic efficiency. We aim to maintain our progress to achieve our goal of 65% MyChart activation, further strengthening patient engagement and clinic efficiency.

POSTER PRESENTATIONS

Category: Ambulatory Cardiology and Telemedicine

1684 - EVALUATION OF TELEMEDICINE PRACTICES IN AN AMBULATORY CARDIOLOGY PROGRAM DURING A 6 YEAR PERIOD BRACKETING THE COVID 19 PANDEMIC

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The University Of British Columbia, Faculty Of Medicine, Vancouver-Canada [1] British Columbia Children, Division Of Cardiology, Vancouver-Canada [2] The University Of British Columbia, Department Of Pediatrics (cardiology), Vancouver-Canada [3]

Background / Hypothesis:
The COVID-19 pandemic affected all of our lives in consequential ways with significant morbidity, mortality, isolation and decreased socialization associated with the virus. We learned to adopt strategies to limit the spread of the disease. In healthcare, this included clinicians using telemedicine to communicate and interact with their patients. We report our experience with the use of telemedicine over a 6-year period bracketing the COVID-19 pandemic.

Materials and Methods:
Data from all ambulatory patients seen in the Children's Heart Centre at our tertiary care hospital between April 1, 2018 and March 31, 2024 were reviewed. Data were retrieved from our Institution's Data Analytics, Reporting and Evaluation Service and sorted by fiscal year and categorized as either in-person at our hospital, at a regional healthcare facility or conducted virtually; and occurring either in the pre-pandemic (2018-2020), peri-pandemic (2020-2022) or post-pandemic (2022-2024) era.

Results:
There were a total of 42,244 clinic visits involving 20,649 patients during the 6-year study period. The mean patient age was 7.6 years (53% male). Thirty-three percent of all clinic visits occurred during the pre-pandemic era, 31% occurred during the pandemic, and 36% occurred during the post-pandemic era. In-person, community outreach, and virtual healthcare visits accounted for 70%, 26% and 4% of all clinic visits, respectively. Three percent of all virtual healthcare visits occurred during the pre-pandemic era. This increased significantly to 36% during the pandemic and was 61% of all virtual visits during the post-pandemic era.

Conclusions:
Although virtual healthcare visits are a small proportion of our ambulatory patient services, there has been a significant increase in their use since the pandemic. It will be interesting to observe whether or not this trend continues in the future.

POSTER PRESENTATIONS

Category: Ambulatory Cardiology and Telemedicine

1777 - EFFECTS OF EXERCISE TRAINING IN PATIENTS WITH FONTAN CIRCULATION A META ANALYSIS

Duck Woo Lee [1], Hee Joung Choi [2], Soo Jin Kim [3]
Seoul National University Children's Hospital, Department Of Pediatrics, Seoul-South Korea [1] Keimyung University Dongsan Hospital, Department Of Pediatrics, Daegu-South Korea [2] Sejong General Hospital, Department Of Pediatrics, Bucheon-South Korea [3]

Background / Hypothesis:
As long-term survival rates after Fontan operation have improved, exercise capacity has become a crucial determinant of prognosis. Various exercise rehabilitation programs involving different populations and protocols have been developed to improve these outcomes. This meta-analysis aimed to compare the effects of exercise rehabilitation in patients with Fontan circulation according to age group and exercise method

Materials and Methods:
We searched the PubMed, Embase, and Cochrane Library databases for articles on exercise rehabilitation programs for patients undergoing the Fontan procedure from the inception of the databases to November 2023.

Results:
After selection and eligibility assessment, 20 studies (five randomized controlled trials [RCTs], two randomized trials, and 13 cohort studies) were included in the meta-analysis of peak oxygen consumption (VO2) and minute ventilation (VE)/validation of carbon dioxide production (VCO2) slope. Peak VO2 was significantly better with exercise training compared with that in the control groups in five RCTs (standardized mean difference [SMD], 0.48; p = 0.0017) and showed a notable increase in 20 studies before and after exercise training (SMD, 0.44; p = 0.001). However, VE/VCO2 did not show significant changes in either RCTs (SMD, 0.22; p = 0.68) or before and after exercise training (SMD, –0.11; p = 0.25). Subgroup analyses revealed significant improvements in peak VO2 for aerobic exercise and in groups that included children.

Conclusions:
Exercise training is an effective strategy for improving exercise capacity in patients after the Fontan procedure, particularly when initiated at a young age and implemented as an aerobic exercise.

POSTER PRESENTATIONS

Category: Ambulatory Cardiology and Telemedicine

1981 - DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF CHILDREN AND ADOLESCENTS WITH HEADACHE AND OR DIZZINESS AND HEMODYNAMIC RESPONSES TO HEAD UP TILT TEST

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The Second Xiangya Hospital, Central South University, Pediatrics, Changsha-China [1] Xiangya Hospital, Central South University, Pediatrics, Changsha-China [2]

Background / Hypothesis:
Headache and dizziness are common symptoms in children and adolescents, but the causes of headache/dizziness in most pediatric patients are not clearly defined. We intended to investigate the demographic and clinical features of pediatric patients with headache and/or dizziness and responses to head-up tilt test (HUTT).

Materials and Methods:
The demographic data and medical records of children and adolescents, with a primary complaint of headache and/or dizziness and undergoing HUTT between January 2001 and June 2023, were retrospectively reviewed and analyzed. Children and adolescents with headache and/or dizziness secondary to fever, trauma, or other obvious etiology were excluded. For those with positive responses to HUTT, the symptom score and HUTT responses were collected after treatment at follow-up.

Results:
Among 2709 patients with unexplained headache and/or dizziness, 1080 (39.87%) cases presented positive responses to HUTT, whereas 1629 (60.13%) cases had negative responses. Among patients with positive responses, 930 (34.33%) cases presented a response of vasovagal syncope, 143 (5.28%) cases of postural orthostatic tachycardia syndrome, and 7 (0.26%) cases of orthostatic hypertension. Multivariate Logistic regression analysis demonstrated that females, older age, and low body mass index percentile increased the risk of being positive responses. At follow-up, HUTT results of 236 patients were collected, among which 131 (55.51%) cases turned negative HUTT responses and had headache/dizziness symptoms improved after treatment targeted autonomic dysfunction.

Conclusions:
HUTT can be applied to evaluate the autonomic function of children and adolescents with headache and/or dizziness and assess the treatment responses in those patients with autonomic dysfunction.

POSTER PRESENTATIONS

Category: Ambulatory Cardiology and Telemedicine

2071 - AGREEMENT BETWEEN OFFICE AND AMBULATORY BLOOD PRESSURE MEASUREMENTS IN PAEDIATRIC ELEVATED BLOOD PRESSURE REFERRALS

Pui See Cheung [1], Yan-wah, Vinson Cheng [1], Hau Man Lee [1]
Alice Ho Miu Ling Nethersole Hospital, Department Of Paediatrics And Adolescent Medicine, Hong Kong-Hong Kong SAR, China [1]

Background / Hypothesis:
Elevated blood pressure (BP) is a common referral in paediatric clinics. Diagnosis with precision could be challenging in an office setting given BP variability in children. We aim to evaluate the agreement between office BP measurement (OBPM) with the gold standard ambulatory BP monitoring (ABPM). Demographics were evaluated to develop screening tools for optimising effective ABPM use.

Materials and Methods:
This single-center retrospective chart review evaluates diagnostic agreement and risk factors in patients aged <18 year-old referred to Alice Ho Miu Ling Nethersole Hospital Paediatric Clinic for elevated BP from Jan 2023 to Dec 2024 with ABPM done. Cohen's kappa (κ) assessed agreement of diagnoses between OBPM and ABPM. Logistic regression identified demographic and first-tier clinical test predictors between the hypertensive versus normal ABPM group.

Results:
Among 119 referred children (median age 15.1 year-old; 77.3% male; 65.5% obese), diagnoses by OBPM per 2017 American Academy of Paediatrics (AAP) hypertension guideline and ABPM demonstrated slight agreement (κ=0.181). While OBPM's high sensitivity (96.2%) for true hypertension supported the role as screening test, low PPV (49.5%) indicated significant over-diagnosis. Only AAP Stage 2 hypertension demonstrated statistical significance in prediction of hypertension (24 out of 36 patients (p=.001)).

Ambulatory hypertension among the referred children correlated with taller height (OR=1.240; 95% CI 1.03, 1.50; p=.027), higher BMI (OR=1.025; 95% CI 1.11, 1.97; p=.008), elevated HbA1c (OR=82.135; p=.035) and fasting LDL (OR=28.097; p=.008). Sokolow-Lyon criteria and T wave inversion on ECG showed no significant association with hypertension.

Conclusions:
High sensitivity but low PPV of OPBM proved its value as a screening tool but ABPM remained essential for diagnosis. Stratification of high-risk patients with first-tier screenings- higher BP, height, BMI and metabolic syndrome screening could optimize ABPM utilisation.

POSTER PRESENTATIONS

Category: Ambulatory Cardiology and Telemedicine

2353 - SOCIAL MEDIA AS SOCIAL SUPPORT FOR CONGENITAL HEART DISEASE A COMPREHENSIVE ASSESSMENT OF PARENTAL PERSPECTIVES

Brittany Ross [1], Rebecca Koopman [2], Mike Finn [3], Stephanie Raymundo [1]
Helen Devos Children's Hospital, Pediatric Cardiology, Grand Rapids-United States [1] Helen Devos Children's Hospital, Internal Medicine-pediatrics, Grand Rapids-United States [2] Betz Congenital Heart Center, Adult Congenital Cardiology, Grand Rapids-United States [3]

Background / Hypothesis:
The diagnosis of congenital heart disease (CHD) can be devastating for families - leaving them lost, confused, and isolated. Social support at the time of diagnosis is important, but in-person resources, patient diagnoses, and family experiences are variable across programs depending on volume of the center and rarity of diagnosis. The internet, however, is typically accessible for families and given the heterogeneity of CHD, social media may be a preferable resource. Families turn to the internet for additional information after diagnosis and an overwhelming majority find it helpful1,2. Social media was noted to be a valuable source of support for those facing a prenatal diagnosis as it provided a community of those who have had similar experiences3. The details of use including particular websites, groups, forums, etc., and the particular social benefits of these resources have not yet been evaluated. By parsing out these details, providers can care for our patients and guide families more completely.

Materials and Methods:
A survey will be given to caregivers of children diagnosed with CHD. The survey includes age at diagnosis and type of CHD, a series of statements investigating the caregiver's experience with social media ranked on a 5-point Likert scale and a free text response section for additional comments and to list specific site(s) they use. We will compile a list of the resources documented by caregivers to distribute to all patients. This will be helpful in building social support for all, but especially those in resource deprived areas within the US and abroad who may not have access to in-person services but would benefit from virtual support.

Results:
We are in the early stages of this project and anticipate IRB approval in the coming weeks with distribution of the survey shortly thereafter and preliminary results in June 2025.

POSTER PRESENTATIONS

Category: Ambulatory Cardiology and Telemedicine

2356 - REVOLUTIONIZING SINGLE VENTRICLE CARE SAFE EFFICIENT AND PRACTICAL IMPLEMENTATION OF TELEMEDICINE FOR INTERSTAGE MONITORING IN SINGLE VENTRICLE PATIENTS

Priyanka Devaguptapu [1], *Jennifer Co-vu* [2], Aaron Scarpa [2], Mahmoud Jaara [2], Connie Nixon [2], Dalia Lopez-colon [2]
University Of Florida College Of Medicine, Uf Health Congenital Heart Center, Gainesville-United States [1] Uf Health Shands, Uf Health Congenital Heart Center, Gainesville-United States [2]

Background / Hypothesis:
Mortality for infants with hypoplastic left heart syndrome (HLHS) in the US is 5% to 22%. Interstage care between Stage I and Stage II palliation is crucial for these patients, involving frequent specialist visits, family education, and significant stress. Telemedicine has emerged as a tool to improve access and reduce burdens. This study assesses clinical outcomes of telemedicine in interstage care.

Materials and Methods:
This single-center retrospective study (2015-2024), patients with single ventricle pathology were grouped into those with in-person visits only vs. a combination of in-person and telemedicine visits. We compared mortality, weight gain between Stage I and Stage II, and complications. Exclusions included patients deceased prior to discharge from Stage I, those proceeding to transplant before Stage II, and those remaining admitted as inpatient between Stage I and II.

Results:
Sixty-nine patients underwent Stage I palliation. Fifteen had at least one telemedicine visit during the interstage period; all survived with 0% interstage mortality. Median weight gain in the telemedicine group was 3.24 kg (IQ 1.65, 4.79), compared to 3.13 kg (IQ 3.01, 3.92) in the in-person group. Hospital admissions were comparable, with no unplanned reinterventions or catheterizations.

Conclusions:
Telemedicine shows promise in interstage care, with 0% mortality, increased weight gain, and comparable hospital admissions to traditional visits, though further study is warranted.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1009 - PLEIOTROPIC MULTI DRUG CO ASSEMBED NANOCOMPOSITES OFFER PROTECTION AGAINST DOXORUBICIN INDUCED CARDIOTOXICITY

Dan Yin [1], Jie Tian [1], Jiajin Li [1], Wenjing Yuan [1]
Children's Hospital Of Chongqing Medical University, Department Of Cardiology, Chongqing-China [1]

Doxorubicin (DOX) remains the first-line medication for cancer therapy. Although various drug delivery strategies were developed to improve the efficiency of DOX delivery to the tumor site, nearly half of the drugs still gather at normal tissues, especially in the heart, which result to severe DOX-induced cardiotoxicity (DIC). Therefore, developing a new therapeutic strategy aiming at relieving DIC without impairing antitumor efficacy of DOX is necessary and challenging. In this work, we developed a pleiotropic and convenient carrier-free self-assemble nanoplatform (PGPP/NPs), achieved by co-assembling Ginsenoside Rb1 with probucol (PB) and phosphoinositide 3-kinase gamma inhibitor (PI), and further modifying with PCM peptide for selectively target cardiomyocytes. The prepared PGPP/NPs can selectively target myocardial tissue, and subsequently alleviate DIC by antioxidative, anti-inflammatory, and promoting autophagy. In an mouse DIC model, intravenously administered PGPP/NPs selectively accumulated in cardiomyocytes, demonstrating their targeted delivery capability. In addition, this nanocomposite reduces DIC while retaining the anticancer efficacy of DOX. Thus, this new therapeutic strategy holds significant promise in overcoming cardiotoxicity caused by chemotherapeutic agents.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1059 - SMARTWATCHES IN CHILDHOOD A MIXED BLESSING

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University Of Melbourne, Department Of Medical Education, Melbourne-Australia [1] Monash University, Department Of Paediatrics, Melbourne-Australia [2]

Background / Hypothesis:
Smartwatches are commonly used within the community, especially amongst its younger population. These devices have a wide range of capabilities, including measuring heart rate and recording electrocardiographic traces. They can issue alerts when 'abnormal' activity is detected. These measurements come with both potential benefits and risks if health-related issues are gleaned from the device. This study aimed to evaluate the current literature on the prevalence, perception and interpretation of smartwatches that document these measurements as they impact on children and their parents.

Materials and Methods:
A scoping review was undertaken based on the principles of Arksey and O'Malley, and which followed the scoping review checklist of the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR).

Results:
The selection criteria yielded 30 papers. They reported that smartwatch usage in children ranged from 15% to 30%, depending on the country of residence. The number of children presenting with smartwatch-based heart concerns has increased, with many false positives and few true arrhythmia diagnoses. Although there was good accuracy of heart rate measurements, there were poor automated algorithms for heart rhythm classification. Up to 25% of paediatric smartwatch users reported anxiety arising from the information provided by the device, with many presenting for clinical evaluation. Some parents reported local discomfort and skin reactions to the device.

Conclusions:
Smartwatch usage has increased in children and adolescents. While smartwatches are able to report heart rate and provide electrocardiographic tracings to allow for a continuous non-invasive means of collecting cardiac-related data, misinterpretation of the data and poor algorithms has led to increased child and/or parental anxiety. There remains a need for ongoing education to understand the variability of heart rate, together with the development of more accurate algorithms for the younger population.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1085 - HEMODYNAMIC SUBPHENOTYPES IN CONGENITAL HEART DISEASE CLUSTER DESCRIPTIONS BASED ON FLOW VENTRICULAR ADAPTATION AND PULMONARY RESPONSE

Vitor Doria Ricardo [1], Felipe Yu Matsushita [1], Paula Vieira De Vincenzi Gaiolla [1]
Instituto Do Coração Do Hospital Das Clínicas Da Faculdade De Medicina Da Universidade De São Paulo, Pediatric Cardiology, São Paulo-Brazil [1]

Background/Hypothesis:
Traditional congenital heart disease (CHD) classifications are anatomy-based, yet patients with the same defect often present divergent hemodynamics. We hypothesized that unsupervised machine learning applied to echocardiographic data could identify clinically meaningful hemodynamic subphenotypes, shifting risk stratification toward physiology-driven models.

Materials and Methods:
This was a retrospective cohort study conducted at a single tertiary center. We analyzed over 640 echocardiographic data from neonatal univentricular patients, classifying parameters based on flow direction, pressure gradients, ventricular function, and chamber adaptations. A machine learning clustering approach (K-Means, k=8) was applied, followed by dimensionality reduction (Principal Component Analysis) and feature importance analysis to identify the key determinants of each cluster.

Results:
We identified eight distinct hemodynamic subphenotypes. Each cluster exhibits distinct circulatory patterns, emphasizing flow-related consequences rather than anatomical structures.
• Cluster 0: Pulmonary Overload (High Shunting, Right Heart Adapting)
• Cluster 1: Left Heart Volume Overload (LV Struggling, Severe Mitral Regurgitation)
• Cluster 2: Right Heart Failure & Pulmonary Hypertension (Eisenmenger Transition Group)
• Cluster 3: Pulmonary Outflow Restriction & RV Hypertrophy (Severe Afterload Stress on RV, Not Shunting Driven)
• Cluster 4: LV Failure with Secondary RV Dysfunction (Advanced Left-Sided Heart Failure)
• Cluster 5: Balanced Circulatory Load (Best Adapted Group, No Major Dysfunction)
• Cluster 6: Transitional Biventricular Dysfunction (The Warning Group)
• Cluster 7: End-Stage Circulatory Collapse (Final Stage Before Death or Transplant)

Conclusions:
This hemodynamic classification redefines congenital heart disease risk, offering a physiologically grounded alternative to traditional anatomy-based labels. These subphenotypes may guide personalized intervention strategies and open new pathways for multicenter validation and outcome prediction.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1124 - NEW FACTORS INFLUENCING IVIG RESISTANCE IN KAWASAKI DISEASE ACROSS DIFFERENT AGE GROUPS DEVELOPMENT OF A PREDICTIVE MODEL BASED ON THE NATIONAL CHILDREN'S REGIONAL MEDICAL CENTER

Ce Wang [1], Xuemei Li [1], Zihan Zhou [1], Jingyi Fan [1], Lin Zhao [1], Ruidi Xu [1]
Shengjing Hospital, China Medical University, Pediatric Cardiology Department, Shenyang-China [1]

Background / Hypothesis:
To explore new risk factors for IVIG Resistance in Kawasaki Disease (KD) patients across different age groups and to develop a predictive model applicable to various age groups.

Materials and Methods:
Clinical data of a total of 2,491 KD patients in five different age groups from medical centers were analyzed, including factors such as clinical characteristics, aetiology, the inactivation process of IVIG, and region, to determine the risk factors for each age group, and feature selection was performed using LASSO regression and multifactor analysis. Ten machine learning algorithms for predicting IVIG resistance were evaluated and model performance was assessed using ROC curves.The model of the Northeast Center was externally validated at the National Children's Regional Medical Center (Central South)

Results:
The inactivation process of IVIG may affect treatment outcomes.KD patients aged 1-3 years and 6-10 years are more likely to be IVIG-resistant when treated with physically filtered IVIG. Of the 10 models, the CatBoost model performed best. Winter onset and Chlamydia pneumoniae infection were independent risk factors for IVIG resistance, and SHAP analysis further elucidated the impact of these risk factors on model predictions.The external model validation results show that the model is not only suitable for children with Kawasaki disease in Northeast China, but also in southern China

Conclusions:
IVIG Resistance risk factors vary by age and are linked to the IVIG inactivation process. The CatBoost model is both accurate and interpretable, providing valuable insights for personalized treatment strategies in KD management.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1301 - RADIOLOGICAL ASSESSMENT OF PULMONARY VASCULARITY IN CONGENITAL HEART DISEASE STANDARDIZED CLINICIAN ASSESSMENT VS DEEP LEARNING BASED PREDICTION

Nisanth Selvam [1], Krishna Kumar [1], Shine Kumar [1], Navaneetha Sasikumar [1], Shilpa Radhakrishnan [2], Pranoti Toshniwal [1], Taniya Issac [1], Akshay Desale [2]
Amrita Institute Of Medical Sciences, Paediatric Cardiology, Kochi-India [1] Amrita Institute Of Medical Sciences, Paediatric Radiology, Kochi-India [2]

Background:
Assessment of pulmonary vascularity on a chest radiograph (CXR) in congenital heart disease (CHD), is limited by subjectivity and qualitative nature perhaps because existing criteria are disparate and insufficiently validated. Artificial intelligence-based deep learning model (DLM) analysis can potentially improve accuracy.

Objective:
To develop and validate a structured set of criteria and a deep learning-based model to evaluate pulmonary vascularity.

Materials and methods:
This was a retrospective study. 400 de-identified x-rays of patients with Fick derived pulmonary to systemic flow (Qp:Qs) ratio and CXR within one week were evaluated by experts (2 staff pediatric cardiologists and 1 staff pediatric radiologist) and trainees (2 pediatric cardiology and 1 pediatric radiology fellow) using 9 pre-specified criteria defining pulmonary vascularity as normal, decreased or increased. A DLM was trained with another set of 1088 CXRs and corresponding Qp:Qs ratios. The 400-clinician evaluated CXRs were then assessed by the DLM to predict the Qp:Qs ratio as a numerical value.

Results:
Baseline demographic details of the two groups were similar. Pearson correlation between Fick derived and deep learning derived QP: QS was 0.870 ($p<0.001$) with root mean squared error of 0.395 ($p<0.001$). The DLM strongly agreed with Fick derived classification of pulmonary vascularity [Cohen's Kappa: 0.770 ($p<0.001$); 92% specificity; 98% sensitivity; area under receiver operator curve: 98%]. Increased and decreased pulmonary vascularity interpretation by clinicians had a concordance of 75% and 66% versus DLM interpretation concordance of 88% and 98% respectively. ($p =0.03$). Number of end-on vessels had a strong inter observer agreement whereas individual peripheral vessels, size of end-on vessel and branch pulmonary arteries with their respective bronchi and opacity of lung fields had modest agreement.($p<0.001$).

Conclusion:
Deep learning-based analysis of CXRs confers accurate quantitative evaluation of pulmonary vascularity, superior to a pre-specified structured assessment by clinicians.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1317 - PERIPHERAL IMMUNE CHARACTERISTICS AND PREDICTIVE MODEL OF ACUTE LUNG INJURY AFTER VENTRICULAR SEPTAL DEFECT SURGERY IN INFANTS

Wei Jiang [1], Hao Wu [2], Weize Xu [1], Jiayu Zhang [1], Weijie Jia [2]
Children's Hospital, Zhejiang University School Of Medicine, Heart Center, Hangzhou-China [1]
Binjiang Institute Of Zhejiang University, Innovation Center Of Child Health, Hangzhou-China [2]

Background / Hypothesis:
To explore peripheral immune cell alterations in infants with ventricular septal defect (VSD) before and after cardiopulmonary bypass (CPB), and to develop an artificial intelligence-based model for early prediction of acute lung injury (ALI).

Materials and Methods:
Infants with VSD undergoing CPB from June 2022 to May 2024 were enrolled. Peripheral blood was collected preoperatively and 6 hours postoperatively. Healthy infants without congenital heart disease served as controls. ALI was defined per Berlin criteria; cases with chronic inflammation were excluded. Immune profiling was conducted using CyTOF with 36 immune markers. Cell populations were annotated using Seurat, and the scExpand algorithm was applied for dataset augmentation. Machine learning models were developed using sklearn, and model performance was assessed with 5-fold cross-validation.

Results:
Twenty-five VSD infants and 15 healthy controls were included. Compared with controls, VSD infants had reduced NK and Th2 cells and increased Th1 cells, with downregulated CD45RO expression. After CPB, most T cell subsets declined while monocytes increased. Postoperative upregulation of CD45RO and decreased monocyte antigen presentation were observed. In ALI cases, preoperative Treg cells and CD11c/CD278 expression were elevated. Six hours post-CPB, memory B cells were reduced and monocyte HLA-DR expression decreased. The AI prediction model achieved AUCs of 0.7539 preoperatively and 0.7964 postoperatively, indicating robust early predictive performance.

Conclusion:
This study identifies key immune alterations related to ALI in VSD infants undergoing CPB and demonstrates that machine learning models based on immune profiles can effectively predict ALI risk. These findings provide a scientific basis for early warning and targeted intervention.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1363 - AI IN EDUCATING ON CONGENITAL HEART DISEASE AND ARRHYTHMIA ARE WE THERE YET

Patrick Elnazir [1]
Alder Hey Children's Hospital, Paediatric Cardiology, Liverpool-United Kingdom [1]

Background / Hypothesis:
Artificial intelligence (AI) has become increasingly prominent, with expanding applications in medical education. In cardiology and congenital heart disease training, AI has shown promise through augmented and virtual reality tools. However, many universities lack opportunities for self-directed learning using AI platforms.

Materials and Methods:
Six medical students from the same year group, all with limited exposure to congenital heart disease and arrhythmia, were divided into two groups of three. They completed a 5-question quiz before and after the following educational sessions:

Group 1 participated in two 1-hour instructor-led sessions.

The first focused on the five main cyanotic congenital heart diseases, using interactive tools such as diagrams and videos of blood flow and anatomy.

The second session covered the causes of paediatric bradycardia and tachycardia, using ECG examples

Group 2 was given one hour to use ChatGPT for self-directed learning on the same topics. They were encouraged to ask as many questions as needed to fully understand the content.

Results:
Students demonstrated a good understanding of the topics. Group 2 appreciated being able to ask any questions freely without feeling judged, but some felt they were easily led off-track by the AI and struggled to refocus.

Additionally, ChatGPT's current limitations include the inability to generate visuals, such as heart images or ECGs, to aid in learning. See figures generated to depict Tetralogy of Fallot and SVT.

Conclusions:
While instructor-led sessions remain essential, self-directed learning via AI platforms like ChatGPT is becoming more common. However, for complex topics such as congenital heart diseases, AI still has limitations. Despite this, medical students are increasingly using AI tools like ChatGPT for exam and project preparation, showing potential for future integration.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1374 - AI ASSISTANT CLINICAL ASSESSMENT OF TRANSCATHETER OR SURGICAL CLOSURE OF ASD BASED ON ECHOCARDIOGRAMS

Xin Zhang [1]
Bejing Children's Hospital, Capital Medical University, Heart Centre, Beijing-China [1]

Background / Hypothesis:
Atrial septal defect (ASD) is the most common type of congenital heart diseasea. The early diagnosis and treatment of ASD are crucial to avoid serious complications. Transcatheter closure has become the preferred treatment for ASD due to its minimally invasive, rapid recovery, and high postoperative quality of life. However, if patients choose improperly, serious complications may still occur, even endangering their lives. But in light of the challenges faced by the current Chinese pediatric healthcare system, including generally unmet demand and uneven development, a significant number of inadequately trained pediatricians working in primary hospitals. Thus, we aimed to develop an automated and interpretable system to assist selection of surgical methods for ASD using deep learning.

Materials and Methods:
We retrospectively collected a dataset of 3474 2D and Doppler TTE scans of ASD patients who have undergone surgery or transcatheter closure. We created a novel deep keypoint stadiometry (DKS) model designed to precisely localize the keypoints, representing the endpoints of ASDs, followed by absolute distance measurement with scale information. Clinical decision rules were applied to derive closure plans and determine the size of the ASD occluder for transcatheter closure.

Results:
The DKS model demonstrated a high accuracy of closure classification in evaluations. The fine-grained keypoint labels provided explicit supervision for network training. Clinicians can intervene and make edits at various stages of the automated process.

Conclusions:
A transparent AI-based multi-view echocardiogram analysis system is proposed to suggest transcatheter or surgical closure. Our DKS model provides interpretable and accurate AI-assisted suggestions. In the future, similar studies using deep learning algorithms shall be developed for size-sensitive treatments. By identifying the explicit clinical practice guidelines, our deep keypoint stadiometry algorithms were able to automatically propose the therapeutic plan, effectively reducing the workload of the clinicians.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1400 - A MODIFIED VGGISH MODEL FOR EARLY DETECTION OF CONGENITAL HEART DISEASE USING WIRELESS PHONOCARDIOGRAPHY

Saji Philip [1]
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Back ground;
Cardiac auscultation is one of the most straightforward and primary methods for detecting cardiac disorders. However, detecting Congenital Heart Disease (CHD) in paediatric patients through auscultation is particularly difficult due to the frequent presence of innocent murmurs, which often complicates diagnosis. As a result, echocardiography is typically employed as a confirmatory diagnostic tool, though its availability is limited in many primary healthcare centres. This work proposes a deep learning-based approach for detecting CHD from phonocardiogram (PCG) signals, or heart sounds, to address this limitation / Hypothesis:

Materials and Methods:
The work focuses on the 5 class classifications of paediatric heart sounds such as atrial septal defect, ventricular septal defect, functional murmur, normal and pathological. The study uses a real-time, self-collected dataset recorded under clinical conditions by cardiologists. The work experimented with audio-trained transfer learning models and developed a modified VGGish-based transformer model for the 5-class classification of paediatric PCGs.

Results:
Depth-wise separable convolution and Light Attention Connected Modules are the components aided in reducing the model complexity and the number of parameters. The proposed model achieved an accuracy of 93.4%, a precision of 94%, and scores 91.4% for both the Kappa and Matthews Correlation Coefficient. The model's transferability is validated using a public multi-class dataset available on GitHub,

Conclusions:
Demonstrating its effectiveness in early CHD detection and its potential to facilitate timely medical intervention.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1416 - VIRTUAL REALITY AND GAMEPLAY AS A MODEL FOR EXERCISE REHABILITATION IN PEDIATRIC SOLID ORGAN TRANSPLANT PATIENTS. A PATIENT AND FAMILY LED INITIATIVE

Christopher Buckland [1], Astrid-marie De Souza [1], Julie Fairbairn [2], Tom Blydt-hansen [3], Orlee Guttman [3], Mark Chilvers [3], John Jacob [4], James Potts [1], *Kathryn Armstrong* [3]
British Columbia Children's Hospital, Children's Heart Centre, Vancouver-Canada [1] British Columbia Children's Hospital, Cystic Fibrosis Clinic, Vancouver-Canada [2] British Columbia Children's Hospital, Multi-organ Transplant Program, Vancouver-Canada [3] British Columbia Children's Hospital, Digital Lab, Vancouver-Canada [4]

Background / Hypothesis:
There are many health benefits for pediatric Solid Organ Transplant (SOT) patients who engage in regular physical activity; however, a barrier to ongoing participation is a lack of interest. Recently, a patient within the Multi-Organ Transplant Program at British Columbia Children's Hospital described their use of virtual reality (VR) gameplay for exercise. As a follow-up, we conducted a feasibility study to assess VR gameplay as a form of exercise for our SOT patients.

Materials and Methods:
All eligible 13-18-year-old SOT patients within our Program were approached. Participants engaged in 8-weeks of VR gameplay followed by 8-weeks of non-gameplay. Participants could play three games with a goal of engaging in VR gameplay 3x/week for 30 minutes/session (24 sessions). Heart rate (HR) during each session was recorded using a smart watch. A treadmill cardiopulmonary exercise test was administered before and after VR gameplay and following the non-gameplay period. Outcome measures included VO2 peak.

Results:
Recruitment rate was 20% (12/59) and only 5/12 engaged in VR gameplay. The median age of participants was 16.1 years (14.3-16.8). Four of five participants (3 heart transplant patients) met the criteria for a maximal exercise test. Z-scores for absolute V̇O2peak ranged from -2.85 to -1.38 with a relative V̇O2peak of 31.0 to 41.5 mL/min/kg; neither improved after VR gameplay. The median number of gameplay sessions completed was 10 (8-22) and the duration of gameplay sessions was 31 minutes (26-35). The percentage of gameplay time spent at ≥50% of peak HR ranged from 85%-100%.

Conclusions:
VR gameplay can elicit an effective exercise stimulus; however, regular weekly exercise in our study was low and this may have contributed to the lack of improvement in V̇O2peak.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1513 - SAME ECG'S DIFFERENT PAIRS OF EYES VISUAL ATTENTION IN ELECTROCARDIOGRAM INTERPRETATION BETWEEN PEDIATRIC AND ADULT CARDIOLOGISTS

Sip Wijchers [1], Johan Pel [2]
Erasmus Mc, Cardiology, Rotterdam-The Netherlands [1] Erasmus Mc, Neurosciences, Rotterdam-The Netherlands [2]

Background / Hypothesis:
Electrocardiogram (ECG) interpretation is a core skill in cardiology. Assessing visual scan paths may help identify differences in diagnostic strategies. This study compares gaze behavior during ECG interpretation between pediatric cardiologists (PC) and electrophysiology (EP) specialists—each with over 5,000 lifetime ECG interpretations—using eye-tracking.

Materials and Methods:
Eight cardiologists (5 PC, 3 EP) underwent two eye-tracked sessions (Tobii T60XL). In the first, participants interpreted ten ECGs (8 adult, 2 pediatric). In the second, they identified their most important lead (MIL) and fixated on it in a new recording. Diagnostic accuracy, total interpretation time, and gaze metrics—including time to first fixation, visit duration, and longest lead fixation (LLF)—were analyzed per lead. Heatmaps were created per ECG to visualize areas of visual attention at the group level.

Results:
EP specialists showed significantly higher diagnostic accuracy (7.0 vs. 6.2/10; $p = 0.045$) and faster interpretation ($p = 0.027$). Pediatric cardiologists had significantly better alignment between MIL and LLF (7.8 vs. 3.3/10; $p < 0.01$), indicating a more consciously guided strategy. EPs fixated earlier and longer on Lead V1 ($p = 0.036$), while PCs made more visits to Lead aVF ($p = 0.021$).
Figure 1 illustrates this for ECG 3 (Wolff-Parkinson-White), where EPs focused on V1 and PCs on Lead I, and for ECG 6 (inferior MI with complete AV block), where EPs fixated on V2 and PCs showed broader attention.

Conclusions:
EP specialists interpret ECGs more accurately and efficiently, using focused scan patterns. Pediatric cardiologists demonstrate a more deliberate and reflective approach. Heatmaps offer qualitative insight into these strategies beyond statistical metrics. These differences likely reflect age-related variation in disease patterns and the associated diagnostic and therapeutic priorities.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1536 - 8 YEAR FOLLOW UP OF COMPASSIONATE USE CASES TREATED WITH PERSONALIZED AUTOLOGOUS HEART VALVES

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Dhzc, Pediatric Cardiology, Berlin-Germany [1] Aims, Pediatric Cardiology, Kochi-India [2]

Background/Hypothesis:
Currently, there are no medical devices on the global market that are specifically designed to treat children and adolescents with congenital heart valve defects. Our goal is to develop the first ever heart valve that is durable and capable of growing throughout life, thus making obsolete the need for re-operation.
Consequently, we have developed a point-of-care solution using a 3D-printed heart valve mould to shape a body-specific heart valve from endogenous pericardial tissue harvested from the patient, sewn into a stent and implanted through a cardiac catheterisation system.

Materials and methods:
In 2017, we treated three pediatric patients in India as compassionate use cases. Approval was granted by local and institutional ethics committees and informed consent was obtained from the patients' parents: a 4-year-old boy underwent tricuspid anterior valve augmentation in a cone procedure, a 6-year-old girl received a completely new pulmonary valve from her own pericardium in the pulmonary position of the native tetralogy of Fallot (TOF), and an approximately 18-year-old patient underwent a stented pulmonary valve procedure during reoperation for TOF due to allograft failure.

Results:
The valve fabrication and implantation proved successful with all three patients. The procedures were fully documented on video. More than 8 years after treatment, all patients are in good health. The two male patients are still being followed up annually and their valves are functioning well. The female patient has unfortunately moved to different Indian state and discontinued treatment.

Conclusion:
The treatment of the three patients with autologous pericardial heart valves has proven successful. Eight years after the autologous valve replacement, the patients are still doing very well. This shows that autologous tissue-derived valves can be a long-term solution for children and adolescents with congenital heart valve defects. This point-of-care solution enables production in the operating room of hospitals all over the world without need for laboratories.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1637 - MULTI PHYSICAL COMPUTATIONAL METHODS TO INFORM CLINICAL DECISION MAKING IN FONTAN MANAGEMENT AND TOWARD PERSONALIZATION

Vijay Govindarajan [1], Akshita Sahni [1], Vikas Kanojjiya [1], Peter Hammer [1], David Hoganson [1], Rahul Rathod [2], Pedro Del Nido [1]
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Background:
The Fontan circulation, used to palliate single ventricle congenital heart disease, creates a low-energy, non-pulsatile flow environment that places patients at risk for both short- and long-term complications. Thromboembolic events remain a significant complication, especially in patients with hypercoagulative blood, and may even lead to Fontan failure and takedown. Over time, chronically elevated venous pressures contribute to Fontan-associated liver disease (FALD). These outcomes are closely tied to patient-specific hemodynamics, yet tools to predict physiologic impact of surgical decisions remain limited. Advances in multi-physical computational modeling now allow prospective simulation of Fontan physiology to support personalized care.

Materials and Methods:
We developed a suite of patient-specific, multi-physical computational models to simulate Fontan hemodynamics, thrombosis, and hepatic response. Anatomical reconstructions were created from MRI or CT imaging. The core CFD model, validated using 4D Flow MRI, predicts flow patterns and pressure distribution under Fontan-specific conditions. Thrombosis risk is modeled by coupling our patient-specific CFD model of the Fontan circulation with biochemical kinetics of clot formation to identify regions of stasis and clot deposition. Separately, the liver model couples CFD-derived hemodynamics with a biochemical model of fibrosis to simulate hepatic venous pressure, perfusion, and extracellular matrix deposition. High-performance computing enabled efficient simulation across patient-specific scenarios.

Results:
In a representative Fontan patient, predicted regions of stasis and fibrin deposition matched clinical thrombus locations. Liver modeling showed that age-related increases in lower body flow elevated hepatic venous pressure and extracellular matrix deposition, indicating progressive fibrotic potential. These findings reflect known clinical trajectories in Fontan-associated complications.

Conclusions:
This multi-physics modeling platform enables personalized assessment of thrombosis and hepatic complications in the Fontan population. By simulating outcomes from individual patient anatomy and flow conditions, it supports data-driven planning and long-term management strategies aimed at improving outcomes in single ventricle patients undergoing Fontan palliation.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1650 - ENHANCING MACHINE LEARNING DETECTION OF RHEUMATIC HEART DISEASE WITH ARTIFICIAL INTELLIGENCE DRIVEN SYNTHESIS OF PATHOLOGICAL DUAL CHANNEL COLOR DOPPLER ECHOCARDIOGRAMS

Christina Yang [1], Pooneh Roshanitabrizi [2], Kelsey Brown [1], Pengfei Guo [3], Taylor Gloria Broudy [2], Joselyn Rwebembera [4], Emmy Okello [5], Andrea Beaton [6], *Craig Sable* [7], Marius George Linguraru [2]
Children's National Hospital, Pediatric Cardiology, Washington, Dc-United States [1] Children's National Hospital, Sheikh Zayed Institute For Pediatric Surgical Innovation, Washington, Dc-United States [2] , Nvidia Corporation, Santa Clara, Ca-United States [3] , Uganda Heart Institute, Kampala-Uganda [4] , Uganda Heart Institude, Kampala-Uganda [5] Cincinnati Children's Hospital Medical Center, Pediatric Cardiology, Cincinnati, Oh-United States [6] Ochsner Children's Hospital, Pediatric Cardiology, Jefferson La-United States [7]

Background / Hypothesis:
Color Doppler echocardiography (echo) is an essential component of the 2023 WHF guidelines for diagnosis of early rheumatic heart disease (RHD). Diagnostic artificial intelligence (AI) holds promise for scaling access to echo in resource limited settings, but model development relies on large datasets. We propose a novel AI-based approach that synthesizes color Doppler echos using a multi-factor conditioned diffusion model. We hypothesize that this approach generates clinically realistic data, and has potential to expand the data pool to enhance clinical AI development.

Materials and Methods:
Our model was trained on a Ugandan pediatric dataset (D1, n = 462) and validated on an independent Ugandan dataset (D2, n = 127) and the public CAMUS dataset (n = 500). The conditional diffusion model generated Doppler flow from B-mode using temporal and class-label conditioning. A previously developed deep learning RHD classifier was trained and tested on both real and synthetic data. To assess clinical realism, 30 cases (10 real, 10 synthetic "normal", and 10 synthetic RHD) were evaluated by two independent, blinded-expert to determine real or synthetic, and further evaluate synthetic cases as RHD or normal.

Results:
Experts were unable to distinguish real from synthetic cases, both normal and RHD. Despite no prior exposure to synthetic data, RHD was correctly identified in synthetic cases with an average accuracy of 95%±5%, reflecting strong clinical fidelity. The RHD classifier trained on D1 and validated on D2 achieved 72%±40% accuracy (73%±40% sensitivity, 68%±50% specificity), while adding 1,414 synthetic cases achieved 82%±40% accuracy (79%±40% sensitivity, 89%±30% specificity; p = 0.008, McNemar test).

Conclusions:
Our approach generates clinically realistic, scalable synthetic data to expand training datasets that enhance AI-assisted RHD prediction. This is especially relevant for underrepresented subtypes like aortic regurgitation, present in only 15% of RHD cases and can accelerate development of real world solutions for AI-based RHD diagnosis.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1655 - AUTOMATED HEART SOUND QUALITY EVALUATION USING DATA AUGMENTATION AND DEEP LEARNING

Thiago Rodrigues [1], Quan Ni [1], Aaron Faugsted [1], *Matheus Lima Diniz Araujo* [2]
One Heart Health, , St Paul-United States [1] Cleveland Clinic Lerner College Of Medicine Of Case Western Reserve University, Biomedical Engineering, North Ridgeville-United States [2]

Background / Hypothesis:
Digital cardiac auscultation to detect abnormal murmurs depends on clean audio recording quality. Environmental noise, stethoscope misplacement, and recording artifacts frequently degrade phonocardiograms (PCGs), compromising diagnosis accuracy. While traditional methods use handcrafted audio features for quality assessment, deep learning techniques offer an alternative by identifying complex acoustic patterns for noise detection, thus enhancing heart murmur detection without the interference of non-cardiac-related artifacts.

Materials and Methods:
We used the CirCor DigiScope Phonocardiogram containing 5272 heart sounds from 1568 subjects (50.2% male, 6.1 ± 4.3 years) collected in rural and urban populations in Brazil. We augmented this dataset by using noise audio data from Google AudioSet, which contains typical clinical and everyday environmental noises. We combined heart sound recordings with noise clips at controlled signal-to-noise ratios. The final dataset comprises a balanced set with 50% of the samples having heart sounds and 50% containing noise audios, we separated 5996 (82%) audio segments for training, and 1058 (18%) for testing. Audio from the patients was either in training or testing sets, not in both. We developed a deep neural network to evaluate PCG quality using spectrograms from original audio files. We processed them through a temporal convolutional architecture employing causal convolutions to preserve temporal causality. The final classification employed fully connected layers activated by Swish Gated Linear Units (SwiGLU).

Results:
The proposed model achieved high accuracy (95.0%), specificity (96.2%), and sensitivity (93.5%) on the test set, demonstrating robust performance in distinguishing diagnostically acceptable heart sound recordings from those degraded by noise. The model produced an F1-score of 94.6% and an area under the ROC curve of 97.4%.

Conclusions:
We developed an accurate detection algorithm to identify noise from heart sounds using a deep learning model. Our model can help minimize data collection errors from digital stethoscope misplacement and enhance heart murmur detection by rejecting non-cardiac-related noise.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1721 - PRENATAL DETECTION OF VASCULAR RINGS WITH DEEP LEARNING PERFORMANCE OF A CONVOLUTIONAL NEURAL NETWORK MODEL

Patrizio Moras [1], Davide Passaro [2], Cosimo Marco Campanale [1], Marco Masci [1], Serena Ventrella [1], Luciano Pasquini [3], Alessandra Toscano [1]
Bambino Gesù Pediatric Hospital, Perinatal Cardiology, Rome-Italy [1] Sapienza University, Statistical Sciences, Rome-Italy [2] A. Gemelli University Hospital, Ginecology And Obstetrics, Rome- [3]

Background / Hypothesis:
Complete vascular rings are congenital anomalies in which the trachea and esophagus are entirely encircled by vascular structures. Prenatal diagnosis relies on fetal echocardiography, typically identifying a “U-shaped” configuration—formed by a right aortic arch and ductus arteriosus surrounding the trachea—as indicative of a vascular ring. In contrast, a “V-shaped” configuration, with both arch and ductus to the left of the trachea, reflects a normal left aortic arch. While the distinction between these two patterns is geometrically clear, accurate prenatal identification requires significant expertise and is often missed during routine evaluations.
This study aimed to evaluate whether a deep learning model could accurately distinguish between fetuses with a complete vascular ring and those with a normal aortic arch based on standard fetal echocardiographic images.

Materials and Methods:
We developed a binary classification model using a convolutional neural network (CNN), implemented in Python with the Keras library. A total of 190 fetal echocardiographic images (upper mediastinal view) were retrospectively collected and classified into two groups: complete vascular ring (Group 1) and normal left aortic arch (Group 2), with equal representation. The dataset was split into 70% for training and 30% for testing.

Results:
The CNN achieved an accuracy of 90% with an Area Under the Curve (AUC) of 0.93, demonstrating high performance in differentiating the two configurations.

Conclusions:
Our study shows that a deep learning model can reliably identify complete vascular rings from fetal echocardiographic images. These promising results support the potential of AI-assisted tools to enhance prenatal detection of vascular anomalies, especially in settings where specialized expertise may be limited. Further validation on larger, multicenter datasets is needed to confirm clinical applicability.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1732 - COST EFFECTIVE 3D PRINTED HEART MODELS IN SURGICAL PLANNING AND SIMULATION OF DOUBLE OUTLET RIGHT VENTRICLE

Ross Foley [1], Eoin O'cearbhaill [2], Colin Mcmahon [1]
Chi, Crumlin, Cardiology, Dublin-Ireland [1] Ucd, Engineering, Dublin-Ireland [2]

Background:
In Double outlet right ventricle (DORV), the aorta and pulmonary artery arise from the right ventricle with an associated ventricular septal defect (VSD). DORV anatomy varies considerably and understanding the complex 3D relationship between the VSD and the outflow tracts is vital for surgical planning.
Advancements in 3D printing technology allow for the generation of high fidelity heart models which are commonly used in the surgical planning of DORV.
Current models are printed with advanced technologies using soft polymers that simulate the characteristics of heart muscle tissue. These allow for the performance simulated surgery but can cost over €1000 per model.
We aim to generate more cost-effective models that maintain accuracy while allowing for surgical rehearsal.

Methods:
We prospectively recruited pre-operative DORV patients over a 1 year period, all of whom would have a computed tomography (CT) cardiac angiogram as part of their pre-operative work-up. The heart structures are then segmented from the background of the CT using a semi-automatic image analysis algorithm. A 3D mesh file is produced that is used to print the models. Using fusion deposition modelling (FDM), an affordable printing technology, we print sacrificial 3D molds in rigid polylactic acid (PLA). These are then injected with silicone which is cheap and superior to polymers in terms of heart muscle simulation. The silicone models are then compared to industry standard models by the surgeon.

Results:
We have recruited 6 DORV patients, 3 of whom have now had pre-op imaging and await surgery. Preliminary results show that the silicone models are accurate with less than 0.5mm difference between the models and CT on measurements of key structures. Subjectively, the surgeon noted that silicone allows for surgical rehearsal well.

Conclusions:
Preliminary results are promising. All imaging and repairs are due to be completed over the next 6 months at which point full results will be available to present.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1748 - EFFICACY OF AI POWERED DIGITAL STETHOSCOPE IN DETECTING CONGENITAL HEART DISEASE A COMPARATIVE STUDY IN A LOW AND MIDDLE INCOME COUNTRY SETTING

Niharika Karandikar [1], Prashant Bobhate [1], Tanuja Karande [1]
Kokilaben Dhirubhai Ambani Hospital, Pediatric Cardiology, Mumbai-India [1]

Background / Hypothesis:
Conventional stethoscopes are commonly used to identify heart murmurs, an early indicator of cardiac issues. However, in low and middle income countries there is a delay in diagnosis of congenital heart diseases (CHD) and critical CHDs can get missed at the primary health care contact. Advancements in technology, such as integration of AI, provide opportunities to improve diagnostic accuracy and help in early detection. Digital stethoscopes with artificial intelligence (AI) have the potential to enhance the accurate detection of heart sounds. Objective The study aims to assess efficacy of AI-powered stethoscope to detect, analyse, and classify abnormal heart sounds associated with CHD.

Materials and Methods:
Consecutive patients and their age, gender and body surface area (BSA) matched controls referred to a tertiary paediatric cardiac center in low and middle income country were recruited. Heart sounds were recorded using a digital stethoscope (Made In India) from 4 conventional sites. The patients were also auscultated by a trained paediatric cardiologist using a conventional stethoscope. All patients underwent echocardiogram on the same day of recruitment in the study. AI bases algorithm was trained to classify the heart sounds as normal or abnormal. Forward testing was done in blinded fashion once the training of algorithm was completed.

Results:
400 participants (215 patients with CHD) were recruited. Mean age of the patients was 10.2 years with male: female ratio of 1.12 and mean BSA 1.52m2. 136 (63%) patients had increased pulmonary blood flow (PBF), 42 (19.5%) had decreased PBF and 37 (17.5%) had normal PBF. AI based algorithm was able to diagnose the CHD with sensitivity of 94% and specificity of 95%.

Conclusions:
Digital stethoscope can be used as a screening tool at primary health care level to detect CHD and help in early diagnosis and treatment

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

1812 - SAFETY AND UTILITY OF SMARTPHONE BASED HEART MONITORS IN PEDIATRIC PATIENTS WITH CARDIOVASCULAR IMPLANTABLE ELECTRONIC DEVICES

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Hkch, P&am, Hong Kong-Hong Kong SAR, China [1] University Of Hong Kong, P&am, Hong Kong-Hong Kong SAR, China [2]

Background / Hypothesis:
Portable heart monitors enable on-demand electrocardiogram (ECG) recordings and enhance symptom-rhythm correlation. However, concerns have been raised regarding potential electromagnetic interference (EMI) from these monitors that may affect cardiovascular implantable electronic devices (CIEDs). The safety and clinical benefits of portable heart monitors in children and adolescents with implanted CIEDs remain to be established.
The primary objective was to determine whether KARDIAMOBILE6L™ and APPLE WATCH™ induce EMI, impacting the function of CIEDs in pediatric patients. Secondary aims included the assessment of the accuracy of heart rate measurement and their ability to detect non-capture events.

Materials and Methods:
In this prospective study, patients aged 5 years or older with implanted CIEDs were recruited from a tertiary pediatric cardiac center. Each subject had four 30-second ECGs acquired using KARDIAMOBILE6L and APPLE WATCH. Subjects were monitored for cardiac symptoms during ECG acquisition, and CIEDs were assessed for EMI. The collected ECGs were analyzed for interpretability, accuracy of heart rate measurement, and detection of non-capture events.

Results:
Thirty-two patients (median age 14.0 years, IQR 9.9-16.6) were recruited. No adverse clinical events were identified. No EMI was detected during ECG acquisition, regardless of patient and CIED characteristics. Ninety-eight percent of acquired ECGs were interpretable. Both devices demonstrated excellent accuracy of heart rate measurement ($\rho = 0.99$) and a sensitivity of 100% for identifying ventricular non-capture events.

Conclusions:
KARDIAMOBILE6L and APPLE WATCH did not induce EMI in children and adolescents with CIEDs, enabling reliable heart rate measurement and accurate identification of ventricular non-captures.

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Category: Artificial Intelligence, Technology and Personalized Medicine

1834 - AN EARLY DIAGNOSTIC MODEL OF KAWASAKI DISEASE BASED ON PLATELET DERIVED MIRNAS AND MACHINE LEARNING

Yuanyuan Zhou [1], Sirui Song [1], Liqin Chen [1], Le Chen [1], Tingting Xiao [1], Min Huang [1]
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Background / Hypothesis:
Kawasaki disease (KD) is the leading cause of acquired heart disease in children, and is steadily increasing in prevalence in East Asia. Delay in diagnosis of KD can lead to severe cardiovascular complications. Along with the deeper understanding of the molecular pathogenesis and development of technology, platelet-derived miRNAs is anticipated to be potential biomarker for early diagnosis of KD,especially with the aid of artificial intelligence algorithms.

Materials and Methods:
GeNorm, NormFinder, and BestKeeper were used to select the most optimal reference gene for relative quantification of platelet miRNAs by qRT-PCR. An independent cohort with acute Kawasaki disease (N=60) and infectious fever controls (N=60) from two hospitals were further included,and differentially expressed platelet miRNAs and clinical indicators correlating with KD were identified. Platelet miRNAs and clinical indicators associated with Kawasaki disease were selected to construct predictive models using multiple machine learning algorithms, including logistic regression, support vector machine, decision tree, random forest, and XGBoost.

Results:
miR-126-3p exhibited the most suitable reference gene for platelet miRNAs quantification in Kawasaki disease. The expression levels of 7 miRNAs were significantly elevated in patients with Kawasaki disease ($p<0.05$). Predicted target genes of these differentially expressed miRNAs are enriched in pathways related to infection, inflammation, and immune process. Ultimately, utilizing a support vector machine algorithm, a diagnostic model incorporating platelet miR-92a-3p, miR-199a-3p, WBC, Hb, PLT and CRP demonstrated strong predictive capabilities. The model achieved an area under the receiver operating characteristic curve of 0.944, with sensitivity and specificity of 0.889 and 0.833, respectively.

Conclusions:
Using miR-126-3p as the internal reference gene, a model combining platelet miRNAs and clinical indicators exhibits strong diagnostic capabilities, particularly in early-stage(with an onset within 5 days) and incomplete KD cases, demonstrating potential for clinical application.

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Category: Artificial Intelligence, Technology and Personalized Medicine

1907 - UTILIZING LARGE LANGUAGE MODELS TO PREDICT PEDIATRIC CARDIOLOGY RECOMMENDATIONS AND FOLLOW UP

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Stanford University, Pediatrics- Pediatric Cardiology, Mountain View-United States [1] Stanford University, Biomedical Data Science, Palo Alto-United States [2]

Background / Hypothesis:
Artificial intelligence is a burgeoning tool in medicine yet seldomly used in management of congenital heart disease (CHD) due to a paucity of data sets. While complex CHD management remains on the horizon, the use of large language models (LLM) to facilitate a patient's initial evaluation remains an untapped opportunity. We explore how LLMs might assist with initial cardiology evaluation by predicting a cardiologist's recommendations.

Materials and Methods:
We conducted a retrospective analysis of initial pediatric cardiology outpatient notes (5/2014-7/2024). Data were extracted from electronic medical records and screened using OpenAI's o3-mini reasoning model to identify physician recommendations for echocardiography and cardiology follow-up. Patients with prior echocardiograms or cardiac diagnoses were excluded. The model was trained using 2014 Pediatric Echocardiography Appropriate Use Criteria (AUC) and asked to predict if an echocardiogram should be ordered based on history, physical exam, and EKG. The model was then unblinded to echocardiogram results and prompted to determine need for follow-up. A sample of 100 notes was used to verify the model's prediction against both AUC and the cardiologist's recommendations.

Results:
1575 cases met inclusion criteria (average age= 10.7 +/- 5.2, 52.5% female). The most common presenting symptoms were palpitations (30.6%), syncope (25.8%), family history (12.5%) and murmur (11.4%). The model had 95% concordance with AUC criteria for echocardiogram and 5% false positive cases related to errors in note formatting. However, the model's predictions exhibited only 66% and 79% accuracy with physician recommendations for echocardiogram and follow-up, respectively.

Conclusions:
Our study suggests that LLMs have greater accuracy when predicting recommendations based on consistent guidelines, like AUC, as compared to predicting physicians' recommendations. This discrepancy may be secondary to practice variability or decisions outside guideline recommendations encouraging that future studies explore training LLMs using both guideline-driven recommendations and clinical examples to improve model accuracy.

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1951 - IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE IN A SINGLE VIEW PORTABLE PEDIATRIC ECHOCARDIOGRAPHY DEVICE POWERED FOR DETECTION OF CONGENITAL HEART DISEASE

Rodrigo Medellin-robles [1], Mohammad Abdullah Bukhari [1], Heranjithan Manoharan [1], Ulziikhishig Byambabayar [2], Jose Miguel Torres-martel [3], Erdenejargal Badarch [2], Todd Newman [1], Alyssa Abo [4], Annamarie Saarinen [4]
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Background / Hypothesis:
Congenital Heart Disease (CHD) is the most prevalent and deadly congenital malformation, underscoring the need for early detection in infants. Traditional echocardiography demands significant expertise, time and equipment, which can delay diagnosis and strain healthcare resources. This study evaluates the efficacy of a novel portable pediatric ultrasound device "RAPID EVA" using a single-view sweep subcostal scan, leveraged by artificial intelligence (AI) to detect CHD in newborns and infants.

Materials and Methods:
A total of 126 newborns and infants were enrolled at the First Maternity Hospital. All subjects underwent physical examination, pulse-oximetry, and evaluation with our novel portable pediatric device using a sweep subcostal scan protocol. This protocol performs a dynamic movement to obtain an extended view of the heart in a single acquisition using the subcostal window. 89 subjects presented normal cardiac anatomy and 37 were diagnosed with CHD, subsequently confirmed by standard echocardiography. Using these studies, we developed a video-based hybrid artificial intelligence system CHD presence detection. A blinded comparison study was conducted between the AI system and four specialist physicians using a randomized subset of 35 patient cases.

Results:
Our hybrid artificial intelligence system for classification of Normal or CHD Detected patients (Abnormal group) achieved 89.43% accuracy, 89.43% sensitivity, and 90.38% specificity in a cross-validation analysis. In the blinded comparison study, the AI system achieved a comparable performance to the best-performing physician with accuracy (91.42% vs. 77.14%), sensitivity (91.42% vs. 77.14%), and specificity (95.23% vs. 76.19%), respectively.

Conclusions:
The novel single-view portable device RAPID EVA paired with our artificial intelligence system, offers a rapid and cost-effective solution for CHD detection in neonates and infants. This technology demonstrates potential for widespread adoption, enhancing pediatric cardiac care accessibility, efficiency and health equity.

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1953 - A MULTI INSTITUTIONAL STUDY USING A FINE TUNED AUDIO SPECTROGRAM TRANSFORMER TO DETECT CONGENITAL HEART DISEASE IN CHILDREN FROM PHONOCARDIOGRAMS

Matheus Lima Diniz Araujo [1], Alexandra Heath [2], Inge Von Alvensleben [2], Jesus Ardiles Spielvogel [2], Ulzii Byambabayar [3], Erdenechimeg Jugder [3], Uvie Onakpoya [4], Olukemi Bamigboye-taiwo [5], Quan Ni [6], Aaron Faugstad [6]
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Background:
Automated cardiac auscultation using digital stethoscopes and artificial intelligence (AI) holds promise to improve early detection of congenital heart diseases (CHD), especially in resource-limited settings. This study aims to assess the diagnostic performance of a deep learning model trained on heart sound recordings collected from pediatric populations across Bolivia, Nigeria, and Mongolia.

Methods:
We conducted a multi-institutional collaboration that collected heart sound recordings from 253 children using the One Heart Health Mobile Application connected to a digital stethoscope. Among these, 108 children had an echocardiogram performed (mean age 7.30 ± 6.26 years; 57 females, 51 males). On average, 5 recordings were obtained per child. Echocardiograms presented 93 cases positive for various CHD variants and 15 negative controls. Data was divided into training (75%, N=104) and test sets (25%, N=35). The training dataset was augmented with the CirCor DigiScope Phonocardiogram Dataset. We fine-tuned an Audio Spectrogram Transformer (version 0.448 from Hugging Face) using the combined dataset. Given that the model outputs a CHD probability for each heart sound recording, the final patient-level probability was computed using the median of the probabilities from all recordings for that patient.

Results:
Our fine-tuned model demonstrated promising diagnostic performance with an area under the precision-recall curve (AUC-PR) of 73% and an area under the receiver operating characteristic curve (AUC-ROC) of 75%. The accuracy achieved was 69%, with a precision of 64%, recall of 82%, and specificity of 55%.

Conclusion:
Our findings indicate that AI-assisted auscultation using deep learning and digital stethoscopes provides moderate diagnostic accuracy in detecting CHD among children. We believe this approach has a large potential value as a screening tool, particularly in underserved regions lacking specialized pediatric cardiac care. Further optimization and validation are required to enhance sensitivity and overall performance.

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1954 - AUTOMATED PHONOCARDIOGRAM ANALYSIS FOR REMOTE CONGENITAL HEART DISEASE SCREENING A COMPARISON WITH ECHOCARDIOGRAM AND EXPERT AUSCULTATION

Matheus Lima Diniz Araujo [1], Alyssa Marum [2], Connor Fields [2], Hangyu Watson [2], Lee Pyles [2], Nita Ray Chaudhuri [3], Steven Blume [2], Alexandra Heath [4], Inge Von Alvensleben [4], Olukemi Bamigboye-taiwo [5], Quan Ni [6], Aaron Faugstad [6]
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Background:
Accurate auscultation for congenital heart disease (CHD) remains challenging in remote regions with limited pediatric cardiology expertise. Leveraging AI-based models with digital stethoscope recordings has the potential to make auscultation more consistent and accessible. We developed a deep learning algorithm to classify normal vs. abnormal echocardiographic findings from remote heart sound recordings.

Methods:
We collected heart sounds from 76 pediatric patients (44 females, 32 males) using the One Heart Health Mobile Application and a digital stethoscope with expert annotation during the auscultation and echocardiogram findings post-auscultation. An average of 5.03 (±0.25) recordings were collected per child. The mean age was 7.95 years (±7.07), the mean height was 100.56cm(±49.17), the mean weight was 33.46kg(±45.88) and the mean BMI was 18.58(±6.37). The dataset was split into training (79%,N=60) and testing (21%,N=16) subsets. The training data were augmented with the CirCor DigiScope Phonocardiogram Dataset to fine-tune an Audio Spectrogram Transformer model. Patient-level CHD probability was computed as the maximum probability across all recorded heart sounds per patient. We evaluated 3 tasks: human auscultation vs. echocardiogram, model vs. auscultation, and model vs. echocardiogram.

Results:
Echocardiograms confirmed CHD diagnosis in 50 patients. During auscultation, 54 patients had murmurs against 22 without murmurs. Trained humans performing auscultation reached 86% precision, 80% recall, 88% specificity, and 76% accuracy. The deep learning model, when compared to the echocardiogram baseline, reached AUC-PR of 91%, AUC-ROC of 67%, accuracy of 67%, precision of 90%, recall of 70%, specificity of 66%, and F1-Score of 78%.

Conclusion:
The deep learning algorithm effectively differentiated abnormal from normal phonocardiographic findings using remotely collected heart sounds. Optimizing thresholds to consider the clinical costs of false positives and negatives is a topic of future investigation. Although further refinement and fine-tuning are required, this method holds significant promise for screening CHD in rural areas lacking expert auscultation resources.

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1984 - INVESTIGATION INTO THE INTELLIGENT RECOGNITION OF COMMON CONGENITAL HEART DISEASE BASED ON ECHOCARDIOGRAPHY

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Children's Hospital, Zhejiang University School Of Medicine, National Clinical Research Center For Child Health, Heart Center, Hangzhou-China [2]

Background:
Congenital heart disease (CHD) is characterized by a high incidence and low detection ratea. The shortage of pediatric echocardiologists limits the routine ultrasound screening for CHD in many institutions. Deep learning has emerged as a promising tool to enhance the CHD diagnosis. This study aims to develop and evaluate a two-stage, two-branch intelligent recognition algorithm (OBICnet) based on echocardiographic images to predict and classify common CDH in pediatric patients.

Materials and Methods:
A total of 8543 echocardiographic images from 3134 children were analyzed, with each child contributing one to seven standard sectional views. The dataset was divided into training, validation, and test sets in an 8:1:1 ratio. OBICnet, comprising two branches, was introduced for CHD classification. Branch 1: The target detection network (YOLOv5) identified and extracted lesion regions, followed by disease classification using the image classification network (ResNet50). Branch 2: The ResNet50 network directly classified diseases by extracting features from whole images. Joint learning mixed scheduled sampling was applied during training to optimize the OBICnet model, with final disease classification achieved by integrating results from both branches. The OBICnet model's performance was evaluated by comparing it with other algorithms and through external validation.

Results:
The OBICnet model categorized normal cases and three common CHD conditions: atrial septal defect + patent foramina ovale (ASD+PFO), ventricular septal defect (VSD), and patent ductus arteriosus (PDA). The accuracy of the single-image disease classification algorithm was 98.32%, with the AUC value of 0.99. For multi-view disease classification, the accuracy reached 98.97%. External validation demonstrated an accuracy of over 90.00% for multi-view classification.

Conclusions:
The OBICnet model exhibited remarkable recognition capabilities for ultrasound images, accurately predicting and classifying common CHD conditions (ASD+PFO, VSD, PDA) in children. This model holds clinical potential for advancing teaching, standardizing CHD ultrasound screening and promoting large-scale echocardiographic screening of CHD in the future.

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1991 - A TWO WAY MENDELIAN RANDOMIZATION STUDY CAUSALITY BETWEEN SERUM 1400 METABOLITES AND PATIENTS WITH SYNCOPE

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Medical School Of Shihezi University, Pediatrics, Shihezi-China [1] The First Affiliated Hospital Of Shihezi University, Pediatrics, Shihezi-China [2]

Background / Hypothesis:
Syncope, a transient loss of consciousness due to cerebral hypoperfusion, involves neural reflexes, cardiovascular dysfunction, or metabolic disturbances, yet 30% of cases lack clear etiology. To address confounding limitations in metabolomics, we applied bidirectional Mendelian randomization to assess causal links between 1,400 serum metabolites and syncope, prioritizing RAAS-related metabolites to uncover therapeutic targets.

Materials and Methods:
Methods: We harmonized UK Biobank and public GWAS datasets to identify genetic instruments significantly associated with 1,400 metabolites ($P<5\times10^{-8}$). Primary causal estimates were derived via inverse variance weighting (IVW), with sensitivity analyses (MR-Egger, weighted median) confirming robustness. Forward MR used FDR correction ($q<0.1$), while reverse MR applied a nominal threshold ($P<0.05$).

Results:
Bidirectional Mendelian randomization analysis identified four metabolites that were significantly negatively associated with syncope risk: Hippurate (β=-0.296, OR=0.744, P=0.029), Xanthurenate (β=-0.122, OR=0.885, P=0.034), GPC (β=-0.092, OR=0.912, P= 0.012), and xanthurenate (β=-0.122, OR=0.885, P=0.034) were negatively associated with the risk of coma. P=0.017) and 1,5-AG (β=-0.086, OR=0.917, P=0.036). In the RAAS pathway metabolites, 1-methyl-4-imidazoleacetate (OR=1.097), N-acetyltaurine (OR=1.108) and Phenylacetylglutamate (OR=1.137) significantly increased the risk of syncope. 4 - hydroxyphenylacetylglutamine and protective effect (OR = 0.750, P = 0.005). The RAAS pathway was significantly enriched (P=0.012), suggesting that it mediates syncope by regulating vascular tone and electrolyte balance. Inverse MR Analysis did not find a significant feedback effect of syncope on metabolites, which supported the unidirectional causal role of metabolites in syncope. The results were robust across multiple methods (all effect values did not cross zero, P<0.05).

Conclusions:
This first bidirectional MR study links serum metabolites to syncope causality, highlighting RAAS metabolic imbalance as pivotal—N-acetyl-taurine exacerbates risk via angiotensin signaling, while 4-hydroxyphenylacetyl-glutamine counteracts RAAS overactivation. Stress-induced metabolic shifts post-syncope suggest bidirectional interplay, warranting functional validation to advance therapeutic targeting.

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2006 - THE FONTAN PARADOX LPA STENOSIS WITH FLOW REDISTRIBUTION DESPITE ZERO GRADIENT

Iris Geschiere [1], Gregor Krings [2], Wouter Huberts [3], Frans Van De Vosse [3]
University Medical Center Utrecht, Congenital Heart Disease, Utrecht-The Netherlands [1] University Medical Center, Congenital Heart Disease, Utrecht-The Netherlands [2] Technical University Of Eindhoven, Cardiovascular Biomechanics, Eindhoven-The Netherlands [3]

Background / Hypothesis:
Due to the possibility of flow run-off, pulmonary artery stenosis gradients are known to be small. Therefore, it is difficult to assess stenosis severity using pressure gradients. In the case of low-flow situations, such as in the Fontan circulation, the pressure gradient across the stenosis becomes an even less reliable determinant of stenosis severity. This work simulated both the biventricular and the Fontan circulation via circulation models, and underscores the need for flow-based evaluation of stenosis severity, since pressure gradients alone often fail to reflect clinical significance.

Materials and Methods:
To simulate the hemodynamic effects of pulmonary artery stenosis in the Fontan circulation, a mathematical model was developed that describes the cardiovascular system. The model is a closed-loop model with the cardiac cavities represented by one-fiber models, the large vessels of interested via one-dimensional wave propagation models and the microcirculation via lumped parameter models. An unilateral pulmonary artery stenosis with 30% radius reduction was applied to both the biventricular and the Fontan circulation.

Results:
The LPA stenosis in the biventricular circulation resulted in a 3.5 mmHg pressure drop, no flow re-distribution and an increased afterload. The LPA stenosis in the Fontan circulation resulted in a near zero pressure drop, no increased afterload but a large flow redistribution of almost 18%.

Conclusions:
Despite a near zero pressure drop in the Fontan circulation, hemodynamics were significantly altered due to substantial flow redistribution putting the affected side at risk for malperfusion, and showing the importance of a flow based assessment in pulmonary artery stenosis in the Fontan circulation.

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2019 - PATIENT AND PROVIDER ASSESSMENT OF LARGE LANGUAGE MODELS IN SUMMARIZING CLINICAL CHANGES FROM CLINICAL DOCUMENTATION

Brian Han [1], Traci Barnes [1], Andrew Shin [1]
Stanford University, Pediatric Cardiology, Palo Alto-United States [1]

Background / Hypothesis:
Effective communication between patients and providers remains the cornerstone of effective clinical care within pediatric cardiology. In particular, large language models (LLMs) have had increasing everyday use by consumers and have been the subject of recent medical research. However, there have been limited studies looking into its usage within pediatric cardiology and even fewer studies assessing their accuracy and utility for both patients and providers. We hypothesize that LLMs can accurately summarize daily changes to clinical plans in a way that is easy to understand and useful for patients.

Materials and Methods:
Fifty different patient encounters of pediatric cardiology patients in the cardiac intensive care unit (CICU) between June 1 2024 and April 1 2025 were identified. From the encounters, two consecutive daily assessments and plans were extracted and deidentified. Using a standardized LLM prompt, a clinical summary of the daily changes in plan was created using the university's secure version of ChatGPT-4o mini. The summaries were then graded by two clinicians and two patient representatives and their scores were averaged.

Results:
The majority of clinical summaries were noted to score highly by clinicians in the criteria of accuracy and alignment with clinician summaries with low scores in need for revision and omission of key information. Clinicians also rated summaries high in readability and perceived helpfulness to families. Meanwhile, patient representatives rated the summaries highly in helpfulness criteria along with ease of understanding and value added during their clinical care.

Conclusions:
LLMs are capable of creating short summaries of clinical changes from existing clinical documentation that are both clinically accurate and helpful for patients and their families. This demonstrates the potential of AI tools to improve communication and care in complex congenital cardiology. Further work is needed to assess safety and usability across subspecialties and to maximize the technology's potential.

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Category: Artificial Intelligence, Technology and Personalized Medicine

2057 - DIAGNOSTIC ACCURACY OF ARTIFICIAL INTELLIGENCE POWERED ECHOCARDIOGRAPHY IN PRENATAL DETECTION OF CONGENITAL HEART DISEASE A META ANALYSIS

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Background / Hypothesis:
Congenital heart disease (CHD) is the most prevalent birth defect globally. Early prenatal screening with fetal echocardiography has the potential to lower the morbidity and mortality caused by CHD. However, the requirement for expertise in fetal cardiology and the high volume of screening cases limits the achievable detection rates. Our objective is to determine the diagnostic accuracy of artificial intelligence (AI) for automated echocardiography analysis in the prenatal detection of CHD.

Materials and Methods:
Literature searching was conducted in 6 databases, including PubMed, Scopus, ScienceDirect, EBSCOHost, ProQuest, and Cochrane. Studies using AI or deep learning algorithms to facilitate echocardiography analysis for prenatal detection of CHD were included. The Newcastle Ottawa Scale for cross-sectional studies and retrospective cohort risk of bias assessment tool were used to assess the quality of each study. Quantitative analysis using Meta-DiSc with a random effects model was performed.

Results:
We included 10 studies involving 117,089 participants. Eight studies used deep learning algorithm, with an overall sensitivity of 0.92 (95% CI 0.91 to 0.92), specificity of 0.95 (95% CI 0.94 to 0.95), positive likelihood ratio of 15.39 (95% CI 8.72 to 27.17), negative likelihood ratio of 0.08 (95% CI 0.04 to 0.15), diagnostic odds ratio of 189.34 (95% CI 85.3 to 420.27), and area under the curve (AUC) of 0.977. Furthermore, the remaining two studies that utilized machine learning and fetal intelligent navigation echocardiography also exhibited high accuracy. Meanwhile, there are still some challenges to address, such as the variability in diagnostic tools used to train these AI systems and the diversity of CHD conditions included in research studies which requires further investigation.

Conclusions:
The use of artificial intelligence in echocardiography shows promise for accurately detecting congenital heart disease (CHD), which could significantly enhance healthcare accessibility, particularly in rural

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2102 - ECG BASED CARDIAC AGE APPLIED TO PREOPERATIVE AND POSTOPERATIVE EVALUATION OF TETRALOGY OF FALLOT

Yu Cao [1], Haiyan Xu [2], Wei Wang [2], Xiangming Fan [2], Qiang Shu [2], Haomin Li [1]
Zhejiang University, Biomedical Engineering, Hangzhou-China [1] Children's Hospital, Zhejiang University School Of Medicine, Heart Center, Hangzhou-China [2]

Background / Hypothesis:
With the development of artificial intelligence technology, ECG-based cardiac age model has been successfully applied in adult cardiac populations. The cardiac age can better reflect the condition of the heart than chronological age. Therefore, this study intends to explore whether ECG cardiac age based on AI technology can be applied to pre- and postoperative assessment of tetralogy of Fallot (TOF).

Materials and Methods:
A pediatric cardiac age model was trained and tested using 58,672 12-lead ECGs of normal children aged 0-7 years. The model integrated a deep residual network and a branch enhancing features via recursive feature elimination. The evaluation study included 570 ECG examinations from 176 preoperative and postoperative TOF repair procedures. Pre- and postoperative cardiac age characteristics of TOF children were analyzed and compared with those of children with postoperative complications (66 cases) to identify statistical differences.

Results:
For normal children, the model's mean absolute error (MAE) was 7.88±6.66 months with an R2 of 0.821. In TOF patients, preoperative MAE was 11.81±9.38 months, and 80.7% had cardiac age younger than chronological age. Postoperatively, MAE increased to 16.51±12.45 months in the complication group but decreased to 9.96±7.94 months in the non-complication group. There was a statistically significant difference in postoperative cardiac age ($p=0.001$) as well as in cardiac age and true age deviation ($p=0.013$) in patients with/without postoperative complications.

Conclusions:
Compared with healthy children, the preoperative cardiac age reflected the deficiencies in cardiac development of patients with TOF, whereas after TOF repair surgery, the deviation of cardiac age in patients without postoperative complications decreased, and the deviation of cardiac age in patients with postoperative complications was significantly increased. These results suggest that ECG-based cardiac age can be used to assess the preoperative cardiac status of TOF and the level of postoperative recovery.

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2111 - DEVELOPMENT OF A MACHINE LEARNING MODEL TO AID IN THE IDENTIFICATION OF STRUCTURES IN HEART SPECIMENS

Rohit Loomba [1]
Ann & Robert H. Lurie Children's Hospital/ Northwestern University, Pediatric Cardiology, Chicago-United States [1]

Background / Hypothesis:
Explanted heart specimens are examined at the time of autopsy and are retained and used for education as well. Examination of such specimens can be difficult, particularly for those who have limited experience. The aim of this study was to determine if a machine learning model could be trained to identify anatomic structures in heart specimens.

Materials and Methods:
Heart specimens with normal intracardiac anatomy retained in institutional registries were imaged. Additional publicly available images of structurally normal hearts were also sourced using electronic image search. A total of 17 structures of interested were predefined and annotated in the collected images. A lightweight convolutional neural network-based object detector was implemented using PyTorch as a simplified variant of the more popular YOLO variant. Training was performed over 150 epochs. Model performance was evaluated on a validation set using standard object detection methods. Mean average precision was computed at an IoU threshold of 0.5 across all annotated structures.

Results:
A total of 943 images were utilized in training with an 80%-20% split between training and validation sets. Mean average precision for the model was 65.9%. Precision (the percent an inference was accurate if a structure was labeled by the model) was 73.3%. Recall (the percent of time a structure was identified as being present if in the image by the model) was 62.7%. This represented good model performance.

Conclusions:
A machine learning model can be trained to ingest images of hearts and identify cardiac structures with good performance. Images can be ingested by using images or acquired using a smartphone camera.

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2170 - VARIANCE IN TRAINING DATA CREATION IN AN ARRHYTHMIA MACHINE LEARNING MODEL WHO IS QUALIFIED

Michael Kim [1], Azadeh Assadi [2], Raj Lalli [3], Daniel Ehrmann [4], Will Dixon [1], Spencer Vecile [1], Robert Greer [1], Mjaye Mazwi [5], Sebastian Goodfellow [6], Anica Bulic [3]
Sickkids, Critical Care, Cincinnati-United States [1] Sickkids, Cardiac Critical Care, Toronto-Canada [2] Sickkids, Cardiology, Toronto-Canada [3] University Of Michigan, Cardiac Critical Care, Ann Arbor-United States [4] Seattle Children's, Cardiac Critical Care, Seattle-United States [5] University Of Toronto, Civil And Mineral Engineering, Toronto-Canada [6]

Background / Hypothesis:
Early identification of arrhythmias in the ICU is important in preventing ICU morbidity and mortality. Timely arrhythmia detection rests on bedside providers' telemetry interpretation. Machine learning (ML) models can function as clinical support tools to facilitate timely, accurate rhythm diagnoses. ML model development requires well-curated training data. The differential performance between labelers of different roles and experience is currently unknown.

We hypothesize excellent agreement for clinicians formally trained in cardiology (κ >0.8) and moderate for other subspecialties and/or less experienced (κ >0.6).

Materials and Methods:
This was a prospective observational study with trainees, nurse practitioners, and faculty across subspecialties. Participants were given 300 10-second lead II telemetry tracings including sinus rhythm, 2nd/3rd degree atrioventricular (AV) block, junctional ectopic tachycardia (JET), ectopic atrial tachycardia (EAT), and supraventricular tachycardia (SVT). Participant demographic information was collected via survey. Interrater and intrarater reliability were calculated.

Results:
7 participants completed the study: 1 Cardiology fellow, 2 Anesthesia staff, 1 PICU fellow, 1 CCCU fellow, and 2 CCCU NPs. Individuals with cardiology training and more experience demonstrated higher levels of agreement (κ 0.53-0.59 vs. κ 0.37-0.49). The overall level of agreement was fair (highest κ 0.59, p <0.001). There was excellent intrarater reliability (κ >0.7, p<0.001). There was a notable differential in agreement based on rhythm type: sinus and AV block were excellent (κ >0.8) compared to others (Junctional: κ <0.54; EAT: <0.46; SVT: <0.62).

Conclusions:
Experienced, cardiology-trained individuals performed better at labeling rhythms. However, the overall performance of non-trained labelers were inadequate in labeling complex rhythms such as JET, EAT, and SVT. Understanding the level of agreement amongst labelers may be important when curating consistent training data for an ML model. Future efforts should focus on consideration of formal training for labelers and collaboration with an electrophysiologist.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

2216 - SEQUENTIAL TWO STAGE SEGMENTATION PIPELINE FOR CARDIAC VASCULAR SEGMENTATION IN CONGENITAL HEART DISEASE

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Amrita Vishwa Vidyapeetham, School Of Computing, Kollam-India [1] Amrita Vishwa Vidyapeetham, Amrita Center For Cybersecurity Systems & Networks, Kollam-India [2] Amrita Institute Of Medical Sciences, Department Of Pediatric Cardiology, Kochi-India [3]

Background / Hypothesis:
Cardiac image segmentation for congenital heart disease (CHD) remains a major challenge due to significant anatomical variability and noisy imaging data. Accurate delineation of cardiac structures is essential for diagnosis and surgical planning. In traditional systems, segmentation models process full-resolution DICOM volumes directly, often resulting in poor boundary detection and class confusion. We hypothesize that a modular, two-stage approach focusing first on anatomical localization can improve segmentation performance and clarity.

Materials and Methods:
We propose a sequential segmentation pipeline trained on multi-clinical datasets. The pipeline consists of two stages. The first model is a blood pool segmentation network (VNet) to localize the cardiac region, which is then padded and used to crop the input DICOM, discarding irrelevant anatomy. The second model, also a VNet, performs class-wise segmentation to identify seven anatomical structures: background, left/right ventricles, left/right atria, pulmonary artery, and aorta. Multiple architectures including 3D UNet, AttentionUNet, and VNet were tested.

Results:
The blood pool segmentation VNet achieved a Dice score of 0.83. The class-wise segmentation VNet achieved a Dice score of 0.68 across all classes. Multiple architectures and preprocessing strategies were explored to identify optimal configurations. By systematically separating localization from anatomical segmentation, the pipeline showed robust performance across diverse clinical data. This modularity offers resilience to anatomical complexity and inter-institutional variability.

Conclusions:
This two-stage segmentation pipeline enhances accuracy and anatomical clarity in CHD cases. It addresses key limitations of monolithic segmentation models and presents a scalable solution for reliable, automated cardiac analysis across varied clinical environments.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

2309 - UNVEILING THE HEART'S HIDDEN DEFECT A META ANALYSIS ON THE DIAGNOSTIC ACCURACY OF DEEP LEARNING BASED ECG FOR ATRIAL SEPTAL DEFECT

Nathaniel Gilbert Dyson [1], Leroy Leon Leopold Lasanudin [1], Shafira Aurelia [1], Rizal Khoirul Huda [1], Elza Nur Warsa Putra [1], Jesiana Rayvita Utami [1]
Universitas Indonesia, Faculty Of Medicine, Central Jakarta-Indonesia [1]

Background / Hypothesis:
Atrial septal defect (ASD) is often underdiagnosed due to subtle clinical signs and the limited diagnostic accuracy of general practitioners. Although an electrocardiogram (ECG) may show suggestive patterns, conventional interpretation frequently misses ASD. Delayed diagnosis increases the risk of adverse outcomes despite effective treatments. Recent advances in artificial intelligence, particularly deep learning models, offer improved ECG interpretation. This meta-analysis assesses the diagnostic accuracy of deep learning-based ECG analysis for ASD detection, highlighting its potential as a non-invasive, accessible screening tool in clinical practice.

Materials and Methods:
A comprehensive literature search was conducted across seven databases, including PubMed, Scopus, and others. Studies using AI or deep learning models to analyze ECG data for ASD detection were considered. The quality of the included studies was assessed using the Newcastle-Ottawa Scale for cross-sectional studies and a risk of bias tool for retrospective cohorts. Quantitative synthesis was performed using Meta-DiSc software with a random-effects model, which accounts for heterogeneity among studies.

Results:
A total of 167 studies were screened for eligibility, and 4 studies met the inclusion criteria. All selected studies applied deep learning models to ECG data for ASD detection. The AI models demonstrated promising diagnostic performance in distinguishing between normal and ASD cases. Meta-analysis of these four studies revealed a pooled sensitivity of 0.84 (95% CI: 0.83–0.86), specificity of 0.77 (95% CI: 0.77–0.77), and an area under the curve (AUC) of 0.8697 using a random-effects model.

Conclusions:
Despite limitations, deep learning-based ECG analysis shows promising potential for ASD detection. However, prospective studies with larger and more diverse datasets are needed to validate AI models further and compare their performance with conventional diagnostic methods before full clinical implementation.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

2315 - REVOLUTIONIZING ATRIAL SEPTAL DEFECT DETECTION THE POWER OF ARTIFICIAL INTELLIGENCE IN ECHOCARDIOGRAPHY – A META ANALYSIS

Nathaniel Gilbert Dyson [1], Leroy Leon Leopold Lasanudin [1], Shafira Aurelia [1], Rizal Khoirul Huda [1], Elza Nur Warsa Putra [1], Jesiana Rayvita Utami [1]
Universitas Indonesia, Faculty Of Medicine, Central Jakarta-Indonesia [1]

Background / Hypothesis:
Atrial septal defect (ASD) is a leading cause of congenital heart disease (CHD) that contributes significantly to morbidity and long-term health complications. Early detection is crucial to prevent adverse cardiovascular outcomes, but the subtle symptoms often lead to underdiagnosis, particularly in areas with limited access to skilled medical professionals. While echocardiography is a key tool in ASD diagnosis, its interpretation can be challenging and prone to delay. Artificial intelligence (AI) offers a transformative solution, enhancing the diagnostic accuracy of echocardiography and providing a non-invasive, efficient screening tool to improve global healthcare outcomes, particularly in underserved regions.

Materials and Methods:
A comprehensive literature search was conducted across seven major databases, including PubMed and Scopus, to identify studies that applied AI models for analyzing echocardiography data in ASD detection. The quality of the included studies was assessed using the Newcastle-Ottawa Scale for cross-sectional studies and a risk of bias tool for retrospective cohorts. Meta-analysis was performed using Meta-DiSc software with a random-effects model to account for heterogeneity.

Results:
From 215 studies screened, 3 studies met the inclusion criteria. All selected studies applied AI models to echocardiography data for ASD detection. The AI models demonstrated strong diagnostic performance, effectively distinguishing between normal and ASD cases. The meta-analysis showed a pooled sensitivity of 0.89 (95% CI: 0.85–0.92), specificity of 0.90 (95% CI: 0.87–0.92), and an area under the curve (AUC) of 0.9215 using a random-effects model.

Conclusions:
Although there are limitations to be addressed before AI-based echocardiography can be fully implemented in clinical practice, the promising results for ASD detection demonstrate its potential. However, further prospective studies with larger, more diverse datasets are needed to validate AI models and compare their performance with traditional diagnostic methods.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

2323 - ENHANCING ATRIAL SEPTAL DEFECT DETECTION THE ROLE OF ARTIFICIAL INTELLIGENCE IN CHEST RADIOGRAPH ANALYSIS – A META ANALYSIS

Nathaniel Gilbert Dyson [1], Leroy Leon Leopold Lasanudin [1], Shafira Aurelia [1], Rizal Khoirul Huda [1], Elza Nur Warsa Putra [1], Jesiana Rayvita Utami [1]
Universitas Indonesia, Faculty Of Medicine, Central Jakarta-Indonesia [1]

Background / Hypothesis:
Atrial septal defect (ASD) is frequently missed due to its mild symptoms and the difficulty general practitioners face in making an accurate diagnosis. Chest radiographs are commonly used as an initial diagnostic tool for cardiovascular conditions, but their interpretation can be challenging, often resulting in delayed diagnoses, especially in resource-constrained settings. Recent advancements in artificial intelligence (AI) present a promising solution, improving the accuracy of chest radiograph analysis. This meta-analysis examines the diagnostic capabilities of AI-powered chest radiograph analysis for detecting ASD, highlighting its potential as a non-invasive, efficient, and widely accessible diagnostic tool.

Materials and Methods:
A thorough literature review was carried out across seven databases to identify studies that utilized AI models for analyzing chest radiographs in the detection of ASD. The quality of the selected studies was evaluated using the Newcastle-Ottawa Scale for cross-sectional studies and a risk of bias assessment tool for retrospective cohorts. Meta-analysis was performed using Meta-DiSc software with a random-effects model to address study heterogeneity.

Results:
From 353 studies screened, 3 studies met the inclusion criteria. All selected studies applied AI models to chest radiograph data for ASD detection. The AI models demonstrated excellent diagnostic performance, effectively distinguishing between normal and ASD cases. The meta-analysis revealed a pooled sensitivity of 0.86 (95% CI: 0.86–0.87), specificity of 0.85 (95% CI: 0.85–0.86), and an area under the curve (AUC) of 0.9372 using a random-effects model.

Conclusions:
Despite limitations, AI-based chest radiograph analysis shows promising potential for ASD detection. While these results highlight AI's ability to enhance diagnostic accuracy, further prospective studies with larger, more diverse datasets are needed to validate these models and compare their performance with traditional diagnostic methods before widespread clinical implementation.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

2337 - INVESTIGATING ACCURACY OF DENSENET 121 ALGORYTHM IN THE DIAGNOSIS OF HEART AND LUNG DISEASE

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Azad University, Payambar Azam Hospital, Kerman-Iran [1] Tehran University, Hakim Hospital, Tehran-Iran [2]

Background / Hypothesis:
Early and accurate diagnosis of heart diseases and pulmonary conditions in children is of utmost importance. In recent years, the use of deep learning algorithms in medical image analysis has gained significant attention. This study aimed to evaluate the accuracy of a deep learning algorithm in diagnosing congenital heart diseases and pulmonary conditions through chest X-rays of children.

Materials and Methods:
In this study, 139 chest X-ray images of children referred to Payambar Azam Hospital in Kerman- Iran were analyzed. Of these, 9 images were excluded due to poor quality. The Dense Net architecture was used for image analysis. Accuracy, sensitivity, specificity, positive predictive value, negative predictive value, and F1 score were calculated for each diagnosis. The GRAD-CAM technique was also used to examine the areas of focus for the model

Results:
The model's performance varied for different diagnoses. The highest accuracy was observed for nodule detection (98.46%) and the lowest for pneumonia diagnosis (49.23%). The model's sensitivity ranged from 15.38% for emphysema to 95.65% for pneumonia. Specificity ranged from 23.81% for pneumonia to 99.21% for nodules. Significant correlations were observed between some diagnoses. A positive correlation was found between infiltration and pneumonia ($r = 0.386$, $p < 0.001$) and between infiltration and consolidation ($r = 0.366$, $p < 0.001$)

Conclusions:
This study demonstrated that the deep learning algorithm can diagnose some cardiac and pulmonary diseases in children's chest X-rays with acceptable accuracy, but performance improvement is needed for some diagnoses. These findings can be used in the development of diagnostic support systems for radiologists. However, further research with larger sample sizes, wider age ranges, standardized imaging protocols, and more complex models is needed to achieve a reliable diagnostic system for clinical settings

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

2360 - EVALUATION OF CARDIOPROTECTIVE EFFECT NATURAL PRODUCT WITH SPECIAL REFERENCE TO ANTIINFLAMAOTRY AND ANTIOXIDANT ACTIVITY

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Background / Hypothesis:

The purpose of this study was to look at the use of natural products for cardioprotection. In light of the importance of herbal medicine, the phytochemistry and cardioprotective effects of various plants and its subsequent fractions will be investigated for their potential cardioprotective effects. Myocardial infarction (MI) in mice will be induced by administering isoproterenol hydrochloride (ISO). Important markers of myocardial injury, like alanine amino transferase (ALT), creatine phosphokinase (CPK), aspartate amino transferase (AST), and lactate dehydrogenase (LDH), leak out of the injured heart cells during MI.
Antioxidant (in vitro and in vivo), antihyperlipidemic (in vitro and in vivo), calcium channel blocking, membrane stabilization, calcium-channel blocking, DNA ladder, and thrombolytic assays will be among the tests performed on the fractions. Hyperlipidemia is a medical condition that is distinguished by heightened levels of triglycerides, low-density lipoprotein cholesterol, and total cholesterol. These high levels have the potential to augment the likelihood of atherosclerotic plaque development, which in turn may lead to myocardial infarction (MI). The samples will be analyzed for their activity against pancreatic lipase, HMG-CoA reductase, and cholesterol esterase in order to determine the potential antihyperlipidemic mechanism. According to a review of the relevant research, MI causes DNA damage in cardiac myocytes. Therefore, DNA fragmentation test will also be performed on the plant samples. This study's findings will lend credence to claims that various plants and its isolated compounds have cardioprotective potential by means of various mechanisms, including antioxidant activity, anti-hyperlipidemia, thrombolytic activity, membrane stabilization, a DNA-protective effect, and calcium channel blocking, all of which are of benefit to the human beings.

Materials and Methods:
Acute toxicity study
An acute toxicity research will be conducted by administering the methanolic extract of certain plants orally to healthy BALB/c mice at different dosages.

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2390 - CARDIAC SEPTAL DEFECT DETECTION MODEL ON ECHOCARDIOGRAM USING ARTIFICIAL INTELLIGENCE AND ITS VALIDITY AGAINST CHANGES IN NT PROBNP BIOMARKERS AND CLINICAL CONDITIONS

Ria Nova [1], Siti Nurmaini [2], Bermansyah - [3]
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Background:
Cardiac septal defects are common but often detected too late. Echocardiogram is the gold standard for detection, but it is limited and there are inaccuracies in interpretation when performed by personnel other than a pediatric cardiologist. It is necessary to automatically predict cardiac septal defects on an echocardiogram using an accurate artificial intelligence (AI) approach to support medical interpretation. This study aims to develop an AI model for detecting cardiac septal defects on echocardiogram, validated by the NT-proBNP biomarker and clinical conditions of heart failure, pulmonary hypertension, and malnutrition.

Methods:
The research data were collected from Moh Hoesin Hospital between January 2021 and January 2022. AI model developed using the Convolutional Neural Networks technique with DenseNet and ResNet architectures. The architecture was trained and validated using a 2-dimensional heart image frame echocardiogram of cardiac septal defects and a normal heart.

Results:
The proposed DenseNet AI model was the best for detecting cardiac septal defects on echocardiograms, with accuracies of 96%, a sensitivity of 95%, a specificity of 97%, a positive predictive value of 93%, and a negative predictive value of 97%, respectively. Detection performance was not affected by NT-proBNP biomarker levels and clinical conditions. The proposed DenseNet AI model performed well on other datasets, with accuracies of 83%, sensitivities of 85%, specificities of 80%, positive predictive values of 81%, and negative predictive values of 85%.

Conclusions:
The proposed DenseNet AI model successfully detects cardiac septal defects with good performance and is validated with NT-proBNP biomarkers and clinical conditions. This model is a first-stage prototype that can be further developed into software applications for detecting cardiac septal defects on echocardiograms, making it applicable to the community in the future.

POSTER PRESENTATIONS

Category: Artificial Intelligence, Technology and Personalized Medicine

2431 - REMOTE PATIENT MONITORING OF PEDIATRIC HEART FAILURE PATIENTS WITH CONSUMER WEARABLE DEVICES A SINGLE CENTER PILOT EXPERIENCE

Brian Han [1], Isha Thapa [2], Atharva Gundawar [3], Ameya Shahu [4], Andrew Shin [1], David Scheinker [2], Ransalu Senanayake [4]
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Background / Hypothesis:
There has been increasing use of remote patient monitoring (RPM) in the outpatient setting. Consumer wearable devices are a popular option for RPM due to their low barrier to entry. However, there has been limited experience utilizing these wearables in the pediatric cardiology population. We describe our single-center pilot experience in remotely monitoring pediatric heart failure patients using a consumer wearable device.

Materials and Methods:
Pediatric cardiology patients followed by the heart failure and transplantation team and admitted to inpatient units between the ages of 10 and 18 were eligible for recruitment. Patients were enrolled either in the cardiac intensive care unit or on the acute care floor. Consented inpatients were enrolled onto the study platform and provided with a Fitbit Charge 6 to wear for four weeks following discharge. After discharge, patients received a heart failure symptom survey at two and four weeks, as well as a Technology Acceptance Model (TAM) survey at four weeks. Patients received a $25 USD gift card upon completion of all three surveys and were allowed to keep the Fitbit at the end of the study.

Results:
In five months, ten patients were enrolled into the study and physiologic and activity data was successfully obtained during the study period, including heart rate trends and activity levels. Seven of the ten patients completed all three surveys, including the TAM survey, which demonstrated positive levels of perceived usefulness and ease of use.

Conclusions:
Our single institution experience demonstrates technical feasibility in using wearables to monitor pediatric cardiac patients in the outpatient setting. Surveys demonstrated that patients had favorable perceptions of the technology. This helps lay the foundation on which wearable technology can be used clinically in pediatric cardiac patients.

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Category: Artificial Intelligence, Technology and Personalized Medicine

2459 - ARTIFICIAL INTELLIGENCE BASED PREDICTION OF PAROXYSMAL SUPRAVENTRICULAR TACHYCARDIA IN CHILDREN AND ADOLESCENTS USING 24 HOUR HOLTER RECORDINGS DURING SINUS RHYTHM

Seayoung Goo [1], Gyun-ho Roh [2], Donghyeon Seo [2], Sa-yoon Park [3], Kwangsoo Kim [4], Mi Kyoung Song [5], *Seung Min Baek* [1]
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Background / Hypothesis:
Paroxysmal supraventricular tachycardia (PSVT) is often difficult to diagnose using standard electrocardiograms (ECG) or 24-hour Holter monitoring alone due to its intermittent nature. In this study, we conducted an artificial intelligence (AI) analysis of Holter data recorded during sinus rhythm to predict the presence of PSVT in children and adolescents, even in the absence of overt arrhythmic episodes.

Materials and Methods:
We analyzed Holter recordings from patients aged 1–18 years collected at a single center (2008-2024). The PSVT group included cases with EPS-confirmed AVRT/AVNRT, or documented PSVT ECG. Patients with structural heart disease, inherited arrhythmia syndromes, or WPW syndrome were excluded.
Mean PR interval, QRS duration, and QT interval were measured using the NeuroKit2 Python library, and their hourly variations were analyzed. Recordings were divided into 10-second segments, excluding those with >3 consecutive PACs. An attention-based multiple instance learning (MIL) model with a CNN encoder and attention pooling was used for classification. Model performance was tested under varying input configurations, and metadata including demographic and Holter summary data were integrated into a multimodal MIL architecture.

Results
QRS duration and QT intervals were longer in the PSVT group, particularly during daytime. QRS duration showed statistically significant prolongation in multiple time periods, most notably between 09:00 and 21:00 ($P < 0.05$). QTc intervals was consistently longer in the PSVT group especially from 10:00 to 22:00 ($P < 0.05$), while PR and RR intervals showed minimal differences.
Training on daytime segments improved performance compared to nighttime segments (AUROC 0.8762 vs. 0.8145), and using the full 24-hour data yielded the best results (AUROC/AUPRC = 0.8807/0.8689). Adding metadata further improved performance (AUROC/AUPRC from 0.8653/0.8486 to 0.8807/0.8689).

Conclusion
AI analysis of sinus rhythm Holter data can predict PSVT in pediatric patients with high accuracy. Incorporating PAC-focused, daytime-weighted input and clinical metadata further enhances model performance.

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Category: Artificial Intelligence, Technology and Personalized Medicine

2478 - UTILIZING A NOVEL MACHINE LEARNING(ML) ENABLED APPROACH TO PREDICT SURVIVAL AFTER INTRA HOSPITAL CARDIAC ARREST(IHCA)IN CHILDREN UNDERGOING SURGERY FOR CONGENITAL HEART DISEASE(CHD) AN AFFORDABLE ACCESSIBLE 'PRAYASH'(PREDICTING RECOVERY POST ARREST IN YOUNG CHILDREN AFTER SURGERY FOR HEART)' FROM SOUTHERN INDIA

Riyan Shetty [1], Suddhasatta Ghosh [1], Ganesh Sambandamoorthy [1], Balasubramanyam S [1], Rajesh Hegde [1]
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Background / Hypothesis:
In-hospital cardiac arrests (IHCA)represent one of the most devastating consequential events in children undergoing surgery for congenital heart disease(CHD). We aimed to develop a novel machine-learning(ML) model for prediction of survival-to-hospital-discharge in children suffering ihca post-chd surgery.

Materials and Methods:
Single-centre, retrospective study performed in children (< 18 yrs) who sustained ihca following chd surgery(january 2021-december 2023). Primary outcome was survival-to-hospital-discharge subsequent to sustained rosc. An extreme gradient boosting (xgboost) ml-model(prayash) was constructed based on easily accessible variables obtained during picu admission post-surgery. The dataset was split into training(80%) and test(20%)for model training and validation respectively. A stepwise selection algorithm was run to select the most appropriate features, which then underwent k-fold cross-validation (k = 5)and incorporated into the final model. The predictive accuracy of our ml-model was compared to five contemporary ml-models (logistic regression, random forest, support vector, k-nearest neighbour, naïve bayes)using roc-statistics. Shap analysis was conducted to determine the key predictors influencing prayash

Results:
348 children, suffering ihca following chd surgery, were included in the study and divided into training(n=278)and test sets(n=70) . Ihca's occurred in 2.4% children, of which 79% survived-to-hospital-discharge. 'prayash' showed auroc of 0.894 (95% ci : 0.852-0.931),90% sensitivity and 97% specificity in the training set and similar results in test set and sustained accuracy on fivefold cross-validation[auroc 0.91 (95% ci 0.812-0.996), sensitivity 78.20%, specificity of 96.8%]. Compared to other ml-algorithms , prayash had the best accuracy($p<0.001$)in predicting survival-to-hospital-discharge after ihca. Shap analysis in our innovative model identified vis-score, first pulseless-rhythm, pre-arrest lactate and time to rosc as the most important features influencing survival post-ihca and contributing to the model's accuracy.

Conclusions:
Incorporating readily accessible picu variables , prayash provides a novel, real-time ml-model for early prognostication of children suffering ihca-post cardiac surgery.

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Category: Artificial Intelligence, Technology and Personalized Medicine

2492 - EARLY IDENTIFICATION OF HIGH RISK TETRALOGY OF FALLOT PATIENTS USING QRS DURATION DYNAMICS

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Universitat Pompeu Fabra, School Of Engineering, Barcelona-Spain [1] Waterloo University, , Waterloo-Canada [2] University Of Toronto & The Hospital For Sick Children (sickkids), Labatt Family Heart Centre, Toronto-Canada [3]

Background / Hypothesis:
Advances in Tetralogy of Fallot (ToF) surgery have improved survival and quality of life, but residual lesions can impair right ventricular function and increase the risk of late complications. As surgery represents a key milestone, mapping clinical pathways can guide anticipatory, personalized care. Given the association between prolonged QRS duration (QRSd) and adverse outcomes, and the limited use of its temporal evolution, we hypothesize that QRSd trends can identify high-risk ToF patients at early ages, enabling earlier intervention and lifelong management.

Materials and Methods:
We retrospectively analyzed 95 children with Tetralogy of Fallot from SickKids Hospital (Toronto) with biennial clinical and ECG data from birth to age 18, retaining 52 patients with complete trajectories or one forward-filled missing value. A bimodal QRSd z-score distribution enabled classification into two trajectory clusters using KMeans time-series clustering (tslearn) on full QRSd trajectories from a 70–30% training–testing set. One cluster showed minimal post-surgical change and narrower QRS, while the other demonstrated a rapid early increase with persistently broader QRS. Trajectory separability by age 2 was assessed using the optimal 0–2 y.o. QRSd slope threshold derived from ROC analysis (Youden J index).

Results:
The two identified patient clusters had mean QRSd z-scores of 1.21 ± 1.00 and 4.74 ± 1.23. The higher QRSd cluster showed greater mechanical dispersion ($p = 0.027$), reduced RVEF and LVEF (both $p < 0.001$), higher prevalence of septal flash ($p = 0.0195$) and QRS fractionation ($p = 0.0112$), as well as lower peak and predicted VO_2 ($p < 0.001$). A QRSd increase rate of 1.98 z-scores/year from 0 to 2 y.o. optimally discriminated the clusters in the test cohort with 100% sensitivity, 87.5% specificity, 94.4% accuracy, and AUC = 0.988.

Conclusions:
Early QRSd trajectories with a 0–2 y.o. slope ≥1.98 z-scores/year may help distinguish ToF phenotypes differing in ventricular function, conduction, and exercise capacity.

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Category: Artificial Intelligence, Technology and Personalized Medicine

2525 - DIAGNOSTIC ACCURACY OF AI ASSISTED AUSCULTATION AND ECG FOR CONGENITAL HEART DISEASE DETECTION IN PEDIATRIC POPULATIONS A SYSTEMATIC REVIEW AND META ANALYSIS

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Background / Hypothesis:
Congenital heart disease (CHD) is a leading cause of morbidity and mortality in children worldwide. Considering the limited access to echocardiography in many areas, developing effective and easily implementable screening methods like Artificial intelligence (AI)-assisted auscultation and electrocardiography (ECG) may provide a practical screening alternative in primary care. This study aims to evaluate the diagnostic accuracy of AI-assisted auscultation and/or ECG for CHD detection in pediatric populations.

Materials and Methods:
A systematic review and meta-analysis following PRISMA guidelines evaluated the sensitivity and specificity of AI-assisted auscultation and ECG for detecting CHD compared to echocardiography. Searches were conducted in PubMed, ScienceDirect, EuropePMC, and Cochrane Library. The inclusion criteria were original English articles and full-text articles conducted on CHD in pediatrics. Methodological quality was assessed using the Quality Assessment of Diagnostic Accuracy Studies-2 (QUADAS-2) framework, and the results were visualized using the ROBVIS tool. Pooled estimates were calculated using a random intercept logistic regression model. Heterogeneity was quantified using the I^2 statistic.

Results:
A total of 426 articles were obtained, but only ten articles were eligible for the inclusion criteria. The analysis included 9,534 participants for sensitivity estimation and 4,719 for specificity. Pooled sensitivity was 90.1% (95% CI: 84.3%–93.9%; I^2 = 97.4%), and pooled specificity was 92.2% (95% CI: 87.0%–95.4%; I^2 = 94.8%). The pooled DOR was 104.10 (95% CI: 44.27–244.81; I^2 = 97.1%). The SROC curve yielded an AUC of 0.959, with a partial AUC of 0.917, indicating excellent discriminative ability across algorithms and settings.

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Conclusions:
AI-assisted auscultation and ECG demonstrate high diagnostic accuracy for CHD detection in children, supporting their potential as accessible screening tools in resource-limited settings. Further multicenter prospective studies are needed to confirm effectiveness and guide implementation.

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Category: Artificial Intelligence, Technology and Personalized Medicine

2618 - ARTIFICIAL INTELLIGENCE–AUGMENTED SURGICAL PLANNING IN TOTAL ANOMALOUS PULMONARY VENOUS CONNECTION A PILOT STUDY

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Shanghai Children's Medical, Heart Center, Shanghai-China [1] Shanghai Children's Medical Center, Heart Center, Shanghai-China [2]

Background / Hypothesis:
Pulmonary vein stenosis (PVS) continues to be a major complication after surgical repair of total anomalous pulmonary venous connection (TAPVC). Precise understanding of preoperative pulmonary venous morphology is crucial for surgical planning and could lower the incidence of post-repair PVS. This study sought to investigate whether artificial intelligence (AI)–augmented planning could improve the early outcomes after TAPVC repair.

Materials and Methods:
This pilot study prospectively enrolled patients (< 18 years of age) undergoing TAPVC repair between July 2024 and May 2025. Patients who had AI-augmented surgical planning preoperatively were compared to those not having AI-augmented preoperative planning. Preoperative AI-augmented planning included (1) 3-dimensional morphological assessment of pulmonary vein (PV) and left atrium (LA) based on the attention-augmented encoder-decoder network and (2) individual risk prediction of post-repair PVS. The primary outcomes were in-hospital mortality and postoperative PVS. Secondary outcomes included cardiopulmonary bypass (CPB) time, aortic cross-clamping time, and surgeon satisfaction score.

Results:
A total of 63 patients were included. Thirty-eight patients received AI-assisted preoperative evaluation, while 25 patients were served as non-AI observational controls. The system significantly improved the in-hospital mortality and postoperative PVS rate (0% vs. 16.0%, P = 0.021; 2.6% vs. 32.0%, P = 0.002). Improvements in secondary endpoints were also observed, with reduced CPB time (71±28 vs. 102±45 min, P < 0.001), shorter aortic cross-clamp time (38±20 vs. 56±31 min, P < 0.001), and higher surgeon satisfaction score (96±5 vs. 72±11, P < 0.001).

Conclusions:
AI-assisted preoperative planning system was associated with improved short-term outcomes after TAPVC surgery. This study provides evidence supporting the clinical value of AI-enabled decision support in complex congenital cardiac surgery.

POSTER PRESENTATIONS

Category: Basic Science

1041 - TDCIPP INDUCED ENDOTHELIAL TO MESENCHYMAL TRANSITION AND METABOLIC REPROGRAMMING LEAD TO CARDIOVASCULAR TOXICITY

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Guangdong Cardiovascular Institute, Cardiovascular, Guangzhou-China [1]

Background / Hypothesis:
Cardiovascular diseases (CVDs) are the leading cause of mortality and a major contributor to global morbidity, with a significant association with the ubiquitous presence of organic pollutants such as tris(1,3-dichloro-2-propyl) phosphate (TDCIPP). TDCIPP, widely used in consumer products, is suspected to exhibit cardiovascular toxicity, highlighting potential health risks to human populations.

Materials and Methods:
Human umbilical vein endothelial cells (HUVECs) and zebrafish models were exposed to TDCIPP to assess EndMT and metabolic changes. Cell proliferation, gene expression, protein levels, and metabolomic profiles were analyzed.

Results:
TDCIPP induced EndMT in HUVECs and zebrafish, leading to lipid metabolism abnormalities and vascular development disruptions. Metabolomic analysis revealed significant perturbations in lipid metabolism pathways, consistent with EndMT-induced metabolic reprogramming.

Conclusions:
TDCIPP exposure triggers EndMT and disrupts lipid metabolism, potentially contributing to cardiovascular toxicity. These findings underscore the need for stricter regulations on TDCIPP and highlight the importance of further research into its metabolic impact.

POSTER PRESENTATIONS

Category: Basic Science

1042 - GUT MICROBIOTA IMPACTS CARDIAC METABOLISM AND OXIDATIVE STRESS IN POSTNATAL MOUSE HEARTS

Ruyue Zhang [1], Jiazichao Tu [1], Zirui Huang [1], Xiang Liu [1], Jimei Chen [1]
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Background / Hypothesis:
The heart's early differentiation during embryogenesis is crucial for embryonic survival and development. The gut microbiota plays a significant role in modulating the host's physiological state and disease predisposition, including cardiovascular health.

Materials and Methods:
We utilized 4D-label-free quantitative proteomics to assess cardiac tissues from one-day-old (P1), seven-day-old (P7), and germ-free (GF) mice at P7. Proteomic analysis was complemented by immunofluorescence validation to explore differential protein expression associated with cardiac development and function.

Results:
Our analysis revealed significant differences in protein expression profiles between GF and specific pathogen-free (SPF) mice, particularly at P7. Gene Ontology (GO) and KEGG pathway analyses highlighted the gut microbiota's influence on biological processes, molecular functions, and cellular components, with enrichment in pathways related to glycometabolism, lipid metabolism, and mitochondrial oxidative stress. Immunofluorescence assays confirmed changes in myocardial proteins such as TOMM20, COX4, Gys1, PHKG1, and MGST2, suggesting the gut microbiota's role in modulating cardiac energy metabolism and oxidative stress.

Conclusions:
The gut microbiota plays a pivotal role in shaping cardiac metabolic phenotypes and development through its interactions with glucose metabolism, lipid metabolism, and mitochondrial proteins. Our findings provide novel insights into the gut-heart axis and its potential as a therapeutic target for cardiovascular health.

POSTER PRESENTATIONS

Category: Basic Science

1064 - HIGH SUTURE RETENTION AND NITRIC OXIDE (NO) GENERATING SILK FIBROIN BASED ON ARTIFICIAL BLOOD VESSEL

Se Yong Jung [1], Moonhyun Choi [2], Woojin Choi [2], Jinkee Hong [2], Yu Rim Shin [3]
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Background / Hypothesis:

Materials and Methods:

Results:
Cardiovascular disease (CVD) is a group of diseases related to the heart and vasculature, including coronary, cerebral, and peripheral artery disease, and is the major cause of death worldwide. Vascular grafts are one of the main materials used in cardiovascular surgical treatment. Autologous grafts or xenografts are limited by the amount of tissue available from the patient or animal donors, which can be challenging to source and must meet specific criteria. Herein, we have developed silk fibroin (SF)-based artificial blood vessels with a biologically functional polyurethane (PU) template. The template has the ability to generate nitric oxide (NO) through nitrosylation and can improve mechanical properties by regulating the secondary structure of SF. The NO effect of SF/PU suppressed platelet adhesion and smooth muscle cell (SMC) proliferation while absorbing ROS radicals and improving the growth of epithelial cells. Additionally, the suture retention force of two-layered SF/PU has been demonstrated to be higher than 3.4N. We have investigated the circulation availability of SF/PU using a blood pressure controllable system. In the circulation test, there were no leakages or failures during 2,535 minutes, with no changes in the ultimate stress of SF/PU. SF/PU materials can provide biological functions and desirable mechanical properties cost-effectively in cardiovascular surgical fields.

Conclusions:

POSTER PRESENTATIONS

Category: Basic Science

1086 - THE PRIMARY STUDY ON CELLULAR AND IMMUNOLOGICAL MECHANISMS OF IMMUNOGLOBULIN RESISTANCE IN KAWASAKI DISEASE

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Anhui Provincial Children's Hospital, Pediatric Cardiology, Hefei-China [1]

Background / Hypothesis:
Kawasaki disease (KD) is an acute febrile illness of unknown etiology affecting predominantly young children. 10-20% of KD patients are resistant to Intravenous immunoglobulin (IVIG) which the mechanism is not known. Recent studies have revealed that immune cell infiltration may play a role in IVIG resistance. This study aimed to identify the cytokine patterns in KD patients and healthy individuals and identify potential serum biomarkers for IVIG response.

Materials and Methods:
We conducted a cross-sectional cohort study, prospectively enrolling 26 pediatric patients diagnosed with KD admitted to our Hospital from January 2021 to December 2022. Among them, 5 patients were classified as IVIG-unresponsive Kawasaki disease (NR group). Twenty-one patients were classified as IVIG-responsive KD (KD group). Additionally, we selected 16 healthy controls admitted during the same period (HC group). Peripheral blood samples were analyzed using flow cytometry to determine the proportions and quantities of certain immune cells. Serological autoimmune profiles were obtained using human cytokine microarrays, and plasma samples were globally analyzed for cytokines. Differentially expressed cytokines were validated using enzyme-linked immunosorbent assay (ELISA). Statistical analysis was performed using SPSS 26.0 software, with $P<0.05$ considered statistically significant.

Results:
Flow cytometry analysis revealed significant increases in total white blood cell counts and neutrophil numbers and proportions in both the KD and NR groups ($P<0.05$). Monocyte and CD16+ monocyte numbers and proportions were significantly higher in the KD group and NR group compared to the HC group ($P<0.05$).Quantitative ELISA results showed significantly elevated levels of the cytokine IL-3 in the KD group compared to the HC group ($P<0.05$).Using cytokine array technology, levels of the cytokine IL-6 was significantly higher in the NR group compared to the KD and HC groups ($P<0.05$).

Conclusions:
Our findings contribute to understanding the peripheral immune response in KD patients, particularly those resistant to IVIG.

POSTER PRESENTATIONS

Category: Basic Science

1130 - ALTERED ARGININE METABOLISM IN CHILDREN WITH SINGLE VENTRICLE HEART DISEASE UNDERGOING STAGE 3 PALLIATION

Benjamin Frank [1], Sierra Niemiec [2], Ludmila Khailova [1], Christopher Mancuso [2], Tanner Lehmann [1], Gareth Morgan [1], Michael Dimaria [3], Carmen Sucharov [4], Jelena Klawitter [5], Jesse Davidson [1]

University Of Colorado, Pediatric Cardiology, Aurora-United States [1] University Of Colorado, Biostatistics, Aurora-United States [2] University Of Michigan, Pediatric Cardiology, Ann Arbor-United States [3] University Of Colorado, Medicine, Aurora-United States [4] University Of Colorado, Anesthesiology, Aurora-United States [5]

Background:
Children with single ventricle heart disease (SVHD) experience morbidity due to insufficient pulmonary blood flow. Prior work from our group suggested a relationship between altered arginine metabolism at Stage 2 palliation for SVHD and impaired pulmonary blood flow. No prior study evaluated circulating arginine metabolites at the Stage 3 (Fontan) operation to evaluate the relationship between metabolite concentrations and outcomes.

Materials and Methods:
Prospective cohort study of 82 SVHD cases and 49 healthy controls. We measured pre- and post-op serum concentrations of 11 members of the arginine metabolism pathway by tandem mass spectrometry. Primary post-operative outcomes were length of stay (LOS) and pleural drainage.

Results:
Pre-op cases showed lower arginine, arginosuccinate, cysteine, NMMA, higher glutathione, and lower arginine/ADMA, arginine/citrulline, and arginine/ornithine ratios compared to controls. Post-op cases experienced derangements in 9 of 11 metabolites including progressively decreasing citrulline concentration and higher arginine/ADMA, arginine/citrulline, and arginine/ornithine ratios compared to pre-op. Multiple metabolite levels were associated with prolonged LOS including 2h and 24h citrulline (31.4% and 33.9% longer LOS for 50% decrease in [citrulline], respectively), and 24h arginine/ADMA (55.6% longer LOS for 50% decrease in [arginine]/[ADMA], Table 1). Increased pleural drainage was associated with decreased 24h citrulline level (44.6% increased drainage for 50% decrease in [citrulline]), decreased arginine/ADMA ratio (74.2% increased drainage for 50% decrease in [arginine]/[ADMA]), and decreased arginine/ornithine ratio (74.5% increased drainage for 50% decrease in [arginine]/[ornithine], Table 2).

Conclusions:
Arginine metabolism is altered in children with SVHD pre- and post-Stage 3. Low post-operative citrulline, arginine/ADMA ratio, and arginine/ornithine ratio were associated with increased LOS and pleural drainage. Patients with greater morbidity may experience disproportionate conversion of arginine to ADMA and ornithine with insufficient endogenous nitric oxide (NO) generation from conversion to citrulline. Whether this phenotype can be rescued by peri-operative repletion of citrulline is an important area for future study.

POSTER PRESENTATIONS

Category: Basic Science

1154 - COMPARISON OF BLOOD PRESSURES OF TERM NEONATES OF HYPERTENSIVE AND NORMOTENSIVE MOTHERS IN YENAGOA BAYELSA STATE NIGERIA

Adaku Nwaneri [1], *Chika Duru* [2], Evi Joboy-okei [1], Wilson Sadoh [3]
Federal Medical Centre, Paediatrics, Yenagoa-Nigeria [1] Niger Delta University, Paediatrics, Yenagoa-Nigeria [2] University Of Benin, Paediatrics, Benin-Nigeria [3]

Background / Hypothesis:
The burden of hypertension in pregnancy is high, complicating 5-10% of pregnancies globally, and 5-22% of pregnancies in Nigeria and other developing countries. Hypertensive disorders during pregnancy could affect the neonatal blood pressure leading to hypertension which could lead to adverse outcomes in later life. This study aimed to compare the mean systolic blood pressure (SBP), diastolic blood pressure (DBP) and mean arterial pressure (MAP) of term neonates of both hypertensive and normotensive mothers in Yenagoa, Bayelsa state in the first 2 days of life.

Materials and Methods:
This was a comparative cross-sectional study carried out over a 6 month period amongst 160 neonates of hypertensive mothers (subjects), and 160 gestational age and sex-matched controls recruited from the postnatal wards of 4 government-owned hospitals in Yenagoa. Following ethical approval from the hospitals and written informed consent from mothers, all recruited neonates had a general examination done and their blood pressures measured. Maternal history of hypertension and maternal blood pressure at antenatal visits was used to determine mother's hypertensive or normotensive status during the index pregnancy. Data were analyzed using SPSS version 25, and p value < 0.05 considered statistically significant.

Results:
The mean ages of the hypertensive and normotensive mothers was similar; 31.6 ± 7.0 years versus 30.4 ±5.6 years (p=0.112). The neonates of hypertensive mothers had slightly higher mean SBP, DBP and MAP than their controls on both days 1 and 2 of life, but the difference was not statistically significant (p>0.05). Among neonates of hypertensive mothers, 14 neonates (8.8%) were hypertensive compared to 3 (1.9%) of normotensive mothers and this difference was statistically significant (2 = 7.52; p = 0.023)

Conclusions:
Hypertension in pregnancy is a risk factor for neonatal hypertension. Followup studies are advocated to monitor for long term consequences.

POSTER PRESENTATIONS

Category: Basic Science

1384 - THE ROLE AND MECHANISM OF HUMAN FGFBP2 HOMOLOGOUS GENE FGFBP2A IN ZEBRAFISH HEART DEVELOPMENT

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Background / Hypothesis:
Congenital heart disease (CHD), the most common birth defect, accounts for 1/3 of congenital defects and contributes significantly to neonatal mortality. Human FGFBP2 has been predicted as a risk gene for CHD, while its functional role in cardiac development remains uncharacterized. Zebrafish offers unique advantages for studying cardiac formation due to conserved molecular pathways and optically accessible embryonic development. This study investigates the function of zebrafish fgfbp2a (ortholog of human FGFBP2) in cardiac left-right (LR) axis patterning, with emphasis on dorsal forerunner cell (DFC)-derived Kupffer's vesicle (KV) morphogenesis.

Materials and Methods:
Morpholino (MOs) targeting fgfbp2a were validated via EGFP fluorescence reporter assays and p53-MO co-injection to exclude nonspecific apoptosis. Functional conservation was confirmed through human FGFBP2 mRNA rescue experiments. fgfbp2a knockdown zebrafish models were generated by microinjecting fgfbp2a-MO at different embryonic stages, including a DFC-specific fgfbp2a knockdown model. Cardiac phenotypes were analyzed in Tg(flk1: GFP). KV phenotypes were analyzed in Tg(sox17: GFP) embryos using confocal microscopy. KV ultrastructure was quantified via dand5 in situ hybridization and acetylated α-tubulin immunofluorescence. Whole-mount in situ hybridization assessed LR determinants (lefty1, bmp4) and KV-associated genes (foxj1a, cldn5a).

Results:
fgfbp2a-MO effectively inhibited fgfbp2a expression without inducing apoptosis-related off-target effects. Human FGFBP2 and zebrafish Fgfbp2a exhibit functional homology. Both global and DFC-specific fgfbp2a knockdown resulted in defects in cardiac LR axis establishment, reduced heart rate, and dysregulated expression of lefty1 and bmp4. Targeted knockdown of fgfbp2a in DFCs resulted in reduced KV cell number, smaller KV lumen, and fewer KV cilia without altering foxj1a/cldn5a expression.

Conclusions:
Human FGFBP2 and zebrafish Fgfbp2a are functionally homologous. fgfbp2a knockdown may disrupt cardiac development, particularly LR axis establishment, by affecting the expression of lefty1, bmp4 as well as impairing DFC and KV development.

POSTER PRESENTATIONS

Category: Basic Science

1484 - OPTIMAL CROSSLINKING FOR DECELLULARIZED CARDIAC XENOGRAFTS

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Background / Hypothesis:
Effective decellularization and optimal crosslinking are critical to use cardiac xenografts clinically. This study aims to evaluate the effects for low concentrations of glutaraldehyde (GA) and EDC (1-ethyl-3-(3-dimethyl aminopropyl)-carbodiimide)/N-hydroxysuccinamide (NHS) fixation and amino acid detoxification on biocompatibility of decellularized cardiac xenografts.

Materials and Methods:
Cardiac xenografts were decellularized with sodium dodecyl sulfate through the multi-step methods with hypotonic, isotonic and hypertonic buffer solution, and treated with space-filler. The xenografts were crosslinked with GA and EDC/NHS, treated with organic solvents, and detoxified with amino acids. We investigated the biomechanical properties, and crosslinking efficacy, and cytotoxicity test. The xenografts were subcutaneously implanted for eight weeks in rats.

Results:
Mechanical test (tensile strain at break, tensile displacement at break, and tensile stress at break), and permeability test demonstrated that differently treated cardiac xenografts resulted in no significant alterations in material characteristics. Purpald test showed good efficacy of glutathione for detoxification of GA crosslinking. Crosslinking efficiency decreased in low concentrations of GA fixation, but increased in EDC/NHS double crosslinking with GA in pronase, ninhydrin test, and thermal stability test. Cytotoxicity was reduced by low concentrations of GA fixation and glutathione detoxification, but increased by EDC/NHS double crosslinking. In vivo study demonstrated that low concentrations of GA fixation, EDC/NHS double crosslinking and glutathione detoxification decreased calcification. The titer of IgG decreased with anticalcification treatment for GA, and histological findings were compatible with in vivo calcification.

Conclusions:
We have verified that low-dose GA fixation, EDC/NHS double crosslinking, and glutathione detoxification of decellularized cardiac xenografts can be safe and effective for use in cardiovascular bioprosthetics.

POSTER PRESENTATIONS

Category: Basic Science

1486 - THE EFFECT OF PAMIDRONIC ACID ON MINERALIZATION OF RIGHT SIDED CONDUITS IN A LARGE ANIMAL MODEL.

Nataliya Nichay [1], Irina Zhuravleva [2], Anna Dokuchaeva [2], Elena Kuznetsova [2], Yuriy Kulyabin [3], Eugene Boyarkin [4], Tatiana Timchenko [2], Yanina Rusakova [2], Alexander Bogachev-prokophiev [5]
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Background / Hypothesis:
Valved conduits are frequently used to replace pulmonary arteries. Calcification, linked to both patient factors and biomaterial properties, is a major cause of conduit failure. Bisphosphonates show promise as anti-calcification agents. Objective: To assess the anti-calcification efficacy of diepoxy-treatment (DE) combined with pamidronic acid (PAM) immobilization for pulmonary conduits made from bovine pericardium and bovine jugular vein (BJV) using a large animal model.

Materials and Methods:
Twenty-four minipigs underwent PA replacement and were divided into four groups of six based on the type of implanted conduit: DE-treated BJV (DE-BJV), DE-BJV with PAM-immobilization (DE+PAM-BJV), DE-treated bovine pericardial valve conduit (DE-PVC), and DE-PVC with PAM immobilization (DE+PAM-PVC). After six months, the animals were euthanized, and the explanted conduits were analyzed.

Results:
All conduits were successfully implanted without surgical complications. Both DE-BJV and DE+PAM-BJV grafts showed good integration and vitalization, with a thin neointimal layer and endothelial monolayer on the inner wall surface, while leaflets were neointima-free. Mineralization was absent in the walls and leaflets of BJV, except at anastomotic sites. In some cases, small calcium deposits were observed around sutures in BJV tissue, irrespective of PAM-immobilization. In contrast, large calcium deposits formed along the conduit joining sutures of all PVCs, regardless of whether PAM was immobilized. Powdery calcification was observed around some suture holes along the anastomotic line, but mineralization did not occur outside the suture lines in either the DE-PVC or DE+PAM-PVC groups. All PVCs demonstrated successful integration and graft vitalization, characterized by a uniform neointimal layer and a well-developed endothelium.

Conclusions:
Our study demonstrated that PAM-immobilization did not significantly reduce mineralization in either BJV or PVC within a blood-contacting environment. However, DE-treatment prevented calcification of elastin and collagen in the graft walls and leaflets outside the suture line during the six-month follow-up.

POSTER PRESENTATIONS

Category: Basic Science

1585 - INVESTIGATING CARDIOVASCULAR PHENOTYPES IN DOWN SYNDROME USING INDUCED PLURIPOTENT STEM CELL DERIVED CARDIOMYOCYTES

Rebecca Hulbert [1], Rifdat Aoidi [1], Eva Lana-elola [1], Andreia Bernardo [2], Victor Tybulewicz [1]
The Francis Crick Institute, Down Syndrome Laboratory, London-United Kingdom [1] Imperial College London, National Heart And Lung Institute, London-United Kingdom [2]

Background / Hypothesis:
Congenital heart defects (CHD) occur in approximately 50% of people with Down Syndrome (DS) and contribute significantly to morbidity and mortality within this population. Our previous work using the Dp1Tyb mouse model, which recapitulates the human cardiac DS phenotype, demonstrated defects in mitochondrial activity and reduced proliferation in Dp1Tyb embryonic cardiomyocytes. Furthermore, we identified Dyrk1a as one of the genes required in three copies to cause CHD and the proliferative and metabolic cardiomyocyte phenotypes.
Based on the findings from the Dp1Tyb mouse, we hypothesize that proliferative and metabolic defects are also present in human DS cardiomyocytes. This study aims to address this hypothesis and identify possible cellular mechanisms that may underlie CHD in human DS.

Materials and Methods:
A standard WNT modulation protocol was used to differentiate Trisomy 21 (T21) hiPSCs and matched isogenic controls into cardiomyocytes (hiPSC-CMs) in vitro. Bulk RNA sequencing, proliferative analyses and functional metabolic analyses of hiPSC-CMs were performed at multiple timepoints over the differentiation process.

Results:
T21-hiPSC-CMs have reduced proliferation, consistent with observations from the Dp1Tyb mouse model and transcriptomic data from human DS embryonic hearts, suggesting reduced proliferation is a key cardiomyocyte phenotype in DS.
Bulk RNA sequencing data demonstrated reduced expression of oxidative phosphorylation related genes in early T21-hiPSC-CMs, which is then reversed in cardiomyocytes at later stages of differentiation. This suggests that there may be developmental stage-specific mitochondrial defects during cardiomyocyte development in DS.

Conclusions:
We have shown that T21-hiPSC-CMs have proliferative defects similar to those in the Dp1Tyb mouse model of DS, suggesting this may be an important contributor to CHD in human DS. Our gene expression data suggest that metabolic immaturity may be a stage-specific phenotype, present in early cardiomyocyte development and thus it could play a role in CHD in DS as cardiac septation occurs at an early developmental stage.

POSTER PRESENTATIONS

Category: Basic Science

1587 - BEAT TO BOWEL EXPOSURE OF PEDIATRIC CARDIAC SURGICAL STOOL TO PORCINE ORGANOIDS AFTER CARDIOPULMONARY BYPASS

Lisa Gerjevic [1], Adrian Black [2], Ram Subramanyan [3], *Jeffrey Salomon* [4]
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Background/Hypothesis:
The intestinal milieu is important in regulating intestinal inflammation in congenital heart disease (CHD). These interactions are amplified after exposure to the inflammatory insult of cardiopulmonary bypass (CPB). Determining intestinal tissue responses to stool content from CHD patients can elucidate mechanistic understanding of post-surgical intestinal injury. We hypothesize postop stool will induce more inflammatory changes on organoids than preop stool, and the CPB organoids exposed to postop stool will show the highest amounts of inflammation.

Methods:
Stool was isolated from a neonatal patient with unique pro-inflammatory changes between pre- and post-cardiac surgery. Organoids form a porcine model of CPB were generated from isolated ileum crypt cells during animal sacrifice and placed in a nutrient matrix gel to grow, then transitioned to luminal-out formation for experimentation. Pre-op and post-op homogenized stool were added to organoids from CPB piglets and control piglets (mechanically ventilated) and allowed to interact for 72 hours. Organoids were then isolated and processed for evaluation.

Results:
Four groups were studied: CPB organoids exposed to pre-op stool(1) and post-op stool(2); control organoids exposed to pre-op(3) and post-op stool(4). Immunohistochemical staining and western blot revealed that CPB organoids(1-2) had more epithelial injury with increased cleaved-caspase 8 and intestinal fatty acid binding protein than control organoids(3-4). Epithelial barrier dysfunction with reduced claudin-2 and claudin-3 tight-junction proteins, and upregulation of inflammatory mediators, specifically PGE2 synthase and PGE2 receptor production, was more pronounced in CPB organoids(1-2). Postop stool exposure to the CPB organoids resulted in the highest amount of inflammatory changes and barrier dysfunction.

Conclusion:
Porcine intestinal organoids after CPB had more injury than control organoids and post-operative stool content induced a larger degree of intestinal injury and dysfunction than pre-operative stool. Further studies using isolated metabolite exposure are needed to determine causal mechanism of intestinal injury.

POSTER PRESENTATIONS

Category: Basic Science

1594 - BRAIN APOPTOTIC PROTEOMIC RESPONSE TO HYPOXIA AND EXTRACORPOREAL MEMBRANE OXYGENATION RECOVERY IN A NEONATAL PORCINE MODEL.

Peter Pastuszko [1], Michael Katz [2], Gaia Chen [3], Justin Marciano [3], Sean Eliyahu Shtraizent [3], Talia Ebel [1], Joanna Kubin [1], Ivana Capin [2], Hylton Gordon [4], Vishal Nigam [5]
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Background / Hypothesis
The use of extracorporeal membrane oxygenation (ECMO) is a life saving for children with heart defects complicated by hypoxic cardiac arrest. However, limited information is available regarding post-recovery neurological injury. This study aims to evaluate brain apoptotic proteomic response in a neonatal porcine model. The study's hypothesis is that ECMO may reverse brain proteomic changes following hypoxic cardiac arrest.

Materials and Methods
Thirty-two 3-week-old Yorkshire piglets were subjected to hypoxia with short-term (5-7 min) cardiac arrest, followed by a 6-hour recovery with veno-arterial ECMO. The animals were assigned to one of four groups: Sham, Hypoxic cardiac arrest, Hypoxic cardiac arrest followed by ECMO, and ECMO control. A total of 42 apoptosis-related proteins were analyzed in brain using a proteomic antibody array assessed the cell death cycle. The levels of cysteine proteases mRNAs were evaluated by qPCR. A DNA fragmentation assay was performed. Brain tissue was examined using Fluoro-confocal microscopy.

Results
Hypoxic cardiac arrest activated DNA fragmentation and expression of proteins involved in brain cell death. DNA fragmentation and anti-apoptotic proteins were elevated following ECMO treatment compared to sham. We found that the hippocampus and striatum exhibited higher expression of P27 (42.6%) and P53 (16.5%), which regulate the cell cycle and DNA repair. The sTNF-R2 neuro-inflammatory factor involved in apoptosis and necrosis inhibition, increased to 415.7±23.4 RLU versus 102.1±14.6 RLU in sham. The TNF-alpha pro-inflammatory immune cytokine was significantly higher in the ECMO treatment group. Unexpectedly, in the ECMO control, proteomic changes were related only to inflammation, with no alterations in pro-apoptotic or anti-apoptotic proteins.

Conclusions
The data suggest that brain cell death caused by hypoxic cardiac arrest may be reversed by ECMO. Advancing our understanding in the impact of hypoxic cardiac arrest followed by ECMO on a children's nervous system is crucial for improving patient outcomes.

POSTER PRESENTATIONS

Category: Basic Science

1644 - LCN2 MODULATES BRAIN INJURY UNDER CHRONIC HYPOXIA INSIGHTS FROM A CONGENITAL HEART DISEASE MODEL

Nishant Patel [1], Zhaocong Yang [1], Jirong Qi [1], Xuming Mo [1]
Children's Hospital Of Nanjing Medical University, Department Of Cardiothoracic Surgery, Nanjing-China [1]

Background / Hypothesis:
Congenital heart disease (CHD) is the most common birth defect, with cyanotic CHD (CCHD) leading to chronic hypoxia and increased risk of neurological dysfunction. While early interventions improve survival, the mechanisms underlying hypoxia-induced brain injury remain unclear. Lipocalin 2 (LCN2) is implicated in neuroinflammation, but its role in chronic hypoxia is poorly defined. This study investigates how LCN2 regulates neuroinflammation and apoptosis via the MAPK/ERK pathway.

Materials and Methods:
LCN2 expression was analyzed using public datasets, serum samples from CHD patients (ELISA, qRT-PCR), and a chronic hypoxia mouse model (qRT-PCR, Western blot). Neurological injury was assessed using histopathology and behavioral tests. In vitro, siRNA and plasmid transfection were used to examine LCN2's role in regulating neuroinflammation and apoptosis. Key molecular markers were analyzed via Western blot, immunofluorescence, and ELISA.

Results:
Bioinformatics identified LCN2 as a key regulator of chronic CNS inflammation. Serum ELISA showed lower LCN2 levels in CCHD patients. Hypoxic mice exhibited reduced brain LCN2 expression. Functionally, LCN2 overexpression reduced neuronal necrosis and improved spatial learning. Mechanistically, LCN2 downregulation increased ROS, BAX, p-ERK1/2, and IL-6, while its overexpression reduced ERK phosphorylation, suppressed apoptosis, and enhanced Bcl-2. ERK inhibition further reduced neuronal apoptosis and neuroinflammation.

Conclusions:
LCN2 plays a critical role in hypoxia-induced brain injury by modulating neuroinflammation and apoptosis through the MAPK/ERK pathway. These findings provide new insights into potential molecular targets for mitigating neurological damage in CCHD patients.

POSTER PRESENTATIONS

Category: Basic Science

1652 - RIGHT VENTRICULAR (RV) METABOLIC DERANGEMENTS IN MURINE CARDIAC TRANSPLANT IDENTIFYING OPPORTUNITIES FOR OPTIMIZATION OF METABOLISM DURING CARDIAC PRESERVATION

Jason Breithaupt [1], Jack Zakrzewski [1], Li Lu [1], Anit Tyagi [2], Jesse Davidson [3], Matthew Stone [1]
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Background / Hypothesis:
Cardiac transplantation success is limited by ischemia reperfusion injury (IRI) and resultant primary graft dysfunction (PGD), which disproportionately affects the RV. Ex vivo heart perfusion (EVHP) is a novel, alternative preservation strategy to cold static preservation (CSP) that enables donor heart treatment. Our group has defined this strategy with hypothermic, acellular perfusate as superior to CSP yet implicated metabolic pathways of IRI remain undefined. The purpose of this study was to identify the metabolic profiles of transplanted RVs to define targets for EVHP-mediated therapy.

Materials and Methods:
Wild-type murine hearts were explanted and stratified by 60-minute preservation method: CSP (Group 1), EHVP (Group 2), and no-transplant controls (Group 3). Group 1 and 2 hearts were heterotopically transplanted onto the cervical vessels of recipient mice for 120-minutes of reperfusion prior to assessment of RV myocardium by mass spectrometry.

Results:
Groups 1 and 2 demonstrated significant differences from controls in principal pathways of metabolism (Table 1). Specifically, transplanted RVs had significant alterations in amino acid (AA) and nucleotide metabolism and distinct metabolic profiles related to glycolysis and oxidative phosphorylation. AA concentrations in transplanted tissues demonstrated lower levels of ATP precursors (ADP and AMP) while glycolysis and oxidative phosphorylation were also impaired (higher glucose, lower succinate/itaconate). Further, alterations in glutathione homeostasis, polyamine synthesis, and creatine metabolism characterized potential mechanisms for reactive oxygen species accumulation, decreased spermine concentrations, and decreased phosphocreatine in EVHP-preserved hearts.

Conclusions:
The presented findings provide a comprehensive metabolic profile for transplantation-associated IRI and PGD, identifying key mediators of myocardial injury and metabolic dysfunction. Importantly, the identified metabolic mediators of myocardial injury provide targets for therapeutic delivery and perfusate development, harnessing the potential of EVHP. Future study will build upon this foundation to provide the optimal environment for hearts during EVHP preservation to decrease IRI and RV PGD.

POSTER PRESENTATIONS

Category: Basic Science

1660 - A NOVEL GONADAL MOSAIC NKX2 5 MUTATION IN A SIBLING CASE OF ATRIOVENTRICULAR BLOCK WITH LEFT VENTRICULAR NONCOMPACTION

Keiko Uchida [1], Masaya Kunimatsu [2], Tadashi Tadashi [3], Kazuki Kodo [4], Utako Yokoyama [1], Hiroyuki Yamagishi [5]
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Background:
NKX2-5 is the first cardiac transcription factor necessary for cardiac development and maturation. Gene variants of NKX-2.5 have been reported to be associated with various congenital heart diseases, such as atrial septum defect (ASD), atrioventricular block (AVB), and left ventricular noncompaction (LVNC). LVNC is the third most prevalent form of cardiomyopathy. However, it is not yet clear how NKX2-5 variants cause cardiac disease.

Methods:
We performed exome sequencing on cases of siblings presenting with LVNC and AVB and their parents. Using human genome databases, only rare variants with minor allele frequencies of less than 1% were considered as candidates. In silico analyses narrowed down some pathogenic variants using seven prediction damaging scores. Next, we introduced deletion mutations at the genomic site homologous to this variant into zebrafish by genome-editing technique and examined the cardiac phenotypes.

Results:
Our cases were Japanese siblings born to healthy parents. Their electrocardiography showed that AVB had developed, and the younger brother underwent pacemaker implantation at 18 years of age. Additionally, the findings of echocardiography in the siblings were compatible with LVNC. We narrowed down the variants detected by exome sequencing to six de novo variants in affected siblings, based on allele frequencies and pathogenic scores. Finally, we identified a novel de novo frameshift variant in NKX2-5 in both sibling cases, but not in the parents, that is the first familial case of germline mosaicism of the NKX2-5 variant. We then established two deletion mutant zebrafish lines, which exhibited cardiac dilatation and pericardial effusion at 3 days post-fertilization.

Conclusions:
We identified a novel NKX2-5 truncation variant inherited by germline mosaicism. And the pathogenicity in the heart was confirmed using genetically modified zebrafish. Our study supports the clinical significance of genetic testing for NKX2-5 variants as a risk assessment tool for patients with AVB and LVNC.

POSTER PRESENTATIONS

Category: Basic Science

1688 - GENETIC BACKGROUND OF PERSISTENT TRUNCUS ARTERIOSUS AND PULMONARY ATRESIA WITH VENTRICULAR SEPTAL DEFECT IN JAPANESE POPULATION

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Background / Hypothesis:
Persistent truncus arteriosus (PTA) and pulmonary atresia with ventricular septal defect (PA-VSD) share overlapping genetic backgrounds among congenital heart defects. The 22q11.2 deletion is associated with approximately 35 % of PTA and PA-VSD cases. Single-gene variants, such as NOTCH1, FLT4, and TMEM260 have also been reported sporadically. We aimed to elucidate the impact of TMEM260, NOTCH1, and FLT4 variants on PTA and PA-VSD in the Japanese population.

Materials and Methods:
We enrolled 41 PTA and 169 PA-VSD cases. After screening for 22q11.2 deletion using FISH and excluding cases with other known genetic causes, we performed next-generation sequencing on genomic DNA from 30 PTA and 79 PA-VSD cases.

Results:
In PTA, biallelic TMEM260 variants were identified in 7 cases (17 %), similar to 22q11.2 deletion (5 cases, 12 %). All identified TMEM260 variants in PTA were either c.1617del or exon 6-7del, both specific to the Japanese population. Variants in NOTCH1 and FLT4 were detected in 3 and 2 PTA cases, respectively, two of which were compound heterozygotes for NOTCH1 and FLT4. In PA-VSD, the 22q11.2 deletion was observed in 74 cases (44 %). Biallelic TMEM260 variants and single NOTCH1 or FLT4 variants were also identified, but no compound heterozygotes for NOTCH1 and FLT4 were observed.

Conclusions:
TMEM260, NOTCH1, and FLT4 are frequent single-gene causes of PTA or PA-VSD in Japan. In particular, biallelic TMEM260 variants, following an autosomal recessive inheritance pattern, are the most common cause in PTA cases without 22q11.2 deletion in Japan. Variants in NOTCH1 and FLT4 are each involved in PTA or PA-VSD, and oligogenic inheritance of NOTCH1 and FLT4 may contribute to the more severe PTA phenotype.

POSTER PRESENTATIONS

Category: Basic Science

1772 - EFFECT OF POLYMORPHISM OF GATA BINDING PROTEIN 4 GENE AND INSULIN LIKE GROWTH FACTOR 1 PROTEIN CONCENTRATION IN VENTRICULAR SEPTAL DEFECT AT GENERAL HOSPITAL SOETOMO SURABAYA INDONESIA

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Background:
Ventricular septal defect (VSD) is the most common form of congenital heart disease (CHD), often influenced by genetic and molecular factors. Variants in the GATA4 gene, a critical transcription factor for heart development, and alterations in Insulin-like Growth Factor-1 (IGF-1) levels, a key growth regulator, have been implicated in VSD pathogenesis. This study explores the association between Single Nucleotide Polymorphisms (SNPs) of the GATA4 gene and IGF-1 protein concentration in patients with VSD

Methods:
A descriptive analytic study was conducted on 102 participants (51 VSD cases and 51 healthy controls) at RSUD Dr. Soetomo from January to September 2024. Blood samples were collected for GATA4 SNP analysis (via PCR-Sanger sequencing) and IGF-1 quantification (using ELISA). Statistical tests included the Shapiro-Wilk test, Mann-Whitney U test, and odds ratio analysis with a significance threshold of $p < 0.05$

Results:
IGF-1 concentrations were significantly lower in VSD patients (mean = 3.68 ± 2.65) compared to controls (mean = 8.99 ± 8.97) ($p = 1.00 \times 10^{-5}$). Odds ratio analysis showed that low IGF-1 levels were associated with a 3.51-fold higher risk of VSD (95% CI: 1.61–7.63; p = 0.0023). Analysis of the GATA4 gene polymorphism c.1220C>A revealed no significant association with VSD risk (OR = 2.037; 95% CI: 0.179–23.13; p = 0.57)

Conclusion:
This study identifies a significant association between low IGF-1 concentrations and increased VSD risk, suggesting IGF-1 as a potential biomarker for VSD. Although the GATA4 c.1220C>A polymorphism showed no significant relationship.

POSTER PRESENTATIONS

Category: Basic Science

1925 - IDENTIFYING VIABILITY AND OPTIMAL PRESERVATION CONDITIONS OF PORCINE SEMILUNAR VALVES AS "LIVING" GRAFTS TO INCREASE COLD STORAGE TIME

Muhammad Faateh [1], Aadhyasri Ramineni [1], Jeffery Molkentin [2], David Morales [1], Carolina Moore [1], *Awais Ashfaq* [1]
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Background / Hypothesis:
Living allogenic valve transplantation(LAVT) is an evolving technique that offers a growing heart valve replacement for children. However, optimal preservation conditions of these valves are yet to be established. Our aim was to develop a preservative solution allowing for extended cold storage of these valves.

Materials and Methods:
Aortic and pulmonary valve leaflets were excised from discarded porcine hearts. Valve Endothelial Cells(VEC) and Valve Interstitial Cells(VIC) were isolated and subjected to cold preservation(4°C) for 24h(baseline), 7, 10 and 14 days in University of Wisconsin(UW) solution with or without preservation additives: antioxidant α-tocopherol(αT) and caspase inhibitor Q-VD-OPH. Cellular viability and apoptosis were assessed.

Results:
Aortic and Pulmonary VECs were found to have a decrease in viability from 24h to 7d(Aortic VEC % of baseline viability at day-7: 24%; day-14: 11%); Pulmonary VEC(day-7: 33%, day-14: 8%) of cold preservation in UW solution as compared to Aortic and Pulmonary VICs which were more resistant(Aortic VIC day-7: 100%, day-14: 13% ; Pulmonary VIC day-7: 67%, day-14: 7%). The addition of Q-VD-OPH resulted in significantly lower apoptosis in VECs at day-7 of cold preservation. The testing conditions with the highest viability and lowest apoptosis ratio at day-7 of cold preservation was: Aortic VEC in UW + αT 3.75 µM + Q-VD-OPH 50 µM (viability:apoptosis ratio 100%:8%); Pulmonary-VEC in UW + αT 3.75 µM + Q-VD-OPH 50 µM (63%: 3%); Aortic-VIC in UW + Q-VD-OPH 6.25 µM (96%:78%) and Pulmonary-VIC in UW + αT 3.75 µM + Q-VD-OPH 25 µM (100%:81%).

Conclusions:
Aortic and Pulmonary valve interstitial cells had minimal decrease in viability after seven days of cold preservation. The addition of a caspase inhibitor significantly decreased apoptosis during cold preservation of valve endothelial cells. These findings suggest that with an optimal preservation solution, valve cells can remain viable for up to seven days of cold storage.

POSTER PRESENTATIONS

Category: Basic Science

1932 - LATE INFECTIVE ENDOCARDITIS FOLLOWING TRANSCATHETER ATRIAL SEPTAL DEVICE CLOSURE

Jayani Ranasinghe [1], Duminda Samarasinghe [1]
Lady Ridgeway Hospital For Children, Cardiology Unit, Colombo 08-Sri Lanka [1]

Background / Hypothesis:
This case report details the clinical course of a 9-year-old girl who developed late-stage bacterial endocarditis following an atrial septal defect (ASD) closure. The initial transcatheter ASD closure was performed four years prior, using a 14mm SHSMA Septal Occluder. While the device is designed to be endothelialized within six months, incomplete endothelialization allowed for the development of bacterial endocarditis. This case emphasizes the rare yet serious risk of infective endocarditis following transcatheter ASD closure. The incomplete endothelialization of the device, even after several years, suggests a potential for prolonged bacterial colonization. Consequently, prophylactic antibiotics and antiplatelet therapy for up to six months post-procedure may not always suffice. The device size and material may also contribute to the incomplete endothelialization. Finally, this case highlights the importance of long-term and close follow-up and the need for further research into factors influencing endothelialization of the devices. It also underscores the necessity of individualized prophylactic strategies to mitigate endocarditis risks in patients undergoing ASD closure with devices.

Materials and Methods:

Results:

Conclusions:

POSTER PRESENTATIONS

Category: Basic Science

1999 - AN UNUSAL PRESENTATION OF AN ATRIAL SEPTAL DEFECT

Dr. Jayani Ranasinghe [1], Dr. Duminda Samarasinghe [1], Dr. Shehan Perera [1], Dr. Kanchana Singappuli [1]
Lady Ridgeway Hospitalfor Children, Cardiology Unit, Colombo 08-Sri Lanka [1]

A 2year old girl presented with a history episodic shortness of breath, sweating and excessive crying “clinging onto the mother”. Echocardiogram revealed a moderate size Atrial septal defct, significantly dilated RA/RV with a smallish LV, normal coronary origins and moderate pulmonary hypertension (PHT). She was extensively investigated to look for causes of the PHT as pulmonary hypertension is disproportionate to shunt. ECG showed a sinus rhythm, holter monitoring was normal. USS abdomen did not reveal portosystemic shunts. CT pulmonary angiogram showed the evidence of PHT or no pulmonary embolism. HRCT showed multiple segmental opacities due to atelectasis. Hematology assessment showed no risk factors for thromboembolism. Her symptoms were more suggestive of an episodic angina. This made to reevaluate. Troponin I was elevated (2.35ng/ml). ECG strip showed T inversions in V1-V6 which had not been observed previously, Coronary angiogram showed Non dominant right coronary artery (RCA), intramural left middle coronary artery (LMCA) with severe osteal stenosis. Holter was repeated and this time an episode occured during which ST depressions were observed. She was taken up for immediate surgery –LMCA osteoplasty with ASD closure. Intraop the LMCA was seen to have a short intramural course with a small inferior flap in the orifice- which explained the dynamic obstruction. She had an uneventful post-operative period. Post op CT coronary angiogram was normal. Her pulmonary hypertension resolved gradually. Clinical suspicion that a patient’s problems may be the result of coronary anomalies remains an important challenge in diagnosis, especially in children. Investigations alone may not be reliable therefore it is best to follow clinical clues. Intramural coronaries are a common cause of this rare presentation.This case gives importance of using multiple views and angles when imaging. It also highlights the importance of diagnosis with clinical picture when the investigations are misleading.

POSTER PRESENTATIONS

Category: Basic Science

2000 - BILATERAL SUPERIOR VENA CAVA WITH RIGHT SUPERIOR VENA CAVA DRAINING INTO LEFT ATRIUM A RARE CONGENITAL MALFORMATION OF SYSTEMIC VEINS.

Dr. Jayani Ranasinghe [1], Dr. Shehan Perera [2], Dr. Duminda Samarasinghe [2], Dr. Malik De Zoysa [2]
Lady Ridgeway Hospital For Children, Cardiology Unit, Colombo 08-Sri Lanka [1] Lady Ridgeway Hospital For Childre, Cardiology Unit, Colombo 08-Sri Lanka [2]

Background / Hypothesis:
A 2 years old girl presented with cyanosis which was observed shortly after birth by her parents but not further investigated. Clinical examination was unremarkable apart from mild clubbing and low oxygen saturation of 88–90% in room air. Her ECG and chest X-ray were unremarkable. Echocardiography showed bilateral SVC connected by a small innominate vein. The right SVC drains directly into the LA while the left SVC drains into the right atrium (RA) via a dilated coronary sinus. There is a small superior sinus venosus type atrial septum defect (ASD) with left to right shunt. There is partial anomalous pulmonary venous return with right upper and right middle pulmonary veins draining directly into the right SVC, which is connected to LA. The right lower pulmonary vein and left pulmonary veins drain directly to LA. The rest of her echocardiography demonstrated normal. This patient was referred for surgical correction, including baffling of the right SVC to the RA and closure of the ASD. Drainage of the right SVC to the LA is an exceedingly rare congenital malformation of systemic veins. Despite this small inter-atrial communication, our patient had minimal clinical symptoms except for mild cyanosis. If left untreated, may cause serious complications such as fatal brain abscess. A major goal of this case report is to highlight the importance of recognizing this infrequent anomalous systemic venous connection as one of the very rare causes of cyanosis in the pediatric age group. This demonstrates and confirm the importance of using pulse oximetry. With pulse oximetry screening before discharge becoming the standard of care on the detection of critical CHD in newborns. The finding of a borderline oxygen saturation needs full medical work-up, including a thorough echocardiography study

Materials and Methods:

Results:

Conclusions:

POSTER PRESENTATIONS

Category: Basic Science

2136 - TUMOR NECROSIS FACTOR A STIMULATION ENDOTHELIAL TO MESENCHYMAL TRANSITION DURING CARDIAC FIBROSIS VIA ENDOTHELIN 1 SIGNALING

Huan Hu [1], Wenjuan Li [1], Kun Sun [1]
Xinhua Hospital, Shanghai Jiao Tong University School Of Medicine, Pediatric Cardiology, Shanghai-China [1]

Background:
Cardiac fibrosis is an important pathological change after myocardial infarction (MI). High concentration of tumor necrosis factor-α (TNF-α) contributes to cardiac fibrosis. However, the role and molecular mechanisms of TNF-α during cardiac fibrosis remain largely unexplored.

Materials and Methods:
We developed a mouse infarction (MI) model and we collected heart tissue to evaluate changes histologically and transcript levels after seven days. We conducted an in vitro study using human umbilical vein endothelial cells (HUVECs) to investigate the role of TNF-α and Endothelin-1 (ET-1) in EndMT. To evaluate the effect of ET-1 on TNF-α-induced EndMT, we detected the changes of marker genes involved in EndMT and TGF pathway.

Results:
We investigated significant fibrosis formation in mice after 1 week of MI operation. The expression of inflammatory factors and ET-1-associated genes of the MI model were also significantly upregulated. The results suggested that ET-1 and TNF-α expressions were associated with myocardial fibrosis process. We found that TNF-α greatly upregulated ET-1 expression during EndMT in HUVECs. After treatment with both ET-1 on TNF-α factors, HUVECs cells displayed significant cell migratory ability, accompanied by increased expression of mesenchymal markers and reduced expression of the endothelial marker compared to TNF-α induced cells. The level of p-SMAD2 was significantly increased when cells treated with TNF-α and ET-1 together. It suggested that ET-1 regulates EndMT processes through the TGF pathway. To confirm the effect of ET-1 on TNF-α induced EndMT, we found The ET-1 antagonist PD142893 inhibited the expression of mesenchymal markers, and stimulated the expression of VE-cadherin compared to TNF-α induced cells. These data showed that ET-1 is a mediator of TNF-α-induced EndMT.

Conclusions
In summary, our findings suggest ET-1 is involved in the process of TNF-α induced EndMT by activating the phosphorylation of Smad2 to induce EndMT-associated gene expressions during cardiac fibrosis after MI.

POSTER PRESENTATIONS

Category: Basic Science

2200 - MATERNAL DI(2 ETHYLHEXYL) PHTHALATE EXPOSURE INCREASES THE RISK OF CONGENITAL HEART DISEASE IN MICE OFFSPRING

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Children's Hospital Of Fudan University, Cardiology, Shanghai-China [1]

Background / Hypothesis:
Epidemiological data suggest that maternal occupational exposure to mixed phthalates comprising di(2-ethylhexyl) phthalate (DEHP) increases the risk of congenital heart disease (CHD). In this study, we used mice as an animal model to validate impact of first-trimester DEHP exposure on the risk of CHD in offspring, to elucidate the possible mechanisms and to provide a potential feasible intervention.

Materials and Methods:
Eight-week-old C57BL/6J pregnant mice were randomly divided into standard and DEHP diet groups.Cesarean section and HE staining were performed on E14.5 to observe the embryonic heart development. Embryonic mouse heart tissue, neonatal mouse primary cardiomyocytes (NMCMs), immortalized cardiomyocyte cell lines were used to examine the expression of embryonic heart development related genes at both the animal and cellular levels. RT-qPCR, Western blot, ELISA, and cell and tissue immunofluorescence, were employed to investigate the potential mechanisms.

Results:
The incidence of CHD in DEHP diet group offspring was up to 14.41% observed via HE staining. Quantitative PCR analysis revealed that expression of key genes involved in cardiogenesis were suppressed at the transcriptional level, which may be due to decreased nuclear translocation of p65. The inhibition of DEHP on key genes was rescued to some extent by choline through driving p65 into nuclear. In the mice, supplementation of choline during DEHP exposure reduced the incidence of CHD in offspring from 14.41% to 4.63%.

Conclusions:
Our study demonstrates that mice first-trimester DEHP exposure significantly increases the risk of CHD in the offspring via inhibiting mRNA levels of key genes in cardiogenesis, and choline could protect against the pathogenesis.

POSTER PRESENTATIONS

Category: Basic Science

2318 - TESTICAN 2 MODULATES PHENOTYPIC TRANSITION OF VASCULAR SMOOTH MUSCLE CELLS IN KAWASAKI DISEASE

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Hangzhou Hospital Of Chinese Traditional Medicine, Central Laboratory, Hangzhou-China
[1] Children's Hospital, Zhejiang University School Of Medicine, Department Of Cardiology, Hangzhou-China [2]

Background / Hypothesis:
Kawasaki disease (KD), also known as mucocutaneous lymph node syndrome, is an acute, self-limiting systemic vasculitis that primarily affects children under the age of five, with a higher incidence in boys. The most severe complication of KD is the development of coronary artery aneurysms. However, the precise role of VSMC phenotypic transition in KD vasculitis is not well elucidated.

Materials and Methods:
This study was conducted by the Declaration of Helsinki and approved by the relevant ethics committees. Four-week-old male C57BL/6 mice were used to establish a CAWS-induced vasculitis model and received AAV9-Spock2 injections. Tissues were harvested for histological staining and analysis. Primary bone marrow-derived macrophages and aortic vascular smooth muscle cells were isolated and cultured for co-culture experiments. RNA-sequencing was performed to analyze gene expression. qRT-PCR, ELISA, and immunoblotting were used to detect various indicators. Data were presented as means ± SEM and analyzed using appropriate statistical tests.

Results:
We investigated the fibroblast-like phenotypic transition of VMSCs during KD vasculitis and identified that testican-2 is a key regulator of VMSC phenotypic transition, participating in the progression of aortic aneurysm of KD. Additionally, we first report that testican-2 interacts with MMP2 to dampen activation of MMP2, which maintains the contractile phenotype of VMSCs and alleviates CAWS induced-abdominal aortic aneurysm.

Conclusions:
The current study provides valuable insights into the underlying mechanisms of CAA in KD. The transition of VSMCs from a contractile to a synthetic phenotype, particularly a fibroblast-like phenotype, occurs during CAWS-induced vasculitis. SPOCK2 plays a critical role in CAWS-induced aortic aneurysm through directly interacting with MMP2. These findings suggest that SPOCK2 may be a potential therapeutic target for CAA in KD, offering new directions for future research and treatment strategies.

POSTER PRESENTATIONS

Category: Basic Science

2365 - EFFECTS OF GENETIC POLYMORPHISMS ON THE OCT1 AND OCT2 MEDIATED UPTAKE OF ATENOLOL

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Children's Mercy Hospital, Ward Family Heart Center, Kansas City-United States [1] University Of Kansas Medical Center, Pharmacology, Toxicology, And Therapeutics, Kansas City-United States [2]

Background / Hypothesis:
Atenolol, a selective beta-1 receptor antagonist, is a commonly utilized drug for a variety of conditions, including arrhythmias, hypertension, and aortic root enlargement. Unfortunately, pediatric patients continue to have suboptimal response to. The effect of known genetic variations (also known as polymorphisms) in the transporters involved in the disposition of atenolol, leading to altered functionality, and therefore differences in clinical effect, is unknown. The human organic cation uptake transporters (OCT) 1 and 2, encoded by the SLC22A1 and SLC22A2 genes, are influx transporters involved in the uptake of atenolol, as well as the antidiabetic drug, metformin. Polymorphisms in OCT1 and OCT2 are known to alter the pharmacokinetics of metformin. The objective of this study is to determine the role of SLC22A1 and SLC22A2 polymorphisms on the cellular uptake and clearance of atenolol.

Materials and Methods:
We have transiently transfected human embryonic kidney 293 cells with OCT1 and OCT2 and measured uptake of the positive control [3H]-MPP+ and atenolol. Site-directed mutagenesis is used to generate four of the most polymorphisms in both OCT1 and OCT2. Uptake of these variants is to be compared to uptake of the wild-type OCT1 and OCT2.

Results:
[3H]-MPP+ and [3H]-atenolol were transported by OCT1 and OCT2. Uptake by the four OCT1 mutants (R61C, G401S, M420STOP, and G456R) was compared to wild-type OCT1 transporter. The variants G401S, G456R and G401S showed no significant atenolol uptake, compared to the control (empty) plasmid. R61C reduced uptake by about 90%.

Conclusions:
Four of the common OCT1 polymorphism decreased different levels of atenolol uptake compared to the wild-type transporter. Next steps include uptake experiments with OCT2 wild-type and polymorphisms, and performing kinetics experiments. This investigation will provide a mechanistic understanding of polymorphisms associated with OCT1 and OCT2 expression and function, to individualize pharmacologic therapy atenolol, as well as other OCT1 and OCT2-dependent drugs.

POSTER PRESENTATIONS

Category: Basic Science

2454 - CARDIOVASCULAR RISK PROFILE BY TRIGLYCERIDE AND GLUCOSE INDEX OF NON INSULIN PACIENTS FOLLOWED AT A BASIC HEALTH UNIT

Fernanda Farias [1], Alessandra Castellanos [1], Emanuely Gomes [1], Juliana Gomes [1], Daniele Hossaka [1]
Ses/df, Esp/fepecs, Brasilia-Brazil [1]

Background / Hypothesis:
The Triglyceride and Glucose Index (TyG) is a biomarker derived from fasting triglyceride and glucose levels, which has a stronger predictive value than HOMA-IR in the diagnosis of type 2 diabetes in adolescents and children, and can also be used to assess macrovascular complications in individuals with type 2 diabetes. We aimed to evaluate the cardiovascular risk profile of patients, by tTyG, of non-insulin pacients followed at a basic health unit and, the need to aply this index in children and adolescents enrolled in schools under the responsibility of the health unit.

Materials and Methods:
We evaluated 18 adults and elderly individuals of both sexes followed in a Basic Health Unit (BHU). The TyG index was measured by the formula: TyG index = (fasting triglycerides [mg/dL] x fasting blood glucose [mg/dL])/2. We used a cutoff of 4.68, obtained from a Mexican study, to associate the TyG index with insulin resistance and cutoff of 8.99, obtained from an Italian study, to predict cardiovascular disease.

Results:
The average age of the individuals was 61.3 years. The majority were female (83.3%) and had some degree of overweight (56.2%), with an average fasting blood glucose of 131.2 mg/dL and average blood triglycerides of 89.9 mg/dL. Approximately 44.4% of the individuals had indices above the cutoff point for insulin resistance. This number drops to 11.1% when assessing the prediction of cardiovascular disease based on the Tyg index cutoff of 8.99.

Conclusions:
The TyG index values found in the group evaluated raise awareness of the cardiovascular risk of these individuals, and alert to the importance of promoting health in children and adolescents, as a way to avoid the identified profile and prevent diseases earlier

POSTER PRESENTATIONS

Category: Basic Science

2532 - SPATIOTEMPORAL ATLAS OF PRESSURE OVERLOAD DOMINATED RIGHT VENTRICULAR MATURATION

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Background / Hypothesis:
Pressure overload (PO) represents a major and common pathological cardiac condition. Cardiac maturation, the culmination of postnatal cardiac development, is critically linked to cardiac regenerative capacity and normal cardiac function; however, the impact of PO on this maturation process remains poorly understood.In addition, many landmark studies rely on fragmentary human myocardial samples to make conclusions, potentially overlooking the critical spatiotemporal heterogeneity inherent in cardiac tissues and posing significant risks to precision therapy.

Materials and Method
Utilizing the only currently available neonatal right ventricular PO model (induced by pulmonary artery banding) and the most advanced Xenium spatial transcriptomics platform, which are with true single-cell segmentation and highest resolution,this study presents the first whole-ventricle spatiotemporal atlas of right ventricular maturation under chronic PO.

Results:
Key findings include: (1) Delayed global right ventricular maturation in PO, characterized by a transmural maturation gradient (mid-myocardium > subepicardium = subendocardium); (2) Spatiotemporal progression of pathological remodeling, initiating in the subepicardium, extending to the subendocardium, and ultimately involving the mid-myocardium; (3) Distinct spatiotemporal dynamics of major cardiac cell types (cardiomyocytes [CMs], fibroblasts, endothelial cells) under PO; and (4) The critical role of CREB-binding protein (CBP)-mediated chromatin remodeling in PO-induced cardiac regeneration.

Conclusions:
This study not only challenges prevailing methodologies reliant on fragmented cardiac tissue sampling for single-cell analyses but also proposes a new framework for spatially-resolved cardiac sample collection. Critically, it decodes fundamental biology of cardiac maturation.

POSTER PRESENTATIONS

Category: Basic Science

2542 - PROXIMITY BARCODING ASSAY REVEALS DYNAMIC PLASMA EXOSOME PROTEIN PROFILES AND SUBPOPULATION CHARACTERISTICS IN PATIENTS UNDERGOING TRANSCATHETER PULMONARY VALVE REPLACEMENT

Runzhang Liang [1], Naijimuding Abudurexiti [2], Jiaxiong Wu [1], Jing Ling [2], Zirui Peng [2], Canxin Wang [1], Jinxin Li [1], Haiyun Yuan [2], Shusheng Wen [2]
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Background / Hypothesis:
Patients with congenital heart disease complicated by right ventricular outflow tract obstruction (RVOTO) often develop secondary pulmonary regurgitation (PR) after corrective surgery, necessitating pulmonary valve replacement (PVR). This study employed proximity barcoding assay (PBA) to dynamically monitor changes in plasma exosome protein profiles and subpopulation characteristics during the perioperative period of transcatheter pulmonary valve replacement (TPVR).

Materials and Methods:
This study collected 120 human plasma samples from 10 patients undergoing TPVR at three stages, preoperative (T1 group), 1 day postoperative (T2 group), and 1 week postoperative (T3 group), as well as 10 healthy individuals (N group). Single-exosome analysis was performed using PBA. We performed combinatorial analysis and functional analysis of membrane proteins on single exosomes across different groups and evaluated their predictive performance as biomarkers using Receiver Operating Characteristic (ROC) curves. Exosome subpopulations were clustered and characterized.

Results:
Compared to the control group, the disease group exhibited significant downregulation of the protein combination DSCAML1 + ALCAM + ITGA1 + CR1 ($P<0.05$; AUC=1) and upregulation of BCAM + CD36 + DSCAML1 + ITGB1 ($P<0.05$; AUC>0.82). Gene Ontology (GO) analysis indicated that the proteins are associated with pathways related to response to stress, membrane side, and protein binding, while Kyoto Encyclopedia of Genes and Genomes (KEGG) analysis revealed enrichment in the Hematopoietic cell lineage pathway. Subpopulation analysis revealed increased cluster 1 and decreased cluster 2 proportions in T1-T3 groups compared to the N group. Subpopulation markers showed CD8A dominance in cluster 1, while DSCAML1 predominated in cluster 2.

Conclusions:
This study pioneers PBA-based dynamic monitoring of plasma exosomes in patients with TPVR, identifying novel diagnostic protein signatures and disease-specific subpopulation redistribution patterns.

POSTER PRESENTATIONS

Category: Basic Science

2544 - ESSENTIAL ROLE OF NONO HOXA1 WNT AXIS IN CARDIOMYOCYTE DIFFERENTIATION AND MATURATION

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Background / Hypothesis:

NONO is recognized as a critical molecular scaffold involved in both transcriptional and posttranscriptional regulation. Mutations in NONO are frequently linked to congenital heart diseases (CHDs) in humans.However, the mechanisms by which NONO regulates cardiac development remain elusive.

Results:
Here, we identified NONO as a pivotal dual-function regulator of cardiomyocyte differentiation in human induced pluripotent stem cells (hiPSCs). NONO deficiency in hiPSCs results in two distinct defects: one affecting early cardiomyocyte differentiation and the other impairing cardiomyocyte maturation. Mechanistically, NONO interacts with HOXA1 and regulates the dynamic expression of key genes during early cardiomyocyte differentiation. ChIP-seq analysis reveals that NONO loss reduces HOXA1 occupancy at target genes, compromising its transcriptional regulation. Additionally, NONO and HOXA1 cooperatively activate the Wnt signaling.

Conclusions:
Taken together, these findings establish the NONO-HOXA1-Wnt axis as a key molecular mechanism in cardiomyocyte differentiation/maturation and provide new insights into the etiology of CHDs associated with NONO mutations.

POSTER PRESENTATIONS

Category: Basic Science

2545 - ZMIZ2 DRIVES CARDIOMYOCYTE DIFFERENTIATION VIA FOXM1 ISOFORM REGULATION

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Background / Hypothesis:

Current evidence suggests that approximately one-third of CHD cases are attributable to genetic factors. This study aims to identify novel candidate pathogenic genes associated with CHD using genetic sequencing data from CHD families and sporadic cases, and to further elucidate the molecular mechanisms.

Materials and Methods:

Peripheral blood samples were collected from members of CHD families and subjected to whole-exome sequencing. Candidate pathogenic variants and genes were identified based on inheritance patterns and bioinformatics analyses. Targeted sequencing of the candidate gene was then performed in a cohort of sporadic CHD patients.To explore the functional roles of the candidate gene, CRISPR/Cas9 technology was used to generate embryonic stem cell (ESC) lines with identified variant. ESCs were then differentiated into cardiomyocytes. Mature differentiated cardiomyocytes were subjected to flow cytometry, immunofluorescence, and calcium transient assays. Furthermore, transcriptomic and proteomic analyses were conducted to investigate the underlying molecular mechanisms.

Results:
In the CHD2656 family, a de novo variant (NM_031449: c.A1468G: p.S490G) predicted to be high pathogenic was identified in ZMIZ2. Targeted sequencing in a sporadic CHD cohort revealed that the mutation frequency of ZMIZ2 was significantly higher than in the gnomAD East Asian population (P = 4.3e-06).
In the in vitro cardiomyocytes differentiation model, both ZMIZ2-KO and ZMIZ2-S490G ESC lines showed a reduced proportion of TNNT2+ cells on day 15 of differentiation, along with disrupted sarcomere structure and reduced peak calcium influx. Proteomic analysis revealed that ZMIZ2 interactome was enriched in RNA splicing pathways. Alternative splicing analysis further showed that the isoforms of the transcription factor FOXM1which regulates 1,578 DEGs on cardiomyocytes switched since day 5 of differentiation. The interaction between FOXM1 mRNA and ZMIZ2 was validated with RIP-seq.

Conclusions:
ZMIZ2 is a novel candidate pathogenic gene for congenital heart disease. ZMIZ2 regulates the isoforms switch of FOXM1 to influence the cardiomyocytes differentiation.

POSTER PRESENTATIONS

Category: Basic Science

2610 - TO INVESTIGATE THE CHANGES AND CLINICAL SIGNIFICANCE OF PERIPHERAL BLOOD T LYMPHOCYTE SUBSETS IN CHILDREN WITH KAWASAKI DISEASE BASED ON SINGLE CELL TRANSCRIPTOME SEQUENCING TECHNOLOGY

Shuhui Wang [1], Haitao Lv [1]
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Background:
To establish the peripheral blood immune cell profile of KD children based on single cell transcriptome technology (scRNA-seq), and to detect the peripheral blood T lymphocytes and their subsets before and after IVIG treatment,This study provides new insights into the role of adaptive immunity in the pathogenesis and treatment of KD.
Method:
After the same amount of mixed samples, scRNA-seq was performed on the 10× Genomics sequencing platform to compare and analyze the changes of T cell subsets and differential gene expression. The cytokine protein chip was used to detect the plasma of sensitive group and resistant group before and after treatment, and the most obvious changes in cytokines were screened out and verified by ELISA. Flow cytometry was used to detect the changes of T cells and their subsets in the peripheral blood of KD children.

Result:
The expression of PD-1 on CD8+T cells in IVIG-sensitive group decreased after treatment, while the expression of PD-1 on CD8+T cells increased in IVIG-unresponsive group after treatment. After stimulated by PMA and Iono, the levels of IL-2 and TNFα+ IFN-γ+ secreted by CD8+T cells in IVIG-sensitive group increased after treatment, while those in IVIG-non-response group decreased. These results suggest that CD8+T cells in non-IVIG response group were exhausted after treatment.

Conclusions:
Single-cell transcriptome sequencing is the first time to map the immune cells in peripheral blood of IVIG-unresponsive KD, and T cells are involved in the development of IVIG-unresponsive KD. When the percentage of CD4+HLA-DR+T cells was more than 1.14, the sensitivity was 100%, the specificity was 76.7%, the positive predictive value was 58.8%, and the negative predictive value was 100% for the diagnosis of non-response to IVIG. The CD8+T cells in non-response to IVIG tended to be exhausted.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

1083 - FACTORS ASSOCIATED WITH INTENSIVE CARE UNIT ADMISSION AFTER ELECTIVE PEDIATRIC CARDIAC CATHETERIZATION

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Background / Hypothesis:
As pediatric cardiac catheterization and interventional procedures become more complex and involve critically ill children, there's an increased need for post-procedure ICU admissions. The primary objective was to evaluate if patient demographic data is associated with ICU admission following elective pediatric cardiac catheterization. The secondary objectives were to evaluate the association between ICU admission and the preoperative ASA physical grade and the pre-catheterization diagnosis category, physiological category, and procedure risk category based on the based on the Catheterization Risk Score[CRISP] for Pediatrics online model.

Materials and Methods:
193 pediatric patients who underwent elective cardiac catheterization between 1st June 2023 and 31st May 2024 were included in this prospective observational study at a tertiary cardiac care center. Children meeting the inclusion criteria were shifted to the ICU or high dependency/general ward post-procedure. Demographic data (age, gender, weight), ASA physical status, pre-catheterization diagnosis, and physiologic and procedure risk categories based on the CRISP model were recorded and compared. An attempt was made to identify independent factors associated with ICU admission.

Results:
A total of 193 children were enrolled, but only 169 were eligible. 27 patients were admitted to the ICU. Univariate analysis showed that age ($p<0.001$), weight ($p<0.01$), ASA Grade 4 physical status ($p=0.001$), CRISP categories 2 and 3 of pre-catheterization diagnosis and physiology were factors associated with ICU admission. Multivariate analysis showed weight ($p=0.029$), ASA physical grade 4 ($p=0.024$), CRISP pre-catheterization diagnosis category 3 ($p=0.048$), and physiologic risk category 3 ($p=0.025$) were independently associated with ICU admissions after elective cardiac catheterization.

Conclusions:
The results indicated that a child's weight, ASA physical grade, and the diagnosis and physiologic categories by the CRISP model may predict the likelihood of a pediatric patient requiring an ICU bed after cardiac catheterization procedures.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

1084 - PREDICTORS OF EXTENDED MECHANICAL VENTILATION AFTER COMPLETE ATRIOVENTRICULAR SEPTAL DEFECT REPAIR IN CHILDREN WITH TRISOMY 21

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Background / Hypothesis:
Variable durations of mechanical ventilation following a complete atrioventricular septal defect have been suggested. The primary objective of this study is to identify factors that may suggest a mechanical ventilation duration longer than 24 hours, assuming that 24-hour mechanical ventilation is a benchmark for these patients undergoing intracardiac repair. The factors considered were patient demographic data, cardiopulmonary bypass data, vasoactive inotrope score on admission to the intensive care unit, serial lactate values, presence of arrhythmias, and leucoglycemic index [LGI] values on arrival to the intensive care unit.

Material and methods:
One hundred and ten pediatric cardiac patients with Trisomy-21 undergoing primary elective AV canal repair between January 1st, 2021, and December 31st, 2023 were included . The Demographic and cardiopulmonary bypass data, baseline hemodynamic and ABG data, vasoactive inotrope score index [VIS] on admission to PICU, postoperative lactate values [0, 2 & 4 hrs], preoperative & postoperative Leucoglycemic index [LGI], duration of mechanical ventilation, intensive care unit stay, total hospital stay, duration of vasopressor administration, in-hospital postoperative mortality were recorded for all patients. Postop. mechanical ventilation was considered prolonged if >24 hours. An ICU stay was considered long if > 2 days. Hospital stay was considered long if > 7 days

Results:
One hundred and four patients completed the study. The incidence of extended ventilation was 38.5% [95% C.I. 29.1-48.5]. Univariate analysis showed that the duration of CPB, ACC time, VIS on ICU admission, and LGI score on ICU admission were associated with the duration of MV. Multivariate logistic regression analysis showed that the VIS score on ICU admission was an independent factor for predicting prolonged MV.

Conclusion:
Vasoactive Inotrope Score (VIS) on ICU Admission is an independent predictor of prolonged mechanical ventilation in children with Trisomy 21 post-cardiac surgery

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

1175 - ANAESTHETIC MANAGEMENT OF THE PERSONALISED EXTERNAL AORTIC ROOT SUPPORT(PEARS) PROCEDURE

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Background / Hypothesis:
The Personalised External Aortic Root Support(PEARS) procedure involves implanting a custom made, macroporous mesh(ExoVasc®) around the patient's dilated aortic root/ ascending aorta(AA) to prevent it from further expansion. It is offered to patients with genetically driven aortopathies such as Marfan syndrome(MFS).

The first PEARS was done twenty years ago. However, there is little published on its anaesthetic management.

Materials and Methods:
A 41 year old male with MFS and dilated aortic root(45mm) underwent the PEARS procedure.

Anaesthesia was mantained using total intravenous anaethesia. The surgery involves sternotomy, followed by mobilisation of the aortic root and AA, then placement of the mesh. Controlled hypotension was used to facilitate dissection and mobilization of the AA around the coronaries and at the aortoventricular junction. It was performed off-pump to preserve the normal anatomical relations of the aortic root. Remifentanil, sodium nitroprusside and glyceryl trinitrate were titrated to achieve a systolic blood pressure below 65MmmHg. INVOS™ regional oximeter(Somanetics, Medtronic) was used to monitor oxygen saturation. He had 2 runs of atrial fibrillation that aborted with synchronized cardioversion.

A trans-oesophageal echocardiogram was placed to measure the aortic root, assess the aortic valve, visualize the coronaries and monitor for regional wall motion abnormalities.

Intravenous morphine and paracetamol were administered and bilateral parasternal intercostal nerve blocks was performed.

The total operative time was 174 minutes.

Results:
The patient was extubated on-table and transferred to the intensive care unit. He was discharged home on POD4.

Conclusions/discussion:
Controlled hypotension is usually well tolerated in young patients. Surrogate markers of tissue perfusion such as cerebral oximetry can be used.
Complications such as arrhythmias, hemodynamic instability or injury to the coronaries may necessitate the emergent use of cardiopulmonary bypass. It is important to assess the coronaries after mesh implantation.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

1180 - HOW COOL IS TOO COOL THE IMPACT OF TEMPERATURE ON CEREBRAL PERFUSION AND AUTOREGULATION IN NEONATES UNDERGOING CARDIAC SURGERY

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Background:
Improved treatment of congenital heart disease (CHD) have increased survival rates, but neurodevelopmental delays remain prevalent in up to 50% of children – negatively impacting quality of life. Historically, hypothermia is a key neuroprotective strategy during cardiac surgery. Despite its widespread use, the impact of hypothermia on cerebral perfusion and cerebrovascular autoregulation (CA) in neonates remains poorly understood, with conflicting evidence in literature. We aimed to investigate the association between temperature, cerebral blood flow velocity (CBV), and CA in neonates undergoing cardiac surgery.

Methods:
A prospective cohort study (ClinicalTrials.gov ID: NCT04713605) with neonates undergoing cardiac surgery with cardiopulmonary bypass was performed. Bilateral CBV in the medial cerebral artery and invasive arterial blood pressure (ABP) were continuously measured. CA was evaluated using the mean flow index (Mxa). Mxa and time with impaired CA were compared between different degrees of hypothermia and across surgical phases. A multivariate analysis of variance was used for statistical comparisons.

Results:
Forty-one neonates, mean gestational age of 7.95 days at surgery, were included. A linear relationship (beta = 0.75 mmHg/degree Celsius) was found between temperature and MAP. Analysis across surgical phases revealed that mean Mxa and percentage of time with impaired CA were higher during cooling (0.52 and 71%) and rewarming (0.30 and 54%) compared to pre- (0.13 and 20%) and post-bypass (0.24 and 39%) and during stable hypothermia (0.17 and 40%).

Conclusions:
Cooling and rewarming during neonatal cardiac surgery were associated with impaired CA to a greater extent than stable hypothermia. Furthermore, this study found an inverse relationship between target body temperature and Mxa, associating higher temperatures with more impaired CA. However, this finding may be confounded by blood pressure. We are a step closer to understanding the hemodynamic effects on brain perfusion during cardiac surgery, but we need prospective studies on hypothermia and perfusion

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

1240 - VALIDATION OF A NOVEL METHOD FOR NONINVASIVE MIXED VENOUS OXYGEN SATURATION MONITORING IN ANESTHETIZED CHILDREN

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Background / Hypothesis:
Mixed venous oxygen saturation (SvO 2) is a critical variable in the assessment of oxygen supply and demand but is rarely used in children due to the invasive nature of pulmonary artery catheters. The aim of this prospective, observational study was to investigate the accuracy of noninvasively measured SvO 2 acquired by the novel capnodynamic method, based on differential Fick equation (Capno-SvO 2), against gold standard CO-oximetry.

Methods:
Capno-SvO 2 was compared to SvO 2 measured by pulmonary artery blood gas CO-oximetry in children undergoing cardiac catheter interventions and subjected to moderate hemodynamic challenges. Bland-Altman analysis was used to describe the agreement of absolute values between CO-oximetry and Capno-SvO 2 , and a concordance rate was calculated to evaluate the ability of Capno-SvO 2 to track change.

Results:
Twenty-five procedures were included in the study. Capno-SvO 2 showed a bias toward CO-oximetry of +3 percentage points; upper and lower limits of agreement were +11 percentage points (95% confidence interval [CI], 9-14) and -5 percentage points (95% CI, -8 to -3), respectively. The concordance rate was 92% (95% CI, 89-96).

Conclusions:
In conclusion, this first clinical application of a novel concept for noninvasive SvO 2 monitoring without the need for a pulmonary artery catheter indicates that Capno-SvO 2 generates absolute values and trending capacity in close agreement with the gold standard reference method.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

1249 - USE OF PARAVERTEBRAL BLOCK IN PEDIATRIC CARDIAC SURGERY. A PROSPECTIVE COHORT STUDY.

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Background / Hypothesis:

Pain remains the challenge in the perioperative period in pediatric cardiac surgery. Inadequate pain management can lead to excessive physiological stress, respiratory complications, use of high doses of opioid analgesics, development of chronic pain syndrome, and delayed postoperative recovery.
Our objective was to evaluate the efficacy and safety of paravertebral block (PVB) in pediatric cardiothoracic surgery.

Materials and Methods:
A prospective cohort study on the use of PVB in pediatric cardiac surgery was initiated in August 2023 in our centre.
Inclusion criteria were: elective cardiac surgical interventions, patient age from 1 to 18 years.

Results:
Sixty-six patients were enrolled in the study, 37 (56%) received the block. Age, body weight, duration of surgery, cardiopulmonary bypass time, and aortic cross-clamp time did not differ significantly between the groups.
The intraoperative fentanyl requirement differed significantly between the groups: 1.25 mcg/kg/h, IQR [1;1.8] in the PVB group and 8.3 mcg/kg/h, IQR [7.5;10.9] in the non-block group, p-value < 0.001. The postoperative dose of fentanyl also significantly differed between the groups: 0.77 mcg/kg/h (95% CI 0.7–0.87) in the block group and 1 mcg/kg/h (IQR [0.96;1.13]) in the non-block group, p-value < 0.001.
The duration of postoperative mechanical ventilation in the PVB group was 0 minutes [0;30], and 120 minutes [85;190] in the non-block group, p-value < 0.001. In the PVB group, 24 patients (64.9%) were extubated in the operating room.
In the PVB group, postoperative nausea and vomiting (PONV) occurred in 4 patients (10.8%), while in the non-block group, it occurred in 17 patients (58.6%). The relative risk of PONV with PVB was 0.19 (95% CI 0.07–0.5).

Conclusions:
Based on the obtained data, it can be suggested that the use of regional anesthesia has a favorable impact on the perioperative care in children undergoing cardiac surgery. However, further studies are required to confirm these findings.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

1283 - CEREBRAL AUTOREGULATION DURING ANTEGRADE CEREBRAL PERFUSION IN NEONATES UNDERGOING CONGENITAL CARDIAC SURGERY

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Background / Hypothesis:
Antegrade cerebral perfusion (ACP) is utilized for brain protection during aortic arch reconstructions. Optimal ACP flow, to avoid excessive or inadequate flow is unknown. Cerebral autoregulation regulates flow, protecting the brain from edema and ischemia. However, it is unknown whether autoregulation remains intact during ACP. This study aims to determine whether neonates exhibit cerebral autoregulation during ACP. Our hypothesis is that vasoreactivity is functional.

Materials and Methods:
This is a retrospective study of all neonates who underwent cardiac surgery with cardiopulmonary bypass (CPB) and ACP between Aug. 2021 to Jan, 2025. Demographics, procedural data and physiologic waveform including blood pressure and cerebral oximetry were collected. The primary outcome is Hemoglobin Volume Index (HVx), which is calculated as a moving Pearson correlation coefficient between mean arterial blood pressure (MAP) and the regional total hemoglobin (THb). THb is obtained from near-infrared reflectance spectroscopy using light that is isosbestic for hemoglobin species. Below the lower limit of autoregulation (LLA), THb and MAP will positively correlate. Cerebral autoregulation curves were constructed for each patient to determine the LLA using an HVx cutoff of >/= 0.2.

Results:
59 cases involving 58 unique patients were included. The median age was 5 days (IQR 3, 9), weight was 3.2kg (IQR 2.9, 3.5), CPB time was 163min (IQR 143, 182) and ACP time was 61min (IQR 47, 77). The median LLA was 37.2mmHg (IQR 34.5, 41.12) and the MAP during ACP was 31.3mmHg (IQR 28.2, 34.7). 17 patients (28.8%) demonstrated intact autoregulation. Patients who showed intact autoregulation had significantly less hypotension (LLA–MAP) compared to those who did not show intact autoregulation, 4.98mmHg (IQR -0.5, 7.17) vs. 8.42mmHg (IQR 4.6, 12.3), p = 0.029.

Conclusions:
This study demonstrated that neonates retain the ability to autoregulate during ACP. Hypotension below LLA is associated with impaired autoregulation during ACP.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

1459 - ERECTOR SPINAE PLANE BLOCK VERSUS RETROLAMINAR BLOCK FOR PERIOPERATIVE ANALGESIA IN PEDIATRIC CARDIAC SURGERY A RANDOMIZED CONTROLLED TRIAL

Rajesh Mdavathazathil Gopalakrishnan [1], Shinde Nilkanth Dattatraya [1], Georg Gutjahr [2], Malavika Krishnakumar [2], Sreelakshmi P Leeladharan [1], Sharath Padhmanabhan [1], Diana Thomas [1], Raman Krishna Kumar [3]
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Background / Hypothesis:
In pediatric cardiac surgery, enhanced recovery protocols and opioid-sparing strategies highlight the role of myofascial blocks for perioperative analgesia. The erector spinae plane block (ESPB) is well-established, while the retrolaminar block (RLB), though less studied, offers a safer, landmark-based alternative. This study compares the effectiveness of RLB with ESPB in attenuating the surgical incision response, alongside comparisons of block administration time, anesthetic and opioid use, postoperative pain, ICU outcomes, and ventilatory resource utilization.

Materials and Methods:
A prospective, randomized, double-blinded controlled trial was conducted in a pediatric cardiac surgery unit at a tertiary care center. Patients aged 1 day to 18 years undergoing elective surgery were randomized into ESPB and RLB groups. Emergency cases were excluded. Blocks were performed under ultrasound guidance by separate anesthesiologist, with both the treating anesthesiologist and intensivist blinded to the group assignment. Sample size calculation (145 patients per group) ensured 90% power ($\beta = 0.90$) to demonstrate non-inferiority, based on a 70% success rate for block efficacy (defined by <20% HR increase after incision).

Results:
This study represents the first comparative analysis of ESPB and RLB in pediatric cardiac surgery. Baseline demographic characteristics, RACHS scores, and intraoperative variables were comparable between groups. A >20% increase in heart rate following surgical incision was observed in 22% of the ESPB group and 27% of the RLB group ($p = 0.3$). No significant differences were noted in block performance time, intraoperative sevoflurane, dexmedetomidine, and fentanyl consumption. Postoperatively, pain (CPOT) and sedation (PSAS) scores at 2, 6, and 12 hours were equivalent across groups. Intensive care unit outcomes, including duration of mechanical ventilation, length of stay, reintubation rates, and associated costs, did not differ significantly.

Conclusions:
RLB is non-inferior to ESPB regarding efficacy, time taken to administer, safety, analgesia duration, and immediate postoperative outcomes in pediatric cardiac surgery.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

1525 - DECISION MAKING AND TIMING OF INTERVENTIONS IN A COMPLEX NEONATAL SURGICAL CASE WITH POSTNATALLY DIAGNOSED CONGENITAL HEART DISEASE

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Background:
The occurrence of coexisting esophageal atresia (EA) with tracheoesophageal fistula (TEF), duodenal atresia (DA) and total anomalous pulmonary venous return (TAPVR) is rare.
Due to coexistence of multiple surgical emergencies requiring specific surgical timing and perioperative care, this condition requires careful multidisciplinary decision making to avoid short- and long-term complications.

Case Presentation:
We present a case of a premature male newborn, with prenatally diagnosed EA. After birth he underwent a standardized VACTERL screening in our hospital, where DA and non-obstructed supracardiac TAPVR were discovered. At day 1 after birth, during uncomplicated general anesthesia, the patient underwent two procedures: tracheoscopy which showed very short carina-to-fistula distance, and a duodenal atresia repair. Several multidisciplinary discussions took place to establish a sequence for the repair of the two remaining conditions: EA with TEF and non-obstructed supracardiac TAPVR. These multidisciplinary discussions involved pediatric cardiac anesthesiologists, surgeons, intensivists, cardiologists and neonatologists. The risks on anesthesiologic complications during thoracoscopy in the presence of unrepaired TAPVR were estimated to be high. The presence of a TEF caused difficult mechanical ventilation which could be detrimental during TAPVR correction. We performed a two-step OE repair, with binding the fistula first, and OE repair only after early TAPVR correction. The patient underwent all three procedures without intraoperative complications. He went home after 3 months stay in our children's hospital.

Conclusion:
Individual approach with rigorous pre- and post- operative assessment by a multidisciplinary team during admission, resulted in an uncomplicated and successful treatment.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

1696 - ASD CLOSURE VIA AXILLARY APPROACH

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Background:
There are several advantages to the axillary minithoracotomy approach for an atrial septal defect (ASD) repair, including reduced surgical trauma, faster recovery, and a more aesthetically pleasing cosmetic outcome, especially for female patients.

Case/Methods:
3yo Female with a secundum ASD. The family was offered device closure in the cath lab or open surgical closure on cardiopulmonary bypass (CPB). The parents were concerned about potential complications with the cath procedure but were still concerned about the surgical scar, so they were offered a minimally invasive thoracotomy approach.

The Patient was taken to the OR, had an inhalation induction and intubated for the surgery. The patient had two peripheral IVs, a right radial arterial line, and a right IJ CVP, and TEE for the case. The patient was placed in the left lateral decubitus position and tidal volumes were reduced for surgical visualization.

Results:
The ASD was repaired via axillary minithoracotomy approach on cardiopulmonary bypass (CPB) without complications. The patient was extubated in the OR and transported to the ICU. The patient was discharged from the ICU home.

Conclusions:
There are several options to close a secundum ASD. The cath lab device closure option does have risks and potential complications, including migration of the device, embolization, bleeding, device thrombosis, failed closure, infection, and arrhythmias. Some of these complications are also present for the open heart repair option, including infection, bleeding, and arrhythmias. The open heart procedure provides the safety of having the CPB available for any cardiac or pulmonary complications and also has a minimally invasive approach via thoracotomy by the right axillary approach.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

1788 - DEVELOPING A SCORING SYSTEM FOR ON TABLE EXTUBATION FOLLOWING PEDIATRIC CARDIAC SURGERY CONSTRUCTING THE FRAMEWORK WITH MULTIVARIATE REGRESSION MODELS

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Background / Hypothesis:
On-table extubation (OTE) following pediatric cardiac surgery has multiple purported advantages which have been extensively researched and published in the past. However, formal criteria for OTE decision making are used by very few practitioners. At our hospital, we have been following an OTE protocol since 2018. We believe that a migration of our protocol into a formal scoring system would ensure more widespread use of OTE technique. This expertise could be crucial in transforming extubation practices and optimizing the advantages of early extubation, particularly benefiting resource-limited countries. Through this study we aim to identify risk factors for failed extubation, which would then be used as additional parameters to be included in the OTE scoring system.

Materials and Methods:
Data was collected prospectively from January 1, 2023 to December 31, 2023, including all children undergoing cardiac surgery at our center. We exclude neonates, RACHS score > 4, preoperatively ventilated children and emergency surgeries from the OTE pathway. We performed univariate regression analysis to identify risk factors which contribute to reintubation as well as early extubation (within 6 hours of surgery). Covariates with a p value < 0.2 were then used to build multivariate regression models.

Results:
Amongst the 336 children, 142 (42.3%) were extubated on table, 20 (6%) were extubated within 6 hours, 97 (28.9%) were extubated between 6-12 hours and 77 (22.9%) were extubated beyond 12 hours of surgery. Younger age, lower body surface area, higher RACHS score, prolonged surgery and cardiopulmonary bypass time were some of the risk factors which were used to construct the multivariate regression model. We also found an increased incidence in overall complication rate if extubation was delayed beyond 12 hours of surgery.

Conclusions:
Multivariate model building has helped identify the predictors which would influence the OTE scoring system.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

2041 - ON TABLE EXTUBATION IN DOWN SYNDROME CHLDREN UNDERGOING CONGENITAL HEART SURGERY A CASE SERIES

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Background / Hypothesis:
Craniofacial and cardiac anomalies of Down syndrome places these children at higher risk of anesthesia-related complications following cardiac surgery. We have been routinely implementing an on-table extubation (OTE) protocol at our institute since 2023. We want to report the success of this OTE protocol when implemented in patients with Down syndrome as there are few reports of the same in literature.

Materials and Methods:
Data was collected retrospectively for Down patients undergoing congenital heart surgery (CHS) at our institute from January 1, 2023 till March 1, 2025. All patients were anesthetized with an identical anesthetic protocol. All children received supplemental analgesia in the form of either a transversus thoracis plane block (TTPB- when plane was visualized) or pecto-intercostal fascial block (PIFB- when TTPB plane is not visualized). Criteria used for extubation included stable hemodynamics with minimal inotropic supports (Vasoactive Inotropic Score < 10), absence of severe pulmonary artery hypertension (pulmonary artery pressures > 40 mmHg), optimal echocardiographic, coagulation and respiratory parameters.

EC Number: 2025/ IEC/ 009

Results:
Of the 11 Down patients who were operated, we were able to successfully extubate 9 patients in the operating room. Of the 9 patients, 4 children underwent ventricular septal defect (VSD) closure, 4 children underwent repair for complete atrioventricular canal defect (CAVCD) and one child underwent intracardiac repair for double outlet right ventricle (DORV). The age of the children ranged from 1 to 12 months while the weight ranged from 2.7 to 7.5 kilograms. None of the patients required reintubation or had any other complication during their hospital stay. The mean duration of ICU stay and hospital stay were 29.33 + 10.58 hours and 113.7 + 26.32 hours.

Conclusions:
On-table extubation is a safe practice following CHS in appropriately selected Down syndrome children.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

2067 - CALCULATING VARIABILITY IN CEFAZOLIN CONCENTRATIONS IN THE CARDIOPULMONARY BYPASS PRIME IS A WEIGHT BASED DOSE APPROPRIATE

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Duke University Medical Center, School Of Medicine, Durham-United States [1] Duke University Medical Center, Department Of Anesthesia, Durham-United States [2]

Background / Hypothesis:
Antibiotic dosing regimens for pediatric cardiac surgery vary widely, with 65% of institutions adding a weight-based antibiotic dose into the CPB prime. Previous literature supports this approach, but the optimum dose has not been elucidated. Our aim was to calculate antibiotic concentrations present in CPB prime volume (PV) and total circulating volume (TCV) using weight-based dosing. Our hypothesis was that this method risks large variability in antibiotic concentrations.

Methods:
We performed a retrospective analysis of pediatric patients who received cardiac surgery with CPB at our institution between 1/1/2023-9/30/2023. 208 records were reviewed using EPIC and VIPER. Patients were divided into four age groups: neonate (<29 days), infant (29-365 days), child (1-12 years), and teenager (12-18 years). TCV was defined by EBV plus PV. Cefazolin concentrations in PV and TCV were calculated using an assumed weight-based cefazolin dose of 30 mg/kg and the average PV for each circuit size. Welch's ANOVA was performed to determine statistical significance.

Results:
The calculated cefazolin concentrations ranged from 19.7-356.1 mg/100 mL in PV and 12.6-38.3 mg/100 mL in TCV. The concentrations increased proportionately to weight for each circuit, with reduced concentrations present in patients at the lowest weight range. There was a statistically significant difference in antibiotic concentrations among the three circuits (p = 4.1423E-113).

Conclusions:
Antimicrobial prophylaxis for pediatric cardiac surgery using CPB remains non-standardized despite consensus guidelines. A national survey identified 30 mg/kg cefazolin as the most common dose, yet studies suggest that concentrations >30 mg/100 mL in PV are often required to achieve therapeutic plasma levels (TCPC >40 mg/L) in 80% of patients. Our findings confirm that weight-based dosing leads to extreme variability in both PV and TCV concentrations, putting certain patients at risk for inadequate coverage. Future steps include pKa analysis to determine if dosing by TCV leads to consistent and adequate tissue plasma concentrations.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

2167 - NEODOPPLER INSTANTLY DISPLAYS CEREBRAL BLOOD FLOW VELOCITIES DURING CARDIAC SURGERY AND INTENSIVE CARE

Jakob Klcovansky [1], Hans Torp [2], Gunnar Bentsen [3], Gaute Døhlen [1], Siri Ann Nyrnes [4]
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Background / Hypothesis:
NeoDoppler has emerged as a new technique for continuous monitoring of cerebral perfusion in children with an open fontanelle. A small ultrasound probe is placed above the anterior fontanelle and measures blood flow velocities in the brain, displaying the Doppler spectrum in real-time and at several depths simultaneously. Cerebral blood flow velocities are displayed continuously as curves and numerical values, including systolic, mean, and diastolic velocities.

Materials and Methods:
We wish to briefly describe two cardiac surgery cases where NeoDoppler has added valuable clinical insight. Patient a) had elective surgery for a large VSD, whereas patient b) had emergency surgery for a hypoplastic arch.

Results:
Patient a) underwent successful intracardiac repair, but upon right atrial closure damage of the venous intima in the SVC was revealed. During repair with bulldog clamps, NeoDoppler immediately displayed reduced cerebral arterial flow velocities which normalized instantly when the bulldog clamps were released. CVP increased during clamping of the SVC, while arterial blood pressure remained unaffected. Cerebral arterial flow velocities decreased during SVC clamping because of reduced pressure difference between arteries and veins. Significantly, end-diastolic velocity was reduced to zero, which means CVP equalled diastolic pressure during clamping.

Patient b) underwent arch repair and was successfully weaned from cardiopulmonary bypass. Approximately two hours after surgery, the patient suddenly deteriorated with severe arterial hypotension requiring chest compressions but without cardiac arrest. As expected, NeoDoppler showed decreased cerebral arterial blood flow velocities during hypotension. However, a few minutes after CPR, NeoDoppler displayed increased arterial blood flow velocities for a short period of time. This represents cerebral reperfusion and hyperflow after a period of severe hypotension.

Conclusions:
NeoDoppler can be a valuable tool for instantly displaying pathological changes in cerebral arterial blood flow velocities. It is a promising method for monitoring cerebral perfusion in neonates and infants during cardiac surgery.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

2178 - PATIENT AND ANESTHETIC CONSIDERATIONS IN ROBOT ASSISTED PEDIATRIC CONGENITAL CARDIAC SURGERY

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Duke University, Anesthesiology, Durham-United States [1] Duke University, Cardiac Surgery, Durham-United States [2]

Background / Hypothesis:
Minimally invasive techniques in cardiac surgery began in the early 1990s, with the intention of minimizing operative trauma, particularly in children. Surgical access is achieved using standard 8mm port incisions, reducing pain and bleeding while expediting recovery and hospital discharge. The ability to safely perform robot-assisted cardiac surgery in children and adolescents is predicated upon individual anatomy. Of particular importance are the dimensions of the thoracic cavity, and the potential for peripheral cannulation are considerations. The adaptation of robotic assistance in the context of pediatric cardiac surgery remains limited, and here we describe the experience at our institution.

Materials and Methods:
A retrospective chart review analysis of patients aged 21yr and under years who underwent robot-assisted cardiac surgery was performed. Outcomes included operative time, bypass time, need for post operative ventilation, ICU and hospital length of stay.

Results:
11 patients met the inclusion criteria, with a minimum age of 10 years, a minimum weight of 32kg. 10 patients underwent atrial septal defect closure, while one patient underwent mitral valve repair. 8 patients were extubated in the operating room, one case required reoperation for bleeding, one case required hyperbaric oxygen for air gas embolism. The mean hospital length of stay was 5 days, and mean ICU stay was 55 hours.

Conclusions:
Robotic-assisted cardiac surgery in pediatric patients can be safely performed. Our case series includes a 32kg, 10yr old patient, the youngest and smallest reported in the literature. Unique challenges require judicious planning. Institutional experience with pediatric robotic-assisted surgery may play a valuable role in enhanced recovery after pediatric cardiac surgery.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

2255 - EFFECTS OF SUBCUTANEOUS VERSUS TOPICAL NITROGLYCERIN ON DIAMETER AND EASE OF RADIAL ARTERY CANNULATION IN PEDIATRIC PATIENTS UNDERGOING SURGERY A RANDOMISED CONTROLLED STUDY

Chandni Verma [1], *Rajarajan Ganesan* [1], Varun Mahajan [1], Indranil Biswas [1], Banashree Mandal [1], Preethy Mathew [1]
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Background / Hypothesis:
Peri-arterial subcutaneous nitroglycerin (NTG) injection and topical NTG patch have been shown to be superior compared to placebo in increasing the radial artery internal diameter in children. However, there is no study comparing the two interventions. Hence, we conducted a non-inferiority randomized controlled trial, hypothesizing that topically administered NTG is non-inferior to subcutaneous NTG injection in enhancing the internal diameter of the radial artery

Materials and Methods:
Forty five Patients of age group 2-8 years undergoing cardiac or non-cardiac surgery at a single tertiary care hospital were randomized to receive either ultrasound guided subcutaneous NTG injection at a dose of 5 mcg/kg in 0.5ml of normal saline following anesthesia induction (group SC)or 40mg NTG topical patch 30 minutes before induction (group T). Baseline ultrasound dimensions of the radial artery were obtained in the pre-operative area in both the groups and post-intervention measurement was performed after anaesthesia induction in group T and 3 minutes after the injection in group SC. The ultrsound guided cannulation procedural outcomes and hemodynamics were also assessed.

Results:
The baseline radial artery internal diameters were similar in both the groups at baseline and post-intervention.(table) The percentage increase in diameters was higher and the depth of the radial artery was lesser in group T compared to group SC. The first attempt success rate and procedure time in group SC vs. group T were 81.8% (n=18) vs. 100%(n=23) and 20.64 ± 8.2 vs. 18.30 ±5 seconds respectively.There was no local complications or hemodynamic disturbance in both the groups.

Conclusions:
The topical NTG patch was superior to the subcutaneous NTG injection in increasing the diameters and cross-sectional area of the radial artery without significantly affecting the depth of the radial artery.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

2347 - VENUS P VALVE A SINGLE CENTER EXPERIENCE

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Background:
Adults with congenital heart disease (ACHD) remain a true challenge for the anesthesiologist who has to provide anesthesia care in the catheterization laboratory. Chronic pulmonary valve regurgitation is the culprit of mid and long-term complications in patients with Tetralogy of Fallot (TF) repair with trans annular patch. The percutaneous pulmonary implant appears as an ideal technique in these patients, reducing morbidity and mortality by avoiding surgery. Venus p-valve is a self-expanding percutaneous heart valve designed for implantation in a native patched right ventricle outflow tract (RVOT). We report our initially experience in this procedure concentrating in the anesthetic management and perioperative complications.

Methods:
After consent was obtained, 10 patients were selected for percutaneous Venus p-valve implantation (6 female, 4 male). Mean age was 37 years (range 13-70), mean weight 57.5 kg (range 40-75). Inclusion criteria were TF post trans annular patch with severe pulmonary regurgitation; right ventricle dilation and dysfunction (NYHA class II) requiring pulmonary valve replacement. Monitoring: pulse oximetry, pletysmography, EKG, capnography, cerebral oximetry and invasive hemodynamic monitoring. The anesthetic management was standardized. After cannulation radial artery and insertion 2 large IV line, induction of anesthesia was accomplished with fentanyl 2µg/kg, atracuriun 0.5mg/kg and propofol 2mg/kg. Maintenance of anesthesia was achieved with sevoflurane 2% and remifentanil 0.3mcg/kg/min. Extubation was performed under remifentanil to prevent cough or any sudden movement that may cause valve dislodgment.

Results:
The implantation procedure was successful in all the patients resulting in an immediately functional valve. No patient experienced hemoptysis after deployment of the valve. One patient had AV block that resolved after 6 hours. All patients remained 24hrs in de ICU and then were discharged home.

Conclusions:
Percutaneous pulmonary valve replacement with the Venus p-valve was safe and effective in our initial cohort of patients.

POSTER PRESENTATIONS

Category: Cardiac Anaesthaesia

2461 - A PAEDIATRIC CASE OF HARLEQUIN SYNDROME WITH PERIPHERAL CARDIO PULMONARY BYPASS FOR RE DO CARDIAC SURGERY

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Case Summary
Twelve-year-old boy presented for cardiac re-do sternotomy surgery and RV-PA conduit replacement on a background of repaired transposition of the great arteries (with abnormal coronary origins, ventricular septal defect and coarctation aorta). Pre-operative workup revealed a midline coronary vessel immediately underlying the sternum and right ventricle adherent to thoracic wall necessitating cautious surgical approach. Otherwise, cardiac function was preserved despite dilated right ventricle and elevated pressures measuring two-thirds systemic from outflow tract obstruction.

Anaesthesia was induced with inhalational induction, intubated and invasive lines sited (radial arterial and left internal jugular venous), bilateral parasternal fascial plane blocks analgaesia and maintained with intravenous anaesthesia. Full cardiac monitoring including 5-lead electrocardiogram, proximal (right-hand) and distal (left-foot) pulse oximetry, cerebral near infrared spectroscopy (NIRS) and processed electroencephalogram (pEEG) were utilised. Operative plan to establish peripheral cardiopulmonary bypass (CPBP) via right femoral artery (using Gore-Tex conduit) and right femoral vein (RFV) before median sternotomy was performed. Peripheral veno-arterial bypass was uneventful and were able to deliver full size matched cardiac index flows. Ventilation was paused to facilitate operative conditions but despite unchanged bypass flows, saturation (SpO2%) indices measured in the right hand and NIRS decreased from 99% and 80 to 60% and 56, respectively, while distal left-foot saturations continued unchanged at 99%. We suspected this hypoxia was a result of ceasing ventilation & suspected the differential proximal-distal nature could be a Harlequin syndrome effect. With resumption of ventilation proximal saturations were quick to normalise. Peripheral bypass with gentle ventilation was then continued through the intracardiac operative phase and easily weaned bypass following completion without further issue.

Conclusion:
Reminder of the benefits of dual upper & lower oxygen saturation monitoring plus an added utility of NIRS. It also shows the safety of instituting peripheral bypass before midline re-sternotomy in high-risk or multiple re-do surgeries.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1019 - HEALTHCARE ASSOCIATED INFECTION MANAGEMENT IN 62 ICUS FOR PATIENTS WITH CONGENITAL HEART DISEASE IN CHINA A SURVEY STUDY

Xiaofeng Wang [1], Zhiyuan Zhu [1], Shilin Wang [1], Chenyu Li [1], Qinnan Chen [1], Xu Wang [1]
National Center For Cardiovascular Disease Fuwai Hospital, Picu, Beijing-China [1]

Background / Hypothesis:
All patients with congenital heart disease (CHD) receive postoperative management in ICUs. Infection prevention and control (IPC) has a significant impact on prognosis. This study provides a preliminary understanding of the fundamental aspects of IPC in ICUs following CHD surgery in China.

Materials and Methods:
From September to October 2023, we initiated a survey on healthcare-associated infection (HAI) management in hospitals that perform CHD surgeries independently. The questionnaires were jointly completed by the ICU physicians and IPC personnel. The contents of our questionnaires covered hospital and ICU capacity, performance of the infection control department, HAI surveillance, implementation of IPC measures, and antimicrobial stewardship (AMS).

Results:
62 of 118 questionnaires were completed with a response rate of 53%. The CHD surgical volume in 2022 of included 62 hospitals was 36342, accounting for 52% of annual CHD surgical volume (69672) across the country. The postoperative infection rates obtained from 15 ICUs varied from 1.3% to 15%, with the median rate of 4.5%. A total of 16 ICUs provided the data of drug-resistant bacteria, Klebsiella pneumoniae exhibited the highest frequency. More than 95% ICUs established complete HAI management system. Information-based HAI surveillance was conducted in 89% ICUs. The rate of hand hygiene, drug-resistant bacteria, and environmental hygiene surveillance achieved a commendable 97%. Over 95% ICUs conducted device-associated infection, surgical site infection and muti-drug resistant organism surveillance. The prevention of surgical site infection exhibits significant heterogeneity. About 67% ICUs stopped prophylactic antibiotics within 48 hours after surgery. In complex cases, carbapenems were administered empirically in 89% ICUs. 98% ICUs took culture before commencing antibiotics.

Conclusions:
A relatively complete HAI management system has been established throughout the country in ICUs for CHD patients. Actions should be taken to facilitate the implementation of IPC measures and AMS bundles. Training and feedback are critical for implementing IPC measures.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1021 - THE EFFECTS OF STANDARDIZED INTRAVENOUS TREPROSTINIL IN PULMONARY ARTERIAL HYPERTENSION PATIENTS AFTER TOTAL CAVO PULMONARY CONNECTION PROCEDURE

Xiaofeng Wang [1], Zhiyuan Zhu [1], Chenyu Li [1], Xu Wang [1]
National Center For Cardiovascular Disease Fuwai Hospital, Picu, Beijing-China [1]

Background / Hypothesis:
For high-risk patients (mean pulmonary arterial pressure, mPAP > 15 mmHg) after total cavo-pulmonary connection (TCPC) procedre, between the inhaled and oral targeted medications, the intravenous treprostinil as a bridge therapy is core postoperative treatment.

Materials and Methods:
This was a single-center retrospective study. High-risk pediatric patients who underwent TCPC procedure from 2015 to 2022 were included. Since the regimen of treprostinil was standardized in 2021, the patients in 2020 and before were included in group 1, patients in 2021 and 2022 were included in group 2. The hemodynamic parameters were compared before and after the maintenance dose of treprostinil. The differences of postoperative recovery were compared between the two groups.

Results:
A total of 51 patients were included. Group 1 included 35 patients who received treprostinil at 1-3 postoperative days and dose of 12 ± 4 ng/(kg·min). Group 2 included 16 patients who received treprostinil within postoperative 1 day at dose of 22 ± 7 ng/(kg·min). There were no significant differences between the two groups in demographic characteristics and surgical data ($p > 0.05$). After 24 h of treprostinil treatment, the mPAP in group 1 reduced from 17 ± 3 mmHg to 15 ± 2 mmHg ($p < 0.001$), and in group 2 from 17 ± 2 mmHg to 14 ± 2 mmHg ($p < 0.001$). In the postoperative recovery, patients in Group 2 exhibited a reduced duration of mechanical ventilation($p = 0.001$) ; a shorter stay in the ICU ($p = 0.006$) ; and a shorter postoperative length of stay ($p = 0.032$). Patients in Group 2 also exhibited a lower incidence of thromboembolic events ($p = 0.043$) and renal replacement therapy ($p = 0.011$).

Conclusions:
Treprostinil reduces pulmonary artery pressure after TCPC procedure. The standardized application of treprostinil may improve the postoperative recovery which should be proven by RCTs.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1024 - EFfiCACY OF INTRAVENOUS TREPROSTINIL IN HIGH RISK SINGLE VENTRICLE PATIENTS UNDERGOING GLENN PROCEDURE

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National Center For Cardiovascular Disease Fuwai Hospital, Picu, Beijing-China [1]

Background / Hypothesis:
Pulmonary hypertension is a crucial factor affecting the recovery after Glenn procedure. This study explores the effects of intravenous treprostinil on hemodynamic status and hospital postoperative recovery under different administration strategies.

Materials and Methods:
We retrospectively included pediatric patients admitted to Fuwai Hospital from 2019 to 2022 who underwent the Glenn procedure and had intraoperative mean pulmonary artery pressure (mPAP) >15 mmHg postoperatively. Patients with non-anatomical single ventricle physiology undergoing the Glenn procedure and those requiring postoperative extracorporeal membrane oxygenation were excluded. Due to the standardized use of treprostinil in our center starting in 2021, patients from 2019–2020 were included in Group 1, and patients from 2021–2022 were included in Group 2. The changes in hemodynamic data before and after medication for both groups of patients, as well as the differences in postoperative recovery, were compared.

Results:
Twenty-eight patients were eventually enrolled in the study. Group 1 consisted of 14 cases, with a maintenance dose of 11±2 ng/(kg·min) 1 to 2 days postoperatively. Group 2 also consisted of 14 cases, with a maintenance dose of 26±7 ng/(kg·min) 1 day postoperatively. After a 24-h observation period, the mPAP decreased from 17±3 to 13±3 mmHg ($p < 0.001$) in the first group and decreased from 18±3 to 13±3 mmHg ($p < 0.001$) in the second group. The vasoactive-inotropic score in the first group decreased from 9 (6,17) to 6 (4,9) ($p = 0.001$) and decreased from 12 (6,23) to 10 (3,15) ($p = 0.002$) in the second group. Group 2 patients had a shorter postoperative hospital stay than Group 1, with durations of 18 (11,22) days and 29 (19,47) days, respectively($p = 0.021$).

Conclusions:
Treprostinil in high-risk patients after the Glenn procedure can decrease pulmonary artery pressure, reduce vasoactive-inotropic score. Standardized use of treprostinil facilitates postoperative recovery and shortens postoperative length of stay.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1030 - RISK FACTORS ANALYSIS OF ADVERSE EVENTS AFTER CARDIAC SURGERY IN CHILDREN WITH RESPIRATORY VIRUS INFECTION INCLUDING SARS COV 2

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National Center For Cardiovascular Disease Fuwai Hospital, Picu, Beijing-China [1]

Background / Hypothesis:
To explore the risk factors associated with adverse events following cardiac surgery in children with respiratory virus infections. The innovation particularly focuses on SARS-CoV-2 infection, symptomatic infections, and the necessity of waiting negative test results prior to surgery.

Materials and Methods:
A single-center, retrospective analysis was conducted on pediatric patients with congenital heart disease who underwent surgical treatment between 2021 and 2022. Patients with positive respiratory viral nucleic acid test before operation were included. Patients who did not have corresponding RACHS-1 categories were excluded from the study. The patients were categorized into two groups based on the postoperative adverse events: Group 1, which experienced adverse events (respiratory bacterial/fungal infections, reintubation, tracheotomy, high-frequency oscillatory ventilation, extracorporeal membrane oxygenation assistance, death), and Group 2, which did not experience. The two groups were compared across age, weight, gender, RACHS-1 categories, cardiopulmonary bypass surgery, palliative surgery, residual cardiac/multisystem malformations, SARS-CoV-2 infection, symptomatic infection, persistent positive viral detection before surgery. Multivariate analysis was performed using logistic regression.

Results:
A total of 216 patients were included in the study, with 55 patients in Group 1 and 161 patients in Group 2. Through multivariate analysis, age (OR 0.975 95%CI 0.957-0.995p=0.013) and symptomatic respiratory infection (OR 3.74, 95% CI, 1.729-8.09, p=0.001) were identified as risk factors for adverse events. The results of the ROC curve analysis indicated that age <12 months combined with symptomatic respiratory virus infection could predict postoperative adverse events with an area under the curve of 0.801, sensitivity of 0.845, and specificity of 0.655.

Conclusions:
Age <12 months and symptomatic respiratory viral infections (both traditional respiratory viruses and SARS-CoV-2) were risk factors for adverse events after cardiac surgery in children with respiratory viral infection. Persistent positive viral detection before surgery was not found to be independent risk factor for adverse events.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1044 - POSTOPERATIVE MODIFIED BLALOCK TAUSSIG SHUNT HOSPITAL AND INTERSTAGE OUTCOMES AND RISK FACTORS FOR HOSPITAL MORTALITY.

Thita Pacharapakornpong [1], Teerapong Tocharoenchok [2], Jarupim Soongswang [1], Chodchanok Vijarnsorn [1], Prakul Chanthong [1], Paweena Chungsomprasong [1], Kritvikrom Durongpisitkul [1], Supaluck Kanjanauthai [1]
Faculty Of Medicine Siriraj Hospital, Mahidol University, Department Of Pediatric Cardiology, Bangkok-Thailand [1] Faculty Of Medicine Siriraj Hospital, Mahidol University, Department Of Surgery, Bangkok-Thailand [2]

Background / Hypothesis:
The modified Blalock-Taussig shunt (MBTS) is an important palliative procedure for pulmonary-dependent ductal circulation. Given the evolution of care, mortality rates remained high, ranging between 9% and 50%. This study assessed hospital and interstage outcomes and determined risk factors associated with hospital mortality.

Materials and Methods:
Patients who underwent MBTS between January 2010 and December 2020 were identified in a single-center retrospective review. Those who underwent MBTS as part of another procedure or required an additional procedure were excluded. Logistic regression was performed to identify risk factors for hospital mortality, and survival analysis was conducted to evaluate interstage mortality.

Results:
Patients (n = 208; median age 44 (16-316) days; weight 3.4 (2.8-7.0) kg) were 14% preterm, 44% neonates, and 41% single-ventricle; of these, 28% (24/85) had isomerism. The sternotomy approach was used in 27.9% of patients; of those, 50% (29/58) required cardiopulmonary bypass (CPB). Postoperative pulmonary overcirculation was present in 8% (17/208) and 2.8% required duct ligation or shunt banding (6/208). Reoperation or reintervention for shunt thrombosis or stenosis was required in 11% (23/208). Hospital mortality was 6.8% (18/208). Pulmonary overcirculation (adjusted OR 7.10 (1.84-27.31), P = 0.004), isomerism (adjusted OR 3.47 (1.03-11.64), P = 0.044), and CPB for shunt were independent risk factors for hospital mortality. Interstage death was 11% (21/190), with the majority of deaths (65%, 13/21) attributed to shunt thrombosis.

Conclusions:
Hospital mortality remained high in MBTS, especially among patients with isomerism, requiring CPB, and experiencing pulmonary overcirculation post-operation. There was also high interstage mortality, in most cases due to shunt thrombosis.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1054 - CASE SERIES OF PROBIOTIC SEPSIS ASSOCIATED WITH PROBIOTIC USE IN CHILDREN FOLLOWING CARDIAC SURGERY

Xiaofeng Wang [1], Chenyu Li [1], Zhiyuan Zhu [1], Xu Wang [1], Shilin Wang [1]
National Center For Cardiovascular Disease Fuwai Hospital, Picu, Beijing-China [1]

Background / Hypothesis:
This study aims to investigate the probiotic sepsis in children following cardiac surgery as a pilot study for future investigation.

Materials and Methods:
This study was conducted retrospectively at our single center. We included patients from 2019 to 2024. Clinical data were retrieved from their medical records.

Results:
Among all 57 positive blood cultures, 6 cases were probiotics. Case 1, aged 6 years, underwent Fontan surgery and tested positive for Bacillus licheniformis without probiotics use. She was treated with imipenem + vancomycin and had no infection-related complications. Case 2, aged 8 months, underwent pulmonary artery banding surgery and tested positive for Bacillus subtilis with probiotics use. He was treated with linezolid + cefoperazone/sulbactam and had complications of embolic stroke. Case 3, aged 8 months, underwent right ventricular pulmonary artery connection surgery and tested positive for Bacillus subtilis without probiotics use. He was treated with meropenem and had no infection-related complications. Case 4, aged 1.5 years, underwent double switch surgery and tested positive for Bacillus subtilis with probiotics use. He was treated with meropenem + vancomycin and had no infection-related complications. Case 5, aged 9 months, underwent pulmonary artery banding surgery and tested positive (Blood + central venous catheter) for Bacillus subtilis without probiotics use. She was treated with piperacillin/tazobactam and had no infection-related complications. Case 6, aged 13 years, underwent tricuspid valve replacement surgery and tested positive for Lactobacillus rhamnosus with probiotics use. She was treated with meropenem and died of septic shock.

Conclusions:
Probiotic sepsis is not uncommon in children after cardiac surgery. Both the gastrointestinal tract and central venous catheters are potential routes of transmission. Because it can cause serious comorbidities, the use of probiotics cannot be considered risk-free and should be carefully evaluated.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1057 - IMPACT OF A MULTIFACETED PREVENTION PROGRAM ON VENTILATOR ASSOCIATED PNEUMONIA IN A SURGICAL PEDIATRIC CARDIAC ICU AT THE NATIONAL CARDIAC CENTER OF CHINA

Xiaofeng Wang [1], Chenyu Li [1], Zhiyuan Zhu [1], Xu Wang [1], Shilin Wang [1], Qinnan Chen [1]
National Center For Cardiovascular Disease Fuwai Hospital, Picu, Beijing-China [1]

Background / Hypothesis:
To explore the impact of a comprehensive prevention program, which includes eight preventive measures based on the integration of current guidelines and our clinical practice, on the incidence of ventilation-associated pneumonia (VAP).

Materials and Methods:
A quasi-experimental study was conducted in a pediatric cardiac ICU from 2023-2024. We compared VAP rates during a 5-month pre-intervention period, a 12-month intervention period, and a 7-month post-intervention period in a cohort of patients who received mechanical ventilation (MV) for ≥ 48h. Other outcome measures, such as duration of MV, postoperative length of stay, postoperative mortality were compared before and after intervention.

Results:
A total of 838 patients and 5677 ventilated-days at risk were observed. VAP incidences (events/1000 ventilator days) in the three period were 25.7, 11.3 and 10.8, respectively. VAP rates decreased by 56% (HR 0.4, 95% CI 0.3–0.53; P < 0.001) in the intervention and by 58% (HR 0.37, 95% CI 0.29–0.47; P < 0.001) in the post intervention periods. We documented reduction of postoperative length of stay in patients MV ≥ 48h between the pre and post intervention periods; 22 (16, 35) v.s. 21 (15, 28) days, p=0.04.

Conclusions:
Our preventive program produced a sustained decrease in VAP incidence. And it may have a positive effect on reducing the postoperative length of stay.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1075 - ASSOCIATION OF CHANGE IN PREOPERATIVE AND POSTOPERATIVE PRO BNP LEVELS WITH IN HOSPITAL ADVERSE OUTCOMES AMONG PEDIATRIC PATIENTS UNDERGOING HEART SURGERY

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Background / Hypothesis:
Congenital heart disease (CHD) affects approximately 1% of live births, with complex CHD contributing to significant morbidity and mortality. Despite advancements in surgical interventions, adverse postoperative outcomes remain high. Identifying reliable biomarkers to predict post-surgical complications in pediatric patients is essential for risk stratification. N-terminal pro-B-type natriuretic peptide (NT-proBNP) is widely used in adults as a marker of heart failure, but its utility in pediatric cardiac surgery remains underexplored.

Materials and Methods:
This prospective cohort study included pediatric patients (0–18 years) with complex CHD undergoing cardiac surgery at the Philippine Heart Center between September 2022 and February 2023. Patients with renal dysfunction or failed weaning from cardiopulmonary bypass were excluded. NT-proBNP levels were measured preoperatively and at 12, 24, and 36 hours postoperatively. Statistical analyses, including logistic regression, were used to determine associations between NT-proBNP changes and in-hospital adverse outcomes.

Results:
Among 57 patients, 34 (60%) experienced in-hospital adverse outcomes. Significant predictors of adverse outcomes included lower weight ($p=0.015$), shorter height ($p=0.019$), prolonged aortic cross-clamp time ($p<0.001$), cardiopulmonary bypass time ($p<0.001$), and ICU stay >5 days ($p<0.001$). Patients requiring >3 inotropes had significantly higher preoperative NT-proBNP levels (7311 vs. 500 pg/ml, $p<0.001$) and greater postoperative increases at 12 hours ($p=0.004$) and 24 hours ($p=0.016$). Prolonged mechanical ventilation (>3 days) was associated with higher NT-proBNP levels at all postoperative time points ($p<0.05$).

Conclusions:
Serial NT-proBNP measurements provide valuable prognostic information in pediatric patients undergoing cardiac surgery. Increased perioperative NT-proBNP levels correlate with prolonged ICU stay, inotrope use, and mechanical ventilation, suggesting its potential role in postoperative risk stratification. Future studies should explore integrating NT-proBNP into perioperative management protocols to improve patient outcomes.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1077 - COMPARING EARLY TRANSFERS BY ADMISSION SOURCE DIRECT VS ED

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Background:
Early ICU transfers, defined as occurring within 24 hours of hospital admission, are significant events in pediatric care. Previous studies indicate that up to 1% of general pediatric patients experience such transfers. This study examines differences in characteristics and outcomes of pediatric cardiology patients who are early transfers to the cardiac ICU (CICU) from the acute care cardiology unit (ACCU), based on their admission source: direct or from the emergency department (ED).

Methods:
This single-center retrospective cohort study covered February 2019 to October 2024. We included patients admitted to the ACCU and transferred to the CICU within 24 hours. Direct admissions were from home, clinics, or other hospitals. Exclusions applied to transfers from CICU to ACCU. We used Pearson's Chi-squared test and Wilcoxon rank sum test for statistical analysis.

Results:
Out of 2848 ACCU admissions, 114 (4%) were early CICU transfers. Direct admissions comprised 34% (39/114) and ED admissions 66% (75/114), both with a 4% transfer rate. Direct admits were younger (median 2.8 months) than ED admits (11.6 months, p=0.002). More direct admits were Caucasian (74% vs 51%) and fewer were Black/African American (17% vs 42%, p=0.018). Direct admits were likelier to have undergone stage 1 palliation (26% vs 10%) and less likely to have had biventricular surgical repair (8.6% vs 29%, p=0.018). They required less high-flow nasal cannula prior to transfer (5.7% vs 20%, p=0.05) and were more commonly admitted on weekdays (51% vs 32%, p=0.044). Direct admits showed a non-significant trend towards cardiovascular transfer reasons (53% vs 37%) and lower emergent intervention rates (5.7% vs 10%, p=0.68). Length of stay and mortality rates were similar between groups.

Conclusion:
Approximately 4% of pediatric cardiology patients experience early CICU transfers. Direct admits are younger, predominantly Caucasian, and more likely to have undergone stage 1 palliation. These insights can help identify at-risk patients.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1091 - EVALUATING THE NECESSITY OF THE ROUTINE CHEST RADIOGRAPHY POST CHEST TUBE REMOVAL IN CARDIAC SURGERY CHIDREN.

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Royal Hospital, Pediatric Cardiac Icu, Muscat-Oman [1] Royal Hospital, Cardiac Anesthesia, Muscat-Oman [2]

Background / Hypothesis:
Many units routinely perform a chest radiograph (CXR) after chest tube removal postoperatively in pediatric cardiac surgical patients to detect complications like pneumothorax or pericardial effusion. However, the necessity of this practice remains unclear, raising concerns about its cost-effectiveness. Growing evidence suggests routine CXRs may not be needed postoperatively without compromising patient safety. The primary objective of this study was to assess the incidence of pneumothorax, as identified by CXR, in pediatric cardiac patients. The secondary objective was to determine the frequency of interventions following pneumothorax detection.

Materials and Methods:
After ethical approval, we reviewed 427 patients with all levels of RACHS scores after pediatric cardiac surgery over 3 years. Patients in whom chest tube dislodgment occurred accidentally and patients on ECMO support were excluded. Continuous variables will be presented as mean and standard deviation, whereas categorical variables will be presented as frequency and percentage. The incidence of pneumothorax was reported in percentage with a 95% confidence interval.

Results:
340 out of the 427 patients had routine postoperative tube removal CXRs. The remaining 87 patients did not have CXR. Mild pneumothorax was present in 9 patients. A chest tube was reinserted for only one patient, and the remaining eight were asymptomatic and required no intervention. All pneumothoraces were seen in patients who were already extubated. No patient had clinically indicated CXR. The incidence of pneumothorax was 2.6% (95% confidence 1.2-5). All patients were discharged home without further complications from their chest tubes. The cost of those films was more than 7000 US dollars.

Conclusions:
Based on our data, the incidence of developing pneumothorax after chest tube removal was too small. This did not justify routine CXR, as the intervention decision remained clinical rather than radiological. Even patients with pneumothorax post chest tube removal were hemodynamically stable and did not require further intervention.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1093 - INVASIVE FUNGAL INFECTIONS AND POTENTIAL PREVENTION STRATEGIES FOLLOWING PEDIATRIC CARDIAC SURGERY INSIGHTS FROM THE NATIONAL CARDIAC CENTER OF CHINA

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National Center For Cardiovascular Disease Fuwai Hospital, Picu, Beijing-China [1]

Background / Hypothesis:
Invasive fungal infection is a rare but serious complication in pediatric patients following cardiac surgery. Information about the epidemiology, clinical characteristics and prevention strategies remains limited.

Materials and Methods:
We retrospectively reviewed a prospectively maintained database between 2018 and 2024. All patients who developed invasive fungal infection following cardiac surgery were included. Since our center began the multifaceted fungal infection prevention bundle in 2021, patients from 2018-2020 were included in group 1, patients from 2021-2004 were included in group 2.

Results:
In this cohort of 19,761 patients, 38 cases (0.19%) of invasive fungal infections were identified as fungal sepsis. The infected patients had a median age of 16 (5, 71) months and STAT score of 3 (2, 4). The median time from surgery to infection was 23 (8, 56) days, with a mortality rate of 24%. Following group stratification, the incidence of invasive fungal infections was lower in Group 2 (0.11%; 12/11,194) than in Group 1 (0.3%; 26/8,567), p=0.002. Fifteen breakthrough infections were identified despite prophylactic antifungal therapy, with Group 2 exhibiting higher proportion (75%) compared to Group 1 (23.1%), p=0.007. Group 2 had a higher proportion of continuous renal replacement therapy than Group 1 (42% v.s. 8%, p=0.039). Comparative analysis between study periods (2018-2020 vs. 2021-2024) revealed improvements in infection control measures. Hand hygiene compliance increased from 47.9% to 60.7% (p=0.007), the incidence of bacterial infections decreased from 4.33% to 1.99% (p<0.001), antibiotic defined daily dose reduced from 32.7 to 27.5 (HR: 0.842; 95% CI: 0.815-0.970; p<0.001).

Conclusions:
This study demonstrates that a comprehensive prevention bundle can significantly reduce the incidence of invasive fungal infections. In patients undergoing renal replacement therapy, the efficacy of prophylactic antifungal agents may be compromised. However, optimizing the prophylactic strategy through either dose escalation of fluconazole or conversion to echinocandin-based therapy could potentially enhance prophylactic outcomes.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1103 - A DIGITAL MODEL TO EXPLAIN THE NECESSITY OF PROSTAGLANDIN E1 AFTER BALLOON ATRIAL SEPTOSTOMY IN D TRANSPOSITION OF THE GREAT ARTERIES

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Background / Hypothesis:
Patients with D-Transposition of the Great Arteries (TGA) often require prostaglandin E1 (PGE) even after balloon atrial septostomy (BAS). This study builds a computer simulation that analyzes whether or not elevated pulmonary vascular resistance (PVR) could explain the profound hypoxemia seen in some patients after PGE discontinuation.

Materials and Methods:
Design: Computer simulation. Patients/Subjects: 6 patients were simulated using our digital model. Interventions: Balloon atrial septostomy and prostaglandin E1

Results:
In low-PVR conditions, following the BAS and the subsequent discontinuation of PGE (closure of the patent ductus arteriosus (PDA)) we found that the systemic arterial oxygen saturation decreases from 84% to 73% but systemic blood flow increases from 1.78 to 3.03 L/min/m2 (70.2% increase) and systemic oxygen delivery increases from 300 to 445 mL O2/dL blood (48.3% increase). By contrast, in high-PVR conditions, the BAS followed discontinuation of PGE led to a drop in arterial O2 saturation from 69% to 55% and increased systemic blood flow from 2.68 to 3.43 L/min/m2 (28.0% increase), which only increased oxygen delivery from 372 to 379 mL/dL (1.9% increase).

Conclusions:
Discontinuation of PGE decreases systemic arterial oxygen saturation but increases systemic blood flow, resulting in a net increase in the overall systemic oxygen delivery. However, when the PVR is high, the increase in systemic blood flow is less and the decrease in oxygen saturation is greater compared to low-PVR conditions, resulting in diminishing positive impact on systemic oxygen delivery. Therefore, high-PVR conditions limit the effectiveness of the BAS to successfully discontinue the PGE in these patients.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1111 - VASOPRESSIN AS A POSTOPERATIVE MANAGEMENT STRATEGY IN FONTAN PROCEDURE A COMPARATIVE STUDY

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Background / Hypothesis:
The Fontan procedure is crucial for managing univentricular heart conditions but can lead to prolonged pleural effusions, which can affect recovery and hospital stays. This study evaluated the effectiveness of vasopressin in reducing pleural effusion and improving recovery outcomes post-Fontan procedure.
We hypothesized that the amount and duration of pleural fluid outflow would be decreased by the early postoperative administration of vasopressin

Materials and Methods:
This comparative observational study reviewed patient records from October 2021 to September 2023. Two cohorts were included of 23 patients each: patients who received postoperative vasopressin from October 2022 to September 2023 (VP group) and a historical control group from the previous year (NVP group), excluding those who underwent fenestrated Fontan. Vasopressin was administered postoperatively to the VP group to mitigate pleural effusion. Primary outcomes were the volume and duration of chest tube drainage. Secondary outcomes included hospital and intensive care unit (ICU) stay durations and fluid balance metrics.

Results:
There were no significant differences in the primary or secondary outcomes between the vasopressin and control groups. The median total drain outputs in the VP and NVP groups were 69.4 ml/kg and 53.9 ml/kg, respectively ($p = 0.96$). The median duration of chest tube stay was 5.5 days for the VP group and 6 days for the NVP group ($p = 0.74$). Hospital stay duration ($p = 0.74$) and ICU stay duration ($p = 0.82$) showed no significant difference.

Conclusions:
Vasopressin does not significantly impact chest tube drainage volume or duration, nor does it reduce hospital stays in Fontan patients, suggesting a limited role in managing postoperative pleural effusions. Further research is needed to explore its benefits for specific patient subgroups and acute hemodynamic instabilities postoperatively.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1117 - FEEDING HOST AND DISEASE FACTORS ASSOCIATED WITH GUT MICROBIOME AMONG INFANTS WITH CHD VS HEALTHY CONTROLS

Amelia St. John [1], Jinbing Bai [2], Rachael Keiffer [3], Christina Calamaro [4], Scott Gillespie [5], Patricia Denning [6], Anne-marie Brown [7], Micheal Fundora [8]
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Background / Hypothesis:
There is growing literature demonstrating the importance of the gut microbiome in hospitalized children. Since dysbiosis may have a negative impact on morbidity, mortality, and outcomes, this study endeavored to explore the gut microbiome (GM) of congenital heart disease patients. This study examines the impact of feeding type, feeding routes, and disease factors on the gut microbiome in children with congenital heart disease (CHD).

Materials and Methods:
This study is a secondary analysis of a prospective matched cohort design. Newborns with CHD were enrolled from the cardiac intensive care unit (CICU) at Children's Healthcare of Atlanta and matched by age, sex, and race/ethnicity to healthy newborns from a newborn nursery at a large academic hospital. Demographics, clinical variables, and feeding type were collected from electronic medical records. Diversity and abundance analyses were conducted for the associations between environmental, feeding, clinical and demographic factors and the GM, using Microbiomeanalyst 2.0 and QIIME 2.

Results:
41 CHD patients were matched to 40 healthy controls. Infants with CHD showed a higher alpha diversity (p=0.007) and differential beta-diversity compared with healthy controls (p=0.0409). NG feeding tubes influenced the beta diversity (p=0.002). Fortified human milk (HM) vs non-fortified HM influenced beta diversity (p=0.008). Comparing patients fed HM vs. any formula exposure, formula exposure is associated with more enterococcus and haemophilus. NG fed infants had more strep and enterococcus in their GM (Log2FC -2.41, -1.76). Cases without aortic cross clamp had more alpha diversity (p=1.3198E-5, p=5.713E-5). Additionally, those without cross clamp had more beta diversity (p=0.004, p=0.002). Patients with higher socioeconomic status had more alpha diversity (p=.07), and those with lower socioeconomic status had more enterococcus (p=0.0287).

Conclusions:
The use of feeding tubes, formula exposure and surgical variables such as cross clamp is associated with altered GM. Further research is needed to determine

POSTER PRESENTATIONS

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1121 - INTESTINAL INSIGHTS METABOLITES LINKED WITH T CELL DIFFERENTIATION INFLAMMATION AND POOR OUTCOMES AFTER PEDIATRIC CARDIAC SURGERY

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Background/Hypothesis:
There is increasing evidence that gut health influences heart health, particularly in children with congenital heart disease (CHD). Intestinal inflammatory mediators and protective metabolites play crucial roles regulating gut health, inflammatory transcriptomics, and outcomes following pediatric cardiac surgery. We hypothesized that higher levels of intestinal inflammatory metabolites would correlate with worse post-surgery outcomes in this patient population.

Methods:
This prospective study involved pediatric CHD patients aged 0-3 years undergoing cardiac surgery. Blood and stool samples were collected pre- and post-surgery to assess gut metabolites, plasma cytokines, and inflammatory gene activation. These biomarkers were compared against clinical variables indicating poor outcomes, such as vasoactive inotrope score (VIS), ECMO use, reoperation (excluding chest closure), renal failure, prolonged ventilation, extended hospitalization, and mortality. Patients experiencing mortality or two or more adverse outcomes were categorized as having poor outcomes.

Results:
Of the 45 enrolled patients, 16 (35.5%) experienced worse outcomes, including three deaths. No differences in age, weight, bypass time, or STAT category were noted between groups. Patients with poor outcomes exhibited elevated levels of inflammatory eicosanoids, particularly prostaglandin E2 (PGE2), which negatively correlated with postoperative IL-10 and T-regulatory cells (T-regs). Patients with poor outcomes also had reduced short-chain fatty acid (SCFA) producing organisms. Reduced stool and plasma SCFA, specifically butyric acid, correlated with decreased postoperative IL-10 and T-regs. Inflammatory transcriptomics in poor outcome patients revealed increased PGE2 synthase activity, downregulated T-reg genes, alongside elevated pro-inflammatory Th1/Th17 genes. Furthermore, VIS, prolonged ventilation, and hospital duration negatively correlated to butyric acid and positively correlated to intestinal PGE2 levels.

Conclusion:
Our findings establish a novel association between intestinal PGE2, butyric acid, and adverse outcomes following pediatric cardiac surgery. Data suggests the potential benefit of butyric acid, and the need for research into the causal role of PGE2 and T-cell differentiation to identify potential therapeutic interventions.

POSTER PRESENTATIONS

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1131 - IMPROVING RESPIRATORY THERAPISTS' KNOWLEDGE AND COMFORT LEVEL IN MANAGING PEDIATRIC CARDIAC PATIENTS IN THE CICU

Duncan Geddes [1]
Children, Respiratory Care, Denver-United States [1]

Background / Hypothesis:
Respiratory therapists (RT's) who intermittently manage pediatric cardiac patients in the cardiac intensive care unit (CICU) often have limited exposure to the specialized anatomy, physiology, and ventilator management strategies required for this population. Existing educational resources are frequently complex and designed for physicians and nurses, leaving RTs without concise, practical tools to support clinical decision-making.

Materials and Methods:
A series of laminated reference cards, specifically tailored to respiratory care and cardiac interaction, were developed as quick-access educational tools. Each card includes:

Front Side: A diagram of the preoperative anatomy of a specific cardiac defect, key anatomical features, and preoperative ventilator management strategies.

Back Side: A diagram of the post-repair anatomy, details of the surgical repair, postoperative ventilator management strategies, and key postoperative considerations.

The effectiveness of these reference cards will be evaluated using a pre- and post-implementation study design. A cohort of Respiratory Therapists (anticipated n = 36) will complete:

A knowledge assessment on pediatric cardiac anatomy and ventilator management.

A validated survey measuring confidence and comfort levels in managing CICU patients.

These surveys will be completed pre-implementation, at two months, at six months, and finally at one year after implementation.

Results:
We anticipate that the reference cards will lead to measurable improvements in RTs' knowledge and self-reported confidence levels. Data analysis will help determine the effectiveness of targeted, simplified educational tools made available for Respiratory Therapists in a specialized ICU setting. (Data Pending)

Conclusions:
This project aims to address a critical gap in RT education for pediatric cardiac care in the CICU. By equipping RTs with accessible, practical resources, we hope to elevate the standard of care, improve patient outcomes, and enhance RT confidence and competence in managing this complex population.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1141 - BEDSIDE LEFT VENTRICLE VENTING UNDER TRANSESOPHAGEAL ECHOCARDIOGRAPHY FOR PATIENTS ON VENOARTERIAL EXTRACORPOREAL MEMBRANE OXYGENATION

Phung Tran [1], Yen Nguyen [2]
City Children Hospital, Cardiac, Ho Chi Minh-Vietnam [1] City Children Hospital, Cicu, Ho Chi Minh- [2]

Background / Hypothesis:
Venoarterial extracorporeal membrane oxygenation (VA ECMO) supports patients in cardiogenic shock but can lead to left ventricular (LV) distension. Early management of LV distension is crucial. Traditional decompression methods range from medical management to surgical venting, but these can be challenging. This report presents a bedside LV venting technique using transesophageal echocardiography (TEE).

Materials and Methods:case report

Results:
A 9-year-old girl with refractory cardiogenic shock from acute fulminant myocarditis was placed on VA ECMO. After two days, her condition worsened with ventricular tachycardia, absent aortic valve opening, LV distension, and blood stagnation. Bedside LV venting was performed under TEE guidance. A 5 French guiding catheter was inserted into the right atrium, and a 0.014 guidewire punctured the atrium septum using a monopolar RF electrosurgical instrument. An 8 French sheath was guided into the LV and connected to the ECMO circuit for drainage. The LV function improved significantly, and ECMO was weaned two days later.

Conclusion:
LV distension during VA ECMO can worsen the condition and impede myocardial recovery. Direct venting is the optimal strategy. Bedside LV venting using TEE is feasible and effective for patients on VA ECMO.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1164 - DETERMINANTS OF PERMANENT PACEMAKER IMPLANTATION TIMING IN POSTOPERATIVE COMPLETE ATRIOVENTRICULAR BLOCK IN PEDIATRIC PATIENTS

Hacer Kamali [1], Merve Maze Aydemir [1], Samet Paksoy [1], *Hasan Candas Kafali* [1], Betül Cinar [1], Ensar Duras [1], Aylin Demirel [2], Okan Yildiz [2], Ismihan Selen Onan [2], Sertac Haydin [2], Alper Guzeltas [1], Yakup Ergul [1]
Mehmet Akif Ersoy Thoracic And Cardiovascular Surgery Training Research Hospital, Pediatric Cardiology Department, Istanbul-Türkiye [1] Mehmet Akif Ersoy Thoracic And Cardiovascular Surgery Training Research Hospital, Pediatric Cardiovascular Surgery Department, Istanbul-Türkiye [2]

Background:
Permanent pacemaker implantation is typically recommended within 7–10 days for persistent postoperative complete atrioventricular (AV) block. However, multiple clinical and logistical factors may necessitate deviation from this timeline.

Objective:
To identify and analyze the factors influencing the timing of permanent pacemaker implantation in pediatric patients with persistent postoperative complete AV block.

Methods:
A prospective cohort of pediatric patients who developed irreversible complete AV block following cardiac surgery between June 2021 and January 2025 was analyzed. Patient demographics, surgical diagnoses, clinical course, and pacemaker implantation timing were evaluated.

Results:
Out of 2,260 cardiac surgeries performed during the study period, 32 patients (1.41%) required permanent pacemaker implantation due to persistent AV block. Median age was 60 months (range: 4–246), and median weight was 17 kg (range: 3–76). Common diagnoses included AV septal defect (28%) and left ventricular outflow tract obstruction (34%). Implantation occurred at a median of 12.2 days postoperatively (range: 5–28). Key factors affecting timing included ICU complications (6 cases), lack of epicardial leads (14 cases), recurrence after initial recovery (2 cases), threshold instability (1 case), urgent reoperation (1 case), and clinical decision for delayed pacing (3 cases). Two hybrid pacing procedures were successfully performed in low-weight infants.

Conclusion:
The timing of permanent pacemaker implantation in pediatric patients with postoperative AV block is influenced by diverse clinical and resource-based factors. Understanding these variables is essential for optimizing patient outcomes and procedural planning in pediatric cardiac surgery centers.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1218 - INTRACARDIAC MYXOMA ASSOCIATED TO BRAIN EMBOLUS IN A PEDIATRIC PATIENT

Ivan Salinas Sanchez [1], Scarleth Velasquez [2], Andre Funez [3]
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A 6-year-old male patient from Honduras had a history of multiple episodes of significant respiratory distress from the first year of life, which were managed as bronchial asthma. the mother states that the patient presented an episode of syncope 5 days prior to admission. Physical examination revealed 80% capillary saturation, tachypneic and hemoptysis. Chest x-rays were requested where cardiomegaly and bilateral pulmonary radio-opacities, which is why an echocardiogram was performed and dilatation of the left chambers was reported, an intracardiac mass of 70x50 millimeters with irregular edges in the left atrium, pedicled, attached to the interatrial septum at the level of the fossa ovale, with protrusion to the left ventricle in diastole, tricuspid regurgitation with a gradient of 48 mmHg and mild left lateral pericardial effusion. During your hospitalization with visual hallucinations and behavioral changes characterized by irritability, a brain tomography was performed that reported a cerebellar ischemic event on the right side.

Management:
It was decided to operate, by means of left atriotomy and extracorporeal circulation, finding a gelatinous mass of approximately 70 millimeters in diameter, which was extracted in its entirety.

Outcome:
Pathological anatomy was sent for analysis, who concluded that it was a benign neoplasm composed of lobed myxoid stroma corresponding to cardiac myxoma.
The patient evolved satisfactorily, with evident neurological sequelae, ataxic cerebellar gait, with uncoordinated movements in the lower limbs, enlargement of the base of support and dysmetria. On his postoperative echocardiogram he showed moderate tricuspid regurgitation, intact interatrial septum, moderate mitral regurgitation, with a 4-millimeter contracta vein, no stenosis gradient, with preserved biventricular function.

Discussion:
Primary cardiac tumors are infrequent, they are found more in adults; Its estimated incidence in pediatrics is 0.001 to 0.003%, with the most common in order of frequency being rhabdomyomas, fibroids, and myxomas.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1262 - ANOMALOUS ORIGIN OF ONE PULMONARY ARTERY BRANCH FROM THE AORTA EARLY AND MID TERM SINGLE CENTER OUTCOMES

Yu Zhu [1], Yaping Mi [1]
Children's Hospital Of Fudan Univerisity, Cardiovascular Center, Shanghai-China [1]

Background / Hypothesis:
We analyzed the clinical characteristics of patients with anomalous origin of one pulmonary artery branch from the aorta and analyze the first surgery between single-surgery patients and patients with multiple surgeries.
Materials and Methods: We performed a single-center retrospective study of patients with anomalous origin of one pulmonary artery branch who underwent surgical repair from January 2013 to December 2024.

Results:
A total of 16 children underwent pulmonary artery angioplasty, including 14 cases of anomalous origin of right pulmonary artery and 2 cases of anomalous origin of left pulmonary artery. Five (31.25%) patients underwent a second intervention with anomalous origin of the right pulmonary artery from the ascending aorta. Median time from first to second intervention was 26.5 month (95% CI 25, 43). The age and weight of the re-intervention group were significantly lower than those of the single-surgery group ($p<0.001$. The cardiopulmonary bypass time, mechanical ventilation time, and length of CCU stay of the re-intervention group were significantly higher than those of the single-surgery group. NT pro-BNP was lower in the single-surgery group.

Conclusions:
The cardiopulmonary bypass time and length of CCU stay were different in the single-surgery group and re-intervention group.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1290 - PERIPHERAL LYMPHATIC FLOW DURING NON INVASIVE NEGATIVE INTRATHORACIC PRESSURE WITH BIPHASIC CUIRASS VENTILATION

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Background / Hypothesis:
Single ventricle heart defects have an increased central venous pressure and a congested and vulnerable lymphatic system. Central venous pressure is sensitive to the intrathoracic pressure and decreases during inspiration aiding venous return to the heart and lymphatic return to the venous system. In contrast to positive pressure ventilation, biphasic cuirass ventilation (BCV) mimics pressure changes of natural breathing and further decreases the intrathoracic negative pressure. To improve the knowledge and understanding of the interplay between lymphatic function and intrathoracic pressure, we plan to evaluate the impact of non-invasive negative biphasic pressure ventilation on the peripheral lymphatic system.

Materials and Methods:
20 cardiopulmonary healthy individuals between the ages of > 18 and < 40 years and with a BMI ≤ 30 was recruited. Non-invasive negative intrathoracic pressure is achieved by BCV, which controls inspiration and expiration by controlling the pressure environment inside the cuirass. Lymphatic function is examined using Near-Infrared Fluorescence (NIRF) imaging, allowing for measurements of contraction frequency and velocity.
The microvascular fluid filtration is measured through strain gauge plethysmography, enabling estimations of capillary filtration rate. Fluid filtration and lymphatic function is measured during spontaneous respiration and negative pressure biphasic cuirass ventilation (inspiratory pressure: -30 mmHg; expiratory pressure: +2; respiration frequency: 10-14).

Results:
All 20 study subjects are included at the time of abstract submission, and analysis concludes in June.
Primary endpoints:
• Changes in lymphatic vascular contraction frequency and velocity during BCV.
Secondary endpoint:
• Changes in SGP-estimated capillary filtration rate during BCV.

Conclusions:
This study aims to describe the interplay between intrathoracic pressure and peripheral lymphatic fluid transport. In the future, BCV may serve as a viable alternative to positive pressure ventilation in individuals with a vulnerable lymphatic vasculature prone to lymphatic complications.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1338 - PREOPERATIVE GROWTH PATTERNS OF TOTAL CAVOPULMONARY CONNECTION AND THEIR IMPACT ON PROGNOSIS

Na Jiang [1], Li Guan [1], Huifeng Zhang [1], Gang Chen [1], Ming Ye [1], Yaping Mi [1]
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Objective:
The aim of this study was to analyze the growth patterns prior to total cavopulmonary connection (TCPC) surgery, and to investigate the impact of somatic growth on surgical prognosis.

Method:
Our study is a retrospective single-center study that includes patients with SV who underwent TCPC surgery between 2008 and 2023. The height and weight measurements were converted into height for age z-score (HAZ), weight for age z-score (WAZ), and weight for height z-score (WHZ). Any Z-score≤-2 was defined as somatic growth restriction.

Results:
All patients who underwent staged TCPC surgery exhibited significantly higher HAZ and WAZ at the time of TCPC surgery compared to bidirectional cavopulmonry shunt (BCPS) surgery. The univariate linear regression model demonstrated a negative linear correlation between TCPC-WAZ/TCPC-WHZ and age at TCPC surgery ; however, there were no linear or non-linear correlations between TCPC-HAZ and age at TCPC surgery. The loess regression model revealed that the ΔHAZ and ΔWAZ initially increased with the interval time of surgery before decreasing over time. The results of quadratic regression were statistically significant [HAZ(P=0.045); WAZ(P=0.031)]. Furthermore, the results of univariate COX regression model indicated that higher HAZ(P=0.007), WAZ(P=0.022) and ΔHAZ(P=0.021) suggested a better prognosis. HAZ≤-2 was identified as a risk factor for a worse long-term prognosis(HR=9.21 95CI 1.56-54.51 P=0.014).

Conclusion:
Patients with SV showed catch-up growth after BCPS surgery. The growth values of height and weight increased first and then decreased with extension time after BCPS surgery. Patients with normal growth before TCPC surgery had a good prognosis. Higher HAZ, WAZ, and ΔHAZ were protective factors for good long-term prognosis, and HAZ≤-2 was a risk factor for poor long-term prognosis.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1392 - PRE OPERATIVE RISK STRATIFICATION EVALUATION OF PEDIATRIC CARDIAC PATIENTS IN A TERTIARY CARDIAC REFERRAL CENTER

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Background / Hypothesis:
Post-operative management of cardiac patients starts with pre-operative evaluation. Risk models created stratify cardiac surgery and predict mortality. The aim of this study is to identify the pre-operative and intraoperative risk factors, morbidity and mortality among pediatric patients who underwent cardiac surgery using the Pre-operative Risk Stratification Evaluation.

Materials and Methods:
This is a cross-sectional retrospective descriptive study which included patients less than 19 years old who underwent open or closed heart surgery from 2020 to 2022. The Pre-operative Risk Stratification Evaluation Form used included pre-operative risk factors and were classified patients into either low, moderate and high risk. The participants were also categorized according to the RACHS-1 and STS-EACTS Categories.

Results:
A total of 588 post-operative pediatric cardiac patients were included. Five hundred fifty-nine (95%) were stratified as low risk, 29 (4.9%) as moderate risk, and none in high risk. It was noted that age, gender, weight, RACHS-1 Category, STS-EACTS Category and presence of cardiopulmonary bypass showed significant differences between the low and moderate risk groups. Moreover, in-hospital mortality, prolonged hospital stay and presence of post-operative complications were significantly different between the two groups.

Conclusions:
Surgical mortality, length of hospital stay and post-operative complications are significantly different between low and moderate groups using the proposed Pre-operative Risk Stratification Evaluation Form among pediatric cardiac patients after surgery.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1472 - PEDIATRIC CARDIAC EXTRACORPOREAL MEMBRANE OXYGENATION OUTCOMES AND RISK FACTORS FROM A MULTICENTER STUDY

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Background / Hypothesis:
Extracorporeal membrane oxygenation (ECMO) is a critical intervention for pediatric patients with cardiac-related medical indications. However, data on its outcomes and associated risk factors, particularly in Korea, are limited. This study aimed to evaluate these outcomes and identify predictors of mortality.

Materials and Methods:
A multicenter retrospective study was conducted on 152 pediatric patients who underwent ECMO for cardiac-related medical conditions between 2012 and 2021. Data on patient demographics, clinical features, laboratory findings, and outcomes were collected and analyzed. Statistical methods included descriptive analysis, group comparisons, and regression analysis to evaluate risk factors for mortality.

Results:
Cardiomyopathy was the most common indication for ECMO, and peripheral cannulation was used in 57.2% of cases. Acute kidney injury requiring dialysis was observed in 57.2% of patients. Non-extracorporeal cardiopulmonary resuscitation (ECPR) patients showed better outcomes, with a 68.4% survival-to-discharge rate compared to 33.3% in the ECPR group. Significant predictors of mortality included elevated lactate levels before ECMO, reduced 24-hour urine output post-ECMO, dialysis use, and pulseless electrical activity/asystole. While pre-ECMO left ventricular ejection fraction showed no overall association with outcomes, it was significantly higher in survivors with acute myocarditis.

Conclusions:
This study provides valuable insights into the outcomes and risk factors of pediatric ECMO for cardiac-related medical indications in Korea. Lactate levels, urine output, and pre-ECMO rhythm were identified as prognostic factors. These results are expected to aid clinicians in managing this patient population and lay the groundwork for future prospective research.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1504 - INCIDENCE AND RISK FACTORS FOR ACUTE KIDNEY INJURY IN CHILDREN WITH CONGENITAL HEART DISEASE UNDERGOING CARDIAC SURGERY IN A TERTIARY CARE CENTER.

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Nicvd, Peads Cardiology, Karachi-Pakistan [1] Nicvd, Nicvd, Karachi-Pakistan [2]

Background / Hypothesis:
To determine the incidence and risk factors associated with acute kidney injury (AKI) in children with congenital heart diseases (CHDs) who underwent cardiac surgery in a tertiary care center.

Materials and Methods:
Paediatric Cardiac Intensive Care Unit (PCICU) of National Institute of Cardiovascular diseases, Karachi, Pakistan. Period: November 2022 to May 2023. Material & Methods: We included patients of both genders and any age who underwent open or closed heart surgery for congenital heart defects. All patients undergoing CHD repairs were monitored for the total duration of PCICU stay. The development of AKI was labeled as per RIFLE criteria, and management thereafter was performed as per standard institutional protocols.

Results:
In a total of 93 patients with CHD, there were 50 (53.8%) males and 43 (46.2%) females. The mean age was 9.71±9.14 year ranging between 3 months to 60 years. There were 6 (6.5%) patients who developed AKI post-surgery. Overall, mortality was noted in 7 (7.5%) patients. Cardiopulmonary bypass (CPB) time and aortic cross-clamp (ACC) time were significantly higher among patients who developed post-surgery AKI (<0.001). Moreover, post-surgery AKI was significantly associated with intra-operative hypotension (p<0.001), post-operative hypotension (p<0.001), and post-operative sepsis (p<0.001). It was also found that AKI had significant association with higher post-operative inotropic scores (p<0.001), prolonged duration of mechanical ventilation (p<0.001), and length of PCICU stay (p<0.001). Mortality had significant association with AKI (33.3% vs. 5.7%, p=0.013).

Conclusions:
We noted the incidence of AKI among patient who underwent cardiac repairs to be 6.5%. CPB time and ACC time were significantly higher among patients who developed post-surgery AKI. Post-surgery AKI was significantly associated with intra-operative hypotension, post-operative hypotension, and post-operative sepsis. Mortality was significant high among cases that had AKI.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1508 - WEARABLE ULTRASOUND MONITORING DURING PRECISE FLUID ADMINISTRATION FOR CCU PATIENTS WITH PERICARDIAL EFFUSION A CASE STUDY

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Background / Hypothesis:
Delayed postoperative pericardial effusion (PE) can result from lymphatic or vascular injury, improper anticoagulation management, or excessive fluid administration. Rapid or extensive accumulation of pericardial fluid can lead to cardiac tamponade, significantly decreasing cardiac output and venous return, potentially progressing to shock or death. Accurate fluid management is therefore essential, as both inadequate drainage and excessive fluid administration may lead to severe cardiovascular complications. This study hypothesizes that continuous monitoring using wearable ultrasound technology can enhance fluid management precision in patients admitted to cardiac care units (CCU).

Materials and Methods:
A wearable ultrasound monitoring device, previously reported by our research group in 2018, was employed to continuously monitor a 69-year-old male CCU patient from the initial detection of pericardial effusion throughout the course of treatment and recovery. Interventions included pericardiocentesis, fluid restriction therapy, and goal-directed fluid resuscitation based on real-time ultrasound visualization integrated with standard bedside monitoring.

Results:
Continuous wearable ultrasound monitoring effectively tracked the progression and resolution of the pericardial effusion. After pericardiocentesis, ultrasonography identified persistent hypovolemia despite effusion resolution. Ultrasound-guided targeted fluid resuscitation was initiated promptly based on these findings, resulting in increased cardiac chamber volume and normalization of blood pressure, as confirmed by traditional monitoring methods.

Conclusions:
Compared to conventional monitoring techniques, wearable ultrasound monitoring demonstrates superior visualization and accuracy in managing pericardial effusion and optimizing fluid balance. Continuous ultrasound monitoring enables clinicians to rapidly identify and effectively intervene in complications such as hypovolemia, thus enhancing prognosis and safety in critically ill cardiac patients.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1548 - PRACTICE REVIEW ROUNDS – AN INNOVATION COMBINING PERFORMANCE ASSESSMENT AND TARGET BASED CARE

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Background / Hypothesis:
Pediatric cardiac surgical patients are at risk for complications and adverse outcomes. Retrospective insights cannot modify patient course or comprehensively explore team performance. Review of team performance and target-based care(TBC)have been described separately. Visualization of patient course and outcomes are key to both innovations. We combined these concepts in a single visual format that permits review of performance and identification of course deviations. Collating and contextualizing data for visualizations is labor intensive, therefore we developed an automated, context aware visual tool that directly abstracts data elements from our electronic data warehouse.

Materials and Methods:
Multidisciplinary clinical experts developed consensus about data to display. A weekly Practice Review Rounds (PRR) leverages the tool to review each surgical case within a week of operation. Categorization/identification of performance, adverse events, and course delays are completed for each case, generating action items addressed through operational/quality improvement structures. Benchmark procedure lengths of stay (LOS) were used as a metric for TBC.

Results:
Seventy-one patients were discussed over a 3-month period. Performance issues were common (39% of cases). Average team performance was most common (59%), followed by poor (25%), and exemplary (15%). Poor performance was more likely with multiple performance errors or team-based errors occurred. Individual errors were most common (57% of cases), occurring more commonly than team (23%) or system errors (20%). Course delay was identified in 20 cases. Action items were frequent (31% of cases). Identification of course deviation occurred twice, leading to course correction discussions. LOS benchmarks were available for 42% of cases and were exceeded 60% of the time.

Conclusions:
Deviation from desired performance is common in longitudinal care of pediatric cardiac surgical patients. PRR utilizing an automated clinical data visualization tool is an efficient mechanism of identifying these. Integration of benchmarks enables target-based care and timely response to patient course deviation.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1603 - AUGMENTED RISK ASSESSMENT FOR CONGENITAL HEART SURGERY A NEW PREDICTIVE TOOL FOR LOW RESOURCE SETTINGS

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Background / Hypothesis:
Risk stratification in congenital heart diseases enables surgical outcome comparisons and is valuable for quality improvement initiatives across diverse settings. In low and middle income countries (LMICs), however, preoperative condition appears to additionally impact outcomes and need to be included in risk stratification models. We have developed and validated an 'Augmented Risk Assessment for congenital heart surgery' model that can be specifically applied to LMIC settings.

Materials and Methods:
A comprehensive review of our institutional database of 559 children who underwent congenital heart surgery was done. A composite outcome that included mortality, postoperative sepsis, and duration of mechanical ventilation was used as an integrated measure of risk severity. Using an odds ratio plot, five preoperative variables were found to be associated with adverse outcomes: RACHS category 3 or greater, syndromic conditions, non-cardiac malformations, preoperative sepsis, and need for preoperative ICU stay. Two models were generated to predict the composite score. 1. RACHS score as the only predictor. 2. The augmented model included RACHS score and the above identified five preoperative variables. C statistic, Brier score, and R2 were used to compare performance of the two models. The models were then tested prospectively on an external validation cohort of 383 patients. Calibration curves were used to assess the performance of the models.

Results:
Overall the augmented RACHS model performed superiorly in predicting composite outcomes, sepsis and duration of ventilation (Table). The RACHS model was found to closely predict outcome at lower risk categories by calibration curves. The Augmented RACHS Model performs significantly better at higher risks, providing predictions closer to actual probabilities.

Conclusions:
The Augmented RACHS Model that incorporates preoperative patient variables improves prediction of postoperative morbidity and mortality after congenital heart surgery.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1619 - DOUBLE BONANZA OR DOUBLE TROUBLE COMBINED HEART KIDNEY TRANSPLANTATION IN A FAILING FONTAN PATIENT WITH VENTRICULAR ASSIST DEVICE

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Introduction:
We report a novel case of simultaneous heart-kidney transplantation in an adolescent with failing Fontan circulation on ventricular assist device (VAD) support with dialysis-dependent renal failure, highlighting the complex and multidisciplinary post-operative management.

Case Report:
A 16-year-old male with chronic congestive heart failure due to failing Fontan circulation was admitted to the cardiac intensive care unit (CICU) after HeartMate 3 SVAD implantation as a bridge to heart transplant (HTx). Post-operatively, he developed renal failure requiring continuous renal replacement therapy (RRT) and could not transition to intermittent dialysis due to hemodynamic instability, necessitating prolonged intermittent RRT. Seven months after VAD implantation, he underwent simultaneous heart-kidney transplantation. He had reassuring graft function of heart and kidney, never needed dialysis, extubated on postoperative day (POD) 4, chest tube removal by POD 9, transferred out of CICU at POD 84.

Post-transplant course was remarkable for – (i) new-onset seizure with subarachnoid hemorrhage managed conservatively without vasospasm (ii) delayed initiation of diuresis until 72hours to reduce nephrotoxicity, (iii) prolonged inotropic (until POD24) and pulmonary vasodilator support (until POD 47) to reduce risk of right ventricular failure and optimize renal function, (iv) recurrent urinary tract infections necessitating removal of ureteral stent at POD 29, (v) hemoptysis and evidence of ongoing elevated filling pressures needing aortopulmonary collateral occlusion at POD 69. He continues to have significant diuretic need, poor vasomotor tone needing mineralocorticoid supplementation, and hypogammaglobulinemia needing IVIg infusions.

Hemodynamics at surveillance cardiac catheterizations are summarized in Table. By POD 93, he has not had rejection of either organ, remains with excellent cardiac function and slowly improving stage 1 AKI.

Summary:
Heart-kidney transplantation in a patient with complex single ventricle congenital heart disease and on VAD support carries multiple risk factors for post-operative complications. Successful outcomes require assimilation and collaboration of vasoactive and fluid management strategies.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1621 - RELATIONSHIP BETWEEN LOW CARDIAC OUTPUT AND FEVER IN SINGLE VENTRICLE PATIENTS IN THE FIRST 72 HOURS POST OPERATIVE SURGERY

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Background / Hypothesis:
Infants undergoing single-ventricle staged-repair (Norwood, Glenn or Fontan) are at high risk for low CO and fever in the first 72 hours post-operative. We seek to evaluate whether there is an association between markers of low CO and fever in a cohort of patients with single-ventricle physiology.

Materials and Methods:
Single-center, retrospective analysis. Central and peripheral temperature, and blood laboratories were collected within 72 hours from the Norwood, Glenn or Fontan procedures in patients admitted from January 2013 to August 2024. Fever was defined as central temperature > 38oC. Markers of low CO were defined as a lactate level > 2 mmol/L and a difference between central and peripheral temperature > 3oC. The occurrence of fever and makers of low CO were tabulated, and Fisher's exact test was used to evaluate the significance of the odds ratio.

Results:
There were 2555 evaluations with complete temperature and lactate data. In this data set, the odds of experiencing markers of low CO among patients with fever is 36/83=0.434. Whereas the odds of experiencing markers of low CO among patients without fever is 255/2181=0.117. Hence, the odds ratio is 3.71 (Fisher's test p-value = 9.02e-9).

Conclusions:
In infants undergoing staged single-ventricle palliation, fever within the first 72 hours postoperatively is strongly associated with markers of low cardiac output, including elevated lactate and widened central-to-peripheral temperature gradients. These findings suggest that fever may serve as an early clinical signal of impaired perfusion in this high-risk population, underscoring the importance of vigilant temperature monitoring and prompt hemodynamic assessment in the immediate postoperative period.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1694 - CLINICAL EVALUATION OF CARDIAC CATHETERIZATION IN CARDIAC INTENSIVE CARE UNIT DURING THE EARLY POSTOPERATIVE PERIOD FOR CONGENITAL HEART DISEASE

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Background / Hypothesis:
To assess the timing and safety of early unplanned cardiac catheterization in the cardiac intensive care unit (CICU) following surgery for congenital heart disease (CHD).

Materials and Methods:
This retrospective cohort study reviewed the medical records of children who underwent unplanned cardiac catheterization in CICU after CHD surgery at Children's Hospital from January 1, 2013 to December 31, 2022.

Results:
A total of 24 children with congenital heart disease who underwent surgery were enrolled in this study, during which 26 unplanned cardiac catheterizations/interventions were performed. There were 13 males (13/24, 54.17%). The median age was 1.05 years (from 3 days to 15 years) and the median weight was 8.9 kg (from 2.56 kg to 41.1 kg). The diagnosis of congenital heart diseases included tetralogy of Fallot (33.33%), pulmonary atresia (25%) and single ventricular malformation (12.5%). The median interval between surgery and cardiac catheterization was 15 days (from 8 hours to 31 days). The reasons for initiating cardiac catheterization included severe postoperative low cardiac output, multiple organ dysfunction, repeated failure in ventilator weaning and significant hypoxia. The issues detected through cardiac catheterization included systemic pulmonary collaterals in eighteen cases, left/right pulmonary artery stenosis or occlusion in seven cases, residual ventricular septal defect in four cases and pulmonary hypertension in seven cases. Twenty-one patients (21/24, 87.5%) received concurrent interventional therapy. The most frequently performed intervention involved systemic pulmonary collateral occlusion. Five patients (20.83%) required reoperation due to anatomical complications identified during the cardiac catheterization procedures. Only one adverse reaction related to cardiac catheterization occurred, which was one coil drift leading to occlusion. No deaths associated with cardiac catheterization were reported throughout the study period.

Conclusions:
Cardiac catheterization, including concurrent transcatheter interventions, can be safely performed in the early postoperative period following congenital heart surgery. This procedure has the potential to improve patient outcomes.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1728 - ECHOCARDIOGRAPHIC ASSESSMENT OF CARDIAC PHENOTYPE PREDICTS COMPLICATIONS AND GUIDES INTENSIVE CARE MANAGEMENT FOLLOWING PULMONARY VALVE BALLOON DILATION IN NEONATES WITH PULMONARY ATRESIA CRITICAL PULMONARY STENOSIS WITH INTACT VENTRICULAR SEPTUM

Patrizio Moras [1], Cosimo Marco Campanale [1], Marco Masci [1], Serena Ventrella [1], Luca Di Chiara [2], Gianfranco Butera [3], Luciano Pasquini [4], Alessandra Toscano [1]
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Background / Hypothesis:
Pulmonary Atresia with Intact Ventricular Septum (PAIVS) and Critical Pulmonary Stenosis (CPS) are rare, ductal-dependent congenital heart diseases characterized by critical obstruction of the right ventricular outflow tract and variable degrees of right ventricular hypoplasia. Advances in transcatheter interventions, particularly pulmonary valve balloon dilation (PVBD), have transformed the management of these conditions by reducing morbidity and mortality compared to surgical approaches. However, post-procedural complications and clinical outcomes are heavily influenced by the morphological phenotype of the right ventricle. This study aims to determine whether echocardiographic morphological and functional analysis can predict post-procedural complications and guide intensive care strategies in neonates undergoing PVBD.

Materials and Methods:
We retrospectively analyzed 27 neonates with PAIVS or CPS treated with PVBD at our institution between October 2017 and August 2023. Patients were categorized into two groups based on right ventricular morphology: Group A (tripartite right ventricle, well-developed infundibulum) and Group B (bipartite right ventricle, hypoplastic infundibulum). Echocardiographic, catheterization, and clinical data were reviewed to assess complications and outcomes.

Results:
Group A patients exhibited higher rates of transient left ventricular dysfunction (92.9% vs. 15.4%, $p<0.001$). They also required inodilators and experienced a prolonged period of mechanical ventilation compared to Group B. Conversely, Group B patients were more prone to infundibular spasm (76.9% vs. 21.4%, $p=0.004$) and required additional pulmonary blood flow interventions or beta-blocker therapy. No significant differences were observed in intensive care unit stay or overall hospitalization duration between the groups.

Conclusions:
Echocardiographic assessment is essential for predicting complications and formulating tailored post-PVBD management strategies. Future multicenter studies are warranted to validate these findings and optimize care for neonates with PAIVS and CPS.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1759 - CHARACTERISTICS OF ELECTROCARDIOGRAM IN CHILDREN WITH FULMINANT MYOCARDITIS

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Background / Hypothesis:
To investigate the electrocardiogram(ECG) characteristics of children with fulminant myocarditis, and to provide evidence for early diagnosis and treatment

Materials and Methods:
Patients diagnosed with acute myocarditis in Anhui Children's Hospital from January 2021 to October 2024 were retrospectively analyzed and divided into fulminant myocarditis group(FM) and non fulminant myocarditis group (NFM) according to clinical diagnosis. The FM was divided into ECMO group and non-ECMO group according to whether or not they received ECMO treatment. The predictive value of ECG parameters for ECMO treatment was analyzed.

Results:
Compared with the NFM, patients in FM had significantly abnormal ECG: right bundle branch symptoms, limb lead low voltage or low voltage trend, chest lead low voltage or low voltage trend, and ST segment elevation were more frequent (all $P < 0.05$). ECG parameters showed that except for aVF and V2 leads, QRS amplitude in FM was lower than that in NFM group ($P<0.01$). The mean heart rate and QTS wave duration in FM were higher than those in NFM and control group ($P < 0.05$). Multivariate regression analysis showed that larger QRS wave width and lower mean limb pressure were risk factors for diagnosis of FM; Whether OR not thoracic lead low voltage or low voltage tendency were the factors influencing the need for ECMO treatment in the FM The results showed that the average power supply of limb leads was < 5.96mv and the QRS wave width was > 98mv, which had certain predictive value in the diagnosis of fulminent myocarditis. Thoracic lead QRS evaluation voltage < 10.30mv has a certain predictive value for ECMO treatment of FM.

Conclusion:
Patients with FM have significant and severe ECG abnormalities, and the characteristic changes of ECG can provide important clues for the diagnosis and ECMO treatment of FM.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1793 - IT IS MORE BLESSED TO GIVE THAN TO RECEIVE MYOCARDIAL HYPERTROPHY WITH LEFT VENTRICULAR OUTFLOW TRACT OBSTRUCTION IN A PREMATURE TWIN TWIN TRANSFUSION RECIPIENT – A CASE REPORT

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Background / Hypothesis:
Myocardial hypertrophy, a recognized complication in twin-twin transfusion recipients, has mostly been clinically asymptomatic, with decreasing incidence attributed to advancements in fetal intervention. This case report elucidates a unique manifestation of cardiogenic shock resulting from biventricular hypertrophy in a newborn affected by twin-twin transfusion, recently delivered at Princess Margaret Hospital.

Materials and Methods:
A pair of monochorionic diamniotic twins were delivered prematurely due to fetal distress indicative of acute stage II twin-twin transfusion syndrome. Following birth, the heavier twin exhibited signs of hypertension, followed by diuresis. Within 48 hours, the baby developed shock with acute kidney injury. Echocardiography revealed biventricular hypertrophy and left ventricular outflow tract obstruction. Stabilization involved aggressive fluid resuscitation, inotropic support, and careful management of post-acute kidney injury diuresis.

Results:
The affected twin was discharged at one month of age with regression of biventricular hypertrophy in echocardiography assessments, while the other twin showed no cardiovascular abnormalities on screening.

Conclusions:
This case underscores the potential for cardiovascular complications in twin-twin transfusion recipients, emphasizing the importance of early clinical monitoring and echocardiographic assessments to avert adverse outcomes.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1824 - SAFETY AND EFFICACY OF THYROID HORMONE SUPPLEMENT IN CHILDREN POST OPEN HEART SURGERY A SYSTEMATIC REVIEW AND META ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Background / Hypothesis:
Euthyroid sick syndrome in children after open heart surgery complicates post- operative treatment. T3 supplementation shows improvement of outcomes in children who underwent congenital heart surgery; however, various randomized controlled trials have different outcomes

Materials and Methods:
This study was a meta-analysis and systematic review conducted using the PRISMA Guidelines. Mortality rate, duration of intubation, ICU length of stay, post-op hospitalization duration, inotropic score, and cardiac index were compared using fixed- effects and random-effects meta-analysis. Safety data was summarized using narrative review. PROSPERO registration number CRD42024510790.

Results:
Fourteen studies were included in the meta-analysis. The pooled odds ratio showed significantly lower mortality rate in those given thyroid hormones than placebo (OR=0.53, 95%CI=0.30 to 0.96, p=0.04). The pooled Mean Difference showed significantly lower duration of intubation (MD=-0.52 days, 95%CI= -0.99 to -0.05, p=0.03) and lower ICU stay (MD=-0.57 days, 95%CI= -0.99 to -0.16, p=0.006 in those given thyroid hormones. No significant difference in duration of post-op hospitalization was observed (MD=-17.21 days, 95%CI= -55.35 to 20.92, p=0.38). The pooled Standardized Mean Difference showed significantly better inotropic score in those given thyroid hormones (MD=-0.85, 95%CI= -1.31 to -0.39, p=0.0003). No significant difference in cardiac index was observed (MD=0.57, 95%CI= -0.32 to 1.46, p=0.21).

Conclusions:
The use of routine thyroid hormone therapy administered over at least 24 hours significantly improved clinical outcomes of children following open heart surgery. Thyroid hormone therapy reduced the risk for mortality by half, and decreased duration of intubation, ICU length of stay, and improved inotropic score. This treatment is recommended given its benefits and low safety risk. Further studies with larger sample size and longer follow-up period are recommended.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1923 - POSTOPERATIVE AND SHORT TERM OUTCOMES FOR CHILDREN WITH SINGLE VENTRICLE ANATOMY AND MAPCAS UNDERGOING UNIFOCALIZATION IN THE MODERN ERA

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Background / Hypothesis:
Children with major aortopulmonary collaterals (MAPCAs) and single ventricle anatomy are amongst the most challenging groups to treat. Unifocalization and pulmonary artery reconstruction must result in low pulmonary artery pressures to perform successful staged palliation. The goal of our study is to describe the early postoperative course and short term outcomes of children with this anatomical subset at our institution.

Materials and Methods:
We reviewed the medical records of all patients with single ventricle anatomy and MAPCAs undergoing unifocalization surgery at our institution from 2014 through 2024. We collected baseline demographics, anatomic and surgical info, and reviewed the postoperative course through the most recent diagnostic catheterization.

Results:
Fifteen children at a median age of ten months with a variety of intracardiac anatomy underwent bilateral unifocalization and pulmonary artery reconstruction or aortopulmonary window during the study period (Table 1). None of the patients demonstrated significant other intracardiac anomalies such as obstructed total anomalous pulmonary venous return (TAPVR) or valvular regurgitation. Immediate postoperative outcomes were good (Table 2) and comparable to our previously published data for children with two ventricle anatomy undergoing unifocalization surgery. Median follow-up PAP was 16.5mmHg (Table 3). Five patients died prior to further palliation and three are alive but ineligible for further palliation due to elevated PAP. Two were palliated to Glenn circulation with anticipated future Fontan completion. Five children have undergone Fontan operations.

Conclusions:
Approximately half of the children with single ventricle anatomy and MAPCAs presenting to our institution have undergone successful single ventricle palliation in the recent era. The immediate postoperative course of this complex group of children is reasonable without excessive ICU or hospital morbidity. Future studies will examine the long term outcomes of the reconstructed pulmonary vascular bed in palliated patients.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1934 - IMPROVING COMMUNICATION TO BUILD TRUST AMONGST LONG STAY CVICU PATIENTS AND FAMILIES

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Background / Hypothesis:
The cardiac intensive care unit (CVICU) provides highly specialized care for children with heart disease. Physicians in academic centers generally attend in the ICU for a specified time before transitioning to the next physician. While this rotating model has benefits to both physicians and patients, it can also create the unintended consequence of discontinuity and challenges to building trust amongst long-stay cases.

Materials and Methods:
We employed design-thinking methodology to create an approach for continuity of care and consistent messaging for long stay (>2 weeks) CVICU patients and families. The approach focused on internal and external (patient/family facing) communication and was implemented during the last quarter of 2024. We incorporated weekly patient care discussions between the attending who went off service and the new on-service attending three days following formal handoff. Additionally, we identify families with baseline or developing distrust in the medical team and intervene by offering weekly family meetings with the on-service attending and ancillary services. Data was collected through surveys sent weekly to the on-service physicians and by reviewing family driven escalations to nursing and hospital management.

Results:
Internal weekly patient care discussions have occurred 85% of the time. 71% of physicians believe the communication gave them an opportunity to connect and collaborate with a colleague. 86% believe the practice positively impacted patient care. The majority of the time there was no more than one family meeting scheduled for each attending per week. There were no grievances or complaints to nursing or hospital administration during the intervention period.

Conclusions:
Simple methods to improve internal communication and create additional communication opportunities for long stay families with baseline or developing distrust can lead to an improved CVICU experience. Given emerging evidence of post-traumatic stress in congenital heart families, improving their experience in the CVICU could be important in mitigating long term consequences.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

1966 - AN UNUSUAL CALM IN A STORM A MILD CASE OF GROUP A STREPTOCOCCAL INFECTIVE ENDOCARDITIS WITH SEPTIC EMBOLI AND SUSPECTED INFLAMMATORY ARTHROPATHY

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Background:
Staphylococcus aureus and viridans streptococci are common causes of infective endocarditis, whereas Group A Streptococcus (GAS) is rare. Although GAS endocarditis is typically fatal and rapidly progressive, milder forms can occur. We report a case of a 19-year-old Ecuadorian immigrant with a two-month history of symptoms, diagnosed with GAS endocarditis complicated by septic emboli and suspected inflammatory arthropathy.

Case Presentation:
The patient presented with a worsening hip, thigh, and back pain, night sweats, weight loss, and recent febrile illness with sore throat and vomiting. On PICU admission, he was febrile, tachycardic, and tachypneic, with well-healed superficial knife wounds, limited left hip/knee motion, and a swollen, warm left knee.

Results/Discussion:
Laboratory evaluation revealed anemia, thrombocytopenia, elevated inflammatory markers, and a positive rapid strep test. Blood cultures grew GAS. Echocardiography identified a large (2.2 × 1.7 cm) flailing tricuspid valve vegetation and a previously undiagnosed restrictive ventricular septal defect (VSD). Imaging showed bilateral pleural effusions and pulmonary septic emboli. MRI of the left hip revealed synovitis and perifascial edema without osteomyelitis. He was started on IV ceftriaxone, vancomycin, and clindamycin.

Due to high embolic risk, he underwent tricuspid valve vegetation removal and VSD closure after 10 days of antibiotics. Postoperatively, he completed four weeks of IV ceftriaxone, with improvement in joint pain following NSAIDs and therapy. PCR of the vegetation was positive for GAS confirming GAS endocarditis. He was discharged on daily penicillin and scheduled follow-up with cardiology, rheumatology, and infectious disease.

Conclusions:
Group A Streptococcus is a rare cause of infective endocarditis and is typically associated with significant morbidity and mortality. This case highlights a milder and prolonged presentation, possibly linked to less virulent GAS serotypes. Further studies are needed to clarify the relationship between GAS serotypes and the severity of endocarditis and other invasive infections.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2033 - THE ROLE OF PROCALCITONIN AND WHITE BLOOD CELL COUNT IN GUIDING ANTIBIOTIC USE FOLLOWING CONGENITAL HEART DISEASE SURGERY

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Objective:
To explore the guiding significance of various inflammatory markers in determining the use of antibiotics following congenital heart disease (CHD) surgery.

Methods:
A total of 806 patients, aged between 28 days and 18 years, who underwent cardiac surgery and were subsequently admitted to the Cardiac Intensive Care Unit from January 1, 2021 to December 31, 2022, were included in this study. The information of patients in the electronic medical record and inflammatory markers including white blood cell count (WBC), C-reactive protein (CRP) and procalcitonin (PCT) on the first postoperative day were collected.

Results:
Among 806 patients, 448 were male and 358 were female, with a median age of 1.58 years and a median weight of 10.80kg. The cohort comprised 464 cases in the antibiotic escalation group and 342 cases in the non-escalation group. Significant differences were observed between the two groups regarding age, weight, height, RACHS-1 classification, cardiopulmonary bypass time and aortic cross-clamp time (P<0.001). There were also significant differences in CRP, WBC and PCT on the first postoperative day between the two groups (P<0.001). The levels of CRP, WBC, and PCT were categorized into four groups (Q1 to Q4) based on their degree of increase from low to high for trend analysis. Increased levels of WBC and PCT (Q3 and Q4) correlated with antibiotic escalation. Among these categories, Q4 with the most significant increase in both WBC and PCT exhibited the strongest association with antibiotic escalation (OR=3.74, 95%CI: 2.16-6.60, P<0.001 and OR=2.57, 95%CI: 1.56-4.27, P<0.001, respectively).

Conclusions:
Patients who were younger, had lower body weight and underwent complex cardiac surgery were more likely to experience antibiotic escalation. Compared with CRP, the significant increase in PCT and WBC counts during the early postoperative period provided more meaningful guidance for antibiotics escalation in pediatric patients following cardiac surgery.

POSTER PRESENTATIONS

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2037 - PROGNOSTIC VALUE OF LACTATE TRENDS IN PEDIATRIC ECPR FOLLOWING IN HOSPITAL CARDIAC ARREST

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Background / Hypothesis:
The prognostic significance of biomarkers and their association with favorable outcomes in pediatric extracorporeal cardiopulmonary resuscitation (ECPR)remains unclear. This study investigates the relationship between peri-arrest lactate trends and favorable outcomes in pediatric patients who underwent witnessed in-hospital ECPR.

Materials and Methods:
This retrospective study included patients ≤18 years old who experienced witnessed in-hospital cardiac arrest and underwent ECPR between January 2020 and October 2024, as reported to the Extracorporeal Life Support Organization Registry. The primary outcome was a composite of survival to hospital discharge, heart transplantation, or placement of a durable ventricular assist device. Statistical analyses included univariate and multivariate logistic regression, Kaplan-Meier survival curves, and joint modeling.

Results:
A total of 1,903 patients were analyzed, with 788 (41.4%) achieving a favorable composite outcome. Patients with favorable outcomes had significantly lower lactate levels at all measured time points: post-cardiac arrest, before ECMO cannulation (median [IQR]: 7.0 [3.0,12.0] vs. 9.5 [4.5,14.6] mmol/L, p<0.0001; OR 0.95, 95% CI: 0.93,0.97), within 6 hours of ECMO cannulation (9.8 [5.6,13.9] vs. 13.9 [9.2,17.0] mmol/L, p<0.0001; OR 0.91, 95% CI: 0.89,0.92), and at 24 hours of ECMO support (1.5 [1.0,2.3] vs. 2.5 [1.5,5.7] mmol/L, p<0.0001; OR 0.74, 95% CI: 0.70,0.79). In joint modeling, patients with lactate levels in the highest tertile pre-ECPR (>11.7 mmol/L), at 6 hours (>14 mmol/L), and at 24 hours (>2.8 mmol/L) had significantly worse outcomes (log-rank p<0.0001). Persistent hyperlactatemia (>11.1 mmol/L) was associated with significantly poorer survival (p=0.018), with each 1 mmol/L increase in lactate corresponding to an estimated 3.27% increase in the hazard of death.

Conclusions:
Higher lactate levels following cardiac arrest and during the first 24 hours of ECPR are associated with worse outcomes in pediatric patients. Lack of lactate clearance by 6 and 24 hours post-ECMO cannulation is

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2110 - PHYSICAL ACTIVITY HEMODYNAMIC RESPONSE PHENOTYPES IN CARDIAC INTENSIVE CARE PATIENTS INSIGHTS USING THE HEMOSPHERE NONINVASIVE CARDIAC OUTPUT MONITOR

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Background / Hypothesis:
Anecdotally, a standard hemodynamic response to physical activity is expected. With pediatric and congenital heart disease, a variety of circulatory physiologies exist and a standard response becomes less likely. The aim of this study was to characterize the hemodynamic response to physical activity in patients admitted to a cardiac care unit.

Materials and Methods:
Patients admitted to our cardiac intensive care unit participating in ambulatory physical therapy were eligible for inclusion. Patients deemed eligible for inclusion had a ClearSight Jr cuff placed on them that was connected to a HemoSphere monitor (Becton Dickinson, Franklin Lakes, NJ, USA) prior to physical therapy. This remained on during physical therapy and then for a few minutes into recovery. Cardiac index, indexed systemic vascular resistance, mean arterial pressure, and heart rate were noninvasively monitored.
The percent change in these values from rest to physical activity was calculated. A random forest cluster analysis was conducted to determine phenotypes of hemodynamic response to physical activity.

Results:
A total of 20 patients were included in this study.
Random forest cluster analysis resulted in two discrete hemodynamic response clusters (91% accuracy). Cluster 1 demonstrated a large increase in cardiac index, a decrease in indexed systemic vascular resistance, mild increase in mean arterial pressure, and moderate increase in heart rate. Cluster 2 demonstrated a slight decrease in cardiac index, an increase in indexed systemic vascular resistance, large increase in mean arterial pressure, and mild increase in heart rate. Patients in cluster 1 tended to have mildly depressed systemic ventricular function and all Fontan patients were in this cluster. Patients in cluster 2 tended to have normal systemic ventricular function and all Eisenmenger patients were in this cluster.

Conclusions:
The hemodynamic response to physical activity differs across admitted patients. Future studies confirming these findings and their associations with clinical outcomes are warranted.

POSTER PRESENTATIONS

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2145 - AORTIC PEAK FLOW VELOCITY FOR PREDICTING FLUID RESPONSIVENESS IN MECHANICALLY VENTILATED CHILDREN

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Background / Hypothesis:
Administration of fluids is frequently a crucial aspect of managing the critically ill children. This study aims to examine the area under the curve (AUC), sensitivity, specificity, and optimal threshold values of parameters obtained via transthoracic echocardiography (TTE) in predicting fluid responsiveness in pediatric intensive care patients.

Materials and Methods:
This cross-sectional study included intubated pediatric patients aged 1 month to 15 years who required a fluid challenge in the pediatric intensive care unit. Fluid responsiveness was defined as a greater than 10% increase in stroke volume, as measured by transthoracic echocardiography (TTE). Aortic peak flow velocity variation (ΔVpeak) was assessed using TTE and performed by a cardiologist.

Results:
Thirty-one patients were included in this study, with a median age of 31 months (range 7.2–80.6 months). The results showed that ΔVpeak, with a threshold of 14.5% measured by TTE, demonstrated high reliability in predicting fluid responsiveness (AUC 0.97, sensitivity 100%, specificity 95%).

Conclusions:
The evaluation of ΔVpeak via TTE, using a 14.5% threshold, proved highly reliable for predicting fluid responsiveness in mechanically ventilated pediatric patients.

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2215 - CHARACTERISTICS AND RISK FACTORS OF FUNGAL INFECTIVE ENDOCARDITIS IN NEONATAL AND PEDIATRIC INTENSIVE CARE UNITS OF A TERTIARY HOSPITAL IN MEDINA.

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Background / Hypothesis:
Fungal infective endocarditis (FIE) is a rare but devastating complication in critically-ill pediatric populations, associated with extremely high 75-90 % mortality rate. Understanding local epidemiological patterns and risk factors are crucial for timely intervention. This study was conducted to identify the characteristics and risk factors of FIE cases admitted to neonatal (NICU) and pediatric intensive care units (PICU).

Materials and Methods:
This study is a retrospective analysis that was conducted in NICU and PICU of a tertiary hospital in Medina. We enrolled 50 patients diagnosed with FIE who were admitted to our hospital between January 2022 and January 2025. Demographic, clinical, microbiological, and outcome data were collected and analyzed.

Results:
Neonates comprised the largest group (56.0%) in this study. Regarding gestational age, 52.0% were born at term, while 48.0% were preterm. Low birth weight was frequent, with 68.0% being extremely low or low birth weight. Underlying congenital heart disease (CHD) was present in 88.0% of cases, most commonly combined atrial septal/patent ductus arteriosus defects (ASD/PDA, 60.0%). Overall, the cases showed prolonged hospitalization time with a median of 66 days. Clinical presentations included dyspnea (74.0%), poor feeding (62.0%), and lethargy (42.0%). Whereas a lower extent of the cases presented with fever (20.0%) and echocardiographic vegetations (22.0%). Candida species were the sole isolates; C. parapsilosis (28.0%) was isolated more often than C. albicans (24.0%), while 44.0% were unidentified Candida species. Survival-to-discharge occurred in 70.0% of cases.

Conclusions:
FIE predominantly affected neonates with low birth weight and underlying CHD. Non-specific clinical signs, along with infrequent fever and vegetation detection, pose diagnostic challenges. Microbiological findings with Candida species predominance with high proportion of unidentified isolates, pointed to potential diagnostic limitations. The 70% survival rate, notable in this high-risk group alongside these specific characteristics, encourages for increased vigilance and local tailored prevention/treatment protocols.

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2270 - PATHOGEN AND IMMUNE SIGNATURES FOLLOWING CHD SURGERY IN CHILDREN

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Background / Hypothesis:
Postoperative infections are a leading cause of morbidity in infants and young children undergoing congenital heart disease (CHD) surgery. However, the spectrum of pathogens and associated clinical profiles in this population remain insufficiently characterized, hindering optimized prophylactic and therapeutic strategies.

Materials and Methods:
We conducted a retrospective cohort study of pediatric patients who underwent CHD surgery and were admitted to the CICU with suspected infections between June and December 2024. Clinical specimens were subjected to metagenomic next-generation sequencing (mNGS), and patients were stratified into infection and negative groups based on mNGS results and clinical assessment. Clinical features and laboratory parameters were collected for statistical analysis.

Results:
Among 212 clinical samples, the most frequent specimen types were sputum, bronchoalveolar lavage fluid, and blood. The spectrum of infectious pathogens in pediatric patients following congenital heart surgery was predominantly composed of bacterial only, bacterium and virus, and bacterium plus fungus. Isolated bacterial infections were associated with increased neutrophil and monocyte counts, and elevated inflammatory markers such as PCT and CRP. IL-10 levels were significantly higher in bacterial-only compared to bacterial-viral co-infections. Viral infections were marked by elevated lymphocyte percentages and decreased absolute eosinophil counts, alongside reductions in mean corpuscular hemoglobin (MCH), mean corpuscular volume (MCV), and mean corpuscular hemoglobin concentration (MCHC). IL-8 was significantly elevated in viral infections compared to the negative group. Mixed infections exhibited higher IL-4 levels than bacterial-only infections. Notably, IL-12p70 was significantly elevated in both isolated bacterial and mixed bacterial infections, with the highest levels observed in bacterial-fungal co-infections. Antibiotic regimens were adjusted in 65.9% of infected patients based on mNGS results.

Conclusions:
Postoperative infections in pediatric CHD patients display distinct immunological and hematological patterns. IL12p70 may serve as a promising biomarker to aid in pathogen-specific diagnosis and guide individualized antimicrobial therapy.

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2271 - DRIVING PRESSURE AND NOT POSITIVE END EXPIRATORY PRESSURE IMPACT CENTRAL VENOUS PRESSURE IN MECHANICALLY VENTILATED CHILDREN AFTER CARDIAC SURGERY

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Umcg, Picu, Sappemeer-The Netherlands [1]

Background / Hypothesis:
Positive Pressure Ventilation (PPV) is common in both infants and children surgery for their congenital heart defect (CHD). There is paucity of data on the impact of positive pressure ventilation (PPV) on the cardiopulmonary interactions in these patients. We conducted this exploratory study to investigate the interactions between ventilator settings, their effects like esophageal pressure (Pes), and circulatory parameters. This was a hypothesis generating study since there is no data on Pes in this category of patients.

Materials and Methods:
This prospective study included patients aged 0-18 years who underwent repair or palliation for their CHD with cardiopulmonary bypass and were ventilated for at least one night postoperatively. Pes was measured and used as a respiratory parameter according to unit protocol. Besides demographic data at admission, routine hemodynamic parameters as well as ventilation parameters were measured at three time points (admission, peak low cardiac output syndrome, day after).

Results:
We included 23 patients with a median age of 5 [3-8] months and a median weight of 5.6 [4,38-7,25] kg. Patients were ventilated using a time controlled pressure controlled ventilation mode (PC) or pressure support. Correlations ($p<0,05$) were found between both Peak Inspiratory Pressure (PIP) and Pressure Above Peep (PAP) pressure with Central Venous Pressure (CVP) with ρ being 0,504 and 0,491 respectively during PC-mode, no correlation was found between PEEP and CVP.

Conclusions:
Dynamic driving pressure as measured with both PIP and PAP impact CVP more than PEEP does. This questions routine practice that recommend lower PEEP strategies when using PPV in infants and children after surgery for their CHD. These findings warrant further research into the effect of ventilator setting like PEEP in these patients.

POSTER PRESENTATIONS

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2344 - SUICIDE LEFT VENTRICLE IN PEDIATRIC PATIENT FOLLOWING COARCTATION OF AORTA REPAIR

Matthew Smith [1]
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Background / Hypothesis:
Suicide left ventricle (LV) is a serious, but rare complication involving repair of the left ventricular outflow tract (LVOT) or aortic arch. Typical presentation includes older adult patients undergoing repair for aortic valve stenosis. We present the first reported case of suicide left ventricle in a pediatric patient undergoing correction for severe coarctation of the aorta.

Severe coarctation of the aorta leads to increased afterload that begins during fetal development and leading to increased intraventricular pressures and a smaller ventricular cavity. Following correction, the significant drop in afterload leads to significantly decreased filling pressures resulting in the left ventricle. This then sets off a sequela of events that result in the LVOT collapsing on itself and systolic anterior motion of the mitral valve obstructing the LVOT and leading to cardiogenic shock.

Intervention requires quick access to echocardiogram in surgery and quick transition to ECMO for proper circulatory hemodynamics. Fluid levels should be kept elevated, inotropes should be reduced, and non-dihydropyridine calcium channel blockers or beta blockers should be initiated as an attempt to increase preload volumes.

Materials and Methods:

Results:

Conclusions:

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2382 - THE EFFECT OF THE COVID 19 PANDEMI ON CHILDHOOD MYOCARDITIS

Zulal Ulger [1], Gizem Kulakoğlu [2], Eser Doğan [1], Bulent Karapinar [3], Erturk Levent [1]
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Background / Hypothesis:
Myocarditis may develop in children during COVID-19 infection, and
MIS-C (Multisystem inflammatory syndrome), or after after COVID-19 vaccine. The aim of the study was to evaluate the effect of Covid 19 pandemic in childhood myocarditis compared to the children diagnosed as
myocarditis in prepandemic period.

Materials and Methods:
In this study, the files of children, diagnosed as myocarditis and hospitalized between the 2017-2022(two and a half years before and after
pandemi) were retrospectively analyzed.Sociodemographic characteristics of the patients, anthropometric data, vital signs at the admission,complaints at admission, laboratory and imaging results, disease severity and prognosis, need for intensive care unit, treatment methods,morbidity-mortality data, risk factors for intensive care need were evaluated.

Results:
A total of 61 children, 41 boys (67%) and 20 girls (33%), were included in the study. Groups of patients diagnosed with myocarditis before and after pandemi were compared. Patient groups diagnosed with post-COVID-19 myocarditis were subgroped as COVID-19 related, MIS-C related,Covid 19 vaccine related and COVID-19 unrelated. In our study, 18% (n=11) of 61 patients were diagnosed with pre-COVID-19 and 82% (n=50) post-COVID-19 myocarditis. Post-COVID-19 patients had significantly higher heart rate, respiratory rate, body temperature,and significantly lower systolic and diastolic blood pressures at the time of admission.While disease severity was mostly mild in pre-COVID-19,
patients, disease severity was moderate-severe in post-COVID-19 patients. The length of hospital stay was longer in the post-COVID-19 group. The need for intensive care unit was found to be significantly higher after COVID-19. Septic shock, permanent cardiac systolic dysfunction and multi-organ involvement were found to be significantly higher after COVID-19. The variables that best predicted the need for intensive care unit were determined as CRP and ProBNP.

Conclusion:
The COVID-19 pandemic has increased the incidence of myocarditis. The severity of the disease was more severe in patients diagnosed with myocarditis after COVID-19.

POSTER PRESENTATIONS

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2389 - ENHANCING PEDIATRIC CARDIAC INTENSIVE CARE THROUGH TARGETED RESPIRATORY THERAPY TRAINING PROGRAMS IN CHINA

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Background / Hypothesis:
The need for Respiratory Therapy (RT) training in China is critical, particularly in the context of pediatric cardiac care. Despite advancements in medical education and healthcare infrastructure, there remains a significant gap in specialized respiratory care training, which is essential for improving patient outcomes in pediatric cardiac intensive care units (PCICUs). The hypothesis is that targeted RT training programs can significantly enhance the quality of respiratory care services within PCICUs in China.

Materials and Methods:
Since 2016, TEDA International Cardiovascular Hospital (TICH) in Tianjin and The Hospital for Sick Children (SickKids) have collaborated to enhance pediatric cardiac care at TICH. This partnership focused on training critical care nurses to become the respiratory care team within the PCICU at TICH. Delegation visits to Tianjin and exchange visits to Toronto informed the initial aspects of this training. A customized curriculum was developed using a hybrid teaching model, involving TICH Senior RT delivering the teaching module with the support of SickKids Subject Matter Experts (SMEs), other curriculum sessions co-delivered by SMEs and the TICH Senior RT. The curriculum included formal academic programs in RT at accredited centers in China and didactic/clinical training programs at TICH.

Results:
The curriculum and clinical placements provided essential skills needed to improve respiratory care services within the PCICU at TICH. This initiative has significantly enhanced the quality of care for pediatric patients with acquired and congenital heart disease. The collaboration involved delegation visits to China and exchange visits to Toronto, fostering a robust educational exchange. The train-the-trainer framework ensured ongoing knowledge translation and capacity building.

Conclusions:
The partnership between SickKids International and TICH exemplifies the importance of specialized RT training in improving pediatric cardiac care. By addressing the existing need for RT training and leveraging collaborative educational programs, significant strides can be made in enhancing respiratory care

POSTER PRESENTATIONS

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2397 - VASOACTIVE INOTROPE SCORE (VIS) AS PREDICTOR OF OUTCOME IN INFANTS WHO UNDERWENT OPEN HEART SURGERY UNDER CARDIOPULMONARY BYPASS AT THE PHILIPPINE HEART CENTER A PROSPECTIVE STUDY

Pristine Rose Fajardo [1]
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Background / Hypothesis:
Congenital heart diseases (CHD) are prevalent structural defects present at birth, affecting approximately 0.8-1.2% of live births globally. Despite advancements in surgical techniques and perioperative care, complications such as low cardiac output syndrome, arrhythmias, and acute kidney injury remain significant concerns. The Vasoactive Inotrope Score (VIS) is a critical tool for assessing the severity of illness and guiding postoperative management in pediatric cardiac surgery.

Materials and Methods:
This prospective cohort study was conducted at the Philippine Heart Center from August 2023 to November 2024, involving infants under 365 days old who underwent open heart surgery with cardiopulmonary bypass. A total of 52 patients were included, with data collected on demographic factors, surgical parameters, and postoperative outcomes. The VIS was calculated based on the administration of various vasoactive medications during the first 48 hours post-surgery.

Results:
The study found that 67% of participants experienced adverse clinical outcomes. Early mortality was observed in 7.69% of patients, while central nervous system injury occurred in 19.23%, and low cardiac output syndrome was noted in 38.46%. The median length of ICU stay was 6 days, with 64.71% of patients experiencing prolonged stays. The VIS on Day 1 and Day 2 showed significant associations with adverse outcomes, with odds ratios of 1.1837 (95% CI: 1.0599 to 1.3221, $p = 0.003$) and 1.4867 (95% CI: 1.1477 to 1.9259, $p = 0.003$), respectively. Higher VIS values correlated with increased likelihood of mortality, prolonged ICU stay, and extended mechanical ventilation ($p < 0.05$).

Conclusions:
The findings underscore the importance of the VIS in predicting postoperative outcomes in infants undergoing cardiac surgery. Higher VIS values are associated with increased morbidity and mortality, highlighting the need for meticulous perioperative management. Routine utilization of VIS for risk assessment and postoperative planning is recommended to enhance patient outcomes and minimize complications in this vulnerable population.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2399 - UTILITY OF INHALED NITRIC OXIDE FOR PULMONARY HYPERTENSION IN CYANOTIC CONGENITAL HEART DISEASE A COHORT STUDY WITH PROPENSITY SCORE MATCHING

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National Center For Cardiovascular Disease Fuwai Hospital, Picu, Beijing-China [1]

Background / Hypothesis:

Pulmonary hypertension can lead to hemodynamic instability and worsen the outcome after repair of cyanotic congenital heart disease with decreased pulmonary blood flow. However, the safety and effectiveness of targeted therapy such as inhaled nitric oxide remain controversial.

Materials and Methods:
This retrospective cohort study included patients who underwent corrective repair for tetralogy of Fallot, double outlet right ventricle, or pulmonary atresia with ventricular septal defect with hypoplastic pulmonary vasculature in Fuwai Hospital between 2014 and 2021. Patients were divided into regular treatment group and combined treatment group depending on whether inhaled nitric oxide was prescribed. The improvement in low cardiac output syndrome within 24 hours after surgery and main clinical outcomes during hospitalization were compared between the two groups after 1:1 propensity-score matching.

Results:
Among all the 2284 patients, a total of 79 suitable patients were enrolled, including 42 in the regular treatment group and 37 in the combined treatment group. The patients in the two groups were matched by propensity score, generating 29 matched pairs. In the combined treatment group, the incidence of low cardiac output syndrome was lower compared to regular treatment group ($P < 0.001$). The rate of renal replacement therapy (14% vs. 41%, $P = 0.04$) was lower in the combined treatment group.

Conclusions:

The inhaled nitric oxide therapy is effective in the treatment of patients with pulmonary hypertension after corrective repair of cyanotic congenital heart disease with decreased pulmonary blood flow. The regular treatment combined with inhaled nitric oxide is better than regular treatment alone in improving low cardiac output syndrome and renal protection.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2400 - RISK FACTORS FOR PROLONGED INTENSIVE CARE UNIT STAY AFTER PEDIATRIC CARDIAC SURGERY DATA FROM NATIONAL CENTER FOR CARDIOVASCULAR DISEASES IN CHINA

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Background / Hypothesis:
After pediatric cardiac surgery, many patients require prolonged stay in the intensive care unit. These patients require tremendous resources, which adds an additional burden to the healthcare systems. To date, few studies have investigated risk factors in pediatric patients with congenital heart disease, especially in developing countries. This study aimed to explore the risk factors for prolonged intensive care unit stay after pediatric cardiac surgery to improve care planning and resource management.

Materials and Methods:
This retrospective study included pediatric patients with congenital heart disease who underwent surgical repair at our single center from January 2021 to December 2022. We analyzed 44 potential risk factors across pre-operative, intra-operative, and post-operative variables using logistic regression to identify independent risk factors.

Results:
Prolonged intensive care unit stay was defined as ≥95th percentile (≥12 days). Of the 4348 patients studied, 246 experienced prolonged intensive care unit stay or hospital death after surgery were categorized as Group 1, while 4,102 patients without prolonged stay or hospital death after surgery were designated as Group 2. Multivariable analysis identified 14 independent risk factors: age, pre-operative data cystatin C, palliative procedure, duration of cardiopulmonary bypass, lactic acid at weaning from cardiopulmonary bypass, postoperative arrhythmia, renal replacement therapy, re-operation, cardiopulmonary resuscitation, re-intubation, central venous pressure 2 hours after transferred to the intensive care unit, volume of chest tube drainage 2 hours after transferred to the intensive care unit, vasoactive-inotropic score on post-operative day 1, left ventricular ejection fraction on post-operative day 1.

Conclusions:
This study identified 14 risk factors associated with prolonged intensive care unit stays after pediatric cardiac surgery. These findings can help identify at-risk patients for targeted interventions to reduce intensive care unit duration and associated costs.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2402 - IMPLEMENTATION AND VALIDATION OF A COMPREHENSIVE UNIT BASED SAFETY PROGRAM TO REDUCE MULTI DRUG RESISTANT ORGANISM INFECTIONS IN A PEDIATRIC CARDIAC ICU

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Background / Hypothesis:
In recent years, multi-drug-resistant organisms (MDRO) have posed an increasingly severe disease burden in ICUs. Pediatric patients who have undergone cardiac surgery are at a higher risk of MDRO infection.

Materials and Methods:
A prospective quasi - experimental study was conducted over a seven - year period from 2018 to 2024. In 2021, a comprehensive multifaceted intervention for MDRO prevention was launched, which included a comprehensive unit - based safety program (CUSP). To evaluate the effectiveness of our CUSP - based intervention measures, we compared the differences in MDRO incidence and postoperative MDRO - related days between the periods before and after the intervention, namely Group 1 and Group 2.

Results:
A comparative analysis of the study periods (2018 - 2020 versus 2021 - 2024) revealed improvements in infection control measures. Hand hygiene compliance increased from 48% to 61% ($p < 0.001$), and environmental hygiene pass rates rose from 81% to 93% ($p < 0.001$). During the same period, antibiotic consumption (defined daily dose) decreased from 32.7 to 27.5 (HR: 0.842; 95% CI: 0.815 - 0.970; $p < 0.001$). Group 1 included 8,567 patients with 58 resistant bacterial specimens (0.68%), comprising 49 cases of gram - negative bacilli (0.57%) and 9 cases of gram - positive cocci (0.11%). Group 2 comprised 11,194 patients with 38 resistant bacterial specimens (0.34%), including 27 cases of gram - negative bacilli (0.24%) and 11 cases of gram - positive cocci (0.1%). The incidence of multidrug - resistant gram - negative bacilli showed a 57.9% decrease ($p < 0.001$), whereas the incidence of multidrug - resistant gram - positive cocci decreased by 9.1% ($p = 0.876$).

Conclusion:
Our multifaceted approach utilizing the CUSP model has been associated with improvements in infection control measures and a reduced incidence of multidrug - resistant gram - negative bacilli.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2406 - FACTORS AFFECTING SURVIVAL FOLLOWING FONTAN PROCEDURE EXPERIENCE FROM A HIGH VOLUME CENTER

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Background / Hypothesis:
The Fontan procedure is the final surgical stage for single ventricle patients, separates the systemic and pulmonary venous returns and corrects cyanosis. This single-center study aimed to investigate survival rates and factors influencing survival following Fontan surgery.

Materials and Methods:
This study included all patients who underwent Fontan surgery at our center between January 2012 and December 2022. Demographic, echocardiographic, angiographic, and surgical data, as well as postoperative course, additional interventions, follow-up duration, and survival status were analyzed.

Results:
Fontan surgery was performed in 297 patients during the study period. The median age and weight at the time of surgery were 5.3 years (IQR: 4.1–8.1) and 17 kg (IQR: 15–22.5), respectively, with no significant association between these parameters and survival. The median ICU stay was 3 days (IQR: 2–8), and median hospital stay was 15 days (IQR: 11–22). Prolonged pleural drainage (>14 days) occurred in 87 patients (29.3%), but its association with mortality was not statistically significant. A total of 42 transcatheter procedures were performed in 34 patients, and 21 patients required reoperation during the early postoperative period. Survival was significantly lower among patients undergoing surgical revision, while no significant association was found between survival and transcatheter interventions. ECMO support was required in 22 patients (7%), with significantly lower survival in this group. The hospital survival rate was 93.6%. Mortality decreased over the years, from 12.5% in 2012 to 2.9% in 2022.

Conclusions:
Advances in preoperative evaluation, perioperative monitoring, and surgical techniques have improved clinical outcomes of the Fontan procedure. Consistent with the literature, both the number of operated patients and survival rates have increased over the years in our series. The markedly lower survival in patients requiring ECMO or reoperation underscores the importance of thorough preoperative assessment and prevention of residual lesions.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2409 - BEYOND THE SHUNT POSTOPERATIVE RIGHT VENTRICULAR DYSFUNCTION AND SATURATION IMBALANCE PREDICT MORTALITY IN PULMONARY ARTERIAL HYPERTENSION

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Background / Hypothesis:
This study aims to identify prognostic indicators associated with in-hospital mortality in patients with severe pulmonary arterial hypertension (PAH).

Materials and Methods:
A prospective observational cohort study included 29 PAH patients undergoing Potts shunt from January 2023 to December 2024. Clinical, echocardiographic, hemodynamic, and biochemical parameters were recorded preoperatively at 24, 48, and 72 hours postoperatively. Mortality predictors were identified using univariate and multivariate logistic regression analyses, with receiver operating characteristic (ROC) curve evaluations.

Results:
Of 29 patients (mean age: 11.95±8.12 years), 25 survived and 4 did not. Non-survivors had significantly lower preoperative tricuspid annular plane systolic excursion (TAPSE)-z scores (-3.84±0.95 vs. -0.17±2.69, p=0.013) and higher RV end-diastolic volume index (RVEDVi; 222.30±108.42 vs. 147.25±49.80 ml/beat/m^2, p=0.020). Postoperatively, non-survivors exhibited worsening trends, including reduced abdominal regional oxygen saturation (p<0.001), elevated arterial oxygen saturation gradients (ΔSaO_2 upper-lower, p=0.001), increased CVP (p=0.008), deteriorating TAPSE-z scores (p=0.001), rising right-to-left shunt velocity (p=0.003), and reduced left ventricular diastolic dimensions (p<0.001) compared with the survivors. Multivariate analysis identified POD48hr TAPSE-z as a protective factor (OR=0.34, 95% CI: 0.008–0.997, p=0.049; optimal cutoff -1.75, sensitivity 96%, specificity 100%) and POD72hr ΔSaO_2 as a strong mortality risk factor (OR=4.03, 95% CI: 1.2–71, p=0.002; optimal cutoff 15%, sensitivity 75%, specificity 100%). ROC analyses showed excellent predictive performance (AUC=0.99 for TAPSE-z at POD48hr, AUC=0.98 for ΔSaO_2 at POD72hr).

Conclusions:
Postoperative RV function, as measured by TAPSE-z, and ΔSaO_2 upper-lower are critical predictors of survival in pediatric patients undergoing Potts shunt.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2417 - ASSOCIATION BETWEEN COMPLICATIONS CLINICAL CHARACTERISTICS AND ULTRASOUND FINDINGS IN PEDIATRIC PATIENTS POSTOPERATIVELY UNDERGOING CARDIOVASCULAR SURGERY AT THE CHILDREN'S HOSPITAL OF MEXICO

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Background / Hypothesis:
The use of ultrasound in critically ill pediatric patients undergoing cardiovascular surgery is a noninvasive method for the early detection of potential immediate complications. Currently, there is no protocol focused on pediatric patients. Existing protocols focused on cardiac surgery patients perform a sequential analysis to detect shock (cardiogenic, hypovolemic, obstructive), valvular disease, mobility disturbances, prosthetic dysfunction, and noninvasive hemodynamic assessment.

Materials and Methods:
This study is analytical, prospective, cross-sectional and experimental. 28 patients were studied.

The clinical characteristics analyzed were: patient age, date of surgery, pre- and postoperative diagnoses, fluid overload index, central venous pressure,electrocardiographic rhythm, pre- and postoperative creatinine, uresis in the first 18 hours, diuretic use, extracorporeal circulation time, aortic cross-clamping time, circulatory arrest time, and bleeding in the first 18 hours. The ultrasound findings were: inferior vena cava distensibility, pericardial effusion, pleural effusion, pneumothorax, A lines, B lines, sliding sign, barcode sign, optic nerve sheath measurement of the right and left eyes, VEXUS protocol, LVEF, qualitative function, clot anterior to the right ventricle, Kissing Wall sign, cerebral and renal NIRS.

Results:
There was no significant relationship between optic nerve sheath diameter and aortic cross-clamp time and cerebral NIRS measurements. Regarding central venous pressure and tricuspid regurgitation, a higher central venous pressure value was observed in patients with tricuspid regurgitation. Comparing the VEXUS protocol and acute kidney injury staged using the KDIGO scale, there was no relationship between the two. Comparing VEXUS with glomerular filtration rate, slightly higher glomerular filtration rates were observed in patients without venous congestion, but the difference was not statistically significant.

Conclusions:We conclude that if ultrasound assessment in the immediate postoperative period is useful, as it identifies immediate complications and provides guidelines for rapid treatment, it is worth continuing the study.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2436 - RENAL COMPLICATIONS AFTER ARTERIAL SWITCH OPERATION INCIDENCE PREDICTORS AND CLINICAL IMPACT

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Background / Hypothesis:
Acute kidney injury (AKI) is a common postoperative complication following arterial switch operation (ASO) for transposition of the great arteries (TGA), potentially affecting recovery and outcomes. This study aimed to evaluate the incidence of AKI, identify intraoperative risk factors, and assess its clinical impact

Materials and Methods:
A retrospective analysis was conducted of patients who underwent ASO between 2009 and 2024 at Kokilaben Dhirubhai Ambani Hospital, Mumbai. Patients were classified based on AKI severity using standard criteria. Clinical, operative, and postoperative variables were analysed to identify predictors and outcomes associated with severe AKI.

Results:
Among 677 patients, 155 (22.9%) developed AKI, and 68 (10.0%) had severe AKI. Patients with severe AKI had significantly longer aortic cross-clamp times (median 82 min [IQR 61–127] vs. 73.5 min [IQR 53–136], p = 0.02). Elevated lactate levels during cardiopulmonary bypass (CPB) were associated with increased risk of severe AKI (OR 1.5; 95% CI: 1.0–2.0; p = 0.03). Severe AKI correlated with prolonged mechanical ventilation, delayed fluid balance normalization, and a higher need for peritoneal dialysis.

Conclusions:
AKI occurred in nearly one-quarter of patients undergoing ASO, with severe AKI affecting 10%. Prolonged cross-clamp duration and elevated intraoperative lactate levels were significant risk factors. Severe AKI was associated with increased postoperative morbidity. Early identification of at-risk patients and optimized intraoperative management may reduce the incidence and impact of postoperative renal complications.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2440 - CHRONIC HYPOXEMIA AS A RISK FACTOR FOR THROMBOTIC EVENTS IN CHILDREN WHO HAVE UNDERGONE CARDIAC SURGERY

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Background:
Thrombotic complications in paediatric and neonatal patients with congenital heart defects are a significant socio-economic and medical problem. The most common risk factors for the development of hemostasis disorders include hereditary disorders, heart failure, as well as chronic hypoxia.
The aim of the study was to study the degree of hypoxia paediatric cardiac patients and its role in the implementation of thrombotic events.

Materials and Methods:
The prospective single-center “case-controlled” study included 179 patients undergoing open cardiac surgery. Thrombotic events (TE) were verified in 42(23.46%) patients. Gas exchange indicators (pH, paO2, paCO2, oxygen content (CaO2), arterial concentration O2(ctO2), extraction index O2(O2EI), SaO2,SvO2,(A-a)O2, p50, as well as the hematological profile of the patients included in the study were studied.

Results:
The frequency of TE in the study groups was 23.46%. Patients with verified thrombotic complications had a statistically lower weight ($p<0.05$) and BMI($p=0.05$). Chronic hypoxia, being a trigger mechanism for many pathological processes, refers to the latent risk factors of TE. In the group with TE, there were lower SO2%($p<0.05$; $R=-0.341$) and paO2($p<0.05$; $R=-0.310$). The oxygen content in patients in the group with TE was 13.8 ml of O2/100 ml, while in the control group 14.01 ml of O2/100 ml ($p=0.65$). The total concentration of O2 (ctO2) was 12.98±2.89 mmol/l and 12.29±2.03 mmol/l in groups with TE and without TE, respectively ($p=0.81$). The risk of TE implementation is associated with low values of pvO2($R=-0.264$) and SvO2($R=-0.311$).

Conclusions:
Chronic hypoxemia is a significant risk factor for TE. The search for criteria for the degree of hypoxemia allows you to stratify the risks associated with disorders of the hemostasis system in the population of patients with CHD with restricted pulmonary bloodand univentricular physiology and chronic heart failure. Perioperative management ofsuch patients should include antithrombotic support in order to avoid TE that prevent further surgical correction.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2452 - TO COMPARE THE EFFECT OF PROPHYLACTIC AMIODARONE VERSUS DEXMEDETOMIDINE ON REDUCING THE FREQUENCY OF POST SURGICAL JUNCTIONAL ECTOPIC TACHYCARDIA (JET) FOLLOWING PEDIATRIC OPEN HEART SURGERY.

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Nicvd, Paeds Cardiology, Karachi-Pakistan [1]

Background / Hypothesis:
One of the common complications of pediatric cardiac surgery is junctional ectopic tachycardia (JET), which could be due to exaggerated automaticity of the atrioventricular (AV) nodal tissues, which is explained by AV dissociation. The literature reports the frequency of JET following pediatric cardiac surgery for the correction of congenital cardiac defects ranging between 2 -22%.
It is a randomized controlled trial study.

Materials and Methods:
Children of both genders aged between 1 to 12 years and planned to undergo cardiopulmonary bypass surgery were included. Children in the amiodarone group (n=50) were given amiodarone at the time of induction of anesthesia as 5-10 mcg per kg per minute (depending upon the hemodynamic) and continued for the next 48 hours. In the dexmedetomidine group (n=50), children were administered dexmedetomidine at the time of induction of anesthesia as 0.2-0.5 mcg per kg per hour (depending upon the hemodynamics) and continued for the next 48 hours.

Results:
A total of 100 children underwent cardiopulmonary bypass surgery, 61 (61.0%) were boys, while the mean age was 6.4±4.8 years. The mean cardiopulmonary bypass and aortic cross clamp times were 86.7±34.5 minutes and 45.9±24.1 minutes, respectively. The most frequent types of CHDs were ventricular septal defect (VSD) and tetralogy of Fallot (TOF), noted in 38 (38.0%) and 26 (26.0%) children, respectively. Overall, the frequency of JET was noted in 18 (18.0%) children. The frequency of JET was 5 (10.0%) children in the amiodarone group versus 13 (26.0%) in the dexmedetomidine group (p=0.0373).

Conclusion:
Post-surgical JET was found to be a common observation in children undergoing cardiopulmonary bypass surgery. Prophylactic amiodarone resulted in significantly less frequency of JET when compared to dexmedetomidine.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2458 - A SINGLE CENTER EXPERIENCE OF RIGHT VENTRICULAR OUTFLOW TRACT STENTING FOR CONGENITAL HEART DEFECTS WITH LOW PULMONARY BLOOD FLOW

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Background / Hypothesis:
Right ventricular outflow tract (RVOT) stenting is a palliative bridge to definitive surgical repair of congenital heart defects (CHDs) with low pulmonary blood flow in high-risk surgical patients. The indications for this procedure have not been standardized, and there is high variability in the time to definitive surgical repair. This study characterized the RVOT stenting experience in a pediatric intensive cardiac care unit.

Materials and Methods:
Retrospective cohort analysis of patients with CHD and low pulmonary blood flow who underwent RVOT stenting at the Instituto Nacional de Cardiologia Ignacio Chavez (CDMX, Mexico) between 2007 and 2025. Demographic and clinical data were retrieved from medical records.

Results:
The analysis included 225 patients (Table 1). 123/225 (55%) were male; their median age and weight were 3.6 years (1-14.8) and 12.5kg (7.6-24.3). The most frequent CHDs were tetralogy of Fallot (102/225, 45.3%) and double outlet right ventricle with pulmonary stenosis (44/225, 19.6%). The most common indication for stenting was pulmonary artery branch hypoplasia (115/225, 51.1%). Successful stenting occurred in all but one patient. 36/225 (16%) experienced periprocedural complications, the most common of which was intraoperative hypotension (10/225, 4.4%). 125/225 (55.6%) underwent a follow-up intervention, of which 48/125 (38.4%) had a definitive surgical correction with a median 29.5mo bridge (14.5-53.5), whereas 54/125 (43.2%) required re-stenting after a median of 25.5mo (13.5-41.8). There were 32 (14.2%) recorded deaths in the study period. 16/225 (7.1%) occurred before a follow-up intervention, 7/225 (3.1%) after corrective surgery, 5/225 (2.2%) after re-stenting and 4/225 (1.8%) after pulmonary-systemic shunting.

Conclusions:
This extensive single-center analysis of RVOT stenting for CHD with low pulmonary blood flow identified a very high initial stenting success rate and 16% occurrence of perioperative complications, albeit with a high re-stenting rate within two years from the initial intervention and prolonged time to definitive corrective surgery.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2483 - COMPARATIVE MACHINE LEARNING MODELING OF RESTING ENERGY EXPENDITURE ESTIMATION IN MECHANICALLY VENTILATED CHILDREN AFTER CARDIAC SURGERY

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Background / Hypothesis:
Nutrition status is vital for children's recovery following the cardiac surgery, with substantial inter-individual variability in metabolic demands. We aimed to develop machine learning (ML) models of postoperative resting energy expenditure (REE) by analysing the influential factors.

Materials and Methods:
We retrospectively analyzed pediatrics who underwent indirect calorimetry (IC) for valid REE measurements within 4 to 24 hours after cardiac surgery between January 2021 and December 2022 at our center. Nine ML algorithms were trained to predict REE. Bland-Altman analysis assessed agreement with measured REE, and SHAP was used for population-level interpretation and a representative patient case.

Results:
A total of 278 mechanically ventilated children were analyzed. REE was measured by IC ranged from 387 - 2642 kcal/day (715 [550, 964]), and 21 - 239 kcal/kg/day (51 [39, 63]) reflecting weight-adjusted values. The route mean square error (RMSE) of the ML models ranged from 163 to 227 kcal/day, while the Schofield equation's is 168 kcal/day. The top 10 important variables associating with REE of model with optimal performance are weight, height, age, cardiopulmonary bypass (CPB) time, preoperative serum creatinine, systolic blood pressure (SBP), postoperative N-terminal pro-B-type natriuretic peptide (NT-proBNP), vasoactive inotropic score (VIS), preoperative serum albumin and serum creatinine kinase-myocardial band (CK-MB).

Conclusions:
This study developed ML models to predict REE in children after cardiac surgery, with some models outperforming conventional equations. By analysing multiple perioperative variables through ML algorithms, we identified the factors associated with postoperative metabolic levels.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2484 - MACHINE LEARNING PREDICTION OF EARLY SEVERE CARDIAC ADVERSE EVENTS AFTER CONGENITAL HEART DISEASE SURGERY IN CHILDREN

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Background / Hypothesis:
We aim to develop and validate an early warning model, integrating perioperative parameters, to predict cardiac severe adverse events (CSAEs) occurring within the first 48 hours following congenital heart disease (CHD) surgery in pediatric patients.

Materials and Methods:
We retrospectively analyzed children underwent CHD surgery at Fuwai Hospital from January 2021 to December 2022. Perioperative variables were collected from the preoperative period to four hours postoperatively. Feature selection was performed using literature review, clinical judgment, and LASSO regression. Nine machine learning algorithms were developed and evaluated using the area under the receiver operating characteristic curve (AUC-ROC) and other performance metrics. Model interpretability was assessed using SHapley Additive exPlanations (SHAP) values.

Results:
There were 4115 patients underwent cardiac surgery involved. CSAEs incidence was 4.7% (194/4115). Among the nine machine learning (ML) models developed, the XGBTree achieved the highest predictive performance (AUC-ROC = 0.977). Feature importance analysis identified the vasoactive-inotropic score (VIS) at 4 hours postoperatively and at PICU admission as the top two contributors to CSAEs prediction. Other important variables included the 4-hour postoperative PaO_2/FiO_2 ratio, 4-hour lactate level, aortic cross-clamp (ACC) time, PICU admission blood glucose level, cardiopulmonary bypass (CPB) time, 4-hour central venous pressure (CVP), PICU admission PaO_2/FiO_2 and age.

Conclusions:
We developed ML models capable of accurately predicting the risk of CSAEs in pediatric patients following CHD surgery. This may facilitate early identification and timely intervention for high-risk patients in critical care settings.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2485 - THE ASSOCIATION BETWEEN A RIGOROUS INTEGRATED TREATMENT MODEL AND IMPROVED HOSPITAL OUTCOMES IN NEONATES WITH CRITICAL CONGENITAL HEART DISEASE

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Background / Hypothesis:
Effective medical management strategy is critical for neonates with congenital heart disease (CHD). Leveraging cross-center differences in the neonatal referrals, we evaluated the effect of our rigorous integrated treatment model compared to conventional management pathways.

Materials and Methods:
We retrospectively analyzed neonates (≤ 28 days) with CHD hospitalized at our center between January 2019 and December 2024. Subjects were divided into two groups for comparison: Group 1 included neonates managed under the rigorous treatment model, which involved prenatal CHD diagnosis, birth in the designated maternity hospital, and transfer to our center via a specialized green channel for cardiac surgery. Group 2 included neonates transferred from other hospitals or self-referred. Major adverse events (MAEs) were defined as in-hospital death or discharge against medical advice (DAMA). Multivariable logistic regression models were used to assess the association between different management strategies and outcomes while adjusting for confounders.

Results:
A total of 587 neonates (141 in Group 1, 446 in Group 2) were analyzed; 439 underwent neonatal surgery. MAEs occurred in 11.0% overall. Compared with others, patients in group 1 were admitted to CICU earlier (day 0 vs 6), operated on sooner (7 vs 15 days), had lower low-birth-weight rates (5.7% vs 18.2%), higher surgery rates (82.3% vs 72.4%), and fewer emergency surgeries (9.5% vs 18.9%). Group 2 had higher MAE rates (12.8% vs 5.7%). No significant differences were found in ventilation time, ICU stay, or hospital stay. after adjusting for confounding factors, our integrated model was associated with fewer MAEs (aOR = 0.36, 95% CI 0.11–1.20).

Conclusion:
Our rigorous integrated neonatal management model ensures safety and timeliness of neonatal transportation, optimizes preoperative conditions for high-risk neonates, and reduces hospital mortality or DAMA.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2486 - POSTOPERATIVE UNPLANNED ICU READMISSION IN CHILDREN WITH CONGENITAL HEART DISEASE A SINGLE CENTER RETROSPECTIVE CASE CONTROL STUDY BASED ON PROPENSITY SCORE MATCHING

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Background / Hypothesis:
To investigate the reasons for unplanned postoperative ICU readmission in children with congenital heart disease (CHD) and analyze the associated risk factors to provide evidence for targeted prevention.

Materials and Methods:
We retrospectively collected data on CHD patients who underwent unplanned ICU readmission after cardiac surgery between January 2020 and December 2020 at our center. Using propensity score matching (PSM) based on four baseline variables—sex, age, weight, and RACHS-1 surgical risk classification—we performed a 1:2 matched case-control study by selecting non-readmitted patients from a preexisting database. Univariate analysis was conducted to identify potential predictors, followed by multivariate logistic regression modeling.

Results:
A total of 80 matched patient pairs were successfully identified. Compared with the non-readmission group, the readmitted patients had lower preoperative left ventricular ejection fraction (LVEF) ($P < 0.001$), higher preoperative hemoglobin (Hb) levels ($P < 0.001$), and a higher proportion of cyanotic CHD ($P < 0.001$). No statistically significant differences were found in palliative surgery status, renal replacement therapy, preoperative serum creatinine, preoperative blood urea nitrogen, cardiopulmonary bypass time, or aortic cross-clamp time ($P > 0.05$). The readmission group had longer mechanical ventilation duration (19 vs. 21 h, $P = 0.004$), total ICU stay (4 vs. 8 days, $P < 0.001$), and total hospital stay (15 vs. 32 days, $P < 0.001$). In addition, the first postoperative ICU stay was significantly shorter in the readmission group than in the non-readmission group (2 vs 4 days, $P = 0.009$).

Conclusions:
Preoperative optimization of cardiac function, increasing attention within a reasonable range to ICU discharge decisions for children with cyanotic CHD after surgery, and providing high-risk patients with an appropriate safety buffer of about two days before ICU discharge may help prevent postoperative ICU readmission and potentially improve overall ICU and hospital length of stay.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2487 - IMPROVED SURVIVAL IN HYPOPLASTIC LEFT HEART SYNDROME FOLLOWING IMPLEMENTATION OF A STANDARDISED PERIOPERATIVE CARE BUNDLE A SINGLE CENTRE EXPERIENCE

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Background / Hypothesis:

Hypoplastic left heart syndrome (HLHS) is among the most complex congenital heart defects and was universally fatal in the neonatal period until the advent of the Norwood procedure and its modifications. Despite significant advances, perioperative mortality remains a major challenge.

Materials and Methods:
We conducted a single-centre, retrospective, observational cohort study of 56 consecutive patients undergoing Norwood surgery for HLHS between June 2008 and May 2025. Two eras were compared: Era 1 (2008–2016, n=17) and Era 2 (2017–2025, n=27), the latter following implementation of a perioperative care bundle. This included a postoperative checklist, modulation of inotropic use with adjunctive nitroglycerin, avoidance of preoperative ventilation when feasible, prophylactic fibrinogen/cryoprecipitate before cardiopulmonary bypass weaning, prenatal diagnosis with scheduled delivery, surgical refinements, early re intervention policy, and early ECMO availability. The primary outcome was in-hospital mortality at 28 days.

Results:
Overall mortality was 16% (9/56), decreasing from 47% (8/17) in Era 1 to 7.4% (2/27) in Era 2. All deaths occurred within 30 days postoperatively, except for three during the interstage period. Improved survival was attributed to surgical refinements, optimized perioperative haemodynamic, avoidance of preoperative ventilation, prenatal diagnosis, and greater team experience. Avoidance of preoperative mechanical ventilation was the only variable significantly associated with reduced mortality.

Conclusions:
Our findings suggest improved survival after Norwood surgery was multifactorial, with avoidance of preoperative mechanical ventilation potentially playing a key role. The study is limited by its small sample size, which may have reduced statistical power for other associations. Implementation of a standardized perioperative care bundle could be associated with marked reduction in early postoperative mortality following Norwood surgery for HLHS. Continued refinement of multidisciplinary strategies and surgical techniques is essential.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2505 - ISCHEMIC REPERFUSION PULMONARY EDEMA AFTER LATE REPAIR OF TETRALOGY OF FALLOT CASE SERIES AND LITERATURE REVIEW

Bana Naser Agha [1], Basel Harahshaeh [2], Marwan Al Hobani [3], Khalid Al Hawari [4], Abdu Rahman Almesned [5], Mohmad Kabbani [6]

Psccq, Cardiac Intensive Care, Buridha-Saudi Arabia [1] Psccq, Cardiac Surgery, Buridha-Saudi Arabia [2] Psccq, Cardiac Intensive Care, Buridha-Saudi Arabia [3] Psccq, Cardiac Surgery, Buridha-Saudi Arabia [4] Pssccq, Pediatric Cardiic, Buridha-Saudi Arabia [5] King Abdulaziz Medical City, Cardiac Intensive Care, Riyadh-Saudi Arabia [6]

Background / Hypothesis:
Ischemic/reperfusion pulmonary edema after pediatric cardiac surgery is a rare but immense complication. Identifying high-risk vulnerable groups will help in early detection and offer timely and appropriate management. In this report, we described four cases of total repair of tetralogy of Fallot (TOF) who had severe ischemic/reperfusion injury post-surgery. We will discuss the pathophysiology of such complications, identify possible risk factors and available preventive strategies, and set a management plan

Materials and Methods:This report will present four cases of ischemic/reperfusion pulmonary edema post tetralogy of Fallot repair with different degrees of pulmonary stenosis but without major aorto-pulmonary collaterals (MAPCAs

Results:
Conclusions:Ischemic/reperfusion lung edema post-TOF repair is a rare but destructive complication. Identification of high-risk groups who are prone to this scenario, modified strategies of reoxygenation during cardiopulmonary bypass and after surgery, with special attention post-surgery, are key elements to overcome such complications

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2513 - ASSOCIATION BETWEEN HOSPITALIZATION COSTS AND PERIOPERATIVE FACTORS IN CONGENITAL HEART DISEASE SURGERY

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Background / Hypothesis:
Congenital heart disease (CHD) is a major contributor to childhood morbidity, with surgical treatment imposing a significant economic burden on patients and their families. This study aims to investigate the relationship between hospitalization costs and perioperative indicators, providing a basis for optimizing the allocation of medical resources and informing cost-control strategies.

Materials and Methods:
This retrospective study analyzed data from 3767 patients who underwent CHD surgery at the National Center for Cardiovascular Diseases between January 2021 and December 2022. Variables included demographic and perioperative data such as age, surgical complexity, and emergency operation status. The correlations between hospitalization costs and other indicators were assessed, along with a multivariable regression model for further analysis.

Results:
All costs are expressed in Chinese yuan (CNY). Hospitalization costs for the included patients ranged from CNY 23,253 to CNY 1,816,672, with a median cost of CNY 68,510. In the multivariable regression model, gender, age, preterm, cardiopulmonary bypass, and emergency operation were not statistically significant factors influencing hospitalization costs. However, the following factors were found to be independently associated with hospitalization costs: preoperative ventilatory support, RACHS-1 scores of 3 or higher, pacemaker use , cardiopulmonary bypass (CPB) time, aortic cross-clamp (ACC) time, and length of stay in the pediatric intensive care unit (PICU).

Conclusions:
This study provides data-driven support and serves as a reference for the rational allocation of medical resources and cost-control measures. Our findings highlight the critical role of surgical complexity and intensive care demands on the economic burden, suggesting that optimized perioperative management may effectively reduce hospitalization costs and alleviate the financial strain associated with pediatric CHD surgery.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2550 - BERLIN HEART EXPLANTATION FOR MYOCARDIAL RECOVERY A THREE CASE SERIES

Alexandre George [1], Celine Thibault [1], Ismael Bouhout [2], Nassiba Alami Laroussi [3], Karen Harrington [1]
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Background / Hypothesis:
20%- 30% of children awaiting heart transplantation are bridged with ventricular assist device(VAD) . Myocardial recovery (MR) is uncommon, with reported explantation rates of 8.6%-10%. We describe three recent cases of successful explantation for MR.

Materials and Methods:
Case review of three patients explanted from Berlin Heart (BH) between July 2024 and February 2025. Clinical characteristics, weaning process, and outcomes were collected from electronic medical records.

Results:
Case 1. A 4-month old girl with known Belhassen ventricular tachycardia (VT) received ECMO-CPR for intractable VT and cardiovascular collapse. ECMO transitioned to BH for non-recovery and intractable VT. Arhythmia control was achieved after 7 weeks, followed by MR. Successful explantation occurred after 118 days of support.

Case 2. A 4-months girl with DCM and severe heart failure (HF) received BH LVAD at INTERMACS Stage2. At 3 months, contractility improved but HF symptoms and LV dilatation required increasing LVAD support. At 5months, stable clinical and echo parameters and strong parental desire prompted a wean trial. Over 7 weeks, LVAD support was successfully decreased from 3L/m2/min to 1,75L/m2/min. Successful explantation occurred after 215 days of support.

Case 3 A 12-yo girl with DCM received a BH LVAD for severe HF at INTERMACS Stage2. At 7months a resistant deep cannula infection required considering explantation for source control. Despite mitigated response to previous brief VAD rate decreases, a formal wean trial was well tolerated. Successful explantation occurred after 227 days of support.

Conclusions:
MR permitting explantation in children on VAD as a bridge to transplant is uncommon but occurs. This case series illustrates that MR may be observed in patients of different ages, after variable durations of support time, and that MR may be missed if not systematically sought by way of a formal weaning trial

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2568 - CLINICAL PROFILES AND OUTCOMES OF LONG STAY PATIENTS WITH CONGENITAL HEART DISEASE IN PAEDIATRIC INTENSIVE CARE UNIT

Shuhei Yoshida [1], Wataru Kashimada [1], Kenji Morimoto [1], Ichiro Watanabe [1], Osamu Saito [1]
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Background
Long-stay patients (LSPs) in paediatric intensive care units (PICUs) have high readmission and mortality rates and are challenging to manage. Those with congenital heart disease (CHD) require more complex care and resources. We aimed to compare characteristics and outcomes of LSPs with and without CHD.

Methods
We retrospectively reviewed all PICU admissions (2018–2022) at Tokyo Metropolitan Children's Medical Centre, which data was collected by electrical medical record. LSPs were defined as stays >27 days; only the first long-stay admission per patient was included. Patients with poor neurological prognosis and transitioned to palliative care within 28 days were excluded. The primary outcomes were 1- and 2-year PICU readmission and all-cause mortality, comparing LSPs with CHD to those without CHD. Secondary outcomes were total bed-days and the duration of critical care therapies.

Results
Among 3,697 admissions, LSPs comprised 3.8% (141/3,697). After exclusions, 117 patients remained (CHD group: 64%, 75/117). Median length of stay was 36 days (CHD) vs 42 days (non-CHD) (p=NS).
One-year mortality was 29% (CHD) vs 7% (non-CHD), and 2-year mortality 32% vs 10% (both p<0.01). Among survivors, 1-year readmission occurred in 63% (CHD) vs 41% (non-CHD) (p=NS), but 2-year readmission was higher in CHD (76%) vs non-CHD (46%) (p<0.01). Duration of all critical care therapies, except invasive mechanical ventilation (p=0.28), was significantly longer in the CHD group.

Conclusion
LSPs represented a small proportion of PICU admissions but had high illness severity. Those with CHD had greater resource utilisation, higher long-term mortality, and higher 2-year readmission rates compared with non-CHD LSPs. Targeted strategies to improve outcomes in this subgroup should be prioritised in PICU care planning.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2584 - AWAKE ECMO IN PAEDIATRIC PATIENTS BRIDGING TO EARLY REHABILITATION A CASE SERIES

Lulu Suet Wing Chung [1], Karen Ka Yan Leung [1], Andy Ka Hang Kwok [1], Yiu Fai Cheung [2], Nicholson Yam [3], Stephen Wing Wai Chan [4], Kam Lun Hon [1]
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Background / Hypothesis:
Awake extracorporeal membrane oxygenation (ECMO) is increasingly employed in adult ICUs, experience in children however remains limited due to concerns over complications associated with unpredictable cooperativeness. While sedation facilitates stable circuit operation, it poses issues from prolonged intubation, muscle deconditioning, and sedation-related delirium. Early extubation and rehabilitation may benefit patients in improving functional and psychosocial outcome upon discharge.

Materials and Methods:
We describe our experience in managing paediatric ECMO patients without invasive ventilation and continuous sedation, facilitating early rehabilitation.

Results:
We report four patients aged 8–15 years, two supported with venoarterial-ECMO, one with venovenous-ECMO, and one initially on venoarterial-ECMO, subsequently converted to venopulmonary-ECMO following left ventricular assisted device (LVAD) implantation. Indications include acute myocarditis, heart graft rejection with cardiogenic shock, dilated cardiomyopathy, and cystic fibrosis with refractory respiratory failure. The mean ECMO duration was 21 days (range 7–37), with patients free from invasive ventilation and sedation 30-70% of the support period. Patients were selected based on cooperativeness and cardiopulmonary stability. Two patients on venoarterial-ECMO were extubated to room air on day 3 and 4 respectively. The patient on venovenous-ECMO was extubated to non-invasive ventilation on day 12. The patient with dilated cardiomyopathy (venoarterial-ECMO) was extubated on day 20, found cardiac tamponade on day 9 post- LVAD implantation requiring re-intubation for drainage, then extubated 5 days after while on venopulmonary-ECMO. During awake ECMO runs, two patients achieved ambulation, two were mobilised on bed; patients experienced minor cannula site oozing, while no major complications like interrupted flow and accidental decannulation. Three patients showed satisfactory functional assessment at follow-up 5-13 months post-discharge. One remains an inpatient and is making good rehabilitation progress.

Conclusions:
Our experience suggests that management of paediatric awake ECMO can be both feasible and safe in carefully selected patients with multidisciplinary planning. This strategy facilitates early rehabilitation and may contribute to improved long-term outcomes.

POSTER PRESENTATIONS

Category: Cardiac Intensive Care

2592 - SUCCESSFUL RESCUE OF ACUTE FONTAN FAILURE WITH VA ECMO IN A CHILD WITH MASSIVE PLEURAL EFFUSION

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Background:
Fontan circulation is highly preload-dependent, and disturbances such as massive pleural effusion can precipitate a rapid downward spiral into acute Fontan failure. We report the successful rescue of a child with decompensated Fontan physiology using veno-arterial extracorporeal membrane oxygenation (VA ECMO).

Case Presentation:
A 4-year-old, 15 kg girl, status post Fontan completion, was admitted with massive pleural effusion. Therapeutic drainage of ~1.5 L resulted in acute hypovolemia, causing Fontan circuit imbalance and severe desaturation. The patient required positive pressure ventilation, which further compromised Fontan flow and cardiac output. Progressive deterioration led to severe ventricular dysfunction, further impairing Fontan hemodynamic.

Management and Outcome: VA ECMO was initiated as a rescue measure to interrupt the cascade of acute Fontan failure. Ventricular function improved over time, enabling successful decannulation and extubation. The patient was discharged in a clinically stable condition.

Conclusion:
This case highlights the vulnerability of Fontan physiology to volume shifts and ventilatory strategies, and the potential role of VA ECMO as a life-saving bridge to recovery in acute Fontan failure. Prompt recognition and early initiation of mechanical support can avert irreversible deterioration and improve outcomes in this complex patient group.

POSTER PRESENTATIONS

Category: Cardiac Morphology in Extended Reality

1157 - COMPUTATIONAL FLUID DYNAMICS STUDY IN OPTIMIZING THE MORPHOLOGICAL OF VALVES IN EPTFE VALVED CONDUITS

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Background / Hypothesis:
This study aims to evaluate the impact of leaflet morphology on the hemodynamics of expanded polytetrafluoroethylene (ePTFE) valved conduits and to provide theoretical guidance for the clinical optimization of valved conduit designs using full-factor experimental design (DOE) and in vitro fluid dynamics experiments.

Materials and Methods:
An in vitro dynamic experiment was conducted to test the hemodynamic performance of ePTFE valved conduits based on current template. Based on the experimental results, a computational simulation model of the valved conduit was established. DOE was employed to optimize leaflet trimming parameters, iterating three key parameters: leaflet height, commissure height, and free-edge length. The optimization objective was to maximize the valve orifice area and minimize regurgitation.

Results:
A 22mm ePTFE valved conduit was fabricated following the current surgical template. In vitro pulsatile flow testing showed an average effective orifice area (EOA) of 1.077 cm^2, a regurgitation fraction of 7.86%, and a mean transvalvular pressure gradient of 18.64 mmHg. High-resolution imaging revealed twisted and overlapping leaflets during diastole. Fluid-structure interaction (FSI) simulations indicated a significant correlation between leaflet trimming parameters and the hemodynamic performance of the valved conduit prosthesis. Reducing leaflet height improved hemodynamic performance, with the optimized parameters set as follows: free-edge length at 1/3 of the conduit circumference(C), leaflet height at approximately 0.012 diameter(D), and commissure height at about 0.24D (Table 1). Under a cardiac output of 3.5 L/min, the optimized valve exhibited a 3.79% reduction in peak flow velocity, a 45.18% decrease in maximum equivalent strain, and a 66.57% reduction in leaflet coaptation area(Table 2).

Conclusions:
Proportionally reducing the free-edge length and appropriately controlling the leaflet height can effectively decrease regurgitation caused by redundant leaflets overlap during diastole. Additionally, this optimization helps reduce leaflet strain, thereby improving the durability of the valved conduit.

POSTER PRESENTATIONS

Category: Cardiac Morphology in Extended Reality

1372 - SUPER FLEXIBLE THREE DIMENSIONAL HEART MODELS OF CONGENITAL HEART DISEASE MADE VIA STEREOLITHOGRAPHY PRINTING AND VACUUM CASTING

Isao Shiraishi [1], Masaaki Yamagishi [2], Shigemitsu Iwai [3], Kennichi Kurosaki [1]
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Background:
Three-dimensional (3D) printing is an advanced technology for accurately understanding anatomy and supporting the successful surgical management of complex congenital heart disease (CHD). To evaluate whether our super-flexible 3D heart models could facilitate preoperative decision-making and surgical simulation for complex CHD, we conducted a physician-led clinical trial in complex congenital heart disease.

Materials and Methods:
The super-flexible heart models were fabricated by stereolithography 3D printing of the internal and external contours of the heart from cardiac computed tomography (CT) data, followed by vacuum casting with a polyurethane material similar in elasticity to a child's heart. Nineteen pediatric patients with complex CHD were enrolled (median age, 10 months). The primary endpoint was the percentage of patients rated as "essential" on the surgeons' postoperative 5-point Likert scale. The accuracy of the models was validated by a non-destructive method using industrial CT.

Results:
The super-flexible heart models allowed detailed anatomical diagnosis and simulated surgery with incisions and sutures. Thirteen patients (68.4%) were classified as "essential" by the primary surgeons after surgery, with a 95% confidence interval of 43.4-87.4%, meeting the primary endpoint. The product error within 90% of the total external and internal surfaces was 0.54 ± 0.21 mm.

Conclusions:
The super-flexible 3D heart models are accurate, reliable, and useful tools for assisting surgeons in decision-making and allowing for preoperative simulation in CHD.

POSTER PRESENTATIONS

Category: Cardiac Morphology in Extended Reality

1409 - FROM VIRTUAL TO REALITY VIRTUAL REALITY INSTRUCTION IMPROVES CONFIDENCE AND PERFORMANCE IN CONGENITAL HEART DISEASE EDUCATION

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Texas Children's Hospital/ Baylor College Of Medicine, Cardiology, Houston-United States [1]
Boston Children's Hospital/harvard Medical School, Cardiology, Boston-United States [2] Ut Southwestern Medical Center, Cardiology, Dallas-United States [3]

Background / Hypothesis:
Developing educational content that results in meaningful education of 3D cardiac anatomy presents significant challenges. Virtual Reality (VR) presents an opportunity to bridge this gap. This study explores the efficacy of VR in enhancing congenital heart disease instruction, with a specific focus on the complex and intricate lesion, Double Outlet Right Ventricle (DORV).

Materials and Methods:
Forty-one participants, including pediatric cardiology fellows (20) and cardiac associated practice providers (21), engaged, in pairs, in a 30-minute instructional session within a virtual reality environment. The session centered on a patient-specific VR model of DORV derived from MRI source data. Pre- and post-testing assessed participants' knowledge of DORV and their ability to interpret associated echocardiograms. Embedded survey questions solicited subjective learning experiences including diagnostic confidence before and after VR instruction.

Results:
Overall objective knowledge scores significantly increased from pre-instruction (2.6±1.2) to post-VR instruction (3.9±1.1), $p<0.001$. Fellow participants demonstrated enhanced accuracy in interpreting an echocardiogram following VR instruction (68.2% vs 40.9%, $p<0.014$). Participants reported improved comfort in understanding (7.6±1.4 vs 5.0±1.7, $p< 0.001$) and confidence in diagnosing double outlet right ventricle (DORV) (4.3±2.4 vs 2.9±2.0, $p<0.001$) after the VR teaching session. Participants further reported enhanced understanding of DORV with VR instruction when compared with their prior experiences with bedside teaching diagrams (9.1±1.0) and textbooks (9.2±1.0).

Conclusions:
This study demonstrates that VR instruction was effective in enhancing both subjective understanding as well as objective knowledge performance in congenital heart disease among pediatric cardiology fellows and cardiac associated practice providers.

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1463 - ISOLATED LEFT BRACHIOCEPHALIC ARTERY A REPORT OF FOUR CASES

Kumiyo Matsuo [1], Mio Kairiku [1], Haruka Nisino [1], Amane Kato [1], Ken Hayashi [1], Masahiro Mori [1], Dai Asada [1], Yoichiro Ishii [1], Hisaaki Aoki [1]
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Background / Hypothesis:
Isolated left brachiocephalic artery (LBA) is a rare congenital anomaly in which the LBA arises from the pulmonary artery via the left ductus arteriosus. After birth, closure of the ductus arteriosus results in retrograde blood flow through the left common carotid and left vertebral arteries, supplied via the right cerebral circulation through the circle of Willis. Here, we report four cases of isolated LBA.

Cases:
Case 1: Prenatal diagnosis of right aortic arch (RAA), bilateral ductus arteriosus, and isolated LBA. After birth, ductus arteriosus closure led to LBA isolation. Brain SPECT at 10 months showed no perfusion asymmetry.
Case 2: Fetal diagnosis of tetralogy of Fallot (TOF) with RAA. Postnatally, 22q11.2 deletion syndrome was confirmed. Catheterization at 11 months identified isolated LBA.
Case 3: Fetal diagnosis of double outlet right ventricle (DORV), infundibular pulmonary stenosis, and RAA. Postnatally, trisomy 21 and isolated LBA with a left ductus arteriosus were confirmed. Mild hypoperfusion in the left temporal and occipital lobes was noted in the Brain SPECT before PDA closure. Ductal closure was confirmed on day 10.
Case 4: Transferred after birth with a patent ductus arteriosus. Diagnosed with RAA, right patent ductus arteriosus (RPDA), left patent ductus arteriosus (LPDA), and isolated LBA. Despite ibuprofen treatment, RPDA and LPDA remained patent. The patient is under observation.

Conclusions:
Isolated Left Brachiocephalic Artery is extremely rare but is frequently associated with a right aortic arch (RAA), congenital heart defects such as tetralogy of Fallot (TOF) and complete transposition of the great arteries (TGA), as well as tracheal stenosis. Additionally, systemic conditions such as 22q11.2 deletion syndrome, CHARGE syndrome, and trisomy 21 have been reported in association with these anomalies.
If the patent ductus arteriosus (PDA) remains open, patients may present in infancy with increased pulmonary blood flow and pulmonary hypertension. After PDA closure, symptoms may manifest later in adulthood due

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1529 - 3D VIRTUAL REALITY BASED BAFFLE PLANNING FOR LEFT VENTRICLE TO AORTA ROUTING IN COMPLEX CONGENITAL HEART SURGERY A FEASIBILITY STUDY

Harikrishnan Anilmaya [1], Amit Kumar Pandey [2], Brijesh Kottayil [2], Sarin Xavier [1], Krishna Kumar Raman [2], *Mahesh Kappanayil* [2]
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Background:
Left Ventricle to Aorta baffling is a critical step in complex CHD surgeries, conventionally guided by intraoperative assessment.
We studied feasibility of using immersive 3D virtual reality (3DVR) to
1.Simulate baffle placement & identify case-specific challenges and surgical approach.
2.Define morphometrics of predicted baffle.
3.Use 3D printed baffle as template for pre-shaping pericardial patch intraoperatively.

Materials and Methods:
Prospective study conducted in a tertiary center with dedicated 3D Printing & VR Laboratory. 3DVR medical modelling techniques (using cardiac CT data, Vea Simulations software) were used to analyze intracardiac spatial anatomy, simulate LV-Aorta baffle placement and plan surgical approach in a series of complex CHD cases undergoing surgical repair.
Digitally designed baffles were analyzed for morphometrics, and 3D printed using flexible (elastic) resin into templates for guiding intraoperative baffle creation. Adherence to simulation-based surgical plan and ease of baffle creation were assessed in operating room.

Results:
16 complex CHD cases (median age 6.8 years) included - DORV (n=9; 2 with common AV canal, 2 with superoinferior ventricles), double-outlet both ventricles (n=1), CCTGA (n=4), d-TGA (n=2). Situs abnormalities (5/16), dextrocardia (7/16), pulmonary stenosis/atresia (13/16) added to complexity. 13/16 had been previously surgically palliated. (Table)
Digital twins were created, 3DVR assessment and baffle planning were successfully done for all. Intraoperative findings were concurrent with 3DVR predictions in all cases. Patient-specific 3D-printed baffles allowed tangible morphometric assessment and served as physical templates to pre-cut and shape pericardial patches in operating room. Initially prepared with 1cm margin along the predicted shape the patches were trimmed as they were sutured in position. Deviation from predicted morphometrics was < 10%.

Conclusions:
Advanced 3D technologies, 3DVR simulation and predictive baffle modelling can help plan and assist LV-Aorta baffling, improving efficiency, accuracy and predictability of complex heart surgeries.

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1535 - AMELIA PERSONALISED 3D VIRTUAL REALITY FOR CARDIAC MORPHOLOGY MODEL

Yi Chuan Tham [1], Daobo Wang [2], Yoke Leng Ng [3], Kok Hooi Yap [1], *Alvin Chun Sheng Tan* [2]
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Background / Hypothesis:
With the advancement in virtual reality and hardwares that are now readily available in competitive price. A tailored virtual reality cardiac morphology programme is increasingly affordable and available to be personalised.

Materials and Methods:
We applied for institutional grant for a pilot project for a new virtual reality cardiac morphology programme. The aim is to employ a company to create a new virtual reality cardiac morphology programme in accordance to the criteria set by the authors. The award was advertised in an open tender platform. Qualified companies were shortlisted and it was finally awarded to one company with a very competitive package.

Results:
We were able to utilise the total SGD 44000 grant to engineer a new 3D virtual reality cardiac morphology software programme that came with original source code which enable future upgrade by any eligible group/individual. This also came with an upgradable hardware. The final product of the programme was constructed with ability to store all 3D heart models in an indexed library, equipped with ability to dissect, measure and label the models. This multi-user interface programme was designed to be an adjunct tool for perisurgical planning, education and enhancing communication with patients, family and within multidisciplinary team.

Conclusions:
In an increasingly competitive market, the ability to engineer an new personalised 3D virtual reality cardiac morphology with competitive price to cater to the need of a cardiac department is possible.

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1678 - FROM 3D PRINTING TO EXTENDED REALITY THE EVOLVING ROLE OF IMMERSIVE TECHNOLOGIES IN CARDIAC DECISION MAKING AT A POINT OF CARE 3D LAB IN TERTIARY CARE CENTER

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Background:
3D Printing (3DP) and Extended Reality (XR) enhance morphological understanding, surgical planning, and collaboration in pediatric cardiac sciences. 3DP offers unmatched tactile feedback but requires hardware, materials, and time. XR enables faster, versatile visualization. We present our decade-long experience with a point-of-care (POC) cardiovascular 3D-lab at a tertiary center in South India.

Materials and Methods:
We reviewed data on establishment and utilization of POC 3D-Lab at our center since its inception in 2015, with focus on utilization and sustainability. This high-volume, limited-resource pediatric cardiac center is destination-of-choice for complex congenital heart surgeries.

Results:
Established in 2015, the Cardiovascular 3D-Lab began with proprietary segmentation software and low-cost 3D printers to treat complex heart defects. Sustainability grew with multi-specialty use. In 2021, specialist engineers replaced clinician-run model, and XR adoption enabled faster, more versatile visualization without requiring physical 3D prints. 3DP and XR were used for decision-making and surgical planning in 254 complex congenital heart disease(CHD) cases, where conventional formats of imaging and discussions were insufficient for treatment planning. Cases included complex variants of double outlet right ventricle (n=61), congenitally corrected transposition of great arteries (n=25), transposition of great arteries (n=43), tetralogy of Fallot (n=41), aortic arch anomalies (n=20), criss-cross hearts (n=11) and others. 3DP was used in 65, XR in 147 and both in 43 cases. Until 2022 3DP was the dominant modality, used in over 70% of cases. Trajectory shifted to greater utilization of XR (2022-2024), accounting for 73% of cases. Comprehensive cardiac morphology collection (both physical and virtual models) has become a valuable resource for teaching and research.

Conclusions:
It is feasible and rewarding to establish and grow immersive 3D ecosystem even in limited resource settings.Growing adoption of XR over 3DP highlights shift towards interactive digital visualization. Both technologies complement each other, enhancing complex cardiac decision-making and surgical planning.

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Category: Cardiac Morphology in Extended Reality

1697 - BRIDGING HEALTH AND DESIGN DEVELOPING EDUCATIONAL TOOLS FOR CONGENITAL HEART DISEASE

Charles Larson [1], Rochus Hinkel [2], Melissa Iraheta [2], Tony Yu [2], Bryn Jones [3], James Thompson [2], Nancy Ji [2], James Helal [2], Amy Gray [3]
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Background / Hypothesis:
3D representations of congenital heart disease (CHD) are effective and engaging learning tools for families and medical trainees. While they may offer particular value in complex lesions, little is known about which design features best support learning.

Materials and Methods:
A 2023 collaboration between the Royal Children's Hospital and Melbourne School of Design brought together expertise in cardiac imaging, 3D visualization, education, sustainable design, and consumer engagement. ICU site visits, interviews, and co-design workshops informed a shared understanding of current limitations and needs for CHD education. Design-based research methodology informed the creation of several Tetralogy of Fallot and Hypoplastic Left Heart Syndrome prototypes that could be compared and evaluated with stakeholders. CT data was used to create myocardial and blood pool 3D prints, colored to indicate oxygenation, and with varied combinations of material hardness and transparency. Digital models simulated the ability to personalize anatomical features, such as degree of aortic override or level of pulmonary obstruction. Prototypes were evaluated via usability testing and focus groups.

Results:
Thirty-six participants (19 nurses, 12 trainees, 5 family members) from ICU, cardiology, and pediatrics provided feedback. Themes were: (1) Inadequacy of 2D representations – "The cardiologists have drawn us many pictures but we are still confused." (Family). (2) New insights – "I'm shocked. How do you even operate on an aorta that size?" (Nurse). (3) Preference for realism – Health team preferred tactile myocardial models printed to scale. Families favored digital models personalized to reflect their child's condition. (4) Linking to existing knowledge – Trainees oriented models alongside diagrams and echo views. (5) Need for flexibility to learners and context – Families preferred physical models during explanations and digital ones for review in their own time and to share with extended family.

Conclusions:
In designing CHD learning tools, realism, personalization, and format flexibility were valued across stakeholder groups.

POSTER PRESENTATIONS

Category: Cardiac Morphology in Extended Reality

1715 - DECISION MAKING IN COMPLEX CONGENITAL HEART DEFECTS USING EXTENDED REALITY CONTEMPORARY EXPERIENCE FROM A LOW RESOURCE CENTER WITH DEDICATED EXTENDED REALITY LABORATORY

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Background / Hypothesis:
3D Virtual Reality (3DVR) visualisation can transform treatment planning by enhancing spatial understanding of complex cardiac dysmorphology. 3D digital tools allow intuitive engagement with data and anticipation/simulation of critical surgical steps.
We present institutional experience with use of Extended Reality (XR) for treatment planning in a large cohort of complex CHD.

Materials and Methods:
Prospective study conducted at tertiary pediatric cardiac center in India with dedicated Cardiovascular XR Lab. 112 consecutive cases with complex CHD with lack of clarity/ consensus on morphology and/or treatment plans after conventional evaluation, were included.

Workflow involved creation of 'digital twins' from cardiac CT using 3DVR modelling softwares (Elucis, Realize Medical; Vea Simulations), MetaQuest devices, and use of digital tools (virtual dissection, moving, scaling, measuring, annotating) for manipulating 3D rendered models. Baffle placements and septal resections were digitally simulated. 'Multiplayer collaborative VR' allowed simultaneously viewing by team-members. Case-specific challenges & treatment plans were defined.

Results:
Case mix (Table) comprised CHDs with significant morphological complexities, & management dilemmas. 48% were previously palliated.

3DVR allowed immersive interaction with anatomy. Feasibility & optimal strategies for 2-ventricle/1.5-ventricle repair were considered. Intraventricular tunnelling, conduit placement, ventriculotomy site, septal defect enlargement, ventricular adequacy and sternotomy were among critical surgical strategies studied & planned. Multiplayer VR collaboration enhanced team communication and understanding. Digitally simulated and 3D-printed baffles were used as templates for intraventricular baffle-creation in 16 cases. 75% (n=85) patients underwent surgical correction (2-ventricle/1.5 ventricle) after XR assessment. Morphological observations and anticipated challenges correlated with intraoperative findings in all, with no major deviation from preoperative plans. Average bypass time was 380 min and cross clamp time 150 min, with no surgical mortalities in operated cohort.

POSTER PRESENTATIONS

Conclusions:
XR tools can enhance morphological understanding and enable precise surgical planning in complex CHD. Strategic use of XR and integration with clinical workflow can help optimize outcomes.

POSTER PRESENTATIONS

Category: Cardiac Morphology in Extended Reality

1729 - NOVEL EXTENDED REALITY TECHNOLOGY FOR MULTIPLAYER COLLABORATION AND KNOWLEDGE SHARING INTERNATIONAL FEASIBILITY STUDY

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Background / Hypothesis:
Extended Reality (XR) technologies have transformative potential in healthcare applications. We explored feasibility of using XR for collaborative visualisation and analysis of 3D digital heart models by remotely located pediatric cardiac professionals for knowledge-sharing, morphological understanding, treatment planning and remote training .

Materials and Methods:
Seven pediatric cardiac teams from developing world (one each from Brazil, Malaysia, Vietnam & four centers across India) participated. Each site was provided two MetaQuest3 VR devices with collaborative XR software (MedisphereXR, India), creating a Mixed Reality '3D-model viewing' system capable of multi-player remote collaboration (using Wifi internet). 3D digital twins of selected complex CHD modelled from tomographic data were imported into system for collective viewing.

Participants simultaneously logged into virtual rooms using personalized passcodes and were able to see, hear and actively interact with each other as lifesize digital avatars while simultaneously viewing and interacting with 3D heart-models with custom digital tools (dissection, measurement, annotation etc). Case discussions were led by an expert. Post-session feedback was obtained.

Results:
Feasibility studies were successfully completed with three collaborative XR meetings (between December 2024-March 2025) involving all teams. The novel technology allowed seamless immersive collaboration, collective viewing of cases and active engagement despite large geographical distances. Mixed Reality format with avatars and virtual hearts being projected into real-world environment evoked a unique sense of togetherness. Ability to converse (inbuilt microphones and speakers) and physically move and interact through physical spaces made the interaction immersive and realistic.
Feedback showed : 1). 100% participants felt that XR enhanced their learning experience and understanding of the complex cases, and their ability to plan treatment. 2). All participants perceived 'presence' and 'engagement' with other participants in the virtual space.

Conclusions:
XR technologies can be meaningfully used for borderless collaboration and knowledge sharing between pediatric cardiac professionals across the globe.

POSTER PRESENTATIONS

Category: Cardiac Morphology in Extended Reality

2046 - PULMONARY ATRESIA IN CONGENITAL HEART DEFECTS CAN WE DEDUCE EMBRYOLOGICAL MECHANISMS FROM MORPHOLOGICAL PHENOTYPE

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Background / Hypothesis:
Pulmonary atresia (PA) is usually classified into tetralogy of Fallot with pulmonary atresia (TOF-PA) and pulmonary atresia with intact ventricular septum (PA-IVS). It can also be part of more complex cardiac lesions. Our objective was, analyzing fetal and neonatal human heart specimens, to determine the anatomical and pathophysiological mechanisms responsible for the different phenotypes of PA.

Materials and Methods:
We analyzed macroscopically 150 specimens with PA from the anatomic collection of the French Reference Center for Complex Congenital Heart Defects. Measurements included the height and width of the subpulmonary atrium, the diameter of the tricuspid valve, the size and thickness of the subpulmonary ventricle, the location of the outlet septum, the nature of the PA (muscular or valvar), the diameter of the pulmonary arteries.

Results:
Hearts were classified in six groups: TOF-PA, 48 (32%); PA-IVS, 41 (27 %): tricuspid anomalies (TAs), 18 (12%); atrioventricular septal defects, 21 (14%); anomalous ventriculo-arterial connections, 11 (7%); univentricular hearts, 10 (7 %), double discordance, 1. The right atrium was larger in TAs. The right ventricular (RV) wall was thicker in PA-IVS and thinner in TAs. Outlet septum was incorporated to ventricular septum in PA-IVS and TAs, malaligned in TOF-PA, variable in other groups. Pulmonary atresia was mostly valvar in TAs and PA-IVS and muscular in the other groups. Pulmonary arteries were larger in PA-IVS.

Conclusions:
The anatomical differences between the groups support the hypothesis of mechanisms occurring at different stages of cardiac development. Larger pulmonary arteries in PA-IVS, incorporated outlet septum and valvar atresia in PA-IVS and TAs may indicate a late phenomenon. Increased RV thickness in PA-IVS may impair transpulmonary blood flow, leading to late valvar atresia. A similar phenomenon could induce PA in TAs, secondary to another type of RV myopathy with a thinner myocardium, and to tricuspid regurgitation.

POSTER PRESENTATIONS

Category: Cardiac Morphology in Extended Reality

2359 - MORPHOLOGICAL ANALYSIS OF 61 CASES OF DOUBLE OUTLET VENTRICLES USING IMMERSIVE 3D VIRTUAL REALITY AND DIGITAL DISSECTION

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Background:
Double outlet ventricles, including double outlet right, left, and both ventricles (DORV, DOLV, DOBV, respectively), are morphologically diverse and spatially complex forms of congenital heart disease (CHD).'Modifiers' help in understanding and categorization. However, traditional training (without morphological specimens) and conventional imaging often leave cognitive gaps in spatial comprehension. Immersive 3D Virtual Reality (3DVR) visualization provides powerful new opportunities for deeper morphological understanding of these complex lesions.We describe the morphological spectrum, modifiers, and determinants of 61 digital specimens of double outlet ventricles using 3DVR tools.

Methods:
3D modelling software (Vea Simulations) and VR hardware (Meta Quest, GPU) were used to visualize and analyse consecutive cases of complex DOVs that underwent CT/MRI scans for decision-making (2018–2025) at a tertiary care centre in South India with a dedicated cardiovascular VR lab.Critical anatomical determinants/modifiers (Tables 2,3) included orientation of the outlet septum, great artery relationships, and VSD type.

Results:
61cases (47 prospective, 14 retrospective) were studied. 58 were characterized as DORV and 3 as DOBV. Among DORV,67% (39/58) were 'simple' (without major segmental/structural/rotational defects),while 33% had major defects like ventricular inversion, atrioventricular canal defects, and rotational/tilting abnormalities (e.g.,crisscross hearts)(Table 1)
Among simple DORV: VSD was subpulmonary in 51% (20/39),subaortic in 41% (16/39),and doubly committed in 8% (3/39).The outlet septum (OS) was parallel to the interventricular septum (IVS) in 41% (16/39);75% (12/16) had the pulmonary artery (PA) wedged between OS and IVS, with pulmonary stenosis in 75% (9/12).OS was perpendicular to IVS in 35.8% (14/39); 5 had VSD committed to PA, 8 had VSD committed to aorta, and 1 doubly committed. In 23%, OS was angulated to IVS (>45° in 6/39,<45° in 3/39).Complex DORV cases added morphological variables affecting surgical planning (Table 4).DOBV cases (3/61) featured a saddle-shaped, doubly committed VSD with perpendicularly OS

Conclusions:
3DVR visualization and virtual dissections enabled deeper insights into morphological determinants, enhancing surgical planning. precision

POSTER PRESENTATIONS

Category: Cardiac Morphology in Extended Reality

2371 - CARDIAC MORPHOLOGY EDUCATION UTILIZING THREE DIMENSIONAL SCANNING AND RENDERING OF HEART SPECIMENS

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Background / Hypothesis:
Hands-on examination of rare pediatric heart specimens is the gold standard for teaching congenital heart defect (CHD) anatomy and pathology. However, specimens are scarce, deteriorating, and housed in few institutions, limiting access for medical education and surgical training, especially in resource-limited regions. Cardioscape preserves and disseminates CHD anatomy through interactive, high-resolution 3D models and educational media.

Materials and Methods:
We digitized pediatric heart specimens using structuredlight scanning to generate fullcolor, highresolution 3D models. Cardioscape was built in Unity to provide a consistent, interactive interface on Windows, macOS, and Meta Quest VR. Models and accompanying media—expert walkthrough videos, annotated diagrams, and quizzes—were hosted on AWS (S3, RDS, CloudFront) for secure, scalable access. Development occurred in partnership with leading pediatric cardiology centers to ensure clinical accuracy and anatomical fidelity.

Results:
The scanning process successfully preserved 151 cardiac specimens with resolution up to 0.05mm. Within Cardioscape, users can explore models from any angle, toggle annotated landmarks, and compare hearts sidebyside. Pilot testing with over 100 medical professionals demonstrated that the platform enhanced spatial understanding of complex cardiac anatomy and improved diagnostic confidence among trainees. Participants reported that 3D models with commentary simulated oneonone tutoring. Users also reported that exposure to malformations rarely seen in training improved preparedness for real cases.

Conclusions:
High-resolution digital modeling effectively preserves rare pediatric cardiac specimens while significantly expanding access to this valuable educational material. The Cardioscape platform democratizes CHD education by providing a permanent, widely accessible repository of virtual heart specimens that can be examined from any angle. Future development will include expanding the model library, integrating clinical imaging data, and enabling collaborative VR learning sessions to further enhance understanding of congenital heart disease anatomy and pathology.

POSTER PRESENTATIONS

Category: Cardiac Morphology in Extended Reality

2482 - REFRAMING MYOCARDIAL ARCHITECTURE IN TETRALOGY OF FALLOT A 3D REGION SPECIFIC APPROACH USING HIERARCHICAL PHASE CONTRAST TOMOGRAPHY

Vaishnavi Sabarigirivasan [1], Joseph Brunet [2], Hector Dejea [3], Adrian Crucean [4], Anusha Jegatheeswaran [5], Lisa Chestnutt [2], Claire Walsh [2], Peter Lee [2], Andrew Cook [1]
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Background / Hypothesis:
Myocardial aggregate orientation governs ventricular contractility, conduction, and remodelling. While the left ventricle (LV) is well characterised, the right ventricle (RV) remains poorly understood, particularly in complex congenital heart disease. We hypothesised that Tetralogy of Fallot (TOF) exhibits both intrinsic abnormalities in myocardial architecture and distinct regional remodelling, particularly in the RV and interventricular septum.

Materials and Methods:
Twenty paediatric hearts (11 TOF—3 repaired, 8 unrepaired—and 9 age-matched controls) were imaged using hierarchical phase-contrast tomography (HiP-CT) at the European Synchrotron (BM18 at ESRF), followed by structure tenosor analysis to quantify 3D myocardial orientation. A novel local cylindrical coordinate system was developed for anatomically grounded, region-specific mapping of helical angle (HA). A cyclic, perceptually uniform colourmap was used for visualisation. The RV was divided into inlet, outlet, and apical regions based on developmental and anatomical landmarks. Quantitative comparisons were performed across regions and TOF phenotypes.

Results:
TOF hearts demonstrated disrupted transmural HA gradients, increased angular dispersion, and a rightward shift toward longitudinal orientation in the right ventricular outflow tract. The interventricular septum in TOF showed near-equal RV and LV contributions, analogous to that found in the fetus. Unlike controls, where the RV was thinner and architecturally distinct from the LV, TOF hearts exhibited similar wall thicknesses and HA profiles between ventricles. These abnormalities persisted after surgical repair, indicating remodelling is established early and not reversed post-operatively.

Conclusions:
This study presents a novel framework for region-specific myocardial analysis in CHD. The RV structure in TOF is developmentally abnormal and left-ventricle-like, with structural disorganisation that persists despite surgical correction. Results in the interventricular septum suggest disrupted interventricular interdependence. These results improve knowledge of RV structural changes in TOF and may help inform surgical strategy and provide fine-grained data for future computational modelling.

POSTER PRESENTATIONS

Category: Cardiac Morphology in Extended Reality

2512 - VIRTUAL STENTING AS A METHOD FOR OPTIMIZING RIGHT VENTRICULAR OUTFLOW TRACT STENTING PRIOR TO RADICAL CORRECTION OF TETRALOGY OF FALLOT IN CHILDREN

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Background / Hypothesis:
The aim of the study was to evaluate the efficacy of right ventricular outflow tract (RVOT) stenting using virtual stenting (VS) technology in children with tetralogy of Fallot and Fallot-type congenital heart defects (CHD). The virtual stenting technique facilitates the selection of optimal stent parameters tailored to each patient, considering anatomical characteristics and the thoroughness of coverage of the stenotic region. Notable advantages include preoperative compatibility evaluation, three-dimensional visualization, and accurate determination of stent length and diameter. This technology proves particularly beneficial for intricate anatomical variations, as it enables the modeling of the implantation process, thereby enhancing the safety and efficacy of the intervention.

Materials and Methods:
We analyzed 22 cases of RVOT stenting in patients aged 2.36 [0.73-3.07] months (2018-2024). In 8 cases, stenting planning was performed using CT angiography and VS technology.

Results:
The procedural success rate was 95%. Oxygen saturation increased from 80 [71-88] % to 95 [92-98] % ($p<0.001$), and the systolic pressure gradient (SPG) decreased from 70 [41-80] mmHg to 30 [21-39] mmHg.
VS implementation improved stent positioning accuracy to 95% (vs 78% without VS) and reduced re-intervention rate (1 vs 4 cases).
The stent diameter should match the effective diameter of the supravalvular region of the pulmonary artery and exceed the area of stenosis, while remaining smaller than the distance from the tricuspid valve to the pulmonary trunk bifurcation. A strong correlation ($r = 0.88$, $p = 0.008$) was found between the length of the stent and the distance from the tricuspid valve to the stenosis zone, indicating potential for practical application in future stent selections.

Conclusions:
RVOT stenting using virtual modeling technology demonstrates high clinical efficacy, significantly improving oxygenation and hemodynamic parameters while reducing the need for repeat interventions.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1082 - POSTOPERATIVE CARE OF CHILDREN WITH END STAGE HEART FAILURE UNDERGOING THE IMPLANTATION OF LEFT VENTRICULAR ASSIST DEVICES

Jun Zhou [1]
The Children, Cicu, Hang Zhou-China [1]

To summarize the postoperative nursing experienee of 5 children with end-stage heart failureundergoing the implantation of left ventricular assist devices. in view of the problems of left and right ventricularvolume load mismatch,right ventricular failure,hemorhage and thrombosis,pump displacement,and decreasedexereise capacity after lelt ventricular assist device implantation caused by small cardiac cavity and thoracie cavityvolume in chillren,measures such as blood pump rotation titration,optimization of volume load,systematicanticoagulation management,position management,and strengthening phase I cardiac rehabilitation training weretaken. Afer careful treatment and nursing,all 5 cases were discharged from hospital with good prognosis.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1181 - EMPOWERING PEDIATRIC CARDIAC CARE THROUGH NURSING AND ALLIED HEALTH ROUNDS A MODEL FOR KNOWLEDGE SHARING INNOVATION AND INTERDISCIPLARY GROWTH

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Background / Hypothesis:
Ongoing education and interdisciplinary collaboration are critical to the advancement of pediatric cardiac care. Nursing and Allied Health Rounds were established to provide a structured forum to highlight the unique contributions, innovations, and expertise of nursing and allied health professionals within a high-acuity pediatric cardiac environment.

Materials and Methods:

The primary aims of these monthly rounds are to:

1. Showcase clinical innovations, research, quality improvement initiatives, and conference presentations from nursing and allied health staff.

2. Disseminate emerging and relevant knowledge tailored to this specialized workforce.

3. Inspire professional development and pediatric specialization, especially among novice staff.

Results:
This initiative has enhanced visibility for frontline innovations, improved cross-disciplinary understanding, and fostered a culture of continuous learning. It supports staff engagement, strengthens team-based care, and offers a replicable model for academic and clinical programs aiming to elevate nursing and allied health voices in pediatric cardiac contexts

Conclusions:
Nursing and Allied Health Rounds serve as a powerful platform for promoting excellence in pediatric cardiac care. Through thoughtful planning, accessible presentation formats, and strong institutional support, this initiative effectively bridges clinical practice and professional development for a dynamic and evolving workforce.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1421 - THE NEW NORMAL HOW HEALTHCARE TEAMS FACILITATE PAEDIATRIC PATIENTS TRANSITION HOME AFTER DURABLE VENTRICULAR ASSIST DEVICE IMPLANTATION

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Background / Hypothesis:
The HeartMate3 (HM3) Left Ventricular Assist Device (LVAD) is increasingly being used in paediatric patients with end-stage heart failure (HF). While discharge planning for adult HM3 patients is well established, paediatric patients require additional considerations. We examine the experience of our Ventricular Assist Device (VAD) team in supporting patients who have undergone HM3 implantation transition home and back to school after their hospitalization.

Materials and Methods:
A comprehensive discharge process was adapted to meet individual patient and caregiver needs. The process was guided by existing literature around discharging VAD patients, along with the Advanced Cardiac Therapies Improving Outcomes Network (ACTION) protocol. This included early initiated patient and caregiver training, school reintegration support, and collaboration with community partners. A combination of in-class education and hands-on simulation training was provided to patients, caregivers and community partners. Knowledge of key concepts was tested and demonstrated before discharge.

Results / Discussion:
Existing literature highlights some of the challenges children face after returning home from their hospitalization and VAD implantation. Challenges include decreased psychological and emotional well-being, stress and difficulty adjusting to physical limitations and changing family dynamics. Through our experience, we identified essential factors for a successful transition home. This includes early patient and caregiver engagement, proactive communication with schools, and partnerships with EMS and local healthcare providers. However, ensuring the school's readiness for the patient's return has presented significant challenges.

Conclusions:
Our VAD team's experience highlights the importance of an individualized and structured discharge plan that extends beyond the hospital setting. We identified strategies that reduce the disruption to the patient and caregiver's psychosocial life and emotional well-being and promote a smooth transition home and back to school. A comprehensive discharge plan helps to minimize the long-term impact of the patient's illness and medical device on their development and quality of life.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1443 - STANDARDIZING NEURODEVELOPMENTAL CARE FOR PRETERM INFANTS IN THE CARDIAC CRITICAL CARE UNIT A QUALITY IMPROVEMENT INITIATIVE

Andie Hayward [1], Karina Macintrye [1], Julia Baxter [1], Sarah Furness [1]
The Hospital For Sick Children, Cardiac Critical Care Unit, Bradford-Canada [1]

Background / Hypothesis:
Preterm infants with congenital heart disease (CHD) admitted to the cardiac critical care unit (CCCU) have unique care needs due to increased risk of neurodevelopmental disability and comorbidities. Many team members have not had formal education regarding the neurophysiology of premature infants, and are therefore not trained in delivering standardized, evidence-based care that promotes optimal outcomes. The aim of this initiative is to develop educational material that will foster care providers' familiarity with this unique patient population and evaluate its integration into bedside care.

Materials and Methods:
The intervention will consist of 3 phases: 1) Toolkit development; 2) Education and implementation; and 3) Evaluation. The developed toolkit will be based on our Preterm CHD Care Model, including the following domains: 1) Physiologic positioning and positive touch; 2) Oral stimulation and nutrition; 3) Sensory development and stress minimization. It will contain helpful information and visual aids to support nursing staff in providing gestational age-appropriate neurodevelopmental care. Education and implementation will utilize mandatory quarterly education days for all staff, real-time bedside training, and incorporation of biweekly neurodevelopmental rounds. Knowledge and comfort level of CCCU nurses regarding neurodevelopmental care delivery for preterm infants will be assessed using pre- and post-implementation questionnaires inquiring about fundamental concepts of neurodevelopmentally-friendly nursing care and can be answered with "yes", "somewhat", or "not at all". The results of this questionnaire will highlight specific knowledge gaps that will allow us to tailor our toolkit and educational initiatives to better support staff.

Results:
We hypothesize that the provision of this evidence-based toolkit and supplemental education will result in increased knowledge and confidence among nurses, improving neurodevelopmentally appropriate care for preterm infants with CHD.

Conclusions:
This quality improvement initiative will standardize CCCU care in the realm of neurodevelopmental care for preterm infants, optimizing outcomes for this unique patient population.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1469 - QUALITATIVE STUDY ON THE CHALLENGES AND NEEDS OF CAREGIVERS FOR CHILDREN WITH DILATED CARDIOMYOPATHY

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Background / Hypothesis:
Dilated cardiomyopathy, as a complex and progressive disease, often leads to heart failure and death in its advanced stages, imposing multiple challenges on family caregivers. Existing research has primarily focused on medical interventions, with insufficient exploration of the comprehensive impact on family caregiving systems and support needs.

Materials and Methods:
A descriptive qualitative research method was employed. Through purposive sampling, 16 caregivers of children with dilated cardiomyopathy hospitalized in the Department of Cardiovascular Medicine at a tertiary children's hospital in Zhejiang Province from August 2023 to March 2025 were selected for semi-structured in-depth interviews. The interview themes focused on daily caregiving, practical challenges, impacts on family relationships, psychological evolution, knowledge acquisition, and needs. Directed content analysis was used to analyze the data.

Results:
Six themes were identified: Multidimensional burden of caregiving, including the intensity of daily care and the complexity of medical care. Restructuring of the family system, encompassing financial strain, role conflicts, and hindered career development. Bidirectional psychological evolution, involving the accumulation of negative emotions and psychological empowerment.Paradox of information acquisition, characterized by information overload coexisting with a lack of actionable information, leading to decision-making dilemmas. Fragmentation of support systems and unmet needs, including gaps in medical, financial, and psychological support.

Conclusions:
Effective coping resources can help caregivers address multiple challenges. Healthcare professionals should enhance education on dilated cardiomyopathy, develop scientific and systematic family management plans, and advocate for improved medical support systems and stronger social support. These measures can enhance caregivers' ability to cope with the disease and promote their physical and mental well-being.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1487 - ENHANCING NURSING KNOWLEDGE ON CEEG IN THE CARDIAC CRITICAL CARE UNIT

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The Hospital For Sick Children, Cardiac Critical Care Unit, Bradford-Canada [1]

Background / Hypothesis:
The use of cEEG in the Cardiac Critical Care Unit (CCCU) is a basic form of aEEG which nurses can set-up and interpret. cEEG in the CCCU is used on patients who experienced long bypass times, following cardiopulmonary events, patients who are muscle relaxed, and patients at higher risk of ischemic injury or stroke. Nurses in the CCCU feel they lack the confidence and knowledge required to interpret cEEG findings. This initiative aims to improve their knowledge and skill in cEEG interpretation, which will inevitably lead to earlier recognition and intervention.

Materials and Methods:
A questionnaire will be given to bedside nurses to understand their current knowledge of cEEG. Collecting numerical and written data will help further identify the gaps in knowledge and inform the areas of need for further education. A comprehensive guide in the form of an information booklet will be developed and will be available on every cEEG machine. These booklets will guide bedside nurses in the set-up of the machine, troubleshooting and analysis of cEEG findings. The guide will help nurses identify changes in brain activity such as sleep/wake cycles, sedation and seizure activity. The dissemination of the education to the nursing team will be done in two phases. 1) Just-in-time training with bedside nurses caring for a patient placed on cEEG; 2) High-fidelity simulations using the cEEG for nurses to participate in during mandatory education days for all staff.

Results:
Following education on cEEG and the use of the educational booklets, we hypothesize there will be an increase in confidence and enhancement of competency in identifying cEEG baseline changes.

Conclusions:
By increasing the knowledge base of the bedside nurse on cEEG, not only will this give nurses more confidence in working with this technology, but result in improved quality of care.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1579 - NEONATAL ABSTIENCE SYNDROME EDUCATION IN THE CARDAIC CRITICAL CARE UNIT

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Background / Hypothesis:
Neonatal abstinence syndrome (NAS) is a condition that the Cardiac Critical Care Unit (CCCU) currently has no education on. This gap in education leads to patients often being treated using the wrong tools, leading to worsening withdrawal symptoms.

Materials and Methods:
The plan is to incorporate education on caring for the NAS patient in the CCCU. Education will include the Finnegan scoring system, non-pharmacological interventions to help with withdrawal, and general information on what the condition is. Special considerations will include caring for the post-operative NAS infant, by teaching about pain vs withdrawal.

Results:
Inclusion of this education will increase confidence in nurses by preparing them with the necessary tools and skills to care for the NAS patient.

Conclusions:
This education will help provide nurses will the best possible tools to improve the quality care given to the NAS population.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1586 - SELF SELECTED TRANSITION GOALS A TOOL FOR ADOLESCENT HEART TRANSPLANT RECIPIENTS IN PREPARATION FOR TRANSITION TO ADULT CARE

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Transition goals promote autonomous participation of adolescents in personal healthcare. We review adolescent heart transplant (HTx) recipients who were asked to independently choose a transition goal with an aim to categorize the goals, quantify early success rates and describe healthcare provider engagement.

We retrospectively reviewed all adolescent (12-18y) HTx pts since 2021 when transition goals started being discussed at nurse practitioner (NP) involved clinic visits. Those unable to participate due to communication challenges were excluded. We describe the experience to early 2025.

45/49 pts were eligible to participate (68% female, median age at HTx 3.8y (1wk-16yrs) mean age at goal setting 13.9±1.0y). 4 pts were excluded (developmental exceptionalities, 1; non- verbal, 3). To date, 30/44 (68%) pts have chosen and are working towards at least 1 goal (range 1-3) with 44 goals created in total. Delays in selecting goals (n=13) were due to health changes, early adolescence (recently turned 12 y), or psychosocial barriers. 43 (97%) goals were created during NP led visits, 30 (68%) in-person and 14 (32%) virtual. 1 (3%) goal was created during an HTx fellow led visit.
To date 12 (39%) pts have achieved 1 goal. The average time to complete a goal was 1.2±0.8 y. 5/12 (42%) goals achieved were provider facilitated and 7(58%) were independent achievements.

This early review of the implementation of self-selected transition goals as a tool in promoting autonomous participation in transition preparation for adolescent HTx recipients, has revealed that most self-selected goals involve HTx related care or heart healthy lifestyle. It is also not always necessary for a healthcare provider to facilitate goal achievement, but NPs play a crucial role in partnership with adolescents. This novel transition tool in promoting self-management in adolescent HTx recipients could offer a way to enhance engagement and improve outcomes post transition.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1591 - SUPPORTING INFANT DEVELOPMENT IN THE FIRST YEAR OF LIFE THROUGH NURSING EDUCATION IN THE CARDIAC CRITICAL CARE UNIT

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Background / Hypothesis:
Infants in the Cardiac Critical Care Unit (CCCU) often face a higher risk of experiencing developmental delays due to the intensive care environment as well as their congenital heart defect (CHD). The first year of life is a crucial period marked by developmental milestones in physical (gross and fine motor), cognitive, social and emotional areas. Children with CHDs can have prolonged hospital stays and will have limited opportunities for natural play, movement, interaction and stimulation, which are crucial for development. During a hospital stay, developmental needs are often overlooked in favour of acute medical needs. It has been found that there is a knowledge gap in new orientated nurses in the CCCU in understanding these developmental milestones in the first year of life and how to provide developmentally appropriate care that is conducive to meeting these milestones in the constraints of this critical environment.

Materials and Methods:
The dissemination of education will consist of 2 phases. 1) working with occupational therapy and physiotherapy to develop evidence-based educational material to provide new nurses during their orientation. This material will highlight how to foster development through play and interaction in the CCCU; 2) Education and implementation. Working alongside the Nurse Educator, we will present this education to new nurses during their in class orientation period on how to foster an environment conducive to healthy development with their patients.

Results:
Following the integration of this education into the orientation period, we hypothesize bridging the gap in knowledge regarding developmental milestones in the first year of life and increased confidence in incorporating this into their nursing care.

Conclusions:
The creation and distribution of this education will not only increase the knowledge of developmental milestones in new nurses, it will inform their nursing practice to meet the developmental needs of infants in the CCCU.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1667 - EXISTENTIAL EXPERIENCES OF CHILDREN LIVING WITH CONGENITAL HEART DISEASE A SCOPING REVIEW

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Background / Hypothesis:
Congenital heart disease (CHD) is a life-threatening condition requiring lifelong management, and children living with CHD have to overcome several challenges and conflicts. This scoping review aims to organize information about the existential experiences of children living with CHD and comprehensively synthesize experiences that such children encounter in their daily lives.

Materials and Methods:
The scoping review is based on a framework proposed by Arksey and O'Malley (2005). The CINAHL, MEDLINE, and APA PsycArticle databases were used to locate peer-reviewed journals published between 2015 and 2025 using search terms "heart disease, congenital," AND "child," AND "experiences or perceptions or attitudes or views or feelings." Two researchers screened the retrieved studies based on the selection criteria. From the selected literature, results related to existential experiences of children with CHD were extracted and analyzed.

Results:
Twelve of the 1079 retrieved articles were selected for review. Among 12 selected studies, ten focused on adolescents and young adults. Further, three studies investigated transitional experiences, two investigated physical activity, and two investigated life experiences. Existential experiences of the children were categorized as follows: recognizing disease and coping in one's way; avoiding the effects of CHD and attempting to integrate into society; restricted by physical limitations and instructions from others; appreciating parents and attempting to meet expectations; struggling to achieve independence from the position of a shelter; lacking information about physical management and feeling stressed due to changes; lacking of support and making daily life difficult; and faith in God supports accepting reality.

Conclusions:
Regardless of their developmental stages, most children recognized their disease, attempted coping in their own way and integrating into society. Further, they encountered difficulties or stress because of a lack of support and information. Research on the experiences of children with CHD has a limited focus, and further research is required.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1703 - KNOWLEDGE ATTITUDES AND PRACTICES TOWARDS CARDIAC REHABILITATION AMONG PARENTS OF CHILDREN WITH CONGENITAL HEART DISEASE A CROSS SECTIONAL STUDY

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Background
Congenital heart disease (CHD) is among the most common congenital disorders, often requiring comprehensive management, including cardiac rehabilitation, to optimize outcomes. Parents play a critical role by acquiring relevant knowledge, fostering positive attitudes, and engaging in effective practices. However, factors such as limited information, low confidence, and external barriers may hinder their engagement. Identifying these barriers and examining parents' knowledge, attitudes, and practices (KAP) is essential to inform targeted interventions and enhance pediatric rehabilitation outcomes.

Materials and Methods
This cross-sectional study was conducted from 2024.03 to 2024.08 using convenience sampling to recruit 212 parents of children with CHD from a tertiary children's hospital in Zhejiang, China. A self-developed questionnaire with strong reliability and validity (Cronbach's $\alpha = 0.960$) assessed demographic characteristics, KAP related to cardiac rehabilitation (25 items), and barriers to practice.

Results
A total of 212 valid responses were collected. The average standardized scores for knowledge, attitudes, and practices were 74.32%, 88.45%, and 76.19%, respectively.
¬Knowledge: Only 55.2% of parents achieved an excellent level. The weakest areas were K1 ("Basic CHD knowledge"), K8 ("Recognition of home-based exercise risks"), and K10 ("Postoperative assessment and intervention").
¬Attitudes: While overall attitudes were positive, 34.4% of parents lacked confidence in their abilities (A7), and 28% reported low self-efficacy in supporting their child's rehabilitation (A8).
¬Practices: Moderate and excellent levels were observed in 34.9% and 56.6% of parents, respectively. However, adherence was low for P1 ("Proactively learning") and P2 ("Communicating with healthcare professionals"), whereas P4 ("Cooperating with healthcare professionals") was more commonly practiced. A gap remained between knowledge, attitudes, and actual behavior.
¬Barriers: The most frequently reported challenges included time constraints, limited access to information, and a lack of systematic guidance.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1709 - PSYCHOLOGICAL AND PATIENT REPORTED OUTCOMES DURING THE COVID 19 PANDEMIC PREDICTIVE FACTORS FROM THE KOREAN SUBCOHORT OF THE APPROACH IS II STUDY

Song Yi Nam [1], Ju Ryoung Moon [1], Min-ji Kim [2], June Huh [3], I-seok Kang [3], Jinyong Song [3], Ji-hyuk Yang [4], Tae-gook Jun [4], Sung-a Chang [5], Philip Moons [6]
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Background / Hypothesis:
The COVID-19 pandemic has significantly impacted psychological well-being and patient-reported outcomes (PROs) among individuals with chronic health conditions, including congenital heart disease (CHD). This study aimed to identify demographic and clinical predictors of key PROs in South Korean adults with CHD during the pandemic period.

Materials and Methods:
Data were drawn from 208 South Korean participants enrolled in the APPROACH-IS II study. Eight outcome domains were evaluated: anxiety, depression, physical health, mental health, quality of life (QOL), illness identity, empowerment, perceived stigma, social support, and perceived healthcare climate. Univariable linear regression analyses were performed, and variables with a p-value < 0.1 were subsequently included in multivariable linear regression models to determine independent associations.

Results:
The median age of participants was 29 years (interquartile range: 22–43), and 50.5% were female. Most participants had complex congenital anatomy (57.5%) and were classified as NYHA class II (91.3%). Depression scores were significantly higher among participants with suspected (p = 0.032) or confirmed (p = 0.006) COVID-19 infection after adjusting covariates. Physical health was inversely associated with age (p = 0.011) and worse NYHA functional class (p = 0.034), indicating both age-related and functional vulnerabilities. Quality of life (QOL) was significantly lower in participants with worse NYHA class (p = 0.038) and greater social media use (p = 0.032). Perceived stigma increased with a higher number of cardiac surgeries (p = 0.035). Social media use was also associated with lower perceived healthcare climate scores (p = 0.008). Notably, family support was negatively associated with the number of cardiac surgeries (p = 0.010) and worse NYHA class (p = 0.022).

Conclusions:
These findings highlight the multifactorial influences on patient well-being and underscore the necessity for integrated psychosocial interventions tailored to the specific clinical and social contexts of this population.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1714 - ASSESSMENT OF ORAL FEEDING SKILLS AND RELATED FACTORS IN INFANTS WITH CONGENITAL HEART DISEASE UNDERGOING CARDIAC SURGERY

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Background:
Feeding difficulties are common among infants with congenital heart disease (CHD). However, there has been limited research on the feeding abilities of infants following cardiac surgery.

Materials and Methods:
A descriptive correlational study was conducted using observational methods and the 'Early Feeding Skills' scale to assess the oral feeding abilities of infants who underwent cardiovascular surgery within their first six months of life. Observations began the day after extubation and continued every two days up to 30 days post-extubation. Primary caregivers completed the 'Parenting Stress Index' twice during the hospitalization: once on the day the infant was transferred out of the ICU and again on the day of hospital discharge.

Results:
On average, infants achieved full oral feeding 8.8 days after extubation, with 23% being able to do so within the first week. However, 15.4% of infants could not consume their required milk intake orally within 30 days of extubation. The most challenging aspect of oral feeding was 'oral coordination,' followed by 'engagement ability' and 'physiologic stability.' The type of surgery performed significantly influenced whether infants could achieve full oral feeding within 10 days after extubation; those who underwent complete corrective surgery were more likely to achieve this milestone compared to those who received palliative surgery. Parenting stress levels were moderate, with scores at the 53.9th percentile upon leaving the ICU and the 50.4th percentile at hospital discharge. While overall parenting stress decreased across subscales at discharge, the score for the "difficult child" subscale increased from 60.9 to 66.1. Parents of infants who could feed entirely orally reported lower levels of parenting stress compared to those whose infants could not.

Conclusions:
This study highlights the complex relationship between infant feeding abilities and parenting stress, providing valuable insights for studies aimed at improving feeding outcomes for infants with CHD.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1765 - ACHD WOMEN'S THOUGHTS ABOUT FUTURE PREGNANCY AND CHILDBIRTH

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Background / Hypothesis:
ACHD women need to confront their own femininity while carrying CHD.

Materials and Methods:
To understand ACHD women's thoughts about future pregnancy, childbirth, and the way of life as a woman.
79 women with CHD aged 16 to 33 years old without childbearing experience (regardless of whether they were married or unmarried, wanted to become pregnant or not, and whether they were able to become pregnant or not).
A self-administered survey was conducted on their thoughts about future pregnancy, childbirth, and life as a woman in relation to cardiac disease.
Codes, subcategories, and categories were extracted by qualitative descriptive analysis of the contents of free descriptions based on similarity.

Results:
Data from 28 respondents were obtained. The analysis revealed 49 codes, 36 subcategories, and 10 categories of Anxiety about heredity, Anxiety about employment and continuing employment, Negative thoughts about surgical scars, Hope and anxiety about pregnancy and childbirth, Gaining understanding from partner about the disease and pregnancy and childbirth, Understanding heart disease for safe childbirth, Contraindication to pills and Effects of taking the pill, Impact of taking the pill, Impatience and anxiety about the age limit for pregnancy and childbirth, Anxiety about raising children, and Feelings about the difficulty of pregnancy and childbirth were extracted. The most frequently occurring word was anxiety.

Conclusions:
The study showed barriers related to love and marriage prior to pregnancy and childbirth, anxiety about raising children beyond that, and the feelings of women with severe CHD who have already been told they will have difficulty conceiving and giving birth.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1899 - IMPACT OF SOPHROLOGY ON CARDIOPULMONARY FI TNESS AND HEALTH RELATED QUALITY OF LIFE IN YOUTH WITH CHD THE SOPHROCARE RANDOMIZED CONTROLLED TRIAL

Johan Moreau [1], Marion Audie [2], Sophie Guillaumont [3], Huguette Romieu [1], *Pascal Amedro* [2]
Chu Montpellier, Pediatrics, Montpellier-France [1] Chu Bordeaux, Pediatric Cardiology, Bordeaux-France [2] Chu Montpellier, Pediatric Cardiology, Montpellier-France [3]

Introduction:
Despite significant medical advances in recent decades, cardiopulmonary fitness decreases faster in youth with congenital heart disease (CHD) than in healthy peers, resulting in impaired health-related quality of life (HRQoL) and increased cardiovascular risk.). Apart from cardiac rehabilitation, non-pharmacological preventive interventions, have been scarcely evaluated in this population. Sophrology, a relaxation technique combining breathing exercises, visualization, and mindfulness, has demonstrated benefits for mental health and well-being. This multicenter randomized controlled trial evaluated the impact of a remote sophrology program on cardiopulmonary fitness and HRQoL in youth with CHD.

Methods:
A total of 200 13-to-25 year-old CHD patients were randomly assigned to either the intervention (i.e., 8 individual remote sophrology sessions), or the standard of care (Fig. Flow chart). The primary outcome was the change in maximum oxygen uptake (VO2max) measured by cardiopulmonary exercise testing from baseline to 12 months. Secondary outcomes included HRQoL and mental health assessments. Clinical trials registry site and number: Clinicaltrials.gov (NCT03999320).

Results:
No significant VO2max group difference was observed (mean difference -0.11; 95% CI -2.02, 1.79; P=0.91). HRQoL was improved in the young adult intervention subgroup (18-25 years), and: the “Mental Component Summary”, “Mental Health” and “Vitality” SF-36 scores increased by 8.98 (95% CI 2.73; 15.23, P<0.01, effect size 0.84), 14.49 (95% CI 3.17; 25.81, P=0.01, effect size 0.74), and 15.75 (95% CI 3.97; 27.53, P<0.01, effect size 0.78) points, respectively.

Conclusions: The remote sophrology program did not improve cardiopulmonary fitness, but significantly enhanced HRQoL in young adults with CHD. Integrating relaxation techniques in cardiac rehabilitation programs should be further evaluated.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1955 - CHALLENGING THE ONE SIZE FITS ALL FOR MINIMALLY INVASIVE ATRIAL SEPTAL DEFECT REPAIR – "RETURN TO WARD PACU PATHWAY"

Monika Magnatta [1], Carrie Morgan [2], *Cecilia St. George-hyslop* [3], Christoph Haller [4], David Rosen [5], Azadeh Assadi [6], Jill O'hare [7], Jacqueline Lopez [7], Merit Hayden-town [1], Alie Drabble [7], Bruce Macpherson [5]
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Background / Hypothesis:
Between 2018 and 2025, 250 atrial septal defect (ASD) repairs were performed using minimally invasive thoracotomy approach (MIS-ASD) with recovery initially in Cardiac Critical Care Unit (CCCU), followed by transfer to Cardiology ward (4D). Traditional "one-size-fits-all" model required a minimum four-hour stay in CCCU, constrained by limited bed availability/ high resource costs. Witnessing severity of other patient conditions and intensity of life-saving interventions evokes anxiety and exacerbates emotional burdens of families in CCCU.

MIS-ASD thoracotomy approach has shown low complication rates, shorter recovery times, prompting development of a new postoperative pathway that enhances patient experience. This pathway allows for direct transition from Operating Room (OR) to Post-Anesthesia Care Unit (PACU), followed by 4D, bypassing CCCU. This quality improvement initiative emphasizes interprofessional education/collaboration, modeling principles of precision child health.

Materials and Methods:
CCCU, OR, PACU, 4D collaborated to design an innovative postoperative recovery pathway, termed Return to Ward (MIS-RTW-P). This initiative included various educational strategies, i.e. needs assessments, curriculum development, didactic lectures, Just-in-Time training, and simulations. New workflows created for PACU/4D, included standardized MIS-ASD admission/ transfer processes, checklists, and handover tools.

Results:
Patient and Family Care: Prioritization of value-based healthcare improved quality of care, patient outcomes and experiences.

Education:
Interprofessional training increased PACU and inpatient staff competence/confidence in managing MIS-ASD patients, addressing postoperative complications, and facilitating translation of knowledge to broader cardiac populations.

System:
Optimized operational efficiency/financial health by reducing CCCU costs for MIS-ASD procedures, thus increasing CCCU bed capacity for more complex congenital heart disease cases.

POSTER PRESENTATIONS

Conclusions:
This successful initiative enhances resource utilization while ensuring a patient- and family-centered care approach. Plans include broadening patient selection criteria and extending the pathway to encompass a wider variety of heart conditions. Newly developed pathway challenges the traditional one-size-fits-all model by tailoring care to unique characteristics and needs of each child, allowing for targeted surgical interventions/treatments.

POSTER PRESENTATIONS

Category: Cardiac Nursing

1962 - TRANSFORMING TRANSITION A QUALITY IMPROVEMENT INITIATIVE TO ENHANCE ADOLESCENT PATIENT EDUCATION ON ENDOCARDITIS PREVENTION IN CONGENITAL HEART DISEASE

Gray Cillian [1], Hollis Joanne [2], Usman Aleena [3], Doyle Niamh [1], Khambadkone Sachin [1]
Great Ormond Street Hospital, Cardiology, London-United Kingdom [1] Great Ormond Street Hospital, Clinical Nurse Specialist, London-United Kingdom [2] University College London, Cardiology, London-United Kingdom [3]

Background / Hypothesis:
Effective adolescent patient education is critical for supporting self-management and improving outcomes, particularly for those with congenital heart disease (CHD) whom are at increased risk of infective endocarditis (IE). Observing that IE knowledge was not being consistently retained among patients, this quality improvement (QI) project aimed to enhance educational strategies to boost retention and self-management skills in a tertiary NHS centre.

Materials and Methods:
The project employed a literature review, stakeholder engagement, and program theory to identify and refine strategies through plan-do-study-act (PDSA) cycles. A patient panel co-designed the interventions, integrating constructivist pedagogy and motivational interviewing. Key initiatives included personalised online education, teach-back method, tailored goal-focused letters, and a digital quiz accessible via QR codes in clinic waiting areas. Baseline and follow-up surveys were conducted to measure impact, with digital tools enhancing response rates.

Results:
Baseline surveys of 142 new patients confirmed low IE knowledge (average score 1.78/10), with 80% reporting no prior discussion, despite documentation. Previous methods, including mailed information and extended sessions, yielded modest knowledge improvement (average 3.18/10) retained after 205 days. New interventions significantly improved retention: with scores of 5.1 and 6.5 (for multiple quiz attempts ($p<0.01$)) noted 60 days post-clinic, and immediate post-CNS-video clinic scores averaging 8.8/10 ($n=71$, $p<0.001$). Knowledge retention remained high, averaging 8.4 at 91 days post-intervention ($p<0.001$), compared to 4.0 after 521 days with previous methods. Goal-setting around oral hygiene was successful, with 87% of patients reporting improved habits, compared to 68% in the prior cycle. Feedback highlighted increased satisfaction, with the digital quiz achieving a 300% attempt rate and reducing perceived waiting times at clinic.

Conclusions:
This project demonstrates how patient-centered, interactive educational tools can significantly improve knowledge retention and self-management skills ($p<0.001$), providing a replicable model for enhanced transition education and supporting better long-term health outcomes.

POSTER PRESENTATIONS

Category: Cardiac Nursing

2262 - ACHD WOMEN'S PERSPECTIVES ON FUTURE PREGNANCY AND CHILDBIRTH

Sayuki Koide [1], Yuko Yakushijin [2], Takashi Higaki [3], Yusuke Akazawa [4]
Ehime Univercity Hospital, Nursing, Toon-Japan [1] Ehime University Graduate School Of Medicine, Department Of Nursing, Pediatric Developmental Nursing, Division Of Basic And Practical Nursing Science, Toon-Japan [2] Ehime University Graduate School Of Medicine, Community Pediatrics And Perinatology, Toon-Japan [3] Ehime University Graduate School Of Medicine, Cardiovascular, Respiratory, Renal And Hypertension Medicine, Toon-Japan [4]

Background / Hypothesis:
Women with Adult Congenital Heart Disease (ACHD need to confront face their own challenges regarding femininity while carrying congenital heart disease (CHD).

Materials and Methods:
To understand ACHD women's perspectives on future pregnancy, childbirth, and life as a woman.
79 women with CHD aged 16 to 33 years old without previous childbearing experience (regardless of marital status, desire for pregnancy, or fertility status).
A self-administered survey was conducted on their thoughts about future pregnancy, childbirth, and their lives as a woman in relation to cardiac disease.
Codes, subcategories, and categories were extracted by qualitative descriptive analysis of the contents of free descriptions based on similarity.

Results:
Data from 28 respondents were analyzed. The analysis revealed 49 codes, 36 subcategories, and 10 categories including Anxiety about heredity, Anxiety about employment and maintaining employability, Negative feelings toward surgical scars, Hope and anxiety about pregnancy and childbirth, Gaining understanding from partner about the disease and pregnancy and childbirth, Understanding heart disease for safe childbirth, Contraindication to pills and Effects of taking the pill,Impact of taking the pill, Impatience and anxiety about the age limit for pregnancy and childbirth, Anxiety about raising children, and Feelings about the difficulty of pregnancy and childbirth were extracted. The most frequently mentioned theme was anxiety.

Conclusions:
The study showed barriers related to love and marriage prior to pregnancy and childbirth, anxiety about raising children beyond that, and the feelings of women with severe CHD who have already been told they will have difficulty conceiving and giving birth.

POSTER PRESENTATIONS

Category: Cardiac Nursing

2536 - PREOPERATIVE NURSING CARE OF A NEONATE WITH PA IVS COMBINED WITH RIGHT VENTRICULAR DEPENDENT CORONARY CIRCULATION

Junwen Deng [1], Zhipeng Li [1], Zhigang Liu [1]
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Background / Hypothesis:
Pulmonary atresia with intact ventricular septum (PA/IVS) is a rare, duct-dependent, critical congenital heart defect with high neonatal mortality due to refractory hypoxemia. When complicated by right ventricular-dependent coronary circulation (RVDCC), the risk of myocardial ischemia and sudden death escalates dramatically, necessitating meticulous preoperative stabilization to facilitate urgent surgical palliation. This paper aims to detail the specialized preoperative nursing management of a neonate diagnosed with PA/IVS and RVDCC and highlight the unique physiological challenges and targeted interventions required.

Materials and Methods:
Hemodynamic Surveillance: Continuous assessment of ductus arteriosus patency via serial echocardiography and clinical examination (peripheral pulses, saturation differentials, murmurs), with immediate escalation protocols for suspected closure. Prostaglandin E1 Titration: Precise medication management to maintain ductal patency while minimizing adverse effects (apnea, hypotension, fever) through dose adjustment and vigilant monitoring. Strict Oxygen Restriction: Absolute prohibition of supplemental oxygen to prevent pulmonary overcirculation and systemic steal, jeopardizing coronary perfusion; close monitoring of respiratory status for signs of pulmonary congestion or hypoxemia. Balanced Systemic-Pulmonary Circulation: Individualized fluid and volume management to optimize cardiac output without exacerbating pulmonary edema or compromising systemic (including coronary) perfusion. Frequent assessment of end-organ perfusion (capillary refill, urine output, lower body/core temperature gradient) was critical. Cardioprotection & Risk Mitigation: Continuous cardiac function monitoring, strict aseptic technique, and enteral feeding protocols balancing caloric enhancement with aspiration and NEC prevention (small volume, fortified feeds, paced feeding). Multidisciplinary Coordination: Close collaboration with cardiology, cardiac surgery, intensivists, and nutritionists for rapid decision-making on surgical timing, individualized treatment plans, and pre-emptive emergency protocols.

Results:
Through targeted, vigilant nursing care over one week, the infant achieved optimal hemodynamic stability, allowing successful progression to planned surgical intervention.

Conclusions:
This case underscores the critical role of anticipatory monitoring, individualized physiological management, and seamless multidisciplinary collaboration in stabilizing these high-risk infants for definitive surgical repair, directly impacting survival outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1020 - THE FACTORS FOR POSTOPERATIVE PERITONEAL DIALYSIS TREATMENT IN INFANTS AFTER CONGENITAL CARDIAC PROCEDURE

Xiaofeng Wang [1], Zhiyuan Zhu [1], Chenyu Li [1], Qinnan Chen [1], Xu Wang [1]
National Center For Cardiovascular Disease Fuwai Hospital, Picu, Beijing-China [1]

Background / Hypothesis:
Fluid overload is common after congenital cardiac surgeries. This requires early application of peritoneal dialysis (PD) in infants to improve surgical outcomes. The objective of this study is to ascertain the factors correlated with the necessity for PD in infants, thereby informing the prophylactic placement of PD catheters intraoperatively.

Materials and Methods:
This was a single-center retrospective study. Infants aged three months or younger who underwent congenital cardiac procedures between 2021 and 2022 were included. Patients with chronic renal failure or without RACHS-1 categories were excluded. Based on whether postoperative PD treatment was performed, the patients were classified into PD and non-PD groups. Preoperative and intraoperative parameters were compared between the groups to identify factors for postoperative PD treatment.

Results:
A total of 405 eligible patients were enrolled, with 35 and 370 patients allocated to the PD and non-PD groups. Multivariable analyses revealed that age (OR 0.563, 95% CI 0.348-0.911p=0.019), preoperative cystatin C level (OR 1.028, 95% CI 1.003-1.053p=0.03), cardiopulmonary bypass (CPB) minutes (OR 1.015; 95% CI 1.006-1.024p=0.001) and blood lactate level after weaning from CPB (OR 1.453, 95% CI 1.173-1.800p=0.001) were predictors for PD treatment. The ROC curve determined the following cutoff points for postoperative PD treatment: age less than 1 month, preoperative cystatin C level above 1.36 mg/L, CPB duration exceeding 130 minutes and blood lactate levels greater than 4 mmol/L. The multiple ROC curve demonstrated a sensitivity of 0.875, specificity of 0.826 and an area under the curve of 0.902.

Conclusions:
To facilitate the initiation of postoperative PD treatment, it is advised that intraoperative prophylactic PD catheterization be concurrently performed in patients presenting with all four identified factors.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1028 - OUTCOMES OF BIVENTRICULAR CONVERSION AFTER FAILING FONTAN CIRCULATION CASE SERIES

Xiaofeng Wang [1], Chenyu Li [1], Zhiyuan Zhu [1], Kai Ma [2], Xu Wang [1], Shoujun Li [2]
National Center For Cardiovascular Disease Fuwai Hospital, Picu, Beijing-China [1] National Center For Cardiovascular Disease Fuwai Hospital, Cardiac Surgery, Beijing-China [2]

Background / Hypothesis:
To assess the outcomes of biventricular conversion following takedown of failing Fontan circulation in selected patients.

Materials and Methods:
This was a retrospective single-center study. Patients who underwent Fontan takedown and biventricular or one-and-a-half ventricular conversion due to failing Fontan circulation between 2017 and 2024 were included.

Results:
A total of four patients were included. All patients had a biventricular heart morphology. Patient 1 was a 12-year-old female with DORV, who received one-and-a-half ventricular conversion for protein-losing enteropathy (PLE). During procedure, the CABG was performed due to injury of left main coronary artery. Postoperatively, severe heart failure precluded weaning from mechanical ventilation. This patient succumbed to a profound fungal infection. Patient 2 was a 4-year-old male with DORV, who received conversion for PLE. Postoperatively, he was mechanically ventilated for 1,931 hours, and were hospitalized in ICU for 94 days. A permanent pacemaker was implanted 10 months postoperatively. The patient was followed up for 6 years, with LV-EDVi of 60.5 ml/m^2. Patient 3 was a 9-year-old male weighing 24.5 kg with d-TGA/VSD and PS, who received conversion for cyanosis. Postoperatively, he required mechanical ventilation for 151 hours, ICU stay of 22 days. One-and-a-half years after surgery, the valved RV-PA conduit was replaced. The patient was followed up for 3 years, with LV-EDVi of 72 ml/m^2. Patient 4 was a 14-year-old male with DORV, who received conversion for cyanosis. Postoperatively, he required mechanical ventilation for 45 hours, ICU stay of 7 days. The patient was followed up for 1 year, with LV-EDVi of 56.5 ml/m^2.

Conclusion:
When the size and function of cardiac structures are suitable, conversion to a biventricular repair presents a reliable option for managing failing Fontan. The systemic ventricular function, as assessed during follow-up, has been deemed satisfactory. Preoperative presenting with PLE is associated with a less favorable prognosis.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1037 - CORRECTION OF A LARGE CORONARY ARTERY FISTULA WITH COMPLETE RECOVERY OF VENTRICULAR FUNCTION IN A 7 MONTH OLD INFANT AT MID TERM FOLLOW UP

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Background/Hypothesis:
A coronary artery fistula (CAF) is a connection between a coronary artery and a cardiac chamber or a major blood vessel. The incidence of CAF accounts for approximately 0.3% of congenital heart anomalies and 75% of cases are small, clinically silent, and incidentally discovered. However, large-caliber fistulas may cause coronary steal and complications related to myocardial ischemia and/or pulmonary hyperflow. Small CAFs are typically managed conservatively, but larger or symptomatic fistulas require interventional or surgical treatment.

Materials and Methods:
Information was obtained through a review of medical record, patient interview, and literature review. The informed consent form was signed by the family.

Results:
A 2-year-old female patient was referred to a quaternary hospital at 7 months of age presenting fatigue during feeding since 3 months, cardiac murmur, and decompensated heart failure. Echocardiography and CT angiography revealed aneurysmal dilation throughout the left coronary artery (LCA) trunk and left anterior descending artery (LAD), a large CAF between the LAD and the right ventricle (RV) with three broad connections, severe tricuspid valve (TV) insufficiency, and RV systolic pressure of 95 mmHg. Cardiac catheterization showed pulmonary hypertension with hyperflow and increased vascular resistance (Qp:Qs 1.76 | PVRi 6 WU·m^2). Surgical correction of the CAFs and TV repair were performed at 8 months. Postoperatively, she developed a thrombus adherent to the surgical patch in the LCA, causing left ventricular (LV) diastolic restriction, moderate biventricular dysfunction. Due to this unfavorable progression, dual antiplatelet therapy and anticoagulation were initiated, with follow-up by the pediatric heart transplant team. One year after surgery, during follow-up, the patient showed preserved biventricular function, no indirect signs of pulmonary hypertension, significant thrombus reduction, and no further hospitalizations.

Conclusion:
When appropriately indicated, surgical correction combined with clinical management improves prognosis and can reduce the likelihood of requiring heart transplantation in the coming years

POSTER PRESENTATIONS

Category: Cardiac Surgery

1046 - SURGICAL REPAIR OF PARTIAL AND TRANSITIONAL ATRIOVENTRICULAR SEPTAL DEFECTS MID TO LONG TERM OUTCOMES IN A SINGLE CENTER COHORT

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Background / Hypothesis:
This study was designed to evaluate mid- to longterm surgical outcomes in patients with partial and transitional atrioventricular septal defects (AVSD). Specifically, we aimed to assess survival, reoperation, and the effectiveness of atrioventricular valve (AVV) repair techniques. The study also explored the relationship between surgical approaches, including cleft closure and annuloplasty, and patient outcomes. By analyzing these factors, we sought to determine optimal strategies for AVSD repair and identify factors influencing long-term success.

Materials and Methods:
A retrospective analysis of patients undergoing partial and transitional AVSD repair from January 2020 to December 2022 was performed. Patients with significant annular enlargement and severe LAVV regurgitation underwent reductive or ring annuloplasty, while moderate or less severe cases were managed with cleft closure, alone or with reductive annuloplasty. Outcomes included mortality, reoperation, and AVV repair effectiveness, highlighting tailored surgical strategies and favorable mid- to long-term results through follow-up evaluations.

Results:
A total of 139 patients with partial (74.1%) and transitional AVSD (25.9%) underwent surgical repair, with a median age of 23 years. Preoperative LAVV regurgitation was moderate or severe in 73.4% of cases. Postoperatively, 11.5% had moderate or severe LAVV regurgitation, increasing to 16.5% during follow-up. The reoperation rate was 6.5%, primarily due to LAVV-related issues (55.6%). No early or late mortality occurred, and complications included infections and atrioventricular block requiring pacemaker implantation. Surgical outcomes were favorable, with low morbidity.

Conclusions:
Surgical repair of partial and transitional AVSD achieves excellent survival with low reoperation rates. Focused atrioventricular valve repair strategies are crucial to minimizing LAVV reinterventions and LVOTO. Our LAVV approach, emphasizing tailored techniques such as cleft closure and selective use of ring annuloplasty, provided favorable outcomes while reducing costs for financially constrained patients. Long-term follow-up remains essential to fully evaluate the durability and benefits of specific atrioventricular valve repair methods, including the impact of ring annuloplasty.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1052 - TAKEUCHI TECHNIQUE FOR ALCAPA REPAIR IN AN ADOLESCENT PATIENT

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Background / Hypothesis:
Coronary artery disorders are rare congenital anomalies with an approximate incidence of 1 in every 300,000 live births; ALCAPA is characterized by the anomalous birth of the left coronary artery that arises from the pulmonary artery and its importance lies in the fact that without management it can present a mortality of up to 90% in the first year of life.

Materials and Methods:
We present the case of a school patient with a diagnosis of ALCAPA who underwent correction with the Takeuchi technique the first time it was performed in our institution.

Results:
Through median sternotomy, a pulmonary artery approach was performed where an anomalous implantation of the left coronary ostium was visualized emerging at the left lateral level of the pulmonary artery. Aortic and pulmonary perforation is performed with a 4mm punch forceps to create an aortopulmonary window, a pericardial patch is placed isolating the pulmonary artery and connecting the left coronary ostium to the aortopulmonary communication. Aortography and pulmonary raphia are performed in two planes with 4-0 prolene. Total aortic clamp time was 169 minutes, cardiopulmonary bypass time 199 minutes. Pump output in sinus rhythm. The patient was extubated 4 hours after surgery and was discharged 48 hours after the surgical procedure, currently being followed up without complications.

Conclusions:
The Takeuchi technique is indicated when you have an unfavorable anatomy, as in the case we present; To date, there have been no complications during follow-up; however, close evaluation is required, especially for mitral insufficiency.
The outstanding thing about this case is that it is a rare pathology, and it is the first time that the Takeuchi technique has been performed in our center for its repair.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1055 - RIGHT VENTRICULAR EXCLUSION SURGERY IN HYPOPLASTIC RIGHT VENTRICLE SYNDROME A SURGICAL ALTERNATIVE

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Background:
The right ventricular exclusion is a surgical procedure performed to decompress an anatomically malformed right ventricle. It involves placing a patch at the level of the tricuspid valve and creating a fenestration within the patch. This technique is primarily used for Ebstein's anomaly; however, its application in patients with hypoplastic right ventricle syndrome has been rarely reported.

Materials and Methods:
A case report describing right ventricular exclusion in an adolescent patient with hypoplastic right ventricle syndrome.

Results:
A 15-year-old female patient was diagnosed with double inlet left ventricle with ventriculoarterial discordance and a hypoplastic right ventricle. At the age of two, she underwent atrial septectomy and pulmonary artery banding. During follow-up, a transthoracic echocardiogram revealed an obstructive gradient of 73 mmHg at the pulmonary artery band and regurgitation of both the right and left atrioventricular (AV) valves, leading to left ventricular dilation of 341 ml/m^2.

She was admitted to the hospital due to worsening functional status and significant cyanosis. Surgical intervention was decided, consisting of atrioventricular valve exclusion with partial reduction of the right atrium, and replacement of the left atrioventricular valve with a St. Jude 29 mm mechanical mitral prosthesis.

In the immediate postoperative period, the patient experienced significant hemodynamic instability. A transthoracic echocardiogram showed severe regurgitation of the excluded valve and left ventricular dysfunction with a left ventricular ejection fraction of 39%. An interventional catheterization procedure was performed to close the residual defect in the excluded AV valve using a Figulla PLD 11x12mm device. Following the procedure, the patient showed significant improvement and was discharged home after 10 days without complications and with adequate ventricular function.

Conclusions:
The ventricular exclusion procedure has been increasingly used over the years for specific congenital heart diseases; however, it is important to consider it as a viable alternative for patients with hypoplastic right ventricle syndrome especially in this age group.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1073 - TWO DECADES OF NORWOOD OPERATIONS GRADUAL IMPROVEMENTS AND CONTINUOUS REFINEMENTS

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Background / Hypothesis:
The Norwood operation remains one of the most complex congenital cardiac procedures, historically associated with high mortality rates of 40%, though recent reports indicate improvements to 10–30%. This study evaluates a 20-year experience at Siriraj Hospital, the largest tertiary referral center for congenital heart disease in Thailand.

Materials and Methods:
A retrospective review was conducted on patients who underwent the Norwood operation from 2004 to 2023. Clinical and operative data were extracted from medical records. Postoperative outcomes, including 30-day mortality, ECMO support, and complications, were analyzed.

Results:
A total of 48 patients underwent the Norwood operation, with 19.1% receiving an RV-PA conduit and 80.9% a systemic-PA shunt. The overall 30-day mortality was 45.8%, with rates declining across three chronological periods (56.3%, 43.8%, and 37.5%; $p = 0.56$). ECMO utilization increased over time (7.7%, 28.6%, 25%), with an overall rate of 18.8%. Mortality for ECMO patients was 55.6%, compared to 35.3% for non-ECMO patients ($p = 0.27$). Among ECMO cases, immediate ECMO had a higher mortality rate (66.7%) compared to delayed ECMO (33.3%; $p = 0.34$). Delayed sternal closure was increasingly adopted (31.3%, 87.5%, 100%; $p < 0.01$), reaching 72.9%.

Preoperative balloon atrial septostomy (BAS), additional arterial cannulation for lower body perfusion, larger aortic arch size, and shorter bypass time were associated with better survival ($p = 0.04$, 0.05, 0.03, 0.02, respectively). Multivariable analysis additionally identified higher circulatory arrest temperature and greater body weight as independent survival predictors ($p = 0.04$, 0.02, respectively).

Conclusions:
Over two decades, 30-day mortality after the Norwood operation has gradually declined. ECMO utilization increased, and delayed sternal closure became routine. Survival predictors include preoperative BAS, larger aortic arch size, greater body weight, and higher circulatory arrest temperature.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1080 - LONG TERM OUTCOMES OF LEFT VENTRICULAR ASSIST DEVICE (LVAD) IN CHILDREN WITH ADVANCED HEART FAILURE A SINGLE CENTER CLINICAL EXPERIENCE

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Background / Hypothesis:
This study focuses on the application of LVAD in children with advanced heart failure due to cardiomyopathy and explores its long-term clinical outcomes.

Materials and Methods:
Children who underwent LVAD implantation surgery at Children's Hospital School of Medicine Zhejiang University from February 2023 to December 2024 were included and followed up. The cardiac function of the children was classified according to the New York Heart Association (NYHA) classification criteria and the Interagency Registry for Mechanically Assisted Circulatory Support (INTERMACS) criteria, and staged according to the American College of Cardiology (ACC) staging criteria. After discharge, the quality of life was scored using the Kansas City Cardiomyopathy Questionnaire (KCCQ).

Results:
A total of 11 children with advanced heart failure due to dilated cardiomyopathy underwent LVAD implantation surgery from February 2023 to December 2024. After excluding 1 case of short-term postoperative death, a total of 10 children were followed up. Among them, there were 6 boys and 4 girls, with an age range of 6 to 14 years, and a weight range of 11 to 53 kg. Their cardiac function was NYHA class III-IV, INTERMACS class I-III, and ACC stage D. After a follow-up period of 3 months to 2 years, the physical fitness of the children increased significantly. All NYHA classes improved to class I, and the KCCQ scores increased significantly. In terms of complications, there were 2 cases of cable infection, 2 cases of heart failure,and 1 case of thrombosis.Two children underwent heart transplantation

Conclusion:
The long-term clinical outcomes of implantable left ventricular assist devices in children with advanced heart failure due to cardiomyopathy suggest that the cardiac function of the children is significantly improved, and the quality of life can be significantly enhanced.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1087 - ARTERIAL SWITCH OPERATION IN A 5 YEAR OLD AND 6 YEAR OLD PATIENT WITH TRANSPOSITION GREAT ARTERIES WITH INTACT VENTRICULAR SEPTUM

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Introduction:
Transposition of the great arteries (TGA) is a rare cyanotic congenital heart defect (CHD) that typically presents within the first month of life, with the arterial switch operation (ASO) ideally performed within the first three weeks. This study explores the management of late-presenting TGA with an intact ventricular septum (TGA-IVS) through left ventricular (LV) training and staged ASO.

We examine the pathophysiology and challenges of delayed ASO, the role of preparatory procedures such as Modified Blalock-Taussig Shunt (mBTS), Pulmonary Artery Banding (PA banding), and Balloon Atrial Septectomy (BAS), and echocardiographic and hemodynamic criteria guiding LV readiness. Two cases of TGA-IVS underwent LV training before ASO at 5 and 6 years of age.

Discussion:
These cases are unique because both patients underwent ASO beyond the conventional neonatal period following a two-stage surgical approach with LV training. The 2D echocardiographic parameters prior to ASO included: Left ventricular mass index ≥ 50 g/m^2, Left ventricle-to-right ventricle (LV/RV) pressure ratio ≥ 0.85, Left ventricular end-diastolic volume > 90% of normal and Left ventricular ejection fraction ≥ 50%. However, the median interval between Stage I (LV training procedures) and Stage II (ASO) was notably longer than the typical 5 to 6 weeks.

Conclusion:
In patients with TGA-IVS, the preferred approach is to perform ASO within the first few weeks of life, when the LV remains adequately prepared to support systemic circulation. However, in late-presenting cases or those initially deemed unsuitable for a primary switch, a two-stage approach with LV training remains a viable option. These cases demonstrate that, even beyond the neonatal period, delayed ASO can be successfully performed with appropriate preoperative LV conditioning.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1090 - FOLLOW UP OF PEDIATRIC PATIENTS WITH TOTAL CORRECTION OF TETRALOGY OF FALLOT OVER A 20 YEARS PERIOD.

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Background / Hypothesis:
Tetralogy of Fallot is a common pathology in infancy. Surgical correction has excellent results although it still presents long term complications.
Materials and Methods:Descriptive, retrospective study in which the records of patients who have been followed up by the clinic for a period of 20 years were reviewed.

Results:
A total of 160 patients were admitted, the mean age at the time of correction was 4 years (3-13), 49% were male and 12% had genetic alterations. 20% required palliative surgery (FSP) between 4 and 10 days of life (mean 6), being the indication in 57% severe hypoplasia of the pulmonary branches and the rest also had hypoplasia of the pulmonary ring. Between 12 and 21 months (mean 18) after the FSP corrective surgery was performed.
All cases of total correction were performed by median sternotomy with prolonged longitudinal ventriculostomy towards the annulus, trunk or branches when hypoplasia was present. The interventricular defect was closed with a patch and all required a patch on the RVOP. Coronary anomalies were found in 7% of the cases. In 255 of the cases there were signs of septic shock in the first 36 hours after surgery. Only 5 cases presented complete AV block and 2 required permanent pacemaker placement. Chylothorax was observed in 3 cases, of which 2 could be resolved with medical treatment and one required surgical management,
In total 3 cases required reintervention, one at 14 days for chylothorax and diaphragmatic paralysis and another at 10 days for pacemaker placement.

Conclusions:
Survival is close to 100% for those without genetic syndromes. Current surgical therapy goals should be to mitigate late right ventricular dysfunction.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1094 - FIVE YEAR OUTCOMES OF AORTIC ARCH REPAIR IN NEWBORNS UNDER NORMOTHERMIC SELECTIVE CEREBRO MYOCARDIAL PERFUSION PROTECTION

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Background / Hypothesis:
Aortic coarctation with tubular arch hypoplasia is a serious problem and there is no unity among congenital specialists regarding the best approach to treatment. Each option for correction and for protection techniques has its proponents and evidence base is scarce. We aimed to assess 5-year results in patients operated for aortic arch hypoplasia under normothermic selective cerebro-myocardial perfusion.

Materials and Methods:
We conducted a retrospective observational study of 16 patients operated from 2014 to 2018 years. Hospital and ambulatory medical records were analyzed for immediate and 5-year results, respectively. When needed patients were contacted via the phone.

Results:
Mean follow-up time was 5.05 (2.49-8.12) years. Mortality was 6.25% (1 patient died from generalized viral and bacterial infection 11.8 months after the operation). One (6.25%) patient was lost to follow-up. Unplanned reoperations were performed in 6 (37.5%) patients (recoarctation balloon angioplasty – 3 (18.75%), diaphragm plication for paresis – 1 (6.25%) patient, brachiocephalic artery cannulation site repair – 1 (6.25%) patient, left ventricle outflow tract membrane resection – 1 (6.25%) patient). Planned reoperations were performed in 5 (31.25%) patients.(ventricular septal defect repair – 4 (25%), pulmonary artery debanding – 1 (6.25%) patient). One patient (6.25%) had stroke diagnosed 10 months after correction with magnetic resonance imaging. Median pressure gradient measured by transthoracic echocardiography was 16 [IQR: 13.25-25] mmHg.

Conclusions:
From the presented data we assume that aortic arch surgery in newborn under normothermic selective cerebro-myocardial perfusion is feasible. Five-year results (mortality, reoperation rate, stroke rate) do not differ from the available published data.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1098 - PREVALENCE OF AORTIC ARCH DEFECTS IN THE NEONATAL PERIOD IN A REFERENCE HOSPITAL IN A PERIOD OF 10 YEARS

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Backgro / Hypothesis:
Coarctation of the aorta and interruption of the aortic arch are frequent pathologies in the neonatal stage, being one of the main causes of cardiogenic shock and death. Objective. The objective of this study was to know the frequency, demographic data, management, and surgical results of aortic arch defects in the neonatal period in a period of five years

Materials and Methods:
This is a descriptive, observational, cross-sectional, retrospective, and case series study. Recording of media, maximum, and minimum was made for continuous numerical variables and for categorical variables the percentage was measured.

Results:
We found a total of 104 patients with predominance in the male gender (56.8%), 11.4% of the cases represent Interruption of the Aortic Arch, 52% of patients with CoAo prsent some associated heart disease such as atrial septal defect, ventricular defect and bileaflet aorta. The mean weight was 3.2kg and the transfer time in days was 12. Patients were divided into two groups based on the time: less than 10 days and equal to or greater than 10 days. The finding was that only 32.6% were transferred to the first group, while tre remaing 67.4% were transferred to group II. The overral mortality rate was 13.6% with 100% patients belonging to the greater that 10 days group. No correlation was found between mortality andd low weight.

Conclusions:
It is common for aortic arch defects in the neonatal period to present as critical heart disease, that is, pathologies that if not detected and treated in time, patients have a high risk of dying in the first ten days of life. It is important to perform an adequate physical examination and cardiological screening for the timely detection and transfer of these patients.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1100 - AN UN PECULIAR OBSTRUCTION ON BOTH SIDES

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Background / Hypothesis:
"Univentricular" heart diseases are classified based on the anatomy of the atrioventricular valves and the position of the great vessels. It represents approximately 2% of congenital heart diseases and is characterized by the lack of development of one ventricle (usually the right), forcing the remaining ventricle to handle the load of both circulations.

Materials and Methods:
Neonate, 37 weeks gestational age, weighing 2,600 kg. Prenatal diagnosis of tricuspid atresia. Hospitalized in neonatology, hemodynamically stable, oxygen saturation 94%, sinus rhythm, preserved pulses. Imaging studies were performed, preoperative Doppler echocardiogram: tricuspid atresia with transposed vessels, Type II B. Aortic atresia, hypoplastic ascending aorta, ventricular septal defect, patent foramen ovale. Wide patent ductus arteriosus
In the case of Type B, it represents 10% of tricuspid atresias. Aortic atresia is an uncommon entity that causes critical obstruction to the left outflow tract in the neonate, associated with other severe lesions such as aortic coarctation or interruption of the aortic arch. It represents approximately 0.1% to 0.3% of all congenital heart diseases.

Results:
prostaglandins were indicated, and palliative surgery was scheduled on the 3rd day of life, Norwood - Sano, undergoing postoperative care in intensive care, where several complications we struggled with, including postoperative bleeding, low cardiac output syndrome, and arrhythmias.

Conclusions:
The combination of Type II B tricuspid atresia and aortic atresia represents a significant diagnostic and therapeutic challenge within congenital heart diseases with univentricular physiology. Echocardiography, both prenatal and postnatal, is essential for the early detection and classification of these complex malformations, allowing for precise and timely surgical planning.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1102 - PRENATAL DIAGNOSIS COURSE AND OUTCOME OF PATIENTS WITH TRUNCUS ARTERIOSUS COMMUNIS

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Background / Hypothesis:
The arterial trunk is a complex congenital heart disease in which a single vessel emerges from the heart. It is characterized by pulmonary hyperflow and hypoxemia. It is responsible for supplying systemic, pulmonary, and coronary circulation. The frequency is 1-1.5% of congenital heart diseases. Diagnosis is made through Doppler echocardiography both prenatally and postnatally, with complex anatomy cases requiring confirmation through Angio-CT or Angio-MRI.

Materials and Methods:
To raise awareness of the presence of complex congenital heart disease diagnosed in the neonatal period and its evolution and resolution postnatally.

Results:
In the fetal Doppler echocardiogram, we found:Ventricular septal defect high perimembranous VSD , subtruncal. In the five-chamber view, a vessel is seen overriding the ventricular septal defect in relation to a large defect. In the three-vessel/trachea view, a vessel emerging to the left is visualized, bifurcating into the pulmonary artery emerging from the dominant vessel leaving the heart. The pulmonary artery trunk has an acceptable caliber and confluent branches.The baby is born at 39 weeks weighing 3.250 kg.He is admitted to Neonatology hemodynamically stable with 97% Gradually, the patient begins to have heart failure , treated with diuretics to relieve overload. At 12 days of life, corrective surgery is performed: aortotomy, extraction of the pulmonary artery trunk, exploration of the aortic valve Aortic reanastomosis, ventriculotomy, closure of the subtruncal VSD with an autologous pericardial patch. Connection from the right ventricle to the pulmonary artery with a valvulated GORE-TEX tube. Doppler echocardiogram shows acceptable biventricular function, laminar flow in the right ventricle-pulmonary artery tube. Moderate insufficiency, moderate mitral insufficiency.

Conclusion: Mortality for arterial trunk ranges from 5-10%,currently, the outcomes of arterial trunk repair have significantly improved due to prenatal diagnosis (allowing care for the unborn patient in a high-complexity center),performing surgery at early ages, and improvements in extracorporeal circulation and post-operative management.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1109 - ANOMALOUS LEFT CORONARY ARTERY FROM THE PULMONARY ARTERY (ALCAPA) A RETROSPECTIVE COHORT STUDY FROM THE LAST 15 YEARS OF PATIENTS WHO UNDERWENT SURGICAL INTERVENTION

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Background / Hypothesis:
Anomalous left coronary artery from the pulmonary artery (ALCAPA) is a rare congenital heart defect that, if untreated, leads to ischemia and death. Although early surgical repair improves outcomes, long-term data on postoperative recovery and reoperation are scarce. This study evaluates the clinical course of surgically treated ALCAPA patients over 15 years at a quaternary care center.

Materials and Methods:
This was a retrospective cohort study of patients diagnosed with ALCAPA in a reference quaternary hospital who underwent surgical intervention. Patient data were extracted from institutional medical records, and the following variables were analyzed: baseline characteristics (gender, age at surgery, preoperative cardiac dysfunction, and comorbidities); surgical procedures (left coronary artery implantation, mitral valve plasty, pulmonary artery plasty); and postoperative outcomes. Continuous variables were summarized using mean ± standard deviation (SD) or median and interquartile range (IQR), depending on distribution. Categorical variables were reported as counts (percentages).

Results:
Among the 71 patients diagnosed with ALCAPA, preoperative cardiac dysfunction was observed in 27 patients (38.0%).Following surgical correction, 8 patients (11.3%) required reoperation. Mortality was observed in 4 patients (5.6%), a rate that, while relatively low, emphasizes the critical nature of ALCAPA surgery and the need for long-term follow-up. Encouragingly, 16 patients (22.5%) who had preoperative dysfunction demonstrated full recovery of cardiac function postoperatively, while 11 (15.5%) did not fully recover.

Conclusions:
These findings suggest that surgical correction of ALCAPA enables functional recovery in a substantial subset of patients. However, significant rates of reoperation and persistent dysfunction highlight the need for long-term surveillance and individualized postoperative care.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1110 - SYSTEMIC HYPERKALEMIA FOR CARDIAC ARREST ON CARDIOPULMONARY BYPASS DURING CONGENITAL HEART SURGERY

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Background
In congenital heart surgery, aortic cross-clamping could be challenging due to adhesions or anatomical features. Additionally, developed collateral vessels disrupt adequate myocardial protection. The systemic hyperkalemia (SHK) method, which causes cardiac arrest by increasing the systemic potassium level, has been reported in adult cardiac surgery, but there are no reports of its use in congenital heart surgery.

Methods
All consecutive patients who underwent congenital heart surgery with the SHK between January 2022 and December 2024 were included in this study. Mortality, major complications and serial changes in cardiac function were retrospectively reviewed. The SHK protocol is as follows: (1) At the initial cardiac arrest, additional potassium is administered until cardiac arrest; (2) During cardiac arrest, blood potassium level is maintained at 9 mEq/L or higher; (3) the bladder temperature is maintained at 30°C.

Results
Twelve patients (median age, 9.5 years) were eligible. The median follow-up period was 2.0 years (interquartile range, 0.6-2.0 years). The surgical procedures were RVOTR in 3 cases, atrioventricular valve surgery in 3 cases, AVR in 2 cases, coronary surgery in 2 cases, and others in 2 cases. The methods of cardiac arrest were the SHK alone in 5 cases, SHK with cardioplegia in 5 cases, and SHK with hypothermic circulatory arrest in 2 cases. The reasons for applying the SHK were adhesions in 2 cases, anatomical features in 3 cases, collateral vessels in 6 cases, and post-CABG in 1 case. The postoperative peak creatine kinase-MB level was a median of 45.1 IU/L (interquartile range, 26.2-166.1 IU/L). No significant changes were identified in the electrocardiogram. There was an acute death due to nonocclusive mesenteric ischemia. Multiple cerebral infarction was seen in 1 case.

Conclusions
The SHK method maintained stable cardiac arrest and could be an option in case standard myocardial protection strategies are unsuitable.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1115 - RISK FACTORS OF RECOARCTATION AFTER SURGICAL REPAIR FOR COARCTATION OF THE AORTA A 10 YEAR RETROSPECTIVE REVIEW AT A SINGLE TERTIARY CARE CENTER IN THAILAND

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Background / Hypothesis:
Recoarctation after surgical repair for coarctation of the aorta remains one of major adverse postoperative outcomes. We aimed to determine the associated risk factors of recoarctation after surgical repair for coarctation of the aorta.

Materials and Methods:
The study was a retrospective review of medical records between January 2011 and December 2021. We included all patients diagnosed with coarctation of the aorta whose age ranged from birth to 18, had a history of surgical coarctation repair, and had done a follow-up at Siriraj Hospital. . The results were recorded on the case record form and analyzed by the IBM SPSS Statistics Data Editor.

Results:
One hundred and seven patients were included. The median age of diagnosis was 43 days (IQR 11-121). Twenty-seven patients (25.2%) were diagnosed with recoarctation by a clinician and echocardiography upon follow-up, with a median interval of 12 months (IQR 5-35) from the previous surgery. After a univariable analysis, residual coarctation after surgery was the only factor t significantly associated with recoarctation (P value <0.001).

Conclusions:
Postoperative residual coarctation defined by an echocardiography is a significant parameter to predict recoarctation.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1151 - CLINICAL AND BIOMECHANICAL OUTCOMES OF ELIXP™ FIXED BOVINE PERICARDIAL PATCHES IN CARDIOVASCULAR SURGERY A SYSTEMATIC REVIEW

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Background / Hypothesis:
Bovine pericardial patches are widely used in cardiovascular surgery. However, conventional glutaraldehyde fixation leads to increased calcification, reduced elasticity, and structural degradation, necessitating reintervention. ElixP™ fixation technology is a novel preservation method designed to enhance durability, maintain collagen integrity, and minimize calcification. This systematic review evaluates the biomechanical, histological, and clinical outcomes of elixP™-fixed bovine pericardial patches in congenital and adult cardiovascular surgeries.

Materials and Methods:
A systematic literature search was conducted in PubMed, Scopus, and Google Scholar to identify studies evaluating elixP™-treated bovine pericardial patches. Inclusion criteria encompassed studies assessing biomechanical properties, histological integrity, and clinical applications in cardiovascular procedures. Primary outcomes analyzed included calcification resistance, mechanical strength, surgical handling, and mid-term clinical outcomes. Two of the included studies are preprints, which have not yet undergone peer review.

Results:
Four studies met the inclusion criteria. Bhende et al. (2023, 2024) demonstrated the successful application of elixP™ - fixed patches in Tetralogy of Fallot (TOF) repair and Ventricular Septal Defect (VSD) closure. These studies reported no patch-related complications, excellent surgical handling, and favorable postoperative outcomes. Experimental investigations on elixP™ fixation revealed a 92 % reduction in calcification compared to glutaraldehyde-fixed patches, with significantly enhanced mechanical properties, including higher tensile strength (16.78 MPa) and improved elasticity, closely resembling native pericardium. Additionally, histological analysis confirmed superior suture retention and a reduced inflammatory response. The largest clinical study (n = 282 patients) reported no patch-related mortality, high surgeon satisfaction, and promising early outcomes, warranting further long-term evaluation.

POSTER PRESENTATIONS

Conclusions:
ElixP™-fixed bovine pericardial patches show significant biomechanical and clinical advantages, including reduced calcification, superior elasticity, and improved long-term durability. These properties suggest that elixP™ fixation may reduce reintervention rates and enhance surgical outcomes in congenital and adult cardiac repairs. However, long-term multicenter trials are needed to confirm its efficacy and durability over extended follow-up periods.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1167 - VALVE OUTCOME IN TRICUSPID VALVE DETACHMENT FOR VENTRICULAR SEPTAL DEFECT CLOSURE

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Background / Hypothesis:
In transatrial VSD closure, accurately defining the margins is essential for a successful closure. Tricuspid valve detachment is done to improve visualization, which may be impaired by chordal attachment and tricuspid valve leaflets but may be associated with increased operative time, heart block, and postoperative tricuspid regurgitation.

Materials and Methods:
All pediatric patients who underwent isolated transatrial VSD closure between 2011 and 2021 were studied. Based on the use of tricuspid valve detachment (TVD), clinical outcomes, including tricuspid valve function, residual VSD, and postoperative AV dissociations were compared between the two groups.

Results:
Of 268 patients, 88 (32.8%) were performed with TVD and 180 (67.2%) without TVD. Preoperative characteristics were similar between groups, including median age and body weight (13.5 vs. 12.5 months and 7 vs. 6.9 kgs). VSD was predominantly perimembranous type in both groups (83% vs. 88.3%; p = 0.176) and the size was (7.8 vs. 7.5 mm; p = 0.315). There were no significant differences in the degree of postoperative tricuspid valve regurgitation (more than mild TR 7.1% vs. 5%; p = 0.38), residual VSD (11.8% vs. 19.6%; p = 0.116), and incidence of AV block (2.3% vs 4.4%; p = 0.378). At the median follow-up time of 38.3 months, there was no reoperation for tricuspid valve regurgitation and residual VSD, but one patient from the non-TVD group required postoperative permanent pacemaker implantation. The cardiopulmonary bypass and cross-clamp time were significantly longer in the TVD group (70±25 vs. 61±19 min; p = 0.002) and (50±18 vs. 40±15 min; p=0.000).

Conclusions:
Besides longer operative time, the tricuspid valve detachment technique is associated with comparable outcomes in terms of tricuspid valve function and cardiac conduction. It can be an equally safe alternative for challenging-to-expose transatrial VSD closure.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1168 - SHOULD THE PULMONARY AUTOGRAFT IN THE MITRAL POSITION (ROSS II PROCEDURE) BE A BRIDGING APPROACH FOR PEDIATRIC PATIENTS WITH SEVERE MITRAL VALVE DISEASE A RETROSPECTIVE COMPARATIVE STUDY

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Background / Hypothesis:
We aimed to compare the clinical outcomes of pulmonary autograft in mitral position (Ross II procedure) and mechanical mitral valve replacement in pediatric patients with severe congenital mitral valve disease.

Materials and Methods:
This study retrospectively reviewed consecutive pediatric patients who underwent Ross II procedure or mechanical mitral valve replacement from 2019 to 2023. Baseline and outcome characteristics of these two groups were compared. The clinical characteristics of Ross II patients were summarized. Freedom from death and reoperation rates were estimated using Kaplan-Meier analysis. Mitral valve velocity and mean gradient were compared at follow-up.

Results:
A total of nine Ross II and thirty-four mechanical mitral valve replacement patients were included in this study. Ross II patients were younger (1.3 years [Interquartile range (IQR): 0.6 to 3.8] vs. 9.2 years [IQR: 3.6 to 13.17]; P = 0.001), suffered more mitral stenosis (8/9, 88.9% vs. 8/34, 23.5%; P = 0.001), and longer duration of cardiopulmonary bypass (202 minutes [IQR: 196 to 213] vs. 144 mins [IQR: 115.5 to 169.75]; P = 0.003). Aplastic chordae tendineae and directly attached papillary muscles to leaflets were the predominant anomalies of mitral valves in Ross II group. Survival at five years were similar in patients received Ross II (8/9, 89.9%) and mechanical mitral vavle replacement (33/34, 97.1%) but the incidence of reoperation was higher in patients with Ross II (2/9, 22.2%) than mechanical mitral valve replacement (0/34, 0%). Mitral valve mean gradient were higher in Ross II compared with mechanical mitral valve replacement (18mmHg [IQR: 10 to 18.5] vs. 6 mmHg [IQR: 5 to 7]; P = 0.017) at three years after initial surgery.

Conclusions:
Ross II procedure may serve as a bridging approach for younger pediatric patients with irreparable mitral valve when prosthetic valves are unavailable, albeit its higher reoperation rate compared with mechanical mitral valve replacement.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1172 - POTENTIAL ROLE OF PACEMAKERS AND DAPAGLIFLOZIN IN TREATMENT OF DIASTOLIC DYSFUNCTION IN SINGLE VENTRICLE PATIENTS A CASE SERIES

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Background / Hypothesis:
Diastolic dysfunction in patients with a functionally single ventricle significantly impairs quality of life. The mechanisms behind its development and correction remain unclear. This study evaluates the effectiveness of pacemaker therapy and dapagliflozin in these patients.

Materials and Methods:
The study included 4 patients:
Patient 1: HLHS, pre-Fontan, diastolic dysfunction (EDP 16 mmHg), based on 24-hour ECG monitoring with mean heart rate of 68 bpm and a junctional rhythm, pacemaker implanted in AAI mode (80 bpm).
Patient 2: DILV, pre-Fontan, diastolic dysfunction (EDP 15 mmHg), based on 24-hour ECG monitoring with an average heart rate of 75 bpm and a junctional rhythm, pacemaker implanted in AAI mode (100 bpm).
Patient 3: Tricuspid Atresia, 7 years post-Fontan, diastolic dysfunction (EDP 16 mmHg), preserved systolic function, E/A ratio of 2.3, and IVRT of 94 ms. started dapagliflozin therapy.
Patient 4: HLHS, 7 years post-Fontan, diastolic dysfunction (EDP 21 mmHg), moderately reduced systolic function, DT of 70 ms, and E/A ratio of 2.0, started dapagliflozin therapy.

Results:
Patient 1: After 9 months, EDP improved to 8 mmHg; Fontan completed successfully.
Patient 2: After 12 months, EDP improved to 10 mmHg; awaiting Fontan procedure.
Patient 3: After 4 months, E/A ratio improved to 2.1, IVRT decreased to 46 ms.
Patient 4: After 8 months, DT increased to 154 ms, E/A remained at 2.0.

Conclusions:
Pacemaker implantation with a higher base stimulation rate may improve diastolic function in patients with a functionally single ventricle. Dapagliflozin therapy shows some improvement in diastolic function, though no overall trend was observed. A prospective study is needed to evaluate the impact of this therapy.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1178 - SURGICAL OUTCOMES OF REPAIR FOR TETRALOGY OF FALLOT WITH ABSENT PULMONARY VALVE OUR EXPERIENCE

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Background:
Tetralogy of Fallot (TOF) with absent pulmonary valve (APV) occurs in 3-6% of patients with TOF. This entity is physiologically distinctive from other forms of TOF, due to tracheobronchial compression resulting from massive dilatation of the main pulmonary artery and branches. We analysed the surgical outcomes of this challenging subset of TOF at our centre using the various described surgical strategies.
Patients and Methods:
Retrospective data of all patients with diagnosis of TOF with APV who underwent surgery at our institute between May 2018 to December 2024 was collected. All the demographic data, type of surgery, in-hospital mortality, ventilation duration, length of ICU and post-operative hospital stay was collected. Early follow-up parameters with need for reinterventionwas also included.

Results:
A total of 28 patients (aged 30 days to 19 years, median 9 months) were included in the study. Their weight ranged from 3.5 to 39 kg (median 5 kg). Six patients (21.4%) were neonates. Surgical procedures included branch pulmonary artery (PA) reduction in 21 patients (75%), valveless transannular patch in 5 (17.8%), 0.1 mm PTFE valve with transannular patch in 12 (42.8%), PTFE valve with Lecompte's manoeuvre in 6 (21.4%), and valved conduit repair in 5 (17.8%). One patient (3.6%) died in the hospital. Mechanical ventilation lasted 4–82 hours (median 11 hours); five neonates required prolonged ventilation (>72 hours, median 74.5 hours). ICU stay was a median of 24 hours, and hospital stay was 6 days. One patient (3.5%) needed re-intervention for RVOT obstruction. The mean follow-up duration was 22 months.

Conclusion:
Surgical therapy, individualised to the patients based on clinical presentation and anatomy, leads to reasonable outcomes in TOF with APV. Earlier presentation and presence of tracheobronchial compression need a more aggressive surgical approach. Neonates in our study needed a longer duration of ventilatory support.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1182 - MYCOTIC (INFECTED) PSEUDOANEURYSM POSTCARDIAC SURGERY – CASES REPORT

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Background / Hypothesis:
Pseudoaneurysms are a rare and serious complication of infectious endocarditis, especially in patients with a history of cardiac surgery. They can lead to severe complications, such as rupture, compression of cardiac structures, or fistulization. The exact incidence is unknown, although certain congenital heart diseases and surgical procedures are known to increase the risk of development.

Materials and Methods:
We present the cases of two patients who underwent surgical intervention for the treatment of congenital heart disease and subsequently developed infectious pseudoaneurysms as a complication. The main symptom was the presence of a pulsatile mass in the anterior chest wall, above the sternum. A study protocol was implemented with echocardiography and CT scan. The first case is a 2-year-old female patient diagnosed with Tetralogy of Fallot, who underwent surgical correction at 22 months of age. Four months after correction a transesophageal echocardiogram revealed a loss of continuity at the level of the right Valsalva sinus, secondary to a 46x44 mm pseudoaneurysm, causing obstruction of the right ventricular outflow tract, a Bentall-Bono procedure was performed. The second case is a 12-year-old female patient with pulmonary atresia with ventricular septal defect. She underwent a Rastelli procedure at 12 months of age and later presented with fever, paroxysmal coughing, and pulsatile mass measuring 6x7 cm in the upper third of the surgical wound. A transthoracic echocardiogram showed loss of continuity at the level of the pulmonary artery, secondary to a 60x75 mm pseudoaneurysm,causing dynamic obstruction at right ventricular outflow tract (RVOT). Complete resection of the pseudoaneurysm capsule was performed.

Conclusions:
Pseudoaneurysms in infective endocarditis in children undergoing surgery for congenital heart disease represents a dangerous source of pulmonary and systemic embolization. Therefore early diagnosis through imaging studies and blood cultures, along with aggressive antibiotic treatment and surgery, are key to to reducing mortality and preventing complications.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1186 - LONG TERM FOLLOW UP RESULTS OF SURGERY FOR AORTOPULMONARY WINDOW IN CHILDREN A SINGLE CENTER STUDY

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Background / Hypothesis:
Aortopulmonary window (APW) is a congenital heart malformation with low incidence rate. We here present the long-term outcome of surgical repair of APW patients in our center.

Materials and Methods:
Between January 2011 and December 2023, patients undergoing surgery for APW were analyzed retrospectively. Postoperative echocardiography and electrocardiogram follow-up were performed.

Results:
15 patients diagnosed with APW underwent the operation, with 11 (73.3%) being males. Median age and weight at repair were 3 months (range 18 days-8 years) and 5.1 kg (range 2.3-25 kg), respectively. Eight patients had type I, four had type II, and three had type III APW based on Richardson's classification. 2 patients were associated with concomitant interrupted aortic arch (type A), 1 patient diagnosed as Berry syndrome had coarctation of the aorta and 1 was combined with pulmonary atresia with ventricular septal defect. According to preoperative echocardiographic evaluation, 5 out of 15 patients had severe pulmonary arterial hypertension. The mean size of the APW defect was 11.25±5.70 mm. Autologous pericardial patch repair of APW was performed using the sandwich method (trans-window) (n=3;20%), transaortic (n=2;13.3%), and transpulmonary artery (n=2;13.3%) approaches. 2 patients (13.3%) underwent double ligation and 6 (40%) underwent division and suturing. There was one late death at 3 months after surgery due to multiple organs failure and disseminated intravascular coagulation over a mean follow-up of 89.9±40.6 months. None of the patients experienced new onset of arrhythmia and required any kind of reintervention.

Conclusions:
Despite the combination of complex cardiac malformations and pulmonary arterial hypertension, most patients who underwent timely APW surgery during their infancy achieved good long-term prognosis.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1195 - LONG TERM HEPATIC COMPLICATIONS IN FONTAN CIRCULATION DIAGNOSTIC CHALLENGES

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Background/Hypothesis:
The Fontan procedure, a palliative surgical strategy for patients with single-ventricle physiology, has significantly improved long-term survival. However, it is increasingly associated with hepatic complications due to chronically elevated systemic venous pressure. Fontan-associated liver disease (FALD) encompasses a spectrum from mild fibrosis to cirrhosis and hepatocellular carcinoma (HCC). Reliable, noninvasive methods for fibrosis staging are critical, yet current tools may be misleading in this unique physiology. We hypothesize that standard noninvasive fibrosis markers and elastography overestimate fibrosis in Fontan patients compared to histologic analysis.

Materials and Methods:
A cross-sectional cohort of 61 post-Fontan patients was evaluated. All patients underwent a standardized hepatic assessment including laboratory tests (biochemistry, coagulation, AFP), fibrosis scores (Forns, FIB-4, APRI, GUCI, CDS), liver elastography, abdominal MRI, and ultrasound-guided percutaneous liver biopsy. Liver fibrosis was evaluated according to the METAVIR score.

Results:
The median time since Fontan completion was 7.7 years (IQR: 6.2–11.7). Noninvasive fibrosis scores suggested moderate to severe fibrosis in the majority of patients, with a high rate of false-positive cirrhosis classification. Elastography likewise consistently indicated advanced fibrosis (≥F3) in over 70% of cases. However, histological examination revealed significantly milder changes, with 41% classified as F1, 36% as F2, and only 11% meeting criteria for cirrhosis (F4). There was poor correlation between noninvasive methods and biopsy-confirmed fibrosis stage. MRI findings varied, with nonspecific hepatic heterogeneity but limited staging accuracy. AFP levels were elevated (>7.29 ng/mL) in a minority, without confirmed HCC.

Conclusions:
Our findings demonstrate that elastography and serum-based fibrosis indices systematically overestimate hepatic fibrosis in the Fontan population, likely due to chronically altered hemodynamics. Liver biopsy remains the gold standard for fibrosis assessment. Given the diagnostic limitations of noninvasive tools in this context, tailored hepatic surveillance protocols are essential to avoid overtreatment and to ensure early detection of clinically significant liver disease.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1204 - CARDIOPLEGIA PRACTICES IN PEDIATRIC CARDIOVASCULAR SURGERY SURVEY ACROSS ASIA EUROPE AND NORTH AMERICA

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Background:
Cardioplegia is fundamental for myocardial protection in pediatric cardiovascular surgery. However, there is no contemporary report of clinical practices. Therefore, we conducted a survey of pediatric cardioplegia practices across Asia, Europe (EU) and North America (NA).

Materials and Methods:
An online survey was designed in REDCap to assess practices for cardioplegia composition, delivery strategy, adjunct protection and use or hesitancy with using del Nido. This survey was distributed to all members of the Congenital Heart Surgeons' Society, European Congenital Heart Surgeons Association, and Asian Association for Pediatric and Congenital Heart Surgery from March to September 2024.

Results:
Complete responses were obtained from 71 surgeons and seven perfusionists representing 70 institutions. Most respondents use del Nido (60%, 47/78), followed by HTK (14%, 11/78), St. Thomas No.2 (13%, 10/78), customized depolarizing solutions (8%, 6/78) or other formulations (5%, 4/78). While cardioplegia type varied greatly across Asia and EU, 81% of NA respondents use del Nido. Cold cardioplegia (<10C) is the predominant strategy (92%, 72/78). Common practices for blood-to-crystalloid delivery ratio are 1:4 (41%, 32/78), followed by 4:1 (26%, 20/78) and pure crystalloid solutions (27%, 21/78). The most frequent dosing regime is induction between 20-30 mL/kg (76%, 59/78) and re-doses between 10-20 mL/kg (63%, 49/78) but with a large range in re-dose timings (10–120 mins). Notably, 28% of respondents use single dose cardioplegia (22/78). To enhance myocardial protection, 56% of respondents use topical cooling (44/78) with only 8% using 'hot shot' cardioplegia (6/78). Amongst respondents not using del Nido, three key concerns emerged regarding challenges with regulatory approval, procurement, and lack of clinical evidence.

Conclusions:
Most institutions across NA exclusively use del Nido, while heterogeneity remains in cardioplegia solutions used across Asia and EU. There also remains significant variation in practices, highlighting a need for outcomes studies to establish optimal cardioplegia strategy.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1223 - TREATMENT PATHWAYS SURVIVAL AND HOSPITAL RESOURCE UTILISATION IN A NATIONAL COHORT OF PATIENTS WITH PULMONARY ATRESIA WITH INTACT VENTRICULAR SEPTUM (PA IVS)

Asmita Singhania [1], Dan-mihai Dorobantu [2], Qi Huang [3], Ferran Espuny Pujol [3], Rodney Franklin [4], Katherine Brown [5], Christina Pagel [3], Sonya Crowe [3], Serban Stoica [1]
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Background:
Management of PA-IVS has evolved in the past decades, especially with more transcatheter RV decompression procedures. We aim to report contemporary national outcomes for PA-IVS patients from 0-18 years.

Methods:
All patients with PA-IVS born between 2000-2021 in England and Wales were linked to hospital and outpatient records using a national dataset framework. Patients were classified as single ventricle pathway (SV) if undergoing either Glenn or Fontan operations, or biventricular repair pathway (BV), with some being non-committed.

Results:
510 PA-IVS patients were included of which 278 (54.5%) were BV repair, 136 (26.7%) SV and 96 (18.8%) non-committed. Median follow-up was 8.9 years, with 1-year and 5-year mortality 19.3% and 20.5%, respectively. Those having palliative stage 1 as the first intervention had higher 1-year mortality compared to those having RV decompression as their first intervention (36.5% vs 7.5%, $p<0.05$). Overall, RV decompression was predominantly transcatheter (81.7%). In those undergoing BV repair, freedom from any cardiac reintervention was 36.3% at 10 years. Median total number of days at the hospital was highest during the first year of patients' lives (36 days) and decreased gradually down to 1 day per year by 10 years old. SV individuals spent more days in the hospital compared to BV patients(Table).

Conclusions:
This is one of the biggest PA-IVS series reported to date. Transcatheter RV decompression has become the most prevalent initial treatment option in PA-IVS, with good survival but a high burden of reintervention. Early mortality after non-antegrade flow augmentation remains high. Compared to the SV pathway, BV repair has lower mortality and hospital resource utilisation. Key future directions should be in ductal stenting versus aortopulmonary shunts as the first palliation choice, and new interventions to address high mortality associated with RV-dependent coronary circulation.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1226 - SURVIVAL OUTCOME REINTERVENTION AND HOSPITAL RESOURCE UTILISATION IN A NATIONAL COHORT WITH ATRIO VENTRICULAR SEPTAL DEFECT (AVSD)

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Background:
Large multicentre contemporary outcome data on the management of complete AVSD is lacking. We aim to report national outcomes and hospital resource utilisation between 0-18 years based on the diagnosis of complete balanced AVSD.

Methods:
All patients with AVSD (without other more complex CHD) between 2000 and 2021 undergoing a cardiac procedure in England and Wales were linked to hospital and outpatient records using a national dataset framework. Tetralogy of Fallot, unbalanced, and partial AVSD were excluded. Risk factors for mortality, reintervention, and time spent in the hospital were evaluated using multivariable regression.

Results:
2698 complete AVSD patients were followed up for a median of 10.6 years, of which 89.7% had complete AVSD repair at a median age of 149 days since birth, while the remainder had staged repairs; with 1-year and 5-year mortality for the whole cohort being 7.4% and 9.9% respectively. Early outcomes including mortality and need for cardiac reintervention at 30 days after complete AVSD repair were 1.8% and 4.6% respectively. Freedom from any cardiac structural reintervention at 10 years was 83.7%, most procedures being atrioventricular valve repair or replacements. The median total number of days in hospital was highest during the first year of life, at 52 days, and decreased gradually down to 3 days after 10 years. Long-term mortality, reintervention after complete AVSD repair, and reduced median days at home during the first year of life were analysed separately (Table).

Conclusions:
Hospital resource utilization is high in the first year of life for infants with AVSD. Reporting survival by diagnosis accounts for pre-pathway procedures and higher overall mortality. Beyond the first year of life, there is an increasing burden of atrioventricular valve reintervention. Risk factors associated with worse outcomes are mostly non-modifiable but can inform decision-making and targeted improvements in quality of care.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1234 - POSTOPERATIVE CONDUCTION SYSTEM DISORDERS FOLLOWING VENTRICULAR SEPTAL DEFECT ENLARGEMENT A SINGLE CENTER EXPERIENCE

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Introduction:
Ventricular septal defects (VSDs) functioning as the outlet of the heart (referred to as the bulboventricular foramen) may require enlargement when restrictive. This restriction can arise at any stage of surgical repair or palliation. This study aims to evaluate postoperative conduction disturbances in patients undergoing VSD enlargement and to identify associated clinical factors.

Methods:
VSD enlargement at our center is performed according to ventricular looping anatomy: via the anterosuperior margin in D-loop ventricles and the posteroinferior margin in L-loop ventricles, using muscle resection. Twenty patients who underwent VSD enlargement between 2015 and 2025 were retrospectively reviewed. Diagnoses, age and weight at surgery, and follow-up data were collected. Distribution by diagnostic group, ventricular looping pattern, and postoperative arrhythmias were analyzed.

Results:
The mean age and weight at surgery were 39.7 months and 12.8 kg, respectively (range: 0.1–137 months; 2.85–43 kg). The most frequent diagnoses were double inlet left ventricle (DILV) with ventriculoarterial (VA) discordance (9 patients) and tricuspid atresia (TA) with VA discordance (6 patients). Looping was evenly distributed: 50% D-loop and 50% L-loop. Three patients died in the early postoperative period. Complete AV block developed in three patients; two required permanent pacemaker implantation, and one died early postoperatively. One cTGA patient had preoperative complete AV block and was excluded from new-onset block analysis. No clinically significant postoperative ventricular arrhythmias or mechanical dyssynchrony requiring cardiac resynchronization therapy (CRT) were observed during follow-up.

Conclusion:
Conduction disturbances, particularly complete AV block, may occur following VSD enlargement and are influenced by age, weight, and diagnosis. Our experience highlights the need for careful rhythm monitoring postoperatively. No significant ventricular arrhythmias were identified, supporting the relative safety of this procedure in terms of ventricular electrical stability.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1253 - MASTERING NEW STYLE OF SURGICAL TIMING IN TETRALOGY OF FALLOT CAN HIDDEN PATTERNS IN OXYGEN EXTRACTION RATIO REVEAL THE BEST MOMENT A PRELIMINARY STUDY

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Background:
Tetralogy of Fallot (ToF) is the most common cyanotic congenital heart disease, requiring timely surgical repair to optimize outcomes. Despite standardized techniques, postoperative mortality remains variable, highlighting the need for reliable prognostic indicators. The Oxygen Extraction Ratio (O_2ER) may serve as a cost-effective predictor for surgical outcomes. This study evaluates the relationship between preoperative O_2ER and early mortality in ToF patients undergoing total repair surgery with a physiology-based approach.

Methods:
A retrospective cohort with survival analysis study was conducted on 35 ToF patients who underwent total repair surgery between April 2023 and March 2025. Preoperative O_2ER was calculated from arterial and mixed venous oxygen saturation, with an $O_2ER < 11\%$ threshold derived from the mean O_2ER of non-survivors. Variables, including age, body mass index, hematocrit, and rate pressure product, were analyzed as factors correlated with O_2ER. Early mortality, defined as death within 120 hours post-surgery, was assessed using multivariate Cox regression.

Results:
Patients with $O_2ER < 11\%$ had a significantly higher mortality rate (90.91%) than those with $O_2ER \geq 11\%$ (16.67%). The mean O_2ER was significantly lower in non-survivors (11.0%) than in survivors (20.9%) ($t = 4.272$, $p = 0.002$). Hematocrit was inversely correlated with O_2ER ($r = -0.185$), and RPP was positively correlated ($r = 0.019$). In contrast, age, gender, and BMI showed no significant correlation with O_2ER. Chi-square analysis confirmed a strong association between O_2ER and early mortality ($\chi^2 = 17.32$, $p < 0.001$). Multivariate Cox regression showed that $O_2ER < 11\%$ increased early mortality risk (HR = 8.32, $p = 0.043$, 95% CI= 1.07-64.76), with hematocrit and RPP acting as confounders.

Conclusions:
Low preoperative O_2ER significantly increases the risk of early postoperative mortality in ToF patients undergoing surgical repair, when combined with abnormal hematocrit and RPP. Highlights O_2ER, hematocrit, and RPP as key factors in surgical risk assessment.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1261 - OUTCOMES OF COMPLETE REPAIR OF MIXED TYPE TOTAL ANOMALOUS PULMONARY VENOUS RETURN

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Background / Hypothesis:
Retrospective chart review of 14 cases, description of preoperatieve imaging, anatomic findings and confirmation at surgery, surgical technique, and outcomes

Materials and Methods:
Mixed-type total anomalous pulmonary venous return is classified based on the pattern of pulmonary venous drainage. Type I refers to '2+2' drainage of venous pairs, type II refers to '3+1' and type III refers to all other variants. Six patients (43%) had type I "2+2" drainage; 2 patients had 2 supra-cardiac and 2 cardiac connections, and 4 patients had 2 infra-cardiac connections and 2 cardiac. 4 patients (29%) had type II "3+1" drainage. Three patients had 3 cardiac and 1 supra-cardiac variants and one had a rare supra-cardiac pulmonary venous combination. 4 patients (29%) had type III morphology. 2 patients of them had 3+2 anatomy with 3 supra-cardiac and 2 cardiac connections, both of which included 3 right-sided pulmonary veins. The remaining 2 patients had unique anatomy, one with tri-level attachment to cardiac, supra-cardiac, and infra-cardiac and the last with all supracardiac pulmonary venous drainage but in a "3+1+1" pattern

Results:
mixed-type total anomalous pulmonary venous return has a higher mortality rate, with univariate analysis of mixed-type versus cardiac type with statistically significant hazard ratios of 2.88 in previous study and mortality as high as 42-50%. We achieved improved outcomes, with overall survival of 79% and no intraoperative mortality. Both patients who had complex intracardiac lesions (1 with ventricular septal defect and 1 with tetralogy of fallot) ultimately died. Of the remaining patients, 29% developed pulmonary venous obstruction on echocardiography follow-up with 3 requiring interventions with cardiac catheterization

Conclusions:
Mixed-type total anomalous pulmonary venous return has a wide variety of connections, which contributes to the complexity

POSTER PRESENTATIONS

Category: Cardiac Surgery

1276 - SINGLE CENTER EXPERIENCE IN MINIMALLY INVASIVE PEDIATRIC CARDIAC SURGERY – ACCEPTING A NEW GOLD STANDARD OF CARE

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Background / Hypothesis:
A minimally invasive approach in the surgery of congenital heart defects has recently become a good alternative and potential future gold standard for the vast majority of common congenital heart defects. We want to present our results since 2022, when we started to use this approach as a preferred method in the repair of common CHD.

Materials and Methods:
The study included 97 pediatric patients with a median age of 1.5 years (0.2 - 17) and median weight of 9.5 kg (4.4 - 56) who were operated on using vertical right axillary thoracotomy (VRAT) between September 2022 and December 2024.

Results:
Out of the 97 cases there were: ASD – 37, VSD - 38, DORV VSD type - 1, ASD+RPA stenosis - 1, ASD+PDA - 1, CAVSD - 1, PAVSD - 4, PAPVR - 6, Cor triatriatum sinister – 2, Mitral valve repair - 3, Subaortic membrane resection – 2, ToF – TAP repair - 1. All cases had central type of cannulation. There were no in-hospital or 30-day mortality. Complications included: 1 case of p/o bleeding requiring mediastinal exploration (1%), 1 left AV-valve cleft sutures dehiscence requiring reoperation after CAVSD repair (1%). Mean CPB time was 112 min (+- 43), AoX time 57.8 min (+-32.7), mean ICU stay 1.8 days (+-1.27), and mean in-hospital stay 5.7 (SD+-3). All cases were performed by 2 surgeons, with a junior surgeon initially trained to repair common CHD using only VRAT.

Conclusions:
Our single-center report indicates that the vertical right axillary thoracotomy approach in repair of common CHD offers superior cosmetic result, short ICU and in-hospital length of stay and despite its technical complexity and shallower learning curve it may be advised as a new standard for repair of common CHD.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1278 - THE TEMPERATURE DILEMMA A SYSTEMATIC REVIEW AND META ANALYSIS OF NORMOTHERMIA AND HYPOTHERMIA DURING CARDIOPULMONARY BYPASS IN PAEDIATRIC CARDIAC

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Background / Hypothesis:
Cardiopulmonary bypass (CPB) is predominantly performed under mild hypothermia; however, normothermic CPB has gained increasing attention due to its potential to enhance postoperative recovery. Despite numerous studies comparing hypothermic and normothermic CPB in pediatric patients, findings remain inconclusive. This study aims to systematically evaluate and compare the outcomes of hypothermic and normothermic CPB in pediatric cardiac surgery.

Materials and Methods:
A systematic review and meta-analysis was conducted following PRISMA guidelines. A comprehensive literature search was performed across four major databases: PubMed, SageJournal, Cochrane Library, Google Scholar, and ScienceDirect. Studies were selected based on predefined inclusion and exclusion criteria. Only articles published in English between 2015 and 2025 were included. Data extraction and statistical analysis were conducted using Review Manager (RevMan) software to compare normothermic versus hypothermic CPB outcomes in pediatric cardiac patients.

Results:
A total of 7 studies encompassing 603 pediatric patients met the inclusion criteria. Analysis revealed significant advantages for normothermic CPB, including: Reduced CPB duration (mean difference: -17.25 minutes; 95% CI: -30.52 to -3.98; p=0.01); Shorter ICU length of stay (mean difference: -28.71 hours; 95% CI: -56.72 to -0.70; p=0.04); Lower serum lactate levels (mean difference: -1.14; 95% CI: -1.69 to -0.59; p<0.01), indicating enhanced metabolic status. However, no significant differences were observed between the two groups in terms of intubation duration, overall hospitalization length, or aortic cross-clamp time.

Conclusions:
Normothermic CPB demonstrates superior outcomes in pediatric cardiac surgery, characterized by shorter CPB duration, reduced ICU stays, and improved metabolic parameters. These findings suggest normothermic CPB represents a safe and viable alternative to conventional hypothermic approaches.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1279 - COMPARATIVE EFFECTIVENESS OF THE OZAKI TECHNIQUE AND ROSS PROCEDURE FOR AORTIC VALVE REPLACEMENT IN PEDIATRIC PATIENTS A SYSTEMATIC REVIEW AND META ANALYSIS

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Background / Hypothesis:
Pediatric aortic valve disease presents significant challenges, requiring surgical interventions that not only address valve dysfunction but also accommodate the child's ongoing growth. Aortic valve replacement (AVR) is often needed for severe valve dysfunction, with conventional treatments including mechanical valves, bioprosthetic valves, and homografts. The Ross procedure, which replaces the aortic valve with the patient's pulmonary valve (autograft), offers growth potential as the child matures. However, the Ross procedure carries risks such as autograft failure and the potential need for reoperation. The Ozaki technique, which reconstructs the aortic valve using pericardium, has shown promising results in adult patients, with improved long-term valve durability and reduced need for lifelong anticoagulation therapy. Additionally, the pericardial valve expands as the child grows, making it a potential alternative to the Ross procedure in pediatric cases. Understanding the comparative effectiveness of these techniques is crucial for guiding clinicians in selecting the most appropriate treatment for pediatric aortic valve disease.

Materials and Methods:
A systematic review and meta-analysis were conducted using databases, focusing on studies published from 2020 to 2025. This review aimed to compare the clinical effectiveness of the Ozaki technique and the Ross procedure in pediatric aortic valve replacement, using Review Manager version 5.4 for analysis.

Results:
Of the 437 articles initially identified, 5 studies met the inclusion criteria, involving 292 patients who underwent the Ozaki technique and 156 who underwent the Ross procedure. The meta-analysis showed a significant reduction in hospital stay for the Ozaki technique (mean difference -1.81 days, 95% CI: -3.51 to -0.12, $p = 0.04$). No significant differences were observed between the two techniques regarding mortality, age, weight at operation, or annulus size ($p > 0.05$).

Conclusions:
The Ozaki technique demonstrates promising potential as an alternative to the Ross procedure for pediatric aortic valve replacement, offering a shorter hospital stay and potentially quicker recovery.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1280 - INVESTIGATING OUTCOMES OF SURGICAL VENTRICULAR SEPTAL DEFECT CLOSURE WITH VERSUS WITHOUT OTHER MAJOR CONGENITAL HEART ANOMALIES

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Background / Hypothesis:
Surgical ventricular septal defect closure is the most commonly performed pediatric cardiac procedure worldwide. The aim of this study is to investigating outcomes of surgical ventricular septal defect in VSD patients with or without other major congenital heart anomalies.

Materials and Methods:
This is a retrospective study with two group analysis conducted in Mohammad Hoesin Hospital. Perioperative data of 54 cases of surgical VSD closure were collected from the electronic medical record, which divided into two groups: group I was VSD patients and group II was VSD patients with other major congenital heart anomalies (Tetralogy of Fallot or Double Outlet Right Ventricle or Pulmonary Hypertension). Outcomes included residual shunt and mortality rate.

Results:
Group I had 25 patients and group II had 29 patients. In group I, the types of VSD were peri membranous in 17 (68.0%) patients and sub arterial doubly committed in 8 (32%) patients, the median ventilator time was 4 (1-72) hours, the mean ICU stay was 3.72 ± 1.815 days. Residual shunt was diagnosed in 6 (24.0%) patients. In group II, the types of VSD were peri membranous in 25 (86.2%) patients and sub arterial doubly committed in 4 (13.8%) patients, the median ventilator time was 16 (1-144) hours, the median ICU stay was 3(1-24) days. Residual shunt was diagnosed in 14 (48.3%) patients. Analysis of two group regarding residual shunt and mortality rate in VSD patient compared to VSD with other major congenital heart anomalies revealed that residual shunt can increased mortality rate five times (OR 5.000 [95% CI (0.64-39.05)]) in VSD patients with other major congenital heart anomalies.

Conclusions:
Residual shunt in VSD patients with major congenital heart anomalies had five times greater to increased mortality rate compared to VSD patients without major congenital heart anomalies.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1281 - UTILITIES OF INTRACARDIAC CONDUIT FONTAN OPERATION FOR COMPLEX SYSTEMIC VENOUS ANOMALIES IN SINGLE VENTRICLE

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Background:
Systemic venous anomalies pose challenges to cavopulmonary connection in univentricular patients. At our unit, the intracardiac conduit Fontan has been introduced for cases involving apicocaval juxtaposition (i.e., inferior vena cava on the same side of the apex). This addresses issues of a long-curved extracardiac conduit to the contralateral pulmonary artery and potential compression of the extracardiac conduit to the ipsilateral pulmonary artery.

Methods:
We present 4 patients at various stages of palliation who underwent an intracardiac conduit Fontan operation. This includes primary superior cavopulmonary connections with the surgical setup for physiologic Fontan completion in the lab.

Results:
Intracardiac conduit placement was done in 4 levocardic univentricular patients. The first one with inferior caval interruption who previously underwent Kawashima operation on the left, subsequently developed pulmonary arteriovenous malformation with desaturation. The ipsilateral atrial-drainage hepatic veins were connected to the right pulmonary artery using an intracardiac fenestrated conduit. The second and third patients with left apicocaval juxtaposition and pre-existing bilateral bidirectional cavopulmonary connections underwent inferior caval vein to the right pulmonary artery connection using an intracardiac fenestrated conduit. The fourth patient with bilateral superior vena cava, left apicocaval juxtaposition, and ipsilateral hepatic vein drainage, presented at the age of 10 years without previous surgery. He underwent bilateral bidirectional cavopulmonary connections, right hepatic veins to conduit baffling, and inferior caval vein to the main pulmonary artery connection using an intracardiac conduit with double fenestrations (4 mm and 7 mm) to allow a gradual change in the ventricular preload (discharge oxygen saturation of 80%) and set up for interventional closure of the larger fenestration later for physiologic completion of the fenestrated Fontan. All the patients had an uncomplicated recovery, unobstructed fenestrated conduits, were anticoagulated, and followed without thromboembolic or bleeding events.

Conclusions:
Intracardiac conduit Fontan operation provides a safe and effective cavopulmonary connection in selected patients with systemic venous anomalies.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1282 - EFFICACY OF PROPHYLACTIC MILRINONE IN PREVENTING LOW CARDIAC OUTPUT SYNDROME AFTER PEDIATRIC CARDIAC SURGERY

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Background / Hypothesis:
Milrinone is widely used to prevent low cardiac output syndrome (LCOS) after pediatric cardiac surgery. This study compares the efficacy between preoperative and postoperative use of milrinone to prevent LCOS in children undergoing cardiac surgery for congenital heart disease (CHD).

Materials and Methods:
Fifty-six consecutive patients undergoing cardiac surgery for CHD were included. Group A included 21 patients received milrinone as continuous IV infusion at 0.375 – 0.7mcg/kg/min for 24 hours before surgery until a minimum of 36 hours postoperatively. Group B included 35 patients received milrinone 1 hour postoperatively in the same manner. Both groups were observed for LCOS incidence.

Results:
Overall LCOS prevalence was 35.7%. Group A showed significantly reduce LCOS incidence ($p = .040$), with 19% LCOS occurrence, compared to 81% in Group B. While there were no significant difference in LCOS primary predictors, such as cardiac index, arteriovenous oxygen saturation difference, and lactate serum level between two groups ($t = -1.861$, $p = .068$; $t = 1.253$, $p = .216$; $t = 1.236$, $p = .222$), preoperative milrinone was associated with improve postoperative outcomes. Group A had shorter durations of ventilation, ICU care, and hospital stays. Logistic regression revealed that milrinone and cardiac index were associated with lower odds of LCOS, but were not statistically significant ($p = .794$, OR = .601; $p = .082$, OR = .011). Increase serum lactate >3mmol/ L and arteriovenous oxygen saturation difference >20% were associated with higher likelihood of LCOS, with lactate being the statistically significant predictor ($p = .049$, OR: 17.82; $p = .097$, OR: 1.88).

Conclusions:
Although preoperative milrinone administration is not more superior in preventing LCOS than postoperative milrinone administration, it appears to be beneficial in reducing the incidence of LCOS and improving postoperative recovery. Further studies are needed to confirm its definitive role in reducing LCOS risk.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1287 - GIANT CORONARY ARTERY FISTULA IN A PEDIATRIC PATIENT

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Background / Hypothesis:
Coronary fistula is a rare congenital anomaly, defined as an abnormal connection between the coronary arteries and the cardiac chambers. In many cases, it represents an incidental finding. It constitutes approximately 14% of coronary artery anomalies and representes approximately an incidence of 0.002% in the general popularion with a prevalence of 0.08% to 0.4% of all congenital heart disease.

Materials and Methods: We present the case of a school aged patient diagnosed with a giant coronary fistula.

Results:
A 6 year old female was referred for a heart murmur. A CT angiogram was requested, reporting a large coronary fistula in the distal segment of the left anterior descendning artery wich empties into the apical region of the right ventricle, associated with significant aneurysmal dilatation of the left main coronary artery along the entire course of the left anterior descending artery, mainly in its distal course. Ectastic dilatation of the proximal and middle segments of the right coronary artery, as well as the aortic root and ascending aorta. It was decided to close the fistula from the left anterior descending artery to the right ventricule with a double velour parch, pump time 318 minutes, aortic cross clamping 283 minutes. Currently, the patient is progressing well with improved functional class.

Conclusions:
Coronary fistulas are rare but potentially ominous anomalies that are usually asymptomatic but pathologically significant and can have lethal cardiac complications.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1292 - SURGICAL OUTCOMES OF CONGENITAL TRACHEAL STENOSIS AND CYANOTIC HEART DISEASES

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Background / Hypothesis:
Despite significant advancement in surgeries for congenital tracheal stenosis associated with congenital heart disease, the combination with cyanotic congenital heart disease carries an extremely high mortality rate, with only a few reported survivors. This study aims to review our team's current approach to managing this lethal combination.

Materials and Methods:
Between 2010 and 2024, 18 patients with congenital tracheal stenosis and cyanotic heart disease underwent tracheoplasty. Three patients had functional single ventricle, and six had pulmonary atresia. Twelve patients underwent simultaneous tracheoplasty and cardiac surgery, including 2 who had bidirectional Glenn procedure, 4 who underwent an adjustable classical shunt (3 with a Melbourne shunt and 1 with a Waterstone shunt), and 3 who underwent total anomalous pulmonary venous connection repair. Since 2021, a convertible cardiopulmonary bypass to veno-atrial extracorporeal membrane oxygenation circuit has been used for the most severe cases. With this system, cardiac procedures were performed on cardiopulmonary bypass, while tracheoplasty was performed on extracorporeal membrane oxygenation, with a target activated clotting times of 200-250s. Staged surgery was performed on six patients.

Results:
There were 2 in-hospital deaths; one patient with tricuspid atresia and a Melbourne shunt who developed postoperative Alagille syndrome, and another with Tetralogy of Fallot and major aortopulmonary collateral arteries, who died from pulmonary hemorrhage. Three patients experienced late deaths due to pulmonary hemorrhage, sepsis, and sudden death. Among 13 long-term survivors, only 1 patient with congenital subglottic stenosis required tracheostomy. Cyanosis was completely resolved in 11 patients.

Conclusions:
Our surgical results for congenital tracheal stenosis and cyanotic congenital heart diseases were satisfactory. The appropriate use of classical systemic pulmonary shunts, coupled with advancement in the cardiopulmonary bypass system, has made it possible to save patients with this previously difficult-to-treat combination of conditions.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1298 - INCIDENCE AND PREDICTORS OF RECOARCTATION AFTER AORTIC ARCH SURGICAL REPAIR IN PEDIATRICS

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Background:
Recurrent coarctation (reCoA) after surgical repair remains a significant complication in pediatric patients, with reported rates ranging from 2.4% to 44%. Conflicting evidence exists regarding risk factors, including surgical techniques, patient weight, and aortic dimensions. This study aimed to determine the incidence and predictors of reCoA in pediatric patients from Oman.

Methods:
A retrospective single-center study of 113 patients undergoing CoA repair (2016–2022) with ≥6 months follow-up. Demographic, surgical, and echocardiographic variables were analyzed. ReCoA was defined as reintervention guided by clinical/echocardiographic criteria. Multivariate logistic regression identified predictors.

Results:
The incidence of reCoA was 23% (26/113). Significant predictors included:
• Lower weight at surgery (OR 0.085, p=0.047),
• Bovine patch augmentation (OR 5.35, p=0.048),
• Smaller transverse aortic arch (p=0.019) and isthmus dimensions (p=0.018).
Patients with reCoA were younger (12 vs. 25 days, p=0.002) and more likely dysmorphic (27% vs. 9%, p=0.042). End-to-end anastomosis was associated with lower reCoA rates (54% vs. 70%, p=0.006).

Conclusion:
reCoA incidence aligns with global data, with lower weight, patch augmentation, and smaller aortic dimensions as key risk factors. End-to-end anastomosis may reduce recurrence. These findings underscore the need for tailored surgical planning and vigilant postoperative monitoring in high-risk infants.
Keywords: Coarctation of the aorta, recurrent coarctation, pediatric cardiac surgery, risk factors, aortic arch repair.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1300 - LARGE RIGHT ATRIAL MYXOMA WITH ASSOCIATED MODERATELY EXTENSIVE PULMONARY THROMBOEMBOLISM AND MULTIPLE PERIPHERAL PULMONARY ARTERY ANEURYSMS A CASE REPORT

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A 22-year-old female presenting with sporadic history of syncope and worsening shortness of breath with previous history of treated pulmonary tuberculosis (PTB) was diagnosed with a right-sided cardiac myxoma. Further investigation showed associated moderately extensive pulmonary thromboembolism, multiple tiny pulmonary aneurysms in the tributaries of the segmental arteries of both lungs, and tree-in-bud pattern in both upper lobes.

This report discusses the probable association between right-sided cardiac myxoma and multiple peripheral pulmonary artery aneurysms, and the diagnostic dilemma of the radiographic similarities of pulmonary emboli and infectious causes such as PTB.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1302 - LARGE RIGHT ATRIAL MYXOMA WITH ASSOCIATED MODERATELY EXTENSIVE PULMONARY THROMBOEMBOLISM AND MULTIPLE PERIPHERAL ARTERY ANEURYSMS A CASE REPORT

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Introduction:
Right sided atrial myxomas are rare, and pulmonary artery aneurysms with associated pulmonary thromboembolism caused by a right-sided cardiac myxoma have rarely been described. The aneurysm formation has previously been attributed to cardiac myxoma cells1.

We present a case of a large right atrial myxoma with associated moderately extensive pulmonary thromboembolism and multiple peripheral pulmonary artery aneurysms in a patient experiencing sporadic episodes of syncope and worsening shortness of breath on a background of treatment history for pulmonary tuberculosis.

Discussion:
Patients with left-sided cardiac myxomas may develop embolism to the systemic circulation with subsequent evolution of cerebral aneurysms formed in its association. About 35% of left-sided myxomas can embolize to the brain, kidneys, and lower extremities3. In cases of right-sided cardiac myxomas, 10% can embolize to the pulmonary circulation. The pathogenesis of aneurysms caused by left-sided cardiac myxomas still remains unclear. It is theorized that direct embolization of fragile and myxomatous materials to the lumen of the vessel, with invasion of tumor cells into the endothelium and disruption of the internal elastic lamina, may result in dilation of the disrupted vascular wall and aneurysmal formation.

Conclusion:
The importance of and possible association between right-sided cardiac myxoma and pulmonary aneurysms should be further explored and must not be underestimated. In the workup of patients with right-sided cardiac myxoma, it is important to rule out the possible presence of pulmonary emboli that may herald the development of aneurysms. Investigating for the possibility of concurrent infectious processes should also not be overlooked, as the radiographic findings of myxomatous embolism may mimic their appearance.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1306 - INTERRUPTED AORTIC ARCH REPAIR IN THE DEVELOPING WORLD CURRENT OUTCOMES AND RISK FACTORS

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Background:
The disadvantage in developing countries is that fetal diagnosis is not widespread, so there are many cases of delayed referral, shock, worsening heart failure, and transportation with infection, which are reflected in the differences in outcomes compared to Western countries. Published data on surgical treatment of interrupted aortic arch (IAA) in the developing world are limited. Therefore, this study sought to identify patient characteristics, the midterm outcomes, and the risk factors for mortality and morbidity among patients undergoing surgery for IAA in a high-volume center in Vietnam.

Methods:
From May 2012 to November 2022, patients diagnosed with IAA who underwent biventricular repair were reviewed retrospectively and divided into the truncus group (n=15) and non-truncus group (n=92). Multivariable Cox regression determined patient factors associated with mortality and reintervention.

Results:
Median age and median weight were 24 days (IQR, 14-42 days) and 3.3 kg (IQR, 3-3.7 kg), respectively. Overall survival in truncus groups was 45% (95% CI, 19.38%-68.7%), significantly lower compared with 84.1% (95% CI, 74.53%-90.24%) in the non-truncus group (P=0.0035). Freedom from aortic arch reintervention at 10 years was 95.8% (95% CI, 87.32%-98.64%). Competing risk analysis shows that 5 years after initial operation, 19.6% had died without left ventricular outflow tract obstruction surgery, 12.1% underwent left ventricular outflow tract surgery, and 67.3% were alive without left ventricular outflow tract surgery. Risk factors for overall mortality were prolonged postoperative mechanical ventilation (P=0.001), diagnosed IAA-truncus (P=0.005), and preoperative sepsis (P=0.01). Risk factors for left ventricular outflow tract reoperation were diameter of the left ventricular outflow tract < 4.4mm (P=0.005), bicuspid aortic valve (P=0.025), and IAA type B (P=0.036).

Conclusions:
Although the results of aortic arch reconstruction in IAA patients were excellent, the complexity of biventricular repair for IAA-truncus group posed a heavy burden for overall survival in IAA patients in the developing world.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1308 - SHORT TERM OUTCOME OF NEW HEARTMATE 3 IN PEDIATRIC LEFT VENTRICULAR ASSIST DEVICE

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Background:
Heart failure in pediatric patients is a complex and challenging condition. While heart transplantation is the gold standard for treating end-stage heart failure, limited donor availability necessitates alternative therapies, such as ventricular assist devices (VADs). The HeartMate 3 (HM3) VAD use in adults is well-established, but there is less data regarding outcomes in children. This study aims to evaluate the short-term outcomes of the first pediatric HM3 VAD program in Saudi Arabia.

Methods:
We conducted a retrospective cohort study involving 15 consecutive pediatric patients treated with HM3 at a single tertiary cardiac center from 2022-2024. Postoperative outcomes included stroke, device thrombosis, driveline infection, hospital mortality, follow-up survival and time to transplantation.

Results:
The cohort had a mean age of 11.07 years, with a predominance of females (67%). Average body surface area (BSA) was 1.2 m2 (range 0.85-1.76 m2). The most frequent diagnosis was dilated cardiomyopathy (n=13, 87%). The median lengths of ICU and hospital stays were 42 days and 56 days, respectively. The complications included strokes (n=2, 13%), re-exploration for bleeding (n=1, 7%), driveline infection (n= 1, 7%) and device thrombosis (n=1, 7%). In-hospital mortality occurred in 2 patients. The median follow-up period was 17 months, and 60% (n=9) of patients underwent successful transplantation. No mortality was reported beyond hospital discharge, and the overall one-year survival was 87%. The one-year transplantation-free survival rate was 55%.

Conclusions:
HM3 LVADs have favorable safety profiles and survival outcomes in pediatric patients with end-stage heart failure. These findings support HM3's as a viable option for managing advanced heart failure in this population, with further studies warranted to assess long-term outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1312 - GROWTH POTENTIAL OF THE PULMONARY VALVE ANNULUS FOLLOWING VALVE SPARING REPAIR IN TETRALOGY OF FALLOT

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Background:
Tetralogy of Fallot (TOF) repair has shifted toward a valve-sparing approach to minimize long-term complications. While this technique may leave residual right ventricular outflow tract obstruction, it preserves pulmonary valve function. This study evaluates pulmonary valve annulus growth and short-term right ventricular function following standardized valve-sparing repair.

Methods:
This single-center study included TOF patients who underwent valve-sparing repair by a single surgeon (2020–2023). The approach was standardized, irrespective of annulus size or morphology, provided post-repair pulmonary valve gradient was <40 mmHg and right ventricular pressure was < of systemic pressure. One-year follow-up data included survival, reinterventions, and echocardiographic parameters, compared to a historical transannular patch cohort (2016–2023).

Results:
The valve-sparing (n=34) and transannular patch (n=39) groups had similar preoperative annulus sizes (7.04 ± 1.77 mm vs. 6.54 ± 1.58 mm, $p>0.05$) and z-scores (-2.56 ± 1.02 vs. -2.27 ± 1.36, $p>0.05$). Significant annulus growth (10.17 ± 2.28 mm, $p<0.05$) and z-score improvement (-1.3 ± 1.58, $p<0.05$) occurred in the valve-sparing group. Post-operative right ventricular fractional area change at one year follow up was higher in the valve sparing compared to the transannular group(40% vs. 34%, $p<0.05$). No mortality occurred in either group; one valve-sparing patient required reintervention. Ten patients in the valve-sparing group showed no annulus z-score improvement, despite higher preoperative z-scores compared to the rest of the patients in the group (-1.77 ± 0.8 vs. -2.9 ± 1.21, $p<0.05$). Multivariate analysis found no significant predictors of annulus growth

Conclusion:
Valve-sparing TOF repair promotes pulmonary annulus growth and preserves right ventricular function. However, initial annulus size did not predict growth, suggesting other influencing factors. Further studies are needed to identify predictors of pulmonary valve annulus growth potential which may help refine patient selection and optimize long-term outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1315 - PROSPECTIVE OBSERVATIONAL STUDY COMPARING THE OUTCOMES OF FENESTRATED AND NON FENESTRATED EXTRACARDIAC FONTAN PROCEDURE FOR SINGLE VENTRICLE PALLIATION

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Background:
Fenestration in the Fontan procedure was introduced to improve early postoperative outcomes by reducing systemic venous pressure and increasing preload to the systemic ventricle. This approach is thought to decrease pleural drainage, shorten hospital stay, and reduce complications. However, fenestration may cause systemic arterial desaturation and increase the risk of paradoxical thromboembolism. There is no consensus regarding the benefits of routine fenestration. This study aims to further evaluate these outcomes.

Materials and Methods:
Between August 2024 and December 2025, 34 patients underwent Fontan completion at our institution. Twenty-four patients met inclusion criteria and were prospectively divided into two equal groups: non-fenestrated (Group 1) and fenestrated (Group 2). Patients undergoing primary Fontan, with high pulmonary vascular resistance (>2.5 Wood units), elevated transpulmonary gradient, or significant branch pulmonary artery distortion were excluded. Data on demographics, inotrope and ventilation duration, chest drain duration and volume, ICU stay, and total hospital stay were collected and analysed. Continuous variables were compared using independent t-test or Mann-Whitney U test, with $p < 0.05$ considered significant.

Results:
There were no statistically significant differences in baseline demographics or intraoperative parameters. Postoperative metrics such as ventilation duration, inotrope requirement, total drainage, drain duration, and cardiopulmonary bypass time were similar across groups. Oxygen saturation at discharge did not differ significantly. The fenestrated group had a shorter median hospital stay of 6.5 days [IQR 10.5], compared to 8 days [IQR 7.5] in the non-fenestrated group. However, this difference was statistically not significant (p=0.214).

Conclusion:
Fenestration did not confer a significant advantage in most perioperative outcomes. Although the fenestrated group demonstrated a shorter median hospital stay, the difference was not statistically significant. Larger, long-term studies are needed to confirm these findings.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1319 - POSTOPERATIVE OUTCOMES OF UNROOFING TECHNIQUE FOR ANOMALOUS AORTIC ORIGIN OF A CORONARY ARTERY WITH INTRAMURAL COURSE SINGLE CENTER PERSPECTIVE

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Background:
Anomalous aortic origin of coronary artery (AAOCA) with an intramural course is a rare congenital anomaly associated with sudden death in children. The unroofing technique is a standard surgical procedure, however, comprehensive reports on outcomes and complications are lacking in Japan.

Objective:
To evaluate the surgical outcomes of the unroofing technique for AAOCA.

Methods
We retrospectively analyzed 16 patients who underwent surgical correction using the unroofing technique for AAOCA at our institution between March 2008 and August 2024.

Results
The median age at surgery was 13years (range: 3–49). and 88% were male. The distribution of coronary anomalies was as follows: anomalous aortic origin of right coronary artery from left coronary sinus (AAORCA) in 10 cases (63%), anomalous aortic origin of left coronary artery from right coronary sinus (AAOLCA) in 5 cases (31%), and anomalous aortic origin of left coronary artery from noncoronary sinus in 1 case (6%). Preoperative symptoms, including syncope and chest pain, were noted in 63% of cases (5 each in AAOLCA and AAORCA cases). Three patients underwent concomitant cardiac surgeries.

The median follow-up period was 6 months (range: 1 month–16 years). Postoperative evaluations included transthoracic echocardiography(all cases), contrast-enhanced computed tomography (12 cases), and cardiac catheterization(4 cases). No deaths or coronary reintervention occurred. New or worsened aortic regurgitation (AR) was observed in 37.5%, but all were mild or less. Mild AR developed postoperatively in cases with bicuspid aortic valves or where surgical manipulation extended to the commissure. Mild regional wall motion abnormalities were observed in 2 cases, but no patients had cardiac dysfunction or symptom recurrence.

Conclusion
The unroofing technique for AAOCA with an intramural course yielded excellent outcomes, with no mortality or coronary reintervention. However, given the potential for postoperative AR, particularly when surgical manipulation involves the commissure, long-term follow-up is essential.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1322 - EFFECT OF INTRAOPERATIVE OXYGEN CONSUMPTION ON ACUTE KIDNEY INJURY AFTER PAEDIATRIC CARDIAC BYPASS SURGERY A CAUSAL MACHINE LEARNING ANALYSIS

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Background / Hypothesis:
Goal-directed perfusion in paediatrics requires refinement. We aimed to identify the relationship between granular intraoperative perfusion data and the occurrence of postoperative acute kidney injury (AKI).

Materials and Methods:
Single-centre retrospective study of 762 consecutive patients. The explanatory variables were preoperative laboratory and demographic data, and minute-by-minute intraoperative perfusion data. AKI was reported on the ordinal KDIGO scale. Large language models were used to extract data from textual fields. Causal analysis of the impact of oxygen delivery on AKI used serum creatinine ratio (postop to preop) and duration with urine output below 0.5 ml/kg/hr (within 48hrs post-surgery). Oxygen delivery impact was quantified by comparing the difference between Oxygen Extraction Ratio (OER) and a target value of 22% (global median of the combined data from all patients). Total positive differences and negative differences between OER and the target value (OER plus and minus respectively) were computed. Causal inference of their impact on the above two components of AKI was performed using causal random forests. This methodology continues our novel physiological framework for the role of OER in paediatric goal-directed perfusion (in press: https://doi.org/10.1101/2024.11.12.24317213).

Results:
OER-plus is found to be a significant risk factor for serum creatinine ratio, i.e., larger and longer-lasting positive deviations of OER from 22% increase the risk of high serum creatinine ratios. Similarly, we find OER-minus is a significant risk factor for patients' postoperative urine output. If both OER-plus and OER-minus were fully eliminated from our dataset, the number of patients with severe AKI (2 or 3) would reduce from 206 to 140.

Conclusions:
The shift in focus from oxygen delivery to consumption combined with advanced ML algorithms may help refine goal-directed perfusion and reduce end-organ injury further.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1339 - WRITTEN PREOPERATIVE NOTES AND BRIEFING CONVERTED INTO AN OPERATIVE REPORT IMPROVES TEAM LEARNING AND TEAM COHESION

Laszlo Kiraly [1], Senthil Subbian [1], Maung Aye [1], Swapna Thampi [2], Ching Kit Chen [3]
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Background / Hypothesis:
Success of complex and wide-ranging congenital cardiac procedures depends on communication and cooperation of the multidisciplinary team (MDT). Preparation for surgery requires building of shared mental images and proactive team attitudes. We introduced detailed preoperative operation notes and briefing (PONB). We investigated the value of this practice as a tool for team-learning, improving team cohesion.

Materials and Methods:
Stepwise and patient-specific procedure descriptions were created and circulated across MDT, preoperatively. Documents delineated demographic/diagnostic details, indication, anaesthetic/surgical steps, included diagrams, alternative pathways and possible deviation points/complications, consumables/implants, postoperative expectations and continuity-of-care plan. MDT conducted briefing just before the patient's entering the operating room. Preoperative notes were edited into the operative report. Efficacy of the PONB was evaluated by anonymous multiple-choice and Likert-scale questionnaires.

Results:
PONB have been practiced for each elective and most emergency cases in our program for 4 years. Operating surgeons spent 1-1.5hours with creating the notes. Differences between preoperative expectations and actual course were recorded in the operation report in the operating room (OR). Operation reports' accuracy, granularity improved significantly (median:3.6 to 4.8; scale:1-5;$p<0.01$). Team responses to Likert-scale questions revealed high satisfaction rates(4.9), preparedness for unforeseen scenarios(4.7), improved knowledge(4.7). MDT-briefing with the written notes allowed clarifications(5), and actualization of team roles(4.9). Surgeons reported 'mental visualization', OR nurses, critical care team 'preparedness', anaesthesia 'control over the course', pediatric cardiology 'communication' as the most important aspect of PONB.

Conclusions:
PONB is an addition to compulsory preoperative briefing and it contributes to building a shared mental image of the procedure, contributes to streamlined MDT performance. Surgeons visualize and mentalize the operative scenarios in preparing written notes. Extra work is partially recovered by converting the notes into the operative report.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1341 - OUTCOME OF PATIENTS WITH TRUNCUS ARTERIOSUS UNDERGOING SURGICAL REPAIR AT A NATIONAL REFERRAL CENTER IN MÉXICO

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Background / Hypothesis:
Truncus arteriosus (TA) is a rare congenital heart disease characterized by a single ventriculo-arterial connection. The aim was to evaluate the clinical and surgical outcomes of patients diagnosed with TA underwent surgical repair.

Materials and Methods:
This retrospective study included pediatric patients with TA who underwent cardiac surgery from January 1, 2003 through December 31, 2023. Demographic and perioperative characteristics were described. Kaplan-Meier survival analysis was performed.

Results:
A total of 87 patients were included. At the time of surgery the median age was 10.6 months (IQR: 5.8-14.7) and weight was 5.9 kg (IQR: 4.4-7.5). A comparison was made between patients who survived and those who died, but no statistically significant differences were found. The overall survival was 86.2%, with higher mortality in the early postoperative period (< 30 days) and in younger patients (10.9 months [IQR: 6-16.3] in survivors versus 7.3 months [IQR: 5.2-11.7] in those who died). A significant association was identified between truncal valve repair and mortality (OR: 5.27; 95% CI: 1.35 - 21.8 ; p = 0.01).

Conclusions:
Survival in patients with TA has shown a significant improvement. Nevertheless, it is imperative to emphasise the management of the truncal valve, especially in younger patients and in the early postoperative period, given its impact on mortality.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1344 - OUTCOMES OF REPAIR FOR AORTOPULMONARY WINDOW 15 YEARS OF EXPERIENCE FROM A TERTIARY CARE CENTRE IN AN EMERGING ECONOMY

Avvayyam Rattan [1], Simran Kundan [2], Hari Bipin Radhakrishnan [1], Smruti Ranjan Mohanty [1], Suresh G. Rao [1]
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Background:
Aortopulmonary window (APW) is a rare congenital anomaly requiring early surgical intervention. This study evaluates surgical outcomes at a high-volume centre, emphasizing the impact of comorbidities on recovery and survival.

Methods:
Our congenital heart surgery registry was queried for all APW repairs. Descriptive statistics were applied, with Mann-Whitney U and Fisher's exact tests for comparisons. Survival analysis used Kaplan-Meier and Cox proportional hazards models. Patients with additional cardiac anomalies were categorized as Group I, others as Group II.

Results:
Sixty-four children underwent APW repair at a median age of 3 months (1–6 months); 37 (58%) were boys, with a median weight of 3.5 kg (2.7–4.8 kg). Defects were classified (Mori) as Type I in 33 (52%), Type II in 24 (38%), and Type III in the rest. All underwent patch closure with cardiopulmonary bypass. Group I lesions included VSD (22%), aortic arch interruption (16%), pulmonary artery hypoplasia (9%), AV valve insufficiency (11%), cono-truncal anomalies (8%), and anomalous pulmonary venous drainage (2%).
Median cardiopulmonary bypass and ischemia times were 144 (97–171) and 70 (45–110) minutes. Group I had longer ventilation (3 vs. 1 day, p=0.01) and ICU stay (6 vs. 4.5 days, p=0.02). Operative mortality was 1.5% (p=0.74). Low birth weight was associated with mortality (p=0.03). Median follow-up was 2 years (4 months–6 years); 17% were lost. Three reinterventions occurred in Group I, linked to low birth weight, age <1 month, and aortic arch anomalies (p<0.02).

Conclusion:
APW repair yields excellent outcomes with low mortality. Additional cardiac anomalies increase morbidity, emphasizing the need for optimized perioperative management. In addition, this study reinforces the feasibility of successful surgical repair of simple and complex AP window in an emerging economy with significant resource limitations.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1345 - OUTCOMES OF CEREBRAL AND END ORGAN PROTECTION FOLLOWING THE AORTIC ARCH SURGERY IN NEWBORNS.

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Background / Hypothesis:
To assess the efficacy and safety of perfusion strategies in newborns undergoing aortic arch surgery.

Materials and Methods:
A total of 160 patients were included and categorized into two groups based on the perfusion technique used: whole-body perfusion (WBP) (n=43; 26.9%) and selective antegrade cerebral perfusion (SACP) (n=117; 73.1%). After propensity score matching (PSM), two balanced groups were formed: WBP (n=40) and SACP (n=40).
Results: The primary endpoint was acute kidney injury (AKI), assessed by the pediatric KDIGO scale. AKI was observed in 22.5% of patients in the WBP group and 47.5% in the SACP group (p=0.034). Identified risk factors for AKI included the use of SACP (OR 6.2, 95% CI [1.6; 19.5]) and the inotropic index on postoperative day 1 (OR 1.08, 95% CI [1.01; 1.17]). Neurological complications were reported in 10% of WBP patients and 12.5% of SACP patients (p>0.99). The only significant risk factor for neurological complications was low birth weight (OR 4.6, 95% CI [2.7; 16], p=0.041). Postoperative mortality was comparable between groups (2.5% in WBP vs. 5% in SACP, p>0.99).

Conclusions:
Whole-body perfusion during aortic arch surgery in newborns is an effective and safe organ protection technique that may reduce the incidence of acute kidney injury. High VIS is presented as a specific risk factor that significantly increases the risk of acute kidney injury in postoperative period.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1348 - SYSTEMATIC HYBRID APPROACH FOR A BICAMERAL REPAIR OF A CONGENITAL CORONARY ARTERY FISTULA

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Introduction:
Congenital coronary artery fistulas (CCAF) are a rare abnormality, and in cases of isolated fistulas majority are Asymptomatic. Although indications for interventions are debatable, Significant fistulas should be addressed either by surgical or trans-catheter techniques, to prevent known complications.

Case:
We present a case of a 6 year old child who was initially planned for a trans-catheter intervention, but due to unforeseen complications that arose during catheterization was treated surgically using a Bicameral approach. The child was successfully managed using a Systematic Hybrid approach facilitating in the identification of the fistulous opening, thereby reducing Cardiopulmonary bypass time and expediting postoperative recovery. Postoperative recovery was uneventful and child was discharged on 9 th Post operative day. Follow up done after 1 month revealed no abnormality on echocardiography and good recovery.

Conclusion:
A systematic hybrid approach can be a safe and effective treatment option for congenital coronary artery fistulas. By combining the advantages of surgical and interventional techniques, this approach may improve outcomes and reduce the risk of complications. Further studies with larger patient populations and longer follow-up periods are needed to confirm these findings and refine the optimal hybrid strategy for CCAF repair.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1349 - MIGRATION OF A PACEMAKER INTO THE SIGMOID COLON IN A THREE YEAR OLD CHILD A CASE REPORT.

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Meshalkin National Medical Research Center, Arrhythmia, Novosibirsk-Russia [2]

Background / Hypothesis:
Implantation of an epicardial pacemaker in young children is carried out in a pocket above the rectus muscle. In extremely rare cases, pediatric patients may experience migration of the pacemaker into the abdominal cavity. Symptoms can range from mild abdominal discomfort, diarrhea, vomiting to potentially dangerous intestinal obstruction due to perforation of the large intestine.

Materials and Methods:
We present a case of a 3-year-old child with migration of the pacemaker into the sigmoid colon with the formation of a colonic fistula.
Results:A 3.2-kg, 2-day-old boy underwent an epicardial implantation of a dual-chamber pacemaker due to congenital complete AV block. Three years later, the child was brought to a specialized hospital with fever, symptoms of intestinal obstruction, and a discovered intestinal fistula. Abdominal X-ray showed device migration into the large intestine. Colonoscopy revealed that the site of perforation was the sigmoid colon. The device caused an obstruction of the lumen of the large intestine. Emergency surgery was performed. Prior to the abdominal phase, a single-chamber pacemaker was implanted epicardially to the left ventricle through left-sided thoracotomy. Intraoperatively, the sigmoid colon was dissected from adhesions. The fistula tract was limited by a omentum. The entry point of the pacemaker was on the anterior surface of the proximal part of the sigmoid colon. The pacemaker was retrogradely moved to the entry point and removed from the large intestine. The laparotomy incision was sutured. The child received antibiotic therapy for 7 days. On the 10th day, the child was discharged from the clinic in satisfactory condition.
In conclusion, it should be noted that pacemaker migration into the large intestine is a life-threatening complication. It is possible that fixation of the electrodes to the surrounding tissues will minimize this complication.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1354 - COMPARISON OF STERNOTOMY ACCESS VERSUS THORACOTOMY ACCESS IN THE SURGICAL TREATMENT OF AORTIC COARCTATION A PROPENSITY SCORE MATCHED STUDY

Ilya Soynov [1], Yriy Kulyabin [1], Nataliya Nichay [1], Serezha Manukyan [1], Alexey Arkhipov [1]
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Background:
The search for the “Holy Grail” of surgical repair for aortic coarctation involves finding an access and correction method that successfully and consistently avoids aortic recoarctation and arterial hypertension. The controversy persists as there is still no consensus on the best surgical approach and technique to achieve these objectives.
Objective: The objective of this study is to compare sternotomy and left thoracotomy as surgical techniques for treating patients with aortic coarctation and hypoplasia of the distal aortic arch.

Methods:
From January 2008 to December 2020, 103 surgical procedures were performed using an extended oblique anastomosis. The patients were divided into 2 groups: oblique, extended anastomosis from thoracotomy access (n-68; 66%) and oblique extended anastomosis from sternotomy access (n-35; 34%). After performing a propensity score analysis (1:1) for the entire sample, 25 patients from sternotomy access were matched with 25 patients from thoracotomy access.

Results:
The mortality rate in the thoracotomy group was 4%, with 1 patient, while it was 8% with 2 patients in the sternotomy group, $p > 0.99$. There were no significant differences in early postoperative complications between the two groups. Recurrence of aortic coarctation was observed more frequently in the thoracotomy group (20.8% vs 0%). Low weight was identified as the only risk factor for aortic re-coarctation.

Conclusion:
The mortality rates and early postoperative complications associated with the surgical repair of aortic coarctation were similar between the sternotomy and thoracotomy approaches. Nevertheless, sternotomy approach may be beneficial in reducing aortic recoarctation.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1357 - RESULTS OF CORRECTION OF COARCTATION WITH HYPOPLASIA OF THE AORTIC ARCH "ASCENDING SLIDING" VS PLASTY OF THE AORTIC ARCH WITH A PATCH FROM THE PULMONARY HOMOGRAPH

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Background
The main complications in the long-term period in children after the elimination of obstructive pathology of the aortic arch are arterial hypertension and recoarctation of the aorta. It is possible that persistent arterial hypertension is associated with the architectonics of the aortic arch and the nature of blood flow in it.

Aim:
To evaluate the immediate and long-term results after reconstruction of the aortic arch in conditions of artificial circulation by two methods: aortoplasty by "ascending sliding" (technique with native tissues) and aortoplasty using a patch of pulmonary homograft (technique using foreign material).

Materials and Methods:
In the presented single-center, pilot, prospective randomized study, the results of surgical treatment of coarctation with hypoplasia of the aortic arch in conditions of artificial circulation were assessed. According to the study design, depending on the method of correction of aortic coarctation, all patients were divided into two groups: aortoplasty by the "ascending sliding" method (30 patients); aortoplasty with a patch from a pulmonary homograph (30 patients).

Results:
There was no lethality in the hospital period. In the early postoperative period, the compression of the bronchi or trachea in the "ascending sliding" group was 20% versus 0% in the aortoplasty group using a patch from a pulmonary homograph. Recoarctation of the aorta in the aortoplasty group using a patch from a pulmonary homograph was 30%, while in the "ascending sliding" group there was no recoarctation. Arterial hypertension in the "ascending sliding" group was 13.3%, and in the aortoplasty group, using a patch from a pulmonary homograph was 56.6%.

Conclusion:
Patients after "ascending sliding" correction have a higher chance of bronchial and tracheal compression in the early postoperative period, while patients after correction by aortoplasty with a patch from a pulmonary homograph had a higher incidence of hypertension and aortic recoartcation.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1369 - EVALUATION OF THE COURSE OF SINGLE VENTRICLE PATIENTS WITH PULMONARY ARTERY BANDING

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Background/Hypothesis:
Multi-stage palliation is the basic treatment in management of infants with single ventricle(SV), and approach to be chosen varies depending on anatomy. In order for patients to progress in SV pathway, it is recommended that PAB be performed without delay in first weeks of life, especially in patients with unrestricted pulmonary blood flow. Here, our SV patients who underwent PAB were evaluated.

Materials and Methods:
SV patients followed up between 2014-2024 were screened, PAB patients were retrospectively reviewed. Demographics, diagnoses, interventional/surgical procedures, final status were recorded.

Results:
66 SV patients were included.
Thirty were female(45.5%). Tricuspid atresia was most common diagnosis(30%)
Patients were first diagnosed in a median of 0.68months(1day-14months).
PAB was performed in a median of 1.47months(0.17-14.57months) and in 19 in first month(28%).
Median follow-up period was 40.5months(0.2-160months). Twelve died(18%), 6 of these after PAB. A total of 45 patients underwent Glenn(68%), 17 were completed to Fontan.
Median age for Glenn was 13.4months(6-105months).
In four patients, rebanding was performed, band was tightened before Glenn. These underwent Glenn far later with a median age of 22months(12-104months).
Median age of PAB in patients who were not suitable for Glenn was 5.65months(1.73-14.5months) with a statistically significant difference between groups($p<0.05$).
19 patients who underwent PAB in less than 1 month were operated in a median of 0.7months(0.17-1month),PAB of 9 patients was before 14 days and 2 of these died after operation. Glenn could be performed in all patients who underwent PAB between 14days and 1month.
73% who underwent PAB less than 1 month could undergo Glenn while 81% who underwent PAB between 1-4 months could undergo Glenn.

Conclusion:
In our study, approximately 80% who underwent PAB upto 4months of age were able to progress to SV pathway. All PAB performed in 2-4weeks of life reached Glenn, even if band had tobe tightened,but poor results seen in bandings less than two weeks of age, consistent with literature.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1373 - THE DESCENDING AORTIC TRANSLOCATION WITH NATIVE TISSUE GRAFT INTERPOSE FOR THE RIGHT DESCENDING AORTA WITH THE LEFT INTERRUPTED AORTIC ARCH COMPLEX

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Background:
The right descending aorta with a left interrupted aortic arch complex is extremely rare. The specific reconstruction of the arch is required due to the longer length of the reconstruction and the high risk of postoperative left bronchial stenosis.

Methods:
A month-old female with the right descending aorta and a left interrupted aortic arch complex underwent bilateral pulmonary artery banding for respiratory collapse and low cardiac function. After improving cardiac function, she underwent aortic arch reconstruction using descending aortic translocation technique, ventricular septal defect closure, and bilateral pulmonary artery debanding. After median sternotomy, the innominate artery, thoracic descending aorta, and both caval veins were cannulated for cardiopulmonary bypass. The descending aorta was exposed and translocated anterior to the bronchial bifurcation. Under cardiac arrest, the ascending aorta was incised on the posterior-right lateral side. The ascending aorta and descending aorta were interposed using a graft made by the native pulmonary artery wall and glutaraldehyde-treated autologous pericardium because direct anastomosis was unable for the long length between the ascending and descending aorta. After ventricular septal defect closure and bilateral pulmonary artery debanding, cardiovascular bypass was weaning.

Results:
The postoperative course was uncomplicated, and the delayed sternal closure was performed 2 days after surgery. The patient was extubated on postoperative 5 days, and the patient was discharged 44 days after surgery. The contrast computed tomography after surgery showed no stenotic reconstructed aortic arch and bronchus.

Conclusions:
The descending aortic translocation with graft interpose is an effective technique for patients with a right descending aorta and left interrupted aortic arch complex to prevent left bronchial stenosis.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1379 - NATIVE AORTIC VALVE AS PUMONARY VALVE IN ROSS PROCEDURE

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Background / Hypothesis:
The Ross procedure is a durable technique for addressing aortic valve disease in children and young adults. However, a limitation of the Ross procedure is the need for a cryopreserved pulmonary homograft which is not widely available

Materials and Methods:
A 31-year-old Filipino male with congenital aortic stenosis underwent a modified Ross procedure at the age of 5. In the absence of a homograft, an annuloplasty was performed on the explanted native aortic valve and used as the neo pulmonary valve contemplating that the diseased aortic valve is sufficient when placed in the pulmonary position. This type of repair lasted for 26 years until the patient developed an aortic root aneurysm. He underwent surgical repair for the aneurysm, however intraoperatively, the explanted aortic valve in the pulmonary position has shown good functional capacity underlining the feasibility of this modified approach to the Ross procedure

Results:
The Ross procedure confers several advantages when compared to using bioprosthetic valves for congenital aortic stenosis including favorable hemodynamic characteristics, low endocarditis risk, low thrombogenicity, avoidance of lifelong anticoagulation and autograft size increasing with age. In our country, we do not have access to a pulmonary homograft and such we deprive our patients of these advantages. By using the explanted diseased aortic valve as a conduit, we were able to replicate and even exceed the durability of the Ross repair with the same advantages

Conclusions:
A first of its kind, this novel modification to the Ross procedure is a viable alternative to the original Ross procedure in the absence of a pulmonary homograft

POSTER PRESENTATIONS

Category: Cardiac Surgery

1383 - PREDICTORS OF OUTCOME OF NEONATES WHO UNDERWENT CARDIAC SURGERY A FIVE YEAR RETROSPECTIVE COHORT STUDY

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Background:
Congenital heart disease (CHD) is the most common birth defect in neonates. In the Philippines, annually, about 20,000 children are born with CHD, and one out of four of those patients die without medical treatment. This study aimed to determine the predictors of outcome of neonates with CHD who underwent cardiac surgery at a cardiovascular specialty hospital.

Materials and Methods:
This was a retrospective cohort study of neonates who underwent cardiac surgery between January 1, 2017 to December 31, 2021. Descriptive statistics were used to summarize the clinico- demographic profile while logistic regression was performed to determine the factors associated with the outcome. The primary outcome was mortality, and the secondary outcomes were complication, post operative length of stay, and mechanical ventilation duration.

Results:
A total of 97 patients were included in this study, 60 males and 37 females. On binary logistics regression analysis, the factors associated with mortality were infection (odds ratio, 8.3 [95% confidence interval, 1.02-67.69], P=.048), neurologic complications (odds ratio, 7.71[95% confidence interval, 2.00-29.61], P=.003), kidney injury (odds ratio, 41.6 [95% confidence interval, 12.52-138.25], P= <0.001), other complications (odds ratio, 11.08 [95% confidence interval, 4.19-29.28], P=<0.001). Neonates who died less likely stayed for over 10 days after surgery (62.24%).

Conclusions:
This study identified infection, neurologic complications, kidney injury, other complications and <10 days postoperative length of stay as predictors of mortality among neonates who underwent cardiac surgery.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1389 - TRANSTHORACIC CLOSURE OF VENTRICULAR SEPTAL DEFECT IN PATIENTS WITH AORTIC VALVE PROLAPSE A SINGLE CENTER PRELIMINARY OUTCOME

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Children's Hospital Of Fudan University, Cardiovascular Center, Shanghai-China [1]

Background / Hypothesis:
Device closure of patients with ventricular septal defect (VSD) companied with aortic valve prolapse (AVP) remains a challenging issue. There is little clinical data available in the literature about the feasibility and safety of transthoracic device closure for such patients. In this study, we summarize our experience of transthoracic closure technique and report our follow-up outcome of feasibility, safety and efficacy in 81 patients.

Materials and Methods:
In a retrospective observational study design, data of eighty-one patients of VSD associated with AVP who was performed transthoracic VSD closure with eccentric occlude guided by transesophageal echocardiography (TEE) in Children's Hospital of Fudan University from 2012 to 2024 was collected. Contradictions of this technique include preoperative aortic regurgitation (AR) or emerging AR during closure.

Results:
With a median age of 3.1(1.6, 5.1) years old and a median weight of 14.5(12.1,19.7) kg, these patients have a median VSD diameter of 4.1(3.7,5.0) mm. All patients are performed transthoracic VSD closure with eccentric occlude successfully with a median procedure time of 56(45, 72) minutes, a median occluder diameter of 6(5, 6) mm. The median CCU stay time is 1(1,1) day and the median length of stay is 9(8, 11) days. There is no AR during follow up. Nineteen patients (23.4%) emerge arrhythmia after surgery and ten patients resolve after a median follow-up of 54(35.5, 80.5) months. Two patients (2.4%) have residual shunt after closure. Three patients need reintervention including one VSD repair with removal of the occluder, one VSD repair with removal of the occlude and implantation of permanent pacemaker, and one pericardiocentesis drainage.

Conclusions:
Transthoracic VSD closure with eccentric occlude guided by transesophageal echocardiography (TEE) is technically feasible and highly effective. Though post-operative incidence of arrythmia is relatively high, but prompt management can minimize damage of these patients.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1391 - AORTIC ARCH RECONSTRUCTION USING MINI J STERNOTOMY IN CHILDREN

Yuriy Kulyabin [1], Ilya Soynov [1], Alexey Voytov [1], Nataliya Nichay [1], Alexey Arkhipov [1]
E.meshalkin National Medical Research Center, Pediatric Cardiac Surgery, Novosibirsk-Russia [1]

Background / Hypothesis:
We present our experience of aortic arch reconstruction under cardiopulmonary bypass (CPB) in older children using mini-J sternotomy.

Materials and Methods:
In period between 2020 and 2024 twenty three patients underwent aortic arch plasty under CPB using the minimally invasive sternotomy. The median age was 11 years (range 8-15 years). Fifteen patients have undergone coarctation repair before in infancy and were presented with small proximal aortic arch (z-score < -2) with clinical signs of recoarctation. Eight patients had coarctation with hypoplastic proximal aortic arch without any intracardiac defects. All patients underwent aortic arch reconstruction under CPB using beating heart full-body perfusion through mini-J sternotomy in the 3rd or 4th intercostal space. End-to-end anastomosis with arch augmentation using the dacron patch was performed in patients underwent primary repair.

Results:
Median CPB time was 83 minutes (range 51-116 minutes). No postoperative complications (chylothorax, nerve palsy, bleeding) were observed during early period. Median postoperative blood loss was 120ml (range 80-204 ml). Median length of hospitalization was 8 days (range 7-10 days). Median follow-up was 2.6 years (range 0.5-4 years). No patients were presented with recoarctation. Residual arterial hypertension was presented in 16 patients (69%).

Conclusions:
Minimally invasive sternotomy provides sufficient exposure for aortic arch reconstruction under CPB in children and make postoperative period smoother due to less blood loss, postoperative pain and fast patient's recovery without increasing the risk of postoperative complications.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1398 - EARLY MANAGEMENT OF NEONATES WITH ANOMALOUS ORIGINATED PULMONARY ARTERY COMBINED WITH HEART LESIONS SINGLE CENTER EXPERIENCE

Yuriy Kulyabin [1], Ilya Soynov [1], Alexey Voytov [1], Nataliya Nichay [1], Alexey Arkhipov [1]
E.meshalkin National Medical Research Center, Pediatric Cardiac Surgery, Novosibirsk-Russia [1]

Background / Hypothesis:
Neonates with pulmonary artery (PA) originated from the aorta are at risk of PA occlusion. However, early reimplantation or PA stenting is essential, concomitant intracardiac lesions may complicate the management of these patients. We present our experience of management of neonates with anomalous PA and significant intracardiac lesions.

Materials and Methods:
A retrospective review between 2020 and 2023 includes 13 patients who had undergone repair of anomalous origin of the pulmonary artery (PA) from the aorta with significant concomitant heart lesions including tetralogy of Fallot (4 patients), pulmonary atresia (2 patients)and ventricular septal defect (8 patients). Median age was 13 days (range 3-28 days). Patients were divided into 2 groups. Seven patients (54%) who underwent early surgical repair with reimplantation of the pulmonary branch were included in the “Primary” group. Six patients (46%) underwent palliative repair with balloon angioplasty and stenting of the proximal part of anomalous originated pulmonary branch following with the surgical repair under CPB after 3 months were included in the “Staged” group.

Results:
No early mortality was observed in both groups. Patients in Primary group had higher rate of prolonged mechanical ventilation (42% vs. 16%, p=0.04). Patients in the “Staged” group had shorter duration of stay in ICU (p=0.02). Median follow-up was 14 months (9 months-3.4 years). Median doppler gradient on the reimplanted PA according to echocardiography was 26 (18-46) in the Primary group and 16(13-36) in the Staged group (p=0.97). One patient in the Primary group underwent balloon angioplasty of the PA due to restenosis (p=0.80).

Conclusions:
Neonates with anomalous originated PA could be effectively managed with both early surgical repair or staged repair with sufficient PA growth. Staged approach is more safe in terms of postoperative complications.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1414 - THE UTILITY OF A SMS TEXT MESSAGING PLATFORM TO SUPPORT CHILDREN AND FAMILIES AFTER CARDIAC SURGERY

Christopher Buckland [1], Astrid-marie De Souza [1], Erin Bleker [1], Cindy Sha [2], Mohammed Al Aklabi [1], Andrew Campbell [1], James Potts [1], *Kathryn Armstrong* [1]
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Background/Hypothesis:
Cardiac surgery patients and their families may need additional support from healthcare providers (HCP) between hospital discharge and their post-surgical follow-up visit. In our program, a nurse practitioner makes one follow-up phone call between visits. A SMS text messaging platform may enhance support for patients and their families following cardiac surgery. We explored the utility of a SMS text messaging platform (WelTel) in our cardiac surgical program.

Materials and Methods:
Patients scheduled for cardiac surgery between January 1 and November 15 2023, were offered WelTel at either their pre-admission visit or immediately post-surgery. Parents or adolescents (capable of self-care) were enrolled and received a weekly automated message every Monday asking, "How are you?" Participants could respond with any non-emergency health-related question and receive a reply within 48 business hours from their HCPs. Participants were asked to contact the on-call team for urgent inquiries. At discharge, participants received a feedback survey and were removed from WelTel. Text messages and care conversations (> 2 text messages exchanged) were tabulated.

Results:
One-hundred and five participants (102 adults, 3 adolescents) consented and 99/105 (94%) participants (96 parents, 3 adolescents) completed the study. The weekly response rate was 61% (388/641) with 2872 text messages exchanged. There were 316 care conversations: 158/316 (50%) reporting no concerns; 107/316 (34%) had health concerns; 34/316 (11%) had administrative questions; and 17/316 (5%) had medication/prescription refill questions. Specific health concerns included: 46/107 (43%) with post-surgical symptoms and 36/107 (34%) with surgical wound healing. The survey response rate was 81%: 65/80 (81%) found it helpful to text their child's HCPs and 58/80 (73%) felt better connected to their child's HCPs.

Conclusions:
SMS text messaging (WelTel) was helpful and increased families' feelings of support post-surgery. Further research needs to determine the impact of WelTel on clinical workflow within our surgical program.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1418 - LONG TERM OUTCOMES AFTER REPAIR OF TOTAL ANOMALOUS PULMONARY VENOUS DRAINAGE A 20 YEAR COHORT STUDY

Hong Jun Yong [1], Kazi Zahidul Hoque [2], Ben Smith [3], Mark Davidson [4], Walid Gabir [2], Vivian Bader [2], Andrew Mclean [2], Mark H. Danton [2], *Edward Peng* [2]
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Objectives:
This study assesses the long-term outcomes of survival after total anomalous pulmonary venous drainage (TAPVD) repair, with focus on the impact from reintervention on pulmonary venous (PV) obstruction.

Methods:
Ninety-eight patients (between 2000-2023) underwent repair for TAPVD [37(37.8%)-supracardiac, 30(30.6%)-infracardiac, cardiac-22(22.4%), mixed-8(8.2%)] were analyzed. 39% (38) were obstructed at presentation, including 1 in extremis with atretic PV drainage (3.1% patients pre-op ECMO). Median(interquartile) age at repair was 6 days (5-60 days) and weight 3.5kg (3.0-4.1kg) at the time of surgery. Kaplan-Meier analysis was used to assess freedom from death and reintervention.

Results:
Early mortality (≤30 days) was 9.2% (9). 12.2% (12) required post-operative ECMO with 75% (9/12) mortality among this cohort. Overall, PV reintervention rate was15/98(15.3%): (i) 4(4.1%) involved confluence alone: all survived at long-term follow up (range 1.9-21.0 years) (ii) 11(11.2%) involved branch PV: 7(64%) died (five within 1-year, two 1-5 year post TAPVD repair) with 4 long-term survivors (follow-up range 17.1-year to 23.2-year). Overall freedom from PV reintervention was 88% (1-year), 84% (5-year), and 82% (at 10, 15-year). Branch PV reintervention impacted on survival (54.5% at 1-year, 36.4% at 5,10,15, 20-years) (vs none or confluence reintervention alone; log-rank χ^2 = 8.713, p-value=0.013). Overall long-term survival post–TAPVD repair was 79% (1-year), 76% (5,10-year), and 72% (15, 20-year). After excluding deaths within 1-year post repair, survival was 97% (5 & 10 years) and 92% (15, 20-year).

Conclusions:
Reintervention on branch PV obstruction, but not confluence stenosis, remained the main risk factor impacting on survival. Patients without branch PV obstruction have excellent long-term survival following TAPVD repair.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1432 - ASSOCIATION BETWEEN MRI ASSESSED THORACIC LYMPHATIC PERFUSION PATTERNS AND LATE FONTAN FAILURE.

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Background / Hypothesis:
Fontan circulation is characterized by elevated venous pressure, which favors venous and lymphatic congestion, and may imply late circuit failure. Our aim was to determine the association between MRI-assessed thoracic lymphatic perfusion patterns and late Fontan failure.

Materials and Methods:
A cross-sectional study was performed. We included patients who underwent the Fontan procedure between January 2005 and December 2019, and who were evaluated with lymphatic mapping using MRI. The prevalence of late failure was determined, and logistic regression analysis was performed to establish the association between the variables of interest and outcome.

Results:
Fifty-four patients were included with a mean age at surgery of 8.8 years ± 3.5 years, 42.6% were men. The most frequent diagnosis was tricuspid atresia, representing 50% of the cases. In addition, 96.3% of Fontan procedures were performed using an extracardiac conduit. The prevalence of late Fontan failure was 35.2%. The lymphatic perfusion patterns observed were: Type 1 in 25.9% (n=14), Type 2 in 46.3% (n=25), Type 3 in 25.9% (n=14) and Type 4 in 1.8% (n=1), with no differences in relation to late failure (p = 0.42). The age at surgery was found to be a factor associated with the late Fontan failure (OR: 1.23; 95% CI: 1.02-1.48; p = 0.02).

Conclusions:
One third of patients with Fontan circulation are at risk of late failure, with older age often being a contributing factor to these complications.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1434 - AORTIC VALVE REPAIR IN CHILDREN A SINGLR CENTER EXPERIENCE

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Background:
Surgical treatment of aortic valve (AV) disease in children is challenging. Whether aortic valve repair (AVr) has similar outcomes in children with tricuspid aortic valve (TAV) and bicuspid aortic valve (BAV) remains unclear.

Methods:
This is a single-center, retrospective comparative study, which aims to demonstrate that AVr yields similar short to mid-term outcomes in TAV and BAV children with AV disease. The primary endpoint is the incidence of new-onset AV disease during follow-up, and the secondary endpoint is AV reintervention during follow-up.

Results:
From 2019 to 2025, a total of 52 children underwent AVr at our center, including 35 in the TAV group and 17 in the BAV group. The median age of the included children was 9.0 (6.0 – 12.0) years, with 33 (63.5%) being male. Aortic regurgitation was the predominant lesion in the TAV group, while aortic stenosis was the predominant lesion in the BAV group (P = 0.008). Leaflet shaving, plication, and elongation were the most commonly adopted AVr techniques in the TAV group, whereas commissurotomy, leaflet shaving, and elongation were the most common techniques in the BAV group. There was no difference in the patch use rates between the two groups (34.3% vs 41.2%, P = 0.989). The overall median follow-up time was 19.0 (3.8 – 35.3) months. During the follow-up period, new-onset AV disease occurred in 7 (20.0%) children in the TAV group and 10 (58.8%) children in the BAV group (log-rank P = 0.148), while 1 (2.9%) child in the TAV group and 3 (17.6%) children in the BAV group received AV reintervention (log-rank P = 0.165).

Conclusions:
The short to mid-term outcomes of AVr in children are acceptable but appear relatively less satisfactory compared to adult patients. In children with TAV and BAV, there is no significant difference in the short to mid-term outcomes following AVr.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1435 - NORWOOD PROCEDURE IN AN 8 MONTH OLD PATIENT

Alejandro Reyes Rodriguez [1], Violeta Castañuela Sanchez [1], Orlando Jose Tamariz Cruz [1], Moises Mier Martinez [1], Hector Diliz Nava [1], Diego Rodriguez Alvirde [1], Luis Antonio Garcia Benitez [1], Luis Gerardo Motta Amezquita [1], Marcela Barrera Fuentes [1], Alexis Palacios Macedo Quenot [1]
National Institute Of Pediatrics, Division Of Cardiovascular Surgery, México City-Mexico [1]

Background / Hypothesis:
The Norwood procedure allows reconstructing the outflow tract of the single ventricle in patients with hypoplastic left heart syndrome (HLHS). As a duct-dependent disease, it is usually performed in the neonatal age. The creation of a systemic to pulmonary shunt regulates blood flow to the lungs, and allows for a proper progression to the Glenn procedure.

Materials and Methods:
To present the case of a patient with HLHS who was successfully underwent the Norwood procedure at 8 months of age.

Results:
An 8-month-old male with prenatal diagnosis of HLHS. At birth, parents refuse surgical treatment and opted for compassionate care. Because the ductus arteriosus remained open, he was referred again at 7 months 26 days of age to evaluate surgical treatment. Echocardiogram showed aortic and mitral atresia, wide ductus arteriosus, and partially restrictive atrial septal defect. On a clinical and echocardiographic basis, it was considered feasible to take the patient to a Norwood procedure. The surgery, performed with a 5 mm Blalock-Taussig-Thomas fistula, proceeded without complications. The patient was discharged after 40 days in good condition. Echocardiographic and tomographic assessment showed satisfactory anatomical results. Cardiac catheterization showed normal PVR. The patient will undergo a Glenn procedure in the next weeks.

Conclusions:
Because HLS is a duct-dependent disease, late presentation is rare and there are no reports of a Norwood procedure performed in infants. In this case, the presence of a partially restrictive foramen ovale, in the presence of a patent ductus arteriosus, probably established an acceptable physiology for the successful performance of the procedure.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1441 - OZAKI PROCEDURE INITIAL EXPERIENCE IN MEXICO

Alejandro Reyes Rodriguez [1], Alexis Palacios Macedo Quenot [1], Orlando Jose Tamariz Cruz [1], Diego Rodriguez Alvirde [1], Andres Gonzalez Ortiz [1], Luis Antonio Garcia Benitez [1], Jimena Jimenez Martinez [1], Hector Diliz Nava [1]
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Background / Hypothesis:
The therapeutic options in the treatment of aortic valve lesions in pediatric patients depend on the mechanism of injury, as well as the size of the structures, specifically the aortic annulus, with the ideal option being any type of plasty that offers a lasting result. The disadvantage of prostheses is poor durability and anticoagulation. The Ozaki technique has the advantages of not having a ring, no foreign body and preserves mobility of the ring, it has a lower gradient per maximum effective orifice, it can be applied to practically any pathology. The improvement and refinement of Ozaki's technique has provided a solution that can give a satisfactory result in children.

Materials and Methods:
To present the case of a 6-year-old patient diagnosed with double aortic lesion operated with the Ozaki technique.

Results:
Patient with bivalve, bicomitsural bivalve aortic valve, to which commissurotomy was initially performed and the rupture site caused by dilation with left coronary leaflet balloon was repaired, however, with suboptimal result, it was decided to resect the leaflets, each neo valve was constructed with autologous pericardium treated with 0.6% glutaraldehyde, individual measurements of distance between commissures, the cusps and nadir of the ring with silk to later mark the points to be cut in the pericardium since we do not have a pericardial template, the neocuspid is sutured to the aorta with 4/0 monofilament. The postoperative echocardiogram showed preserved biventricular systolic function, without residual aortic stenosis and without insufficiency.

Conclusions:
Surgical treatment options for congenital aortic valve disease in pediatric patients are limited due to the smaller size of the ring, early calcification, and rapid structural deterioration of bioprostheses, so the Ozaki technique has potential benefits, although the long-term results with respect to valve replacement need to be evaluated.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1448 - THE COMMANDO OPERATION FOR AORTOVENTRICULAR DISRUPTION

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Background / Hypothesis:
Aorventricular disruption is a rare and often fatal complication of aortic valve surgery especially in patients with severe aortic and mitral annular calcification. The Commando procedure with intervalvular fibrosa reconstruction permits repair of aortoventricular disruption by using the sewing rings of both prosthetic mitral and aortic valves as anchor points for a dacron patch, reconstructing the aortomitral curtain and preserving the left ventricular outflow tract

Materials and Methods:
A 55-year-old female was referred for elective aortic and mitral valve replacement for severe aortic and severe mitral stenosis for rheumatic heart disease. Transthoracic Echocardiography revealed severe aortic stenosis with aortic valve area 0.3 cm2 and mean pressure gradient 70 mm of Hg, severe mitral stenosis with a mitral valve area of 0.9 cm2, left ventricular hypertrophy with good left ventricle systolic function and dilated left atrium. During surgery, heavily calcified aortic leaflets and aortic annulus were identified. As well as severe anterior mitral annular calcification. Meticulous debridement of calcified annulus was carried out. Twenty-five millimeter mechanical valve was implanted in an intra-annular position in the mitral annulus and 18 millimeter mechanical valve was implanted in a supra-annular position in the aortic valve both using interrupted pledgeted sutures. The patient came off bypass with minimal inotropic support. However, prior to decannulation there was noted torrential pulsatile bleeding coming from the aortic root below the aortotomy suture line. The patient was reconnected to cardiopulmonary bypass. Upon examination, we observed a disruption in the aortoventricular continuity with significant fragmentation of the calcified aortomitral curtain. This case report details the use of the commando operation to reconstruct the aortomitral curtain and repair the aortoventricular disruption

POSTER PRESENTATIONS

Category: Cardiac Surgery

1450 - SHOULD WE DO MITRAL VALVE SURGERY FOR MODERATE ISCHEMIC MITRAL REGURGITATION

Michael Louis Burdador [1], Christopher Cheng [2]
Vsmmc, Cv Surgery, Talisay-Philippines [1] Phc, Cv Surgery, Manila-Philippines [2]

Background / Hypothesis:
Ischemic MR is common in patients undergoing CABG but the decision to perform additional mitral valve surgery remains controversial

Materials and Methods:
This is a retrospective, single center cohort study conducted at the Philippine Heart Center using data from patients 19 years old and above with Ischemic MR undergoing CABG from January 2012 to December 2022. Those with concomitant procedures aside from MVR were excluded. Preoperative 2D echo LVEF,LVEDD,RegVol,RegFrc,MVA were compared at 6 months and latest follow-up with data collected from electronic health records. Consecutive criterion-based sampling was used. Sample size was based on incidence of postoperative acute renal failure among CABG versus CABG+RMA. Missing data were neither replaced nor estimated. Wilcoxon signed rank test was used to determine the difference of mean, rank and frequency within groups and Mann–Whitney U test for comparison between groups

Results:
n=153 patients were included in this study. Mean age 68 years(+/-7.7) Mean follow up 55 months(+/-27.2). Subjects were predominantly male(130/153,85%). 60/153(39.2%) underwent isolated CABG, 73/153(47.7%) CABG+RMA, 9/153(5.88%) CABG+MVR. Mean Pre-operative LVEF 45.05%(+/-11.44). At 6-months Mean LVEF improved to 46.56%(+/-8.45) and by the latest follow-up Mean LVEF increased to 50.04%(+/-8.10). At latest follow-up CABG shows significant increase in LVEF vs CABG+RMA(+8.48%vs+3.45%,p=<0.001). CABG+RMA have significant recurrence of MR(p=<0.001) at latest follow-up. CABG+MVR showed long-term decline in LVEF (-7.44%,p=0.03). Significant in-hospital morbidity in CABG+MVR vs CABG (p=<0.002,HR 11.667)

Conclusions:
There is significant long-term improvement in LVEF in patients undergoing isolated CABG. Isolated CABG is non-inferior to CABG+RMA for MR but patients undergoing CABG+RMA experience recurrent MR over time. CABG+MVR negatively impacts long-term LV function and increases in-hospital morbidity

POSTER PRESENTATIONS

Category: Cardiac Surgery

1451 - BIVENTRICULAR REPAIR OF A HEART WITH UNIVENTRICULAR PHYSIOLOGY SYSTEMIC RIGHT VENTRICLE INITIAL EXPERIENCE

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Background / Hypothesis:
The presence of two well-formed ventricles is not synonymous with biventricular repair when there is also a complex intracardiac anatomy. Fontan's circulation offers a solution to this group of patients, and the harmful effects of the hypertensive venous system are becoming clearer, so conversion to biventricular circulation is becoming more and more frequent. This strategy is also not free of complications, in addition to using the right ventricle as a systemic ventricle and its implications.

Materials and Methods:
To present the case of a patient with double discordance, pulmonary atresia, ventricular septal defect, dextrocardia, sequentially operated on for systemic pulmonary shunt and cavopulmonary shunt, who, upon being evaluated for Fontan, was considered and performed biventricular conversion.

Results:
A 5-year-old and 8-month-old patient with double discordance/pulmonary atresia/ventricular septal defect, patent ductus arteriosus with confluent pulmonary branches who underwent neonatal surgery at 11 days of birth systicopulmonary fistula with 3.5 mm PTFE graft in order to ensure pulmonary flow, later taken at 2 years to bidirectional Glenn surgery. at 5 years of age, biventricular conversion was decided and VSD closure, disassembly of cavopulmonary anastomosis, pulmonary artery plasty, superior vena cava cava anastomosis and right atrial appendage, placement of a valvulated tube from the morphologically left ventricle to the pulmonary artery, aortic valve plasty and section and suture of the ligament arteriosus. Echocardiographic assessment showed satisfactory anatomical resolution.

Conclusions:
A subpulmonary ventricle decreases venous hypertension and increases cardiac output, characteristic sequelae of the Fontan procedure. Although such effects can occur at any time, congestion and liver injury is an established damage for adolescence. Biventricular repair with a systemic right ventricle has the advantage of establishing a subpulmonary ventricle

POSTER PRESENTATIONS

Category: Cardiac Surgery

1457 - LONG TERM OUTCOMES AND RE INTERVENTION RATES OF VALVED CONDUITS IN PATIENTS WITH CONGENITAL HEART DISEASE A 40 YEAR FOLLOW UP STUDY

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Background / Hypothesis:
This study aimed to assess long-term survival rates and identify risk factors for re-intervention in conduits used for right ventricular outflow tract reconstruction in pediatric patients.

Materials and Methods:
The research involved 528 consecutive patients (286 females, median age at initial conduit implantation 2.9 years, IQ range 0.3 – 6.9 years) who received their first valved conduit between 1981 and 2020. Diagnoses included pulmonary atresia (N=130), tetralogy of Fallot (N=129), truncus arteriosus (N=118), aortic valve replacement via the Ross procedure (N=78), transposition of the great arteries (N=58), and others (N=15). A total of 203 pulmonary, 154 aortic, and 17 unidentified homografts, along with 92 valved xenografts, were implanted.

Results:
The overall mortality rate was 17.7% (82 patients). Significant factors associated with increased mortality included younger age at initial conduit implantation (P=0.001), the diagnosis (P=0.05), and the operational era (P=0.007). Over a follow-up period of up to 40 years (median 13.8 years, range 4.8 – 22.6). Only patients who survived beyond 30 days after the intervention (N = 496) are considered. The median follow-up time for the analysis of primary graft failure is 8.3 years (Q1 = 3.7, Q3 = 15.5, maximum 39.9). A total of 232 instances of primary graft failure were documented, varying by conduit type and size (Figure). A smaller conduit size and younger age at implantation were linked to graft failure (P<0.001 for both). After adjusting for gender, age at implantation, conduit size, and surgical era, pulmonary homografts (HR=0.46, P<0.001 compared to aortic homografts and xenografts) and those having the Truncus diagnosis (HR=2.16, P=0.019) showed a higher risk of graft failure.

Conclusions:
In young patients with congenital heart defects, valved conduits demonstrate satisfactory long-term outcomes. Younger age and diagnosis are associated with increased mortality risk. Pulmonary homografts offer better survival rates free from re-intervention compared to aortic homografts and xenografts.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1473 - LONG TERM CHANGE OF VENTRICULAR FUCTION AND MITRAL REGURGITATION AFTER SURGICAL REPAIR OF ANOMALOUS LEFT CORONARY ARTERY FROM THE PULMONARY ARTERY

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Background:
Long-term data on anomalous left coronary artery from the pulmonary artery(ALCAPA) is limited in terms of surgical outcomes, ventricular function, and mitral regurgitation(MR).

Materials and Methods:
A retrospective review was conducted on 29 patients who underwent surgical correction for ALCAPA between 1983 and 2023. The median age of the patients was 0.5 years(range 43 days to 39.6 years). The mean value of preoperative left ventricle ejection fraction and fractional shortening was 46.3±21.6% and 29.3±10.4%, respectively.

Results:
Operative procedures included reimplantation of the coronary artery in 25 patients(86.2%), ligation in 1 patient, unroofing with proximal end closure in 2 patients, and coronary artery bypass grafting in 1 patient. Concomitant mitral valve repair was performed in one patient with moderate MR and four patients with severe MR. There was 1 hospital and 1 late death, resulting in a 93.0% overall survival rate at 20 years. During a median follow-up of 10.1 years, there were 3 reoperations and 1 stent placement for coronary artery stenosis. The ejection fraction of the left ventricle significantly improved in the first 2 years post-surgery. At the last follow-up, 25 patients(92.6%) had normal left ventricular function. Both left ventricle ejection fraction and Fractional shortening had significantly increased to a mean of 62.2±10.3% and 37.7±6.95%, respectively. Of the 6 patients who had moderate MR preoperatively, 80%(4 of 5) of unrepaired patients showed no regurgitation at the last follow-up. Meanwhile, MV repair for severe MR produced positive results, with 4 patients having less than mild MR and 1 patient having moderate MR after a mean of 9.15±3.39 years.

Conclusion:
Surgical repair of ALCAPA shows good long-term outcomes. Cardiac dysfunction and MR improve over time, particularly within the first year after the operation. Concomitant MV repair is a safe and reliable procedure that may benefit patients with severe MR.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1475 - SURGICAL OUTCOMES OF BERRY SYNDROME A MULTICENTER CASE SERIES AND META ANALYSIS

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Background / Hypothesis:
Berry syndrome is an extremely rare and complex conotruncal anomaly comprising interrupted aortic arch (IAA), aortopulmonary window (APW), and anomalous origin of the right pulmonary artery (RPA) from the aorta. The choice of RPA reconstruction remains controversial due to limited available data. We present a systematic review and meta-analysis of 69 patients, including three from our institutional experience.

Materials and Methods:
We retrospectively reviewed three neonates with Berry syndrome who underwent surgical repair at our center and included 66 additional patients from 20 published reports. Data were extracted on patient demographics, aortic arch and APW anatomy, RPA reconstruction method and postoperative outcomes. Pooled estimates of early mortality, late mortality and reintervention were calculated using proportion statistics with 95% confidence intervals (CI). Subgroup analyses were performed based on RPA reconstruction method and age at surgery.

Results:
Among the 69 patients, IAA type A was the leading aortic arch morphology (n=53, 76.8%) and APW type II was most common (n=42, 60.9%). Median age at surgery was 28.5 days (range: 2–5840; mean: 176.6 days). One-stage correction was performed in 85.5% (n=59) of patients. Pooled early mortality was 11.6% (95% CI: 4.0–19.1%). Late mortality rate was 4.1 per 100 patient-years (95% CI: 0.0–9.7%) over 48.7 patient-years of follow-up. Reintervention rate for RPA stenosis was 20.3% (95% CI: 10.8–29.8%). Age-based subgroup analysis showed similar outcomes between neonates (≤30 days) and infants (31 days–1 year). In the RPA reconstruction subgroups, patients receiving RPA angioplasty with aortic cuff had the lowest early mortality (5.3%) but highest reintervention rate (36.8%). In contrast, RPA reimplantation was associated with both higher early mortality (15.8%) and reintervention rate (26.3%).

Conclusions:
Surgical correction of Berry syndrome is associated with favorable early survival, especially when performed in early life. However, the choice of RPA reconstruction method substantially impacts both early mortality and the risk of reintervention.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1478 - VASCULAR RINGS AND SLINGS A TWENTY YEARS' EXPERIENCE; FROM THE BARIUM SWALLOW TO CRDIAC MSCT

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Background:
Vascular rings are uncommon anomalies that make up less than 1% of all congenital cardiac defects. The clinical manifestations range from no symptoms to feeding difficulties, repeated infections, and life-threatening respiratory compromise. Early diagnosis and prompt surgical relief of airway obstruction can dramatically improve the patient's symptoms.

Materials and Methods:
From October 2004 to October 2024, 212 infants and children were diagnosed with vascular ring; their ages ranged from 7 days to 44 months, and there were 127 males and 85 females. Respiratory symptoms noisy breathing and stridor, were the commonest presenting symptoms. X-ray chest was done for all patients, barium swallow was done for 9 patients, and flexible fiberoptic bronchoscopy was done for 107 patients. Echocardiography was done in 97 patients. Diagnostic cardiac catheterization was done in the first 2 cases and computerized axial tomography was done in 210 patients.

Results:
Double aortic arch was present in 175, innominate artery compression syndrome (IACS) was present in 24, and pulmonary artery sling was present in 13 patients. Associated cardiac defects were found in 15 patients, with TOF being the commonest. Operative approach was left posterolateral in all patients, but 24 cases of IACS and 13 cases of pulmonary artery sling, and 15 cases with associated cardiac defects, where the approach was through a median sternotomy. In only one patient with a circumflex left arch, the approach was through a left posterolateral thoracotomy. There was only one case of early mortality.

Conclusion:
A high index of suspicion of these aortic arch anomalies should increase if an infant or young child presents with a history of recurrent stridor, dysphagia, or asthma-like respiratory distress that is not easily explained. Accuracy in diagnosis is crucial to determine the optimal surgical approach. Surgical management has outstanding early and late results. The need for tracheal surgery is

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1480 - TOTALLY THORACOSCOPIC REPAIR FOR PARTIAL ATRIOVENTRICULAR SEPTAL DEFECT USING MODIFIED DOUBLE ORIFICE VALVE PLASTY TECHNIQUE SURGICAL EXPERIENCE AND EARLY OUTCOMES

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Background:
Surgical repair of partial atrioventricular septal defect (PAVSD) is often complicated by late atrioventricular (AV) valve dysfunction, necessitating reintervention. We present our initial experience and early outcomes using a totally thoracoscopic approach combined with a modified double-orifice valve plasty aimed at reducing postoperative AV valve complications.

Methods:
From 2023 to 2024, 14 patients underwent totally thoracoscopic repair for PAVSD at our center. Clinical data were retrospectively reviewed, and patients were closely monitored postoperatively for adverse events.

Results:
The cohort comprised 6 males and 8 females (mean age: 32.9 ± 15.5 years; mean body weight: 55.1 ± 11.6 kg). All surgeries were completed successfully. Mean operative, cardiopulmonary bypass, and aortic cross-clamp times were 266.6 ± 67.2, 160.7 ± 34.2, and 97.0 ± 31.1 minutes, respectively. Mean ICU stay was 1.7 ± 1.1 days, with in-hospital stay and total hospitalization averaging 6.4 ± 4.2 and 12.6 ± 4.5 days. Preoperatively, left AV valve regurgitation (LAVVR) was mild in 5 (35.7%), moderate in 4 (28.6%), and severe in 5 (35.7%) patients. Postoperatively, 13 patients (92.9%) showed mild or less LAVVR; only one case (7.1%) had moderate regurgitation. By 3 months, all patients had mild or less LAVVR, which remained stable through follow-up (mean: 7.9 ± 3.6 months). Peak LAVV gradients improved from 4.6 ± 2.7 mmHg postoperatively to 3.6 ± 0.6 mmHg at 1 year. Right AV valve regurgitation improved in all patients by 3 months. No mortality, residual shunt, or high-grade AV block occurred. NYHA class improved to grade I by one month in all patients.

Conclusions:
Totally thoracoscopic repair for PAVSD using modified double-orifice technique was safe, simple, and reproducible, demonstrating favorable early outcomes. Longer-term follow-up data are required to confirm its effectiveness.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1490 - MASSIVE PULMONARY ARTERY EMBOLISM WITH ADHESIVE COMPOSITION DURING ENDOVASCULAR OCCLUSION OF A HIGH FLOW CEREBRAL ARTERIOVENOUS SHUNT CASE REPORT

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Background / Hypothesis:
Endovascular embolization using a liquid adhesive composition is the primary treatment for vein of Galen aneurysmal malformation (VGAM). One of the most severe complications of this procedure is the migration of the adhesive material into the pulmonary artery (PA). The manifestation of this complication varies depending on the volume of migrated embolic material, the size of the emboli, and the extent of lung involvement. Objective: to report a case of massive PA-embolism with cyanoacrylate during the endovascular occlusion of a high-flow cerebral arteriovenous (AV) shunt.

Materials and Methods:
A 6-month-old infant was admitted for a repeat stage of endovascular occlusion of VGAM. Intraoperatively, fragments of embolic material migrated through the AV-shunt into the pulmonary circulation, resulting in acute occlusion of the right PA and subsequent right ventricular (RV) dysfunction.

Results:
Four hours post-event, due to acute circulatory failure, the patient was placed on veno-arterial extracorporeal membrane oxygenation (VA-ECMO). PA-embolism was confirmed through pulmonary angiography and echocardiography findings. Six hours after the event, the patient was transported to the cardiothoracic operating room, where an embolectomy of the right PA was performed under cardiopulmonary bypass. Postoperative VA-ECMO was required for 8 days, inotropic support for 10 days, and mechanical ventilation for 18 days. Fifty days after surgery, the patient was discharged home with a six-month continuation of PAH-specific therapy. At the age of 14 months, the patient underwent the final stage of VGAM embolization. The patient's condition was satisfactory, with no evidence of RV-failure or pulmonary hypertension.

Conclusions:
Prompt removal of the embolic material from the PA, combined with PAH-specific therapy, effectively alleviated the manifestations of pulmonary hypertension. The use of ECMO in this scenario played a crucial role in stabilizing the patient's condition and preventing the progression of RV-failure.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1495 - DURABILITY AND MORPHOLOGICAL CHANGES IN THE CONTEGRA BOVINE JUGULAR VEIN CONDUIT A COMPREHENSIVE ANALYSIS

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Background / Hypothesis:
In pediatric patients, xenografts are commonly used for right ventricular outflow tract (RVOT) reconstruction. Among these, the Contegra conduit, derived from bovine jugular vein, is one of the most widely employed options in neonates and children. Objective: To evaluate the long-term durability and morphological alterations of Contegra pulmonary valved conduits in pediatric patients.

Materials and Methods:
This study represents a retrospective analysis of clinical data from 182 patients (1 day to 18 years) after RVOT reconstruction treated between the years 2008 and 2017. Median patient age was 12 months (IQR 5-26 months).

Results:
Median follow-up duration was 6.3 years (IQR 1.2-9.2 years). Conduit replacement or reintervention was performed in 46.7% of patients (n=85). The main cause of conduit failure was stenosis (83.5% of failed conduits). Stenosis was caused by neointimal hyperplasia in 29.6% of cases and calcification in 59.2% of cases. The overall freedom from the first conduit reintervention rate was 78.0% [95%CI 70.0%-84.1%] at 5 years post-operatively and 32.3% [95%CI 23.5-41.6%] at 10 years. Severe fragmentation and disorganization of collagen and elastic fibers were observed in the Contegra conduit wall, accompanied by the intergrowth of coarse connective tissue. Calcium deposits, ranging from small to large, were detected at the cusp base and anastomotic regions. Neointimal hyperplasia thickness was ~1400-3200 µm with neovascularization of deep layers. The luminal surface exhibited fragmentation of the endothelial layer. The areas lacking endothelium were covered with thin-layered thrombi. Additionally, chondroid metaplasia was identified in some of the conduits.

Conclusions:
Contegra conduits demonstrated satisfactory performance. The primary causes of conduit failure were neointimal hyperplasia and calcification, with calcium deposition predominantly occurring at the cusp bases and suture lines.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1501 - PREDICTORS OF SHORT VERSUS PROLONGED PCICU STAY AFTER PRIMARY REPAIR OF TETRALOGY OF FALLOT AT A TERTIARY CARE UNIT KARACHI A SINGLE CENTER STUDY

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Background / Hypothesis:
Pediatric Cardiac Intensive Care Unit (PCICU) stays post-Tetralogy of Fallot (ToF) repair impact outcomes. Limited data on factors affecting PCICU duration exist in the developing world.

Materials and Methods:
A prospective study (Mar-Aug 2021) at NICVD, Karachi, Pakistan, included 93 ToF patients. Short PCICU stay (<48 h) and prolonged PCICU stay (≥48 h) were assessed. Multivariate logistic regression identified predictors of prolonged PCICU stay.

Results:
Mean age: 10.75 years; mean PCICU duration: 74.1 h. Prolonged PCICU stay: 61.3%.
Predictors: low SpO2, intraoperative tricuspid regurgitation, high inotropic score, postoperative pulmonary embolism, and bleeding
Discussion:
Baseline cyanosis, intra/postoperative complications, and severe outcomes influence PCICU stay. Factors like acidosis, high lactate, and inotropes correlate with prolonged stay.

Conclusion:
Identification of factors influencing prolonged PCICU stay after ToF repair aids prognosis prediction, enhancing future patient management.

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Category: Cardiac Surgery

1511 - TREATMENT OUTCOMES OF CONGENITAL HEART DISEASE ASSOCIATED WITH TRACHEOESOPHAGEAL FISTULA

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Background / Hypothesis:
Tracheoesophageal fistula (TEF) is a congenital anomaly that often coexists with other congenital disorders, including congenital heart disease (CHD). Hemodynamically significant CHD in neonates with TEF can influence treatment outcomes.

Materials and Methods:
We retrospectively reviewed the records of 103 patients from 2014 to 2023.

Results:
29 patients (28.2%) were diagnosed with hemodynamically significant CHD. The median gestational age was 36 weeks (range: 26–40 weeks), and the median birth weight was 2110 g (range: 580–3020 g). The most common CHD was VSD (48.2%), followed TOF/PA (17.2%), PDA (10.3%), and ASD (7.0%). Less common diagnoses included TGA, IAA with VSD, vascular ring, TAPVR, and HLHS (each 3.4%). 6 out of 29 TEF-CHD patients (20.6%) were diagnosed with Edwards syndrome. The most common anatomical subtype of TEF was esophageal atresia with distal TEF (type C)(69%). Ten patients had concomitant gastrointestinal obstructions. There were no significant differences in gestational age between TEF patients and TEF-CHD patients. TEF-CHD patients had a significantly lower birth weight compared to TEF patients (2035 g vs. 2499 g, $p = 0.005$). Additionally, TEF-CHD patients had a longer hospital stay compared to TEF patients (94 days vs. 51 days, $p = 0.009$). Out of 103 TEF patients, 8 patients (7.8%) died during their NICU admission. All patients who died had hemodynamically significant CHD ($p<0.001$). Out of the eight deceased patients, two had Edwards syndrome, and five died before undergoing surgery for CHD. Among 21 patients who underwent surgery for CHD during their NICU admission, 10 (47.6%) underwent corrective surgery, 7 (33.3%) underwent palliative procedures—primarily pulmonary artery banding, 3 (14.3%) underwent PDA ligation or device closure, and 1 (4.8%) underwent vascular ring repair.

Conclusion:
Neonates with TEF and significant CHD had a significantly lower birth weight, a longer hospital stay, and a higher mortality rate compared to those without CHD.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1512 - PATIENT REPORTED OUTCOMES IN A PROSPECTIVE COHORT OF CHILDREN TREATED FOR CONGENITAL HEART DISEASE (CHD)

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Background:
Patient-reported outcomes for Quality of Life (QoL) in children with CHD undergoing cardiac procedures are not well known.

Methods:
All children above 8 years who were included in the deep phenotyping study Outcome Monitoring after Cardiac procedure in CHD (OMACp) were eligible to fill a questionnaire that combined three validated QoL tools - CHU9D (Child Health Utility), KIDSCREEN-10 (K-10) and EQ5DY (EuroQol 5-dimension youth) either by themselves or their parent/guardian perioperatively within a year of procedure (at baseline before procedure; 3-months and 12-months post-procedure). A patient and public involvement (PPI) group reviewed the questionnaires, and their comments were incorporated as appropriate.

Results:
Following a cardiac procedure event, 299 individuals responded to the questionnaire at a minimum of 1 time point during the perioperative period. Procedure-based classification was 20% surgery (n=60) and 80% transcatheter (n=239). Average scores for each validated QoL tool are summarised in the Table. 68 individuals with an average age of 12.3 years (minimum 8, maximum 17) responded to the questionnaires at all 3 time points. 80% of these responders underwent a catheter procedure. Classification based on severity of disease included 57.3% (n=39) and 42.6% (n=29) with mild and moderate-severe CHD, respectively.

Conclusions:
Beyond the hospital episode, QoL questionnaires more likely represent a reflection of the chronic condition rather than care delivery. Population heterogeneity, complex treatment pathways, and variable timelines make it challenging to interpret the data despite classifying the cohort based on the severity of diagnosis and procedure type. Overall, health-related QoL in this cohort is comparable to the average population. Exploration of challenges faced in engagement with activities and sleep, and pre-emptive measures to support worries around the procedure can improve the patient experience. Future work with longer follow-up time is warranted to better understand QoL in children with CHD.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1517 - MODIFIED VAN PRAAGH OPERATION PRECEDING THE NORWOOD OPERATION FOR REQUIRING FONTAN CIRCULATION FROM BIVENTRICULAR REPAIR WITH SEVERE PULMONARY HYPERTENSION IN SHONE COMPLEX PATIENT

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Background:
High postoperative mortality for severe mitral stenosis in infants has been reported. In patients with shone complex, borderline cases for biventricular repair may sometimes require conversion to Fontan circulation.

Methods:
A month-old male with shone complex (mitral stenosis with a parachute mitral valve, coarctation of the aorta, and a bicuspid aortic valve), cortriatriatum, and a muscular ventricular septal defect was considered a candidate for biventricular repair and underwent arch repair via right thoracotomy. However, the mitral stenosis progressed to extremely severe, with a Z-score of the mitral valve orifice of -5.7 at 4 months old. Cardiac catheterization revealed a mean pulmonary artery pressure (PAP) of 45 mmHg, necessitating conversion to Fontan circulation. Given the improvement in pulmonary hypertension with minimal invasion, the patient underwent a modified Van Praagh operation (main PA to left common carotid artery graft bypass) along with cortriatriatum repair and bilateral PA banding.

Results:
The postoperative course was uncomplicated. At 8 months old, the mean PAP improved to 15 mmHg on the left and 23 mmHg on the right. The patient underwent the Norwood procedure with a modified Blalock-Taussig shunt. The patient was delayed sternal closed 2 days after surgery, and extubated on postoperative 5 days. The patient is awaiting the Glenn procedure.

Conclusions:
The modified Van Praagh operation preceding the Norwood procedure for patients converting from biventricular repair to Fontan circulation in the presence of severe pulmonary hypertension is considered an effective and less invasive approach.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1531 - COMPLETE AORTIC REPLACEMENT FROM ROOT TO SUPRARENAL ABDOMINAL AORTA IN A PEDIATRIC LOEYS DIETZ PATIENT A CASE REPORT

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Background / Hypothesis:
Loeys-Dietz syndrome (LDS) is a rare connective tissue disorder associated with aggressive aortic aneurysm formation and dissection, necessitating surgical intervention early in life. In particular, valve-sparing aortic root replacement (VSRR) and total arch replacement (TAR) are rarely performed in pediatric patients due to the challenges of growth potential and long-term durability. We present a case of total aortic replacement, from root to suprarenal abdominal aorta, performed in a pediatric patient with LDS.

Materials and Methods:
She was diagnosed with Loeys-Dietz syndrome with TGFBR1 gene mutation and underwent ascending aorta replacement with 20-mm Hemashield graft when she was 7 years old. Three weeks after discharge, she presented with acute aortic dissection at distal arch requiring emergent aortic arch replacement with 22-mm Hemashield graft by island technique. Six days postoperatively, she experienced sudden aortic rupture at the distal anastomosis site while in intensive care, requiring emergent bedside procedure for total descending thoracic aorta replacement with 22- and 16-mm Hemashield grafts. One month later, a thoracoabdominal aorta aneurysm (Crawford type III) was detected on postoperative imaging and was subsequently replaced with 16-mm Hemashield graft. Seven years passed uneventfully, however, gradual dilatation of aortic root (48.6 mm) and residual aortic arch (35.8 mm) necessitated redo aortic surgery. Thus, we performed VSRR with 26-mm Gelweave Valsalva graft, followed by staged completion TAR with 20/10/10/8/8-mm Hemashield Platinum Woven Aortic Branch graft.

Results:
The patient recovered uneventfully without acute complications. VSRR and staged TAR were successfully performed to manage multi-level aortic aneurysm in the pediatric LDS patient.

Conclusions:
This case highlights the complexity and feasibility of staged total aortic replacement in pediatric LDS patients with progressive aortic disease. Given the high risk of major adverse aortic events in young LDS patients, close surveillance and individualized surgical timing are crucial for optimizing long-term outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1533 - MYTH BUSTER MODIFIED ULTRAFILTRATION (MUF) DOES NOT REDUCE INFLAMMATORY MEDIATOR BURDEN AFTER CHILDREN'S HEART SURGERY WITH CARDIOPULMONARY BYPASS.

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Background / Hypothesis:
Cardiopulmonary bypass (CPB) is associated with systemic inflammation contributing to post-operative morbidity. Modified ultrafiltration (MUF) as an effective immunomodulatory therapy is debatable. We examine inflammatory mediator concentration changes through MUF pediatric cardiac surgery.

Materials and Methods:
This sub-analysis of a prospective study (NCT05154864) on 40 pediatric cardiac surgery patients using CPB and sub-zero balance continuous ultrafiltration. Concentrations of 33 inflammatory mediators (complement, chemokines, cytokines, adhesion molecules) were analyzed by Luminex. Patient serum(s) and MUF effluent were examined Pre-MUF and Post-MUF. Within-individual magnitude of mediator concentration change of s-Post-MUF relative to s-Pre-MUF baseline was expressed as a median fold-change (FC), ([s-Post-MUF]–[s-Pre-MUF]/[s-Pre-MUF]) with [95% confidence interval] estimated by 1000 non-parametric bootstrap samples. Adjusting for hemoconcentration alone, predicted s-Post-MUF mediator concentration change (Figure1 red line) was calculated with C1V1=C2V2 principle, multiplying the observed s-Pre-MUF concentrations by MUF hemoconcentration factor (Estimated Patient Circulating Blood Volume/(Estimated Patient Circulating Blood Volume–MUF Volume)). For mediators extracted during MUF, mediator mass extraction fraction was calculated using measured concentrations and estimated patient circulating blood volumes: (Mediator Mass in MUF Effluent/(Mediator Mass in MUF Effluent + Mediator Mass in Patient Serum)). Statistical analysis used Wilcoxon signed rank test with alpha p=0.05.

Results:
C3a concentration was the only decreased serum mediator after MUF (FC=-0.11[-0.21–0.00] (p=0.02)). C2(FC=0.22 [0.05–0.35]), CCL2(FC=0.59 [0.33–0.78]), CCL4(FC=0.16 [0.02–0.35]), IL-1Ra(FC=0.28 [0.10–0.48]), IL-6(FC=1.28 [0.82–1.91]), IL-8(FC=0.70 [0.34–1.06]), P-selectin(FC=0.21 [0.04–0.27]), and ICAM1(FC=[0.02–0.24]) had statistically significant increase after MUF. Most mediators had observed- [Post-MUF] within the predicted-[Post-MUF] ranges, while mediators IL-6, IL-8, and CCL2 increased more than predicted(Figure1). C3a mediator extraction fraction was 71%[62%–79%]; all other mediators were <11%.

Conclusions:
Hemoconcentration increased inflammatory mediator concentrations post-MUF; IL-6, IL-8 and CCL2 increased more than expected. C3a was meaningfully extracted into MUF effluent, with a corresponding serum. Our findings refute the opinion that MUF is immunomodulatory.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1534 - RIGHT ATRIAL APPENDAGE AUTOGRAFT FOR PULMONARY VALVE RECONSTRUCTION IN A DEVELOPING COUNTRY A PROMISING APPROACH

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Background / Hypothesis:
In the effort to delay valve replacement during right ventricular outflow tract (RVOT) reconstruction, several strategies have been developed. The latest approach involves using an autograft from the right atrial appendage to create a neo-pulmonary valve. We present our experience.

Materials and Methods:
Between February 2023 and January 2025, we performed RVOT reconstruction using an autograft from the right atrial appendage in 18 patients. Fourteen patients had Tetralogy of Fallot (TOF), three had TOF with absent pulmonary valve syndrome, and one had pulmonary atresia with a ventricular septal defect. This technique was used in patients with a pulmonary annulus Z-score below -2. Postoperative function of the neo-pulmonary valve was assessed with immediate postoperative echocardiograms and at 4 to 6 months postoperatively.

Results:
The mean age of the patients was 30 months (range: 6 months to 12 years), with weights ranging from 7.05 kg to 30.5 kg. Immediate postoperative echocardiograms showed no insufficiency in 55.5% (n=10), mild insufficiency in 33% (n=6), and moderate insufficiency in 11% (n=2). The mean gradient was 25 mmHg (range: 9-33.6 mmHg). Follow-up echocardiograms at 4-6 months revealed no insufficiency in 25% (n=4), mild in 12.5% (n=2), moderate in 31.2% (n=5), severe in 18.7% (n=3), and free insufficiency in 16.6% (n=2). The mortality rate was 11.1% (n=2), unrelated to the surgical technique. As a modification, we performed atrial appendage eversion in the last two cases, resulting in a smooth tract without pectinate muscles. One patient developed stenosis of the neo-pulmonary valve, but valvuloplasty reduced the gradient from 73 mmHg to 12 mmHg without causing insufficiency

Conclusions:
Right atrial appendage tissue as a neo-pulmonary valve is a reproducible technique that maintains functional competency despite body weight variations. Long-term follow-up is necessary to assess its potential to replace or delay valve replacement.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1546 - EARLY OUTCOMES OF TETRALOGY OF FALLOT REPAIR IN CHILDREN WITH OR WITHOUT TRANSANNULAR PATCH IMPLANTATION AND MONOCUSP USE

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Background / Hypothesis:
To note the early outcomes of tetralogy of Fallot (TOF) repair in patients with or without transannular patch implantation and monocusp use.

Materials and Methods:
This retrospective study was performed at National Institute of Cardiovascular Diseases (NICVD), Karachi, Pakistan, from July 2022 to June 2023, involving 135 patients undergoing open heart surgery for TOF repair. Patients were categorized into three groups. Group-1, in which TOF repair was done without a transannular patch. Group-2 included patients with a transannular patch without monocusp valve implantations. Group-3 included patients with transannular patch with monocusp valve implantation. All procedures were performed as per standard surgical approaches. After the surgeries were completed, all patients were monitored for post-surgery complications and mortality.

Results:
In a total of 135 patients, 77 (57.0%) were male. The mean age was 7.31±6.11 years. Cross-clamp time ($p<0.001$), and bypass time ($p<0.001$) were significantly low among patients undergoing TOF repair without transannular patch. Right ventricular dysfunction was the commonest post-surgery complication, noted in 129 (95.6%). Right ventricular dilatation, and hypotension were observed in 39 (28.9%), and 15 (11.1%) patients, respectively. Patients in TOF repair with transannular patch without monocusp valve implantations experienced worse outcomes in several key measures, including right ventricular dysfunction, right ventricular dilatation, low cardiac output, acute liver dysfunction, longer mechanical ventilation, longer ICU stays, and higher mortality.

Conclusions:
TOF repair with transannular patch implantation without monocusp showed relatively worse outcomes. Transannular implantation with or without monocusp did not yield any kinds of superior post-surgery outcomes when compared to TOF repair without TAP

POSTER PRESENTATIONS

Category: Cardiac Surgery

1554 - EFFECT OF ATRIOVENTRICULAR VALVE INTERVENTION ON PROGNOSIS OF CHILDREN WITH SINGLE VENTRICLE PHYSIOLOGY

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Background / Hypothesis:
Atrioventricular valve (AVV) dysfunction in children with single ventricle (SV) physiology severely impacts prognosis, but the optimal timing for valve intervention is unknown. To investigate this, we sought to study the results of surgical treatment of AVV dysfunction in SV patients and evaluate risk factors for prognosis.

Materials and Methods:
This single-center retrospective study included 54 patients with SV combined with AVV dysfunction at Children's Hospital of Fudan University. Differential analysis was used to access the impact of AVV intervention on prognosis.

Results:
In the intervention group, 10 completed the Fontan procedure, 8 underwent the Glenn procedure, and 1 underwent pulmonary artery contraction surgery. The median age at the time of the Fontan procedure was 6.6 years (interquartile range [IQR]: 4.5-7.3). No valve intervention was needed after the Fontan procedure. In the non-intervention group, 21 completed the Fontan procedure, and 14 underwent the Glenn procedure. Before surgery, there were 4 cases of moderate regurgitation and 15 cases of severe regurgitation in the intervention group, 29 cases of moderate regurgitation and 6 cases of severe regurgitation in the non-intervention group. The morphology of AVV was mitral (n=7), tricuspid (n=31), or common (n=16). Valve intervention included simple annular contraction (n=6), simple valvuloplasty (n=4), annular contraction combined with valvuloplasty n=8), and mechanical valve replacement (n=1). The early mortality was higher in the intervention group than in the non-intervention group (10.5% vs 5.7%, $P<0.05$), but the rate of freedom from AVV failure (70.5% VS 36.4%, $P<0.05$) and Fontan failure (82.4% VS 69.7%, $P<0.05$) was significantly higher in the intervention group than in the non-intervention group.

Conclusions:
AVV intervention in patients with SV combined with AVV dysfunction leads to a higher mortality, but improves survival of AVV and Fontan circulation.

POSTER PRESENTATIONS

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1555 - THE LONG TERM OUTCOMES OF PULMONARY ATRESIA WITH INTACT VENTRICULAR SEPTUM COHORT FROM KOREAN MULTI CENTER REGISTRY

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Background / Hypothesis:
The long-term outcomes in patients with pulmonary atresia with intact ventricular septum (PA IVS) remain still unclear. This study aimed to analyze the outcomes of PA IVS Cohort in Korea.

Materials and Methods:
The medical records of 555 patients who were diagnosed with PA IVS in 10 cardiac centers were reviewed. Data were collected on Patient demographics, baseline anatomical characteristics, details of intervention, and follow-up data. Patients were divided into two groups according to the repair pathway: two-ventricular (2V) repair pathway (n=457) or one ventricular (1V) repair pathway (n=94). The primary outcomes were survival. We also looked at long-term adverse effects, cardiopulmonary exercise test results, oxygen saturations, and functional status.

Results:
Among them, 358 (64.9%) were men. The mean age at was 17.5 years old. The overall survival rates were 87.2% at 10 years. The risk factors of mortality included undergone percutaneous balloon atrial septostomy, having post-procedural complication at the first admission, and NYHA functional class 3 or higher at last follow-up. Compared with the 1V repair pathway group, the 2V repair pathway group had higher TV Z score and PV Z score, moderate TR or higher, PA morphology of critical PS type, and RV morphology of tripartite or bipartite. There was no significant difference in the survival curve between the two groups(p=0.069. In long-term outcomes, the 2V repair pathway group had higher SpO2, superior NYHA class, and higher peak VO2 in CPET compared to the 1V repair pathway group.

Conclusions:
The mortality of pulmonary atresia and intact ventricular septum is still high and early mortality accounts for a large portion. The 2V repair pathway group had better outcomes in terms of exercise capacity and symptoms compared to the 1V repair pathway group, and there was no difference in survival rate.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1577 - AORTIC ROOT MYCOTIC ANEURYSM IN A PEDIATRIC PATIENT WITH A HISTORY OF SURGICALLY CORRECTED CONGENITAL HEART DISEASE THE CHALLENGES IN THE SURGICAL TREATMENT

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Background / Hypothesis:
Aneurysms are arterial dilations due to vessel wall weakness, most commonly affecting the aorta. They can be true or pseudoaneurysms, with rupture risk. Early diagnosis is crucial to prevent fatal complications. Mycotic aneurysm (MA) of the aortic root is a rare, life-threatening condition in pediatric patients, particularly those with congenital heart disease. Streptococcus sanguinis, an oral commensal bacterium, has been linked to infective endocarditis with vascular complications. Treatment requires resection and reconstruction using advanced techniques like Bentall, Cabrol, and Manouguian procedures, posing challenges in pediatrics due to small anatomy and the need to accommodate cardiovascular growth.

Materials and Methods:
A 14-year-old male with a history of subvalvular aortic stenosis and aortic coarctation, surgically corrected in 2018, presented in 2024 with fever, palpitations, and weight loss. Blood cultures identified S. sanguinis, as a relevant history, he had multiple dental extractions under antibiotic prophylaxis. Echocardiography revealed two valvular vegetations and a 45 mm aortic root aneurysm confirmed by MRI with severe aortic insufficiency.
Surgery included:
- Aneurysm and vegetation resection.
- Bentall procedure with mechanical valve replacement.
- Manouguian annular enlargement.
- Cabrol coronary bypass.
- Peripheral ECMO for hemodynamic instability.

Results:
The procedures successfully restored aortic root integrity and coronary circulation. Despite postoperative complications, including pneumonia and pancreatitis, the patient recovered with no residual valvular dysfunction. He was discharged in stable condition.

Conclusions:
Mycotic aneurysm of the aortic root secondary to S. sanguinis infective endocarditis in pediatric patients is an extremely rare condition with high morbidity and mortality. The combination of the Bentall, Manouguian, and Cabrol procedures enabled effective aortic root reconstruction and optimized coronary perfusion in a patient with complex anatomy. Given the limited number of reports on pediatric MA, this case provides evidence of the efficacy of advanced surgical techniques in pediatric aortic surgery, setting a precedent for their application in similar scenarios.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1580 - THE LUGONES PROCEDURE FOR SCIMITAR SYNDROME REPAIR THROUGH RIGHT AXILLARY THORACOTOMY INITIAL EXPERIENCE

Jimena Jiménez-martínez [1], Héctor Diliz-nava [1], Luis García-benítez [1], Diego Rodríguez-alvirde [1], Alejandro Reyes-rodríguez [1], Denya Sánchez-quintero [1], Samuel Alejandro Jiménez-pérez [1], Alexis Palacios-macedo [1]
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Background / Hypothesis:
Several surgical techniques have been described over the years for the correction of Scimitar syndrome. Nevertheless, a pathway obstruction along with an IVC stenosis are common complications associated with these procedures. Lugones and coworkers described a surgical technique for repairing this anomaly through a midline sternotomy with excellent postoperative results. We present two pediatric cases where an alternative approach was performed integrating the advantages of the Lugones technique with the added benefits of a right axillary thoracotomy.

Materials and Methods:
Case 1:
A 6-year-old female referred to our institute with the diagnosis of Scimitar syndrome. Transthoracic echocardiography confirmed the diagnosis, and a CTscan showed a horizontal variant of the scimitar vein. Surgical correction was tailored to address this variant through a right axillary approach.

Case 2:
A 2-year-old male patient referred to our institution with history of neonatal diagnosis. Workup at our institution confirmed the diagnosis and revealed a vertical scimitar vein, and a right intralobar pulmonary sequestration. Pulmonary sequestration was embolized prior to the surgical procedure. The traditional Lugones technique was performed through a right axillary approach.

Results:
The Lugones technique through a right axillary thoracotomy was used successfully in both anatomic variants. Both patients had a favorable recovery, with a 5-day hospital stay, no residual defects, and no significant complications. In both cases, follow-up has been maintained for at least 2 years, with no need for further interventions and an adequate clinical evolution.

Conclusions:
The axillary approach for the Lugones technique is a reproducible, less invasive and effective alternative for correcting Scimitar syndrome. Not only offers better aesthetic results, it provides excellent visualization of the posterior anatomical structures and minimizes the risk of postoperative obstruction, emphasizing the importance of tailoring the surgical approach to the patient's anatomy and the surgical team's expertise.

POSTER PRESENTATIONS

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1590 - IMPROVING POST OPERATIVE COMMUNICATION FOR PEDIATRIC CARDIAC SURGERY A QUALITY IMPROVEMENT INITIATIVE

Emily Tai [1], Amy Fotheringham [1], Andrew Campbell [1]
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Background / Hypothesis:
At BC Children's Hospital in Vancouver, Canada, pediatric patients recovering from congenital heart surgery require monitoring, particularly in the first 30 days post-operatively, when complications are most likely (Agarwal et al, 2014). The existing communication system, relying on phone calls after discharge, was inadequate for timely responses, potentially delaying critical interventions. To address this, we developed the "CardioCare Check-In," an online tool designed to provide real-time updates on key post-operative parameters. The aim of this quality improvement project is to ensure 90% of post-operative pediatric cardiac surgery patients complete a timely check-in within 24-48 hours after discharge within 12 months of implementation.

Materials and Methods:
Patients/families receive text message reminders to report updates on key post-operative parameters like temperature, wound healing, and respiratory status within the targeted 24-48 hour window from discharge from cardiac surgery. Healthcare providers review these updates in real time, ensuring timely responses. Usage and patient/family data is then analyzed and critically evaluated.

Results:
Data collection and analysis is currently ongoing. Initial results suggest the CardioCare Check-In tool enabled faster responses to family-reported concerns, reducing communication delays. Patients/families expressed higher satisfaction with the ability to provide real-time updates.

Conclusions:
The implementation of the CardioCare Check-In tool provides timely follow-up for most post-operative pediatric cardiac surgery patients after discharge. By enabling real-time updates on critical post-operative parameters, the tool improves timeliness, accessibility, and quality of care, leading to better outcomes and greater family and patient satisfaction. This project highlights the potential for technology to enhance care delivery in high-stakes healthcare settings and should be considered for wider adoption across other pediatric specialties.

Agarwal et al. (2014). Postoperative complications and association with outcomes in pediatric cardiac surgery. The Journal of Thoracic and Cardiovascular Surgery, 148(2), pp. 609-616.

POSTER PRESENTATIONS

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1592 - A NEW TECHNIQUE FOR MINIMALLY INVASIVE STERNOTOMY USING THE ALEXIS O WOUND PROTECTOR RETRACTOR IN PEDIATRIC CARDIAC SURGERY

Pierre Maminirina [1], Olivier Baron [1], Jihed Laribi [1], Modesto Fernandez [1], Mohamedou Ly [1]
University Hospital, Pediatric Cardiac Surgery, Nantes-France [1]

Background:
Minimally invasive cardiac surgery is particularly challenging in pediatric patients with low body weight due to limited operative space. We introduce a novel technique to optimize surgical exposure using the Alexis O Wound Protector Retractor (Alexis OWPR) system to facilitate safer and efficient minimally invasive sternotomy in children.

Materials and Methods:
The Alexis O Wound Protector Retractor, originally used in Transperitoneal Laparoscopy surgery, was adapted for use in mini-sternotomy. We developed a new technique integrating this device into pediatric cardiac procedures. The retractor comes in two sizes: Small: 2.5-6 cm and Medium: 5-9 cm. Both sizes are suitable for this method and are selected based on the length of the incision.

Results:
A mini-incision was made, extending from the Angle of Louis to the lower line of the sternum in his insertion to the xiphoid process. The appropriate Alexis OWPR size was chosen accordingly. After performing a complete sternotomy, the retractor was inserted and gently rolled to retract surrounding tissues, providing maximum exposure while minimizing trauma. Following pericardial opening, the pericardium was suspended on the ring of the Alexis OWPR to elevate the heart and aorta. This exposure enabled safe cannulation of the aorta, right atrial appendage, and inferior vena cava for cardiopulmonary bypass. This technique allows for effective performance of standard cardiac procedures such as Atrial septal defect repair, Ventricular septal defect closure, simple Tetralogy of Fallot correction, Right ventricular outflow tract obstruction relief, and surgery for aortic stenosis. At the end of the surgery, the mini incision enables us to provide a short line of scar.

Conclusions:
The Alexis O Wound Protector Retractor system offers a practical and efficient tool for minimally invasive sternotomy in pediatric cardiac surgery. By selecting between two retractor sizes, surgeons can tailor the approach to the patient's anatomy while maintaining excellent exposure and reducing surgical trauma.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1595 - CONVERSION FROM SINGLE VERNTRICLE TO BIVENTRICULAR CIRCULATION IN A BIGLENN WITH ILIAC IVC HOMOGRAFT.

Sara Elena Mendoza [1], Diego Marquez [1], Justo Santiago [2], Claudia Florez [3], Javier Castro [3]
Fcv, Cardiac Surgery, Floridablanca-Colombia [1] Fcv, Cath Lab, Floridablanca-Colombia [2] Fcv, Cardiology, Floridablanca-Colombia [3]

Background / Hypothesis:
The diagnosis of a single ventricle carries significant morbidity and mortality. Fontan patients at 40 years of age have the same risk of death as 75-year-old individuals in the general population. We present a case report on the conversion to biventricular physiology and anatomy in a patient at the Glenn stage.

Materials and Methods:
A 7-y-o male with pulmonary atresia and ventricular septal defect (VSD), underwent a bilateral Glenn procedure with atrial septostomy in Venezuela at 1 year of age. The patient was evaluated for conversion to a biventricular circulation due to good function, appropriate ventricular volumes, and well-sized pulmonary arteries.
The surgical procedure began with the takedown of the left-sided Glenn anastomosis. Reconstruction was performed using an end-to-end anastomosis of the left SVC to an iliac vein homograft with a running suture. The right Glenn was also taken down, followed by right pulmonary artery (RPA) plasty with a bovine pericardium patch.
The aorta was cross-clamped, a 14-mm VSD was closed using a bovine pericardium patch. A 22-mm pulmonary homograft was placed in the right ventricular outflow tract (RVOT). The atrial septal defect (ASD) was repaired with a fenestrated bovine pericardium patch. The iliac vein homograft was directly sutured to the right atrium (RA), reconstructing the RA-SVC junction. Finally, the right SVC was connected to the iliac vein homograft via a lateral-end anastomosis.

Results:
Echocardiography revealed laminar flow through the reconstructed bilateral SVCs to the iliac vein homograft, normal left and right ventricular sizes, and good biventricular function.
During the post operative period, patient experienced: Left SVC Thrombosis: Secondary to jugular catheter, managed with anticoagulation and stent placement.

Conclusions:
Single-ventricle patients have a significant risk of morbidity and mortality. Consider the feasibility of converting single-ventricle patients to a biventricular circulation whenever possible, given its substantial long-term benefits.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1597 - VALVE SPARING ROOT REPLACEMENT AFTER ROSS PROCEDURE A MONOCENTRIC RETROSPECTIVE STUDY

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University Hospital, Pediatric Cardiac Surgery, Nantes-France [1]

Background:
Reintervention after Ross procedure (RP) is frequent in young patients. We describe our experience in Redo surgery after RP focusing on valve-sparing root replacement (VSRR).

Materials and Methods:
We reviewed all patients deferred to a Redo surgery interessing the aortic root, after a previous RP, in our center from 1998 to 2023. The indication could relate to the aortic or the pulmonary root. The follow-up for all of them was provided by local cardiologists, including regular trans-thoracic echocardiography (TTE)

Results:
171 patients underwent a Ross procedure were reviewed. 22 patients needed a Redo surgery for aortic root dilatation or pulmonary root stenosis. Among these 22 patients, 11 underwent a VSRR procedure (David procedure) associated with a changing of the pulmonary homograft: 4 for an aortic root dilatation with aortic valve regurgitation, 6 for a pulmonary tube dehiscence with stenosis, and one for a pulmonary autograft infectious endocarditis. Mean age was 15,8 years (SD = 10,06 years). 9 of them were men. Mean follow up was 4,5 years. Mean cross-clamp and CPB time were 173 minutes (SD = 31, 44), 259 minutes (SD = 77,17). The median ICU and Hospital stay were 4,5 days (IQR = 3,25;7,25), 14 days (IQR = 7,5;18,5). Cumulative survival was 100% at hospital discharge, 1, 2 and 5 years. Freedom from reoperation at hospital discharge was 90,9% (10/11), and equal at 1, 2 and 5 years. One patient underwent a new surgery for infectious endocarditis and one patient needed a coronary catheterism. No aortic valve regurgitation or aneurysmal dilatation was observed during the follow up.

Conclusions:
David procedure seems to present good mid-term results when performed as a Redo after a Ross procedure. In our opinion, this should be performed for both aortic and pulmonary indication, to prevent multiples surgeries, and especially before left ventricular dysfunction.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1598 - TETRALOGY OF FALLOT CORRECTION WITH CONCOMITANT SLIDE TRACHEOPLASTY IS IT SAFE AND EFFECTIVE

Nicolò Vitale [1], Bosco Moscoso [2], Alejandro Cisneros [2], Javier Gomez [2], Oliver Haag [3], Stefano Congiu [2]
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Background / Hypothesis:
We present a case of a patient who underwent simultaneous repair of Tetralogy of Fallot and slide tracheoplasty.
Congenital heart diseases are rarely associated with tracheal pathologies requiring surgical correction. Due to the rarity of this association, no established guidelines exist. The literature contains few reports on the simultaneous surgical correction of congenital heart disease and tracheal pathology. However, existing studies suggest that performing these two procedures in the same surgical intervention does not lead to an increased risk of mortality or morbidity.

Materials and Methods:
The patient is a 1-year-and-4-month-old male diagnosed with Tetralogy of Fallot and tracheal stenosis due to complete tracheal rings. At birth, he underwent a ductal stent placement.

Preoperative Findings:
Echocardiogram: Small patent foramen ovale, preserved ejection fraction, right ventricular hypertrophy, ventricular septal defect (6×7 mm) with bidirectional shunt, overriding aorta, patent ductal stent, and right ventricular outflow tract (RVOT) stenosis with a peak gradient of 80 mmHg.

Computer tomography (CT) Scan: Showed a reduced tracheal lumen a few centimeters above the carina.

The patient underwent Tetralogy of Fallot correction with concomitant slide tracheoplasty.

Results:
The patient had a successful recovery. The most recent echocardiogram showed:
No residual ventricular septal defect (VSD)

Right ventricular outflow tract peak gradient of 17 mmHg

Right ventricular hypertrophy with preserved function

No tricuspid regurgitation

At the latest clinical follow-up, the patient had no stridor or dyspnea, and bronchoscopy confirmed the absence of residual tracheal stenosis.

POSTER PRESENTATIONS

Conclusions:
This case report provides additional evidence supporting the feasibility and safety of concomitant cardiac and tracheal surgery. Our findings align with the limited literature suggesting that these procedures can be performed without an increase in mortality or morbidity.

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Category: Cardiac Surgery

1599 - GOOSENECK DEFORMITY AND LEFT VENTRICULAR OUTFLOW TRACT OBSTRUCTION AFTER COMPLETE ATRIO VENTRICULAR SEPTAL DEFECT REPAIR. HOW TO MANAGE

Nicolò Vitale [1], Bosco Moscoso [2], Alejandro Cisneros [2], Javier Gomez [2], Stefano Congiu [2]
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Background / Hypothesis:
The "gooseneck deformity" is a characteristic radiological sign observed in atrioventricular septal defects (AVSD). This deformity appears as an elongation and narrowing of the left ventricular outflow tract (LVOT) in lateral angiographic images of the left ventricle.
The uniqueness of this case lies in the combination of the Commando procedure (indicated to allow the implantation of a larger mitral prosthesis), with a technique described by Yacoub in 1999 (mobilization of the right and left fibrous trigone), and with a septal myectomy.

Materials and Methods:
The patient is a 16-year-old girl with Down syndrome and a history of complete atrioventricular septal defect surgically corrected at the age of one year. At the age of ten, she underwent mitral valve replacement with an 18 mm mechanical prosthesis.
She was admitted to the hospital with a diagnosis of endocarditis on the mitral valve, moderate aortic valve regurgitation (diameter 8 mm), and left ventricular outflow tract gradient of 60 mmHg.
Surgical intervention was indicated to replace the mitral valve with a larger prosthesis, replace the aortic valve, and enlarge the inflow tract.
The patient underwent a Commando procedure, including:
Mobilization of the right and left fibrous trigone,
Myectomy,
Mitral valve replacement with a 23 mm mechanical prosthesis,
Aortic valve replacement with a 23 mm mechanical prosthesis.

Results:
The patient was successfully weaned off cardiopulmonary bypass without complications.
Postoperative echocardiographic evaluation showed:
No prosthetic leaks in the mitral and aortic valves,
No gradient in the left ventricular outflow tract,
The patient remained in sinus rhythm without the need for a pacemaker.

Conclusions:
This case report aims to propose an alternative approach to managing left ventricular outflow tract obstruction caused by the anatomy underlying complete atrioventricular canal defects.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1607 - INCIDENCE OF MEDIASTINITIS AFTER DELAYED CLOSURE OF STERNUM AFTER PEDIATRIC CARDIAC SURGERY

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Background / Hypothesis:
Delayed Closure of Sternum (DCS) can by applied to optimize hemodynamics after pediatric cardiac surgery and is often required after central cannulation for extracorporeal membrane oxygenation (ECMO). DCS may be associated with increased postoperative risk of infection.

Materials and Methods:
Retrospective evaluation of 93 consecutive patients between 2013 and 2022 whose sternum was left open following pediatric cardiac surgery. Wound swab culture was taken before DCS. Clinical course was analysed.

Results:
Mean patient age was 13 weeks (range 1 day – 166 weeks) and mean duration of open chest was 11 days (range 2 – 21 days). Central cannulation for ECMO was performed in 53 % (n = 49) of children. Positive swab culture was noted in 6,5 % (n = 6) of cases and the most common pathogen was coagulase-negative stapühylococcus. The need for ECMO therapy and duration of open sternum was associated with increased mortality but there was no correlation with increased incidence of culture-positive mediastinitis.

Conclusions:
DCS is associated with low incidence of culture-positive mediastinits and can be safely applied in selected population.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1620 - SURGICAL SITE INFECTION IN DELAYED STERNAL CLOSURE IN PEDIATRIC CARDIAC SURGERY AND ITS RISK FACTORS EXPERIENCE OF A CENTER IN CHILE

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Background / Hypothesis:
Delayed sternal closure (DSC) is used in high-complexity cardiothoracic surgery. It may be associated with increased morbidity and mortality, as well as surgical site infections (SSI). The reported incidence ranges from 1.5% to 34%

Materials and Methods:
Observational, descriptive study in children undergoing heart surgery who required DSC between January 2015 and December 2020 at the Clinical Hospital of the Pontifical Catholic University of Chile who met the definition of SSI established by the Chilean Ministry of Health. The comparison of the SSI rate in DSC between the period 2009-2010 (Rev Chilena Infectol 2016; 33 (5): 495-500) and 2015-2020 was performed by calculating the Poisson rate ratio, including its 95% CI and p value. R statistical program was used

Results:
A total of 1,471 surgeries were performed during the study period, of which 138 (9.3%) required DSC and 6 (4.3%) developed SSI. Of the total number of patients with SSI, 3/6 had a RACHS-1 score of 5-6 and associated comorbidities. 2/6 had previous surgical interventions. 4/6 had extracorporeal circulation (ECC) time >200 minutes, 5/6 had an open chest for more than 2 days, and invasive mechanical ventilation (IMV) for more than 5 days. Causative microorganisms for SSI were identified in 5/6. Comparatively, during the 2009-2010 period, 514 surgeries were performed, 11.2% required DSC, and 22% developed SSI. The SSI rate in 2015-2020 was significantly lower than in 2009-2010, with a rate ratio of 5.16 (95% CI 1.83-16.54, p=0.001). No significant differences were found in the risk factors associated with SSI between the study periods: ECC >200 minutes; IMV >5 days; and RACHS-1 score 5-6. p-value >0.05. (See tables).

Conclusions:
The SSI rate in DSC was 4.3%. This could be attributed to improvements in cardiovascular care, including surgical techniques, specialization of the Intensive Care Unit, and measures implemented by the Healthcare-Associated Infections (HAI)

POSTER PRESENTATIONS

Category: Cardiac Surgery

1635 - THE EFFECT OF BLALOCK TAUSSIG SHUNT SIZE ON PULMONARY ARTERY GROWTH AND TRICUSPID REGURGITATION AT THE TIME OF FONTAN COMPLETION

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Background / Hypothesis:
We previously studied (1) the impact of Blalock-Taussig (BT) shunt size (3.0-mm versus 3.5-mm) on outcomes of the second stage (BCPC) in patients with Hypoplastic Left Heart Syndrome(HLHS)(born between 2006 and 2011). Less tricuspid regurgitation (TR) but smaller pulmonary artery (PA) diameters with 3.0-mm shunts were found. Here we study the outcomes of Fontan completion for this same cohort.

Materials and Methods:
Retrospective assessment. Data were obtained following Fontan completion. Electronic medical records, operative history and imaging studies were reviewed to assess the effect of BT shunt size on Fontan outcomes, PA size and TR severity.

Results:
Forty-six patients survived to Fontan completion (3.0-mm shunt=22, 3.5-mm shunt=24). PA size was smaller in the 3.0-mm group (mean Nakata index -168mm2/m2) compared with the 3.5-mm group (mean Nakata index -271mm2/m2) (p=0.02). Degree of TR at the time of Fontan completion was similar between the two groups. Lifetime need for PA augmentation (transcatheter or surgical) was 56% in the 3.0-mm group and 43% in the 3.5-mm group (p=0.40). 5% of those in the 3.0-mm group had moderate or severe TR at Fontan as compared to 10% in the 3.5-mm group (p=0.85). The lifetime need for tricuspid repair for significant TR was 19% in the 3.0-mm group and 35% in the 3.5-mm group (p=0.23). There were four post-BCPC deaths (4/28) in the 3.0-mm group (1 early and 3 late) and one (1/25) late death in the 3.5-mm group. There were three deaths post-Fontan (3/22, 2 early and 1 late) in the 3.0-mm group with none in the 3.5-mm group. Early deaths were secondary to Fontan failure and significant thrombo-embolism.

Conclusions:
At the time of Fontan completion for patients with HLHS, a 3.5-mm BT shunt during Norwood was associated with a statistically larger PA size than with 3.0-mm shunts, while shunt size did not impact TR.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1642 - BILATERAL BIDIRECTIONAL CAVOPULMONARY DERIVATION TO BIVENTRICULAR PHYSIOLOGY IS IT POSSIBLE

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Background / Hypothesis:
Bidirectional cavopulmonary anastomosis is routinely used as a preliminary step to the Fontan procedure in single ventricle pathophysiology. Therefore, this case represents a milestone, as the patient successfully underwent surgery with biventricular function 11 years after the first procedure.

Materials and Methods:
A 15-year-old female patient was diagnosed at birth with pulmonary atresia with interventricular communication, double outlet right ventricle with anterior and right aorta, posterior and left pulmonary aorta. At 11 months of age, due to deterioration of functional class, angioplasty with stenting on the ductus arteriosus was performed.

At 4 year old, she presented syncope and increased central cyanosis, so she was re-evaluated at an external hospital where they decided to perform bilateral bidirectional cavopulmonary shunt with satisfactory progress. She was followed up in the outpatient clinic with aspirin, and was referred to our unit for further treatment.

She was known at our institute at the age of 15, a catheterization was performed and reported LVD2 10 mmHg, MAP 12 mmHg, McGoon 1.25, Nakata 160.3 mm2/m2.
In a medical-surgical session, it was decided to perform left ventricular flow redirection to the aorta with a bovine pericardial patch, a Rastelli procedure with a 24 mm PTFE tube valved with a 23 mm bovine aortic biological prosthesis, partial closure of the atrial septal defect

Results:
The patient was discharged thirteen days after the procedure with improvement in his functional class and with follow-up in an outpatient clinic.

Conclusions:
A patient undergoing univentricular surgery was reassessed using imaging methods and found to have adequate parameters for biventricular physiology. Even though he had a bilateral bidirectional cavopulmonary shunt, dismantling it was complex due to surgical technical issues and there was a higher risk of postoperative complications. Is it appropriate to call this a biventricular correction or a three-quarters correction?

POSTER PRESENTATIONS

Category: Cardiac Surgery

1646 - EXPERIENCE OF SURGICAL TREATMENT OF INFECTIVE ENDOCARDITIS IN CHILDREN AT THE FEDERAL CENTER FOR CARDIOVASCULAR SURGERY KRASNOYARSK

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Background / Hypothesis:
Infectious endocarditis is very difficult to treat in children

Materials and Methods:
21 children diagnosed with infective endocarditis (IE) underwent surgery. 6 had primary endocarditis (5 left and 1 right-sided), 15 had secondary endocarditis (5 left, 9 right and 1 both chambers). The patients' ages ranged from 3 months to 16 years.
In primary endocarditis, the MV was affected - 3, both the AV and MV - 2, TV in 1 case. In secondary endocarditis: 5 had not undergone prior surgery (3 with bicuspid AV, 1 with VSD, 1 with PDA); among previously operated children: pulmonary conduit involvement was observed in 8 cases, in 1 case of AV involvement (post-aortic stenosis repair) and 1 case of MV involvement (post-VSD repair).
The onset of the disease was associated with acute respiratory viral infection in 7 cases, fever of unknown origin in 7 cases, progression of heart failure in 3 cases, early postoperative period in 2 cases, acute cerebrovascular accident in 1 case, and pneumonia in 1 case. The diagnosis of infective endocarditis was established within the early postoperative period, up to 3 months from the first symptoms. Sepsis was present preoperatively in 6 patients, with no correlation to primary or secondary involvement. Positive blood cultures were obtained in 4 cases. Preoperative antibiotic therapy lasted from 9 to 79 days (29.5±20.6), mostly involving combinations of different.
Surgical correction was performed in all cases, with the following procedures: single-valve interventions – 14 patients; multi-valve interventions – 5 patients,CHD corrections – 1 VSD closure with PA repair, 1 PDA ligation with vegetation removal from the PA.
Two fatal outcomes. In the valve repair group, reoperations were required after 1 year due to valve dysfunction; 19 cases, endocarditis endocarditis treatment was completed with recovery.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1653 - PULMONARY VASODILATOR THERAPY IN PATIENTS WITH FONTAN CIRCULATION A META ANALYSIS

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Background / Hypothesis:
There is no consensus on the effect of pulmonary vasodilator therapy for the patients with Fontan circulation. Therefore, we aimed to assess the effects thereof on the exercise capacity and hemodynamic parameters in patients with Fontan circulation.

Materials and Methods:
Relevant studies were identified by searching the PubMed, EMBASE, and Cochrane Library databases from their inception dates until November 2023. The pooled outcomes were used to assess the efficacy of pulmonary vasodilators in patients with Fontan circulation.

Results:
A total of 21 studies involving 667 patients with Fontan circulation were included in this meta-analysis. The exercise capacity was assessed in 14 studies involving 526 patients. Pulmonary vasodilator therapy led to significant improvement in the oxygen consumption anaerobic threshold (mean difference=1.12 mL/min/kg, 95% confidence interval (CI): [0.35, 1.89]; p=0.004) and minute ventilation versus carbon dioxide production slope (mean difference=-1.14, 95% CI: [-1.97, 0.31]; p=0.007) during cardiopulmonary exercise test. No significant differences were found among drug classes in the effects evaluated by peak VO2, VE/VCO2, and VO2 AT.
Invasive hemodynamic parameters were assessed in 6 studies involving 126 patients. Pooled estimates of the change in mean pulmonary arterial pressure (mean difference=-2.28 mmHg, 95%CI: [-3.83, -0.73]; p<0.02), pulmonary vascular resistance (mean difference=-0.91 WU*m2, 95%CI: [-1.40, -0.42]; p<0.01), and pulmonary flow (mean difference=0.46 L/min/m2, 95%CI: [0.15 ~ 0.78]; p=0.02), were significantly different after treatment.

Conclusions:
Pulmonary vasodilator therapy appears to be beneficial, in the categories of exercise capacity or pulmonary hemodynamics in patients with Fontan. Randomized controlled trials with more data and longer follow-up durations are required to confirm our findings.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1656 - SURGICAL TREATMENT OF AORTIC STENOSIS IN CHILDREN

Pavel Teplov [1], Alexandr Miller [1], Egor Gvozd [1], Mariya Kollodkina [1], Valeriy Sakovich [2], Dmitriy Drobot [3]
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Background / Hypothesis:
Demonstration of the evolution of aortic valve defect treatment methods in children at the Krasnoyarsk Federal Center for Cardiovascular Surgery.

Materials and Methods:
Over 13 years, 122 children underwent 149 interventions for aortic valve pathology.
Age distribution: newborns (15%), 1 month–1 year (21.1%), >1 year (63.9%). Primary interventions included aortic valve repair (55 cases, 29% reoperations), Ross procedure (38, 52.63%), valved homograft (22, 4.5%), mechanical valve replacement (21, 0%), balloon valvuloplasty (6, 33.3%), and Ozaki procedure (7, 85.7%). Reoperations (18.1%) were most common after Ross (25.9%) and homograft replacement (37%). Post-Ross reoperations (20 total) included 7 (35%) due to neoaortic dysfunction. Mortality: 7 cases (4.7%), mostly newborns (71.4%).
Treatment strategies evolved: Ross and repair dominated until 2021, then valved homografts replaced Ross (last performed in 2019). Pulmonary homografts proved safe (one early dysfunction, no mortality), avoiding warfarin but with higher cost. Large-diameter aortic homografts (introduced 2024) show promise but need long-term data.

Results:
Since 2022, balloon valvuloplasty became first-line for critical neonatal stenosis (6 cases), reducing mortality (none post-2021). Compared to open repair, it had similar efficacy (residual gradient 49/24 vs. 41/17 mmHg), lower risk (no mortality vs. 3 deaths), and delayed open surgery by 11 months. Valve insufficiency (≥grade 2) occurred in 13 open repairs.

Conclusions:
Endovascular neonatal treatment reduced mortality, enabling future valve-sparing interventions. Valved homografts currently yield superior outcomes. Mechanical prostheses remain effective but require root augmentation; warfarin increases exudative pericarditis risk.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1658 - WHEN THE AORTA FAILS A CASE OF POSTOPERATIVE TYPE B AORTIC DISSECTION FOLLOWING BENTALL SURGERY

Daniela Martinez Corona [1], Sheila Vania Sanchez Lopez [2], Israel García Dávalos [1], David Salazar Lizárraga [1], Horacio Márquez González [1], Diana López Gallegoz [1], Jaime Alfonso Santiago Hernández [2], Carlos Riera Kinkel [3], Lucelli Yáñez Gutiérrez [2]
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Background / Hypothesis:
The Bentall procedure is performed for aortic root and valve pathologies, combining root replacement with mechanical valve implantation and coronary artery reimplantation into a tubular graft. While survival improves, complications such as graft insufficiency, endocarditis, thrombosis, and rarely, postoperative aortic dissection, can occur. This dissection is uncommon but life-threatening, especially in pediatric patients, requiring specialized management.

Materials and Methods:
We present a 16-year-old female with a bicuspid aortic valve and double lesion (stenosis and insufficiency), who underwent St. Jude 23 mm mechanical valve implantation with the Bentall technique and ascending aorta repair using a Dacron graft. Postoperative follow-up included hemodynamic monitoring, echocardiography, angiography, and laboratory tests. Aortic dissection in the descending aorta was diagnosed via angiotomography, and a conservative approach was chosen.

Results:
A 16-year-old female with bicuspid aortic valve, double lesion (severe insufficiency, moderate stenosis), and ascending aorta aneurysm underwent the Bentall procedure. The postoperative course was initially favorable, only hypertensive crisis, after 48 hours an angiotomography revealed type B aortic dissection in the descending aorta. The patient developed hypotension, dizziness, and fever, requiring ICU admission for norepinephrine and antibiotics. She is currently stable and under outpatient follow-up.

Postoperative type B aortic dissection is a rare complication after Bentall surgery. A conservative approach, including blood pressure control, vasopressors, and antibiotics, was effective. Literature supports conservative management in the absence of ischemia or rupture, with TEVAR considered for more severe cases.

Conclusions:
This case highlights the need for careful postoperative monitoring in Bentall surgery. A conservative approach can be effective in managing type B aortic dissection, with close follow-up crucial to preventing complications. Six months after the surgery, the lesion site has shown no changes, inidcating the effectiveness of the conservative management approach.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1664 - ASCENDING SLIDING ARCH AORTOPLASTY FOR THE TREATMENT OF COARCTATION OF THE AORTA WITH HYPOPLASTIC AORTIC ARCH. LONG TERM CLINICAL AND IMAGING FOLLOW UP

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Background / Hypothesis:
For neonates and infants with coarctation and aortic arch hypoplasia, the technique of aortic arch advancement has shown excellent results, with very low re-coarctation rates. In older children, in whom tissues are less distensible, the technique of ascending sliding arch aortoplasty, that allows to perform the repair using the ascending aorta to enlarge the aortic arch employing exclusively native aortic tissue, without the use of grafts, has been favored, in recent years, by some groups

Materials and Methods:
Between 2011 and 2023, 16 patients underwent Ascending sliding arch aortoplasty. Demographic, preoperative, transoperative and postoperative data, as well as mid-term clinical and imaging data was analyzed.

Results:
Median weigth, 14.4 kg (6.4-54.9). Median age, 52.7 months (8.9-179.1). Mean cardioipulmonary bypass time, 174.21 ±40 minutes. Mean aortic cross clamp time 85.66 ±46 minutes . Mean antegrade cerebral perfusion time, 45.4 min ±16. In only two patients a brief total circulatory arrest period (6 and 2 minutes) was used. Median time for extubation, 19 hours (0-117). Two patients extubated in the OR. Median hospital LOS, 10 days (6-47). The only complication was a transient chordal paresis in one patient. Long term follow-up imaging shows no coarctation recurrence in any patient and good hemodynamic and morphological results.

Conclusions:
Ascending sliding arch aortoplasty, which avoid the use of grafts, is a safe and reproducible procedure in children with coarctation of the aorta with hypoplastic arch, with good clinical, functional and morphological short and mid-term outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1665 - TOTAL CAVOPULMONARY PROCEDURE IN 14 YEAR OLD MALE WITH TRICUSPID VALVE ATRESIA TYPE IB

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Background / Hypothesis:
Tricuspid valve atresia, the third most common cyanotic congenital heart disease, is a cyanotic congenital heart defect in which the tricuspid valve fails to develop, preventing blood passage from the right atrium into the right ventricle. TVA Type IB (normally related great arteries, a ventricular septal defect, and pulmonary stenosis) causes hypoplasia of the right ventricle, requiring alternative pathways for blood to reach the lungs. Early surgery is ideal to establish stable circulation. The gold standard for management is still a staged surgical procedure. Some TVA patients get their first operation at a later age due to a variety of reasons that cause surgical delays in the Philippines. While uncommon and can carry significant hemodynamic and postoperative risks, combining the Glenn and Fontan procedures in a single operation can be considered in select cases.

Materials and Methods:
Case Report
Results: A 14/M with Tricuspid valve atresia type 1B initially presenting with cyanosis in infancy was already apprised for surgery in infancy but was lost to follow-up due to financial constraints. With worsening easy fatigability and cyanosis, opted to return for consult. Hemodynamic studies showed normal pulmonary pressures, acceptable left ventricular end-diastolic pressure and adequate pulmonary artery sizes, hence scheduled for surgery. Total Cavopulmonary Procedure was done. Saturations from 75% preoperatively increased to 96% on room-air post-op. Post-op complications include pleural effusion, and bradyarrhythmia associated with electrolyte imbalances. Postop echo revealed laminar flow across cavopulmonary shunts. Patient was sent home 22 days post-op with Furosemide, Aspirin, Ca and Mg supplementation.

Conclusion:
The single stage total cavopulmonary procedure is a viable option for late-presenting patients, despite associated risks, offering improved oxygen saturation and hemodynamic stability postoperatively, but necessitating careful management.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1675 - SHORT TERM OUTCOME OF INTER FACILITY TRANSFER FOR CHILDREN UNDERGOING EXTRACORPOREAL MEMBRANE OXYGENATION IN EAST CHINA

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Background / Hypothesis:
Extracorporeal membrane oxygenation (ECMO) is critical for patients with cardiopulmonary failure. However, it is not available in all pediatric medical centers. We report our institution's experience with interhospital extracorporeal membrane oxygenation transport.

Materials and Methods:
This retrospective study included a total of 47 patients who transferred to Children's Hospital of Fudan University with ECMO between January 2016 and June 2021. Medical records were reviewed, and data collected. Survival to decannulation and survival to discharge were the main outcomes.

Results:
Patients had age of 36 months (interquartile range, 6-66 months, 18 under 1y and 5 under 1m) and a median weight of 13 kg (interquartile range, 7.5-21.0 kg). Venous- arterial mode was applied in 46 patients. All patients underwent successful ECMO transfer to FDCH by ambulance with a median distance 311km. Among the 23 local hospitals patients from, 7 of them have doctors receiving ECMO-related course in FDCH before. Median duration of ECMO was 182 hrs (IQR, 114-328). Survival to decannulation in all patients was 72.3% (34/47) and survival to discharge 61.7% (29/47). Survival to decannulation was higher in the trained group than the untrained (68.2% vs 56.0%, P >0.05). No risk factors were found related to survival to decannulation.

Conclusions:
Interfacility transfer for ECMO in pediatric patients seems to be safe and have comparable survival rate compared to traditional ECMO patients. This can partly compensate for the uneven distribution of intensive medical care in different areas, especially in developing countries. ECMO-related course might increase the survival to decannulation. With air medical service advances in China, ECMO transportation will benefit more local hospitals in underdeveloped regions.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1682 - MULTIDISCIPLINARY STRATEGY FOR ACCELERATED RECOVERY AFTER COARCTATION REPAIR INSIGHTS FROM A SINGLE CENTER STUDY IN INDONESIA

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Background / Hypothesis:
Coarctation of aorta is a congenital cardiac malformation affecting roughly 5-8% of all congenital heart defects, with juxta-ductal stenosis being the most prevalent anatomical subtype. Due to its complexity, previous studies have reported an average hospitalization duration of 10 days, with a mean ICU stay of 7 days following coarctation repair. Pre-operative planning using Multislice Computerized Tomography (MSCT) enables cardiothoracic surgeon and paediatric cardiologist to perform a comprehensive morphological assessment, facilitating the selection of the most optimal treatment strategy.

Materials and Methods:
We presented the case of a 1-year-old female patient who was referred from Berau, Kalimantan. The patient was diagnosed with severe juxtaductal coarcation of aorta, detected incidentally during cardiac screening despite being relatively asymptomatic. Preoperative MSCT revealed severe juxtaductal coarctation of aorta with post stenotic aortic dilatation, along with a small ventricular septal defect (VSD) and patent ductus arteriosus (PDA). Right heart catheterization demonstrated pulmonary hypertension (PH) with an estimated pulmonary artery resistance index of 4.5. Following a multidisciplinary surgical conference, the decision was made to proceed with coarctation repair, while leaving the VSD as a cardiac offloading mechanism.

Results:
An extended end-to-end anastomosis coarctation repair was performed successfully in this patient with a procedural time of 1 hour and 50 minutes and an aortic clamping time of 15 minutes. Postoperatively, the ICU stay was limited to 3 days with successful ventilator weaning on postoperative day 2. The patient was discharged within 4 days with no major post-surgical complications

Conclusions:
A comprehensive, multidisciplinary preoperative assessment plays a crucial role in optimizing procedural efficiency, minimizing intraoperative risk, and reducing overall hospitalization time in patients undergoing coarctation repair.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1707 - CONTEMPORARY OUTCOMES OF RESTRICTIVE PERIMEMBRANOUS AND SUBPULMONIC VENTRICULAR SEPTAL DEFECTS BEYOND INFANCY

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Background / Hypothesis:
Beyond infancy a subset of perimembranous (PM) and subpulmonic (SP) VSDs become restrictive and asymptomatic. The natural history of these defects merits revisiting in the current era given the increasing trend towards closing these VSDs. We describe the long-term outcomes and indications for closure of restrictive PM and SP VSDs.

Materials and Methods:
This ambispective observational cohort study included all patients with PM or SP VSD beyond one year of age between January 2009 and June 2024. All patients with any additional congenital or acquired heart diseases were excluded. We collected the demographic, clinical, echocardiographic and follow-up data of the patients.

Results:
We identified 499 patients (414 PM VSDs (82.9%), 85 SP VSDs (17.03%)) during the study period. The median age was 8.84 years (males 57.9%). Over a median follow-up duration of 75 months (IQR: 36-133), majority of PM VSD (59.4%) remained asymptomatic when compared to 27.4% of SP VSD (p=0.011). Spontaneous closure occurred exclusively in PM VSDs (4.1%). A significantly higher proportion of SP VSD (54.1%) underwent closure when compared to PM VSD (23.7%, p<0.001). The predominant indications for closure being aortic regurgitation (AR) associated with aortic valve prolapse (AVP) (SP VSD 45.6%, PM VSD 38.2% p<0.001), AVP without AR (SP VSD 34.8%, PM VSD 4%, p<0.001), left ventricular volume overload (PM VSD 30.3%, SP VSD 8.6%, p<0.03) and right ventricular outflow tract obstruction (SP VSD 8.7%, PM VSD 19.7%, p=0.79). There were no incidence of infective endocarditis in either cohort.

Conclusions:
Beyond infancy routine closure may not be indicated in majority of the asymptomatic PM VSD patients. Conversely, SP VSDs warrant stricter follow-up and have lower threshold for closure due to higher rates of aortic valve complications.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1708 - "RETHINKING THE GRAFT A BOOT SHAPED APPROACH TO THE FONTAN PROCEDURE IN HETEROTAXY SYNDROME"

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Background / Hypothesis:
The Fontan procedure in patients with heterotaxy syndrome presents significant challenges due to anatomical anomalies, particularly when the hepatic veins and inferior vena cava (IVC) drain separately into the atrium. Optimizing the cavo-pulmonary connection is essential to preventing hemodynamic complications.

Materials and Methods:
Between September 2023 and June 2024, we performed total cavo-pulmonary connections in four patients with univentricular physiology and separate hepatic vein and IVC drainage. To improve anastomosis and minimize complications associated with larger grafts, we modified the inferior segment of an 18 mm graft into a boot-shaped configuration and connected it to an atrial button containing the hepatic veins and IVC.

Results:
Four patients underwent the Fontan procedure using the boot-shaped graft, all presenting with separate hepatic vein and IVC drainage into the atrium.
• Case 1: A 4-year-old male with dextroisomerism, unbalanced complete atrioventricular (AV) canal, and double outlet right ventricle (DORV) was discharged after 15 days. At one-year follow-up, the cavo-pulmonary connection remained patent without obstruction.
• Case 2: A 6-year-old female with unbalanced complete AV canal, DORV, heterotaxy syndrome, and dextroisomerism was discharged after 13 days. One-year echocardiography confirmed a patent, unobstructed connection.
• Case 3: A 4-year-old male with unbalanced AV canal, DORV, heterotaxy syndrome, dextroisomerism, and asplenia was discharged after 21 days. At one-year follow-up, the connection remained patent with good exercise tolerance.
• Case 4: A 7-year-old male with dextroisomerism, L-looped ventricular morphology, a single right ventricular outlet, and prior total anomalous pulmonary venous connection (TAPVC) repair had an unobstructed connection at six months, with no extrinsic pulmonary vein obstruction.

Conclusions:
Despite complex anatomy, the Fontan procedure using a boot-shaped graft was reproducible and successful, ensuring effective systemic venous return while reducing complications such as flow obstruction or bleeding.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1713 - AN UNUSUAL FINDING OF A RIGHT SIDED CERVICAL AORTIC ARCH IN THE POSTNATAL PERIOD

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Background / Hypothesis:
A right sided cervical aortic arch is a rare congenital anomaly whereby the arch is located above the superior clavicle occasionally high into the neck. Anatomy can be highly variable between patients leading to challenging surgical repairs. Most cases will be asymptomatic however can be associated with genetic conditions in particular PHACE syndrome.

Materials and Methods:
We present the case of an infant boy presenting with a pathological murmur alongside failure to thrive. He was noted to have a segmental facial haemangioma and congenital blockage of the right nasolacrimal duct. An echocardiogram performed showed an aortic arch abnormality alongside a PFO with left to right flow. CT angiogram undertaken showed a very unusual right sided small calibre cervical aortic arch, no vascular ring present. MRI undertaken ruled out PHACE syndrome. The abnormality was not critical with no cardiac decompensation and so arch repair was not undertaken until 5 months of life.

Results:
Repair was undertaken via median sternotomy guided by CT imaging. Noted to be difficult accessing the aortic arch with the left recurrent laryngeal nerve tenting the aorta into the cervical region at the level of the larynx. The left subclavian artery was retro-oesophageal and so transferred onto the left carotid artery. Initial ascending aortic arch gradient 20-35 and so plasty of ascending arch successfully performed. The patient had an uncomplicated post operative course and has since had no hospital admissions.

Conclusions:
Right cervical aortic arch is rare with high anatomical variability. CT/MRI imaging is invaluable in preoperative planning. Clinical experience and reported cases is minimal with each patient receiving a individually tailored surgical approach.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1723 - IMPACT OF ATRIOVENTRICULAR VALVE REINTERVENTIONS ON LONG TERM OUTCOME AFTER COMPLETE ATRIOVENTRICULAR SEPTAL DEFECT REPAIR

Jonathan Kong [1], *Mudasiru Salami* [2], Vivian Bader [1], Muhammed Walayat [3], Andrew Mclean [1], Mark Danton [1], Ed Peng [1]
Royal Hospital For Children, Glasgow, Cardiac Surgery, Glasgow-United Kingdom [1] University Of Glasgow, Cardiac Surgery, Glasgow-United Kingdom [2] Royal Hospital For Children, Glasgow, Cardiology, Glasgow-United Kingdom [3]

Background / Hypothesis:

This study examines impact of atrioventricular (AVV) reintervention on long-term outcome following complete atrioventricular septal defect (AVSD) repair.

Materials and Methods:

90 consecutive patients (76% Trisomy 21) who underwent complete AVSD repair between 2008-2018 at a single tertiary centre were reviewed. Two-patch technique was used in 54 (60%) and Nunn technique in 36 (40%) at a median (interquartile) age of 4.12 (3.13–5.03 months) and weight 4.6 (4.0–5.4 kg) at the time of surgery. Kaplan-Meier analysis was used to assess freedom from death and reintervention.

Results:

Early mortality (≤30 days) was 2.2%(2), with another 2.2%(2) mortality within and 2.2%(2) after one year. AVV reinterventions were required in 14(15.6%) patients (all involved left including 2 concomitants right AVV); half (n=7) occurred within the first year and another half (n=7) after one-year post-repair. The majority of valve reintervention occurred within the first 30-day (5, 5.6%: 4-redo repair, 1-replacement) with 60% (N=3) mortality (vs 1,11.1% mortality post 30-day, p=0.095). Overall long-term survival (freedom form death) was 95.5% (1-year), 94.4% (5-year) and 93.3% (at 10 and 15 years) post repair. Valve reintervention significantly impacted on survival [71.4% at 1, 5, 10-year vs no valve reintervention survival 98.7% (1, 5-year), 97.3%(10-year)], log-rank $\chi^2 = 14.618$, $p < 0.001$). After excluding valve reintervention within first year post-repair, there was no survival difference between valve reintervention (100% at 5 and 10-year vs no valve reintervention: 98.7%(5-year), 97.3% (10-year) log-rank $\chi^2=0.192$, p=0.661).

Conclusions:
Early valve reintervention is associated with reduced survival, highlighting the importance of optimizing initial surgical repair.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1726 - RESTRICTIVE RIGHT VENTRICULAR PHYSIOLOGY EARLY AFTER TETRALOGY OF FALLOT REPAIR – PREVALENCE IN CONTEMPORARY ERA AND IMPACT ON SURGICAL OUTCOME

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Background / Hypothesis:
Post-repair Tetralogy of Fallot is characterised by variable degrees of restrictive RV, with an estimated 46.5% pooled prevalence of pulmonary arterial end-diastolic forward flow (EDFF). Its prevalence in contemporary era and impact on outcome remains unclear.

Materials and Methods:
Early post-repair (day 0/1) echocardiography (N=55, 20% aorto-mitral discontinuity) were reviewed. The Doppler profiles across PA were examined (restrictive RV - defined by EDFF on at least three consecutive cardiac cycles). Primary repair was favoured (median age at repair: 0.6year, range 14.0days–2.5years; 7.4kg, 3.5-12.4kg; 3-BTT shunt) with (i) comprehensive myectomy to achieve unobstructed outflow [peak gradient<2.5m/s in 43(78%)], (ii) mini transannular patch (32/58% with selective PV reconstruction: 5-monocusp, 1-bicuspid from RA appendage) (iv) careful preservation of tricuspid valve [51(93%) TR<moderate, 4(7%) moderate].

Results:
12(22%) patients developed restrictive physiology post-repair, which was associated with higher RV outflow gradient (p=0.007), but not with age, bypass time, transannular patch, tricuspid/pulmonary regurgitation. Overall median extubation time was post-op day 1 (interquartile 1-3; 41(75%) extubated by post-op day 2), and ICU stay 4 days (3-7). A longer ICU stay was not associated with EDFF or transannular patch, but with moderate/severe PR (median 5 vs 3 days when <moderate PR, p=0.015) and bypass time (p=0.018). Early reintervention included 1(1.8%) tricuspid repair and 2(3.6%) permanent pacemaker. All patients were alive at follow-up (median 5.14 years, 3(5%) late RV outflow tract reintervention).

Conclusions:
Restrictive physiology had not resulted in longer ICU stay. Strategies to improve pulmonary valve competency whilst achieving unobstructed outflow tract may further improve early outcome and reduce late reintervention

POSTER PRESENTATIONS

Category: Cardiac Surgery

1736 - EVALUATION OF SURGICAL OUTCOME ENCOMPASSING PAIN AND COMFORT SCORES IN CHILDREN UNDERGOING MINIMALLY INVASIVE SURGERY FOR ATRIAL SEPTAL DEFECT

Vivian Bader [1], Amber Aldridge [2], George Gradinariu [3], Mark Davidson [4], Graeme Foggo [4], *Ed Peng* [5]

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Background / Hypothesis:
It is unclear if minimally invasive surgery result in higher pain level due to local retraction of wound or nerves, as opposed to longer incision in conventional approach.

Materials and Methods:
Forty-four ASD patients (2015-24) were reviewed [29 minimally invasive (20 MS-ministernotomy, 9 MT-minithoracotomy vs 15 FS-full sternotomy]. The pain and comfort level within the first 24 hours post-surgery were assessed by (i) nurse reported pain score (NRS) (0=none, 1=mild, 2=moderate, 3=severe) and (ii) Comfort-B Score (scale 1-5) focusing on 4 domains alertness, agitation, facial tension, physical movement. Surgery were performed by trainees in 12(80%)-FS, 9(45%)-MS and 1(11%)-MT.

Results:
There were no age or weight difference between groups [MS(5.5-year, 19.2kg, range 11.6-70.3kg) vs MT(5.5-year, 21.3, 10.9-45.9) vs FS(6-year, 20.2, 0.0-74.0); p=NS]. The maximal NRS (median, interquartile) were (i) at rest: MS-2.0(2.0-2.0), MT-2.0(1.0-3.0) (p=0.51), FS-1.0 (0.5-2.5) (p=0.51), (ii) on movement: MS- 2.0(2.00-2.25), MT-1.0(1.0-1.5), FS-1.5(1.00-2.25)(p=0.10). The average and maximal Comfort-B scores were comparable between groups (p=NS). There were no difference in cardiopulmonary bypass time (p=0.09) but MT had shortest cross-clamp time (10.0 minutes, 7.0-11.0) (median, interquartile) (vs MS-21.5(10.5-24.0) vs FS-17.0(13.5-27.5); p=0.0049]. The extubation time was post-operative day-0(0-1)(MS) compared to day-1(0-1)(FS) and day-1(1-1.5)(MT) (p=0.014).
Median ICU and hospital stay were 1 day and 5 days for all groups (p=NS). There were no mortality and morbidities included re-exploration for bleeding (n=1) and superficial wound debridement (N=1) (both MS).

Conclusions:
Minimally invasive ASD repair can be performed safely in children with minimal morbidity and no difference in pain or comfort outcome compared to conventional approach.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1743 - QUANTITATIVE ANALYSIS OF AORTIC VALVE GEOMETRY IN CHILDREN WITH AND WITHOUT CONGENITAL AORTIC VALVE DISEASE.

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Background / Hypothesis:
Bicuspid aortic valve (BAV) is the most common congenital heart defect, affecting about 1% of the population. In children, congenital aortic valve disease is more complex as compared to adults, often appearing as monocuspid or functionally monocuspid.
Aortic valve geometry in these children remains unclear.

Materials and Methods:
Echocardiography for children (N=105, median age: 6) with congenital aortic valve disease (N=39 surgery, N=14 balloon valvuloplasty, N=18 no intervention) was compared with controls (N=34) with structurally normal aortic valves. Cusp height at full closure of aortic valve in end diastole (H-C) and full opening (H-O), prior to any valve intervention, were measured from the hinge line at the aortic annulus in the parasternal long-axis view and indexed to annular dimensions.

Results:
BAV patients (N=71) had lower indexed H-C (median=0.333) than controls (median=0.520) ($p < 0.001$), but comparable indexed H-O (p=not significant). Control group H-C (median=0.520) was significantly higher than that in BAV with surgery (median=0.333) ($p < 0.01$), balloon valvuloplasty (median=0.333) ($p = 0.011$), and no intervention (median=0.278) ($p < 0.01$). Indexed H-C was similar across BAV patients, regardless of intervention (p=not significant). 14 BAV patients (19.72%) had free edges that closed below the annular plane (median=-0.40mm), which was not observed in control patients.

Conclusions:
Children with congenital aortic valve disease demonstrate significantly deranged aortic valve geometry compared to children with structurally normal aortic valves. The prognostication value of these indicators require further studies.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1783 - INFLAMMATORY MARKERS AND CARDIAC BIOMARKERS FOLLOWING PEDIATRIC CARDIAC SURGERY HOW HIGH IS TOO HIGH

Naimisha Yenduri [1], Aishwarya Gurav [1], Abish Sudhakar [1], Mahesh Kappanayil [1]
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Background / Hypothesis:
Hyperinflammation is marked by a dramatic rise in markers like IL-6, ferritin, LDH, and D-dimer. While these are established indicators of systemic inflammation, their interpretation in the immediate postoperative period after pediatric cardiac surgery is unclear. CPB-induced inflammation elevates these markers, but distinguishing expected postoperative changes from true hyperinflammation is challenging due to limited reference data. Similarly, post-CPB trends of myocardial injury markers—NT-proBNP, hs-Troponin T, and CK-MB—are poorly described in CHD. This study aims to define typical baseline and postoperative trends for these markers, providing contextual reference values to help differentiate "normal" postoperative responses from pathological hyperinflammation and myocardial injury.

Materials and Methods:
A prospective observational cohort study was conducted in 281 children undergoing CHD surgery at a tertiary cardiac center from 2021-2022. Inflammatory and cardiac biomarkers were measured at three time-points: Baseline (preoperative), Post-operative Day 1 (POD1), and POD5. Trends were analyzed using median, range, and fold-change calculations. Correlations with CPB duration and CHD physiology were also explored.

Results:
All biomarkers showed a postoperative rise on POD1 (Table 1), with peak median (IQR) values as follows: CRP: 37.78 (23.22–54.99) mg/L, IL-6: 89 (55–148) pg/mL, ferritin: 112.5 (68.8–218.6) ng/mL, LDH: 432 (352–554) U/L, and D-dimer: 0.47 (0.29–0.79) µg/mL. CRP, IL-6, and LDH declined by POD5, while ferritin and D-dimer continued to rise. A significant correlation with CPB duration was seen for IL-6, ferritin, and LDH ($p < 0.05$) (Table 2). Cardiac biomarkers peaked on POD1 (Table 3), with NT-proBNP significantly elevated in patients with cyanotic CHD without pulmonary stenosis [median: 12017 (6754–25189) pg/mL], likely due to myocardial strain in this group(Table 4).

Conclusions:
Postoperative elevation in inflammatory and cardiac biomarkers is an expected response following pediatric CHD surgery. This study provides expected biomarker kinetics following pediatric cardiac surgery. These reference patterns may help clinicians interpret postoperative values more accurately and differentiate physiological from pathological responses.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1785 - IMPACT OF AORTIC VALVE REPAIR TECHNIQUES AND IMMEDIATE POSTOPERATIVE RESULTS ON MID TO LONG TERM SURGICAL OUTCOMES IN CHILDREN

Wen Zhang [1], Qi Jiang [1], Yifan Zhu [1], Renjie Hu [1], Wei Dong [1], Haibo Zhang [1]
Shanghai Children, Department Of Cardiothoracic Surgery, Shanghai-China [1]

Background / Hypothesis:

Aortic valve repair (AVr) is the preferred surgical approach for pediatric aortic valve disease. This study evaluates the impact of repair complexity and immediate postoperative results on mid- to long-term outcomes.

Materials and Methods:

We retrospectively analyzed pediatric patients who underwent primary AVr at our center between January 2014 and December 2023. Patients with prior aortic valve surgery or less than moderate preoperative aortic stenosis or regurgitation were excluded. Based on repair complexity and immediate postoperative residual lesions (moderate or greater aortic stenosis or mild or greater regurgitation), patients were categorized into four groups: Group A (simple repair, no residual lesion), Group B (complex repair, no residual lesion), Group C (simple repair, residual lesion), and Group D (complex repair, residual lesion). Outcomes included freedom from more than moderate aortic stenosis or regurgitation, reoperation, and aortic valve replacement (AVR).

Results:
A total of 290 patients (median age: 3.5 years, IQR: 1.0–7.6 years) were included. Simple repair was performed in 152 cases (52%), and complex repair in 138 (48%); 185 (64%) had no residual lesions, while 105 (36%) had residual lesions. The median follow-up was 2.5 years (IQR: 0.7–4.8 years). Freedom from more than moderate aortic stenosis or regurgitation at 2 and 4 years was 85%/80% (Group A), 80%/71% (Group B), 56%/46% (Group C), and 57%/52% (Group D) ($P<0.001$). Freedom from reoperation was 94%/91%, 97%/92%, 94%/90%, and 87%/68% ($P=0.006$), while freedom from AVR was 98%/95%, 97%/94%, 100%/94%, and 87%/68% ($P<0.001$).

Conclusions:
Immediate postoperative results significantly influence mid- to long-term outcomes. Patients with no residual lesions had better outcomes, while those with residual lesions had a higher risk of stenosis, regurgitation, reoperation, and AVR. Among patients without residual lesions, simple and complex repairs showed similar outcomes, whereas complex repair was associated with a higher reoperation rate when residual lesions were present.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1787 - INCIDENCE AND RISK FACTORS OF REINTERVENTION AND OUTCOME OF RIGHT VENTRICLE TO PULMONARY ARTERY CONDUIT

Sarussawadee Thaloengsok [1], Krit Makonkawkayoon [2], Rekwan Sittiwangkul [2]
School Of Medicine, University Of Phayao, Pediatric, Phayao-Thailand [1] Faculty Of Medicine, Chiang Mai University, Pediatric, Chiang Mai-Thailand [2]

Background / Hypothesis:
Since 1964, Rastelli et al. have used right ventricle-to-pulmonary artery (RV-PA) conduit reconstruction surgery to completely repair congenital heart disease. Several factors influence RV-PA conduit reintervention and mortality risk, such as age, weight, underlying disease, and the type and size of the conduit. This study aims to explore the incidence and risk factors of reintervention and the outcome of RV-PA conduit.

Materials and Methods:
This is a retrospective cohort study. Data have been collected for 14 years; all patients (age less than or equal to 18 years old) who underwent RV-PA conduit were included, and univentricular heart disease patients were excluded.

Results:
The incidence of reintervention is 17.4%, and the mortality rate is 24.6%. The Kaplan-Meier curve, analyzed via log-rank test, demonstrates that Dacron material is associated with a longer free interval to reintervention compared to Contegra (p-value = 0.003), while PA/VSD exhibits the highest survival rate (p-value = 0.01). In univariate analysis, the primary risk factor for mortality is the diagnosis. In multivariate analysis, the independent risk factors for mortality include truncus arteriosus, which has an adjusted hazard ratio (HR) of 5.5 with a 95% confidence interval (CI) of 1.6 to 19.2; TGA/VSD/PS, with an adjusted HR of 5.3 and a 95% CI of 1.5 to 18.4; and PTFE graft, which presents an adjusted HR of 5.8 with a 95% CI of 1.1 to 30.1.

Conclusions:
The study shows the incidence of reintervention and mortality rate of RV-PA conduit patients related to previous studies, and Dacron has longer durability than Contegra due to the nature of the material. The case of PA/VSD with 22q11 deletion underwent RV-PA conduit at 6-month-old and used PTFE size 6 mm; high risk operation cause of significant in statistics of PTFE to outcome of RV-PA conduit. The diagnosis is only a prognosis factor in these patients.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1791 - RIGHT ATRIAL APPENDAGE FOR RECONSTRUCTION OF PULMONARY VALVE AN AUTOLOGOUS METHOD OF PROVIDING PULMONARY COMPETENCE.

Krishnan Ganapathy Subramaniam [1], Abhinav Chauhan [1], Shweta Bhakru [2], Bhargavi Dhulipudi [2], Nageshwar Rao Koneti [3]
Rchi, Surgery, Hyderabad-India [1] Rchi, Cardiology, Hyderabad- [2] Rchi, Cardiology Chief, Hyderabad- [3]

Background / Hypothesis:

Background :
Right atrial appendage was introduced as a technique of creating bicuspid pulmonary valve in 2020. We have been using this technique of creating pulmonary valve from late 2022. This series presents our early results using this approach for a variety of situations where transannular patch is required in tetralogy of Fallot or where pulmonary competence is required.

Materials and Methods:
The right atrial appendage is assessed and almost more than 90% of the appendages are suitable for pulmonary valve reconstruction . Two polypropylene sutures placed at a distance equal to the required pulmonary annulus is pulled up to create a cylinder or truncated cone shaped tissue. The base and sides of the tissue is marked and care has to be taken about the right coronary artery in the groove. When pulmonary valve reconstruction is required the apex is incised and the trabeculae in the atrial appendage are excised and divided the required Hegar is passed while the appendage is still attached to the right atrium. For reconstruction we mark the site of annulus , the appendage is divided and two additional sutures are placed at the base , further thinning of the appendage is done and the appendage is evereted so that the smooth surface faces the blood flow. One posterior half of the base is sutured to the annulus , the appendage is pulled up and the two apices are sutured 180o apart and the lateral aspects are suture closed creating the commissure , the required Hegar is passed again to ensure the adequacy of the path, The RVOT patch is sutured and anterior half of the appendage is sutured to the patch using interlocking sutures to prevent purse stringing. This technique in essence provides an bicuspid autologous tissue

POSTER PRESENTATIONS

Category: Cardiac Surgery

1792 - PULMONARY WALL TISSUE FOR AORTIC ARCH REPAIR IN CHILDREN WITH COARCTATION AND INTERRUPTION

Krishnan Ganapathy Subramaniam [1], *Abhinav Singh Chauhan* [1], Shweta Bhakru [2], Bhargavi Dhulipudi [2], Nageshwar Rao Koneti [3]
Rchi, Surgery, Hyderabad-India [1] Rchi, Cardiology, Hyderabad-India [2] Rchi, Cardiology Chief, Hyderabad-India [3]

Background / Hypothesis:

Background:
Different techniques have been described for coarctation repair , with varying degrees of recurrence. The subset in which the transverse arch is hypoplastic requires repair from sternotomy approach . Majority of these , will have a pulmonary hypertension with dilated thick walled pulmonary artery wall . We present our experience in using this tissue as a patch for arch repair.

Materıals and Methods :
The aorta is cannulated either through a graft to innominate artery or laterally to be introduced into innominate artery during period of low flows to provide cerebral circulation during arch repair. A rectangular piece of pulmonary wall is excised from the base of right and left pulmonary artery till above the commisures of the pulmonary valve, care should be exercised to exclude the ductal tissue at the cranial portion of the patch. With antegrade perfusion the coarc segement is excised and the ductal tissue is removed. The healthy native aortic tissue of the arch and descending aorta are approximated posteriorly , anteriorly the incision is extended proximally into the distal portion of the ascending aorta and distally into the descending aorta. This area is patched with Pulmonary wall which matches the aortic tissue in thickness, contour and elasticity. The site form the pulmonary artery from where the patch has been removed is patched with autologous pericardium.

Results :
This technique has been used in 12 patients ranging form 2 day old to 8 yrs old , from 2.5kg to 26 kg The maximum period of follow up is for 7 yrs. This procedure was combined with VSD closure in 11 patients and ASD closure in one patient. 3 patients had aortic interruption .There were no mortality in this series . There has been no recoarctation in any of

POSTER PRESENTATIONS

Category: Cardiac Surgery

1795 - PALLIATIVE SENNING FOR TRANSPOSITION PHYSIOLOGY AN EXCELLENT OPTION FOR LATE PRESENTING TRANSPOSITION WITH SEVERE PULMONARY ARTERY HYPERTENSION.

Krishnan Ganapathy Subramaniam [1], Abhinav Chauhan [1], Shweta Bhakru [2], Bhargavi Dhulipudi [2]

Rchi, Surgery, Chennai-India [1] Rchi, Cardiology, Hyderabad-India [2]

Background / Hypothesis:
Background :
Transposition with VSD with or without significant pulmonary stenosis often present late due to absence of significant cyanosis initially . They are prone to develop early pulmonary artery hypertension and corrective surgery with VSD closure may adversely effect their natural history. For those presenting late heart lung transplantation has been proposed as an option with not so good early or mid term outcomes , and it has its own set of complications and practical difficulties. We propose that for those with severe PAH where the pulmonary artery saturations are more than systemic by 20 percent , an atrial switch procedure will be a very effective palliative strategy converting them into Eisenmenger's physiology with reasonable saturations rather than transposition with Eisenmenger's with severe desaturation.

Materials and Methods :
Patients with Transposition and Ventricular septal defect with systemic saturation of 60-70% with severe pulmonary artery hypertension and with pulmonary artery saturation which is more than 15% of systemic saturation are chosen for palliative atrial switch procedure. The Senning is done using insitu pericardium technique for pulmonary venous baffle construction . 15 patients with age range from 3 yrs to 25 yrs have undergone palliative Senning procedure.

Results :
There has been remarkable improvement in saturation in all the patients. The saturation immediately post procedure has been around 90% for all the patients. The Longest follow up has been 9 yrs and the saturation is maintained more than 85%, all the patients have been kept on pulmonary vasodilators (Sildenafil), One patients who was 25 yrs at the time of surgery has married and has been able to father a child .

Conclusion :
Palliative Sennings is an excellent option for patients with transposition physiology with severe PAH which can convert them into an usual Eisenmenger's

POSTER PRESENTATIONS

Category: Cardiac Surgery

1798 - SURGICAL OUTCOMES AND FOLLOW UP OF SLIDE TRACHEOPLASTY IN CHILDREN WITH CONGENITAL TRACHEAL STENOSIS AND CONCOMITANT CONGENITAL HEART DISEASE

Ziyue Chen [1], Li Ma [1]
Guangzhou Women And Children's Medical Center, Guangzhou Medical University, Heart Center, Guangzhou-China [1]

Background / Hypothesis:
This study aimed to evaluate the efficacy of slide tracheoplasty in pediatric patients with congenital tracheal stenosis (CTS), particularly those with concurrent congenital heart disease (CHD), and to emphasize the importance of postoperative follow-up and comprehensive management.

Materials and Methods:
A retrospective analysis was conducted on 105 CTS patients (male: 58, female: 47) who underwent slide tracheoplasty at our center from December 2015 to December 2024. Among them, 92 cases (87.62%) had concurrent CHD, including 62 cases of pulmonary artery sling (67.39%), 43 atrial septal defects (46.74%), and 23 ventricular septal defects (25.00%). Preoperative fiberoptic bronchoscopy confirmed complete tracheal/bronchial cartilage rings in all patients. Clinical data, surgical outcomes, and follow-up records were analyzed. Key metrics included median surgical age (5.0 months), weight (5.9 kg), preoperative mechanical ventilation (45.70%, 48/105), and postoperative complications.

Results:
Median operative and cardiopulmonary bypass times were 222 and 125 minutes, respectively. Postoperative median ventilator support time was 48 hours, ICU stay 8 days, and hospitalization 19 days. Early mortality (<30 days) occurred in 1.90% (2/105), and late mortality (≥30 days) in 2.85% (3/105). Complications included anastomotic leakage (1.90%), intraluminal granulation (6.67%), residual stenosis (1.90%), and recurrent pneumonia (11.43%). During a median follow-up of 377 days, 11.43% (12/105) exhibited reduced activity tolerance, and 13.33% (14/105) had growth retardation.

Conclusions:
Slide tracheoplasty demonstrates favorable outcomes for CTS, especially in CHD-complicated cases. However, delayed tracheoplasty after initial cardiac repair may increase surgical risks. Long-term follow-up, including regular airway and pulmonary function assessments, alongside multidisciplinary management, is critical to improving quality of life in patients with chronic respiratory symptoms. Early intervention for concurrent CHD and tracheal pathology is recommended to mitigate postoperative morbidity.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1801 - CONGENITAL ABSENT STERNUM – MANAGEMENT IN NEONATE USING CHONDRAL FLAPS.

Abhinav Chauhan [1], Krishnan Ganapathy Subramaniam [1], Shweta Bhakru [2], Bhargavi Dhulipudi [2], Nageshwar Rao Koneti [3]
Rchi, Surgery, Chennai-India [1] Rchi, Cardiology, Hyderabad-India [2] Rchi, Cardiology Chief, Hyderabad-India [3]

Background / Hypothesis:
Background :
Congenital absent sternum is a rare anomaly , putting the anterior mediatinal structures at risk and causing paradoxical movement of the chest resulting in feeding difficulty . We report a neonate who was born with absent sternum and was repaired at 2 months of age with restoration of native protective tissue cover over the mediastinum.

Material and method
A One month old child with birth weight of 3.2 kg was brought to our attention due to absence of sternum with flail movement during breathing and cosmetic concern in the form of swelling in front of the neck during crying . A CT scan showed that there was no sternal ossification centres and the ribs and the nipple had displaced laterally . There was a linear hyperpigmented scar mark extending from the umbilicus to to the midline near the xyphisternum and the gap between the clavicle end was 5 cm during rest and increasing upto 6 cm during crying .

Procedure :
The skin incision was incised to the level of subcutaneous tissue and flaps were raised up to the area of the nipple. The strap muscles and sternocleidomastoid which was attached to the displaced clavicles were also released.After going to the level of rib cage, the pec major flap was raised bilaterally.
The main maneuver which helped in getting the bony cage approximation was creation of a flap using perichondrium of the displaced sternal border. The flap was laterally based opening medially, this tissue was strong and fibrous and enabled in pulling the separated bony margins together
The area under the thoracic cage was dissected next, opening bilateral pleura widely, the thymic tissue was excised, creating space A series of 4, 2-0 PDS sutures were used to approximate the bony structures and see the effect on cardiopulmonary dynamics.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1808 - EBSTEINS ANOMALY WITH ACCESSORY PATHWAY INTRA OPERATIVE ABLATION WITH CONE REPAIR.

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Background / Hypothesis:
Background:
Ebsteins anomaly can be associated with accessory pathway leading with supraventricular arrythmias . The presence of pathways complicates the management as mapping and ablating can be challenging in the Catheterisation lab due to altered anatomy, postoperatively the suture line can hinder the ablation and some of these patients may require cavopulmonary shunt to offload the ventricle further complicating the access for Electrophysiologic ablation.

Materıals and Methods :
Out of 12 patients with Ebsteins anomaly treated in our centre over the last 2 yrs, 2 patients had recurrent supraventricular tachycardia (SVT) due to Atrioventricular reentrant tachycardia requiring frequent admissions prior to surgery. In both the patients the accessory pathway was identified and ablated intraoperatively using radiofrequency ablation .
The mapping was done after opening the sternum with the heart beating and the sites were marked with a suture epicardially . After giving cardioplegia the right atrium was opened and ablation was done where the markers were placed. It is possible to see the break in the fibrous structure near the site of pathway when observed carefully though magnification loupe.

Results :
In both the patients one a 12 yr old boy and the other a 8 yr old girl the procedure was carried on successfully and added only 15 minute to the procedure , 10 min for epicardial pre bypass mapping and 5 minutes for intraoperative ablation , both had subsequent Cone repair with good competence and fortunately did not require cavopulmonary shunt. Both the patients who used to have frequent admissions for SVT had subsequent smooth postoperative recovery with no recurrence of arrythmias.

Conclusion :
Intraoperative ablation of accessory pathways is time saving and efficient way of dealing with reentrant tachyarrythmias during Cone repair for Ebsteins anomaly.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1809 - TOTALLY THORACOSCOPIC WARDEN SURGERY FOR PARTIAL ANOMALOUS PULMONARY VENOUS CONNECTION

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Background:
Minimally invasive cardiac surgery is a growing trend in congenital heart disease. Here, we aims to report our initial surgical experience and evaluate the safety and efficacy of totally thoracoscopic Warden surgery for partial anomalous pulmonary venous connection (PAPVC).

Methods:
A retrospective analysis was conducted on seven consecutive patients (4 males, 3 females; median age: 29 years [IQR 21–58]) who underwent totally thoracoscopic Warden surgery at Guangdong Provincial People's Hospital. Clinical variables included operative time, cardiopulmonary bypass (CPB) time, and aortic cross-clamp (ACC) time. Postoperative outcomes were assessed, including ICU/hospital stays, echocardiographic findings, and complications.

Results:
All procedures were successfully completed without conversion to median sternotomy. The median operative time was 295 minutes (IQR 245–345), with CPB and ACC durations of 194 minutes (IQR 155–240) and 99 minutes (IQR 60–124), respectively. Concurrent procedures included tricuspid valvuloplasty (TVP, n=7) and mitral valve repair/replacement (n=2). Persistent left superior vena cava (PLSVC) was present in 4 cases (57.1%). Postoperatively, the median ICU and hospital stays were 1 day (IQR 1–1) and 5 days (IQR 4–7), respectively. Echocardiography demonstrated a reduction in tricuspid regurgitation (TR) severity from moderate/severe preoperatively to trace/mild in all cases. No major complications occurred.

Conclusions:
Totally thoracoscopic Warden surgery is a feasible and minimally invasive approach for PAPVC in adolescents and adults, even in anatomically complex cases with PLSVC. The technique achieved favorable hemodynamic outcomes with rapid recovery. However, larger studies are needed to confirm its long-term durability.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1810 - VSD WITH ARCH INTERRUPTION IN OLDER CHILDREN – A DIAGNOSTIC AND MANAGEMENT DILEMMA.

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Rchi, Surgery, Chennai-India [1] Rchi, Cardiology, Hyderabad-India [2] Rchi, Cardiology Chief, Hyderabad-India [3]

Background / Hypothesis:

Background :
Ventricular septal defect with arch interruption is associated with severe pulmonary artery hypertension as the main pulmonary artery continues through the ductus into the descending aorta . As there is an obligatory right to left shunt it is very difficult to determine if the pulmonary vascular resistance is reversible and if the child should be offered surgery . The dilemma arises as the modified history after closing shunt in established high pulmonary vascular resistance is worse than the natural history without closing the shunt.

Material and method
A 8yr old boy presented with failure to thrive and increased precordial acitivity , ECHO and CT angiography revealed large subpulmonic VSD with Type b arch interruption , the pulmonary arteries were hugely dilated and cardiac catheterization showed near systemic pulmonary artery pressures with PVR of 8.3 Woods units and with mild reversibility with hyperoxia test. With borderling operability values we offered surgery by leaving a shunt at at all three levels, the atrial , the ventricular and at the great artery level. Which would enable shunting and which could be closed by interventional means if the hemodynamics permit at a later date. The child underwent correction of physiology by VSD closure with Polytetrafluorothylene patch with a 6 mm cruciate fenestration , a sizeable atrial communication was left of 8mm size and a 5mm shunt was connected between the arch and the main pulmonary artery to mimic the PDA.

Results
The intial postoperative course was uneventful with the communications shunting bidirectionally during the early postoperative period and at the time of discharge at 10 days it was predominantly left to right , the pulmonary vasodilators were reduced and the patient required increase of antifailure measures. During 6 month follow up the ventricular communication is very restrictive

POSTER PRESENTATIONS

Category: Cardiac Surgery

1813 - PERSISTENT FIFTH AORTIC ARCH CLINICAL EVIDENCE SUPPORTING COMPLETE RESECTION TO PREVENT RESTENOSIS

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Background / Hypothesis:
Persistent fifth aortic arch (PFAA) is a very rare congenital cardiovascular malformation in humans and has many different anatomical forms and physiological consequences.

Materials and Methods:
This retrospective study collected the clinical data of 13 PFAA patients admitted in Children's Hospital Zhejiang University School of Medicine from January 2015 to December 2024. Analyze the clinical manifestations, echocardiography, computerized tomographic angiography (CTA), genetic information, surgical procedure and outpatient or telephone follow-up.

Results:
13 cases of PFAA were collected consisting of 9 boys and 4 girls with age from 8 to 196 days (mean, 49 days) and weight from 1.70 to 8.00 kg (mean, 3.50 kg).
One case was type A (double lumen), 10 cases were type B (coarctation of the fifth arch and interruption of the fourth arch) and 2 cases were type C (systemic-to-pulmonary connection), according to the Weinberg's classification. Case 5 had complex variation of aorta and its branches, and this anatomical combination of right PFAA with interruption of the right fourth aortic arch, right aortic arch, aberrant left subclavian artery and Kommerell diverticulum at the stump of the left arch has not been reported in the literature. 8 cases of type B underwent two different kinds of surgical method to reconstruct the aorta, while two cases of end-to-end anastomosis of the descending aorta to PFAA developed restenosis after surgery and performed balloon dilation treatment. Surviving patients were followed up to now (mean, 3.6 years [range, 0.5-9.5 years]).

Conclusions:
According the comprehensive summary of the diagnosis, treatment and long-term prognosis of 13 patients in our center, it is considered that complete resection the tissue of the fifth arch in type B PFAA is the key point to prevention of restenosis.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1816 - CRISS CROSS HEART AN UNUSUAL CARDIOPATHY. CASE SERIES.

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Background / Hypothesis:
Criss-cross heart is characterized by abnormal rotation of the ventricular mass along its major axis during development, as a result, inflow streams cross at an atrioventricular level without mixing. Associated cardiopathy are diverse; consequently, the surgical approach should be personalized.

Materials and Methods:
Three cases of criss-cross heart are described to analyze the surgical management and results.

Results:
Patient 1
A 12-year-old male patient diagnosed with levocardia, lateralized pulmonary and systemic venous returns, double discordance, ventricular septal defect, pulmonary stenosis and regurgitation, tricuspid valve prolapse to the right outflow tract, pulmonary branches and left atria dilation, with preserved biventricular function. The patient underwent ventricular septal defect closure through a transpulmonary approach. After surgery, no residual defects, tricuspid regurgitation, or obstructions were found.

Patient 2
A 2-year-old male patient diagnosed with lateralized systemic and pulmonary venous returns, concordant crossed atrioventricular connection, double outlet of the right ventricle, pulmonary atresia, atrial septal defect and patent ductus arteriosus. The patient had a record of a right Blalock-Taussig shunt, an angioplasty with a stent, and a left Blalock-Taussig shunt. A new systemic-pulmonary shunt was performed due to no favorable anatomy for biventricular correction and the presence of a ventriculoperitoneal shunt that contraindicated the univentricular approach.

Patient 3
A 2-year-old male diagnosed with mesocardia, dextroapex, single ventricle morphology with a double way of entry, double outflow, anterior aorta, mixed pulmonary stenosis with hypoplastic ring, post/stenotic dilation, atrial septal defect, mitral and tricuspid regurgitation, and aortic stenosis. The child underwent a modified Blalock-Taussig shunt.

POSTER PRESENTATIONS

Conclusions:
The diagnosis and imaging assessment of the patient's anatomy and associated conditions related to CCH are vital to deciding whether a physiological or anatomical correction is preferred. An individualized surgical approach results in an increased survival rate, better outcomes, and improved life quality.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1817 - SHORT TERM OUTCOMES OF MINIMALLY INVASIVE APPROACH FOR REPAIR OF CONGENITAL HEART DEFECTS

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Background / Hypothesis:
We hypothesize that minimally invasive surgical approach is safe and effective alternative to the conventional full median sternotomy in the repair of simple congenital heart defects

Materials and Methods:
From January 2023 to August 2024, total of 16 medical records of all pediatric patients who underwent minimally invasive surgical approach at King Faisal Specialist Hospital and Research Center -Riyadh have been studied. Surgical approaches were Vertical Axillary Right Thoracotomy (VART, n= 11), Mini Lower Sternotomy (MLS, n=4) and Mini Upper Sternotomy (MUS, n=1). The diagnosis was Atrial Septal defects (ASD, n=9), Sinus venosis ASD with partial anomalous pulmonary venous drainage (SVPAPVD, n=1), Ventricular Septal Defects (VSD, n=4) Subaortic membrane (SAM, n=3) and Double chamber Right ventricle (DCRV, n=2)

Results:
The overall mean follow-up duration was 189.6 months.
The median patient age was 37.34 months, with 56.25% male and 43.75% female.
Most patients (93.75%) did not have genetic syndromes. The average hospital stay was 6.88 days, and ICU stay was 2.31 days. Vertical axillary Right thoracotomy was the most common surgical method (68.75%), followed by mini lower sternotomy (25%) and mini upper sternotomy (6.25%). ASD was the most frequent diagnosis (56.25%), followed by VSD (25%), SAM (18.75%), DCRV (12.5%), and SVPAPVD (6.25%). The average Overall OR time was 210.88 minutes, with 56.2% of patients extubated intraoperatively. Only one patient required 2nd bypass run for residual right ventricular outflow obstruction (RVOTO). A descriptive sub analysis was done For ASD cases, the mean CPB time was 65.78 minutes, Cross Clamp time was 44.11minutes, and OR time was 184.11 minutes.

A complication was observed in only one patient who required a permanent pacemaker implantation post VSD closure 6.25%. We had 100% survial with 0% Sternotomy conversion rate.

Conclusions:
The findings suggest that this approach provides excellent clinical outcomes with better cosmetic impact and shortened recovery periods

POSTER PRESENTATIONS

Category: Cardiac Surgery

1820 - SUPERIOR INFERIOR VENTRICLES WITH ATRIOVENTRICULAR DISCORDANCE SURGICAL MANAGEMENT A CASE REPORT.

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Background / Hypothesis:
Superior-inferior ventricles are an unusual anomaly characterized by a horizontal ventricular septum with the two ventricles lying one above the other rather than side by side. This morphology is often associated with other complex types of congenital heart defects.

Materials and Methods:
We present the case of a 6-year-old female patient who at the age of 8 months was studied for a gastroenteritis clinic presenting cyanosis and establishing the presence of a complex cardiopathy, the reason to refer she to our institute where the diagnosis of situs solitus abdominal and atrial, venous return systemic and pulmonary lateralized systemic to atrium ubicated to the right and pulmonary to the atrium localized to the left, levocardia, discordant atrioventricular connection, double outlet right ventricle, superior/inferior ventricular arrangements with superior right ventricle and inferior left ventricle, right anterior aorta, posterior left pulmonary artery, atrial septal defect ostium secundum septated, patent ductus arteriosus and non-related ventricular septal defect. The patient was treated in other center with a pulmonary artery banding and close of the PDA at the age of two.

Four years later she presented an exacerbation of cyanosis and deterioring of their functional class reason to present for a surgical approach. The palliative way was performed establishing the impossibility of an anatomical correction due to the complex and a very large ventricular septal defect which conditions a functional single ventricle.

Results:
Was performed a BT shunt by thoracotomy without complications improved the cyanosis and the clinical status of the patient.

Conclusions:
Although the approach to performing physiological repair of superior-inferior ventricles may differ from patient to patient, successful functional outcomes can be achieved.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1830 - COMPARATIVE CLINICAL OUTCOMES OF RIGHT LATERAL THORACOTOMY AND TOTALLY THORACOSCOPIC SURGERY FOR ADULT PATIENTS WITH ATRIAL SEPTAL DEFECT A SINGLE CENTER RETROSPECTIVE STUDY

Yushen Fang [1], Zechen Li [1], Jiahong Li [1], Kaiyu Wang [1], Gang Xu [1], Shusheng Wen [1], Jimei Chen [1], Jian Zhuang [1], Haiyun Yuan [1], Xiaobing Liu [1]
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Background / Hypothesis:
To introduce and evaluate a novel minimally invasive surgical approach utilizing a right lateral thoracotomy for the repair of atrial septal defect(ASD) in adult patients, and to compare its clinical outcomes with those of totally thoracoscopic surgery.

Materials and Methods:
A retrospective analysis was conducted on the clinical data of 23 adult patients who underwent ASD repair at Guangdong Provincial People's Hospital between June and October 2024. Patients were devided into two groups based on the surgical approach they adopted: the totally thoracoscopic surgery group(TTS, n=12) and the right lateral thoracotomy group(RLT, n=11). Data were collected and compared between the two groups, including operative parameters such as overall surgical time, cardiopulmonary bypass(CPB) time and aortic cross-clamp(ACC) time. Post-operative outcomes were assessed through changes in echocardiographic parameters, laboratory markers (including growth stimulation expressed gene 2[ST2], brain natriuretic peptide[BNP], myocardial enzymes such as creatine kinase[CK], creatine kinase-MB[CKMB], lactate dehydrogenase[LDH] and cardiac troponin T[cTnT]), blood-gas analysis(BGA), vasoactive-inotrope score(VIS), length of ICU and hospital stay, thoracic drainage time(TDT).

Results:
The overall surgical time was significantly longer in group RLT compared to group TTS(P=0.011). However, CPB time, ACC time, and postoperative VIS, BNP, CK, CKMB, ICU stay, hospital stay, and TDT were similar between the two groups(P>0.05). Group RLT exhibited a significantly higher respiratory index(RI) at <6 hours postoperatively(P=0.01) and lower levels of ST2(P=0.037) and cTnT(P=0.047) at 12–24 hours postoperatively compared to group TTS. Echocardiographic parameters showed no significant differences between two groups, except for a more pronounced reduction in left atrial(LA) size at discharge in group TTS(P=0.008).

Conclusions:
RLT for ASD repair in adults demonstrated comparable clinical outcomes to TTS in terms of postoperative recovery and cardiac function. Further studies with larger cohorts and longer follow-up periods are warranted to fully elucidate the long-term benefits.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1833 - WHAT HAPPENS TO PARENTS A LONGITUDINAL STUDY PROTOCOL ON BURNOUT AND RESILIENCE BEFORE AND AFTER THEIR CHILD'S CHD SURGERY

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Background / Hypothesis:
Between March 2024 and February 2025, 99 pediatric patients (1.5–18 years old) with congenital heart disease (CHD) undergoing surgery were followed at Niguarda Hospital (Milan, Italy). 645 clinical interviews were conducted, involving 88 families.
These children are at increased risk of behavioral and emotional difficulties throughout development. Among the various risk factors, parental mental health plays a crucial role. A nurturing family environment, supported by parental psychological well-being, may represent a protective factor, facilitating an adaptive processing of the illness experience. During critical phases of care -before surgery and during post-operative recovery- parents may suffer from significant psychological distress. Understanding the impact of such distress, along with parents' personal coping resources, on children's well-being is essential. This study will explore:
1. Longitudinal changes in parental burnout, before and after their child's surgery.
2. The relationship between children's behavioral, emotional difficulties and parental burnout and the moderating role of parental resilience.

Materials and Methods:
Eligible participants will include parents of pediatric patients with CHD undergoing surgery. Psychological assessments will be conducted at three time points: before surgery (t0); approximately two months (t1) and one year (t2) post-surgery. At each point, parents will fill out the following self-report instruments:
- Resilience Scale for Adults, to evaluate resilience resources.
- Child Behavior Checklist, to evaluate behavioral/emotional difficulties of children.
- Parental Burnout Assessment, to evaluate parental burnout.

Results:
We expect to find high levels of burnout before surgery, persisting in the immediate post-operative phase.
We further hypothesize that higher parental burnout will be associated with higher children's difficulties, with parental resilience playing a protective role.

Conclusions:
If confirmed, these findings will highlight the decisive role of parental psychological well-being as a protective factor in children adjustment during critical phases of care. Integrating parental psychological support into CHD multidisciplinary management could therefore be essential.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1835 - THE MID TERM OUTCOME AFTER CONE REPAIR IN PATIENTS WITH EBSTEIN ANOMALY

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Background / Hypothesis:
Cone repair is the most anatomical type of repair for Ebstein anomaly. The mid and long term results after Cone repair from high volume centers are encouraging. We present our mid-term results on Cone repair for Ebstein anomaly

Methods
We reviewed our surgical data from June 2014 till March 2025. A total of 48 patients who underwent cone repair for Ebstein anomaly at our institution were retrospectively analyzed. The median age was 12 years (7.7-21.5 years). Female gender was seen in 81.3%. WPW syndrome was seen in 2 pt (4.4%). The median CT ratio 0.65 (0.5-0.75%). Preoperative RV dysfunction was seen in 16 pts (33.3%). Preoperative LV dysfunction was seen in 8%.

Results:
Cone repair was done in 35 pts (72.8%).Cone repair and BD Glenn (One and half ventricle) was done in 13 pts (27.1%).The median CPB and ACC time was 126 (104, 154) minutes and 94 (81,111)minutes respectively. The median duration of ventilation was 5.5 (2,8)hours. The median ICU stay was 2 days (1 -3 days) and the median hospital stay was 4 days (3.7-5days). Predischarge Echo showed trivial to mild tricuspid regurgitation in 93.7%(45pts), and moderate tricuspid regurgitation in 3pts. The median gradient across the repaired valve was 1.4 mmhg (0-8mmhg). None of them needed a pacemaker. There was no stroke or renal dysfunction. There was no perioperative or 30-day mortality. All of them are doing well. The freedom from moderate to severe tricuspid regurgitation was 84.86% (CI :0.75-1.0). One reoperation (2.1%) occurred after 9 years due to severe tricuspid regurgitation. There was no mortality on follow-up.

Conclusions:
Cone repair gives the best durable results in midterm follow-up in Ebstein anomaly. One and half ventricle strategy is very useful in patients who are presenting late with right ventricular dysfunction

POSTER PRESENTATIONS

Category: Cardiac Surgery

1836 - BALLOON PULMONARY VALVULOPLASTY IN SYMPTOMATIC NEONATES WITH TETRALOGY OF FALLOT A 17 YEAR SINGLE CENTER EXPERIENCE

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Background
Symptomatic newborns with Tetralogy of Fallot (ToF) require corrective surgery or palliation within the first month of life. Neonatal corrective surgery carries high morbidity and reintervention rates, while modified Blalock-Taussig shunt placement has significant mortality. Balloon pulmonary valvuloplasty (BPV) is an established treatment for pulmonary valve stenosis, but its role in ToF palliation remains unclear.

Materials and Methods:
This prospective single-center study (2007–2024) evaluated BPV in symptomatic neonates with ToF. Clinical outcomes, oxygen saturation, echocardiographic, and catheterization findings were analyzed before and after BPV.

Results:
BPV was performed in 65 neonates (mean age: 12.2 ± 8.4 days, weight: 3.09 ± 0.6 kg). The mean balloon-to-pulmonary valve diameter ratio was 1.1 ± 0.27. After BPV: Oxygen saturation increased from 77.2% to 92.8%. Systolic pulmonary artery pressure increased from 18.1 mmHg to 29.1 mmHg. No major complications or deaths occurred. Complete repair was performed in 59 (91%) patients at 6.1 ± 4.1 months. The mean Nakata index increased from 116.6 to 194.6 mm^2/m^2 ($p < 0.001$). Pulmonary valve diameter increased from 6.1 mm to 9.4 mm ($p < 0.001$). Left ventricular end-diastolic index increased from 30.1 ml/m^2 to 39.6 ml/m^2 ($p < 0.001$). Six patients (9%) required additional pulmonary blood flow optimization.

Conclusion:
Balloon dilatation of the pulmonary valve is a safe palliation procedure in the neonates with symptomatic tetralogy of Fallot, and has provided effective palliation in 91% of cases.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1839 - THE MIDTERM OUTCOME AFTER OZAKI AORTIC NEOCUSPIDIZATION IN CHILDREN AND YOUNG ADULTS

Vijayakumar Raju [1], Naveen Srinivasan [2], Kaushik Jothinath [3], Sreja Gangadharan [3], Mani Ram Krishna Singaravelu [4], Kalyansundaram Muthuswamy [5], Sanchitha Harini Guruchandrasekar [6]
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Background / Hypothesis:
Aortic valve neocuspidization technique (Ozaki) is an alternative surgical option for patients with aortic valve disease. Long-term outcomes in adults are highly encouraging . We would like to share our midterm results following Ozaki aortic neocuspidization in children and young adults with aortic valve disease

Materials and Methods:
A total of 52 patients underwent ozaki aortic valve neocupidization from November 2019 till March 2025. The mean age was 16+10 yrs and about 75% of them were between 6 yrs to 25 yrs. The male to female ratio was 2:1. The mean body weight was 38+18 kg. Severe aortic regurgitation was observed in 31 patients, severe aortic stenosis in 17 patients, and mixed lesions in 4 patients. Rheumatic heart disease was seen in 44%, bicuspid aortic valve in 20% and unicuspid aortic valve was seen in 10% of patients. Native pericardium treated with 0.6% glutaraldehyde was used in all patients.

Results:
The mean pericardial leaflet size was 20.7+6.8 mm. The mean cardiopulmonary bypass time and aortic cross clamp time was 152.28+ 41.6 and 122.98+32 minutes respectively. TEE showed trivial to mild aortic regurgitation in all, and the mean gradient was 11+ 3mmhg. There was no heart block, infective endocarditis, stroke and 30 days mortality. The mean hospital stay was 4.6+2.4 days. The mean follow up was 3.2+0.6 yrs. There were two deaths on follow up. One patient had a balloon aortic valvuloplasty for severe neo-aortic valve stenosis. At 5 years, the rates of freedom from moderate to severe aortic regurgitation, moderate to severe aortic stenosis, reoperation and survival were 84% (CI: 0.7-0.9), 91% (CI: 0.8-1), 93% (CI: 0.9-1), and 96% (CI: 0.9-1), respectively.

Conclusions
Aortic valve neocuspidization yields good immediate and midterm results in children and young adults with rheumatic and congenital aortic valve lesions

POSTER PRESENTATIONS

Category: Cardiac Surgery

1840 - ENDOTHELIALIZATION IN SYNTHETIC MATERIALS IN VASCULAR GRAFTS CASE REPORT.

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Background / Hypothesis:
In congenital heart disease surgeries, right ventricular outflow tract (RVOT) reconstruction is a necessary treatment procedure. This intervention is performed early which leads to structural changes in the grafts used.

Materials and Methods:
10-year-old male patient with diagnosis of Transposition of the Great Arteries with associated lesions; interatrial communication, ventricular septal defect and pulmonary stenosis. At one month of life, a left Modified Pulmonary Systemic Fistula (MBTS) was performed, at the age of 6 years Rastelli surgery was performed with closure of the interatrial defect, placement of 18 mm Woven Dacron tube and clipping of the fistula and redirection of flow from the left ventricle to the aorta with Goretex patch. The patient was followed up at the pediatric cardiology service and in 2023 is observed by echocardiography; mild mitral insufficiency, moderate tricuspid insufficiency, residual interventricular defect of 18 mm in the upper part of the patch, double lesion in the Woven Dacron tube with obstructive component of 78 mm Hg and significant insufficiency. LVFE 56%. TAPSE 16 mm, RV-FS 30%, for which reason it is presented in medical-surgical session where it is proposed for surgical management, redirection of flow from the left ventricle to the aorta with Gore-Tex patch, Peeling Procedure with implantation of Magna No 23 aortic prosthesis in pulmonary position was performed. Woven Dacron tube is sent to pathology to determine histopathologic changes.

Results:
A tubular tissue specimen measuring 5 cm long x 1.5 cm wide, corrugated aspect covered with white tissue with fibrous aspect that re-endothelializes, concluding as fibrosclerotic cicatricial connective tissue with focal areas of dystrophic calcification with luminal endothelium is received in pathology. No evidence of thrombus or vegetations.

Conclusions:
We have reported structural changes in the grafts, of variable degree, however, it is necessary to evaluate in addition to the histological changes the clinical considerations

POSTER PRESENTATIONS

Category: Cardiac Surgery

1842 - PULMONARY VALVE NEOCUSPIDIZATION USING OZAKI TECHNIQUE IN INFANTS WITH TOF WITH ABSENT PULMONARY VALVE SYNDROME EARLY EXPERIENCE

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Background / Hypothesis:
TOF with absent pulmonary valve syndrome is a very challenging congenital heart anomaly to treat in the infant period due to air way compression by the aneurysmal dilatation of branch pulmonary arteries on the major airways. The basic surgical strategies involve positioning the branch pulmonary arteries anteriorly, performing reduction plasty on dilated branch pulmonary arteries to alleviate airway compression, and ensuring a competent pulmonary valve at the end of the surgery. However, affordability and availability of homograft and valved xenograft is very limited in the resource limited areas. We want share our experience with creating ozaki pulmonary valve using native pericardium in TOF with absent pulmonary valve syndrome.

Materials and Methods:
Total of four infants aged 2 months, 3 months, 8 months, and 11 months underwent surgery. All of them are presented with respiratory distress and needing multiple hospitalization. Echo confirmed the diagnosis of Tetralogy of Fallot with absent pulmonary valve with massively dilated branch pulmonary arteries and severe pulmonary regurgitation. CT thorax confirmed presence of significant compression of the main bronchus by the dilated branch pulmonary arteries. All of them underwent total intracardiac repair in the form of VSD closure with pericardial patch, Lecompte manuver, anterior reduction of bilateral branch pulmonary arteries and pulmonary valve reconstruction using Ozaki technique. Bicuspid pulmonary valve was reconstructed using glutaraldehyde treated native pericardium using Ozaki template. Post procedure TEE showed fully competent pulmonary valve with no forward gradient. All of them had very smooth post operative period. They all returned home within ten days. All children are doing well on follow up.

Conclusion:
There has never before been a case of pulmonary valve neocuspidization in TOF with absent pulmonary valve syndrome utilising the Ozaki procedure.It is a very helpful strategy in places with limited resources

POSTER PRESENTATIONS

Category: Cardiac Surgery

1849 - OUTCOMES OF ADULT PATIENTS WITH TETRALOGY OF FALLOT SURGICAL CORRECTION WITH AND WITHOUT PRIOR PALLIATIVE TREATMENT IN A MEXICAN CARDIOVASCULAR CENTER.

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Background / Hypothesis:
Tetralogy of Fallot (ToF) is a complex congenital heart defect characterized by a ventricular septal defect, right ventricular outflow tract obstruction, aortic override, and right ventricular hypertrophy. Affecting 1-3 in 10,000 live births, it often results in significant morbidity, particularly in adulthood for those lacking timely surgical intervention.

Materials and Methods:
This retrospective study evaluated 22 adult patients with TOF who underwent surgical correction at the Instituto Nacional de Cardiología Ignacio Chávez in Mexico City. Data on baseline characteristics, preoperative evaluations, surgical details, postoperative complications, and follow-up outcomes were collected from medical records and analyzed statistically.

Results:
The cohort's median age was 23 years, with 64% being female. Preoperative assessments revealed significant comorbidities, including other cardiac anomalies. Surgical interventions included outflow tract enlargement and placement of biological prostheses. Follow-up showed 86% classified as NYHA class I, indicating significant functional improvement, although 23% exhibited residual valvular issues. At the time of admission, the New York Heart Association (NYHA) classification for heart failure showed that 14% of the patients were in class I, 41% in class II, 27% in class III, and 18% in class IV. Notably, cyanosis was observed in 59% of the patients upon admission, accompanied by a median oxygen saturation (SaO2) of 92%.

Conclusions:
Management of ToF usually involves surgical intervention to rectify anatomical defects, improve pulmonary blood flow, and alleviate hypoxemia. The ideal timing for surgery has been during infancy. Early surgical correction has been linked to lower morbidity and mortality rates, with studies showing a 30-year survival rate of 85-95% for patients who receive timely surgery. This study underscores the critical need for early intervention and thorough follow-up in adults with TOF. Despite challenges in surgical outcomes, substantial functional improvements were noted, emphasizing the importance of continuous monitoring and potential reinterventions to optimize long-term patient care.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1853 - TOTALLY ARTERIAL REPAIR OF NON FACING ALCAPA

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Background / Hypothesis:
Anomalous left coronary artery from the pulmonary artery (ALCAPA), connected to the non-facing sinus of the pulmonary artery (PA), is a rare condition and presents a technical challenge for repair. Due to the significant distance between the left main coronary artery (LMCA) and the aorta, the use of various materials raises concerns about long-term outcomes and potential stenosis. Therefore, we have designed and performed a totally arterial repair.

Materials and Methods:
A 6-month-old boy was admitted for severe heart failure. Clinical examination, ECG, and chest radiography strongly suggested ALCAPA. Transthoracic echocardiography (TTE) confirmed the diagnosis, associated with severe left ventricular (LV) dysfunction and mitral regurgitation. CT scan clarified the anatomy, showing the LMCA connected to the non-facing sinus of the PA. Emergent surgical repair was indicated.
After extensive dissection of the ascending aorta and pulmonary artery trunk, the orientation and length of the aortic and pulmonary flaps were carefully spotted and marked on the loaded beating heart. Under cardiopulmonary bypass (CPB) and aortic cross-clamping, both flaps were detached and sutured together, creating a completely arterial neo-trunk, connecting the LMCA to the ascending aorta, crossing anteriorly to the PA.

Results:
The postoperative course was rapidly favorable, with progressive improvement in LV function and mitral regurgitation. Six months later, follow-up showed normal LV function, trivial mitral regurgitation, and a large neo-trunk on both TTE and CT scan. Antiplatelet therapy was discontinued. Clinical follow-up at 28 months was uneventful, with no further treatment required.

Conclusions:
Careful planning and intraoperative spotting allow for a totally arterial repair of non-facing ALCAPA, resulting in good mid-term outcomes and likely long-term patency.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1858 - MITRAL VALVE INTERVENTIONS IN PATIENTS WITH HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY STANDARDISING APPROACHES FOR SUCCESSFUL OUTCOMES

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Background / Hypothesis:
Mitral regurgitation (MR) remains the hallmark feature of hypertrophic obstructive cardiomyopathy (HOCM). Management of the patients with mitral valve (MV) anomalies presents a challenging call, requiring comprehesive apporach. The objective of this study was to assess the approaches and surgical outcomes of MV interventions in patients undergoing surgical septal reduction therapy.

Materials and Methods:
The study includes paediatric patients who underwent surgical septal myectomy with concomitant MV interventions. Pre-operatively, all individuals underwent CT/CMR myectomy planning with detailed examination of the anomalous MV apparatus. The interventions on the MV and subvalvular apparatus included: resection of the secondary chords, plication of the anterior mitral leaflet (AML), mobilization of the papillary muscles (PM), and resection of muscular bands/PM attached to the AML.

Results:
We assessed 24 consecutive pediatric patients with mean age of 10.8±4.9. 70.8% of the patients were males. 1 (4.2%) patient presented with pre-operative RBBB post alcohol septal ablation. The mean systolic pressure gradient on the left ventricular outflow tract accounted 79.4±28.5 mmHg versus 16.3±6.4 mmHg in the post-operative period. All patients had moderate/severe MR and systolic anterior motion was present in 79.2% (19 patients) of the cases, whereas after the surgery, none of these findings was identified. Mean AML length after intervention accounted 16.2±3.6 mm versus 23.1±6.2 mm before correction. 4 (16.7%) patients underwent ICD implantation due to extreme left vetricular hypertrophy. 1 patient underwent pacemaker implantation due to complete AV block. In-hospital and overall mortality accounted 0%. Freedom from reoperation was 100%.

Conclusions:
MV interventions remain a cornerstone in HOCM patients due to the absence of standardized approach to its treatment. Our study demontrates a safe and feasible approach to its successful correction using techniques that address subvalvular anomalies and the length of the AML.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1865 - BEYOND CONVENTIONAL BOUNDARIES EXPANDING THE ROLE OF RIGHT ATRIAL APPENDAGE IN PEDIATRIC CARDIAC SURGERY

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Background / Hypothesis:
Tetralogy of Fallot (TOF) is a common congenital heart defect requiring surgical repair. A novel technique using the right atrial appendage (RAA) for pulmonary valve reconstruction has shown promise, but comparative studies are needed to assess its efficacy.
To compare the clinical outcomes of TOF repair using RAA versus the conventional autologous transannular patch (TAP), focusing on postoperative pulmonary insufficiency, right ventricular function, residual right ventricular outflow tract (RVOT) obstruction, and complications.

Materials and Methods:
This retrospective cohort study analyzed TOF repairs performed at the Division of Cardiothoracic Sciences, SIUT, between December 2023 and December 2024. Patients were divided into two groups: RAA reconstruction (Group A, n=22) and TAP repair (Group B, n=36). Data collected included demographics, preoperative echocardiography, surgical details, postoperative pulmonary insufficiency, RVOT gradient, right ventricular function, complications, length of stay, and in-hospital mortality.

Results:
Group A had a mean age of 5.6 years, weight of 12.7 kg, hematocrit of 46.7%, and oxygen saturation of 83%. Group B had a mean age of 5.02 years, weight of 14 kg, hematocrit of 47%, and oxygen saturation of 79%. Bypass and cross-clamp times were significantly lower in Group A ($p<0.05$). On-table extubation was higher in Group A (70%, $p<0.05$). Mortality (4 vs. 5 patients) and postoperative complications were similar between groups. Postoperative PR, Residual RVOT gradient and RV function was also similar between the two groups.

Conclusions:
RAA for pulmonary valve reconstruction yields comparable outcomes to TAP in terms of pulmonary insufficiency, RV function, and complications. It may be a viable alternative for select patients, but long-term follow-up is required.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1871 - THE CASE FOR LIVING HOMOGRAFTS OUTCOMES OF PEDIATRIC PROSTHETIC AORTIC VALVE REPLACEMENTS USING THE PEDIATRIC HEALTH INFORMATION SYSTEM DATABASE

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Background / Hypothesis:
Living homograft valve replacement (partial heart transplant) has been postulated to be a superior alternative to cryopreserved homograft, bioprosthetic, and mechanical valve replacement (pAVR) in young children. However, the feasibility of this as an alternative has not been investigated. We aim to describe this patient cohort and determine outcomes as compared to patients who were eligible for autologous valve replacement (aAVR).

Materials and Methods:
We performed a retrospective review of the Pediatric Health Information System (PHIS) between March 2020 to March 2025 for all patients ≤5 years of age who received an AVR. Procedures were determined using the International Classification of Diseases, 10th revision (ICD-10) procedure code for AVR including all graft types (autologous, non-autologous, zooplastic and synthetic). All grafts that weren't autologous were grouped as pAVRs and outcomes were compared to aAVR patients. Univariate analysis and multivariable regression were used to evaluate these cohorts.

Results:
We performed a retrospective review of the Pediatric Health Information System (PHIS) between March 2020 to March 2025 for all patients ≤5 years of age who received an AVR. Procedures were determined using the International Classification of Diseases, 10th revision (ICD-10) procedure code for AVR including all graft types (autologous, non-autologous, zooplastic and synthetic). All grafts that weren't autologous were grouped as pAVRs and outcomes were compared to aAVR patients. Univariate analysis and multivariable regression were used to evaluate these cohorts.

Conclusions:
AVR remains an infrequent operstion, though pAVRs make up about one-fifth of all AVRs in patients under the age of 5. Young patients unable to receive an aAVR have 3x higher likelihood of mortality after adjusting for age, ethnicity, gender, and severity of condition. More research needs to be done on the long-term impact of living homograft procedures to determine if use is superior.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1874 - "TRANSFORMING PERIOPERATIVE CARE IN PEDIATRIC CARDIAC SURGERY THE ROLE OF ENHANCED RECOVERY AFTER SURGERY (ERAS)"

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Background / Hypothesis:
Enhanced Recovery After Surgery (ERAS) protocols have revolutionized perioperative care by adopting evidence-based, multidisciplinary strategies tailored to optimize outcomes and reduce healthcare costs. In pediatric cardiac surgery, ERAS emphasizes family-centered education, short preoperative fasting, optimized anesthesia, early extubation, effective pain management, early ambulation, nutritional support, and early discharge. By integrating these measures, ERAS aims to minimize surgical stress, enhance recovery, and improve overall patient satisfaction.
This study evaluates the implementation and impact of ERAS protocols in pediatric cardiac surgery in a newly established unit at SIUT, focusing on optimizing perioperative care, reducing complications, and enhancing recovery while ensuring safety and efficiency in patient management.

Materials and Methods:
A retrospective descriptive study was conducted at the Division of Cardiothoracic Sciences, SIUT. Pediatric patients aged 1–18 years who underwent elective cardiac surgeries between April 2023 and December 2024 were included. Data on preoperative, intraoperative, and postoperative metrics were collected from hospital records. Key outcomes included extubation time, length of hospital stay, nutritional recovery, early ambulation, pain control, and 30-day readmission rates.

Results:
Data from 217 pediatric cardiac surgery patients were analyzed. Early extubation (within 8 hours of arrival to PICU) occurred in 83%, with 74% achieving on-table extubation. The reintubation rate was 2%. Most patients (73.6%) were discharged within 3–4 days. Early oral intake commenced within 2–3 hours post-extubation, with full dietary intake by postoperative day 1. Ambulation within 24 hours was prioritized, reducing complications such as atelectasis. A significant reduction in 30-day readmission rates (7%) was observed, with most cases related to minor wound infections and community-acquired illnesses managed in the outpatient setting.

Conclusions:
ERAS protocols in pediatric cardiac surgery demonstrated improved perioperative outcomes, including earlier dietary progression, enhanced mobilization, reduced complications, and lower readmission rates, reinforcing the potential for broader implementation.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1876 - LIFETIME MANAGEMENT OF IMPLANTABLE CARDIAC RHYTHM DEVICES IN CHILDREN THE VALUE OF LEAD SELECTION

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Background / Hypothesis:
Pacing in newborn, infants, and children means a lifetime therapy. The optimal timing of pacemaker implantation depends on underlying aetiology. However, the selection of the pacemaker leads used is still an issue of debate. Although endocardial lead implantation is a feasible, and in some cases the more feasible option, lead complications may develop over time, e.g. venous occlusion, lead failure, or outgrowth of lead size. Nevertheless, lead management is mainly related to lead removal. The aim of this presentation was to discuss a case with lead-related complications and to identify solutions and modify indications for lead use.

Materials and Methods:
The case of a 25-year-old woman with AV block after atrioventricular septal defect repair is presented. Three years later, the epicardial pacemaker was replaced by a transvenous system. At the age of 5 years, the patient underwent redo mitral valve procedure and upgrade of the pacemaker to a DDD device. After several surgeries, now she suffered from syncope due to dysfunction of the ventricular lead.

Results:
Due to occlusion of the subclavian vein, we first planned to remove the ventricular lead and to proceed with the new lead after recanalization of the subclavian vein. During surgery, no one of the leads could be removed and no recanalization of the occluded vein was possible. Finally, new leads and device was implanted successfully from contralateral subclavian vein.

Conclusions:
Although the result in present case was satisfactory, the patient needs a lifetime pacing and therefore a careful long-term follow-up is mandatory. The lead selection in the past is an issue of discussion. Although this selection is very individual, we must also adapt it to future developments, especially in children taking growth-related issues more in to account. Lead management starts with the selection of the more suitable device including the leads.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1877 - PROTOCOL DRIVEN ROUNDS EFFECTIVENESS AND CONTINUITY AUDIT (PRECA)

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Background / Hypothesis:
Effective communication and structured decision-making are critical in the PCICU to optimize patient safety and outcomes. Protocol-driven MDT morning rounds incorporating standardized checklists ensure consistency in care and adherence to evidence-based practices. Evening follow-up rounds reinforce the implementation of morning orders, while periodic audits of the checklist and attendance enhance accountability.
This study evaluates the impact of protocol-driven MDT morning rounds on patient outcomes, including pre and post-operative ECG and ECHO, SSI/infection, bed sore, nutrition and staff education and empowerment, in the PCICU.

Materials and Methods:
The study included paediatric patients admitted to our PCICU. A total of 1076 observations were made from 1st October 2023 to 30th September 2024. Protocol-driven MDT rounds utilized standardized checklists covering critical care domains such as pre and post-operative ECG and ECHO, ventilation strategies, SSI/infection, bed sore examination, nutrition, and medications. Morning rounds focused on planning, followed by evening rounds to verify order implementation. Outcomes were compared with historical controls receiving conventional rounds.

Results:
The introduction of protocol-driven MDT rounds added a significant improvement in compliance rates for critical discussion and planning:

· ECG Compliance: Improved from 33% to 83%.

· ECHO Compliance: improved from 33% to 87%

· Bed Sore Compliance: improved from 68% to 79%

· Nutrition Plan Compliance: improved from 48% to 77%

· SSI/Wound Infection Compliance: improved from 31% to 91%

· Attendance rates: Among healthcare team members varied from 88% to 99%.

These findings underscore the effectiveness of structured protocols in contributing towards improved patient care. Staff surveys indicated improved education, communication, and empowerment. Evening follow-up rounds ensured 95% compliance with morning orders, further enhancing quality care.

POSTER PRESENTATIONS

Conclusions:
Protocol-driven MDT rounds, reinforced by evening follow-ups and systematic audits, substantially improve patient outcomes, promote safe discharges, and empower staff through structured education and accountability. This approach highlights the value of standardized care processes in PCICUs.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1887 - MULTIMODAL INTRAOPERATIVE NEUROMONITORING (MIOM) DURING COMPLEX NEONATAL AND PEDIATRIC CARDIAC SURGERY.

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Background / Hypothesis:
mIOM during Pediatric Cardiac Surgery is an underutilized tool. Nevertheless, it could be a critical tool for intraoperatively stroke identification in complex neonatal and pediatric cardiac procedures. Cardiothoracic surgery carries a high risk of cerebral hypoperfusion, which is why it is pertinent to have cerebral blood flow continuously monitored to ensure anoxic events do not go underdetected. In addition, recurrent laryngeal nerve (RLN) and phrenic nerve can be monitored during these procedures to prevent nerve injury.

Materials and Methods:
Since September 2024, Hospital Sant Joan de Deu of Barcelona has introduced a mIOM protocol in Sixteen patients, ages ranged from 9 days and 12 years old; 11 males and 5 females, have been enrolled for mIOM providing rapid identification of evolving neuronal injury.
The mIOM protocol includes electroencephalography (EEG), combined with somatosensory evoked potentials and RLN and phrenic nerve monitoring during cardiac surgeries.

Results:
This method is able to monitor each lobe of the brain independently for early detection of hypoperfusion of the cortex and prevent injury. Also, the monitoring of vocal chordae and phrenic nerve allow the surgeon to perform a safe dissection and carry a surgery with assurance.

Even so, cardiac surgeons rely on cerebral oximetry for the measurement of brain perfusion and oxygenation. This modality has limitations due the regionality and sensivity.

Conclusions:
Continuous mIOM provides prompt identification of hypoxia to mitigate adverse neurologic events. It will provide the surgeon an extra level of confidence and will optimize patient outcomes and preserve brain function.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1898 - MECHANICAL ATRIOVENTRICULAR VALVE REPLACEMENT WITH EXCLUSION OF DYSPLASTIC ATRIOVENTRICULAR VALVE IN A PATIENT WITH DOUBLE INLET LEFT VENTRICLE (DILV) WITH TRANSPOSITION OF THE GREAT ARTERIES. MADDENING THE NOT DESCRIBED TECHNIQUES.

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Background/Hypothesis:
Congenital heart disease with univentricular physiology includes: single anatomical ventricle, two ventricles where one is unable to sustain circulation or two well-developed ventricles but biventricular repair is impossible.
For these the management is total Cavo pulmonary bypass and the established criteria, complicated situation when it's not the case.

Materials and Methods:
15-year-old female patient diagnosed with DILV and transposition of the great vessels, persistent left vena cava. At another hospital, atrioseptostomy and pulmonary banding at two years of age. Sent to our institution for deteriorating functional class with multiple hospitalizations for heart failure.

Echocardiography reported severe Mitral and Tricuspid regurgitation, left ventricle volume 442ml/m2. Cardiac catheterization, severe regurgitation in both atrioventricular valves. Systemic pressure 79/54mmHg. Pulmonary mean pressure 30 mmHg. Given anatomical and hemodynamic findings, cardiac transplantation was ruled out, leading surgery to correct AV valve insufficiency.

Surgery performed, bicaval cannulation, 30°C, antegrade cardioplegia, ASD enlargement, atrial septum resection, direct right atrioventricular valve closure, partial resection of left atrioventricular valve with mechanical valve placement. The right atrial appendage was excluded. Aortic clamping 37 minutes with CPB 82 minutes. During postoperative, the patient presented hemodynamic instability and dehiscence of valve exclusion was detected. Reason to perform percutaneous closure. Due to persistent postoperative AV block, pacemaker was placed. The patient progressed satisfactorily. The patient was discharged and remained in functional class I for six-months follow-up.

Results:
We present a complex case, patients out of regular context with univentricular physiology, given the atrioventricular valve insufficiency, without criteria for Fontan and pulmonary hypertension ruled out for cardiac transplantation. With dependence for heart failure control, led us to propose this unorthodox therapeutic.

POSTER PRESENTATIONS

Conclusions:
Given the complexity of some congenital heart diseases, the choices for the medical-surgical groups to at least improve the clinical condition of patients may go beyond what is established in the world literature.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1904 - T SHAPED PULMONARY VALVE SPARING PROCEDURE FOR TETRALOGY OF FALLOT WITH LEFT CORONARY ARTERY ANOMALY

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Background / Hypothesis:
The T-shaped pulmonary valve sparing procedure (T-S PVSP) has demonstrated excellent mid-term results in the repair of Tetralogy of Fallot (ToF). As the release of the anterior part of the pulmonary annulus requires a T-shaped infundibulotomy, this technique may be challenged by left coronary anomalies. We report two cases of ToF repair using T-S PVSP combined with mobilization of anomalous left coronary arteries.

Materials and Methods:
Two children (weighing 10 kg and 15 kg) presented with symptomatic ToF and left coronary artery anomalies crossing the right ventricular outflow tract: one with a left descending artery (LDA) arising from the right coronary artery and one with a double LDA. Both underwent ToF repair using T-S PVSP. Mobilization of the anomalous vessels was initiated on cardiopulmonary bypass and completed during antegrade cardioplegia. After muscular resection and closure of the ventricular septal defect, the T-shaped infundibulotomy allowed for release of the pulmonary annulus, commissurotomy, and enlargement of the right ventricular outflow tract using a shield-shaped pericardial patch, positioned beneath the anomalous left coronary artery.

Results:
The postoperative course was favorable for both patients. The last follow-up at 4 and 7 years showed no ischemic complications or significant pulmonary valve dysfunction.

Conclusions:
In children with ToF and left coronary artery anomalies, the T-S PVSP is feasible following careful mobilization of these vessels, and allows for effective preservation of the pulmonary valve.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1905 - MRI DERIVED PULMONARY VENOUS FLOW IS SUPERIOR TO CONVENTIONAL METHODS OF PULMONARY BLOOD FLOW DETERMINATION FOR USE IN PULMONARY VASCULAR RESISTANCE CALCULATION

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Background / Hypothesis:
Accurate inter-stage calculation of pulmonary vascular resistance (PVR) in single ventricle congenital heart disease (SVCHD) is essential to ensuring post-Fontan (total cavopulmonary connection) success and transplantation-free survival. Conventional, catheterization-based calculation of PVR (Fick's method) utilizes estimated pulmonary blood flows (PBF) for PVR calculation and does not account for alternative sources of PBF (aortopulmonary collaterals, APC). Thus, we hypothesized that MRI-derived PBF using total pulmonary venous flow would provide a novel and accurate method for PVR calculation when combined with catheterization-based hemodynamic assessment, and that these measurements are predictive of post-Fontan outcomes.

Materials and Methods:
We performed a retrospective cohort study of SVCHD patients that underwent a same-day pre-Fontan MRI and hemodynamic catheterization assessment. PVR calculation was performed utilizing hemodynamic pressures and: 1. Fick estimated PBF, 2. MRI-based PBF using total pulmonary artery flow calculation (PVR-PA), or 3. MRI-based PBF using total pulmonary vein flow (PVR-PV). Post-Fontan outcomes were evaluated and correlated with multi-modal PVR calculations.

Results:
16 patients had available pre-Fontan catheterization and MRI data. Post-operative complications included persistent pleural effusion (n=4/16, 25%), pericardial effusion (n=1/16, 6.25%), and Fontan failure (n=1/16, 6.25%; Table 2). While PVR-PV was lower than other modalities in uncomplicated patients, PVR-PV was significantly higher in patients with a complicated post-Fontan course (p=0.013). Higher single lung PVR-PV was associated with an increased risk of post-operative effusion in the contralateral hemithorax.

Conclusions:
MRI-derived PVR-PV outperforms both hemodynamic Fick and PVR-PA in predicting post-Fontan success. These findings support adoption of MRI-derived PVR-PV in determining Fontan candidacy to guide both surgical timing and medical management of concomitant pulmonary vascular disease. If validated within a larger cohort, PVR-PV calculations will meet a significant need in providing a reproducible, accurate, and non-invasive measure of PVR in patients with SVCHD.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1910 - GLOBAL WORKFORCE INFRASTRUCTURE AND VOLUMETRIC NEEDS IN PEDIATRIC CARDIAC SURGERY A MODELLING STUDY

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Background / Hypothesis:
Six billion people, including over 90% of children born with congenital heart disease globally, lack access to safe, timely, and affordable cardiac surgical care when needed. Here, a model-based estimate is provided of the surgical workforce, infrastructure, and financing needed to meet the global burden of congenital heart disease.

Materials and Methods:
A model was developed to simulate the required number of cardiac centers, surgeons, procedures, and costs relative to countries' congenital heart disease burdens. Data sources are summarized in Table 1. Deterministic and probabilistic sensitivity analyses were performed to confirm the robustness of results.

Results:
An estimated 1.15 million congenital heart surgery procedures are required globally per year. Globally, an estimated 4,600 cardiac centers and 23,000 congenital heart surgeons are required. This represents a gap of 3,578 centers and 19,142 surgeons, requiring an investment of approximately US$17.89 billion to develop centers and US$11.49 billion to train surgeons. In low- and middle-income countries, an estimated 4,353 centers and 21,760 congenital heart surgeons are needed. Findings were robust in sensitivity analyses, with variations based on assumptions about surgical need, volumetric thresholds, and cost estimates. Country-level analyses are underway to determine country-specific needs and costs.

Conclusions:
Vast gaps in the global pediatric cardiac surgical capacity exist, disproportionately affecting countries and territories with lower gross national incomes. Healthcare professionals, professional societies, patients, non-governmental organizations, policymakers, and funders are encouraged to collaborate to meet the growing needs of the world's population for congenital heart disease care.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1918 - LATE RESULTS OF THE SWITCH BACK ROSS OPERATION

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Background / Hypothesis:
The switchback Ross operation(SBR)is a challenging option for the treatment of neoaortic valve dysfunction and neoaortic root aneurysm post-Jatene operation. However, long-term results are lacking. We herein present the long-term results of two patients.

Materials and Methods:
Patient 1, at age 8yo, had a Jatene operation + LVOT obstruction resection. Moderate neoAo valve regurgitation was noticed post-operatively. In 2006, at age 16yo, he became symptomatic on moderate physical exertion. NeoAo root aneurysm + severe neoAo valve regurgitation + gross LV dilatation were diagnosed and he underwent the SBR. He was last seen in 2020, aged 36yo. He was asymptomatic, under no drugs. Echo findings included normal heart chambers size, preserved LV function, no residual interventriculat flow, light aortic root dilatation and light to moderate AoV regurgitation. RV pressure was stimated at 24mmHg and anterograde PV flow was normal.
Patient 2, on day of life 35, had a Jatene operation + transpulmonary VSD closure for Taussig-Bing heart treatment. When 5yo, he was diagnosed with severe neoAo valve regurgitation + sinus of Valvalsa aneurysm + subAo membrane + pulmonary trunk stenosis, and a SBR was carried out. He was last evaluated in January 2025, at age 23yo. Findings included allograft degeneration with pulmonary stenosis. He awaits for a heart catheterization in order to address this late complication. Left heart chamber size and aortic valve function were normal.

Conclusions:
The SBR is a reasonable solution for neoAo root dilatation with neoAo valve dysfunction post-Jatene operation once late aortic valve regurgitation and pulmonary allograft degeneration dysfunction may occur.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1920 - SURGICAL APPROACHES FOR AORTIC COARTATION REPAIR AFTER PRIMARY INTERVENTIONAL TREATMENT WITH STENT IMPLANTATION

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University Medical Center Mainz, Department Of Pediatric Cardiology, Mainz-Germany [2]

Background / Hypothesis:
Aortic coarctation (CoA) is a common congenital heart defect that was in the past exclusively repaired surgically with resection of the site of coarctation and re-anastomosis of the distal aortic arch and descending aorta. Recently, more and more new-borns and infants are primary treated with interventional palliation of CoA with stent implantation. Final repair of CoA requires a wide spectrum of different type of operations technique, in order to address individual anatomy of each patient.

Materials and Methods:14 patients underwent surgery in the last twelve months, after primary interventional CoA palliation. The beginning of the study coincides with the implementation of some additional advanced surgical strategies such as stent extraction and CoA repair only a few weeks after stent implantation or for example complete aortic arch repair on beating heart. In n= 10 patients lateral thoracotomy was performed of which n= 6 were operated without cardiopulmonary bypass. N= 4 patients were operated through the sternotomy, all of whom were supported with cardiopulmonary bypass; one of those with hypoplastic aortic Arch and CoA was operated on beating heart.

Results:
Patients age was from 44 days to 14 years. The average cardiopulmonary bypass time was 115 ± 70 minutes respectively. None of the patient underwent an episode that met clinical criteria for major adverse cardiovascular events. Mean length of hospital stay until discharge after the operation was 9 days. There was no complication related to the site of cannulation including peripheral cannulation in selected patients.

Conclusions:
The number of patients after primary intervention with stent will increase. This group include mostly neonates who are in cardiogenic shock at the time of presentation and children of various age and anatomy who required definitive repair. A wide range of low risk surgical strategies could be offered for definitive repair of CoA.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1921 - A SURGICAL TECHNIQUE TO REDUCE AORTIC DILATATION AND AVOID THE MISMATCH BETWEEN THE PULMONARY ARTERY AND THE AORTA IN THE ROSS PROCEDURE THE SUPPORTED REDUCTION AORTOPLASTY

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Background / Hypothesis:
One of the most well-known technical difficulties encountered when performing a free-root Ross procedure is the potential mismatch that can occur between a dilated ascending aorta and a normal-sized pulmonary root. In some cases, this could even contraindicate the procedure. On the other hand, the ExoVasc PEARS graft has proved to be a safe technique to prevent aortic root dilatation.

Materials and Methods:
In those patients with aortic dilatation and significant discrepancy between both great vessels, we have adopted the so-called technique of reduction aortoplasty. This consists of excising of part of the right lateral wall of the aorta, reconstructing with a longitudinal suture. In all these Ross procedures, a PEARS graft has been incorporated, which provides support not only for the autograft, but also for all the ascending aorta up to the proximal arch, stabilizing the area of the reduction plasty.

Results:
33 patients had a Ross-PEARS with a reduction aortoplasty to match the size of the dilated aorta and the pulmonary artery. 28 of them had a bicuspid aortic valve. The mean diameter of the ascending aorta preoperatively was 4.52 cm (maximum 5.4 cm). The aimed size intraoperatively was measured with transesophageal echocardiogram and Hegar dilators. Follow-up (maximum 99 months) consisted of serial echocardiograms and MRI scans every two years. Mean ascending aorta size in follow-up MRI is 3.18 cm. No ascending aorta dilatation has been seen during follow-up

Conclusions:
A significant mismatch between the pulmonary artery root and the ascending aorta sizes can be a technical challenge when performing a free-root Ross. Instead of replacing the ascending aorta, we advocate for performing a lateral wall excision (reduction aortoplasty), that, in the case of the Ross-PEARS, can be properly supported by the PEARS graft. Follow-up MRI showed significant decrease in the aorta size compared to preoperatively and no significant dilatation.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1922 - EARLY FONTAN FAILURE IN PATIENTS WITH HETEROTAXY SYNDROME A SINGLE CENTRE EXPERIENCE

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Background:
Heterotaxy Syndrome is a risk factor for poor outcomes at all stages of single ventricle palliation. We aimed to examine the rate of Early Fontan Failure (EFF) in this population.

Methods:
We retrospectively reviewed the early outcomes of all patients undergoing Fontan palliation at our centre between 1996 -2024. We explored the rate of early Fontan failure (Fontan revision or takedown; fenestration creation or enlargement; need for mechanical circulatory support) and death prior to hospital discharge or within 30 days post-op. These data were compared between the heterotaxy and non-heterotaxy patients. Demographic data and perioperative variables were evaluated and compared.

Results:
Of 497 patients who underwent Fontan palliation, 37 (7.5%) had a diagnosis of heterotaxy. Overall, there were 50 (10.1%) cases of EFF and 9 (1.8%) deaths in hospital, of which 8 experienced EFF, and 1 uncontrolled bleeding. EFF rate was 21.6% (8/37) in the heterotaxy group and 9.2% (42/458) in the non-heterotaxy group (p=0.016). None of the deaths occurred in the heterotaxy group, however. Most heterotaxy patients met the EFF criteria due to need for Fontan revision (7/37, 19% vs 26/458, 6%), p=0.002). Rates of chylothorax and permanent pacemaker implantation were not different between the groups. The hospital length of stay (LOS) was longer in the heterotaxy group (median 16, (IQR 7,31) vs 10 (IQR 8,16), p=0.04).

Conclusions:
Patients with heterotaxy undergoing Fontan palliation had a higher rate of EFF due to need for Fontan revision, and a longer LOS. The high prevalence of complex venous anatomy and dextrocardia in this group may be responsible. There was no increase in early mortality associated with heterotaxy.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1926 - PATIENT BLOOD MANAGEMENT IN PEDIATRIC CARDIAC SURGERY SINGLE CENTER EXPERIENCE IN LATIN AMERICA

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Background / Hypothesis:
This study aims to describe the experience in managing perioperative bleeding in patients undergoing surgeries with cardiopulmonary bypass (CPB) at Ricardo Gutiérrez Children's Hospital (Buenos Aires) from December 2023 to December 2024.

Materials and Methods:
In order to encourage the reduction of transfusion rates and thereby decrease patient morbidity and mortality, since 2023 we have implemented a protocol based on the clínical optimization of preoperarative anemia, a thromboelastography-based algorithm and employed a fast-track extubation.

Results:
During this period, 122 patients underwent surgery at our center (45% female, n=55; 55% male, n=67), ranging in age from 4 days to 18 years. Single-ventricle physiology was present in 36.6% (n=44), while 63.4% (n=78) had biventricular circulation. Preoperative anemia was identified in 12.3% (n=15) using a hemoglobin cutoff of 10 g/dL, increasing to 25.4% (n=31) with a threshold of 11 g/dL. Infectious complications within 30 days occurred in 40.9% (n=50) of patients, of whom 34% (n=17) had a preoperative hemoglobin <11 g/dL. Reoperation for bleeding within 24 hours was required in 7.3% (n=9) , of whom 33.3% (n=3) had preoperative hemoglobin <11 g/dL. Overall mortality rate was 10.6% (n=13).

Conclusions:
Our results were compared with expected outcomes in published data.The reported incidence of preoperative anemia in the literature ranges from 20% to 50%, while in our cohort, it was 12.3–25.4%. Mortality rates in congenital heart surgery vary between 3% and 30% depending on RACHS-1 classification, with our observed mortality at 10.6%. These findings suggest that our patient blood management protocol effectively mitigates perioperative risks compared to global benchmarks.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1927 - EVOLVING TRENDS IN POSTOPERATIVE SEDATION AND ANALGESIA IN PEDIATRIC CARDIAC SURGERY IMPACT OF EARLY EXTUBATION

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Background / Hypothesis:
Post-operative pain management and sedation strategies in pediatric cardiac surgery vary across institutions. Using multicenter data, we evaluated these practices and investigated the role of early extubation on post-operative narcotic and withdrawal medication use.

Materials and Methods:
Children undergoing on-pump cardiac operations were identified from the Pediatric Health Information System database. Patients undergoing ECMO, reintubation/reoperation and in-hospital deaths were excluded. We compared the use of withdrawal medications at discharge between patients extubated early (by post-operative day-2) and those extubated later, stratified by Risk Adjustment in Congenital Heart Surgery (RACHS) category. Additionally, we examined trends in medication use from 2007 to 2023.

Results:
A total of 75,717 children were included. Most were male (55%). The distribution by age categories was as follows: Neonates: 21%, infants: 42%, 1-5 y: 18%, 6-10 y: 8%, 11-18 y: 10%. Comparing study years 2007-2012 vs 2013-2017 vs 2018-2023, during post-operative ICU/mechanical ventilation phase, there was a significant trend in use of dexmedetomidine (27% vs 49% vs 66%), ketamine (7% vs 11% vs 14%) and decrease in midazolam (67% vs 59% vs 46%) and fentanyl (59% vs 54% vs 53%). At hospital discharge, acetaminophen was increasingly prescribed(42% vs 44% vs 52%) while oral opioids decreased (30% vs 32% vs 26%). Early (vs late) extubation was associated with significantly lower clonidine and methadone use at discharge across all RACHS categories: RACHS 1/2 (Clonidine:1% vs. 10%, Methadone:0% vs. 10%), RACHS-3 (Clonidine:1% vs. 7%, Methadone:1% vs. 10%), RACHS-4 (Clonidine:1% vs. 6%, Methadone:1% vs. 8%), and RACHS 5/6 (Clonidine:2% vs. 8%, Methadone:1% vs. 6%), all $p<0.05$

Conclusions:
The use of dexmedetomidine and ketamine has increased, while intravenous opioids and benzodiazepines have declined in pediatric cardiac surgery. Early extubation should be prioritized whenever possible as it is associated with decreased use of opioid and withdrawal medications despite adjusting for procedural complexity.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1928 - IMPACT OF REMOTE ISCHEMIC PRECONDITIONING ON POSTOPERATIVE OUTCOMES IN PEDIATRIC CARDIAC SURGERY AN UPDATED SYSTEMATIC REVIEW AND META ANALYSIS

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Background:
Remote ischemic preconditioning (RIPreC) is a potential strategy to reduce ischemia–reperfusion injury during cardiac surgery, particularly following cardiopulmonary bypass. While the efficacy of RIPreC in adults has been demonstrated, the evidence in pediatric cardiac surgery remains limited. This updated systematic review and meta-analysis aims to expand on previous findings and clarify RIPreC's impact on pediatric postoperative outcomes.

Materials and Methods:
A comprehensive search was conducted in PubMed, EMBASE, and Cochrane Library to identify randomized controlled trials (RCTs) that compared RIPreC with a placebo in pediatric cardiac surgery patients. The primary outcomes encompassed postoperative mortality, mechanical ventilation duration, ICU length of stay, and hospital stay. The statistical analysis was conducted using a random-effects model to calculate standard mean differences (SMD) and odds ratios (OR) with 95% confidence intervals (CI) employing the R software.

Results:
A total of fifteen trials enrolling 1,556 children were included in the analysis. A meta-analysis revealed that RIPreC significantly reduced the postoperative duration of mechanical ventilation (SMD -0.42 days, 95% CI -0.79 to -0.06). However, the impact of RIPreC on ICU length of stay (SMD -0.4 days, 95% CI -0.8 to 0.01) and length of hospital stay (SMD -0.15 days, 95% CI -0.36 to 0.06) did not reach statistical significance. Notably, RIPreC was associated with a significant reduction in the incidence of acute kidney injury (OR 0.38, 95% CI 0.25 to 0.6).

Conclusions:
This updated meta-analysis suggests that RIPreC may reduce mechanical ventilation duration and the incidence of acute kidney injury in pediatric cardiac surgery patients. However, it did not have a significant impact on the length of stay in the intensive care unit or the hospital. Consequently, further large-scale studies are warranted to validate these findings and evaluate the broader clinical benefits of RIPreC in pediatric populations.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1935 - TRICUSPID VALVE INFECTIVE ENDOCARDITIS WITH SEPTIC EMBOLIZATION OF BRANCH PULMONARY ARTERY NEEDING EMBOLECTOMY WITHOUT A CARDIOPULMONARY BYPASS

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Background / Hypothesis:
2months old baby with a history of exchange transfusion through umbilical vein catheter for Rh incompatibility was investigated for ongoing fever with rising CPR which was not responded to routine Intravenous antibiotics found to have tricuspid valveinfective endocarditis. Echocardiogram revealed a large mass attached to tricuspid valve by a stalk. Subsequent echo shows thickness of the Tricuspid valve appeared to be less with reduced size of vegetation. Lastly RPA is completely blocked by the probable dislodged vegetation extending in to the MPA.The embolectomy of dislodge vegetation from RPA was done under direct visualization via median sternotomy without a cardio pulmonary bypass.
The predisposing factors can vary, but in this case, it was due to an indwelling catheter in an otherwise structurally and functionally normal heart. The timing of surgery is crucial, as it can be a life-saving decision. The importance of performing the surgery without cardiopulmonary bypass is to minimize the risks associated with bypass, such as bleeding, clotting, and organ dysfunction. Additionally, bypass may not be feasible in some cases, such as in small infants with limited vascular access or those with unstable hemodynamics. The successful surgery without bypass helped minimize risks and potential complications for the baby. The direct timing of the intervention was emphasized as a critical factor in the surgery's successful outcome. The baby was immediately transferred to the operating room for surgical intervention once the diagnosis was made, and the surgery was performed without delay. Delaying or postponing the surgery could have led to potentially life-threatening complications. Thus, the timely intervention played a crucial role in preventing further complications and achieving a successful outcome.

Materials and Methods:

Results:

Conclusions:

POSTER PRESENTATIONS

Category: Cardiac Surgery

1936 - THE USE OF EXPLAINABLE MACHINE LEARNING TO IDENTIFY PREDICTORS OF RIGHT HEART FAILURE AFTER IMPLANTABLE CONTINUOUS FLOW LEFT VENTRICULAR ASSIST DEVICE IMPLANTATION IN CHILDREN AN ANALYSIS OF THE STS PEDIMACS DATABAS

Humera Ahmed [1]
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Background / Hypothesis:
Right heart failure (RHF) develops in up to half of pediatric patients undergoing durable left ventricular assist device (LVAD) implantation but remains difficult to predict. Machine learning (ML) can model complex, non-linear relationships in large, heterogeneous data.

Materials and Methods:
This retrospective study analyzed pediatric patients (<18 years) in the multi-center Society of Thoracic Surgeons (STS) Pediatric Interagency Registry for Mechanical Circulatory Support (PEDIMACS) dataset (2012-2023) who received implantable continuous flow LVADs (CFLVAD). Patients with temporary or pulsatile devices, univentricular anatomy, or primary biventricular devices were excluded. The primary endpoint was RHF, defined as inotrope use ≥ 1 week post-implant and/or subsequent RVAD at any time after LVAD insertion. A boosted decision tree machine learning (ML) algorithm and explainable ML method were trained (80/20% split) to identify key pre-implant factors associated with RHF, including non-linear relationships and risk inflection points.

Results:
412 patients underwent CFLVAD implantation at a median age of 14.1 years (IQR 11.0-16.1); RHF occurred in 209 (50.7%) patients and 13 (3.2%) underwent subsequent RVAD. Figure 1A depicts the strongest pre-implantation predictors of RHF following CFLVAD implantation, listed in descending order; the top 5 were diastolic blood pressure, alanine transferase, estimated glomerular filtration rate, body surface area, and albumin. The model predicted RHF with moderate accuracy (AUC=0.62, F1 = 0.65) and identified important risk inflection points for non-linear variable (Figure 1B).

Conclusions:
Explainable machine learning identified 10 clinically relevant factors associated with the development of RHF following LVAD implantation in children, including risk inflection points that have not been reportedly previously in children.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1942 - AORTO VENTRICULAR TUNNEL CASE REPORT

Martin Alfonso Saldaña Becerra [1], Gabriela Martínez Maya [1], Omar Alonso Rodríguez [1], Mauricio Iván García Guevara [1], Omar Victorica Guzmán [1], Alma Lidia Aguilar García [1], Alvaro Riojas Favero [2], Johann David Adrian Morales Ojeda [2]
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Aorto-ventricular tunnel is a congenital, extracardiac channel which connects the ascending aorta above the sinutubular junction to the cavity of the left, or (less commonly) right ventricle. The exact incidence is unknown, estimates ranging from 0.5% of fetal cardiac malformations to less than 0.1% of congenitally malformed hearts in clinico-pathological series. Approximately 130 cases have been reported in the literature, about twice as many cases in males as in females. Occasional patients present with an asymptomatic heart murmur and cardiac enlargement, but most suffer heart failure in the first year of life. The etiology of aorto-ventricular tunnel is uncertain. It appears to result from a combination of maldevelopment of the cushions which give rise to the pulmonary and aortic roots, and abnormal separation of these structures. Echocardiography is the diagnostic investigation of choice. Aorto-ventricular tunnel must be distinguished from other lesions which cause rapid run-off of blood from the aorta and produce cardiac failure. Optimal management of symptomatic aorto-ventricular tunnel consists of diagnosis by echocardiography, complimented with cardiac catheterization as needed to elucidate coronary arterial origins or associated defects, and prompt surgical repair. Observation of the exceedingly rare, asymptomatic patient with a small tunnel may be justified by occasional spontaneous closure.

We present a case of a male newborn diagnosed with a left aortoventricular tunnel, who underwent surgical correction at 12 days of life, with an insidious course, ultimately being discharged home. The patient was followed up at 6 months in stable condition.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1945 - TIMING OF THE ARTERIAL SWITCH OPERATION IN TRANSPOSITION OF THE GREAT ARTERIES WITH VENTRICULAR SEPTAL DEFECT IS NOT ASSOCIATED WITH MAJOR ADVERSE CARDIOVASCULAR EVENTS.

Alison Howell [1], Devin Chetan [1], Sachiko Kadowaki [2], Luc Mertens [1], David Barron [2], Osami Honjo [2]
The Hospital For Sick Children, Cardiology, Toronto-Canada [1] The Hospital For Sick Children, Cardiovascular Surgery, Toronto-Canada [2]

Background / Hypothesis:
Due to improved neurodevelopmental outcomes associated with early repairs, our institution's timing of the Arterial Switch Operation (ASO) in Transposition of the Great Arteries with Ventricular Septal Defect (TGA/VSD) changed from around 6 weeks to the first week of life. The effect of the earlier surgery on outcomes is unknown.

Materials and Methods:
Single centre retrospective review of 154 TGA/VSDs undergoing ASO between 2009 and 2022. An early repair was classified as on or before 10 days of life, and late repairs after this time. Frequency of major adverse cardiac events (MACE; defined as ventricular arrhythmia, ECMO, cardiac arrest, coronary re-intervention, or death) were analyzed. Continuous data are presented as median (interquartile range [IQR]), discrete data as frequency (percentage). Differences between groups were analyzed with the Mann-Whitney U test. Event frequencies were compared with chi-squared or Fisher tests.

Results:
Early ASO occurred in 77 patients and late ASO in 77. Median cardiopulmonary bypass time and aortic cross clamp times were shorter in the early group (157mins (134-186) vs 190mins (141- 218) p=0.012, and 111mins (90-144) vs 138 (101-165) p 0.022 respectively). There was a trend to earlier chest closure in the early group (0 (0-3) vs 2 (0-6) 0.061). There was no difference in post-operative ventricular arrhythmia (early 21 (27%), late 14 (18%) p = 0.18), ECMO (early 6 (8%), late 3 (4%) p=0.50), cardiac arrest (early 2 (3%), late 4 (5%), p= 0.68). The need for further coronary (early 1 (1%), late 0 (0%), p >0.99) or other cardiac surgery (early 8 (10%), late 10 (13%) p=0.62) was similar. Overall mortality was not different in either group (early 8 (10%), late 7 (9%) 0.79).

Conclusions:
Earlier ASO in TGA/VSD is not associated with an increase in adverse cardiovascular events. Further study of postoperative ICU morbidity is warranted.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1948 - QUADRUPLE HOMOGRAFT BYPASS FOR MID AORTIC SYNDROME WITH MULTI VISCERAL ARTERIAL STENOSES

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Background:
Mid-aortic syndrome or mid-aortic hypoplasia is a rare vascular condition with unclear etiology, characterized by stenosis or narrowing of the mid-portion of the aorta. It can be associated with congenital heart defects, connective tissue disorders or may occur as an isolated condition. Management of this anomaly is particularly challenging. We present a child who was diagnosed with mid-aortic syndrome associated with concomitant involvement of his celiac trunk, superior mesenteric artery, and both renal arteries.

Patient:
A 7-year-old, 24 kg, boy with neurofibromatosis type I syndrome and a history of thoracic aortic coarctation repair at 1-year of age, presented with intermittent claudication and feeding intolerance. Computed tomography scan revealed a long segment of abdominal aortic coarctation and hypoplasia. There was an associated proximal occlusion of his mesenteric and renal arteries. The decision was made to proceed with surgical repair.

Results:
Through a midline laparotomy, and after mobilization of the abdominal viscera, the hypoplastic mid-aortic segment was exposed. A 14-mm descending thoracic aortic homograft was used to bypass the hypoplastic aortic segment and was connected in an end-to-side fashion to the normal segments of the proximal and distal abdominal aorta. Three additional homograft bypass grafts were then connected to this aortic homograft and used to bypass the proximal stenotic segments of the celiac and both renal arteries. The patient was extubated the following day and was discharged on the seventh post operative day. He continues to do well during his 2-year follow-up.

Conclusions:
Management of mid-aortic syndrome continues to be a challenge. Aortic bypass with a homograft represents a reproducible and simple but effective solution for the hypoplastic stenotic aorta. Life-long close follow-up is needed to ensure patency of these grafts.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1949 - MORBIDITY AND MORTALITY RELATED TO SURGICAL TREATMENT IN PATIENTS WITH TETRALOGY OF FALLOT CORRECTED AT THE UMAE 34 TRANSANULAR VS ANULAR PRESERVATION COMPARATIVE

Martin Alfonso Saldaña Becerra [1], José Alberto Rubalcava Castillo [1], Omar Alonso Rodríguez [1], Mauricio Iván García Guevara [1], Omar Victorica Guzmán [1], Alma Lidia Aguilar García [1], José Antonio Del Campo Abadiano [1], Erick Ivan González Pedraza [1]
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Background / Hypothesis:
Years of experience in the surgical treatment of tetralogy of Fallot (TF) have identified the various postoperative sequelae of patients undergoing right ventricular outflow tract (RVOT) enlargement with an extensive transannular pulmonary patch, which leads to less favorable medium- and long-term postoperative follow-up results.
The objective of this study is to evaluate the impact, in terms of morbidity and mortality, of a transpulmonary/transinfundibular approach versus a transventricular/transannular approach in pediatric patients with tetralogy of fallot surgically corrected for the first time.

Materials and Methods:
The study was observational, cross-sectional, comparative, and retrospective. Two patient groups were defined: group 1, transannular patch correction; and group 2, transinfundibular/transpulmonary patch correction. Outcomes were evaluated using descriptive and inferential statistics (Kruskall-Wallis test and Student's t test).

Results:
A total of 82 patients were studied. 28 patients were female (34.14%), and 54 patients were male (65.8%). The median age was 18 months, with a range of 7 months to 6 years and 2 months. Group 1 included 53 patients, and group 2 included 29. The Z scores between the two groups were compared using the Student t test: the average Z score was -2.94 in group 1 and -1.41 in group 2, with a P value of 0.0001.
No statistically significant differences were found in the average number of days of stay in the pediatric ICU. Days on mechanical ventilation: group 2 remained intubated for fewer days (3.83±6.88) vs group 1 (8.09±11.52) p=0.01. Mortality rate: 18 deaths (33.9%) in group 1 vs 2 (6.89%) in group 2, p=0.006.

Conclusions:
It is advisable to seek pulmonary valve preservation in tetralogy of Fallot correction procedures. Lower morbidity and mortality rates were observed in patients with preserved pulmonary valves. Medium- and long-term follow-up is necessary to ensure continuous treatment.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1957 - "TOTAL ANOMALOUS MIXED ANOMALOUS PULMONARY VEIN CONNECTION RARE VARIETY."

Hugo A. Argueta-velasquez [1], Yessica C. Henández-garcía [1], Gerardo Hernández-enciso [1], Diego B. Ortega-zhindón [1], Antonio Benita-bordes [1]
National Institute Of Cardiology Ignacio Chávez, Pediatric Cardiac Surgery And Congenital Heart Diseases, Mexico City-Mexico [1]

Background / Hypothesis:
Total anomalous pulmonary vein connection (TAPVC) is a heterogeneous form of cyanotic congenital heart disease in which the pulmonary veins connect through several pathways to the right atrium instead of the left atrium, constituting between 1 and 1.5% of all children with congenital heart disease.

Materials and Methods:
9 year-old male known to our Institute for a history of repeated respiratory infections and auscultation of a heart murmur.The patient was diagnosed as having a total anomalous connection of the pulmonary veins of the mixed variety.Two years later, the patient attended for deterioration of functional class, admission was decided in order to regulate therapeutic conduct.a catheterization was performed in which the MPASP was found to be 34 mmHg, LVEDP 14 mmHg and it was decided to carry out a total correction with left cavopulmonary bypass + redirection of pulmonary vein flow to the left atrium.

Results:
With extracorporeal circulation technique with tricaval-aortic cannulation, temperature was lowered to 34°C and pulmonary vein flow was redirected to the left atrium with autologous pericardium patch, left bidirectional cavopulmonary bypass, left superior vena cava and ductus arteriosus closure, without obtaining preliminary obstructions in the flow.72hrs later, he presented edema of the left upper limb and difficulty in mobilization secondary to thrombosis of the left superior vena cava and cavo pulmonary shunt, so a stent was placed in the cavopulmonary shunt through catheterization.

Conclusions:
Total anomalous connections of mixed variety pulmonary veins are both diagnostically and surgically challenging due to the multiple morphologic variants, however, they can be safely repaired by a customized approach for each configuration. Considerations must be taken to avoid obstruction of the pulmonary veins, as well as the connections they may present with the systemic venous circulation.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1968 - CLINICAL PROFILE AND SURGICAL REPAIR OF THE ANOMALOUS LEFT CORONARY ARTERY FROM THE PULMONARY ARTERY

Sameth Ung [1], Ladin Ponn [1]
Kunthabopha Hospital, Surgery, Phnom Penh-Cambodia [1]

Background / Hypothesis:
ALCAPA is a rare congenital anomaly that, if left unrepaired has a mortality rate up to 90%. LV dysfunction and ischemic mitral regurgitation secondary to mitral annular dilatation and ischemic papillary muscle dysfunction contribute to morbidity and mortality in this condition. So, the diagnosis of ALCAPA indicates immediate surgical intervention.

Materials and Methods:

A total of 15 cases were identified retrospectively in our hospital who underwent the surgical repair of ALCAPA during 7 years from 2016 to 2023. Medical records recorded demography and necessary data during pre-operative and postoperative to demonstrate.

Results:
The clinical onset was presented in the first month of life, the operation was done at an average age of 13 months and a mean weight of 6,3 kg. In preoperative,40% of cases demonstrated poor overall LV function, 47% was reduced, and 13% was conserved. Most of the patients have MR in grade 2-3 (47%), severe MR is 33%, mild MR was demonstrated in 20%, and 2 cases have concomitant ASD II, and 1 case was diagnosed post-PDA ligation. All 15 cases (100%) underwent coronary implantation, and one-third of cases had MV repair (5 cases) at the time of ALCAPA repair. In the follow-up period of 10 months in mean, the overall LV function was optimized at a normal function of 47%, 46% was in reduced function condition, 7% was still in poor function and 1 patient died.

Conclusions:
The clinical profile of ALCAPA was dementated signs of congestive heart failure and distinguishing left ventricular dysfunction secondary to ALCAPA from dilated cardiomyopathy can be difficult. This study demonstrates that surgical repair of ALCAPA can be achieved with good results. The clinical outcome and left ventricular function are optimized despite severe left ventricular dysfunction at presentation.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1977 - SCIMITAR REPAIR WITH THE LUGONES TECHNIQUE

Sara Elena Mendoza [1], Diego Marquez [1], Justo Santiago [2], Claudia Florez [3], Javier Castro [3]
Fcv, Cardiac Surgery, Floridablanca-Colombia [1] Fcv, Cath Lab, Floridablanca-Colombia [2] Fcv, Cardiology, Floridablanca-Colombia [3]

Background / Hypothesis:
Scimitar syndrome is a challenging pathology due to the high incidence of pulmonary vein obstruction following traditional surgical repair. We present a novel technique, previously described by Lugones et al., as an alternative approach.

Materials and Methods:
A 17-year-old male with right-sided partial anomalous pulmonary venous return (Scimitar syndrome), presented wirh NYHA type 1 was taken for repair.
Median sternotomy, aorta, superior vena cava (SVC), and right femoral vein were cannulated. Dissection of the right hemidiaphragm revealed the Scimitar vein entering the diaphragm muscle. The Scimitar vein was transected, and a lateral-to-lateral anastomosis to the pericardium was created using a 5-0 PVDF running suture, anterior to the right phrenic nerve.

The aorta was cross-clamped, antegrade cardioplegia was administered. A left atriotomy was performed, and the edges of the left atrium were marsupialized. A baffle was constructed using the right-sided pericardium and routed through Sondergaard's groove, a sutureless connection of the Scimitar vein to the left atrium. Two aortic cross-clamp were necessary due to findings in the intraoperative Echocardiogram.
The atrial septal incision was enlarged. The edges of the left atrium were marsupialized again. Additionally, the left atrium was plicated to the right atrium to further enlarge the opening. The pericardial baffle was then reconstructed using the sutureless technique, and the aortic cross-clamp was removed.
Repeat echocardiography demonstrated a median gradient of 0.4 mmHg across the connection to the left atrium.

Results:
The postoperative course was uneventful. The patient required anticoagulation for the first three postoperative months, followed by antiplatelet therapy thereafter.

Conclusion: This technique enables the repair of Scimitar syndrome using natural pericardial recesses, aiming to reduce the incidence of pulmonary venous drainage obstruction in the long term.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1988 - THE VALIDATION STUDY OF A TETRALOGY OF FALLOT (TOF) SCORING SYSTEM TO PREDICT CLINICAL OUTCOMES OF TOF TOTAL REPAIR

Nicole Kris James [1], Maria Theresa Rosqueta [1]
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Background / Hypothesis:
A previous local study developed a scoring system for predicting in-hospital outcomes following surgical repair of pediatric Tetralogy of Fallot (TOF) patients. This study aimed to prospectively validate this TOF Scoring System.

Materials and Methods:
This is a prospective cohort study, which included 50 pediatric patients aged 0 to 18 years old who underwent TOF repair.It was conducted at a tertiary center from July 2022 to Jan 2024. Random sampling was done. Sample size was based on the 95% sensitivity of the TOF Scoring System reported by the derivation study. TOF Scoring System was used to assign preoperative score. Collection of data was done by clinical and laboratory monitoring during hospitalization. A good outcome was defined as survival until discharge with absence of poor outcome. Poor outcome was defined as presence of in-hospital mortality, in-hospital complications (reperfusion injury, infection, right ventricular dysfunction) or prolonged hospital stay. Missing values were neither replaced nor estimated. Logistic regression was used to determine association between the TOF Scoring System and immediate post-repair outcomes. Sensitivity, specificity and likelihood ratios were also computed.

Results:
The incidence of good outcome was 66% (n=33/50) and poor outcome was 34% (n=17/50). Among the latter, mortality rate was 18% (n=3/17)post-operative complication rate was 71% (n=12/17)and prolonged hospital stay rate was 47% (n=8/17). A TOF Scoring System score<1 is significantly associated with poor outcome (OR 9.8462, 95% CI 1.0029-96.6635, p=0.049).A score ≥1 has a sensitivity 97%, specificity 24%,LR+ 1.27,LR- 0.13 in predicting in-hospital survival.

Conclusions:
TOF Scoring System score of <1 is significantly associated with poor in-hospital outcomes among pediatric TOF patients who underwent surgical repair. A TOF Scoring System score of ≥1 has high sensitivity but low specificity for predicting in-hospital survival.

POSTER PRESENTATIONS

Category: Cardiac Surgery

1995 - A SUCCESSFUL AORTIC BIOPROSTHETIC VALVE FOR TRICUSPID VALVE REPLACEMENT IN A 1 YEAR OLD MALE WITH REFRACTORY CANDIDA ENDOCARDITIS A CASE OF MULTIDISCIPLINARY CHALLENGE SURGICAL STRATEGY AND TECHNICAL NUANCES

Mark Lester Ines Tolenada [1], Calixtro Jr. Chan [1]
Philippine Heart Center, Surgery And Anesthesisa, Quezon City-Philippines [1]

Introduction:
Fungal endocarditis in infants is rare but carries high morbidity and mortality. We present a challenging case of a 1-year-old male with Candida endocarditis involving the tricuspid valve (TV), refractory to medical therapy, who underwent successful underwent tricuspid valve replacement (TVR) using a stentless aortic bioprosthesis.

Case Description:
The patient, with a history of prolonged hospital stay and broad-spectrum antibiotics and antifungal, presented with persistent fever, respiratory distress, and fungal sepsis, developed refractory TV destruction despite antifungals and antibiotics. Echocardiography revealed large vegetations on the TV measuring 22mm in widest diameter with severe regurgitation. Despite 3 weeks broad spectrum antibiotics, 4 weeks of liposomal amphotericin B and 2 weeks fluconazole, the infection persisted with worsening hemodynamics. A multidisciplinary team (pediatric cardiology, cardiac surgery, and infectious disease) opted for an Emergent Vegetectomy and Tricuspid Valve Replacment using a 19-mm bioprosthetic aortic valve. The surgery was complicated by friable tissues and extensive destruction of the valve leaflet, but postoperative recovery was remarkable.

Discussion:
Fungal Endocarditis has aggressive nature specially on immunocompromised infants. An early surgical intervention has an important role when medical therapy fails. Techical challenges may encounter in infants who undegor Tricuspid Valve Replacement specifically on small anatomy and anticoagualant and antiplatelet risks.

Outcome:
The child was discharged on antifungals and antiplatelet, with no recurrence. On 2 weeks post discharge OPD follow-up, patient was asymptomatic, no febrile episodes, no bleeding episodes. Continued his cardiac medications and antiplatelet.

Conclusions:
Tricuspid Valve Repair, though high-risk, can be lifesaving in fungal endocarditis. A team-based approach, tailored perioperative care, and close follow-up are critical for success. TVR with an aortic bioprosthesis is a viable option for infants with fungal endocarditis, provided meticulous surgical technique is employed.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2009 - TRANSJUGULAR LEADLESS PACEMAKER IMPLANTATION IN A 15KG CHILD WITH POSTOPERATIVE COMPLETE HEART BLOCK FOLLOWING CONGENITAL CARDIAC SURGERY A CASE REPORT

Shuang He [1], Tiewei Lv [1], Jie Tian [1]
Children's Hospital Of Chongqing Medical University, Cardiovascular Medicine, Chongqing-China [1]

Background / Hypothesis:
To evaluate the safety and feasibility of transjugular leadless pacemaker implantation in young, low-body-weight children (15kg) who developed third-degree atrioventricular block (AVB) after congenital heart surgery.

Materials and Methods:
To investigate the safety and feasibility of transjugular leadless pacemaker implantation in young, low-body-weight children with postoperative third-degree atrioventricular block (AVB) following congenital heart disease (CHD) surgery.

Results:
A 6-year-and-5-month-old female patient (15 kg) with syncope caused by third-degree atrioventricular block (AVB) following congenital heart disease (CHD) repair surgery underwent successful transjugular implantation of an AVEIR leadless cardiac pacemaker after vascular diameter and cardiac size assessment. Postoperative pacing parameters were optimal, with complete resolution of clinical symptoms and no pacemaker-related complications observed.

Conclusions:
A 6.5-year-old female patient (15 kg) with syncope secondary to third-degree atrioventricular block following congenital heart defect repair underwent successful implantation of an AVEIR leadless cardiac pacemaker via the internal jugular vein after comprehensive evaluation of vascular diameter and cardiac dimensions. Postoperative pacing parameters remained optimal, with complete resolution of clinical symptoms and no pacemaker-related complications observed.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2059 - STRATEGIES AND RE EVALUATION OF MINIMALLY INVASIVE RIGHT SUBAXILLARY VERTICAL THORACOTOMY FOR CONGENITAL HEART DISEASE REPAIR.

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Background / Hypothesis:
Right subaxillary vertical thoracotomy has emerged as a minimally invasive alternative to median sternotomy for congenital heart disease (CHD) repair. Here we present a large-scale clinical series to evaluate the efficacy and safety of this approach.

Materials and Methods:
We conducted a retrospective analysis of 680 CHD patients (390 males, 290 females; mean age 6.3±23.8 months [range 1-576 months]; mean weight 8.5±12.6 kg [range 3-75 kg]) undergoing surgical repair via right subaxillary thoracotomy between January 2019 and April 2024. Primary cardiac anomalies included ventricular septal defect (n=452), atrial septal defect (n=179), tetralogy of Fallot (n=21), total anomalous pulmonary venous connection (n=15), atrioventricular septal defect (n=9), and double-chambered right ventricle (n=4). Concomitant procedures involved tricuspid valvuloplasty (n=52), mitral valvuloplasty (n=33), patent ductus arteriosus ligation (n=16), partial anomalous pulmonary venous connection correction (n=11), cor triatriatum repair (n=9), and left ventricular outflow tract obstruction relief (n=6). Left superior vena cava was identified and occluded in 15 cases, including 2 cases of balloon occlusion via internal jugular vein.

Results:
All procedures were successfully performed without conversion to median sternotomy. Mean cardiopulmonary bypass and aortic cross-clamp times were 67.2±45.8 min (26-229 min) and 28.6±12.9 min (14-133 min), respectively. Postoperative metrics included mechanical ventilation duration 5.2±12.8 h (2-94 h), ICU stay 2.6±1.2 days (2-7 days), and hospitalization 8.3±3.5 days (7-21 days). Chest tube removal occurred on postoperative day 2 (72.4%, n=492), day 3 (27.2%, n=185), and day 4 (0.8%, n=6). Complications included subcutaneous emphysema (n=19, 2.8%), atelectasis (n=14, 2.1%), mild residual shunt (n=11, 1.6%), arrhythmia (n=9, 1.3%), diaphragm elevation (n=6, 0.9%), pneumothorax (n=6, 0.9%), and one reoperation for intercostal hemorrhage (0.1%). All incisions healed uneventfully without thoracic deformities.

Conclusions:
The right subaxillary vertical thoracotomy demonstrates safety and efficacy for repair of diverse CHD, characterized by minimal blood loss, reduced postoperative drainage, short ICU duration, low complication rates and an inconspicuous

POSTER PRESENTATIONS

Category: Cardiac Surgery

2069 - IMPACT OF STANDARDISED POST OPERATIVE WARD BASED MANAGEMENT ON CHEST DRAIN OUTPUT AFTER FONTAN COMPLETION

Lindsay Carrigan [1], Anne Stewart [2], Michael Cheung [2], Christian Brizard [3], Igor Konstantinov [3], Stephanie Perrier [3], Edward Buratto [3], Bryn Jones [4]
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Background:
Pulmonary flow in the Fontan circulation is reliant on raised venous pressures to generate a sufficient transpulmonary gradient. A consequence is often prolonged chest drain output in the immediate post-operative period following Fontan completion. Standardised post-operative care focusing on strategies to minimise the rise in venous pressure may decrease chest drain losses and length of stay in these patients.

Materials/Methods:
On 7/2/23 a protocol standardising fluid and dietary restriction, diuretic and ACE-inhibitor regime, and oxygen use in patients immediately following Fontan completion was introduced. In the study period (7/2/21 to 7/2/25) the electronic medical record and echocardiography, catheterisation and surgery reports were reviewed for included patients retrospectively. Pre-operative data included age, resting saturations, dominant ventricular morphology and functional, haemodynamic, angiographic and interventional parameters. The Fontan conduit and fenestration size was noted. Post-operative data included chest drain duration, hospital length of stay and the need for catheterisation or reintervention. Two-tailed Mann-Whitney-U testing assessed significance of differences between groups.

Results:
58 patients were included in the study; 25 prior and 33 following protocol introduction. Pre-operative parameters were similar between groups. All but one had extracardiac Fontan conduits with no difference in fenestration use. Median chest drain duration and length of stay fell by 5 (IQR 8 – 12) and 7 (IQR 11 – 20) days respectively with significance confirmed on Mann-Whitney-U testing ($z= -2.58$, $p = 0.01$ and $z = -2.41$, $p = 0.016$). Fewer patients had chylous drain content after protocol implementation (40% decreased to 25%). There was no difference in post-Fontan catheterisation rates between the groups (20% vs 18%).

Conclusions:
Standardised care of patients following Fontan completion reduced duration and chylous content of chest drain output and the total length of stay.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2074 - HAND SEWN BOVINE PERICARDIAL VALVED CONDUIT IN RVOT EARLY AND MID TERM OUTCOME REVIEW OF 41 CASES

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Amrita Institute Of Medical Sciences & Research Centre, Pediatric Cardiothoracic & Vascular Surgery, Faridabad-India [1] Monash University, Cardiothoracic & Vascular Surgery, -Australia [2]

Background / Hypothesis:
Introduction: The currently available options for restoring the continuity between the right ventricle and pulmonary arteries are far from satisfactory. The ideal conduit should be durable, easily available, cost effective, resistant to infection, non-thrombogenic and apt to grow. Hand sewn bovine pericardial conduit with e-PTFE trileaflet valve can serve a satisfactory alternative especially in resource limited places. Pulmonary vascular status might have an impact on the conduit function in the long term.

Materials and Methods:
All patients who received right ventricle to Pulmonary artery conduit from January 2014 to June 2019 were retrospectively analyzed. A total of 41 patients were classified into two groups; pulmonary hypertension group (PH) and non-pulmonary hypertension group (NPH). The endpoints studied were mortality, re-operation, severe conduit stenosis and conduit regurgitation that necessitated re-intervention.

Results:
The Mean age of patients at time of conduit implant was 56.8 months (range 2-196 months), mean weight was 12.3 kg (range 3-44 kg) and mean size of conduit was 18.4 (range 12-24 mm). Mean follow up duration was 1.5 years (range 0.3-5 years). There was no significant P value between gradient and regurgitation at discharge and at last follow up which encourages the usage of this type of conduit, however more study would be needed to investigate it further.

Conclusions:
Hand sewn bovine pericardial conduit has a good early and midterm outcome therefore it can be considered as an acceptable alternative to commercially available conduits only in resource limited scenarios.
Operative technique and the level of operator experience can have a major impact on outcomes
Modifying the valve leaflet creation technique might aid in mimicking the natural physiology of valve sinuses
Pulmonary hypertension had no impact on the durability of the conduit in early and midterm follow up. However, this need more investigation with a larger sample size and prolonged follow up.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2075 - MANAGEMENT OF ACQUIRED PULMONARY VENOUS ATRESIA FOLLOWING ARTERIAL SWITCH OPERATION

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Background / Hypothesis:
Pulmonary venous atresia after a successful arterial switch operation is an extremely rare complication. It can be insidious in presentation and difficult to diagnose and manage.

Materials and Methods:
we present acquired unilateral pulmonary venous atresia in a 8 years old boy who had undergone arterial switch operation at the age of 14 days for transposition of great arteries. The patient was apparently well till one year Bach when he started to complain of easy fatiguability. He was evaluated and was found to have severe sub-valvar pulmonary stenosis, dilated left pulmonary artery and stenosis/hypoplasia of intra-pericardial segment of right pulmonary artery. Additionally, the left pulmonary veins were not seen on CT angiogram.

Results:
He underwent resection of sub-valvar pulmonary stenosis, patch Plasty of right pulmonary artery. The left pulmonary venous openings were not seen in the left atrium. The left pulmonary veins were fibrosed and atretic upto 15mm from LA. Distally four openings were found which were baffled to a generous opening in the LA. The post-operative recovery was uneventful.

Conclusions:
Acquired unilateral pulmonary venous atresia is an extremely rare complication following arterial switch operation. A regular follow-up after arterial switch operation is recommended for timely detection. Though challenging, atretic pulmonary veins can be recruited.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2082 - VENTRICULAR SEPTAL DEFECT DEVICE CLOSURE IN CHILDREN WEIGHING LESS THAN 8 KG DO WE STILL NEED HYBRID SINGLE CENTER EXPERIENCE.

Alisa Soi [1], Nataliia Yashchuk [1], Dariia Klepach [2], Igor Ditkivskyy [1], Vasyl Lazoryshynetz [3]
Amossov National Institute Of Cardiovascular Surgery, Department Of Interventional Cardiology For Congenital And Asquired Heart Disease, Kyiv-Ukraine [1] Ukranian Children's Cardiac Center, Department Of Neonatal Icu, Kyiv-Ukraine [2] Amossov National Institute Of Cardiovascular Surgery, Department Of Congenital Heart Disease In Children, Kyiv-Ukraine [3]

Background / Hypothesis:
Device VSD closure in small children is still under debates. This study was designed to assess the efficacy and safety percutaneous VSD closure for low weight children in comparison with hybrid VSD closure.ptal defect in children weighing 10 kg or less with different types of devices.

Materials and Methods:
In 22 patients weightning less than 10 kg from 2015 to 2024 device VSD closure was performed. Transcatheter VSD closure was performed in 14 pts (Group 1), and a hybrid approach was applied in 8 patients (Group 2). The mean age in was 12.36±6.36 months in Group 1 vs 9.96±10.08 months in Group 2. Mean weight was 8.33±1.64 kg vs 6.9±2.0 kg in Group 1 and Group 2 respectively. All baseline characteristic of the patients are presented in Table 1.

Results:
The success rate in was 100% (14/14) vs 87.5% (7/8) in Group 1 vs Group 2. There were no major complications in group 1. However, there was occluder dislocation with conversion to surgery in 1 pt in group 2 (12,5%).
In group 1, minor complications included: minimal aortic insufficiency – 1 (7,14%). In group 2 minor complications included: residual shunt more than 2 mm in 1pt (12,5%), first-degree AV block - 1(12,5%).

The mean follow-up was 59,50±26,47 months in Group 1 vs 59,51±28,04 months in group 2. The large residual shunt from group 2 was closed percutaneously in a one year after hybrid. No serious sequel, AI progression or new-onset of valve regurgitation have been observed.

Conclusions:
Both methods demonstrate good result with the fever complications. So, the questions remain open: do we still need hybrid and skin incision? Definitely, needs to be evaluated in a bigger pts group.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2091 - TETRALOGY OF FALLOT WITH HYPERTROPHIC CARDIOMYOPATHY A RARE SUBSET WITH UNIQUE CHALLENGES

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Star Hospitals, Pediatric Cardiology, Hyderabad-India [1] Star Hospitals, Pediatric Ctvs, Hyderabad- [2]

Background / Hypothesis:
Tetralogy of Fallot (TOF) is the most common cyanotic congenital heart disease (CHD), comprising 5–10% of all CHDs. Hypertrophic cardiomyopathy (HCM), the most common inherited heart disease, has a 0.2% incidence in the general population. The coexistence of TOF and HCM is rare, posing unique challenges and often resulting in poorer outcomes. Only a few case reports describe this combination, and even fewer with successful outcomes.

Materials and Methods:
We report a 12-year-old girl with TOF and HCM who underwent complete surgical correction. Diagnosed with CHD at birth, she had no further medical follow-up. She presented at age 12 with worsening cyanosis, exertional dyspnea, and poor weight gain. Family history was significant for a sibling death at one month of age from an undiagnosed cause.

On examination, she had central cyanosis, clubbing, a soft second heart sound, and an ejection systolic murmur. Her oxygen saturation was 55%. CXR revealed oligemic lung fields, cardiomegaly, and left ventricular apex. ECG showed right axis deviation and biventricular hypertrophy. Echocardiography confirmed TOF with severe infundibular and valvular stenosis (gradient 110 mmHg) and asymmetric left ventricular septal hypertrophy, with no left ventricular outflow tract obstruction or systolic anterior motion of the mitral valve. CT angiography showed good-sized pulmonary arteries and left ventricular hypertrophy.

She underwent complete TOF repair with a transannular patch. Postoperatively, she developed recurrent pleural effusions, initially managed conservatively with diuretics and chest drains. Oral propranolol was added. Due to persistent chylous drainage, thoracic duct ligation was performed on postoperative day 42.

Results:
She remained asymptomatic since then. Postoperative echocardiography showed free pulmonary regurgitation with good RV function and no LVOTO. Cardiac MRI confirmed asymmetric septal hypertrophy (8.5 mm, Z-score +13).

Conclusions:
HCM-related diastolic dysfunction and elevated LVEDP likely contributed to the pleural effusion—a complication not previously described in this subset. Long-term outcomes remain to be observed.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2093 - LONG TERM OUTCOMES OF EPICARDIAL PACEMAKER IMPLANTATION IN CHILDREN THE ROLE OF LEAD POSITION IN PREVENTING VENTRICULAR DYSFUNCTION

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Background / Hypothesis:
Pacemaker (PM) implantation remains the gold standard treatment for children with postoperative complete atrioventricular block. For patients <20 kg, epicardial leads are preferred. Optimal ventricular lead positioning is critical to avoid pacemaker-induced cardiomyopathy.

Materials and Methods:
We analyzed 72 patients (2014–2024) comparing median resternotomy (n=36) and left lateral thoracotomy (n=36), the latter including primary implants (n=23) and reoperations after prior RV pacing via sternotomy (n=13). Left ventricular ejection fraction (LVEF), paradoxical septal motion (PSM), and their correlation with lead placement were evaluated.

Results:
Median resternotomy group: mean age 1.3±0.45 years; weight 7.2±1.1 kg. Ventricular leads were primarily implanted on the right ventricular (RV) diaphragmatic surface and free wall. Only five patients in this group achieved successful left ventricular (LV) apical lead positioning due to technical constraints. Postoperative median LVEF significantly deteriorated from 72% [66.8-76%] to 63.5% [56.8-66.8%] in RV-paced patients ($p<0.001$) but was preserved with LV apical pacing. PSM occurred in 25/36 patients (69%)
The cohort of left lateral thoracotomy (mean age 3.7±1.07 years; weight 15.1±3.5 kg) underwent LV lead implantation (lateral wall/apex). Primary implants (n=23) showed stable LVEF (69% [64-72%] preoperatively vs. 69% [65-74%] postoperatively). The reimplantation subgroup (n=13) following prior RV pacing showed significant LVEF improvement from 43% (37-55%) to 68% (65-70%; $p<0.05$). Notably, preoperative PSM was present in 10/13 reimplantation cases (76.9%), resolving postoperatively in 7 (70% resolution rate). Persistent PSM occurred in only 3 patients (23.1%).

Conclusions:
Ventricular lead implantation via lateral thoracotomy demonstrated preserved LV function, while RV pacing was associated with significant LVEF reduction and paradoxical septal motion. Thus, direct LV apical lead implantation is critical via median sternotomy. To facilitate optimal lead positioning in the left ventricular apex position, we recommend «deep stitch», pericardial gauze tamponade and a cardiac positioner device to reduce the risk of pacemaker-induced ventricular dyssynchrony.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2097 - CONGENITAL LV ANEURYSM WITH DRAINAGE INTO THE RV

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Background / Hypothesis:
Congenital left ventricular (LV) aneurysm is a rare condition characterized by the formation of a thin-walled pouch or outpouching of the LV. It is typically asymptomatic but may occasionally present with complications such as arrhythmias, thromboembolic events, or left-sided heart failure. In extremely rare cases, a congenital LV diverticulum can form a fistulous connection to the right ventricle (RV), leading to RV drainage. This case report describes a patient with a congenital LV aneurysm, where the aneurysm communicated directly with the RV, resulting in abnormal RV drainage.

Materials and Methods:
An 8-month-old female infant, previously diagnosed with a ventricular septal defect (VSD) at another hospital and followed up, was diagnosed with a left ventricular (LV) aneurysm with a neck located at the septum and ventricular outflow tract (VOT) during preoperative work-up CT. The connection to the right ventricle (RV) was not observed on CT, but echocardiography revealed an opening suggesting a left-to-right (L-R) shunt from the LV to the RV. The patient, measuring 67.8 cm in height and weighing 8.1 kg, underwent surgical correction of the LV aneurysm. The aneurysm cavity was approached, and primary closure of the neck and obliteration of the LV aneurysm were performed. The total cardiopulmonary bypass (CPB) time was 160 minutes, with an aortic cross-clamp (ACC) time of 115 minutes.

Results:
Intraoperative echocardiography showed that the aneurysm cavity was obliterated, and no inflow was observed from the RV or LV. The patient is currently in the ward and awaits postoperative echocardiographic evaluation after the drain was removed on postoperative day 4.

Conclusions:
Congenital LV aneurysm with a fistulous connection to the RV is a rare but clinically significant condition. Early diagnosis and surgical intervention are crucial to prevent long-term complications such as heart failure and arrhythmias. This case underlines the importance of thorough imaging and timely surgical management

POSTER PRESENTATIONS

Category: Cardiac Surgery

2115 - PARTIAL ANOMALOUS PULMONARY VENOUS CONNECTION WITH CONGENTALLY CORRECTED TRANSPOSITION OF GREAT ARTERIES HEMI MUSTARD IS NOT A CHOICE BUT A NECESSITY!

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Background / Hypothesis:
Partial anomalous pulmonary venous connection (PAPVC) with congenitally corrected transposition of great arteries, ventricular septal defect and pulmonary stenosis (CCTGA,VSD,PS) is an extremely rare association. Hemi-Mustard and Rastelli operations have advantages like technical ease and enhanced durability of right ventricle (RV) to pulmonary artery(PA) conduit. But it's a matter of choice and most surgeons perform Senning and Rastelli operations for CCTGA,VSD,PS.

Materials and Methods:
We present a 16 years old boy with situs inversus, mesocardia and CCTGA,VSD,PS.
We found intra-operatively, that the left sided pulmonary veins were draining at the junction of superior vena cava (SVC) and right atrium. He underwent division of SVC above the entry of pulmonary veins, SVC to left pulmonary artery anastomosis, IVC baffle to tricuspid valve, VSD baffle to Aorta and RV to PA connection using 22mm valved conduit.

Results:
The surgery was uneventful. The total cardiopulmonary bypass and aortic clamp durations were 204 and 122 minutes. The postoperative recovery was uneventful and he was discharged on 9th postoperative day.

Conclusions:
Most surgeons perform Senning and Rastelli for CCTGA,VSD,PS. However, some surgeons prefer Hemi-Mustard and Rastelli due to technical ease and enhanced durability of RV to PA conduit. It is also preferred when RV is hypo plastic. However, in our patient, we did not have any alternative, but to perform Hemi-Mustard and Rastelli due to PAPVC to SVC-RS junction. There was no way a standard Senning could have been performed.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2127 - EARLY EXPERIENCE IN NIKAIDOH PROCEDURE IN A TERTIARY CARE CENTRE

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Background / Hypothesis:
Transposition of the great arteries with ventricular septal defect and left ventricular outflow tract obstruction (TGA/VSD/LVOTO) presents a complex surgical challenge. Traditional procedures such as the Rastelli while effective, carry limitations related to long-term conduit dysfunction and right ventricular outflow tract complications. The Nikaidoh procedure, involving aortic root translocation with coronary artery reimplantation, provides an anatomical correction with potential for improved left ventricular outflow tract alignment. We sought to describe a single surgeon's experience with aortic root translocation for complex TGA/VSD/LVOTO, with acceptable early outcomes.

Materials and Methods:
We present a series of six patients who underwent the Nikaidoh procedure at PGIMER Chandigarh from 2023 -2025. All patients had a diagnosis of TGA/VSD/LVOTO confirmed via echocardiography and cardiac catheterization. The Nikaidoh operation was performed with aortic root translocation, reimplantation of the coronary arteries, VSD closure, and reconstruction of the right ventricular outflow tract.

Results:
Of the six patients operated on, five survived with good postoperative recovery and have shown favorable clinical outcomes and we report good early results with excellent performance of the reconstructed left ventricular outflow tract, aortic valve competence, and no coronary insufficiency. One patient experienced early postoperative mortality due to low cardiac output syndrome despite maximal support. The surviving patients are asymptomatic, with no evidence of significant residual lesions or ventricular dysfunction at follow-up.

Conclusions:
Our early experience suggests that the Nikaidoh procedure is a feasible and effective surgical option for patients with TGA/VSD/LVOTO. It offers anatomical correction with potential long-term benefits in left ventricular outflow tract geometry and coronary perfusion. While technically demanding, it should be considered in specialized centers managing complex congenital heart disease, supported by a multidisciplinary team and vigilant postoperative care.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2138 - EVALUATION OF AORTIC VALVE AND VENTRICULAR FUNCTION AFTER AORTIC VALVE NEOCUSPIDIZATION OZAKI PROCEDURE IN PEDIATRIC PATIENTS USING SPECKEL TRACKING ECHOCARDIOGRAPHY.

Mohamed Azzam [1], Osama Abdelaziz [2], Mahmoud Al Shazly [1], Sonia Al Saidi [3], Rodina Sobhy [3], Mohamed Dahi [4], Hossam Ibrahim [5], Gaser Abdelmohsen [6]
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Background / Hypothesis:
Recently, AV Neocuspidization according to Ozaki showed good short- and mid-term results with no early mortality and adequate postoperative haemodynamic parameters,.However, outcome of this technique in pediatric population is not fully studied.
Our study aimed to evaluate the outcomes and Aortic valve functional changes following aortic valve Neocuspidization in pediatric patients.

Materials and Methods:
This is a Prospective Longitudinal Cohort study that included14 patients with Congenital aortic valve diseases underwent Ozaki procedure. Our study analyzed clinical and aortic valve characteristics. The patients underwent Conventional, TDI and global strain of left ventricle (LV) preoperatively and during follow up period at 1 week, 3 months and 6 months after repair.

Results:
There was a significant reduction in the aortic transvalvular gradient with significant decrease in aortic peak gradient (P value =0.003) and decrease in mean gradients (P =0.019). Only (28.6%) of patients had trivial AI and (14.3%) of patients had mild AI during follow up. No mortality was detected over 6 months. EF was significantly decreased in patients 1 week postoperatively compared with preoperative values. Subsequently, at 3 months and 6 months follow up, EF was recovered to normal values (P<0.001), however, there was significant decrease of Septal S′, Lateral wall E′, RV S`, RV E` and A` velocities and and GLS % when compared to preoperative values (P<0.05).

Conclusions:
Aortic valve Neocuspidization is a safe, effective and a reproducible technique in pediatric population with significant improvement of Aortic valve function and Favorable outcome with mild degenerative changes during short- and medium-term follow up.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2142 - NEO AORTIC ROOT DILATATION FOLLOWING ROSS PROCEDURE IN SCHOOL AGED CHILDREN

Zeynep Gulben Kuk Ozalp [1], Julian Ayer [2], Ian Nicholson [1]
Schn - The Children's Hospital At Westmead, Pediatric Cardiothoracic Surgery, Sydney-Australia [1] Schn - The Children's Hospital At Westmead, Pediatric Cardiology, Sydney-Australia [2]

Background
The neo-aortic root dilatation and aortic valve regurgitation(AR) after Ross procedure has led surgeons to modify the existing technique. Neo-aortic root dilatation is more commonly seen in the young adult population rather than in neonates. Consequently, reinforced neo-aortic graft applications are being performed for this group. However, there is very limited compiled data regarding the risk of dilatation in the pediatric population. We aimed to identify the age period the risk of neo-aortic dilatation begins to increase and investigate whether a specific threshold exists.

Methods
Data on neo-aortic dilatation and AR after the Ross procedure were compiled through a retrospective review of patients treated between 2006 and 2025 at The SCHN – The Children's Hospital at Westmead.

Results
97 patients underwent the Ross/Ross-Konno procedure at our institution. Follow-up data were available for 69 patients. Among these, 29 patients (42.0%) were classified as infants (9 neonates), 9 as toddlers, 4 as pre-school-aged children, 17 (24.6%) as school-aged children, and 10 as adolescents.
The median follow-up duration for the pre-school- and school-aged group was 9 years. None of these patients required reoperation for neo-aortic root dysfunction. Six patients(28.6%) in this group demonstrated mild aortic regurgitation and neo-aortic root Z-scores between 4-6. Five of these six patients had undergone the initial surgery between 8.7-11.2 years of age. Excluding patients who underwent reinforced root techniques, neo-aortic root dilatation (Z-score 4–6) was observed in 1 infant, 1 toddler, 1 preschool-aged child, and 5 school-aged children. Comparing the school-aged group with the infant group, school-aged patients demonstrated a higher incidence of neo-aortic root dilatation ($p = 0.020$).

Conclusions
In our cohort, neo-aortic valve regurgitation and root dilatation were most prevalent in school-aged children. Our data suggest that these risks in this age group and prevention strategies should be explored in larger cohorts.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2149 - NOVEL BILATERAL PULMONARY ARTERY BANDING WITH HEMI CLOSED CLIPS

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Background
Bilateral pulmonary artery banding (BPAB), though a less-invasive surgical option for hypoplastic left heart syndrome (HLHS) or biventricular congenital heart disease with duct dependent circulation. However, achieving an appropriate balance between systemic blood flow and pulmonary blood flow by encircling both pulmonary arteries with constrictive tapes is sometimes very difficult. We devised a new technique of bilateral PAB using hemi-closed surgical clips. Surgical clips, applied hemi-closed around both pulmonary arteries, transform the cross sections of the pulmonary arteries into diamond-shapes, and reduce their cross sectional areas without significantly reducing their circumferences.

Patients and Methods
We performed BPAB for 40 patients (18 univentricular heart/22 biventricular heart). We prepared 5 hemi-closure appliers in which the short diameter is adjusted to become 1.2, 1.3, 1.4, 1.5 and 1.6mm respectively. If the band is considered loose, the clip was removed, and the smaller applier was applied and vice versa. Adjustment was done by direct echo measurement of the velocity at the banding site.

Results
The median age was 4 days (1-20) and median body weight was 2.6kg (1.3-3.8). Three patients underwent ASD enlargement simultaneously. The median operation time was 79 minutes. The band was adjusted so that the systolic velocity was about 3m/s and diastolic velocity was about half of the systolic velocity. Readjustment of the band after the operation was done in only one patient and all the patients survived to the next operation.

Conclusions
BPAB with hemi-closed clips was safe and very useful. This method doesn't rely on the suture adjustment and produces good reproducible results.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2157 - AORTIC VALVE NEOCUSPIDISATION SHORT TERM OUTCOMES IN PEDIATRIC POPULATION

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Background / Hypothesis:
Heart valve diseases, particularly those involving aortic valve, impose significant morbidity and mortality burden worldwide. Every malfunctioning aortic valve may ultimately require replacement. However, the unique challenges presented by growing children necessitate a search for an alternative to valve replacement. Aortic valve repair, although always considered, is severely limited by the available tissue.Aortic valve neocuspidisation using glutaraldehyde-treated autologous pericardium, popularized by Ozaki et al for adults, has been adapted for leaflet reconstruction in paediatric patients.

Materials and Methods:
This was a retrospective analysis study conducted on children who underwent aortic valve neocuspidisation at Postgraduate Institute of Medical Education and Research (PGIMER) from January 2020 to January 2025.Medical records of children were reviewed to extract data on demographics, clinical characteristics, preoperative and post operative echocardiography, redo surgical interventions, incidence of infective endocarditis and ROSS grade of dyspnea

Results:
A total of 16 children underwent aortic valve neocuspidisation during the study period. 2 children had severe aortic regurgitation following ballon dilatation while 14 had severe aortic stenosis preoperatively. All children had either trivial or mild aortic regurgitation immediately after surgery. All remained ROSS I throughout the follow-up period.The mean gradient was 35mmHg +/- 5mm Hg.2 patients developed infective endocarditis after 6months and 7months respectively. Both underwent redosternotomy and aortic valve replacement with mechanical prosthesis.The mean follow-up period was 3.5years with the longest follow-up time of 4.5years.

Conclusions:
The Aortic valve neocuspidisation technique is distinguished by its reproducibility, facilitated by the use of templates.But is associated with risk of endocarditis and reintervention . The mean gradients also remained high on follow up.Thus, a tailored approach is required for its application to pediatric age group.Future studies with larger sample sizes and longer follow up periods to evaluate long-term results in this population is required.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2185 - CRITICAL CONGENITAL HEART DISEASE SURGERY IN NEONATES A 5 YEAR SINGLE CENTER REPORT

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Background / Hypothesis:
To analyze and report the outcomes of neonatal congenital heart disease (CHD) surgeries performed at our center over the past five years, providing a reference for the surgical treatment of critical neonatal CHD in China.

Materials and Methods:
A retrospective analysis was conducted on neonates (age <30 days at surgery) who underwent CHD surgery at the Children's Hospital of Zhejiang University School of Medicine between January 2020 and December 2024. Data on diagnoses, mortality, adverse events, and ECMO support were summarized. Normally distributed continuous variables were expressed as mean ± standard deviation ($\bar{x} \pm s$), non-normally distributed variables as median, and categorical variables as percentages.

Results:
Over the five-year period, 528 neonatal CHD surgeries were performed, including 241 cases requiring cardiopulmonary bypass and 115 cases involving low birth weight (≤2.5 kg). There were 296 male and 233 female patients, with a mean surgical age of 16.69 ± 8.73 days and a mean weight of 2.64 ± 0.94 kg. In-hospital mortality was 16 cases (3.0%). Excluding PDA, the top five diagnoses were TGA (58 cases), TAPVC (57 cases), CoA (48 cases), VSD (31 cases), and IAA (21 cases). Mortality rates were 10.5% for TAPVC, 9.5% for IAA, 8.6% for TGA, and 4.2% for CoA. Postoperative ECMO support was required in 29 cases, with 10 deaths, yielding an overall ECMO mortality rate of 34.5%.

Conclusions:
The surgical success rate for neonatal CHD at our center over the past five years has approached internationally advanced levels. Notably, the mortality rate for critical neonatal CHD cases requiring ECMO support has declined annually, providing valuable experience and reference for neonatal surgical treatment in China.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2187 - PULMONARY ARTERY RECONSTRUCTION IN CHILDREN WITH ALAGILLE SYNDROME AND BRANCH PULMONARY ARTERY STENOSES ANGIOGRAPHIC ANATOMY AND SURGICAL OUTCOMES

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Background / Hypothesis:
Pulmonary artery (PA) stenoses in Alagille syndrome (AGS) can be extend to the lobar and segmental branch points and are resistant to balloon angioplasty and stenting. Surgical PA reconstruction in AGS is associated with higher morbidity and mortality when compared to non-AGS patients. Risk factors within AGS patients have not been defined. In this study we describe the PA anatomy in a large group of surgical AGS patients, and analyze anatomic, hemodynamic, and clinical factors associated with patient outcomes.

Materials and Methods:
Preoperative angiograms were reviewed in 51 Alagille syndrome patients who underwent surgical PA reconstruction (2004-2024). In addition to clinical and surgical variables, anatomic variables included branch, lobar, and segmental PA cross-sectional areas, and qualitative and quantitative assessment of stenoses. Primary outcomes were mortality and prolonged ICU stay (>30 days); secondary outcomes included postoperative RV/PA pressure ratio and lung perfusion.

Results:
Ages ranged 0.5-16.1 years, with 33% having previous PA stenting, 23.5% prior surgical PA interventions, and 25% pre-existing cholestatic liver disease. Median preoperative RV:Ao pressure ratio was 0.98 (IQR 0.23). Surgery addressed 13 (IQR 11) stenoses, with postoperative RV:Ao ratio of 0.34 (IQR 0.14). Ten patients (19.6%) had prolonged ICU stays and four (7.8%) died prior to discharge. Preoperative PA cross sectional areas, liver function, and markers of surgical complexity were not associated with mortality or prolonged ICU stay. Postoperative RV:Ao ratio >0.4 was associated with higher rates of death or prolonged ICU stay (40% vs 6.7%, p=0.011, OR 9.3 [1.6-54]). Among 47 survivors, median RV:Ao pressure was 0.33 with right lung perfusion of 59.1%.

Conclusions:
Quantitative preoperative measures of PA size and anatomic complexity were not associated with mortality or prolonged length of stay following surgical PA reconstruction in AGS. No studied preoperative variables, including traditional measures of liver function and bleeding risk, associated with worse outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2195 - ASSOCIATION BETWEEN SERUM LACTATE LEVELS AND MORTALITY IN PEDIATRIC CONGENITAL HEART SURGERY AT MOH HOESIN HOSPITAL (2024 2025)

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Background / Hypothesis:
Lactate is used as a marker for oxygen deficiency in anaerobic metabolism at the tissue level. High lactate levels following open-heart surgery are often associated with increased postoperative mortality and morbidity rates. This study aims to investigate the association between serum lactate levels and mortality rates as an outcome in pediatric patients undergoing congenital heart surgery.

Materials and Methods:
A retrospective study was conducted at Dr. Mohammad Hoesin Hospital, Indonesia, involving 56 pediatric patients who underwent congenital heart surgery. Perioperative data were collected from electronic medical records, and serum lactate levels within 12 hours post-operation were analyzed. Statistical analyses, including descriptive statistics, ROC analysis, and chi-square tests, were performed using STATA. Postoperative mortality rates were measured as the primary outcome.

Results:
The study included 56 cases, with 30 males (53.57%) and 26 females (46.43%). The cases involved Patent Ductus Arteriosus (33.93%), Atrial Septal Defect (33.93%), Ventricular Septal Defect (25%), and multiple defects (7.14%). The overall survival rate was 87.5%, with a mortality rate of 12.5%.
A significant correlation was found between elevated lactate levels and mortality. Patients with serum lactate levels <4.2 mmol/L had a survival rate of 97.73%, while those with levels ≥4.2 mmol/L showed a mortality rate of 50% ($p < 0.001$). ROC analysis revealed excellent discrimination (AUC = 0.83) for lactate levels measured within 12 hours post-operation. A serum lactate level >4.2 mmol/L increased the risk of mortality by 22 times.

Conclusions:
Serum lactate levels serve as a reliable predictor of outcomes in pediatric patients following congenital heart surgery. Higher lactate levels, particularly those exceeding 4.2 mmol/L, are strongly associated with increased mortality rates. Postoperative lactate monitoring is an effective tool for identifying high-risk patients, enabling timely intervention and improved outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2201 - SURGICAL OUTCOME FOR PARTIAL ANOMALOUS PULMONARY VENOUS CONNECTION INTO SUPERIOR VENA CAVA

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Background / Hypothesis:
Various operative procedures have been devised for partial anomalous pulmonary venous connection (PAPVC), Postoperative complications include supraventricular arrhythmias, superior vena cava (SVC) stenosis, and pulmonary venous obstruction (PVO) sometimes occur.

Materials and Methods:
A total of 19 patients with PAPVC with PV connect to SVC who underwent surgical treatment between August 1997 and December 2024 at our institution, excluding those with mixed TAPVC and other complex cardiac malformations, were studied. The median age, body wight, was 6 years-old (56 days-16 years-old), 17.0 kg (4.9-39.1). 18 patients had ASD, 8 was ostium secundum defect, 8 was sinus venosus defect, 1 was fossa ovalis defect, 1 was fossa ovalis defect and sinus venosus defect. The site PV connection were SVC distal in 7 cases, SVC-RA junction in 10 cases, mixed in 2 cases. The operative procedure underwent were double-decker method (DD) in 8 cases, one patch (OP) method in 7 cases, Williams' method in 2 cases, right atrial wall flap method in 2 cases, and Warden's method in 1 case. The patch used for intra-atrial-rerouting were autologous pericardium in 15 cases, expanded polytetrafluoroethylene in 4 cases.

Results:
2 cases resulted in PVO both underwent OP using autologous pericardium. 3 cases resulted in SVC stenosis, including 1 DD, 1 OP, 1 William's method, The case occurred SVC stenosis underwent DD was 4.9kg who have 3 PVs, right upper PV, right lower PV left upper PV connected to SVC. 1case resulted in supraventricular arrythmia underwent OP.

Conclusions:
The surgical outcome of PAPVC at our institution was generally favorable. Autologous pericardium possibility occurs PVO because of shrinking and thickening. Although the DD has been reported to have fewer postoperative complications, the use of a prothesis should be considered for patients with low body wight and multiple PV connection.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2205 - BEYOND THE HEART DYSPHAGIA AND VOICE SEQUELAE IN PEDIATRIC VOCAL CORD DYSFUNCTION AFTER CARDIAC SURGERY

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Background / Hypothesis:
Vocal cord dysfunction (VCD) is a recognised complication of paediatric cardiac surgery, most commonly resulting from injury to the recurrent laryngeal nerve. This can lead to significant swallowing and voice difficulties, yet the incidence and management of these complications remain inconsistently reported. This systematic review aimed to evaluate the frequency of swallowing and/or voice complaints in paediatric patients with postoperative VCD, and to describe associated management strategies and outcomes.

Materials and Methods:
A systematic literature review was conducted to identify studies reporting on voice and/or swallowing outcomes in children with VCD following cardiac surgery. Eligible studies included pediatric patients with a confirmed diagnosis of VCD and relevant postoperative outcome data. Data were extracted on study design, sample size, diagnostic modalities, interventions, outcomes, and duration of follow-up. Studies lacking specific information on VCD-related swallowing or voice outcomes were excluded.

Results:
Six studies met inclusion criteria. Swallowing-related outcomes were reported in four studies, while voice-related outcomes were reported in three. Five studies described swallowing interventions, such as nasogastric and gastrostomy feeding or thickened feeds. Only one study reported specific interventions for VCD, including speech therapy and cordopexy. Vocal fold recovery was documented in two studies; one reported a 64% recovery rate over a five-year period. Follow-up duration ranged from 12 months to 5 years. Significant variability in diagnostic approaches and outcome reporting limited comparability between studies.

Conclusions:
Swallowing and voice complications are frequently observed in children with VCD after cardiac surgery but are inconsistently documented. Standardised assessment tools, consistent reporting practices, and evidence-based management strategies are lacking. Long-term follow-up suggests potential for recovery in some cases. Further research is needed to establish best practices for evaluation and treatment in this specific population.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2206 - LONG TERM OUTCOMES OF NEONATAL TAPVC REPAIR IN A SINGLE CENTER

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Background / Hypothesis:
Neonatal Total Anomalous Pulmonary Venous Connection (TAPVC) repair historically had high mortality rates. Recent advances have reduced postoperative mortality to 6.7%. Critical risk factors include obstructed TAPVC, prolonged CPB time, pulmonary hypertension and urgency of surgery. This study aimed to capture long-term survival and re-intervention of neonates who underwent TAPVC repair at our center.

Materials and Methods:
This cohort study included 88 neonatal isolated TAPVC repairs at G Kuppuswamy Naidu Memorial Hospital from January 2014 to December 2024. Excluding heterotaxy and other congenital anomalies, data were collected retrospectively and survival data prospectively. The study analyzed demographics, presentation, echocardiographic findings, operative details, post-operative outcomes and survival rates.

Results:
Of the 88 neonates, 12(13.5%) were preterm. 61 (68.5%) of neonates who underwent TAPVC repair in this cohort were boys. 41 (46.1%) of neonates underwent emergency repair. Median weight was 2.8kg (IQR 2.5,3.2). 81(91%) of cases had obstructive type of TAPVC. The overall in-hospital mortality rate was 5(5.6%). Out of these 4 cases belonged to the cases presenting with obstructed TAPVC. The median Length of stay in ICU was 4.8 days (IQR 3.8,6.4). Total length of stay in hospital was 10(IQR 9,13) days. Use of Inhaled Nitric Oxide was implemented since 2018 in 64 neonates. 5(6%) cases underwent redo procedure subsequently in which we have 1(20%) mortality. Among preterm, we had 3(25%) mortality. The 1 year survival was 92% following with 87% survival at 2 to 5 years.

Conclusions:
Our postoperative mortality was on par with other centers according to the recent research data. However our patients who required re-intervention procedure was low when compared with available research evidence. However it is imperative that all these patients need regular follow-up to atleast 5 years period.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2211 - INTRA CARDIAC REPAIR OF RAGHIB SYNDROME ALONG WITH VENTRICULAR SEPTAL DEFECT CLOSURE. A SUCCESSFUL SINGLE SURGERY OUTCOME.

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Background / Hypothesis:
A five-year-old boy diagnosed intra-operatively with Raghib complex consisting of absent coronary sinus, persistent left superior vena cava, and atrial septal defect associated with ventricular septal defect. The surgical management included intracardiac rerouting of the left superior vena cava to right atrium, along with closure of both septal defects, was successfully performed.

Materials and Methods:
This is a case report of a successful intracardiac rerouting of the left SVC in Raghib syndrome patient associated with VSD.

Results:
A five-year-old boy, weighing 12kg and measuring 60cm high, was diagnosed to have ASD and VSD since the age of one year.

The echocardiography diagnosis was: large ASD & VSD both shunting left to right, enlarged left ventricle with severe pulmonary hypertension and persistent left SVC with unspecified drainage.
The intraoperative findings were; absent CS, a left SVC opening below the left upper pulmonary vein and at the upper end of the posterior type of ASD and large perimembranous VSD. A fresh autologous pericardial patch was sutured starting from the opening of the left SVC into the left LA using 5:0 prolene. The patch drains all the small veins en route below the posterior mitral valve annulus until it opens into the right atrium (RA) near the septal leaflet of the tricuspid valve.
Postoperative echocardiography and cardiac CT-scan showed drainage of the neo-CS and left SVC to RA, and unobstructed mitral valve inflow and pulmonary vein drainage.

Conclusion:
This is a case report of a five-year old boy who underwent a successful intracardiac rerouting of left SVC drainage from LA to RA along with ASD and VSD closure during the same cross-clamp surgery

POSTER PRESENTATIONS

Category: Cardiac Surgery

2222 - TECHNICAL CONSIDERATIONS OF MITRAL VALVE REPAIR IN PEDIATRIC MARFAN PATIENTS

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Background / Hypothesis:
Marfan syndrome is the most common hereditary connective tissue disease with a mutation in the FBN1 gene, which codes for the matrix protein fibrillin 1. Cardiac symptoms include aortic dilatation/dissection and mitral valve prolapse, which often require cardiac surgery in childhood and adolescence.

Materials and Methods:
We present two Marfan patients from our patient cohort who faced particular technical challenges.

Results:
Two female patients aged 11 and 13 years, with a height of 167 cm and 180 cm and a body weight of 36 and 56 kg, respectively, underwent mitral valve reconstruction. One patient had a complete sternotomy because a Nuss operation was performed after mitral valve repair to straighten the thorax for severe scoliosis and pectus excavatum. The other patient was operated on via a partial upper sternotomy through 3rd intercostal space. Duration of cardiopulmonary bypass was 142 and 145 minutes, aortic x-clamping time 98 and 77 minutes, respectively. While one patient underwent a complex reconstruction with quadrangular resection and sliding plasty as well as implantation of artificial Goretex cordes completed by a Carpentier-Edwards Physio annuloplasty ring (size 38mm), the other patient's operation was limited to the implantation of a Carpentier-Edwards Physio annuloplasty ring (size 36mm). Postoperative echocardiographic control showed normalization of the left atrial size in both patients, neither prolapse nor mitral valve insufficiency were detectable. Mean postoperative gradient was 1 mmHg.

Conclusions:
Surgical treatment of mitral valve prolapse in pediatric Marfan patients can be challenging, especially in cases of severe pectus excavatum. With careful interdisciplinary planning, a one-stage correction is possible in such cases. In others, with normal thoracic anatomy, minimal invasive approach should be considered.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2233 - ROBOT ASSISTED THORACOSCOPIC SURGERY FOR LIGATION PATENT DUCTUS ARTERIOSUS IN CHILDREN

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Background:
There is limited experience of robot-assisted surgery for patent ductus arteriosus (PDA) treatment in children. In the present study, we update the experience of PDA ligation by using the robotic-assisted thoracoscopic surgery in a larger of pediatric population. Simultaneously, we explored the feasibility, practicality and safety of the day surgery management model for treatment of PDA with robotic surgery.

Methods:
From August 2020 to March 2025, 425 children with PDA who underwent robot-assisted thoracoscopic surgery were enrolled in Children's Hospital of Zhejiang University School of Medicine. The patients' demographic data together with their perioperative clinical variables were retrospectively analyzed. Selected patients were divided into day surgery group and non-day surgery group for further analysis.

Results:
The average age of the 425 patients was 34.2±26.2 months, of which 71% were younger than 3-year-old. The average weight was 14.8±7.1 kilograms. The average PDA diameter was 0.38±0.25 centimeter. One hundred and forty-two patients underwent day surgery and 153 patients underwent non-day surgery. There was no difference in general data between the two groups ($P>0.05$). The length of hospital stay of the day surgery group was significantly shorter than that of the non-day surgery group (1.0±0 vs. 2.6± 1.1 days, $t=-21.938$, $p<0.001$), as well as the hospitalization cost (6966±151 vs. 7337±535 US $, $t=-10.040$, $p<0.001$).

Conclusions:
Robot-assisted thoracoscopic surgery as a minimally invasive approach should be considered for PDA treatment. With less trauma, safety, rapid recovery, the day surgery management model of robot-assisted surgery for PDA ligation in children is practical and feasible.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2234 - FACTORS ASSOCIATED WITH PULMONIC VALVE REPLACEMENT AFTER TOTAL REPAIR OF TETRALOGY OF FALLOT

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Background:
Advancements in surgical techniques and post-operative care have significantly improved survival rates following the total correction of tetralogy of Fallot (TOF). However, long-term complications remain a concern. This study aims to identify risk factors associated with mortality after TOF correction and to determine the variables that influence the need for pulmonic valve replacement (PVR).

Methods:
Six hundred and eleven patients with TOF underwent total repair between 1993 and 2024 were included. A multivariate Cox proportional regression analysis was used to assess the predictors of mortality and PVR following total repair of TOF.

Results:
Median age at TOF correction was 4.2 years (IQR 2.7-6.9 years), with median weight at surgery being 13 kgs (IQR 11-17 kgs). The survival rate of patients at 10, 20 and 30 years after total correction of TOF were 96%, 95%, and 94%, respectively. Factors for mortality post-TOF repair included genetic syndrome [HR 3.5 (95% CI 1.24-9.67)], primarily 22q11 deletion and Down syndrome, and cardiopulmonary bypass (CPB) time ≥ 120 minutes [HR 2.9 (95% CI 1.09-7.71)]. In multivariate Cox regression, transannular patch use [HR 8.8 (95% CI 1.21-64.04)] and right ventricular ejection fraction (RVEF) < 44% via cardiac magnetic resonance (CMR) [HR 2.0 (95% CI 1.13-3.23)] were the predictors for PVR.

Conclusion:
Significant contributors to mortality following total repair of TOF include genetic syndromes such as 22q11.2 deletion and Down syndrome, as well as CPB duration of 120 minutes or more. CMR imaging data identify a RVEF below 44% and the use of a transannular patch as key predictors for the need for PVR.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2239 - CLINICAL AND SURGICAL CHARACTERISTICS OF PATIENTS UNDERGOING THE NORWOOD PROCEDURE AT A TERTIARY REFERRAL CENTER IN SALVADOR BAHIA BRAZIL

Isabela Demoner [1], *Isabel Guimaraes* [1], Nadja Kraychete [1], Gustavo Mello [1], Patricia Guedes [1]
Ana Nery Hospital-federal University Of Bahia, Division Of Pediatric Cardiology, Salvador-Brazil [1]

Background:The Norwood procedure is a complex and high-risk surgery for treating Hypoplastic Left Heart Syndrome (HLHS), one of the most severe congenital heart defects. HLHS is characterized by underdevelopment of the left side of the heart, which leads to significant circulatory dysfunction. Despite improvements in surgical techniques and postoperative care, the Norwood procedure remains associated with high morbidity and mortality. This study aims to describe the clinical profile, complications, and outcomes of patients who underwent the Norwood procedure at a referral hospital in Brazil, providing insights into patient outcomes and contributing to the growing body of literature on HLHS management in resource-limited settings.

Methods:
This observational, descriptive, and retrospective study was conducted at Hospital Ana Nery, a tertiary care center in Salvador, Bahia, Brazil. We included all patients who underwent the Norwood procedure between 2014 and 2023. Data were obtained from electronic medical records, focusing on demographic characteristics, preoperative conditions, complications, and clinical outcomes. Associations between clinical variables and outcomes were assessed using chi-square tests for categorical variables and t-tests for continuous variables. A p-value of <0.05 was considered statistically significant, though no significant associations were found ($p > 0.05$).

Results:
A total of 20 patients were included in the study, with a median age of 13 days (IQR: 8–29). Forty percent of patients experienced cardiopulmonary arrest, 20% had ventricular dysfunction, and 35% experienced bleeding complications. The intraoperative mortality rate was 55%, while postoperative survival at discharge was 45%. Despite an increase in cardiopulmonary bypass time during the 2019–2023 period, no significant impact on clinical outcomes was observed. There were no significant associations found between clinical variables and outcomes ($p > 0.05$).

Conclusion:
This study underscores the high morbidity and mortality associated with the Norwood procedure, reflecting the complexity of managing HLHS. Further studies with larger sample sizes and long-term follow-up are necessary to identify prognostic

POSTER PRESENTATIONS

Category: Cardiac Surgery

2241 - OUTCOMES AFTER INTERRUPTED AORTIC ARCH REPAIR IN LOW WEIGHT PATIENTS IN AUSTRALIA AND NEW ZEALAND

Lachlan Crawford [1], Aditya Patukale [2], Supreet Marathe [2], Tyson Wijohn [3], Tom Karl [4], Matthew Liava'a [5], Ajay Iyengar [3], Igor Konstantinov [6], Anzcors Collaborative [11], Prem Venugopal [2], Nelson Alphonso [2]

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Background / Hypothesis

Interrupted aortic arch (IAA) is an uncommon lesion characterised by complete luminal discontinuity within the aortic arch. Low operative weight (2.5kg or less) is a risk factor for early death after repair. The influence of low weight on recurrent arch obstruction and reintervention is less clear. We aimed to analyse outcomes in low-weight patients undergoing IAA repair in a large binational registry.

Materials and methods

This was a binational retrospective cohort study of children undergoing IAA repair from 2013 to 2024, recruited from the Australia and New Zealand Congenital Outcomes Registry for Surgery (ANZCORS) database. The primary endpoints were death and arch reintervention (surgical or transcatheter) for recurrent arch obstruction.

Results

70 patients were identified, of whom 16 (22.8%) had an operative weight of 2.5kg or less. Median postoperative follow-up was 3.4 years (IQR 2.0–5.9 years). Hospital mortality was 12.5% (n = 2) in low-weight patients compared to 5.5% (n = 3) in patients >2.5kg (p = 0.42). There were no late deaths among low-weight patients, and one late death in the >2.5kg group. Arch reintervention was performed in 4 (25%) low-weight and 7 (13%) patients >2.5kg. The median interval to reintervention was 3 months in low-weight patients and 2 years in patients >2.5kg (p = 0.10). Overall survival at 5 years postoperatively was 87.5% (95% CI 58.6%–96.7%) among low-weight patients and 92.1% (95% CI 80.1%–97.0%) among those >2.5kg (p = 0.43). Arch reintervention-free survival at both 1 and 5 years postoperatively was 66% (95% CI 36.5%–84.3%) in low-weight patients, compared to 96.2% (95% CI 85.7%–99.0%) and 80.7% (95% CI 64.3%–90.1%) in patients >2.5kg (p = 0.051).

Conclusions

IAA repair in low-weight patients is associated with poorer freedom from reintervention over intermediate-term follow-up. There is a trend towards poorer early survival, but no increase in late death.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2243 - EFFICACY CORTICOSTEROIDS FOR REDUCE INFLAMMATION IN CHILDREN UNDERGOING CARDIAC SURGERY SYSTEMATIC REVIEW STUDY

Angeline Fenisenda [1], Gama Satria [1], Ahmat Umar [1], Aswin Nugraha [1], Arie Hasiholan [1], Indra Hakim [1], Ria Nova [2], Iche Liberty [3]
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Background / Hypothesis:
Corticosteroids in pediatric cardiac surgery remain controversial despite their widespread use to mitigate inflammatory responses associated with cardiac surgery. This systematic review analyzes the efficacy of corticosteroid administration, especially on interleukin-6 levels in pediatric patients undergoing cardiac surgery.

Materials and Methods:
The initial search yielded 3,451 results, which were categorized according to inclusion and exclusion criteria, resulting in six original articles. We reviewed six randomized, double-blind, placebo-controlled trials published between 2015-2021, systematically searching databases (Pubmed, Elsevier, Cochrane Central Register of Controlled Trials). These studies encompassed pediatric patients (ranging from neonates to 18 years old) undergoing heart surgery and evaluated various corticosteroid regimens, including methylprednisolone, dexamethasone, and hydrocortisone, compared to placebo.

Results:
Six RCTs comprising 305 pediatric patients were included. All studies consistently demonstrated that corticosteroids effectively reduced pro-inflammatory markers (IL-6). Specifically, the inflammatory response was significantly reduced, as evidenced by lower IL-6 levels in the experimental group compared to the control group. A significant challenge in this research was the variability in outcome measurements across studies, with some studies utilizing standardized mean difference (SMD) while others employed range value statistics. However, this study demonstrates a low risk of bias through its rigorous methodology. (Figure 1)

Conclusions:
Corticosteroid administration consistently reduced IL-6 levels with strong statistical significance. This investigation demonstrates methodological strength through its low risk of bias, establishing it as a credible reference for clinical application. However, several limitations should be noted. This variability in statistical methods complicated the direct comparison of results across studies. These methodological improvements would help strengthen the evidence base for corticosteroid use in pediatric cardiac surgery and provide more definitive guidance for clinical practice. The limited scope of intervention studies represents a significant constraint. Thus, future research endeavors with larger cohorts are strongly indicated to validate and extend these preliminary findings.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2248 - EIGHT YEARS OF EXPERIENCE WITH MINIMALLY INVASIVE VENTRICULAR SEPTAL DEFECT CLOSURE ON THE BEATING HEART AT A SINGLE CENTER

Bakytzhan Nurkeyev [1], Elmira Kuandykova [1], Asel Kabakanova [2], Amangeldy Kerimkulov [1], Akkerbez Adilbekova [1]
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National Scientific Medical Center, Icu, Astana-Kazakhstan [2]

Background / Hypothesis:
The minimally invasive closure of ventricular septal defects (VSD) using an occluder represents a major step forward in cardiac surgery. By utilizing partial sternotomy or intercostal access, this approach significantly reduces surgical trauma. It also eliminates the need for cardiopulmonary bypass, thereby lowering the risks typically associated with conventional open-heart procedures. Furthermore, the technique avoids radiation exposure, improving patient safety, and offers wider clinical applicability compared to traditional interventional methods

Materials and Methods:
retrospective study of 480 patients hospitalized from January 2016 to December 2023 at the Department of Pediatric Cardiac Surgery, National Scientific Medical Center, Astana, Kazakhstan.

Results:
We conducted a retrospective study of 480 patients hospitalized from January 2016 to December 2023 at the Department of Pediatric Cardiac Surgery, National Scientific Medical Center, Astana, Kazakhstan. The study included patients over 6 months old, weighing more than 4 kg, with ventricular septal defects (VSD) sizes ranging from 3 to 14 mm as assessed by transthoracic echocardiography (TTE).
To assess mid-term results, these patients underwent cardiac ultrasounds after hospital discharge at 1, 6, and 12 months, as well as at 3, 5, and 8 years.

Conclusions:
This method is a rapidly developing technique that has proven safe and effective in a selected group of patients in recent years. The advantages of this method include minimal incisions, resulting in postoperative scars ranging from 2 to 4 cm in size. Additionally, it avoids myocardial injury and reduces operation time, intensive care unit stays, and overall hospital length of stay.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2249 - LONG TERM OUTCOMES OF PAEDIATRIC MECHANICAL VALVE REPLACEMENT OVER 3 DECADES IN A STATE BASED POPULATION IN AUSTRALIA

Siddharth Amboli [1], William Foot [1], Narupa Noppawinyoowong [1], Lachlan Crawford [2], Vinod Sharma [2], Homayoun Jalali [2], Tom Karl [3], Supreet Marathe [1], Prem Venugopal [1], Nelson Alphonso [1]
Queensland Children Hospital, Cardiothoracic Surgery, Brisbane-Australia [1] The Prince Charles Hospital, Cardiothoracic Surgery, Brisbane-Australia [2] Queensland Children Hospital, Queensland Pediatric Cardiac Service, Brisbane-Australia [3]

Background / Hypothesis:
Mechanical valve replacement in children is sometimes unavoidable despite requiring anticoagulation and reoperation to upsize the prosthesis. We analysed the outcomes of pediatric mechanical valve replacement over the past three decades in a state-based population in Australia.

Materials and Methods:
Every patient under 20 who had a mechanical valve implanted in any position in Queensland between 1995 and 2024 was retrospectively reviewed.

Results:
200 patients (Indigenous 33, 16%) met the inclusion criteria [91 (45.5%) aortic, 60 (30%) mitral, 21 (10.5%) aortic root replacement, 10 (5%) tricuspid, 10 (5%) truncal valve, 8 (4%) common atrioventricular valves]. Median age was 10.6 years [IQR 4.8,19.2; 11 (5%) < 1-year]. Indications were congenital (113, 56.5%), rheumatic (64, 32%), connective tissue disorder (12, 6%) and infective endocarditis (11, 5.5%). Median duration of follow-up was 10.6 years (IQR 4.8, 19.2). There were 4 (2%) hospital and 28 (14%) late deaths. 24 (12%) had valve-related complications (thromboembolic 15; intracranial bleed 4; valve thrombosis 5). 33 (16.5%) had a redo valve replacement (somatic outgrowth 18; 5 each for thrombosis, infective endocarditis, valve failure). Survival was 90 % (95% CI 85- 94) and 85 % (95% CI 78-90), and freedom from valve replacement was 76% (95% CI 69-82) and 68% (95% CI 59-75) at 10 and 15 years, respectively. On multivariable analysis, Indigenous status ($p<0.001$), congenital aetiology ($p=0.002$) and valve thrombosis ($p=0.02$) were significant risk factors for death. Age < 1 year ($p=0.04$), Indigenous status ($p=0.01$) and congenital aetiology ($p=0.04$) were significant risk factors for redo valve replacement.

Conclusions:
Mechanical valve replacement in children in Queensland is usually required in older children. It has low hospital mortality but a high risk of complications (10%), long-term mortality (15%), and redo valve replacement (15%). Indigenous patients and patients with congenital dysplastic valves have a higher incidence of death and redo valve replacement.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2253 - SUCCESSFUL SURGICAL TREATMENT OF TETRALOGY OF FALLOT USING THE RIGHT ATRIAL APPENDAGE AS A NEOPULMONARY VALVE A CLINICAL CASE

Yerbol Aldabergenov [1], *Bakytzhan Nurkeyev* [1], Asel Kabakanova [2], Elmira Kuandykova [1], Amangeldy Kerimkulov [1]
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National Scientific Medical Center, Icu, Astana-Kazakhstan [2]

Background / Hypothesis:
Tetralogy of Fallot (TOF) is a congenital heart defect marked by reduced pulmonary blood flow. In 2019, Iranian cardiac surgeon Amirghofran A. introduced a novel approach: constructing a neopulmonary valve from the right atrial appendage (RAA), offering a viable option in cases of pulmonary valve hypoplasia or aplasia. The technique uses autologous tissue, potentially allowing for growth and reducing the need for reoperations.

Materials and Methods:
In National Scientific medical center we performed a novel operation by using right atrial appendage as a neopulmonary valve

Results:
On November 22, 2023, Kazakhstan's first successful RAA-based TOF correction was performed at the Pediatric Cardiac Surgery Department of JSC NSMC. The patient, an 11-month-old infant, presented with signs of cyanosis, dyspnea, and feeding difficulties. Diagnostic imaging revealed TOF with a subaortic VSD, tricuspid regurgitation, aortic dextroposition (50%), and significant RVOT obstruction. Following previous RVOT stenting, the patient underwent open-heart surgery lasting 5 hours, including 178 minutes of cardiopulmonary bypass.

Intraoperatively, the pulmonary valve was found to be severely malformed and fused with the stent. Due to inadequate annular size (z-score), a decision was made to excise the native valve and implant a neopulmonary valve fashioned from the right atrial appendage. The RAA was carefully shaped and sutured to reconstruct a functional neobicuspid valve, which was then reinforced with xenopericardial patching of the pulmonary artery and RVOT. Postoperative transesophageal echocardiography showed favorable pressure gradients and valve function.

Conclusions:
This case demonstrates the feasibility and effectiveness of using the right atrial appendage as a neopulmonary valve in TOF repair, particularly in cases involving hypoplastic or absent pulmonary valves. The use of autologous tissue offers potential for growth and long-term durability. While early outcomes are promising, further follow-up is needed to validate long-term results and clinical benefits of this innovative technique in pediatric cardiac surgery.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2256 - CLINICAL EXPERIENCE AND OUTCOMES WITH THE INTRA EXTRACARDIAC (TYPE IV) FONTAN PROCEDURE IN COMPLEX CONGENITAL HEART DISEASE

Juan Rafael David Polanco Lozada [1], Maria Elisa Moran Chaidez [1], Maria Angelica Conde Mora [1], Maria Del Sol Garcia Ortegon [1], David Adrian Romero Perez [1], Tania Leticia Mendoza Torres [1], Guillermo Diaz Quiroz [1], Margarito Morales Cruz [1], Andres Jaime Uribe [1]
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Background / Hypothesis:
The Fontan procedure, developed in the 1970s, is a palliative surgical strategy for patients with single-ventricle congenital heart disease, enabling serial circulation without right ventricular involvement. Over time, modifications such as the extracardiac Fontan (Type III) have become the standard. The Type IV Fontan (intra-extracardiac anatomical) is a recent modification that integrates features of the lateral tunnel and extracardiac conduit. It aims to reduce complications such as protein-losing enteropathy, arrhythmias, and pleural effusion, while improving hemodynamic stability and facilitating fenestration. This study evaluates the safety and efficacy of the Type IV Fontan compared to the Type III at Centro Médico Nacional 20 de Noviembre in Mexico city.

Materials and Methods:
We conducted a retrospective, observational, and analytical study including 16 patients who underwent the Type IV Fontan procedure. Preoperative criteria included anatomical and hemodynamic indices such as Nakata and McGoon scores, and pulmonary vascular resistance. During surgery, the intra-extracardiac configuration was implemented to optimize flow and minimize complications. Postoperative follow-up assessed clinical evolution and complications including pleural effusion, arrhythmias, and fenestration patency.

Results:
The cohort had a mean age of 10 years (range: 8–14). All patients met preoperative hemodynamic criteria. Postoperative oxygen saturation improved from a mean of 75% to 87%. Average hospital stay was 28 days (range: 12–54), comparable to Type III outcomes. The most frequent complication was prolonged pleural effusion (37%, mean duration 27 days), followed by arrhythmias (25%), both manageable. No fenestration obstruction or protein-losing enteropathy was observed. No early mortality occurred.

Conclusions:
The intra-extracardiac (Type IV) Fontan is a safe and effective alternative to the standard extracardiac (Type III) approach. It offers reduced risk of severe complications, maintains hemodynamic stability, and supports improved recovery. Further studies are warranted to assess long-term outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2257 - CLINICAL AND SURGICAL PROFILE OF PATIENTS UNDERGOING THE FONTAN PROCEDURE AT A PEDIATRIC CARDIOLOGY TERTIARY CENTER IN SALVADOR BAHIA BRAZIL

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Background:
The Fontan procedure, the final surgical stage in single-ventricle palliation, has significantly improved survival and quality of life in children with complex congenital heart disease since its first description in 1968. Despite technical advancements—such as the lateral tunnel and extracardiac conduit with or without fenestration—this population remains at high risk for early and late complications.

Objective:
To describe the clinical and surgical profile, postoperative complications, and outcomes of patients with congenital heart disease who underwent the Fontan procedure in a tertiary pediatric cardiology center in Salvador,Bahia, Brazil.

Methods:
A retrospective, cross-sectional study was conducted through chart review of patients aged 3 to under 18 years who underwent the Fontan procedure between January 2015 and December 2023. Demographic, clinical, and surgical data were extracted and analyzed, including sex, age at surgery, diagnosis, type of Fontan procedure, complications, and mortality.

Results:
Twenty-nine patients were included, with a predominance of males (55%). The mean age at the time of surgery was 7.45 years. Most patients (73%) were from the countryside of Bahia, while 27% were from the metropolitan region of Salvador. The most frequent diagnosis was tricuspid atresia: type 1B (34.8%), type 1C (10.3%), and type 1A (6.9%). The extracardiac conduit technique was used in the majority of cases. Postoperative complications included pleural effusion, arrhythmias, and thromboembolic events. The overall mortality rate was 31%, with 8 of the 9 deaths occurring in the late postoperative period.

Conclusion:
Although most patients underwent the Fontan procedure within an acceptable timeframe, the mean age at surgery was slightly above the ideal range reported in the literature. The elevated mortality rate underscores the need for earlier intervention and long-term follow-up to improve outcomes in this population.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2258 - STRUCTURED IMPLEMENTATION OF A PEDIATRIC CARDIAC SURGERY PROGRAM IN A PREVIOUSLY UNSERVED REGION IN LATIN AMERICA SOCIAL IMPACT AND EARLY OUTCOMES

Guilherme Viotto [1], Camila Lino Martins [2], José Mendes Filho [3], Priscilla Costa [3], Natalia Matos Coelho [3], Ellen Calixto [3], Denise Perez [3], Ayrine Faustino [4], Gabriela Assis [4], Fernando Sales Cyrino [1], Alberto Cubel [5], Marcos Bonilha [5], Alessandro Depieri [5], Maria Auxiliadora Dudib [5], Ricardo Ayache [5]
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Background / Hypothesis:
In May 2024, a pediatric cardiac surgery program was established in a region of Latin America previously served by a centers with limited resources for complex congenital heart care. This study describes the implementation model, social impact, and initial clinical outcomes of the first year of the program.

Materials and Methods:
A retrospective review was conducted of 24 patients operated between May 2024 and April 2025. The implementation included in loco multidisciplinary team training, supported by a nationally recognized reference center in congenital heart disease. Data on diagnoses, surgical approaches, ventilation, vasoactive support, ICU and hospital stay, and outcomes were analyzed.

Results:
Among the 24 patients, 3 were reoperations. Of the primary surgeries, 18 were performed via median sternotomy — 12 through mini-incisions— and 3 via lateral thoracotomy. Main diagnoses included ventricular septal defect, atrial septal defect, total and partial anomalous pulmonary venous connection, transposition of the great arteries, and tricuspid atresia. Fourteen patients were extubated in the operating room. Eighteen did not require inotropic or vasopressor support; the vasoactive-inotropic score (VIS) ranged from 0 to 23. There was no intraoperative mortality. One patient required postoperative ECMO support. Median ICU stay was 3,2 days, and median postoperative hospital stay was 6.4 days. The program delivered complex cardiac care with low morbidity and excellent early outcomes.

Conclusions:
The structured implementation of a pediatric cardiac surgery program, through local multidisciplinary training and collaboration with a national reference center, proved feasible and highly effective. The initiative ensured the availability of specialized, high-quality care within the region, eliminated the need for long-distance patient transfers, and significantly improved family support and treatment continuity. These results demonstrate that excellence in congenital heart surgery can be achieved through strategic planning, even in regions without prior access to such services.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2265 - COMPARATIVE OUTCOMES OF PDA STENTING VERSUS MODIFIED BLALOCK – TAUSSIG – THOMAS SHUNT (MBTTS) IN DUCT DEPENDENT CONGENITAL HEART DISEASE A SYSTEMATIC REVIEW AND META ANALYSIS

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Background / Hypothesis:
The debate continues over whether the patent ductus arteriosus (PDA) stent or the modified Blalock-Taussig-Thomas shunt (mBTTS) is more effective for palliating congenital heart diseases.

Materials and Methods:
Literature search was performed using PubMed, ScienceDirect, and Google Scholar for obtaining studies comparing PDA stenting and mBTTS from inception to June 2024. The primary outcome assessed was all-cause mortality. Secondary outcomes encompassed reintervention rates, duration of hospital stay, post-procedural oxygen saturation, and pulmonary artery growth evaluated using the Nakata Index. A subgroup analysis was performed based on sample size, categorized as ≤100 or >100.

Results:
Seventeen studies with 3941 participants were included (PDA stenting=1401, mBTS=2540). Patent ductus arteriosus stent demonstrated reduced risk of all-cause mortality (RR, 0.68, 95% CI [0.50, 0.91]; p=0.009, I2=27%). However, meta-analysis demonstrated significantly lower risk of reintervention in mBTTS group (RR, 1.41, 95% CI [1.01, 1.96]; p=0.04, I2=78%). Significantly shorter length of stay was observed in the PDA stent group (MD, -6.76, 95% CI [-8.55, -4.97]; p<0.00001, I2=95%). In the sub-analysis involving >100 participants, PDA stent demonstrated significantly greater oxygen saturation (MD, 4.18, 95% CI [0.43, 7.92]; p=0.03, I2=79%). Meanwhile, in the sub-analysis involving ≤100 participants, significantly greater pulmonary artery growth was documented in the mBTTS group (MD, -20.17, 95% CI [-36.40, -3.94]; p=0.01, I2=79%).

Conclusions:
The PDA stent is not inferior to the mBTTS and can serve as an alternative when mBTTS is not feasible—and vice versa. The PDA stent shows advantages in terms of overall survival, oxygen saturation, and shorter hospital stays. On the other hand, the mBTTS demonstrates superior outcomes in reducing the need for reinterventions and promoting pulmonary artery growth.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2268 - SURVIVAL FOLLOWING THE UNIVENTRICULAR ARTERIAL SWITCH OPERATION OUTCOMES FROM INDIA

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Background / Hypothesis:
Patients with univentricular hearts, transposition of great arteries & arch hypoplasia represent a challenging subset. The univentricular arterial switch operation (u-ASO) in this setting is a more ideal palliation over the conventional Stage-1 operation. The goal of this study was to examine the credence of this strategy by analyzing the outcomes of the u-ASO for this substrate at our institution.

Materials and Methods:
The Congenital Heart Surgery Database at our institution was queried for all univentricular heart patients who underwent the arterial switch operation.
Statistical analyses were written using R Studio software.

Results:
Seventeen patients underwent the uASO at a median age of 46(30-49) days. There were 10 boys(59%). Primary diagnoses included Double Inlet LV in 13(76%), hypoplastic right ventricular apparatus in 3(18%) and straddling tricuspid valve in 1(6%) patient.

As part of the ASO, pulmonary blood flow was regulated either with pulmonary artery banding in 4 patients(24%), or graft interposition in 13 patients. The LeCompte-manoeuvre in the initial part of our experience was avoided thereafter to retain the normal alignment of the pulmonary arteries.
There was 1 immediate operative death(6%), and 2 early deaths in this series. Eight of the 14 survivors(57.1%) have advanced to Stage-2 palliation, while the other 6 are awaiting it.

Survival remained steady at 82% in the overall cohort, with the interstage period witnessing no attrition in survival or reinterventions. All 14 survivors were alive at last follow-up(26 months) with no residual systemic outflow tract obstruction, normal arch configuration, good LV function & adequate pulmonary blood flow.

Conclusion:
In a single sitting, the uASO addresses the hypoplastic arch, offers anatomical stabilisation of the ventriculoarterial junction & regulates pulmonary over-circulation. On the edifice of these principles, the outcomes from our experience demonstrate the physiological superiority & safety of this operation as a novel strategy univentricular hearts with transposition & arch hypoplasia.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2273 - IDENTIFYING KEY PREDICTORS OF POSTOPERATIVE OUTCOMES IN PEDIATRIC CHD SURGERY EVIDENCE FROM A DEVELOPING COUNTRY PERSPECTIVE

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Background/Hypothesis:
Congenital heart disease (CHD) is the most common congenital anomaly and remains a major health issue, especially in developing countries. Despite advances in surgical care, high rates of mortality and complications persist in pediatric patients. Data on predictors of surgical outcomes in these settings are still limited.

Materials and Methods:
A retrospective cohort study was conducted on children (<18 years) with CHD who underwent cardiac surgery at Dr. Sardjito Hospital from January 2017 to August 2022. Consecutive sampling was used. Associations between variables and outcomes were analyzed using multivariate logistic regression, reported as adjusted odds ratios (aOR) with 95% confidence intervals (CI), and p-values < 0.05 were considered significant.

Results:
A total of 238 children with CHD underwent cardiac surgery. The postoperative mortality rate was 11.8%, while complications occurred in 34.4% of patients. The most common complications were cardiac arrest (14.7%), acute kidney injury (11.8%), and pneumonia (11.3%). Multivariate analysis showed that mortality was significantly associated with age <2 years (aOR = 10.61), malnutrition (aOR = 3.97), $ScvO_2$ <60% (aOR = 5.19), lactate level ≥4.5 mmol/L (aOR = 6.53), and ventilator use ≥48 hours (aOR = 4.05). For complications, significant predictors included age <2 years (aOR = 5.10), CPB duration ≥90 minutes (aOR = 2.88), $ScvO_2$ <60% (aOR = 2.95), lactate level ≥4.5 mmol/L (aOR = 4.99), and prolonged ventilator use (aOR = 9.64).

Conclusions:
Young age, elevated lactate levels, low $ScvO_2$, prolonged ventilator use, and malnutrition were associated with increased mortality after pediatric cardiac surgery. Extended CPB duration also contributed to postoperative complications. These findings emphasize the need for strengthened perioperative care and early risk identification, especially in resource-limited settings.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2275 - ANOMALOUS LEFT CORONARY ARTERY ORIGIN FROM NON FACING ANTERIOR SINUS OF PULMONARY ARTERY SUCCESSFUL SURGICAL REPAIR USING AUTOLOGOUS TISSUE OF TWO PULMONARY SINUSES

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Madras Medical Mission, Pediatric Cardiac Surgery, Chennai-India [1] Madras Medical Mission, Pediatric Cardiology, Chennai-India [2]

Background:
Anomalous left coronary artery from the pulmonary artery (ALCAPA) is a rare congenital cardiac anomaly. The anomalous left coronary artery (LCA)usually arises from the posterior sinus of the pulmonary root or the posterior wall of main pulmonary artery. An anteriorly placed origin of anomalous left coronary artery from non-facing sinus of pulmonary artery is very rare.

Materials and Methods:
A 5-month-old male infant presented with a history of feeding difficulty and fast breathing of one month duration. Echocardiography revealed dilated and severely dysfunctional left ventricle, mild mitral regurgitation and scarred antero-lateral papillary muscle. The left coronary artery (LCA) was arising anomalously from the left anterior non-facing sinus of pulmonary artery. The LCA origin was separated from the aortic root by 15 mm.

After infusion of cardioplegia; the main pulmonary artery was transected and the left commissure of pulmonary valve was detached. The LCA was harvested from the pulmonary artery using a generous cuff of pulmonary artery tissue which included two sinuses of the pulmonary artery (leftward posterior and left anterior sinuses). The LCA was mobilized and the pulmonary artery tissue was folded on itself to fashion it into an open ended tube containing the origin of LCA at its distal end. This tube, which effectively became an extension of the LCA, was then implanted on the left postero-lateral aspect of ascending aorta without any tension. Pulmonary sinuses were reconstructed using autologous pericardium and detached commissure was reattached

Results:
The baby was weaned off CPB uneventfully, required ventilator/inotropic support for 6 days and was discharged home on 12th day

Conclusions:
ALCAPA with remote origin of LCA from left anterior sinus is rare, repair is technically challenging due to the distance required for trans-locating the anomalous coronary to aortic root. Autologous pulmonary artery tissue with preserved blood supply has growth potential and provides long-term patency

POSTER PRESENTATIONS

Category: Cardiac Surgery

2278 - OFF PUMP MIDLINE AORTIC ARCH REPAIR WITH OTHER INTRA CARDIAC DEFECTS USING PARTIAL INTER DIGITATION TECHNIQUE REDUCES INCIDENCE OF ARCH REINTERVENTION MIDTERM ANALYSIS.

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Background / Hypothesis:
We describe our results of the off-pump midline aortic arch repair with concomitant repair of other intra-cardiac defects using the partial inter-digitation technique.

Materials and Methods:
36 patients (median age: 65 days and median weight: 3.8kg) underwent single stage aortic arch repair associated with other intra-cardiac anomalies through midline incision, wherein the aortic arch repair was done prior to the institution of cardiopulmonary bypass.

Results:
All patients had successful repair of the aortic arch without the need for rescue cardiopulmonary bypass. 6 patients were of single ventricle physiology. There was no in-hospital mortality or late mortality. Mean arch gradient at the time of latest follow up was 11mm Hg. A total of 9 patients underwent cardiac re-intervention out of which 5 patients underwent planned single ventricle palliation. 1 patient had aortic arch required balloon coarctoplasty 6 months after the primary operation. Remaing3 underwent re-intervention for other intra-cardiac lesions. Freedom from arch intervention was 97.1% ± 2.8 at the end of 1 year and 5 years.

Conclusions
Aortic arch repair associated with other intra-cardiac lesions can be performed in a single stage midline incision with arch repair being done prior to the establishment of cardiopulmonary bypass without the use of hypothermic circulatory arrest. The partial interdigitation technique for arch repair provides excellent early and intermediate results in terms of survival and freedom from aortic re-intervention.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2281 - OUTCOMES OF 4118 MINIMALLY INVASIVE OPERATIONS FOR CONGENITAL HEART DISEASES WITH DIFFERENT APPROACHES

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Background / Hypothesis:
We retrospectively reviewed the surgical outcomes of 4118 cases of congenital heart diseases with three minimally invasive approaches.

Materials and Methods:
From 2015-1-1 to 2023-12-31, 4118 patients with different congenital heart diseases underwent minimal invasive operations in two hospitals by one surgeon. The surgical approaches include axillary mini-thoracotomy(3345) for simple cardiac anomalies, midline mini-sternotomy(758) for low-weight kids, transverse incision with mini-sternotomy(15) for complex cases such as TAPVC, TGA, VSD combined with aortic arch repair.

Results:
There was one death due to sepsis. Other complications include residual shunts, SVC stenosis, incision healing issues, aortic arch residual stenosis, pleural effusion, pneumotomas. There is no patient needed to convert to conventional approaches. There were 15 patients needed reoperations due to complications.

Conclusions:
Minimall invasive operations can be safely and effectively applied in many patients with congenital heart disease, even in relatively complex cases.

POSTER PRESENTATIONS

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2287 - A TRANSVERSE INCISION FOR PEDIATRIC COMPLEX CONGENITAL HEART SURGERY

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Background / Hypothesis:
Median sternotomy has been the standard incision for complex congenital heart disease (CHD)surgery. However, this approach results in a prominent median sternal scar. We performed a relatively safe, effective, and cosmetically superior alternative incision technique that can address certain complex CHDs

Materials and Methods:
A transverse incision was made through the nipple line. After complete liberating the subcutaneous tissue ,then the sternum was completely divided using a sternal saw. After adequate exposure of the heart, cannulation of the ascending aorta, superior and inferior vena cavae was performed to establish cardiopulmonary bypass (CPB). Cardiac repair was then conducted. We

Results:
Since August 2023, we have performed this transverse incision to treat children with complex CHDs including complete transposition of the great arteries total anomalous pulmonary venous drainage tetralogy of fallot neonatal ventricular septal defect with no wound healing complications. Compared to traditional median sternotomy ,transverse incision provides adequate cardiac exposure and facilitates the cannulation and establishment of cardiopulmonary. Although it took a longer time to dissection ,exposure, and close the wound, the operation time was similar to the standard approach. This transverse wound was not visible under conventional clothes.

Conclusions:
Transverse incision can be a cosmetically superior alternative incision for pediatric complex congenital heart surgery, which is technically safe and effective.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2289 - PERSONALIZED NUTRITIONAL INTERVENTIONS AND GROWTH OUTCOMES IN CHILDREN WITH CONGENITAL HEART DISEASE A CONTEXTUALIZED APPROACH FROM A LMIC

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Background:
Malnutrition is common in children with congenital heart disease (CHD), particularly in low-resource settings. Factors like feeding difficulties, anemia, and poor complementary feeding (CF) practices contribute to undernutrition. Despite known benefits, the impact of nutrition interventions on growth in CHD remains underexplored.

Methods:
This retrospective study was conducted at a CHD nutrition clinic in Pakistan. Records of 129 children (0–24 months) with CHD who visited at least twice were reviewed. Extracted data included length, weight, and their z-scores, nutrition intervention, adherence, and CF indicators (Minimum Acceptable Diet-MAD, Minimum Meal Frequency- MMF, Minimum Dietary Diversity-MDD). Nutrition intervention was provided by dietitians which includes follow ups for patient centric education and counseling for breast feeding (BF), concentrated formula and initiation and improvement in CF practices within the resources. Wilcoxon signed-rank tests assessed within-subject growth. Kruskal-Wallis and Bonferroni-adjusted Mann-Whitney U tests analyzed between-group differences.

Results:
Length and weight improved significantly from first to second visit ($p < 0.001$). However, there was no change in Weight for Age Z scores, Weight for Length Z scores decreased. Children receiving CF demonstrated significantly greater gains in length and weight compared to those on concentrated formula ($p = 0.001$) and BF alone ($p = 0.008$). Among CF recipients (n=96), 41.7% meet MAD. However, no significant differences in growth were observed across MAD, MMF, MDD, or adherence groups, this may be due to small sample size. Regression analysis identified baseline weight as the strongest predictor of follow-up length ($\beta = 0.97$, $p < 0.001$).

Conclusion:
CF contributed to improved growth. Context-specific nutrition strategies are essential for optimizing nutritional status in children with CHD and can have wider public health benefits.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2296 - AUGMENTATION OF AORTIC VALVE CUSPS USING AUTOLOGOUS PERICARDIUM IN CHILDREN WITH CONGENITAL AORTIC STENOSIS SURGICAL TECHNIQUES AND EARLY OUTCOMES

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Background / Hypothesis:
Congenital aortic stenosis (AS) presents a challenging pathology in pediatric patients due to morphological anomalies such as unicuspid and bicuspid valves and underdeveloped commissures. Valve repair strategies that emulate normal anatomy are critical for restoring function and promoting growth. This study presents early outcomes of aortic valve cusp augmentation using autologous pericardial patches in five pediatric patients with congenital AS. The surgical approach involved commissurotomy, cusp shaving, and leaflet extension using pericardial patches. All patients showed improved valve gradients and preserved ventricular function. Autologous pericardium provides a promising material for durable, anatomy-directed valve repair in pediatric patients.

Materials and Methods:
Five pediatric patients (age range: 1 year 11 months to 10 years) underwent open aortic valve repair between January and February 2025 for congenital AS. Indications included high transvalvular gradients (ranging from 55 to 120 mmHg), cusp dysplasia, and history of prior balloon valvuloplasty. Operative reports and echocardiographic data were reviewed. Surgical techniques included commissurotomy, shaving of fibrotic tissue, and augmentation with autologous pericardial patches tailored to restore normal cusp height and coaptation.

Results:
Two patients presented with unicuspid valves, while three had bicuspid morphology with fibrotic leaflet fusion. In all cases, augmentation was performed using fresh autologous pericardium. Aortic cross-clamp times ranged from 35 to 107 minutes, with cardiopulmonary bypass times between 67 and 130 minutes. Postoperative echocardiography showed reduced gradients across the aortic valve (mean PG range 15–46 mmHg), satisfactory leaflet mobility, and preserved ejection fraction (range 60–87%). No patients experienced early valve-related complications or required reintervention.

Conclusions:
Augmentation of aortic valve cusps with autologous pericardium is a reproducible and effective surgical technique for congenital aortic stenosis in pediatric patients. It allows restoration of valve geometry, improves hemodynamics, and may reduce the need for future valve replacement. Further long-term follow-up is needed to assess durability and growth potential of the reconstructed valves.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2310 - AORTIC ROOT RECONTRUCTION FIRST TECHNIQUE FOR AORTIC ROOT TRANSLOCATION IN COMPLEX TRANSPOSITION OF THE GREAT ARTERIES

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Background / Hypothesis:
Complex transposition of the great arteries (TGA) is a rare congenital heart disease characterized by significant left ventricular outflow tract (LVOT) obstruction, often rendering the arterial switch operation (ASO) challenging. In recent years, aortic root translocation (ART) has demonstrated improved early survival and excellent mid-term freedom from reoperation in patients with complex TGA. However, the technical complexity of ART and the potential distortion of aortic root geometry may increase the risk of aortic regurgitation (AR). To address these concerns, a novel surgical strategy was adopted.

Materials and Methods:
Between 2005 and 2024, 14 patients with complex TGA underwent ART at our institution (Table). The cohort included 6 patients with complete TGA and 8 with congenitally corrected TGA (ccTGA). There was one case of hospital mortality (Patient 7). In the most recent 6 patients, the aortic root reconstruction-first (ARRF) technique was employed for LVOT reconstruction. Unlike the conventional approach, the ARRF technique involves first anastomosing the aortic root to the distal ascending aorta, allowing blood to fill the root and enabling real-time assessment of aortic valve competence and root geometry before proceeding with LVOT reconstruction.

Results:
All but one of the patients who underwent surgery using the ARRF technique had ccTGA. All six patients survived and were followed for a median of 3.2 years (range, 6 months to 3.7 years). Echocardiographic evaluations during follow-up demonstrated satisfactory aortic valve function in all cases.

Conclusions:
The ARRF technique can be safely and effectively applied in complex TGA patients undergoing ART. Given the technical demands and prolonged operative time of ART, preserving aortic root geometry and preventing AR are essential for optimal outcomes. The ARRF technique may allow surgeons to perform ART with greater confidence and achieve more favorable aortic root configurations in these complex cases.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2311 - MICS IN CHILDREN SINGLE CENTRE EXPERIENCE IN HONG KONG

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Background / Hypothesis:
An array of successful MICS techniques have been reported for children in literature, including midline sternal-sparing to lateral thoracotomy/thoracoscopic approaches.
Since 2020, the new Hong Kong Children's Hospital (HKCH) became the dedicated paediatric cardiothoracic surgical unit in Hong Kong.
A small MICS program in HKCH was started since 2021.
We hypothesize that it is feasible for a small volume centre to develop one MICS program that is effective, safe and self-motivated for on-going expansion and improvement.

Materials and Methods:
1) Between 2021-2025, four specific MICS techniques have been established in HKCH (in chronological order) – partial (upper and lower) sternotomies, anterolateral submammary thoracotomy, vertical axillary thoracotomy, and total endoscopic (VAT) surgery
2) All-comer approach – case-by-case selection based on patient and surgeon factor:
Body size
Patient-specific anatomy
Proposed operation
MICS experience of the operating surgeon
3) Exclusion criteria
Extreme body size <3kg or >80kg
Emergency operation with haemodynamic instability including pre-operative ECMO
4)Small femoral vessels per se are NOT absolute contraindication
5)Technical review and stepwise development process
- by Deming cycle methology using footages from surgical video recordings

Results:
Since program inception, 72 patients (age 72 day – 18 year, weight 4kg - 54 kg) were treated in HKCH by one of the available MICS approaches at the time of their operations
Include 47 partial sternotomies, 3 submammary thoracotomies, 14 vertical axillary thoracotomies, and 8 total endoscopic (VAT) approaches
Prior chest surgery in 2 children, one with previous thoracoscopic tracheal-oesophageal fistula repair (MICS at 9-month-old) and one with previous thoracoscopic tracheal-oesophageal fistula repair plus sternotomy for aortopexy (MICS at 6-month-old)
No operative mortality
No reoperation for residual cardiac lesion/bleeding
One conversion (low partial sternotomy to full sternotomy)

Conclusions:
It is feasible even for small volume centre to develop a locally-acceptable MICS program
A stepwise evolution approach with continuous review process ensure patient safety, effective surgical treatment
Team debriefing and review also ensure sustained development of MICS by early identifying technical hurdles and discussing viable alternatives.

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Category: Cardiac Surgery

2314 - TOTAL ENDOSCOPIC (VAT) MICS IN CHILDREN THROUGH CENTRAL (AORTIC) CANNULATION

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Hong Kong Children's Hospital, Paediatric Cardiothoracic Surgery, Hong Kong-Hong Kong SAR, China [1]

Background / Hypothesis:
Total endoscopic (VAT) MICS for congenital heart surgery has been reported in literature mostly in large children/adolescent group.
Most groups reporting successful total endoscopic (VAT) MICS are utilizing peripheral cannulation through femoral vessels.
However, femoral cannulation especially arterial cannulation is limited in small children. With potential for vascular trauma or inadequate extracorporeal circulatory support.
Base on our experience with direct-vision mini-thoracotomy (axillary), we hypothesize that similar aortic manipulation (cannulation, antegrade cardioplegia, cross-clamping) are possible indirectly under video camera, can hence possible to extend total endoscopic approach to previously unsuitable (smaller) children.

Materials and Methods:
Retrospective review of operative records/intraoperative footages and electronic patient records

Surgical techniques:
- 3-port VAT technique used in all patients
- Before use of thoracoscopic aortic cannulation, femoral cannulation (and hence MICS-VAT) excluded <20kg
- After use of thoracoscopic aortic cannulation, MICS-VAT considered when >10kg or when femoral venous (IVC only) drainage is feasible
- Separate upper caval drainage (either by IJV cannulation or direct SVC cannulation thoracoscopically)
- Exclusion criteria:
1. Body size <10kg
2. Ultrasound documentation of no patent femoral vein
3. Emergency operation with haemodynamic instability including pre-operative ECMO

Results:
Between 2023-2025, 8 patients underwent total endoscopic (VAT) repair of cardiac lesions (Female 4 (50%), age 3 – 18 year (median 7.5 year, weight 13 – 54 kg (median 21.1kg))
3 patients (age 3–8 year, weight 13-18kg) underwent central aortic cannulation under thoracoscopic vision with minor procedural modifications, last 2 patients also had direct SVC cannulation under thoracoscopic vision
All patients underwent planned surgical repair successfully
Similar incision length to accommodate additional central cannulae
Shorter time from skin incision to on-bypass

POSTER PRESENTATIONS

No mortality/reoperations
No aortic dissection or vascular injury/difference in post-operative bleeding

Conclusions:
Our present series showed central aortic cannulation under thoracoscopic vision is safe and reproducible.
Direct SVC cannulation can be added thoracoscopically for bicaval drainage
Only a small incision (2-3cm) is required to accommodate all cannulae without sacrificing post-operative cosmesis.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2319 - MEDIASTINAL CARDIOVASCULAR ACCESS BY CLAMSHELL THORACOTOMY IN NEONATES – REPORT OF 2 CASES

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Background / Hypothesis:
As an alternative to median sternotomy for simultaneous bilateral thoracic cavity access, the clamshell incision is well-established in thoracic surgery
It is useful for bilateral lung transplantation, bilateral lung tumour or giant anterior mediastinal tumour resections and pericardiectomy.
Description on its use in paediatric age group especially in the neonates is scarce in literature.

Materials and Methods:
Retrospective review of hospital database in a tertiary paediatric cardiothoracic surgical centre in Hong Kong.
Between 2020-2025, hospital operative record database searched of neonates with cardiac or thoracic surgery documented used of transverse thoraco-sternotomy or clamshell thoracotomy.
Clinical notes were reviewed from electronic record system and archieved operative photos were retrieved from departmental database.

Results:
Between 2020-2025, 2 neonates underwent clamshell thoracotomy.
Case 1 was a 1.5kg neonate with S. aureus necrotizing pneumonia/lung abscess complicated by sepsis/DIC and left pulmonary artery rupture. Emergency clamshell thoracotomy was performed for intrapericardial pulmonary artery control and exposure for possible central ECMO cannulation. Uneventful left upper lobectomy was performed.
Case 2 was a 2.6kg neonate with large right thoracic mass with compressive symptom and severe pulmonary hypertension postnatally requiring emergency cervical cannulation for VA-ECMO. After initial stabilization clamshell thoracotomy was performed for mediastinal exploration and exposure for switching to right atrial cannulation. Uneventful resection of giant tumour (of posterior mediastinal origin) was performed on ECMO support.

Conclusions:
Transverse thoracosternotomy or clamshell thoracotomy can be safely applied even to the smallest of neonates.
Due to overall small thoracic volume and superior plasticity of rib cage, clamshell thoracotomy offer excellent exposure to entire chest cavity (except the superiormost area) and thoracic organs in neonates.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2325 - A CASE OF LATE PRESENTATION OF SHONE'S COMPLEX IN BOTSWANA

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Background / Hypothesis:
Shone's complex is a congenital anomaly characterised by left sided heart lesions of varying degrees of obstructions that may include all or some of these lesions: coarctation of the aorta, subaortic stenosis, parachute mitral valve and supra-mitral valve ring. This an unusual case of Shone's complex in a seven-year-old boy presented with other major cardiac defects that included a large patent ductus arteriosus (PDA), large perimembranous ventricular septal defect (VSD) and type 1a bicuspid aortic valve, thus presenting a dilemma in the surgical approach to the case.

Materials and Methods:
A seven-year-old boy with poor weight gain, exertional dyspnoea, excessive diaphoresis, palpitations from a young age. He had been tried on nutritional rehabilitation at a remote local clinic. He was referred to a district hospital following an episode of haemoptysis and further evaluation revealed signs of cardiac disease.

Results:
At the time of presentation to our tertiary hospital, he weighed 17kg, was not in respiratory distress, had an active precordium, with a thrill, 4/6 pansystolic murmur, 4/6 ensystolic murmur and a loud pulmonary heart sound. Echorcardiography confirmed features of Shone's complex with a partial supramitral ring and mild-moderate justaductal coarctation, large PDA, large perimembranous VSD. Computerised tomography of the whole aorta and pulmonary vasculature confirmed the findings. He underwent a successful and uneventful surgical intervention (median sternotomy, PDA ligation, VSD patch closure, mitral valve repair and subaortic resection) and was discharge home on postoperative day ten.

Conclusions:
Despite the complexity of the case, concerted efforts by the Heart Team were made to arrive at the most optimal approach to the repair of the defects, with excellent short-term outcome.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2332 - NOVEL TECHNIQUE FOR TETRALOGY OF FALLOT REPAIR WITH TRANSANNULAR PATCH USING A FRESH BICUSPID AUTOLOGOUS PERICARDIUM VALVE

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Background :
Pulmonary insufficiency (PI) is a common and often unavoidable complication after transannular patch repair in tetralogy of Fallot (TOF) patients with pulmonary valve annulus hypoplasia. While synthetic materials like polytetrafluoroethylene (PTFE) reduce calcification, they lack growth potential, limiting their use in growing children. Autologous pericardium offers a biological alternative with promising long-term viability and potential for growth.

Methods :
We describe a novel surgical technique using a fresh bicuspid valve constructed from free autologous pericardium in a patient undergoing TOF repair. A 6-month-old, 10 kg infant with worsening cyanosis and anoxic spells underwent elective surgical correction. Due to a severely hypoplastic and dysplastic pulmonary valve, native valve preservation was not feasible. After establishing cardiopulmonary bypass and performing the standard TOF repair, a bicuspid valve was fashioned from untreated autologous pericardium, shaped as an equilateral rhombus. The posterior cusp was sutured to the posterior wall of the pulmonary artery, and the anterior cusp was anchored along the anterior incision. A bovine pericardial transannular patch completed the reconstruction.

Results :
The patient was weaned from bypass without difficulty and had an uneventful postoperative course. He was discharged in good condition on postoperative day eight. At six-month follow-up, echocardiography showed no residual pulmonary stenosis and only trivial pulmonary insufficiency.

Conclusion :
The use of a fresh bicuspid valve constructed from free autologous pericardium in transannular patch repair appears to be a feasible and promising alternative in cases of TOF with severely dysplastic pulmonary valves. This approach may improve valve function, reduce PI, and accommodate somatic growth, making it particularly advantageous in pediatric patients. Further studies and long-term follow-up are needed to validate the durability and functional outcomes of this technique.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2333 - NOVEL TECHNIQUE OF IN TOTO EXPLANTATION OF RIGHT VENTRICULAR OUTFLOW TRACT STENT DURING INTRACARDIAC REPAIR.

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Background:
Right Ventricular Outflow Tract Stenting (RVOTS) is an effective, technically feasible, palliation for Tetralogy of Fallot. Explantation of stent can be challenging and following RVOTS, majority of patients end up with a transannular patch during their final repair (ICR).
Here we describe a novel technique of in-toto stent explantation, preserving the pulmonary valve integrity, which was performed in 3 of our patients who had RVOTS previously.

Method:
The institutional protocol for RVOTS is to avoid stenting across the pulmonary valve as far as possible. During ICR, the location of the stent is first assessed by TEE. Under cardioplegic arrest, the stent is explanted by getting a firm grasp over the stent via trans atrial approach. The RV end of the stent is tugged caudally with circumferential coring of the RVOT muscle around the stent which enables the complete retrieval of the stent embedded within the RV musculature. Vertical incision is made in the MPA, and the pulmonary valve leaflets are retracted with stay sutures and the pulmonary valve end of the stent is then gently released from the base of the pulmonary leaflets, preserving the integrity of the annulus and leaflets. An RVOT patch plasty may be required if the muscle is very much thinned out after the stent retrieval.

Conclusion:
The novel approach of circumferential coring of RVOT muscle and gentle release of attached stent struts from the pulmonary valve end enables to preserve the pulmonary valve in selected patients who are palliated with an RVOTS.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2339 - CORRELATES BETWEEN CORONARY PATTERN VENTRICULAR SEPTAL DEFECT AND OUTCOMES FOLLOWING THE ARTERIAL SWITCH OPERATION EXPERIENCE FROM INDIA

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Background / Hypothesis:
To quantify the surgical outcomes in patients who underwent the arterial switch operation (ASO) for transposition of great arteries, based on coronary pattern,ventricular septal defect,& explore possible embryological associations in the same.

Materials and Methods:
A total of 694 patients underwent the ASO at our unit between July 2009 and December 2024. The ASO registry comprising data pertaining to preoperative echocardiography,operative records of the patients were retrospectively analysed to correlate patient outcomes at last follow-up. The modified-Leiden-classification was employed for categorisation. Transposition morphology was broadly categorised as TGA with VSD(Group 1), and TGA with Intact Septum(Group 2).

Results:
340 patients belonged to Group 1,& 354 patients to Group 2.
Among Group 1, 221 patients(221/340,65%) had regular coronary pattern, while the rest(119) had a varying pattern. In Group 2, 259 patients(259/354;73%) had regular coronary pattern, while 95 patients had unusual morphology.
We observed that the most common unusual pattern in Group 1 and 2 were 1RLCx(single coronary), followed by 1L-2RCx & 1L-2RCx, followed closely by 1RLCx, respectively. Seventy eight(78/694;11%) patients across both groups had concomitant aortic arch obstruction.
Univariate risk factors for early death were the presence of a ventricular septal defect($p<0.01$,hazard ratio[HR]=2.4, 95% confidence-interval[CI]=1.5-5.6), circumflex-artery originating from the RCA($p<0.01$;HR=2.8;95%CI:0.8-6.1),concomitant aortic arch repair($p=0.01$;HR=5.2;95%CI=1.7-21),hypothermic circulatory arrest duration exceeding 30 minutes($p=0.03$;HR=3.2;95%CI=1.2-8), duration of cardiopulmonary bypass($p<0.01$;HR=1.2;95% CI=1.002-3.2), duration of myocardial ischaemia($p<0.01$;HR=1.009;95%CI=0.09-1.03) & need for prostaglandin or preoperative inotropic support($p=0.02$;HR=4.3;95%CI=2.3-6.7).
Multivariate risk factors for early death were duration of myocardial ischaemia($p=0.03$;HR=7.3;95%CI=2-29),concomitant aortic arch repair($p=.006$; HR=1.03;95% CI=1.01-1.06), mechanical circulatory support($p<.001$;HR=1.01;95% CI=1.005-1.015).

Conclusions:
Abnormal coronary patterns were frequented in patients of transposition with VSD, with a higher preponderance of single coronary trunk. Although the coronary patterns therein were not ascribable risk factors to early mortality or 1-year survival, the presence of VSD, or aortic arch obstruction, or both remained aggravating factors for the same.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2341 - SURGICAL REPAIR OF BERRY SYNDROME IN A NEONATE INCIDENTAL DIAGNOSIS AND SUCCESSFUL MANAGEMENT

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Background / Hypothesis:
Berry syndrome is a rare variant of the aortopulmonary window characterized by a distal aortopulmonary window, interrupted aortic arch, and anomalous origin of the right pulmonary branch from the ascending aorta. Diagnosis and surgical repair are challenging, as they require simultaneous aortic arch reconstruction, closure of the aortopulmonary window, and reimplantation of the right pulmonary artery. Due to the diagnostic difficulty on echocardiography, some cases are incidentally diagnosed during surgery or in the postoperative period.

Materials and Methods:
To report the case of a neonate who underwent surgical closure of an aortopulmonary window with aortic arch reconstruction. Postoperatively, an incidental finding of an anomalous origin of the right pulmonary artery was identified, which was corrected in a second-stage surgery, resulting in a favorable outcome.

Results:
A 12-day-old male neonate weighing 3.2 kg presented with clinical signs of heart failure, requiring vasopressor support and invasive mechanical ventilation. Initial echocardiographic evaluation revealed a type I aortopulmonary window and interrupted aortic arch, for which surgical repair was performed. In the postoperative period, the patient developed severe respiratory acidosis, right lung atelectasis, and bright red airway bleeding unresponsive to medical management, necessitating ECMO support. Emergent chest CT angiography revealed anomalous origin of the right pulmonary artery from the ascending aorta, resulting in overcirculation to the right lung and subsequent pulmonary edema, identified as the cause of the severe respiratory acidosis. Urgent surgical reimplantation of the right pulmonary artery was performed with a satisfactory outcome. At 6-month follow-up, the patient remained asymptomatic.

Conclusions:
Berry syndrome is a rare variant that should be considered when a patient presents with an aortopulmonary window, interrupted aortic arch, and an intact interventricular septum. Multimodal imaging is key, especially when the postoperative course is not progressing as expected or when echocardiographic findings do not exclude this rare anomaly.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2342 - NEONATAL MESENCHYMAL STEM CELLS ATTENUATE NEUROINFLAMMATION FOLLOWING CARDIOPULMONARY BYPASS IN A NEONATAL SWINE

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Background:
Newborns and infants undergoing surgery for congenital heart defects are particularly vulnerable to neurological complications. Neuroinflammation, driven by activation of glial cells such as microglia and astrocytes, plays a critical role in post-surgical brain injury. This study aimed to evaluate the impact of neonatal mesenchymal stem cells (nMSCs) on neuroinflammation following surgery in a neonatal cardiopulmonary bypass (CPB) swine model.

Methods:
Thirteen neonatal piglets were randomized into three groups: placebo-treated (n=5), nMSC-treated (n=5), and sham (n=3). Piglets in the placebo and nMSC groups underwent CPB with deep hypothermic circulatory arrest (DHCA). After weaning from bypass, animals received either 0.9% saline (placebo) or nMSCs (2 million cells/kg). Animals were monitored for six hours postoperatively, after which brain tissue and blood samples were collected. Systemic inflammation, microglial and astrocyte activation, and in situ apoptosis were assessed in the frontal lobe, brainstem, and cerebellum. Sham animals underwent sternotomy and sample collection without CPB or DHCA.

Results:
All animals in the treatment and placebo groups survived the surgical procedure with no significant differences in hemodynamic parameters. Compared to placebo, nMSC-treated animals exhibited significantly reduced microglial and astrocyte activation in the frontal lobe and brainstem. Additionally, nMSC treatment led to a marked reduction in neuronal apoptosis in these regions. No significant changes were observed in the cerebellum.

Conclusion:
nMSC therapy significantly attenuates neuroinflammation and reduces apoptosis in key brain regions following CPB with DHCA in a neonatal swine model. These findings suggest that nMSCs may represent a promising therapeutic strategy to protect the developing brain during congenital heart surgery.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2343 - OUTCOMES AND RISK FACTORS OF REOPERATION FOLLOWING THE ARTERIAL SWITCH OPERATION WITH CLOSED CORONARY TRANSFER TECHNIQUE

Smruti Ranjan Mohanty [1], Aditya Doddamane [1], Prashant Bobhate [1], Tanuja Karande [1], Kamlesh Tailor [1], Shankar Kadam [1], Keyoor Bhavsar [1], Nilesh Bohra [1], Akshaya Rai [1], Bipin Radhakrishnan [1], Suresh Gururaja Rao [1]
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Background / Hypothesis:
To investigate the timing and nature of risk factors that predispose reoperations following the arterial switch operation(ASO) in the setting of biventricular circulation.

Materials and Methods:
A total of 654 patients with biventricular circulation with transposition physiology underwent the arterial switch operation between August 2009 & August 2023. Our institutional preference is to perform closed coronary transfer with medial trapdoor technique and pulmonary artery reconstruction using a gusset of fresh autologous pericardium. Multivariate analysis was used to identify risk factors for reoperation.

Results:
Thirty-seven patients underwent 46 operations in this duration. Median follow-up was 5.6 years (interquartile range[IQR]: 0.1-14.6). Pulmonary arterioplasty was the most common reoperation(n = 21, 56.7%) at 6.3 years(IQR: 1.7-6.4) postoperatively. Subvalvar right ventricular outflow tract reconstruction was required in twelve(32.4%) patients at 2.5 years(IQR: 1.1-5.3) postoperatively.

Aortic root replacement was required in four(10.8%) patients with progressive aortic root dilatation at 10.8 years(IQR: 9.4-13.4). Aortic arch reaugmentation was necessitated in eight patients (21.6%) with prior concomitant arch repair at 6 months(IQR: 2.5 months-3.5 years). Three patients(8.1%) underwent tricuspid valve repair for infective endocarditis at 2.2 years(IQR: 8 months-7 years). One patient(2.7%) each underwent mitral valve repair,reverse Potts shunt for pulmonary artery hypertension, septal myectomy and coronary ostioplasty.

Presence of ventricular septal defect and great artery size mismatch were risk factors for any reoperation(p= 0.02). Risk factors for specific reoperations included VSD for arch reaugmentation(p=0.03) and Taussig-Bing anomaly for pulmonary reinterventions(p<0.01).

Conclusions:
Apart from progressive neo-aortic root dilatation which appears to be an inherent risk factor in patients with significant aortopulmonary size mismatch, our technique of closed coronary transfer has minimized the need for left-sided reoperations, particularly on the coronary arteries. Notwithstanding this, there are certain subset of patients who continue to carry variable risk for reoperation on the right side. Optimising long-term outcomes would necessitate special attention to these high-risk-sub-groups.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2346 - GRAFT INTERPOSITION FOR THE NORWOOD OPERATION SIMPLE SAFE AND SUCCINCT

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Background / Hypothesis:
We describe a simple technique for the construction of the neo-systemic ventricular outflow tract and arch augmentation employing a beveled interposition graft in the setting of the Norwood Operation with extremely small ascending aorta.

Materials and Methods:
Four patients diagnosed with HLH-complex who underwent the Norwood operation at our institution received graft interposition in the construction of the systemic outflow. The goal of this technique is to incorporate the main pulmonary artery into the systemic outflow by means of the interposition graft, while maintaining retrograde filling of the coronary arteries through the extremely slender native ascending aorta.

The graft for distal anastomosis is beveled to cover the transverse length between the distal aortic arch and the point of takeoff of the left subclavian artery. The distal end of the graft is anastomosed as such to resume continuity from the existing sutureline from the anastomosis between arch and descending aorta. This completes the construction of the systemic outflow. The proximal anastomosis is done to the stump of the MPA.

In our experience of 4 patients, all of whom had an ascending aorta measuring<2.5 mm, we preferred to not open the ascending aorta.

The advantage of this technique is that it establishes proximal continuity with the coronary, cerebral vessels and the descending thoracic aorta, in instances where the luminal caliber of the ascending aorta is extremely labile for a Damus-type anastomosis.

Results:
There was no early operative or in-hospital mortality. While two patients await Stage-2 palliation, one patient was successfully palliated to Fontan circulation while another with borderline left-heart structures and arch interruption was successfully converted to a biventricular circulation.

Conclusion:

Our technique alluding to the employment of an interposition graft for the construction of systemic outflow in the setting of HLH-complex earmarks a simple, safe, and reproducible technique which obviates some well-known complications and risk factors.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2349 - OUTCOMES OF THE DAMUS KAYE STANSEL OPERATION IN 52 PATIENTS FROM AN EMERGING ECONOMY

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Background / Hypothesis:
We aim to describe the analysis of short and intermediate outcomes of patients following the Damus-Kaye-Stansel Operation at a single institution during a 14-year period.

Materials and Methods:
The Congenital Heart Surgery Database at our institution was queried for all patients who underwent the Damus-Kaye-Stansel operation between July 2009 and now. Primary end points include mortality and reintervention. Secondary end points were defined as perioperative morbidity(not resulting in mortality), prolonged hospital stay and need for mechanical circulatory support.
Regression analysis was written on RStudio(Boston,USA) and survival analysis analyzed with Kaplan-Meier method, Cox regression scale and log-rank tests.

Results:
The cohort of 52 patients, included 60.7% with hypoplastic left heart syndrome, 17.6% with a double inlet left ventricle, 7.8% with hypoplastic right heart syndrome, 2% with an unbalanced atrioventricular septal defect and 11.7% with complex univentricular heart morphology.

Median age at surgery was 14 days (range: 2 days – 12 years) and median weight was 3 (1.6 – 45.8) kg. Seventeen patients (33%) were operated within the first week of life and 12 patients (23.5%) were low/ very low birth weight neonates.

Operative mortality was 21.5% since 2009. Overall survival at 6 months and 1 year following surgery was 62.8% and 61%, respectively. Freedom from reoperation at the same times remained at 98%. Perioperative mortality was associated with aortic arch interruption($p<0.01$), ascending aorta caliber under 3mm($p<0.01$),pulmonary artery plasty($p=0.04$), preoperative ventilator support($p=0.01$),and a mitral inflow z-score<-4.2($p=0.02$). Low birth weight and morphology of systemic ventricle did not contribute to the risk of mortality.
Reinterventions were associated with patients with arch hypoplasia($p=0.01$), AV discordance and malnourishment($p=0.02$).

Conclusions:
The Damus-Kaye-Stansel in the setting of hypoplastic systemic outflow in a varying subset of morphologies can be performed with acceptable and good early survival, even in the developing world. This series demonstrates the feasibility of salvaging patients with HLH-complex in limited resource settings.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2351 - OPERATIVE TECHNIQUE SENNING MADE EASY

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Background / Hypothesis:
The Senning Operation is an intriguing concept, both historically and for its virtuosity. Notwithstanding the rise of alternate "anatomical" repairs over time, the role of the Senning has only been cemented stronger as a strong indication for procedures including, correction of isolated inverted atrioventricular connections, the atrial component of the double switch operation and as physiological repair for late-presenting transposition in the developing world.
We wish to enumerate some modifications that obviate pitfalls to make this elegant operation hassle-free and easy to learn.

Materials and Methods:
Technique:(step-by-step)
1. The pericardium is opened to the left(right, in case of inversion) to provide ample room for the pulmonary venous baffle. The virginity of the cavopericardial junction is retained without dissection/looping of both cavae.
2. Low IVC and Innominate venous cannulation is performed. Airlock is avoided with use of atraumatic clamps/clips.
3. Atriotomy is made at a point corresponding with width of either cava from the terminal crista and proceeds parallel to the AV groove. The 1st layer(floor of neo-RA) of the Senning to exclude the pulmonary veins is created with an appropriate-sized boat-shaped patch of Gore-Tex, in lieu of the morphologically deficient atrial septum.
4. The coronary sinus is compulsorily unroofed-the medial lip of which goes with the 1st layer. The limbus is cut across carefully and the 2nd layer(roof of neo-RA) is made from the right lip of the atrium as it is sutured from the mouth of either cavae all the way up to the base of the left atrial appendage, taking with it the lateral lip of the coronary sinus.
5. Autologous in-situ pericardium forms the third layer(roof of neo-LA) and is sutured to the left lip of the RA, starting from the cavopericardial junction culminating at the base of RA Appendage.

Conclusion:
The said modifications will obviate technical nidi associated with the Senning-operation.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2357 - EXPLORING THE FACTORS CONTRIBUTING TO PREOPERATIVE ANXIETY IN PARENTS OF CHILDREN UNDERGOING ELECTIVE CARDIAC SURGERY AT A TERTIARY CARE HOSPITAL IN KARACHI PAKISTAN A DESCRIPTIVE EXPLORATORY QUALITATIVE STUDY.

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Background / Hypothesis:
Parental anxiety, especially in the context of chronic diseases like congenital heart disease (CHD), has significant negative effects on the mental health and well-being of parents and children. In low-middle-income countries like Pakistan, where limited access to healthcare and socioeconomic factors add to the stress experienced by parents, addressing parental anxiety becomes crucial. This is especially important for parents of children with CHD who require surgery. By addressing parental anxiety, parents' overall mental health and well-being can be uplifted, benefiting both parents and children. To explore the factors that contribute to anxiety in parents of children undergoing elective cardiac surgery.

Materials and Methods:
Qualitative exploratory study, with a thematic analysis approach. A purposive sample of ten parents (mother/father) was interviewed in an outpatient setup scheduled for a clinic visit before the cardiac surgery at a tertiary care hospital data analysis.
Results: Five main themes and twelve categories were extracted from the data. The main themes include (1) "emotional or psychological well-being", (2) "physical well-being", (3) "educational status of parents", (4) "financial stability", and (5) "support system" responsible for increased anxiety in the parents. Parents expressed their anxiety related to the surgery along with the intense feelings of self-blame, fear of loss, and fear of the unknown.

Conclusions:
The identified factors should be considered when caring for families with a child with CHD scheduled for surgery during the preoperative period, while multiple factors are responsible for increased anxiety in parents during the preoperative phase, which is associated with their emotional, social, physical, and financial aspects of life. Nursing Care Plans should be devised in a certain way to empower the parents to participate in patient care and enhance their mental health.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2362 - TETRALOGY OF FALLOT WITH DOUBLE ANTERIOR DESCENDING ARTERY SYSTEM TYPE IV OF SPINDOLA FRANCO

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Background / Hypothesis:
Tetralogy of Fallot (TOF) is the most common cyanotic congenital heart defect. Between 6% and 8% of patients present with coronary anomalies, which may alter the conventional surgical approach. One such variant is the double left anterior descending (LAD) artery system type IV of Spindola-Franco, where a short LAD originates from the left coronary artery and a long LAD with a preinfundibular course arises from the right coronary artery. This anatomy increases the risk of coronary injury during standard procedures.

Materials and Methods:
We report the case of a 13-year-old male patient with TOF and 22q11.2 deletion, who previously underwent a right modified Blalock-Taussig shunt at the age of two. Due to progressive dyspnea, cyanosis, and syncope, total correction was indicated. Imaging studies revealed a type IV double LAD system, hypoplastic right ventricular outflow tract, and adequate left ventricular volume.

Results:
Total correction was performed using the Rastelli procedure, avoiding anterior ventriculotomy. A 20 mm elastic PTF vascular graft was used to connect the right ventricle to the pulmonary artery, and left ventricular flow was redirected to the aorta using a bovine pericardial patch. The left pulmonary artery branch was augmented, and the previous shunt was clipped. The patient had a favorable postoperative course.

Conclusions:
Preoperative identification of coronary variants is essential in surgical planning for TOF. In cases with a preinfundibular LAD, alternative techniques such as the Rastelli procedure offer a safe and effective option. This approach avoids anterior ventriculotomy and reduces the risk of major surgical complications, providing satisfactory functional outcomes in anatomically complex cases.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2373 - SYSTEMATIC STUDY AND TARGETED INTERVENTIONS TO IMPROVE BREASTFEEDING IN INFANTS AND NEWBORNS UNDERGOING CARDIAC SURGERY

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Background / Hypothesis:
Breastfeeding is recognised as the optimal feeding method for infants with congenital heart disease (CHD), despite earlier misconceptions about its physical demands on these vulnerable infants. This study aimed to systematically evaluate breastfeeding practices, identify modifiable barriers, and implement targeted lactation support strategies for infants undergoing cardiac surgery.

Materials and Methods:
This prospective study comprised three phases:
•Phase 1: A telephonic survey of 100 mothers whose infants underwent cardiac surgery in the previous year.

•Phase 2 (Jan–Apr 2024): Prospective observation of 50 mother-infant dyads, assessing breastfeeding preoperatively.

•Phase 3 (Nov 2024–Mar 2025): Implementation of structured lactation support for 60 infants by trained lactation experts, including assessments and counselling at admission, postoperatively, and discharge.

Results:
In Phase 1, 88% of mothers were breastfeeding preoperatively, with 28% discontinuing due to perceived inadequate milk or NICU stay. Most (95%) resumed breastfeeding postoperatively within 4 days.
Phase 2 comprised 50 infants (median age 4.5 months [2–7], weight 4.01 kg [3.5–5.1]. Preoperatively, 34% had stopped breastfeeding primarily due to inadequate milk perception. Postoperatively, 78% resumed breastfeeding within 3 days (IQR: 2–4), though delays (>4 days) occurred in 16%.
Phase 3 included 60 infants (median age 7 months [3–9], weight 5.2 kg [3.9–6.9]). At admission, 58.3% received mixed feeds, 28.3% exclusively breastfed, and 13.4% formula feeds; Prior breastfeeding interruption was reported by 16.7%. Initial lactation assessment (BFHI criteria) was rated good in 85%, fair in 3.3%, and poor in 11.7%. Postoperatively, breastfeeding resumed within 3 days (IQR: 2–4); delays occurred in 16.7%. Maternal challenges included inadequate milk supply (31.7%), latching issues (6.7%), fatigue (8.3%), and anxiety (81.7%). Post-intervention, 78.3% of mothers reported high confidence; additional lactation support was needed in 10%.

Conclusion:
Structured lactation support, including timely assessment and counselling, may contribute to improved breastfeeding continuity in infants with CHD undergoing surgery. Integration of breastfeeding into perioperative care could enhance maternal confidence and feeding outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2375 - ULTRAFAST ULTRASOUND A NEW TOOL TO QUANTIFY CHANGES IN CEREBRAL BLOOD VOLUME DURING SELECTIVE CEREBRAL PERFUSION

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Background:
There is no consensus in terms of degree of hypothermia and flow rate of selective cerebral perfusion (SCP) during neonatal aortic arch reconstruction. Ultrafast ultrasound (UUI) is a new technology that can monitor intraoperative cerebral blood volume (CBV) changes.

Hypothesis:
UUI can quantify alterations in arterial and venous CBV during cardiac surgery.

Materials and Methods:
Transfontanelle UUI was performed using a Vantage Research Ultrasound system (Versonics, Kirkland, WA, USA) and a phased array probe (GE-6SD) on two neonates undergoing the arch reconstruction during the Norwood procedure. Scans were acquired after cardio-pulmonary bypass (CPB) initiation, during antegrade SCP and after reinitiation of CPB. CBV was assessed quantitatively by summing the power Doppler signal intensity. Blood flow directionality was used to differentiate arterial from venous CBV. Hemodynamic variables were extracted from the electronic medical record system. Institutional research ethics approval (REB: no. 1000073382) was obtained.

Results:
See Table: Neonate 1 was cooled to 28 C with 35mL/kg/min SCP for 60 minutes. Neonate 2 was cooled to 24 C with 50mL/kg/min SCP for 60 minutes. UUI demonstrated an increase in venous CBV in both neonates from the onset of SCP: on average by 45%. There was lack of variation in arterial CBV in Neonate 1 (less than 7%) from the onset of CBP to halfway through SCP at which point overall CBV increased markedly. Neonate 2 exhibited this lack of arterial CBV variation only during SCP and an increase in both arterial & venous CBV on return to CPB/rewarming. The lack of arterial CBV variation may suggest a loss of cerebral autoregulation and the point of increase in overall CBV a period of reperfusion.

Conclusions:
CBV changes can be monitored using UUI during neonatal cardiac surgery. Future studies should correlate SCP strategies and intra-operative CBV variations with neurological outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2391 - SCORING SYSTEM TO PREDICT MORTALITY OF PATIENTS UNDERGOING TOTAL ANOMALOUS PULMONARY VENOUS RETURN REPAIR AT A TERTIARY CENTER

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Background / Hypothesis:
Total Anomalous Pulmonary Venous Return (TAPVR) repair is the definitive treatment for this condition. Over the years, TAPVR repair outcomes have significantly improved with notable decrease in morbidity and mortality. This study aimed to develop a scoring system that will predict a good outcome for patients undergoing TAPVR repair.

Materials and Methods:
A retrospective review of medical records of all patients who underwent TAPVR Repair from January 2019 to December 2023 was done. Pre-operative variables included in the study were age, gender, weight, anatomic subtype, hemoglobin level, acidosis, congestive heart failure, presence of infection prior to surgery, oxygen saturation, intubated. Operative variables includes echocardiographic variables (Pre operative Pulmonary vein obstruction, PAP by PAT, PAP by TR JET, LVEF, RVEF and LVED), intraoperative variables (cardiopulmonary bypass , Ischemic time and lowest temperature) and lastly, postoperative variables (Post op CVP >8mmhg, Pulmonary hypertensive crisis, low cardiac output syndrome and cardiac arrhythmia). These risk factors were associated with mortality.

Results:
Results on sample gathered revealed that 8 (13%) out of 64 children died. Among the pre-operative variables analyzed, only 3 variables were independently predictive of mortality: Infracardiac Anatomic subtype, (beta coefficient 2.2097, OR at 95% CI 1.01-81.8 ,p-value of 0.048), Presence of infection prior to surgery (beta coefficient 2.5435 ,OR at 95% CI 2.009-80.5648, ,p-value of .007) and Oxygen Saturation <75% (OR at 95%,CI 1.26-37.6, p-value of .026). Other echocardiographic and post-operative variables associated with mortality among TAPVC patients were namely that of LVEF (p-value of .002) , LVED (p-value of .009) and Post op CVP (p-value of .019) and Low Cardiac Output Syndrome (p-value 0.001).

Conclusions:
The development of a scoring index can be utilized as a prompt and straightforward tool in stratifying pediatric patients who will undergo TAPVR repair.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2404 - OPERATIVE OUTCOMES AND SAFETY OF MODIFIED SINGLE PATCH VERSUS DOUBLE PATCH REPAIR IN COMPLETE ATRIOVENTRICULAR SEPTAL DEFECTS A SYSTEMATIC REVIEW AND META ANALYSIS

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Background / Hypothesis:
Complete atrioventricular septal defects (CAVSD) are complex congenital heart defects requiring early surgical repair to improve survival. Traditionally, the double-patch (DP) technique has been the standard approach due to its anatomical precision. However, the modified single-patch (MSP) technique has emerged as a simpler alternative. Given the lack of consensus and recent updates in the literature, we conducted a systematic review and meta-analysis to compare the surgical efficacy and safety of both techniques in pediatric patients.

Materials and Methods:
A systematic search of PubMed, Scopus, and Web of Science was performed through April 2025. We included cohort studies comparing MSP and DP in pediatric patients with complete CAVSD, excluding those with significant associated cardiac anomalies. Data were analyzed using a random-effects model in RStudio version 2024.12.1+563.x. Mean differences were calculated for continuous variables and relative risks for dichotomous outcomes. Heterogeneity was assessed using the I^2 statistic.

Results:
Seventeen studies comprising 2,441 patients were included. Aortic cross-clamp time was significantly shorter in the MSP group (MD: –19.50 minutes; 95% CI: –26.80 to –12.20). Similarly, cardiopulmonary bypass time was reduced (MD: –23.41 minutes; 95% CI: –31.95 to –14.86). No significant differences were observed between MSP and DP regarding permanent pacemaker implantation, reoperation, in-hospital mortality, or length of hospital stay.

Conclusions:
The MSP technique is associated with significantly shorter operative durations, potentially reducing myocardial ischemic burden without increasing short-term mortality or complication rates. Both approaches demonstrate comparable safety and efficacy for the repair of complete CAVSD in children. MSP should be considered a viable alternative; however, prospective studies with long-term follow-up are needed to assess functional outcomes and quality of life. Limitations include moderate heterogeneity among studies and limited data on late outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2405 - POSTERIOR WALL THICKNESS ASSOCIATES WITH OUTCOMES AFTER SEPTAL MYECTOMY IN CHILDHOOD HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY

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Background / Hypothesis:
The impact of left ventricular PWT on outcomes after septal myectomy in children with hypertrophic obstructive cardiomyopathy (HOCM) is unknown. The study sought to correlate left ventricular posterior wall thickness (PWT) z value with outcomes following septal myectomy in children with HOCM.

Materials and Methods:
This cohort study included 80 consecutive children and infants who underwent septal myectomy for HOCM from January 2013 to December 2023. The outcomes after myectomy were compared between two groups of patients with high (group A) and low PWT z value (group B). Mean follow-up among 94.3% (n=50) of hospital survivors was 42.09 ± 24.38 months.

Results:
Fifty (62.5%) children were diagnosed in infancy. The age at myectomy was 5.73 ± 3.87 years. Mean follow-up was 51.18 ± 31.83 months. Survival without death and transplantation was 98.5%, 96.4%and 88.4% at 1, 3 and 5 years. Composite events in group A were higher than those in group B (35% (7/20) vs 7.1% (4/56), P=0.008). Six of 7 late deaths were sudden cardiac death (SCD). Death after surgery was associated with age at procedure less than 2 years (HR=3.953, 95%CI: 1.087-14.370, P=0.037), PWT z value ≥ 9 (HR=4.600, 95%CI: 1.231-17.195, P=0.023) and biventricular obstruction (HR=4.880, 95%CI: 1.325-17.978, P=0.017). SCD was associated with PWT z value ≥ 9 (HR=8.800, 95%CI: 1.377-56.247, P=0.022).

Conclusions:
The long-term survival after surgery in children with HOCM is lower than that in adult patients. A higher PWT z value is a novel risk factor for worse post-myectomy outcomes. The most common cause of death is SCD.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2415 - RECURRENT LEFT MAIN STEM OCCLUSION IN A CHILD WITH KAWASAKI DISEASE THE ROLE OF SURGICAL PATCH ANGIOPLASTY WITH AUTOLOGOUS PULMONARY TRUNK PATCH

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Background:
Coronary ostial stenosis is a particularly rare but life-threatening complication in children with kawasaki disease (kd), posing significant anatomical and technical challenges for surgical management. This case reports a child with kawasaki disease who developed recurrent left main coronary artery (lmca) occlusion, presenting initially cardiac arrest, and required emergency extracorporeal membrane oxygenation (ecmo) support. He underwent multiple revascularization procedures, including percutaneous coronary intervention (pci) and coronary artery bypass grafting (lima to lad), both of which ultimately failed.despite multiple interventions, he remained symptomatic with nyha class iii. Coronary angiography confirmed complete lmca ostial occlusion, and cardiac mri showed reversible myocardial ischemia with global lv dysfunction, which necessitated surgical revascularization.

Method:
We proceeded with redo-sternotomy and lima graft was isolated. After cardiopulmonary bypass and cardioplegia, ascending aorta and pulmonary artery were transected. Lmca was opened from ostium till proximal lad, and coronary stent was debrided. Surgical patch angioplasty(spa) of the left main stem was performed using an autologous pulmonary trunk patch, which ultimately recontructed the ostium and lmca till proximal lad.
Patient demonstrated remarkable recovery, symptoms improvement with transthoracic echocardiography evidence of improved lv function and ct coronary showed widely patent left main coronary artery.

Conclusions:
Surgical patch angioplasty(spa)offers a potentially advantageous alternative for coronary reconstruction in small children, particularly in cases of isolated proximal coronary stenosis, or where traditional cabg may be technically challenging or unsustainable due to small conduit calibre.although the effects of chronic inflammation on patch integrity in kawasaki disease remain unknown, spa may represent a critical surgical option for complex coronary lesions in pediatric patients with inflammatory arteriopathies.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2423 - DURABILITY OF VALVED CONDUITS IN TOTAL REPAIR OF PA VSD EXPERIENCE FROM A HIGH VOLUME CENTER IN A DEVELOPING COUNTRY

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Background / Hypothesis:
Total repair of pulmonary atresia with ventricular septal defect (PA/VSD) often requires the use of valved conduits to establish right ventricle to pulmonary artery (RV-PA) continuity. While this approach is well-established in developed countries, data from developing settings remain limited. This study aims to evaluate the outcomes and performance of valved conduits in total repair of PA/VSD at a high-volume congenital heart center in a lower-middle-income country.

Materials and Methods:
A retrospective review was conducted of 140 patients who underwent total repair using a valved conduit between 2016 and 2022. Two conduit types were used: bovine jugular vein conduits (BJVC) and porcine valve conduits (PVC). Outcomes assessed included early mortality, conduit-related reinterventions or replacements, and mid-term durability.

Results:
The median age at repair was 11.1 months (IQR: 3.9–19.2), with a median weight of 6.75 kg. Early mortality was 3.6%. BJVCs were used in 88% of cases. At a median follow-up of 36 months (IQR: 16–60), both conduit types demonstrated acceptable performance. The incidence rates of reintervention and reoperation were 5.1 and 2.4 per 100 patient-years, respectively. Freedom from reintervention and reoperation at 5 years was 73.6% and 89.4%.

Conclusions:
Despite the eventual need for conduit replacement, valved conduits remain a practical and effective option for total repair of PA/VSD in resource-limited settings. Long-term surveillance is essential to manage conduit-related complications and optimize outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2432 - REASSESSING THE CLINICAL IMPACT OF MAJOR AORTO PULMONARY COLLATERALS IN TRANSPOSITION OF THE GREAT ARTERIES THE SYDNEY EXPERIENCE

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Background / Hypothesis:
This study aims to evaluate the incidence and clinical implications of major aortopulmonary collateral arteries (MAPCAs) in the early postoperative period following arterial switch operation (ASO) in patients with dextro-transposition of the great arteries (d-TGA). As one of the few Australian cohorts addressing this topic, it contributes meaningful data to support timely recognition and management of this rare pathology.

Materials and Methods:
A retrospective review was conducted on 239 consecutive patients with d-TGA who underwent ASO at The Children's Hospital at Westmead between January 2014 and August 2024. Sixteen patients were identified as having hemodynamically significant MAPCAs. Clinical, operative, and catheterization data were analyzed. Patients were categorized into two groups: Group I (with relevant MAPCAs) and Group II (without). Cardiac catheterization was used to confirm MAPCA significance.

Results:
Seventy-four patients (31%) underwent catheterization due to delayed recovery or complex coronary anatomy. Significant MAPCAs were identified and treated with coil embolization in 16 patients (6.6%). Eleven had preoperative balloon atrial septostomy (BAS), with mean oxygen saturation improving from 63.5% to 84.7%. One patient had MAPCA ligation during surgery. Compared to Group II, Group I had longer ICU stays (31 vs. 6 days, p=0.022), hospital stays (47 vs. 29 days, p=0.008), mechanical ventilation (20 vs. 4 days, p=0.005), inotropic support (7 vs. 4 days, p=0.001), ECMO use (6 vs. 3 days, p=0.01), and delayed sternal closure (6 vs. 3 days, p=0.01).

Conclusions:
Although relatively uncommon, MAPCAs can significantly impact early postoperative recovery after ASO in d-TGA. Early catheterization should be considered in patients with unexpected clinical courses. The Children's Hospital at Westmead contributes one of the largest reported Australian experiences, offering critical insight into the recognition and management of this important condition.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2433 - RETROSPECTIVE RESEARCH ON PEDIATRIC CARDIAC INJURIES AT CHINA NATIONAL CHILDREN'S HOSPITAL

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Background / Hypothesis:
Cardiac injury is a life-threatening condition. An early diagnosis and appropriate treatment of cardiac injury can significantly reduce mortality rates. Patients with cardiac injury treated at our hospital showed characteristics distinct from those reported in published research.

Materials and Methods:
A retrospective study was conducted on four patients using their medical records and surgery reports from January 2007 to September 2019. Data on gender, mechanism of injury, red blood cell count, hemoglobin levels, cardiac enzyme levels, heart rate, systolic and diastolic pressure, venous pressure, abnormal findings from electrocardiogram and echocardiography, cardiac/thorax ratio, sternal fracture in X-ray, and surgical record.

Results:
When we compared the pre- and post-operative data, we observed no significant changes in the electrocardiogram apart from tachycardia. After the effusion and blood clots were cleared, echocardiography revealed no persistent damage in cardiac structure and function. The creatine kinase-myocardial band levels (P value: 0.132), venous pressure (P value: 0.275), shock index (P value: 0.003), and mean pressure (P value: 0.028) were analyzed. The last two values showed statistically significant differences. In all four cases, the rupture site was located at the junction of the superior vena cava and the right atrium, as identified during surgery

Conclusions:
Pediatric cardiac rupture, particularly blunt trauma, should be of significant concern. Early diagnosis, emergency surgery are crucial in saving lives. Echocardiography is the most valuable diagnostic technology in such cases. The junction of the superior vena cava and the right atrium is more fragile in clinic.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2437 - CHANGES IN THE CONGENITAL HEART DISEASE SPECTRUM AT CHINA'S CHILDREN'S NATIONAL MEDICAL CENTER A REVIEW OF 10 YEAR DATA

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Background / Hypothesis:
With the decline in the birth rate and simultaneous advancements in medical technology in China, research on how birth population changes have affected congenital heart disease (CHD) surgery in the last 10 years has increased

Materials and Methods:
We investigated the medical data of all patients diagnosed with CHD treated at the surgical department at our hospital from January 2013 to December 2022, including their age and the type of surgery. We classified patients into two groups based on their age: less than 1 year (younger) and greater than 1 year (older). We defined patent ductus arteriosus, atrial septal defect, and ventricular septal defect as simple CHDs and others as complex diseases. Vascular ring diseases, including double aortic arch, pulmonary artery sling, and aberrant left subclavian artery with diverticulum, were considered special conditions.

Results:
We found that 6,440 patients underwent surgery at our hospital in the period mentioned. The number of surgeries conducted annually increased significantly from 609 in 2016 to 941 in 2019 but gradually declined since 2020. The proportion of simple CHD cases increased annually, whereas the proportion of complex CHD cases declined. The proportion of patients with vascular ring disease gradually increased. The proportion of older children increased, whereas that of younger children decreased each year. All changes were statistically significant

Conclusions:
Owing to advancements in medical technology, economic factors, change of birth rate and abortion rate, the number of surgeries for CHDs has decreased significantly. It is challenging to predict future trends. Nevertheless, this phenomenon is specific to China. Policymakers, hospitals, and surgeons must introduce appropriate adjustments in response to this change.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2448 - NAVIGATING THE PARADOX OF CHOICE A CASE REPORT ON NIKAIDOH PROCEDURE FOR COMPLEX TRANSPOSITION OF GREAT ARTERIES WITH LEFT VENTRICULAR OUTFLOW TRACT OBSTRUCTION IN A 9 YEAR OLD CHILD

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Background
Dextro - Transposition of the great arteries (d- TGA) with ventricular septal defect (VSD) and left ventricular outflow tract obstruction (LVOTO) is a rare and complex congenital heart defect, representing less than 1% of all congenital heart diseases. Surgical management remains a challenge because of wide anatomic variability, rarity, age of presentation, surgical options available, and their variable long-term results.

Case Presentation:
We report the case of a 9-year-old girl with dextro-TGA (d-TGA), VSD, and severe PS who presented with cyanosis and exertional dyspnea after being lost to follow-up since infancy. Initial diagnostic workup showed conflicting results between 2D echocardiography and hemodynamic studies regarding the severity of PS. A 3D echocardiogram confirmed severe PS, guiding surgical planning. The patient underwent successful Nikaidoh procedure with patent ductus arteriosus (PDA) ligation. Postoperative recovery was uneventful, and follow-up showed stable hemodynamic status and improved functional condition.

Discussion:
This case highlights the diagnostic challenges and surgical decision-making complexities in late-presenting TGA with VSD and PS. While several surgical techniques exist - Rastelli, Réparation à l'Etage Ventriculaire (REV), and Nikaidoh—the choice depends on detailed anatomical and patient-specific considerations. The Nikaidoh procedure offered the most favorable long-term outlook given the patient's age, VSD morphology, and coronary anatomy.

Conclusion:
Late-presenting TGA with VSD and PS requires individualized surgical planning. The Nikaidoh procedure is a viable and effective option, particularly in cases where anatomical conditions limit the feasibility of other approaches. Multimodal imaging and multidisciplinary evaluation are essential for optimal outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2449 - AXILLARY ARTERIOVENOUS FISTULA AS PALLIATIVE STRATEGY IN COMPLEX CYANOTIC CONGENITAL HEART DISEASE A PEDIATRIC SERIES

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Background / Hypothesis:
Arteriovenous fistulas (AVF) are used as a palliative procedure to increase systemic oxygenation in children with complicated cyanotic congenital heart disease (CCHD), particularly following cavopulmonary connections. However, not much is known about their long-term efficacy and safety. This study aimed to find out the safety and effectiveness of axillary AVF creation in children with CCHD, as a bridge to transplant or in those who are not candidates for definitive surgical repair.

Materials and Methods:
We conducted a comparative retrospective review of children who underwent axillary AVF for CCHD between the years 2015 and 2023. Clinical and laboratory data before and after the procedure including age, hematocrit, ejection fraction, arterial oxygen saturation, and New York Heart Association (NYHA) functional class were recorded. Continuous data were compared via paired t-tests or Wilcoxon signed-rank tests depending on distribution. NYHA class was compared using the exact Wilcoxon test. A p value less than 0.05 was taken to be statistically significant.

Results:
Ten patients (mean age 10.6 ± 1.8 years) were included. Arterial oxygen saturation improved significantly from a median of 74% (IQR 12) to 83% (IQR 5) postoperatively ($p < 0.001$). Hematocrit decreased from 56.4 ± 6.2% to 49.3 ± 4.6% ($p < 0.001$). Ejection fraction showed a modest but significant increase from 55% (IQR 7) to 56% (IQR 5) ($p = 0.021$). NYHA class improved from a median of 2 (IQR 1) to 1 (IQR 1) ($p = 0.012$). No intraoperative or late mortality was reported.

Conclusions:
Axillary AVF is a safe and effective palliative therapy in children with CCHD. It strongly improves oxygen saturation, lowers hematocrit, and enhances functional status without procedural-related mortality. Structured follow-up and careful patient selection are essential to optimize long-term outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2451 - REGIONAL AND DEMOGRAPHIC DIFFERENCES AMONGST ROSS PROCEDURE PATIENTS IN THE UNITED STATES A PEDIATRIC HEALTH INFORMATION SYSTEM DATABASE STUDY

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Background / Hypothesis:
Mortality outcomes post-Ross procedure vary with patient age and institutional case volume. However, regional and racial disparities have not yet been quantified for the Ross procedure.

Materials and Methods:
The Pediatric Health Information System database was queried for patients who underwent the Ross procedure between December 1st, 2003–July 16th, 2024. Patient demographic and clinical variables were collected including total hospital bill charge, length-of-stay, extra-corporeal membrane oxygenation and mechanical ventilation use, priority of admission, median household income, primary source of payment, primary diagnosis, and disposition. Differences were analyzed with analysis of variance and chi-squared tests.

Results:
The South had the greatest billed hospital charges (P=0.002), proportion of Black patients (7.99%, P<0.001), state Medicaid insurance use (34.9%, P<0.001), and lowest median household income (37,445 USD, P<0.001). Compared to White patients, Black patients were younger (6.33 vs. 7.84 years, P=0.018), lower average household income (40,534 vs. 46,536 USD,P<0.001), almost double length-of-stay (20.0 vs. 11.0 days, P=0.028), and trended towards higher hospital bills (333,324 vs. 258,978 USD, P=0.079). Within the South, compared to White patients, Black patients more often had state Medicaid insurance (P<0.001), but there was no difference in household income (40,861 vs. 43,213 USD, P=0.195) or billed charges (301,189 vs. 280,582 USD, P=0.326). Only 0.52% of South patients expired or transitioned to hospice compared to 2.19% in the West (P=0.004), and had the highest discharge to home (97.7%, P<0.001) (Table 1).

Conclusions:
The results reveal regional and intra-regional racial disparities. Future research should investigate the South's increased cost-of-care, associations with long-term readmission and reoperation rates, and modifiable factors to make care equitable for patients of low socioeconomic status.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2453 - CURRENT PRACTICES AND PERCEPTIONS ON THE USE OF AUTOLOGOUS UMBILICAL CORD BLOOD IN NEONATAL HEART SURGERY INSIGHTS FROM A EUROPEAN SURVEY

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Background / Hypothesis:
Neonatal cardiac surgery presents significant challenges due to the fragile physiology of newborns and the risks associated with blood transfusions. Autologous umbilical cord blood (AUCB) has emerged as a promising strategy to minimize allogeneic transfusion requirements. This study examines current clinical practices, identifies perceived barriers, and explores healthcare professionals' perspectives on the use of AUCB in neonatal cardiac surgery across Europe.

Materials and Methods:
A descriptive, cross-sectional online survey was distributed to healthcare professionals involved in neonatal cardiac surgery. The questionnaire, developed by a multidisciplinary team ad hoc, assessed institutional use of AUCB, perceived benefits and barriers, and professionals´ interest in the field. The survey was disseminated through European scientific societies and professional social media platforms. Data were collected anonymously and analyzed using descriptive statistics.

Results:
A total of 42 responses were evaluated, covering multiple key areas (Figure 1). The majority of respondents were neonatologists (50%), followed by perfusionists and neonatal nurses; 78% were based in Spain. Only 10% of participants reported institutional use of AUCB, primarily for selected patients in the postoperative setting. Reported benefits included reduced transfusion requirements and decreased exposure to allogeneic blood products. Among non-users, key barriers included logistical challenges (18%), insufficient scientific evidence (15%), and limited training (10%). The most frequently cited obstacle was a lack of education and training (78%), followed by regulatory restrictions. Only 8% considered the current evidence sufficient to support routine AUCB use. Despite limited implementation, overall interest was high (mean rating 4.6/5), with many respondents expressing interest in future collaboration.

Conclusions:
AUCB use in neonatal cardiac surgery remains limited and varies across institutions in Europe. Significant barriers, including insufficient training, logistical challenges, and perceived evidence gaps, hinder broader adoption. Standardized protocols, targeted educational strategies, and stronger clinical evidence are essential to support its effective integration into neonatal cardiac care.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2456 - MINIMALY INVASIVE PEDIATRIC CONGENITAL CARDIAC SURGERY HOW TO SET UP A MINIMALLY INVASIVE PEDIATRIC PROGRAM

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Background / Hypothesis:
Full midline sternotomy remains the most common appraoch to correct congenital cardiac defects. Minimally invasive cardiac surgical (MICS) programs for the pediatric population are limited possibly due to the steep learning curve and technical difficulties associated with MICS. Our center already has extensive MICS experience in the adult (congenital) population and we used this knowledge to design the MICS children's program. Here we present our initial experience when starting a MICS program for the congenital pediatric population.

Materials and Methods:
Over a period of 2.5 years, pediatric congenital cases were selected for MICS. Defects included ASDII, pmVSD, partial abnormal pulmonary venous return (PAPVR) and partial AVSD (pAVSD). Our approach uses a vertical mid-axillary incision of around 3.5cm with direct cannulation in children weighing ≥5kg. We adapted our adult MICS protocol towards the pediatric population without the need for additional tools and with direct canulation.

Results:
38 MICS performed consisting of 24 ASD II, 9 pmVSD, 3 SVD + PAPVR and 2 pAVSD with a median age of 28,5 months (IQR 20,2-36) and weighing 13,5kg (IQR 10-16). Most children were extubated a few hours after surgery. Early mobilization is possible with 1 pleural drain which is removed on the first operative day. 1 Patient had a post-pericardiectomy syndrome and 1 had a transient AV block without any reoperations. Discharge at 4 days (±1,05 day), with the first cardiology visit at 7 days.

Conclusions:
Pediatric MICS is safe and feasible, especially when MICS experience is already present in the adult population resulting in faster discharge home. The right mid-axillary vertical incision shows excellent cosmetic results with an invisible scar under the right arm. In our center, protocol changes have been made where MICS is now the golden standard for ASDII, pmVSD, PAPVR and pAVSD.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2463 - DOUBLE JEOPARDY IN A NEONATE ACUTE LIMB ISCHEMIA FOLLOWING DAMUS–KAYE–STANSEL PROCEDURE

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Background / Hypothesis:

Complex congenital heart defects such as double outlet right ventricle (DORV) with aortic arch interruption require early surgical correction to maintain systemic and pulmonary circulation. The Damus–Kaye–Stansel (DKS) procedure, often combined with arch repair and systemic-to-pulmonary shunt creation, carries significant postoperative risks. While hemodynamic instability is common, acute limb ischemia is a rare but potentially limb-threatening complication in neonates.

Materials and Methods:
A 1-month-old male with DORV, subpulmonic ventricular septal defect, malposed great arteries, and interrupted aortic arch (Celoria–Patton Type A) underwent DKS procedure, aortic arch repair, PDA ligation, modified Blalock–Thomas–Taussig shunt, and atrial septectomy.

Results:
Immediately postoperatively, the right lower extremity was pale, cool, and pulseless with absent Doppler signals. Contributory factors included intraoperative cardiac arrest, high-dose inotropes, low cardiac output state, and arterial/venous lines in the affected limb. Management involved urgent anticoagulation with unfractionated heparin, removal of invasive lines, and gradual weaning of vasoactive agents. Wound care prioritized preservation of viable tissue, avoiding aggressive debridement. Serial vascular assessments demonstrated progressive return of distal perfusion, with restoration of triphasic Doppler flow.

Conclusions:
Acute limb ischemia, though uncommon after complex neonatal cardiac surgery, warrants high clinical suspicion. Early recognition, prompt removal of precipitating factors, and anticoagulation can allow complete recovery without surgical intervention. Vigilant postoperative vascular monitoring and multidisciplinary coordination are essential to prevent irreversible limb injury

POSTER PRESENTATIONS

Category: Cardiac Surgery

2468 - BREAKING THE BOTTLENECK A DUAL DRAINING SOLUTION TO TOTAL ANOMALOUS PULMONARY VENOUS CONNECTION

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Background / Hypothesis:
Pulmonary venous obstruction (PVO) is a rare and notable complication following conventional surgical repair for total anomalous pulmonary venous connection. It is frequent when the drainage is into coronary sinus (CS) or to cavo-atrial junction (CAJ) at superior vena cava (SVC) to Right atrial (RA)junction. Traditional methods like direct intra-atrial anastomosis often are hampered by the lack of growth between vertical vein and coronary sinus or at CAJ during the follow up. We herewith present our innovative dual drainage repair (DDR) resulting in nonobstructive drainage of pulmonary veins with growth potential that uniformly eliminated the risk of obstruction in the intermediate term follow up.

Materials and Methods:
82 patients with de novo TAPVC underwent surgery at our institution between September 2015 and June 2025. The mean age and weight were 6.6 months (7 day - 2 years) and 4.25 kg (range 2-8) respectively. Among them 52 were supra-cardiac (63%), 15 cardiac (18%), and 15(18%) were infra-cardiac or mixed variety. Among these, 9 (13%) underwent the DDR. 6 had drainage to CAJ and while 3 drained to CS (based on the size of communication between CS and vertical vein). Complete repair was done under standard cardiopulmonary bypass techniques. Primary communication was accomplished with direct anastomosis between LA appendage and common venous chamber on the left hilar while the intra-atrial tunnelling through the enlarged atrial septal defect acted as additional drainage.

Results:
Mean bypass & clamp time was 111 minutes (range 80- 234) and 62 minutes (range 44 - 114). There was no mortality. All are well in the follow up period. Mean follow-up was 37 months (range 6-108). All are in sinus rhythm and serial echos in the intermediate term showed no stomal obstruction.

Conclusions:
DDR is effective in eliminating recurrent PVO in the intermediate term by creating 2 effective pathways.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2479 - CLINICAL RESULTS OF BEATING HEART PULMONARY HOMOGRAFTS IN PEDIATRIC CARDIAC SURGERY

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Background/Hypothesis:
Pulmonary artery homografts are widely used in congenital heart defect (CHD) repair, particularly in right ventricular outflow tract (RVOT) reconstruction. Traditionally, homografts are harvested from donors after circulatory arrest. However, homografts obtained from beating-heart donors—patients undergoing heart transplantation with maintained myocardial contractility—may offer superior tissue quality due to minimized ischemic injury. This study aimed to evaluate early and midterm clinical outcomes of beating-heart pulmonary homografts in pediatric cardiac surgery.

Materials and Methods:
From January 2010 to June 2025, 151 pediatric patients (median age 8.2 years [IQR 5.0–11.4], 60.3% male) underwent RVOT reconstruction or repair of complex CHD using pulmonary artery homografts from beating-heart donors. Diagnoses included tetralogy of Fallot with pulmonary atresia (33%), truncus arteriosus (25%), Ross procedure (21%), and other lesions (21%). Homografts were processed using standard cryopreservation protocols. Median homograft diameter was 23 mm (IQR 21–25). Patients underwent standardized perioperative management and echocardiographic follow-up (median 60 months [IQR 48–72]).

Results:
Hospital mortality was 2.6%, with no late mortality during follow-up. Median cardiopulmonary bypass and cross-clamp times were 135 ± 28 and 82 ± 18 minutes, respectively. Importantly, 41.1% of patients underwent surgery under parallel circulation without aortic cross-clamping. Early postoperative echocardiography showed excellent homograft function with trivial/no regurgitation in 93.8% and mean peak gradient of 12.6 ± 4.8 mmHg. At latest follow-up, freedom from homograft dysfunction (>mild regurgitation and/or gradient ≥40 mmHg) was 95.6%, and freedom from reintervention 97.8%. No homograft endocarditis occurred. Right ventricular dimensions and function remained stable, with no accelerated calcification. Functional status improved in all survivors, with 87.5% achieving NYHA class I.

Conclusions
Pulmonary homografts from beating-heart donors demonstrated excellent early and midterm durability in pediatric RVOT reconstruction. Stable hemodynamics, minimal regurgitation, and very high freedom from reintervention highlight their clinical value. These encouraging midterm results suggest that beating-heart homografts represent a preferred conduit option for complex CHD.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2480 - INTERRUPTED AORTIC ARCH REPAIR 15 YEARS OF SURGICAL EXPERIENCE IN PEDIATRIC PATIENTS OPERATED AT THE IGNACIO CHÁVEZ NATIONAL INSTITUTE OF CARDIOLOGY YANES SANABRIA CC. CERVANTES SALAZAR JL. ORTEGA ZHINDÓN DB. CALDERÓN COLMENERO JE. HERNÁNDEZ GARCÍA YC. PEDIATRIC CARDIOLOGY AND CONGENITAL HEART SURGERY SERVICE IGNACIO CHÁVEZ NATIONAL INSTITUTE OF CARDIOLOGY MEXICO CITY MEXICO

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Background / Hypothesis:
Interrupted aortic arch (IAA) is a rare congenital cardiovascular malformation characterized by anatomical discontinuity between the aortic arch segments.

Materials and Methods:
A descriptive, cross-sectional study was conducted involving 50 patients diagnosed with interrupted aortic arch surgery from January 2010 to December 2024.

Results:
Of the 50 patients, 26 were female and 24 male. Fifteen newborns and 35 patients older than one month of age were operated on. The average age of newborns at the time of surgery was 9 days old. The median age in months at the time of surgery for patients outside the neonatal period was 2 months. The type of interrupted aortic arch was A in 36% of those operated on and type B in 64% of cases. The most frequently associated congenital heart defect was ventricular septal defect in 58.3% of cases, followed by truncus arteriosus (27.1%). The most frequently associated genetic syndrome was 22q11 microdeletion. The 3 surgical procedures usually associated with the correction of AAI were: closure of ventricular septal defect, pulmonary artery banding, and Rastelli surgery. Residual lesions detected by echocardiography in 26 patients included residual interventricular septal defects and valvular insufficiency; 9 patients had obstructive lesions in the left ventricular outflow tract. Mortality was 40%.

Conclusions:
Aortic arch interruption is a complex surgical approach with high mortality, with age and weight at the time of surgery being determining factors. The most frequently associated genetic syndrome was the 22q11 phenotype. Type B interrupted aortic arch was associated with greater postoperative complications. Deaths occurred early after the procedure, while survival remained stable.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2488 - SURGICAL MANAGEMENT AND OUTCOMES OF DOUBLE INLET LEFT VENTRICLE AND TRICUSPID ATRESIA WITH TRANSPOSITION OF GREAT ARTERIES 25 YEARS' EXPERIENCE

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Background / Hypothesis:
Following initial palliation, patients with functional single left ventricle (DILV or TA) with TGA may need further intervention to provide unobstructed systemic outflow. Aims of the study are: i) identify risk factors for developing Systemic Outflow Tract Obstruction (SOTO) at the level of Bulbo Ventricular Foramen (BVF); ii) report long term results to achieve completion of Fontan.

Materials and Methods:
Patients managed between 2000 and 2025 were reviewed. 3 groups were identified according to their initial presentation. Group A had Hypoplastic Aortic Arch (HAA). Group B had no HAA or Pulmonary Stenosis (PS). Group C had PS. Primary outcomes were survival, need for rentervention, freedom from transplant and Fontan completion.

Results:
Group A (21/44, 48%) had initially Norwood type procedure (17/44, 39%), or managed with HAA repair and Pulmonary Artery Banding (PAB) (4/44, 9%), from which 3 patients required DKS at time of BDG (3/4, 75%). Group B (12/44, 27%) had initially Pulmonary Artery Banding (PAB), 5 of the PAB survivors required DKS at time of BDG (5/10, 50%). Group C (11/44, 25%) had mBTT, Sano or BDG shunts. Patients who received PAB (15/44, 34%), were at risk of developing SOTO (9/15, 60%), needing DKS at time of the BDG (8/15, 53%) or VSD enlargement (1/15, 7%). Patients presented with PS had significantly reduced risk of SOTO (1/11, 9%). At a median follow up of 10.9 years (interquartile range, 5-17.9 years), overall survival was (39/44, 89%) and Fontan completion was (34/44, 77%) with 3 early and 2 late mortalities.

Conclusions:
This high-risk group of patients achieve excellent long-term survival.
Patients with unrestrictive BVF are at risk of developing SOTO after initial palliation with PAB particularly when associated with hypoplastic aortic arch.
Late SOTO relief surgery, by means of DKS or BVF enlargement, does not increase mortality or morbidity.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2489 - DEVELOPMENT OF PAEDIATRIC CARDIAC SURGERY IN KENYA

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Abstract
Development of Paediatric Cardiac Surgery services in Kenya

Introduction
Paediatric Cardiac surgery was first done at The Mater Hospital in 1995. Other centres e.g Kenyatta National Hospital started before this time but was not consistent. Later, a few other hospitals (Tenwek Hospital, MP Shah Hospital) joined with sporadic surgeries happening mostly during missions.
Gertrudes Children's Hospital started in 2014 and has since continued steadily.
The surgeries have slowly increased over time both in numbers and scope. Earlier, they were done mostly during missions (conducted by visiting teams – Surgeons, Anaesthesiologists, Nurses and Perfusionists - that came into the country from time to time).

Methods
Data was collected from The Mater Misericordiae Hospital and Gertrudes Children's Hospital, the two leading Paediatric Cardiac surgery centres in Kenya. The duration of study was 15 years for The Mater and 10 years for Gertrudes hospitals respectively.
This was achieved by looking through the records in The Operating Theatres and looking into patient files for data on immediate post-operative survival.

Results;
At the outset the surgeries which were done, comprised of PDA Ligations, ASD and VSD closures, BT shunt, PA Band etc. With time, more complex surgeries were done:- TOF repair, VSD and ASD, COA repair, congenital mitral valve prolapse repair, AVSD.

MATER HOSPITAL (1995 – 2024) GERTRUDES HOSPITAL
(2014 – 2024)
CARDIAC SURGERIES 1717 212
CRUDE OPERATIVE MORTALITY 5.6% 6.8%

These results are provided in greater detail in an attached table.

Conclusion;
Surgeries have increased in number and scope slowly over time. There are still a number of complex surgeries not being done yet the patient material is available e.g DORV Tausig Bing anomaly repair, Transposition of great Arteries repair, Truncus Arteriosus, Completion of Fontan etc.
The availability and scope of Paediatric Cardiac surgeries remains sub-optimal given the population increase and medical needs which have also increased over time.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2491 - A PROPENSITY MATCHED COMPARISON OF MELODY AND MECHANICAL VALVE AS PROSTHESIS FOR MITRAL VALVE REPLACEMENT IN CHILDRENFOR MITRAL VALVE REPLACEMENT IN CHILDREN

Vivek Bagaria [1], Abousteid Ahmed [1], Robyn Lotto [2], Tommaso Generali [1], Ramana Dhannapuneni [3], Ramesh Kutty [1], Attilio Lotto [1]
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Background / Hypothesis:
Mitral valve replacement in children is associated with significant morbidity. Melody MVR was introduced to potentially mitigate risks associated with small mechanical valves. We compared survival, need for reintervention, and morbidity associated with these two valve types in children.

Materials and Methods:
We used a propensity-matched cohort design. An initial cohort of 58 patients (between 2004-2024) was matched 2:1 for age, gender, and weight, resulting in 29 patients (17 mechanical, 12 Melody). Continuous variables were summarised using medians with interquartile range, while categorical data were presented with frequencies and percentages. Comparisons between the two groups were made using Wilcoxon rank-sum test for continuous data. Survival analysis was conducted using Kaplan-Meier curves and the log-rank test, with Cox regression models identifying predictors of mortality. A competing risks framework, using Fine-Gray models, analysed the risk of reintervention while accounting for death.

Results:
Propensity-matching successfully addressed initial baseline heterogeneity. Operative times were longer in the Melody group. The overall complication profile was comparable. Survival analysis showed a non-significant but clinically relevant 7% survival advantage for Melody at five years (83% vs 76%; p-0.64). For children under one year, this advantage was more pronounced, with Melody offering a 17% survival benefit (p-0.44) and 29% longer survival when follow-up was adjusted (p-0.42). Post-operative ECMO use was a strong predictor of mortality (HR = 9.3; 95% CI, 1.25–70.1).
Melody valve was associated with significantly higher and earlier reintervention rates. The five-year cumulative incidence of reintervention was 92% for Melody compared to 18% for mechanical valves. Melody valve use was independently associated with a 6.5-fold (95% CI, 2.02-21.1) higher risk of intervention and a 14.4-fold (95% CI, 4.39-47.1) higher risk of redo MVR.

Conclusion:
Melody MVR confers a survival advantage over mechanical valves, particularly in under one year of age. Melody has higher morbidity for early reintervention both catheter and surgical

POSTER PRESENTATIONS

Category: Cardiac Surgery

2494 - ETHNIC DISPARITIES IN OUTCOMES AFTER THE FONTAN PROCEDURE IN AOTEAROA NEW ZEALAND

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Background / Hypothesis:
The Fontan procedure is the last in a series of operations for single ventricle congenital heart disease. Ethnic disparities in long-term outcomes remain underexplored. This study investigates the association between ethnicity and long-term outcomes after the Fontan procedure in the New Zealand cohort.

Materials and Methods:
A registry-based cohort study using the Australian and New Zealand Fontan Registry (ANZFR) included 407 patients who underwent the Fontan procedure between 1975 and 2023, with follow-up in New Zealand. Ethnic groups were classified as Indigenous Māori, Pasifika, Asian, MELAA (Middle Eastern, Latin America and African), and European. Long-term outcomes, including mortality, Fontan failure, and freedom from reintervention, were assessed using survival analysis with Cox regression

Results:
Fontan failure at 20 years was 81.3% for Māori, 85.4% for European, and 57.4% for Pasifika patient ethnicities. The highest socioeconomic deprivation score decile was associated with Māori and Pasifika ethnicities (OR 3.8 and 5.6, $p<0.001$ vs European), respectively. Pasifika experienced the worst outcomes for all endpoints. Adjusted hazard ratios for mortality and Fontan failure amongst Pasifika were 3.44 ($p=0.02$) and 2.94 ($p=0.01$) compared to European patients. Pre-Fontan atrioventricular valve regurgitation and ventricular dysfunction also significantly predicted adverse outcomes (HR 3.82 & 3.78, respectively, for survival and HR 3.57 & 4.86 for Fontan failure, $p<0.01$).

Conclusions:
This study reveals marked ethnic disparities in long-term Fontan outcomes, with Pasifika patients, who also experience greater socioeconomic deprivation, experiencing notably poorer results. These findings highlight the need for further research into targeted interventions to improve equity in outcomes for Pasifika patients.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2497 - PEDIATRIC HEART TRANSPLANTATION IN PATIENTS WITH ARRHYTHMOGENIC RIGHT VENTRICULAR DYSPLASIA SINGLE CENTER EXPERIENCE

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Hacettepe University School Of Medicine, Pediatric Cardiology, Ankara-Türkiye [2]

Background / Hypothesis:
Herein, we present patients underwent heart transplantation in the setting of ARVD in our clinic.

Materials and Methods:
Between 2008-2024, total of 10 patients underwent heart transplantation for ARVD. Pre-,intra-and post-operative data were analyzed.

Results:
10 pediatric patients (8males, 2females) underwent heart transplantation with a diagnosis of ARVD during the study period. 4 had genetically positive for ARVD and other 2 had strong family history. The median age and weight of the patients were 15(11-17)years and 46(42-54) kg, respectively. The median preoperative left ventricular EF and FS values were 55(50-65)% and 29(25-35)%, respectively, while the median right ventricular EF was 10(9.5-12.5)%. The median mPAP value was 18.5(15.75-22.75)mmHg and TPG was 6(5-7)mmHg. All donors were presented by the ministry system with recipient status 1A, with 2 of them under VA-ECMO support. The median waiting time on the list was 99(51-221)days. Median donor-to-recipient weight ratio was 1.19(1.08-1.35). All transplantations were performed with bicaval technique. The median bypass and clamp times were 158(130-162)mins and 82(68-95)mins, respectively. All explants demostrated ARVD histologically. The median cold ischemia time was 265(228-334)mins. The median postoperative extubation time was 13(9.5-26)hrs, intensive care unit stay was 5(3.75-7) days and hospital stay was 14 days. While no patient developed hyperacute or acute rejection, 1 patient developed chronic rejection in the 2nd postoperative year and was treated with ATG and rituximab in combination. Patients continue NYHA-1 follow-up at a median follow-up of 3 years.

Conclusions:
Although ARVD is a rare condition, it has become increasingly recognized with the development of diagnostic methods. Given the long waiting lists for heart transplantation and the risk of ventricular arrhythmia and sudden death in these patients, the timing of heart transplantation requires a special approach. We strongly believe that those patients should be listed before LV dysfunction starts.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2499 - VSD DOWNSIZING TECHNIQUE IN COMPLETE AVSD

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Background / Hypothesis:
Herein, we would like to present our experience with VSD downsizing technique in patients with complete AVSD.

Materials and Methods:
Between 2015-2024, total of 23 patients underwent complete AVSD repair with VSD downsizing technique. Pre-,intra-and post-operative data were analyzed.

Results:
23 pediatric patients (13 males, 10 females) underwent complete AVSD repair with VSD downsizing technique. 18 patients had Down syndrome. The median age and weight of the patients were 4.2 (3.1-6.3) months and 5.6(5.2-6.4)kg, respectively. VSD size was 12 (8-14) mm in maximum dimension. Left AV valve regurgitation was minimal-mild in 18 and mild-moderate in 5 preoperatively. We utilized VSD downsizing technique by closing the superior and inferior ends of the VSD directly and put a smaller patch to the remaining central VSD. The median clamp and bypass times were 62(48-92)mins and 82(68-105)mins, respectively. There was no operative mortality. The median postoperative extubation time was 9(6.5-26) hrs, intensive care unit stay was 5(3.75-7) days and hospital stay was 12 days. Within the median follow-up of 5 years, 15 patients had mild and 8 patients had mild-moderate left AV valve regurgitation. No patient developed LVOTO.

Conclusions:
VSD downsizing is a promising technique with the ease of applicability and good mid-term outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2500 - MINIMALLY INVASIVE CORRECTION OF PERCUTANEOUS DEVICE COMPLICATIONS

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Background / Hypothesis:
Percutaneous cardiac device closure is a widely accepted alternative to open surgery for selected congenital and structural heart defects. However, complications such as device embolization, malposition, erosion, and residual shunts, though rare, may require surgical intervention. Minimally invasive surgical approaches have been proposed to reduce perioperative morbidity, yet their role in managing such complications remains underreported.

Materials and Methods:
Between 2018 and 2025, 4 patients underwent minimally invasive correction for device complications. Pre-,intra-and post-operative data were analyzed.

Results:
A total of 4 patients (mean age 12 ± 5 years; 65% male) were included. Preoperatively, 3 had ASD and 1 had VSD. Indications for surgery were device embolization (n = 2), malposition with significant residual shunt (n = 1), and device-related erosion (n = 1). Mean time from index procedure to surgical intervention was 1 day for acute complications and 3 ± 1 months for delayed cases. All procedures were successfully completed through a minimally invasive approach, with no conversion to full sternotomy. Median cardiopulmonary bypass time was 48 min (IQR 41–62). There were no in-hospital deaths, major strokes, or need for permanent pacemaker implantation. Mean ICU stay was 1.3 ± 0.5 days, and median hospital stay was 5 days. At a mean follow-up of 3 years, all patients were in NYHA class I, with no recurrent shunts or device-related sequelae.

Conclusions:
Minimally invasive surgical approaches provide a safe and effective alternative to full sternotomy for the management of percutaneous cardiac device complications. Wider adoption may be warranted in specialized centers with appropriate expertise.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2501 - POTPOURRI OF SURGICAL PROCEDURES UTILIZED IN FONTAN FAILURE

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Background / Hypothesis:
Fontan circulation, though life-prolonging in patients with single-ventricle physiology, is associated with progressive functional decline over time.While transplantation is often the definitive option, many patients require interim or alternative surgical procedures to stabilize hemodynamics, address complications, and improve quality of life. Data on the diversity and outcomes of such “salvage” operations remain limited.

Materials and Methods:
Between 2014-2024, total of 22 patients underwent additional surgical procedures for Fontan failure.Pre-,intra-and post-operative data were analyzed.

Results:
22 patients (mean age 16 ± 4 years, 55% male) underwent surgical intervention for Fontan failure. Indications included refractory cyanosis with elevated venous pressures (n=11), severe atrioventricular valve regurgitation (n=4), arrhythmia-related low output (n=3), Fontan conduit problems (n=3) and protein-losing enteropathy (n=1). Procedures performed were: fenestration creation/enlargement (n=5), atrioventricular valve repair/replacement (n=4), Fontan revision/conversion to extracardiac conduit (n=4), conduit revision (n=3), surgical arrhythmia ablation (n=2), systemic-to-pulmonary shunt (n=2), ECMO support (n=1) and transplantation (n=1). There were 2 operative deaths; 30-day survival was 91%. Median ICU and hospital stays were 7 and 23 days, respectively. At median 28-month follow-up, 78% of patients showed improvement in NYHA functional class, and cyanosis resolved or improved in all cases undergoing fenestration procedures.

Conclusions:
Fontan failure requires individualized, often multi-modality surgical strategies tailored to the underlying mechanism of dysfunction.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2524 - ANALYSIS OF SURGICAL OUTCOMES OF UNILATERAL PULMONARY ARTERY OF DUCTAL ORIGIN

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Background / Hypothesis:
Unilateral pulmonary artery of ductal origin (DOPA) is a rare congenital heart disease. This study summarizes the clinical outcomes of surgical treatment at our center.

Materials and Methods:
A retrospective analysis was conducted on the clinical data of 56 pediatric patients (58 cases) with DOPA who underwent surgical treatment at our center from January 2009 to December 2024 (33 males, 23 females). Preoperative evaluation with CTA or retrograde pulmonary venous angiography confirmed the presence of pulmonary artery(PA) remnants at the hilum. The median age was 6.9months, and the median weight was 6.30kg.

Results:
Surgical techniques included conduit implantation (3 Gore-Tex conduits, 9 autologous pericardial conduits), direct anastomosis (11 cases), and PA flap augmentation (35 cases). Except for one early death due to respiratory
infection, all other patients survived. Eleven patients were extubated in the operating room, with a median ventilator time of 28 hours , median ICU stay of 3 days. Follow-up ranged from 1 month to 8.4 years, with no mid- or long-term deaths or occurrences of respiratory symptoms or cardiac dysfunction. Two patients with Gore-Tex conduit implantation to the branch PA underwent flap augmentation using the main pulmonary artery after 6 and 9 years, respectively. Eleven patients underwent balloon dilation for stenotic neo-PAs. At the last follow-up, the hilar diameter(mm) (Z-score) of the affected neo-PA was 5.89 ± 1.89, -2.13 (range: -10.36 to 1.39), showing significant improvement compared to preoperative values (3.42 ± 1.12, -4.51 (range: -8.98 to -0.21)). Increased blood flow velocity of neo-PA was observed in 5 cases, five showed no improvement in Z-scores, and one case developed occlusion. All other patients had patent blood flow without pulmonary hypertension.

Conclusion:
For DOPA patients, early and aggressive surgical intervention to reconstruct pulmonary blood supply effectively restores normal blood flow and promotes PA growth. Neo-PA stenosis is the primary reason for reintervention.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2528 - METHODS OF AORTIC VALVE REPLACEMENT IN CHILDREN AND THEIR LONG TERM OUTCOMES

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Background / Hypothesis:
To analyze the outcomes of aortic valve replacement using different types of prostheses in patients with congenital aortic valve pathology.

Materials and Methods:
The study evaluated 82 cases of aortic valve replacement in 67 patients, including mechanical prostheses (n=26), biological prostheses (n=4), aortic and pulmonary allografts (n=23), and pulmonary autografts (n=29). The median age at the time of replacement was 14.5 years (Q1 – 8.2 years, Q3 – 18.2 years). Immediate and long-term outcomes were assessed.

Results:
Overall surgical mortality was 2.49%.
The 75th percentile of freedom from reintervention was:
Mechanical prostheses: 140.0 months
Biological prostheses: 41.4 months
Allografts: 41.9 months
Autografts: not reached

The 10-year freedom from reintervention was:
Mechanical prostheses: 83.1%
Biological prostheses: 50.0%
Allografts: 49.5%
Autografts: 87.3%

Conclusions:
Aortic valve replacement with a pulmonary autograft (Ross procedure) demonstrates the best mid- and long-term outcomes in adolescents and young adult patients. The long-term results of mechanical prostheses in the aortic position are comparable to those of the Ross procedure. The durability of biological prostheses and allografts in the aortic position is the poorest and does not differ significantly between the two, indicating a general tendency of foreign biological tissue to undergo structural degradation.
Given the limited number of cases in this study, multicenter research—including patients who underwent alternative aortic valve repair techniques (e.g., neocuspidization)—is necessary for definitive conclusions on the advantages and disadvantages of different aortic valve replacement methods.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2534 - A NEONATE WITH ADAMS OLIVER SYNDROME REQUIRING HYBRID TYPE NORWOOD CARDIAC SURGERY

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A 7-day-old, 3.3kg, term baby, with a family history of Adams-Oliver Syndrome. They were admitted to our paediatric intensive care pre-operatively with concern over breakdown of an extensive midline eschar/necrotic scalp lesion related to aplasia cutis congenita, involving sloughing superficial layers with underlying saggital sinus. They also had a duct-dependent cyanotic cardiac background of hypoplastic left heart syndrome with borderline left heart structures (including hypoplastic aortic arch, aortic valve, parachute mitral valve and unrestrictive patent foramen ovale).

Aplasia Cutis Congenita, often associated with inherited Adams-Oliver syndrome, manifests most often with skin defects at the cranial vertex. In severe forms it can extend to periosteum, skull, and dura. More mild defects are limited to dermal layers where they are often considered benign lesions, even healing during gestation appearing as an atrophic scar. Though often managed conservatively, others require operative intervention.

Multi-disciplinary peri-operative decision making invited sub-specialist teams to convey key issues that would define this baby's future. Plastics and Neurosurgery expressed that preventing breakdown of this scalp lesion and optimising potential healing was a key element which would require optimal tissue oxygenation and supportive cares before tissue grafting could be considered. Cardiology and Cardiac Surgery outlined that, given the borderline structures of the left heart, a Hybrid-type Norwood procedure was considered the best option to achieving transient cranial oxygenation and future potential for bi-ventricular repair and also avoiding cardio-pulmonary bypass and total circulatory arrest. By interventionally stenting the patent ductus arteriosus, and openly siting bilateral branch pulmonary artery bands, right-to-left shunting across the ductus is promoted and prostaglandin infusion ceased. This resultant circulation provided oxygenated pre-ductal saturations (SpreO2) ~100% and mixed post-ductal SpostO2 between 70-85%. Cranial tissue oxygenation was critical to their healing and safe recovery, and ultimately went on to require scalp vein ligation then successful bi-ventricular repair at 7-weeks-old.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2541 - PERSISTENT DISTRESS AFTER REPAIR THE HIDDEN VEIN BEHIND A BABY'S RECOVERY

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Background / Hypothesis:
Interrupted aortic arch (IAA) is a rare cyanotic congenital heart defect (incidence ~3 per million live births), commonly accompanied by a VSD and dependent on ductal patency for systemic perfusion. Prompt initiation of prostaglandin E_1 and early surgical correction are essential for survival. Partial anomalous pulmonary venous connection (PAPVC), particularly rightsided vein drainage into the inferior vena cava (as in scimitar syndrome), can present postoperatively with unexplained pulmonary hypertension and rightheart volume overload Concomitant IAA with PAPVC is extremely rare and poses diagnostic and therapeutic challenges

Case report:
A fetus was diagnosed antenatally with IAA and VSD on detailed fetal echocardiography. A fullterm female infant was delivered vaginally at a weight of 3 kg. Prostaglandin E_1 infusion was started immediately after birth, and on day 1 of life the infant underwent singlestage surgical correction of the interrupted arch and patch closure of the VSD. The baby was extubated on postoperative day 3. However, progressive respiratory distress and echocardiographic evidence of severe pulmonary artery hypertension persisted. Repeat echocardiography identified anomalous drainage of right pulmonary veins into the inferior vena cava near the IVCRA junction. CT angiographic reconstruction confirmed this anomalous venous return.
On postoperative day 20, the infant underwent a second operation. Using an intracardiac baffle, the anomalous pulmonary veins were rerouted to the left atrium. Following surgery, the infant experienced gradual improvement in respiratory function and a marked reduction in pulmonary artery pressure. She tolerated extubation and was discharged home in stable clinical condition.

Conclusions:
This case underscores the importance of considering PAPVC in infants with persistent pulmonary hypertension and respiratory distress after otherwise successful repair of IAA and VSD.Concomitant pulmonary venous anomalies may be missed preoperatively, particularly if atrial septum is intact. In PAPVC, especially infradiaphragmatic or scimitartype drainage into the IVC, pulmonary overcirculation and hypertension can persist despite structural repair of other anomalies.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2546 - MID TERM OUTCOMES OF MECHANICAL PULMONARY VALVE REPLACEMENT IN PATIENTS WITH CONGENITAL HEART MALFORMATIONS

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Background / Hypothesis:
To evaluate the mid-term outcomes of mechanical pulmonary valve replacement (PVR) in pediatric patients with congenital heart malformations.

Materials and Methods:
From January 2007 to January 2024, 19 pediatric patients who underwent mechanical PVR at our center were included. The cohort comprised 10 males and 9 females, with a mean age of 19.4 ± 12.9 years, median height of 158.5 cm (IQR: 117.5, 163.8), and mean weight of 40.8 ± 20.4 kg. Comprehensive clinical data spanning preoperative evaluation through postoperative follow-up were analyzed.

Results:
All patients successfully underwent mechanical PVR, with a mean operative time of 381.3 ± 110.7 min, mean cardiopulmonary bypass time of 208.4 ± 83.18 min, and mean aortic cross-clamp time of 127.5 ± 59.93 min. Postoperative outcomes demonstrated a median mechanical ventilation duration of 27.0 hours (IQR 14.3-123.5), mean ICU stay of 6.0 ± 4.71 days, and median hospitalization period of 11.5 days (IQR 8.0-24.0), with a median follow-up duration of 40.0 months (IQR 9.0-97.5). One pediatric patient died due to heart failure during hospitalization. The remaining pediatric patients had no deaths during follow-up and no moderate or severe pulmonary valve regurgitation occurred. Compared to preoperative levels, postoperative follow-up echocardiography showed that the pulmonary valve transvalvular gradient (P=0.02), tricuspid regurgitant area index (P=0.03), and pulmonary regurgitant area index (P=0.008) all significantly decreased. During follow-up, one pediatric patient developed mechanical valve stenosis 10 years after surgery and underwent pulmonary valve bioprosthesis replacement again. One pediatric patient presented with subvalvular thrombosis, while the remaining pediatric patients had no complications.

Conclusions:
The mid-term outcomes of mechanical pulmonary valve replacement in pediatric patients are favorable, but strict anticoagulation management is required to reduce the occurrence of complications.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2548 - NEONATAL CARDIAC SURGERY 20 YEAR EXPERIENCE FROM FUWAI HOSPITAL

Yuze Liu [1], Qiyu He [1], Zheng Dou [1], Xinjie Lin [1], Yanbing Ma [1], Tao Lei [1], Shoujun Li [1]
Fuwai Hospital, Pediatric Cardiac Center, Beijing-China [1]

Background / Hypothesis:
Congenital heart disease is the most common birth defect worldwide, and neonatal surgery is critical for survival in severe cases. Despite advances in surgical and perioperative care, neonates remain at the highest operative risk, making long-term institutional outcome data essential for benchmarking and guiding future improvements.

Materials and Methods:
We reviewed all neonate patients (age < 30 days) who underwent cardiac surgery for CHD from January 2004 to December 2024.

Results:
During the study period, 871 patients underwent surgery at a median age of 15 days; 712 (82%) received definitive procedures. Surgical volume increased markedly, with a rising proportion of definitive operations and diversification of techniques. Conotruncal repairs, initially predominant, declined in proportion, while aortic surgeries increased substantially. Case complexity rose, reflected by a higher proportion of STAT categories 4–5. Median hospitalization costs peaked in the early period, declined notably after the late 2000s, and then stabilized despite increasing volume and complexity. Across four eras (2004–09, 2010–14, 2015–19, and 2020–24), surgical age decreased and the proportion of preterm infants increased, accompanied by longer ICU stays and modestly increased CPB and ACC times—likely due to the greater perioperative challenges in younger, more vulnerable patients.

Conclusions:
The spectrum of defects and surgical strategies has evolved substantially over the past two decades. Advances in surgical techniques and perioperative management have enabled successful operations in younger and smaller neonates; however, neonatal cardiac surgery remains a highly complex and challenging field.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2577 - CLINICAL ANALYSIS OF THE APPLICATION OF TEMPORARY CARDIAC PACEMAKERS IN THE PERIOPERATIVE AND POSTOPERATIVE MANAGEMENT OF PEDIATRIC CONGENITAL HEART DISEASE SURGERY

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Background / Hypothesis:
To assess the clinical utility of temporary cardiac pacemakers (TMPs) in the perioperative management of pediatric congenital heart disease (CHD)

Materials and Methods:
A retrospective review was conducted on 135 pediatric patients with indwelling temporary myocardial pacing (TMP) leads during surgical procedures at the Sichuan Provincial Maternal and Child Health Hospital and Chengdu Cardiovascular Hospital between 2016 and 2024. The patients were categorized into four groups based on their clinical indications: the reserved group (n=79), the type I atrioventricular block (AVB) group (n=35), the type II AVB group (n=14), and the complete AVB group (n=7).

Results:
In the reserved group, 34% of patients initiated pacing. The pacing initiation rates in the type I, type II, and complete AVB groups were 69%, 100%, and 100%, respectively. Follow-up results indicated that the shortest TMP duration was observed in the type I AVB group ($P < 0.05$). One patient in the type II group and two patients in the complete AVB group eventually received permanent pacemaker implantation. One case of sudden death was recorded in the complete AVB group. Yu Jun's findings were consistent with Dou's law. No lead-related complications were observed in the entire cohort.

Conclusion:
the prophylactic indwelling of temporary pacing leads (TMP) is a safe and effective strategy for children with complex cardiac deformities, particularly those who are infants or exhibit low postoperative cardiac output. The decision to proceed with the implantation of a permanent pacemaker should be made through a multidisciplinary approach.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2585 - LONG TERM OUTCOMES AFTER SURGICAL REPAIR OF ALCAPA IN INFANTS AND CHILDREN A 16 YEAR EXPERIENCE FROM A TERTIARY CENTER IN A DEVELOPING COUNTRY

Avvayyam Rattan [1], Suresh Rao [1], Smruti Ranjan Mohanty [1], Hari Bipin Radhakrishnan [1]
Kokilaben Dhirubhai Ambani Hospital, Pediatric Cardiac Surgery, Mumbai-India [1]

Background:
Anomalous origin of the left coronary artery from the pulmonary artery (ALCAPA) is a rare but life-threatening congenital anomaly. Early surgical repair with reimplantation into the aorta is the preferred treatment. We reviewed our single-center experience over 16 years, focusing on survival and recovery of left ventricular (LV) function.

Methods:
We retrospectively analyzed 63 consecutive patients who underwent left coronary artery translocation for ALCAPA between September 2009 and May 2025. Demographic data, preoperative status, perioperative details, and LV ejection fraction (EF) at discharge and follow-up were recorded. Nine patients were lost to follow-up. LV recovery was assessed using echocardiographic EF and qualitative grading.

Results:
Median age at surgery was 4 months (range: 1–60 months). All patients had significant LV dysfunction preoperatively. Mean EF at discharge was 30%, improving to 51% at latest follow-up, representing an average gain of 48 percentage points. The majority of patients achieved normal or near-normal LV function. Residual mitral regurgitation was observed in a minority of cases. There were no early or late mortalities in this series.

Conclusion:
Surgical reimplantation of the left coronary artery for ALCAPA yields excellent long-term survival and significant recovery of LV function. These results underscore the importance of early diagnosis and prompt surgical intervention.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2587 - SURGICAL REPAIR OF SUPRAVALVULAR AORTIC STENOSIS IN CHILDREN WITH WILLIAMS SYNDROME A 20 YEAR EXPERIENCE

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Background / Hypothesis:
Williams syndrome is a rare genetic disorder associated with supravalvular aortic stenosis (SVAS) in childhood. This study reviewed our institutional experience in the management of SVAS in children with Williams syndrome during 20 years.

Materials and Methods:
A total of 71 patients with Williams syndrome underwent repair for SVAS at Fuwai Hospital between 2005 and 2024. The median age at operation was 37.6 months, and the median weight at operation was 12.2 kg. A total of 49 (69.0%) and 22 (31.0%) patients underwent McGoon and Doty repair, respectively.

Results:
Associated cardiac lesions in 36 patients (50.7%) were repaired at the time of the SVAS repair. Mean Z score of the sinotubular junction was -6.52 ± 2.71 and of the ascending aorta was -1.87 ± 1.76. The most common associated cardiac lesion was main pulmonary artery stenosis (24 of 36 [66.7%]). There were 12 (16.9%) patients requiring reoperation for recurrent SVAS. Freedom from reintervention for SVAS at 1, 5, and 20 years was 100%, 82.9%, and 51.8%, respectively. There were 6(8.5%) patients requiring reoperation for recurrent SVAS. Freedom from reintervention for SVAS at 1, 5, and 15 years was 97.0%, 92.1%, and 82.4%, respectively.

Conclusions:
Excellent long-term outcomes can be achieved with Excellent long-term survival rates can be achieved with surgical repair of SVAS. Preoperative NYHA classification III or IV($p < 0.001$) and bovine pericardium as patch material ($p=0.002$) were predictors of recurrent SVAS.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2588 - EFFICACY OF PULMONARY ARTERY BANDING IN PEDIATRIC END STAGE DILATED CARDIOMYOPATHY A CASE SERIES AND LITERATURE REVIEW

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West China Second University Hospital, Pediatric Cardiac Center, Chengdu-China [1]

Background / Hypothesis:
This study assesses the efficacy of pulmonary artery banding (PAB) in pediatric patients with end-stage dilated cardiomyopathy (DCM) and preserved right ventricular function, aiming to guide clinical practice.

Materials and Methods:
We retrospectively analyzed clinical data from four DCM pediatric patients who underwent PAB at our institution. A literature search using “Dilated Cardiomyopathy” and “Pulmonary Artery Banding” was conducted in PubMed up to July 2025.

Results:
Four patients (three females, one male) with DCM and preserved right ventricular function were included. Genetic testing identified RPL3L mutation in Case 1, MYH6 and TNNC14 mutations in Case 2, and no pathogenic variants in Cases 3 and 4. Preoperative echocardiography showed left ventricular end-diastolic diameters (LVDd) of 33–38 mm (Z-scores 4.73–7.13) and left ventricular ejection fractions (LVEF) of 20–25%. Despite anti-heart failure therapy, cardiac function worsened. PAB was performed at 3–9 months of age; Case 3 received concurrent cardiac resynchronization therapy for left bundle branch block. Post-PAB, all patients showed improved left ventricular function at follow-up (1–14 months), with LVDd of 25–28 mm (Z-scores -1.73 to 1.3) and LVEF of 50–67%. No severe complications occurred. Literature review identified 143 PAB-treated DCM cases (14 domestic, 129 international); 71.3% showed improved left ventricular function, 16.8% required transplantation or mechanical support, and 11.9% died.

Conclusions:
PAB is safe and effective for pediatric DCM with preserved right ventricular function, potentially reducing transplantation needs. Further research is needed to refine indications and optimize outcomes.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2589 - A CASE OF SUCCESSFUL SURGICAL REPAIR OF THE ANOMALOUS SINGLE CORONARY ARTERY FROM RIGHT PULMONARY ARTERY IN AN INFANT

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Morozovskaya Children's City Clinical Hospital, Cardiology, Moscow-Russia [3]

Background / Hypothesis:
Anomalous single coronary artery origin from one of the pulmonary artery branches (ASCAPA) seems so easy to be indicated due to the vivid clinical manifestation from the earliest stage after birth, however, in practice occurs to be challengeable either in diagnostics or treatment. The aim of this report is to represent a clinical case of the successful ASCAPA management in infant.

Materials and Methods:
A single case of the successful diagnosis and surgical repair of an extremely rare anatomical condition - anomalous single coronary artery origin from the right pulmonary artery in the caucasian boy aged 1 month at the moment of admission.

Results:
Caucasian boy was admitted to our hospital at the age of 1 month and 10 days. Parents had never noticed anything doubtful in child's state, pathology was first suspected during the routine check-up, where diffuse ventricular hypokinesis, significant left ventricular dilatation and ejection fraction of 20% were detected according to TTE.
Echocardiography did not clearly depict anomalous left coronary artery orifice, so angiocardiography was performed. While none of coronary arteries originated from aorta, it was shown on pulmonography that the only coronary artery took its orifice from the middle third of the right pulmonary artery.
Child was immediately taken to the operating room. Direct single coronary artery reimplantation from the right pulmonary artery to the aortic root was performed. Aortic cross – clamp time was 88 min, cardiopulmonary bypass time – 155 min. Patient's dependence on ECMO had lasted for 8 days. The patient was discharged 4 weeks later after the surgery.

Conclusion:
Coronary artery pathology in children seems to be challenging clinical situation due to the very moderate data collected.Only a few cases of ASCAPA are reported, identified mostly postmortem. The more experience shared and depicted, the better care can be provided to the patients.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2596 - ROLE OF HYBRID STRATEGY AND BILATERAL PULMONARY ARTERY BANDING IN CURRENT PRACTICE

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Bilateral pulmonary artery (PA) banding, with or without ductal stenting, provides initial palliation for infants with hypoplastic left heart syndrome (HLHS), complex left heart obstruction, interrupted or hypoplastic arches, and other complex congenital cardiac lesions. It is particularly valuable in high-risk patients—those with prematurity, low birth weight, extracardiac comorbidities, or unstable physiology—where prolonged cardiopulmonary bypass poses excessive risk.

Between 2016 and 2025, 29 consecutive patients underwent bilateral PA banding ± ductal stenting as Stage I palliation. Diagnoses included truncus arteriosus ± interrupted aortic arch in 9 patients (31%), HLHS in 7 (24%), complex left ventricular outflow tract obstruction (LVOTO) with arch pathology in 8 (27%), transposition/Taussig Bing with arch pathology in 4 (13%), and complete atrioventricular septal defect (AVSD) with interrupted aortic arch in 1 (3%). The mean age at Stage I was 12 days, and the mean body weight was 2.69 kg.

There were 4 deaths (14%) during Stage I, including 3 HLHS patients and 1 with complex LVOTO and arch pathology. Of the 25 survivors, 7 (28%) required interstage reintervention, including catheter-based procedures or band adjustments.

At stage II repair, there were 3/25 (12%) mortalities, 2 involving the LVOTO group, and 1 in the TGA group.
All Truncus +/- IAA patients and HLHS patients survived stage II repair.

Conclusion:
Hybrid strategy and bilateral PA banding provides very high risk neonates with complex anomalies a chance to progress to definitive repair or palliation, at the expense of extra number of operations and interstage interventions.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2597 - AGGRESSIVE SURGICAL MANAGEMENT OF ULTRA HIGH RISK TRACHEAL AND CARDIAC PATHOLOGY HOW MUCH IS TOO MUCH

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Background / Hypothesis:
While outcomes of slide tracheoplasty for long segment tracheal stenosis are well-reported, other highly complex tracheal reconstructions, such as tracheal agenesis or Christmas tree trachea combined with single ventricle CHD or pulmonary vein variants, remain almost unreported. This study analyzes our institution's experience with a highly complex cohort of high risk tracheal and cardiac reconstructions.

Materials and Methods:
We reviewed patients that underwent tracheal reconstruction under cardiopulmonary bypass or ECMO (June 2004–July 2025), categorizing patients by tracheal anatomy, operation, and extratracheal anomalies. We analyzed postoperative and long-term outcomes, including mortality and respiratory status.

Results:
Of 43 patients, 21 (48.8%) were male, and median surgical age and weight were 95 days (IQR 55–302) and 5.3 kg (3.2–7.2). Congenital heart disease was present in 38 (88.4%) patients. Syndromes were present in 17 (39.5%) patients. Operative mortality was seven (16.2%) (five slide tracheoplasties, one slide tracheocarinoplasty, and one esophagocarinoplasty); overall mortality was thirteen (30.2%) (Table 1). We report operative survival of two (66.7%) tracheal agenesis patients, two patients with tricuspid atresia (one bilateral bronchus suis and one slide tracheoplasty (66.7%)), and six (100%) side-to-side reconstructions for bronchus suis. Four of seven operative mortalities had single lung physiology, and five of seven had moderate/great complexity cardiac abnormalities.

Conclusions:
Our cohort reflects the literature's success with slide tracheoplasty and reports novel success with alternative intervention for more rare pathologies. Operative mortality was often complicated by complex cardiopulmonary anomalies, emphasizing the importance of considering individual anatomy in surgical planning.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2603 - MID TO LONG TERM OUTCOMES AND RISK FACTOR ANALYSIS FOR FONTAN PATIENTS FROM SINGLE CENTER STUDY

Huifeng Zhang [1], Ming Ye [1]
Children's Hospital Of Fudan University, Cardiovascular Center, Shanghai-China [1]

Objective
The study aims to evaluate the mid- and long-term outcomes of Fontan patients, with a focus on identifying contemporary risk factors for early mortality and Fontan failure.

Method
This study included 173 patients who underwent Fontan operation at the Children's Hospital of Fudan University. Clinical data were retrospectively collected. Binary logistic regression was used to identify risk factors for early mortality and delayed drainage, while Cox regression models were employed to determine the risk factors for Fontan failure. Differences in mid- and long-term outcomes were analyzed based on patient characteristics, including dominant right ventricle, intracardiac versus extracardiac conduit Fontan, fenestration status, significant preoperative atrioventricular valve regurgitation, heterotaxy syndrome, and delayed postoperative drainage.

Result
59 patients (34.1%) were female, with a median age at Fontan surgery of 52 months (44–72.3 months) and a median follow-up period of 7.8 years. The 5-year, 10-year, and 15-year survival rates in this cohort were 90.1%, 88.0%, and 80.0%, respectively, with freedom from Fontan failure rates of 87.7%, 82.5%, and 73.0%. Pulmonary atresia with VSD or complete atrioventricular canal defect (OR = 13.3 [2.8–63.9], p = 0.001) and delayed sternal closure (OR = 5.1 [1.0–24.7], p = 0.045) were identified as independent risk factors for early mortality. Intracardiac or extracardiac Fontan surgery (OR = 0.5 [0.2–1.1], p = 0.089) and fenestration (OR = 0.6 [0.3–1.1], p = 0.01) were associated with a reduced incidence of delayed drainage. History of Valve surgery (HR = 3.3 [1.0–11.0], p = 0.047), delayed sternal closure (HR = 3.5 [1.2–10.0], p = 0.017), and ICU stay ≥1 week (HR = 7.5 [2.4–23.4], p < 0.001) were risk factors for Fontan failure.

Conclusion
The outcomes of Fontan operations have improved significantly over the years.pulmonary atresia/VSD/AV canal, dominant RV, history of valve surgery seems to indicate poor prognosis.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2613 - OUTCOMES AFTER NEONATAL CARDIOPULMONARY BYPASS SURGERY AT A SINGLE SMALL TO MODERATE SIZE CENTER A 10 YEAR EXPERIENCE

Sofya Sargsyan [1], *Craig Sable* [2], Missy Gamble [3], Kathryn Smiley [3], David Greenhouse [3], Dennis Wells [4], Benjamin Peeler [5]
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Background:
Several publications have reported an association between case volume and outcomes for neonatal cardiac surgery. Our objective was to describe outcomes in neonates undergoing cardiopulmonary bypass (CPB) surgery at a single small to moderate size center.

Methods:
We performed a retrospective review of neonates undergoing CBP surgery between May 2016 and April 2025 at Ochsner Children's Hospital. There was one chief of cardiac surgery (BP) and one other primary surgeon (DW) during this time. Demographic, diagnostic, operative, and postoperative data were compared to Society of Thoracic Surgery (STS) data for a similar time period.

Results:
There were 215 index CPB operations: 66% males, 3% premature babies, 6% < 2.5 kg, 27% 2.5 – 3 kg, and 35% with genetic syndrome or chromosomal abnormalities. Procedure and diagnosis details are provided in Table 1. Day of surgery distribution was 0 – 3 days (11%), 4 – 7 days (36%), 8 – 14 days (35%) and > 14 days (18%). Operative mortality (Table 2) was 4.7%; STAT 4 and 5 cases was 2.5% and 9.5% respectively (STS 8.8% and 14.2%). There was no association between demographic variables or day of surgery and mortality. Complications included postoperative ECMO (1.4%), unplanned reoperation (3.3%), renal failure (0.5%) and neurologic deficit (3.3%). ECMO and neurologic deficits were associated with mortality. Mortality occurred in 5.3% (3/57) of neonates undergoing Norwood (Table 3) operation (STS 12.2%). All Norwood operations were performed by the same surgeon and physician assistant (BP/KS). Right ventricle to pulmonary artery shunts were utilized in 52 patients. CPB and cross-clamp times were shorter than in STS and median length of stay was similar.

Conclusions:
Low mortality and morbidity in neonates in highest risk categories undergoing CPB surgery is achievable in a small to moderate size program. More investigation is needed to identify practices that can be replicated.

POSTER PRESENTATIONS

Category: Cardiac Surgery

2619 - A DECADE OF ARTERIAL SWITCH OPERATIONS FOR TGA VSD SURGICAL TIMING OUTCOMES AND KEY PREDICTORS

Zheng Dou [1], Qiyu He [1], Shoujun Li [1]
Fuwai Hospital, National Centre For Cardiovascular Diseases, Chinese Academy Of Medical Sciences, Peking Union Medical College, Pediatric Cardiac Surgery Center, Beijing-China [1]

Background / Hypothesis:
Advances in pediatric intensive care and cardiopulmonary bypass (CPB) techniques in China have improved the management of complex congenital heart disease, including arterial switch operations (ASO) for transposition of the great arteries with ventricular septal defect (TGA-VSD). The optimal timing of surgery, however, remains debated.

Materials and Methods:
We retrospectively reviewed patients with TGA-VSD who underwent ASO at our center between January 2014 and December 2023, excluding those receiving Rastelli, atrial switch, Fontan procedures, or with severe right ventricular outflow tract obstruction. Surgical age trends, patient characteristics, and outcomes were analyzed. The primary composite endpoint was perioperative mortality, discharge against medical advice, or major adverse events (reoperation, ECMO, heart/renal failure, pleural or pericardial effusion). Secondary outcomes included postoperative length of stay (PLOS), ICU stay, ventilation duration, and hospitalization expense.

Results:
A total of 195 patients (140 males) were included, with a mean surgical age of 328 days. 38 primary events occurred. Mean surgical age showed bimodal peaks in 2014 and 2017, with an overall declining trend by LOESS regression, reaching the lowest value in 2023; however, Spearman correlation showed no significant association between surgical age and annual primary endpoint distribution (P=0.392). Among 43 infants operated at <30 days, longer CPB duration independently predicted the primary endpoint. Longer CPB time and lower gestational age were risk factors for prolonged PLOS and ICU stay, while these factors plus preoperative vasoactive agent use also predicted longer ventilation and higher expenses.

Conclusions:
In this single-center cohort, ASO age for TGA-VSD showed a fluctuating but overall declining trend over the past decade, yet no clear correlation with primary outcomes was observed, likely due to limited sample size. CPB duration and prematurity emerged as key determinants of primary outcomes, with preoperative vasoactive agent use further contributing to prolonged resource utilization.

POSTER PRESENTATIONS

Category: Cardiogenetics

1005 - CHILDHOOD CANCER SURVIVOR SPECIFIC HUMAN INDUCED PLURIPOTENT STEM CELL BASED MULTIORGAN MODEL FOR VALIDATION OF GENETIC RISK FOR ANTHRACYCLINE CARDIOTOXICITY

Yf Cheung [1]
Fsaf, Fdasfweq, Fsadf-Hong Kong SAR, China [1]

Background / Hypothesis:

FDASFSA
Background
Given the demonstration of increased risk in developing anthracycline toxicity in patients with the UGT1A6 rs17863783 variant SNP, UGT1A6, which encodes a UDP-glucuronosyltransferase, could be important in the predisposition to anthracycline-induced cardiotoxicity (AIC) in patients who possess this variant SNP.

Objectives
The aim of our study is to validate UGT1A6 rs17863783 SNP as a risk SNP for AIC using a human induced pluripotent stem cell (hiPSC) model.

Methods
We determined if UGT1A6 rs17863783 SNP affects the detoxification of doxorubicin in hiPSC-derived hepatocytes (hiPSC-HCs) and whether the resultant difference in the concentration of doxorubicin and their metabolites can lead to increased susceptibility of hiPSC-derived cardiomyocytes and three-dimensional engineered tissues to doxorubicin cardiotoxicity.

Results
We found that UGT1A6 rs17863783 SNP is a risk SNP for AIC. Functional data showed that UGT1A6 was expressed in hiPSC-HCs and that UGT1A6 expressed in patients harbouring the UGT1A6 rs17863783 risk SNP has a reduced capacity to metabolize doxorubicin. Furthermore, our study confirmed that cardiomyocytes in the heart are not the primary sites of action for UGT1A6.

Conclusion
The hiPSC-based tissue model validated that UGT1A6 rs17863783 SNP is a risk SNP for AIC and can be an effective model for validating risk SNP for AIC.

POSTER PRESENTATIONS

Category: Cardiogenetics

1031 - ASSOCIATION OF LIPID LOWERING THERAPIES WITH CARDIOVASCULAR DISEASE RISK A DRUG TARGET MENDELIAN RANDOMIZATION AND MEDIATION ANALYSIS

Jinpeng Zhang [1], Jie Tian [1]
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Background / Hypothesis:
Heart failure (HF) is a complex clinical syndrome characterized by structural and/or unctional abnormalities of the heart, leading to impaired ventricular systolic and/or diastolic function. The potential impact of lipid-lowering therapies, particularly PCSK9 inhibitors (PCSK9i), HMG-CoA reductase inhibitors (statins), APOC3 inhibitors (APOC3i), and CETP inhibitors (CETPi), on the risk of HF is a topic of increasing interest. This Mendelian randomization (MR) study aims to elucidate the causal relationship between genetically predicted inhibition of PCSK9, HMG-CoA reductase, APOC3, and CETP, and the risk of cardiovascular disease primarily characterized by HF

Materials and Methods:
Utilizing publicly available summary-level genome-wide association study data, we employed single nucleotide polymorphisms associated with lower LDL-C levels as instrumental variables for genetic inhibition of PCSK9, HMG-CoA reductase, APOC3, and CETP. Various Mendelian randomization techniques were applied to estimate the causal effects of these LDL-C targets on cardiovascular disease primarily characterized by heart failure (HF), while also examining the mediating roles of other lipid metrics in the LDL-C and HF relationship. Sensitivity analyses were conducted to validate the robustness of
the findings

Results:
Genetic prediction of PCSK9 and CETP inhibition was associated with a reduced risk of HF. Using the inverse variance weighted (IVW) method, the odds ratios were as follows: PCSK9i (OR [95% CI] = 0.78 [0.65, 0.90], $p = 7.22 \times 10^{-5}$) and CETPi (OR [95% CI] = 0.56 [0.27, 0.84], $p = 8.26 \times 10^{-5}$). In contrast, inhibition of HMG-CoA reductase and APOC3 did not demonstrate statistically significant associations with HF risk. Furthermore, triglycerides (TG) and total cholesterol (TC) mediated 22.45% (2.94%, 41.96%) and 64.56% (34.01%, 95.11%) of the effect, respectively, in the LDL-C and HF relationship

Conclusions:
Our MR study indicates that genetically predicted inhibition of
PCSK9 or CETP, rather than HMG-CoA reductase or APOC3, is associated with a lower risk of HF. These findings provide evidence

POSTER PRESENTATIONS

Category: Cardiogenetics

1071 - VEGFA STOP GAINED VARIANT DETERIORATES CARDIAC REMODELING IN MYOCARDIAL INFARCTION

Zhongxiang Chen [1], Fen Li [1], Diqi Zhu [1], Min Zhang [2]
Shanghai Children's Medical Center, Pediatric Cardiology, Shanghai-China [1] Shanghai Children's Medical Center, Pediatric Translational Medicine Institute And Pediatric Congenital Heart Disease Institute, Shanghai-China [2]

Background / Hypothesis:
A sustained dosage of Vascular Endothelial Growth Factor A (VEGFA) is crucial for angiogenesis in both homeostasis and cardiovascular diseases. CUG-initiated alternative translation is a conserved mechanism for producing mature VEGFA. Genetic surveys have identified stop-gained variants predicted to prematurely terminate CUG-initiated translation without affecting ATG-initiated translation. However, the impacts of these variants on the vasculature in steady-state and disease conditions remain unknown.

Materials and Methods:
Using CRISPR/Cas9 genome editing, we established VegfaQ150X/Q150 allele (Q150X), a mouse genetic model that mimics the human VEGFA stop-gained variant. The effects of this variant were tested in both adult homeostatic conditions and the acute myocardial infarction (MI) model. We analyzed and quantified cardiac vasculature structure using immunofluorescence and light sheet imaging. Furthermore, we characterized cellular heterogeneity, cell-cell interactions, and gene regulation using single-nuclei RNA-sequencing, as well as cell type-specific transcriptomics and epigenomics.

Results:
Mice carrying the stop-gained variant were viable. VEGFA dosage reduced to 70% in the Q150X homeostatic heart, with no significant alteration in cardiac function or vasculature. In the MI model, VEGFA dosage in Q150X was reduced to about 40% within the first-week post-infarction, leading to functional deterioration in the post-MI hearts. Significant changes in cellular composition were observed three days post-MI. In particular, endothelial cells in Q150X diverged into a state that showed higher level of hypoxia stress, an elevated inflammatory response, and increased extracellular matrix secretion. Additionally, we observed an increase of Nppb+ stressed cardiomyocytes in both 3 days post-MI and homeostasis. Finally, pro-inflammatory macrophages, neutrophils, and Cd8+T cells were enriched in the ischemic zone of Q150X hearts.

Conclusions:
CUG-initiated translation contributes significantly to the production of mature VEGFA in ischemic hearts. VEGFA dosage is critical in determining the cellular microenvironment during ischemic injury.

POSTER PRESENTATIONS

Category: Cardiogenetics

1155 - GENETIC AORTOPATHY IN THAILAND CLINICAL PRESENTATIONS AND OUTCOMES AND ROLE OF WHOLE EXOME SEQUENCING FOR DIAGNOSIS

Kunthika Singhasee [1], Yupada Pongprot [1], Chureerat Phokaew [2], *Rekwan Sittiwangkul* [1]
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Background / Hypothesis:
This study aimed to assess genetic aortopathy in Thai patients through clinical presentations and whole exome sequencing (WES), focusing on diagnosis and natural history for improved patient and family management.

Materials and Methods:
The study included 55 patients (aged 0–60 years) from Chiang Mai University Hospital (2017–2020). Genetic aortopathy was defined as an aortic root diameter Z-score >2 in adults and >3 in children or adult. Patients were classified into Marfan syndrome (MFS), Loeys-Dietz syndrome (LDS), Turner syndrome, and non-syndromic thoracic aortic aneurysm and dissection (NS-TAAD) groups using clinical features and WES result. Statistical analyses were performed to identify predictors of aortic dissection.

Results:
: Among 55 patients, 28 (50.9%) were diagnosed before 18 years old and 27 (49.1%) after. MFS was most common (54.5%), followed by NS-TAAD (23.8%) and LDS (12.7%). Children exhibited more syndromic presentations (85.7% vs. 59.3%, p=0.022), extracardiac symptoms (39.3% vs. 11.1%, p=0.016), and fewer cardiac symptoms (35.7% vs. 62.9%, p=0.04) compared to adults. WES identified 12 gene mutations, with FBN1 being the most common (52.7%), followed by TGFBR1, TGFBR2, MYH11, and others. Aortic dissection was more frequent in adults (40.7% vs. 7.1%, p=0.001). WES improved diagnostic yield from 44% to 100%. Predictors of aortic dissection included older age at diagnosis (HR 1.08, 95% CI 1.01–1.14, p=0.02) and severe aortic regurgitation (HR 0.12, 95% CI 0.02–0.95, p=0.04). NS-TAAD had the poorest prognosis for aortic dissection probability. By using WES which had 92.7% diagnostic yield, we were able to added up the clinical diagnosis from 44% to 100%

Conclusions:
WES is a useful diagnostic tool in genetic aortopathy patients particularly those who did not fulfill the diagnostic criteria of aortopathy syndrome. Severe aortic regurgitation and NS-TAAD diagnosis are key predictors of aortic dissection. Integrating clinical evaluation with genetic testing is vital for

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1159 - THE MECHANISM OF NOTCH1 PATHWAY DYSREGULATION INDUCED BY HDAC1 H3K9AC MODIFICATION OF M5C READING PROTEIN ALYREF IN LEFT VENTRICULAR NONCOMPACTION

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Left ventricular noncompaction (LVNC) is caused by the failure of the normal densification process of the embryonic myocardium resulted in thick trabeculae and deep sunken crypt structures in the ventricular cavity.The normal expression of TBX5 in cardiomyocytes plays an important role in the process of cardiac development.
We constructed adenovirus overexpressing TBX5 and injected it into the heart of young rats with noncompaction of the myocardium. The results showed that the symptoms of noncompaction of the myocardium in young rats were relieved. The transcription factor TBX5 directly binds to Yap1, and then activates the Notch1 pathway to inhibit cardiomyocyte apoptosis and maintain the normal development of the heart. The transcription inhibitor act was added into primary cardiomyocytes of young rats with noncompaction of myocardium and normal myocardium The stability of TBX5 mRNA was detected after D, and the results showed that the stability of tbx5mrna in primary cardiomyocytes of young rats with noncompaction of myocardium was decreased. Merip confirmed that there was m5C modification in TBX5 mRNA in cardiomyocytes, and the methylation level of m5C was low in noncompaction cardiomyocytes, and the expression of m5C writing protein was also significantly down regulated. QPCR results showed that TBX5 mRNA expression was most significantly downregulated after knockdown of alyref, and was most significantly upregulated after overexpression of alyref. After overexpression of HDAC1 in primary cardiomyocytes of normal young rats, the expression levels of alyref and TBX5 were significantly down regulated.

Conclusions:
The expression of HDAC1 is upregulated in LVNC cardiomyocytes, which epigenetically inhibits the transcription of alyref, resulting in reduced expression of alyref protein. Reduced

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1160 - BETA BLOCKER PRESCRIPTION ADHERENCE OF CHILDREN AND YOUNG PEOPLE WITH LONG QT SYNDROME IN NORTHERN IRELAND

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Background / Hypothesis:
Beta Blocker non-adherence has been identified as a key factor in precipitating breakthrough cardiac events (BCEs) in participants affected by Long QT Syndrome (LQTs). In the literature adherence has been examined in adults affected by LQTs but had not been reviewed in children. With progressing maturation young people are expected to take responsibility for their own medication. However, this has been shown to be a time of poor adherence in diverse conditions such as diabetes and asthma.

Materials and Methods:
Patients with LQTs type 1 and 2 (Age Range 1-19, Mean 10) were identified using a local database, medication adherence was reviewed by chart review and contacting the patient's GP to clarify prescription collection over a year. Data was used to calculate a Medication Possession Ratio (MPR) for the year December 2023-December 2024. Adequate adherence was defined as an MPR of >0.8. Risk factor analysis for poor adherence was performed using multivariable binary logistic regression. Factors analyzed included Age, QTC duration, deprivation decile, affected sibling, LQT subtype (KCNQ1/KCNH2), and age.

Results:
79 patients' data were suitable for analysis. The average age of the children involved was eleven years old. The average MPR was 0.76. Factors associated with poorer compliance on multivariable logistic regression included increasing deprivation index and if a sibling was also affected.

Conclusions:
Adherence in this cohort was mostly in the "adequate range". Increased deprivation is a risk factor for poor compliance. MPR, whilst useful, is limited as it is only informative of whether a prescription is being collected, not necessarily administered. We contend that it is a useful measure of non-adherence. Other methods of measuring adherence in this cohort would include exercise stress testing or urine metabolite testing but this must be balanced with its cost and staff time implications.

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1207 - DETECTION OF NOVEL AND RARE MISSENSE VARIANTS LIKELY DISRUPTING TGF β AND HEDGEHOG SIGNALING IN A PATIENT WITH UNICUSPID AORTIC VALVE AND SEVERE COMORBIDITIES

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Background / Hypothesis:
Unicuspid aortic valve (UAV) is a rare congenital defect linked to aortic stenosis and dilation, with poorly understood genetic determinants. This study hypothesizes that whole-exome sequencing (WES) combined with family-based analysis and transcriptomic investigation of human embryonic heart cells could identify genetic variants contributing to UAV and shared mechanisms underlying comorbidities.

Materials and Methods:
A male patient with UAV, aortic stenosis, aortic dilation, severe Crohn's disease requiring colectomy with end ileostomy formation, icterus with suspected primary sclerosing cholangitis, and a history of venous thromboembolism underwent WES (BGI DNA nanoball sequencing) along with his healthy family members (both parents and brother). Rare missense and nonsense variants were analyzed using machine learning and Bayesian statistical tools. Candidate gene expression was assessed using publicly available single-cell RNA sequencing data.

Results:
Highly damaging novel missense variants were identified in ADAMTS7 (de novo, chr15:78791156A>C) and AGTR2 (hemizygous, chrX:116172675T>G). ADAMTS7 encodes a metalloproteinase involved in extracellular matrix (ECM) remodeling and monocyte behavior, while AGTR2 plays a role in renin-angiotensin system (RAS) signaling, both potentially influencing TGF-β activity in endocardial cushion development. The patient also carried a ENPEP variant (rs147367863), affecting angiotensin II metabolism. Notably, RAS dysfunction has been implicated in the pathogenesis of primary sclerosing cholangitis and Crohn's disease, contributing to fibrosis and inflammation. Additionally, a rare DHH variant (rs370049311) was identified, impacting Hedgehog signaling, which is essential for valve formation and has been linked to Crohn's disease. Altered monocyte behavior due to the ADAMTS7 variant may have further exacerbated the inflammatory response in Crohn's disease.

Conclusions:
These findings suggest a genetic link between UAV and systemic comorbidities through disrupted ECM remodeling, monocyte behavior, RAS-TGF-β signaling, and Hedgehog pathway dysfunction. Further functional studies are needed to explore the mechanistic contributions of these variants to congenital valve disease and immune-related disorders.

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1239 - ACTIVATION OF THE CGAS STING PATHWAY MEDIATED BY IRGM1 CONTRIBUTES TO THE DEVELOPMENT OF RESTRICTIVE CARDIOMYOPATHY INDUCED BY CTNIR193H MUTATION

Xiaoli Yan [1], Bo Pan [1], Jie Tian [1]
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Background / Hypothesis:
Restrictive cardiomyopathy (RCM) is a rare, fatal disorder that rapidly progresses in children. TNNI3 mutations represent the most common genetic cause. Although cTnI mutations are known to increase myofilament calcium sensitivity and impair diastolic function, this mechanism alone does not fully account for disease pathogenesis. Recent studies have revealed that the immune system plays an important role in cardiovascular diseases, however, its involvement in RCM remains unclear.

Materials and Methods:
We generated a classic cTnIR193H mouse model using CRISPR/Cas9. RNA sequencing and biotin-mediated proximity labeling were used to explore potential pathogenic pathways and different interacting proteins. Protein interaction and binding levels were detected by co-immunoprecipitation, yeast two-hybridization, and immunofluorescence co-localization. Gross cardiac morphology and function, and levels of cardiac fibrosis were evaluated in cTnIR193H mutation and Irgm1-deficient mice. Protein expression and genes transcription of related pathways were measured by Western blotting, quantitative real-time PCR, and enzyme-linked immunosorbent assay (ELISA).

Results:
Cardiac fibrosis and diastolic dysfunction were found in cTnIR193H mice. RNA sequencing revealed innate immune pathways may be involved in RCM. Irgm1 was confirmed as a crucial differential protein among WT cTnI and cTnIR193H (mutant cTnI) interacting proteins, which played an important role in innate immune responses by degrading cGAS protein. Irgm1 deficiency induced mild fibrosis and diastolic dysfunction in mice, along with notable activation of the cGAS-STING pathway and type I interferon response. In cTnIR193H mouse hearts, increased binding level of cTnIR193H binding to Irgm1 may result in decreased level of Irgm1 binding to cGAS, which lead to activation of the cGAS-STING-type I interferon response. At last, STING inhibitor C176 partially rescued the RCM phenotypes in cTnIR193H mice.

Conclusions:
cTnIR193H activates the cGAS-STING pathway in restrictive cardiomyopathy by sequestering Irgm1, this may provide new insights for RCM treatment from an immunological perspective.

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1271 - EXPLORING GENETIC VARIANTS ASSOCIATED WITH PULMONARY VALVE SIZE IN TETRALOGY OF FALLOT A GENOME WIDE ASSOCIATION STUDY

Hamood Al Kindi [1], Naser Elmi [2], Noor Alkharusi [3], Amin Ardeshirdavani [2], Siamak Saber [4]
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Background / Hypothesis:
The pulmonary valve annulus size varies among patients with Tetralogy of Fallot (ToF), influencing the surgical approach for valve preservation. However, the genetic basis underlying this variability remains largely unexplored. This study aims to identify potential genetic variants associated with pulmonary valve Z-scores in non-syndromic ToF patients.

Materials and Methods:
This single-center study included non-syndromic ToF patients who underwent surgical repair between 2016 and 2020. Blood samples were collected for DNA storage, and echocardiographic measurements of pulmonary annulus size and Z-scores were documented at initial diagnosis. Whole exome sequencing was performed using the Illumina NextSeq 2000 and Agilent SureSelect V6 kit. Variant analysis was conducted using the GenAP pipeline and BCFtools, followed by a genome-wide association study (GWAS) using PLINK2. Gene expression data were examined using the GTEx Portal and the Human Protein Atlas.

Results:
A total of 78 patients were analyzed, with 53% male and 47% female. The median age at surgical repair was 9 months (IQR: 7–12 months). The median pulmonary annulus size at diagnosis was 6 mm (IQR: 5.00–7.43 mm), with a median Z-score of -1.99 (IQR: -2.47 to -1.35). GWAS identified two significant variants: rs2071071 (LRRC23 gene) and rs116101674 (CERS3 gene), both negatively correlated with pulmonary valve Z-scores ($P < 5 \times 10^{-8}$). Expression analysis revealed that LRRC23 is active in the heart, particularly during fetal development and early childhood, suggesting a potential role in pulmonary valve size regulation.

Conclusions:
This study represents the first GWAS investigating pulmonary valve size in ToF patients using whole exome sequencing. The rs2071071 variant in LRRC23 may contribute to pulmonary annulus variability, warranting further studies to elucidate its underlying mechanisms.

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1293 - THE NATURAL HISTORY AND GENETIC ARCHITECTURE OF NEONATAL AND INFANTILE HYPERTROPHIC CARDIOMYOPATHY

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Background:
The long-term outcomes and predictors of adverse outcomes in infantile hypertrophic cardiomyopathy (HCM) remain incompletely characterised.

Methods:
Single-centre retrospective review of all cases of HCM diagnosed <1-year of age 2008 – 2023. Clinical and echocardiographic predictors of all-cause mortality were analysed. Newborns with a clinical course consistent with gestational-diabetes related hypertrophy were excluded.

Results:
Fifty infants with HCM were included, 24 (48%) neonates, 28 (56%) female, median age at diagnosis 1.2 months (IQR 0.3 – 4.7). The diagnosis was made following evaluation of heart failure symptoms (24, 48%), antenatal detection (10, 20%), murmur (8, 16%), syndromic screening (3, 6%), family screening (3, 6%) and post cardiac-arrest (2, 4%). Aetiology included inborn-errors of metabolism (IEM, 16, 32%), Rasopathy-associated (20, 40%) and non-syndromic (14, 28%). Nineteen (38%) had associated congenital heart disease. Genetic studies were performed in 45 (90%), including genomic testing in 39 (78%), with a pathogenic/likely-pathogenic variant in 37 (82.2%).
Twenty-one (42%) infants died during a median of 7.5 (SE 1.04) years of follow-up, with a 1, 2 and 10-year survival of 67.3% (SE 6.7), 61% (SE 7.0), and 52.7% (SE 8.3). Eight (16%) underwent a myectomy at a median age 5.3 years (IQR 3.2 – 6.6). The pattern of left ventricular wall-thickness remodelling over time was progression n=13 (26%), stabilisation n=11 (22%), and regression n=16 (32%). Seven (14%) infants no longer met criteria for HCM at last follow-up.
Underlying diagnosis of IEM (HR 2.7, 95% CI 1.1– 6.3, p = 0.025), and symptomatic presentation (HR 5.1, 95% CI 1.2– 22.2, p = 0.028) were significant univariate predictors of all-cause mortality on Cox regression analysis.

Conclusions:
There is significant mortality associated with a diagnosis of IEM-associated or symptomatic HCM, highest in the first 18 months of life. A high genetic yield confirms the role for genomic testing in cases of infantile HCM.

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1333 - ANALYSIS OF 21 BARTH SYNDROME IN CHILDREN

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Background / Hypothesis:
To investigate the clinical manifestations, treatment, and outcomes of Barth syndrome (BTHS).

Materials and Methods:
A retrospective analysis was conducted on 21 pediatric patients diagnosed with BTHS between January 2010 and December 2023 at Beijing Children's Hospital, Beijing Anzhen Hospital, and Beijing JingDu Children's Hospital. Clinical data including gender, onset age, initial symptoms, clinical manifestations, family genetic history, and laboratory tests were reviewed.

Results:
All 21 patients were male, with an onset age of 4 (1, 9) months. Main clinical manifestations included heart failure (18 cases), neutropenia (16 cases), respiratory symptoms (15 cases), 3-methylpentenediuria (7 cases), develop retardation (8 cases), gastrointestinal symptoms (7 cases), fatigue and anorexia (6 cases), and recurrent infection (2 cases). Electrocardiogram abnormalities included ST changes (18 cases), flattened T wave and low voltage of limb leads (2 cases), abnormal Q waves (1 case). Echocardiographic features showed increased trabeculation, interventricular septum and left ventricular wall thickening, and left ventricular enlargement with reduced ejection fraction. Genetic testing identified TAZ gene variations in 21 patients: 11 missense mutations, 2 nonsense mutations, 2 frameshift mutations, 2 whole code mutations, 2 exon deletions, 1 splicing mutation, and 1 synonymous mutation. In terms of treatment, 18 patients with heart failure received routine heart failure treatment, of which 11 patients received intravenous immunoglobulin and corticosteroids. After follow-up of 91.0 (75.5, 109.5) months, 15 of the 18 patients showed restoration of cardiac function after 4.5 (3.0, 9.8) months of treatment, with 1 case of significant improvement, while 2 cases suddenly died.

Conclusions:
BTHS predominantly affects males with early onset, mainly characterized by abnormal cardiac structure and function, along with clinical features including fatigue, delayed growth and development, and neutropenia. Early diagnosis and intervention, including heart failure treatment, intravenous immunoglobulin, and corticosteroids, can lead to significant improvement in cardiac function, though sudden death remains a risk.

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1397 - CLINICAL AND GENETIC INSIGHTS INTO CONGENITAL LONG QT SYNDROME A SINGLE CENTER RETROSPECTIVE STUDY

Ryuta Takase [1], Kirie Otsu [1], Yuki Yamakawa [1], Kouki Kiyomatsu [1], Yoshiyuki Kagiyama [1], Yozo Teramachi [1], Yoriko Watanabe [1], Kenji Suda [1]
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Background:
Congenital Long QT Syndrome (LQTS) is a hereditary arrhythmogenic disorder associated with sudden cardiac death. To date, more than 15 associated genes have been identified; however, since 2018 in Japan, genetic testing has been widely available only for three major genes: KCNQ1, KCNH2, and SCN5A. However, the presence of variants of uncertain significance (VUS) complicates interpretation and clinical decision-making. We assessed the diagnostic utility of genetic testing over the past 4 years.

Materials and Methods:
Subjects were 34 patients; 18 children identified with QT prolongation through school cardiac screening and 16 individuals identified through family screening including adult relatives. We retrospectively reviewed their clinical data and results of genetic testing.

Results:
Genetic variants were identified in 23 patients (68%), including 26 KCNQ1 variants in 19 cases and 19 SCN5A variants in 12 cases, with up to five overlapping variants observed in some individuals. In terms of pathogenicity, variants were pathogenic in 8 patients (24%), including 2 in KCNQ1 and 6 in SCN5A, while VUS were found in 8 patients (23%), including 5 with KCNQ1 variants and 4 with SCN5A variants (some overlap). In the remaining patients, variants were considered likely benign in 7, and no variants were detected in 11. No arrhythmic events occurred in children. Pharmacological treatment was initiated in 8 patients, and 2 adults with SCN5A mutations received implantable cardioverter-defibrillators (ICDs).

Conclusions:
Genetic testing alone often does not result in a definitive diagnosis of LQTS, and interpreting VUS remains clinically challenging. No arrhythmic events were observed in pediatric cases, but risk stratification and long-term follow-up are essential. Developing a clinical-genetic database is important for accurate diagnosis and effective management of LQTS.

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1408 - LOEYS DIETZ SYNDROME IN THE HETEROGENEOUS COHORT OF GENETIC AORTOPATHIES SAME BUT DIFFERENT

Jakob Olfe [1], Veronika Stark [1], Johanna Kanitz [1], Rainer Kozlik-feldmann [1], Thomas Mir [1]
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Background / Hypothesis:
The term genetic aortopathy (GA) encompasses a variety of disorders, of which MFS is the best known. Due to constantly evolving research in human genetics, more genetic mutations and diseases related to GA have been found. One of these diseases is Loeys-Dietz syndrome (LDS). The rarity of these diseases makes it difficult to describe the characteristics but more importantly their differences. Despite clinically very similar phenotypes, there are crucial differences between them.

Materials and Methods:
Since 2008, we have studied 977 patients with suspected GA. We detected FBN1 mutation in 215 patients and genetically confirmed LDS in 32 patients. We retrospectively analyzed the type of mutation, prevalence of symptoms and systematically compared the two syndromes.

Results:
Our patient population includes 215 MFS patients, 32 LDS and 60 patients with other mutations. The initial age of presentation is on average slightly younger in MFS patients (7,9 yrs) compared with LDS patients (9,5 yrs). This could be due to the fact that in our patient group 27% of MFS patients initially present at a young age with a lens luxation, which we have not seen in any LDS patient so far ($P<0.05$). However, 55% of LDS patients already had SV dilatation at initial presentation, compared with only 38% in children with MFS. There are also significant differences in the degree of dilatation. Already at the age of 2 years, SV dilatation is significantly greater in LDS compared to MFS ($p<0.01$). Bicuspid aortic valves, on the other hand, occur 56% more frequently in MFS.
In both clinical conditions, we use angiotensin-receptor-blockers (ARB) as the medication of choice during therapy. They are used slightly more at MFS (57%) compared to LDS (48%), whereby LDS requires more intensive treatment.

Conclusions:
In addition to MFS, there are many other syndromes from the group of GA with important differences in the phenotype. In our large pediatric patient group with LDS patients, we were able to show that, especially at first presentation and

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1519 - CLINICAL OUTCOME AND RISK FACTOR OF SUDDEN CARDIAC DEATH IN PEDIATRIC ONSET HYPERTROPHIC CARDIOMYOPATHY BASED ON KOREAN MULTICENTER REGISTRY

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Background:
Sudden cardiac death (SCD) is the leading cause of mortality in children with hypertrophic cardiomyopathy (HCM), making early identification of high-risk patients essential.

Purpose:
This study aimed to analyze clinical characteristics and risk factors associated with lethal arrhythmic events (LAEs) in pediatric-onset HCM patients in Korea.

Methods:
A retrospective multicenter cohort study was conducted across 22 Korean centers, including 206 pediatric HCM patients diagnosed before age 19. Patients with secondary HCM were excluded.

Results :
Among 206 patients (63% male), the median age at diagnosis was 10.5 years, and median follow-up was 3.3 years. At presentation, 47% were asymptomatic and 7% had aborted SCD. LAEs occurred in 34 patients (17%) at a median age of 13.5 years: 24% had SCD, 68% were resuscitated, and 9% received ICD shocks. The 5-year and 10-year LAE-free survival rates were 83.7% (95% CI: 0.78–0.90) and 78.5% (95% CI: 0.71–0.86). Among 39 ICD recipients (median age 15), 51% received the device for primary prevention. A total of 23 patients (11%) died, including 7 (3%) from heart failure. The 3-year and 5-year HCM-related mortality-free survival rates were 94.2% (95% CI: 0.91–0.98) and 89.9% (95% CI: 0.85–0.95), respectively. Risk factors for LAE included unexplained syncope (HR 3.1, P = .005) and extensive LV hypertrophy (HR 2.8, P = .013). Protective factors included older age at diagnosis (HR 0.90, P < .001), being asymptomatic (HR 0.46, P = .065), and having a family history of HCM (HR 0.3, P = .005). Genetic testing (performed in 49%) identified pathogenic variants in 23%, most commonly in MYH7 and MYBPC3.

Conclusion :
SCA may be the first sign of pediatric HCM. Early risk stratification and pediatric-specific management are essential to improving outcomes.

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1549 - TRACKING TRAJECTORY OF DOWN SYNDROME CHD CARE AT AN LMIC TERTIARY CENTER SOCIODEMOGRAPHIC BARRIERS AND CONTEMPORARY OUTCOMES.

Shwetha Kuthiroly [1], *Naimisha Yenduri* [2], Mahesh Kappanayil [2], Dhanya Yesodharan [1], Rakhi Balachandran [3], Praveen Reddy Bayya [4], Brijesh P Kottayil [4], Abish Sudhakar [2], Raman Krishna Kumar [2], Sheela Namboothiri [1]
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Background / Hypothesis:
Down syndrome (DS) is commonly associated with congenital heart defects (CHD), often requiring intervention. Access to care can be impacted by societal attitudes, lack of awareness, and paucity of outcome data, particularly in LMIC environments.
We present the experience of a tertiary care center in South India over nearly two decades.

Materials and Methods:
Phase 1 comprised a retrospective longitudinal analysis of consecutive karyotype-confirmed DS patients evaluated between 2005-2017 in pediatric genetics and cardiology services. Surgical recommendations and outcomes were analyzed, focusing on sociodemographic factors influencing parental decisions. In phase 2, contemporary surgical outcomes (2018–2023) of DS CHD were studied.

Results:
In Phase 1, 764 DS patients (M: 444, F: 320) were evaluated. Echocardiography in 733 revealed CHD in 455 (62%), with complete atrioventricular septal defect (23.2%) and ventricular septal defect (22.8%) being most common. The mean age at presentation was 15 months. Surgery was recommended in 255/455 (56%) patients, of whom 161 (63.1%) underwent repair. In 94.6% of remaining cases (89/94) caregivers refused surgery or discontinued follow-up; 5.3% (5/94) died awaiting surgery. The surgical outcomes have been described in Table 1.
The contemporary cohort (2018–2023) included 104 DS CHD patients (Table 1). The median age at surgery was 5 (IQR : 3–12) months. The median postoperative ICU stay was 96 hours (IQR: 60–144), and the median duration of mechanical ventilation was 20 hours (IQR: 17–42). There was no surgical mortality.

Conclusions:
Children with DS CHD can achieve excellent surgical outcomes even in resource-limited settings. Social stigma, and financial constraints can impact access to surgical care. Improved parental counselling, societal awareness, and equitable healthcare access are essential for timely, appropriate care.

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1581 - NEW INSIGHTS ON CENTRAL AND PERIPHERAL LYMPHATIC DYSFUNCTION IN NOONAN SYNDROME

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Background / Hypothesis:
Noonan syndrome (NS) is a multisystem hereditary disorder, affecting approximately 1 in 1000-2500 live births, with a significant predisposition to congenital heart disease (CHD) and lymphatic dysfunction. 50-80% have CHD and widespread central lymphatic abnormalities have been observed in NS individuals with lymphatic dysfunction. However, the full spectrum of lymphatic anomalies in NS remains incompletely characterized, especially in asymptomatic individuals. This study aims to evaluate central and peripheral lymphatic morphology and function in individuals with NS both with and without clinical signs of lymphatic dysfunction (peripheral lymphedema).

Materials and Methods:
Clinical cross-sectional cohort study comprising three study groups; 1) NS patients with clinical signs of lymphatic dysfunction (n = 20), 2) NS patients without clinical signs of lymphatic dysfunction (n= 20) and 3) healthy age- and gender matched controls (n = 10). Central lymphatic anatomy of the thorax and abdomen was visualized using non-contrast T2-weighed MR-lymphangiography. Peripheral lymphatic morphology and function were evaluated using Near-infrared fluorescence imaging (NIRF) on the edematous leg in the symptomatic NS group and on the left leg in the asymptomatic group. Capillary filtration rate was evaluated using strain gauge plethysmography on the edematous/left leg.

Results:
Six NS patients (three symptomatic, three asymptomatic) and three healthy age matched controls have been included. MR-lymphangiography revealed morphological changes in the thorax/abdomen in five NS patients. On the obtained real-time NIRF recordings, three parameters will be measured and used as indices of peripheral lymphatic function; contraction frequency, contraction velocity and pumping pressure in a blinded fashion. NIRF data analysis will be initiated once 10 patients and 5 controls have been enrolled.

Conclusions:
This study demonstrates anomalous lymphatic vessels in both symptomatic and asymptomatic NS patients, providing new insights into the lymphatic spectrum and pathophysiology behind lymphatic disease in NS, thus assisting individualized management and follow-up in affected individuals.

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1617 - NOVEL TECHNOLOGY ENHANCES ASSESSMENT OF DYSMORPHIA IN PATIENTS WITH CONGENITAL HEART DISEASE IN MARRAKECH MOROCCO

Kristina Woodis [1], Lucas Heilbroner [1], Christina Grant [2], Drissi Boumzebra [3], Nadia El Idrissi Slitine [4], Xinyang Liu [5], Faisal Al Munajjed [5], Ichrak Rajil [4], Craig Sable [6], Marius Linguraru [5]
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Background / Hypothesis:
Underlying genetic syndromes impact management of congenital heart disease (CHD), but global access to geneticists is limited. This study aims to evaluate the performance of a novel smartphone application (mGene) that acquires clinical data, images and biometric information to better characterize genetic phenotypes in children.

Methods:
Patients were enrolled in Mohammed VI Children's Hospital in Marrakech, Morocco. Using mGene, images were obtained of the face, right and left profiles, palms, and soles of the feet. Facial biometric measurements were automatically captured. Demographics and cardiac diagnoses were noted. mGene images and data were reviewed by an expert clinical geneticist.

Results:
The cohort included 327 patients, 157 with CHD. Age distribution included 18% newborns (0-2 months) and 16% infants (3-12 months). Almost all subjects (96%) had image sets that were of diagnostic quality to make a dysmorphology assessment. Dysmorphia was present in 29% of patients (32% of patients with CHD). The most common diagnoses were Trisomy 21, Williams Syndrome and Noonan Syndrome. Factors impeding diagnosis were inability to capture an image due to behavioral factors (8), inadequate angles to determine features (4), bandaging impeding facial features (1), and malnourishment affecting the true features of faces (1). 10/14 (71%) of the unphotographed subjects were infants or newborns. 71% of data sets were of sufficient quality to provide automatic biometric information via mGene. The profile-view images (better angles and lighting) and hand images aided in diagnosis in 78% and 34% of cases respectively. mGene performed similarly in patients with and without CHD.

Conclusions:
Use of mGene to assess dysmorphia in children with CHD in a resource-limited setting is feasible and holds promise to enable remote diagnosis by experts. These data could ultimately inform development of an artificial intelligence tool that could provide access to genetic diagnosis on a global scale.

POSTER PRESENTATIONS

Category: Cardiogenetics

1859 - A SINGLE CENTER 5 YEAR EXPERIENCE OF CARDIO GENETICS CLINIC IN SOUTHERN INDIA

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Background / Hypothesis:
Clinical cardiology integrated with cardiac genetics helps in management and prognostication of the child as well as families. We present our 5-year data from single center.

Materials and Methods:
Patients were recruited from paediatric cardiology department. Grouped into (i) Cardiomyopathy, (ii) Channelopathy, (iii) Aortopathy and (iv) Miscellaneous. Detailed clinical history, family history, electrocardiogram and echocardiogram of the patient and the family members were obtained. After counselling required blood samples were drawn from the index patient and if needed from family members and sent to perform exome analysis.

Results:
110 gene positive (male:7) patients excluding trisomy's presented from fetal life (5 cases) to 37 years of age.

Group 1: Cardiomyopathy 49 cases. Dilated cardiomyopathy (DCM) 30. In that ALSTROM syndrome are 5. 16 cases are Hypertrophic cardiomyopathy and 5 are LV non compaction cardiomyopathy. 3 are of fetal diagnosis. Mortality is high in DCM arm.

Group 2: Channelopathy 29 cases. Major history was sudden sibling death which probed the diagnosis. Hearing loss and seizure like episodes are next common. In 6 families other than index child gene was positive in remaining family members. All started on beta blockers only 3 received Mexiletine also. One case had mortality. Gene specific therapy mainly in Long QT3 benefited the children.

Group 3: Aortopathy 16 cases. 2 were fetal diagnosis (FBN2 & EFEMP2 Cutis laxa type II). 12 are positive for Marfan syndrome and 2 for arterial tortuosity syndrome. EMILIN gene involvement caused a Novel mutation involving arterial tree and also urogenital system.

Group 4: Miscellaneous 16. Includes deletion, duplication and point mutations.3 families BMPR2 gene positive.

Conclusions:
Genetic evaluation is useful to diagnose and prognosticate the patients in suspected or symptomatic cases.Family screening is needed. Dedicated genetic clinics will provide the database for the future and further studies in the subset of population.

POSTER PRESENTATIONS

Category: Cardiogenetics

1878 - MUTATION IN SARCOMERIC GENES TNNI3 IN PEDIATRICS CAUSE OF RESTRICTIVE CARDIOMYOPATHY

Alejandra Vazquez Jimenez [1], Sheila Vania Sánchez López [2], Israel García Dávalos [2], David Salazar Lizarraga [2], Horacio Marquez Gonzalez [2], Diana Lopez Gallegos [2], Jaime Alfonso Santiago Hernández [2], Carlos Riera Kinkel [3], Lucelli Yañez Gutierrez [2]
Imss, Pediatrics Cardiology, México-Mexico [1] Imss, Cardiology, México-Mexico [2] Imss, Cardiovascular Surgery, México-Mexico [3]

Background / Hypothesis:
Restrictive cardiomyopathy is the least common of inherited cardiomyopathy and also in childhood. It involves mutations in sarcomeric genes, especially TNNI3 (encoding troponin I). It is characterized by severe diastolic dysfunction with normal systolic function.

Materials and Methods:
We present the case of a 5-year-old female patient with symptoms of heart failure, as well as a family history of unknown heart disease and sudden death, who was genetically diagnosed with a mutation in a sarcomeric gene.

Case Report:
A 5-year-old female toddler presented with symptoms in infancy, with only sweating during breastfeeding. This showed no impact on neurodevelopment and remained in Ross functional class II. At age 4, clinical manifestations of right heart failure began, with overload, deterioration in functional class, and desaturation up to 87%. Chest X-ray revealed cardiomegaly. Transthoracic echocardiography confirmed a diagnosis of restrictive cardiomyopathy with preserved biventricular function and biventricular diastolic dysfunction with dilated atria and mild tricuspid regurgitation. Laboratory studies revealed no abnormalities, so a genetic study was performed, confirming a mutation in the TNNI3 sarcomeric gene.

Results:
The TNNI3 gene encodes the cardiac troponin I protein, located exclusively in cardiac myocytes. The troponin complex is associated with the sarcomere and, therefore, muscle contraction. Restrictive cardiomyopathy progresses to dysfunction, with preserved systolic function in the initial stage. Ventricular stiffness progressively leads to diastolic dysfunction, thus increasing atrial pressure and subsequent hypertrophy and possible arrhythmias.

Conclusions:
Restrictive cardiomyopathy is usually considered idiopathic. In this case, the specific TNNI3 mutation was identified through genetic testing, which directly confirms the cardiac condition and thus excludes the need for an invasive procedure such as heart biopsy.

POSTER PRESENTATIONS

Category: Cardiogenetics

1943 - IDENTIFICATION OF A NOVEL ACTC1 VARIANT CAUSING INTRON RETENTION IN CARDIOMYOPATHY

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Background / Hypothesis:
Pediatric cardiomyopathy is a rare disease and the most common cause of heart failure in children. Despite the pediatric cardiomyopathy has genetically heterogeneous and serious outcomes, the genetic information is still poorly characterized.

Materials and Methods:
Utilizing the pathogenicity score, inheritance mode and whole exome sequencing to find the possible disease-related mutation. We use the minigene system to test the mutation, and use the apoptosis assay and immunofluorescence to test the effect of the mutation on cardiomyocytes in neonatal mice.

Results:
A splicing mutation (NM_005159.5: c.455-6G>A) in actin alpha cardiac muscle 1 (ACTC1) was identified in a female cardiomyopathy infant. The ACTC1 mutation (NM_005159.5: c.455-6G>A) may affect its protein function, which may play crucial roles for this pedigree. We constructed with two kinds of minigene to test the splicing effect, and found that the ACTC1 mutation causes the intron 3 to retain four nucleotides, which may result in premature termination of the codon PTC in exon 4 of the ACTC1 gene. The ACTC1 gene mutation increases the apoptosis in cardiomyocytes.

Conclusions:
Our results indicate that ACTC1 mutation may be involved in cardiomyopathy and should be screened in prospective clinical practice.

POSTER PRESENTATIONS

Category: Cardiogenetics

2034 - MIPEP NOVEL RECESSIVE VARIANT CAUSING CARDIOMYOPATHY SEIZURES AND CHILDREN DEATH A CASE REPORT

Yu Zhu [1], Yaping Mi [1]
Children's Hospital Of Fudan University, Cardiovascular Center, Shanghai-China [1]

Background / Hypothesis:
Mutations in the mitochondrial intermediate peptidase (MIPEP) gene can cause impaired function of the heart, brain and other organs.

Materials and Methods:
We collected and analyzed the clinical data of a child diagnosed with combined oxidative phosphorylation deficiency type 31 caused by a novel homozygous recessive mutation in the MIPEP gene, who was presented with cardiomyopathy as the initial symptom. This report details the patient's clinical presentation, diagnostic examinations and subsequent treatment.

Results:
We present the case of a girl who exhibited dilated cardiomyopathy, heart failure, developmental delay, and subsequently experienced epileptic seizures and multiple organ failure. Whole-exome sequencing revealed that she had a homozygous recessive mutation in the MIPEP gene.

Conclusions:
Mitochondrial dysfunction can affect single or multiple organs. In cases of cardiomyopathy or heart failure with no identifiable cause, mitochondrial disease should be considered as a potential diagnosis. Furthermore, cooperating with Clinical Genetics, Neurology, and other relevant departments is necessary for a comprehensive approach to diagnosis and treatment.

POSTER PRESENTATIONS

Category: Cardiogenetics

2040 - UNTANGLING THE ROLES OF TOP3A IN DNA METHYLATION AND CARDIOMYOCYTE DIFFERENTIATION.

Jiajun Ye [1], Yongxuan Peng [1], Liqing Zhao [1], Shengfang Bao [1], Kun Sun [1], Sun Chen [1], Yuejuan Xu [1]
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Background:
Dilated cardiomyopathy (DCM), characterized by left ventricular enlargement and systolic dysfunction, represents a leading cause of pediatric heart failure and sudden cardiac death, whose pathogenesis remains elusive. Here, we aimed to investigate the role of TOP3A, a type IA topoisomerase, in DCM pathogenesis and dissected the associated molecular mechanisms.

Methods:
Whole-exome sequencing identified compound heterozygous TOP3A variants (c.315-2A>G and p.R225Q) in a child with DCM. To assess the pathogenicity of the variants, we performed functional validation, including minigene splicing assay and Seahorse XF Analyzer-based mitochondrial respiration assays. To evaluate the impact of TOP3A on cardiomyocyte differentiation, we established knockdown cell lines and a P19CL6 mouse embryonal carcinoma differentiation model capable of generating beating cardiomyocyte-like cells. Following successful differentiation, we performed multi-omics analyses (transcriptomics, metabolomics, and methylation sequencing) to elucidate the molecular mechanisms underlying Top3a deficiency.

Results:
The splice-site variant (c.315-2A>G) induced exon skipping and a premature termination codon (p.W105*), while p.R225Q disrupted the Toprim domain, both of which impaired mitochondrial function marked by reduced mitochondrial DNA (mtDNA) copy number and diminished oxidative phosphorylation capacity. Deficiency of TOP3A provokes lethal effects in AC16 and HL-1 cardiomyocytes. Cardiomyocyte differentiation system analysis revealed that TOP3A deficiency drove differentiation defect through a metabolic-epigenetic coupling mechanism: TCA cycle metabolite imbalances (α-KG depletion, elevated SAM/SAH ratio) and dysregulated DNA methylation dynamics (TET1 suppression, DNMT1-UHRF1 activation) synergistically induced promoter hypermethylation of cardiac transcription factors (TBX5, GATA4). Mechanistically, TOP3A deficiency-induced mitochondrial damage provoked mtDNA leakage, activating cGAS-STING-dependent STAT3 phosphorylation to reshape the DNA methylation landscape. Notably, mitochondrial-targeted TOP3A reconstitution rescued mitochondrial ROS overproduction, attenuated DNA damage markers, and reduces cellular DNA methylation levels.

Conclusion:
Our study uncovers TOP3A play an important role in cardiomyocyte differentiation, its deficiency leads to mitochondrial dysfunction, metabolic perturbations and disrupted epigenetic homeostasis. These findings suggest that TOP3A variants contribute to DCM pathogenesis.

POSTER PRESENTATIONS

Category: Cardiogenetics

2056 - RESULTS OF GENETIC TESTING IN CONGENITAL HEART DISEASE PATIENTS FROM SOUTHERN AFRICA

Timothy Spracklen [1], Thomas Aldersley [1], John Lawrenson [1], George Comitis [1], Barend Fourie [2], Andre Brooks [1], Rik De Decker [1], Fenny Shidhika [3], Bernard Keavney [4], Liesl Zühlke [1]
University Of Cape Town, Department Of Paediatrics And Child Health, Cape Town-South Africa [1] Stellenbosch University, Department Of Paediatrics And Child Health, Cape Town-South Africa [2] Windhoek Central Hospital, Department Of Cardiology, Windhoek-Namibia [3] University Of Manchester, Faculty Of Biology, Medicine And Health, Manchester-United Kingdom [4]

Background / Hypothesis:
The burden of congenital heart disease (CHD) falls heavily on low- and middle-income countries. Although it has been shown that a genetic diagnosis can have implications on management, the genetics of CHD in African populations is not well understood. Here we investigated genetic causes of CHD in patients from Southern Africa, with the hypothesis that disease-causing variants will be identified in a subset of patients from our setting.

Materials and Methods:
A total of 361 participants with diverse CHD phenotypes were recruited from paediatric and adult cardiology services in South Africa and Namibia. Patients with known genetic syndromes were excluded. Exome sequencing was used to screen all patients for pathogenic variants in established CHD genes. Variants of uncertain significance were considered reportable if they were rare, damaging, and occurred in patients with similar clinical features to other described mutation carriers.

Results:
We identified 39 pathogenic or likely pathogenic variants in 38 patients (variant yield: 10.5%). There was a high rate of uncertain genetic findings (79.5%). Of these, a further 36 (10%) had strong pathogenic potential. Patients with extracardiac involvement were no more likely to have a reportable genetic finding than those with isolated CHD. However, isolated atrioventricular septal defects and left-sided lesions were significantly more likely to generate a genetic finding. We observed 32 new genotype-phenotype correlations, including 11 new genes for conotruncal defects, mainly Tetralogy of Fallot, and 7 new genes for left-sided lesions.

Conclusions:
A genetic cause of disease can be identified in up to 20% of Southern African CHD patients, in accordance with findings in international CHD studies. Avenues for future research will include determining any associations between identified variants and patient outcomes, and considering the role of common genetic variation in CHD.

POSTER PRESENTATIONS

Category: Cardiogenetics

2070 - A NOVEL FRAMESHIFT VARIANT IN NADSYN1 GENE ASSOCIATED WITH VERTEBRAL CARDIAC RENAL AND LIMB DEFECTS SYNDROME 3

Marisa Rodrigues [1], *Ana Luísa Costa* [1], Ana Grangeia [2], Miguel Leão [2]
Uls São João, Pediatric Cardiology, Porto-Portugal [1] Uls São João, Genetics, Porto-Portugal [2]

Introduction
Nicotinamide adenosine dinucleotide (NAD) synthetase 1, encoded by NADSY1 gene, is responsible for the last step in NAD biosynthesis, whose alterations impair cell metabolism and embryogenesis. We report a case of a 17yo girl with spondylocostal dysostosis (SCDO), aortic coarctation (CoA) and renal failure.

Clinical Case
Third child born to healthy and non-consanguineous parents with irrelevant family history. Fetal karyotype performed due to advanced maternal age was normal. The newborn was admitted to NICU on D2 of life due to suspected congenital heart disease. Postductal CoA was confirmed and surgically corrected at D5. She developed acute renal failure on the same day, progressing to end-stage renal disease. Thorax X-ray showed cervical and dorsal hemivertebrae with rib deformity of the left hemithorax. After discharge, she has multidisciplinary follow-up. At age 5, she had her first genetic evaluation. Vertebral MR presented thoracic convexity scoliosis globally anomalous thoracic vertebrae with butterfly wing morphology. Additionally, right deafness and left transmission hypoacusis were diagnosed. Molecular studies of DLL3, MESP2, LFNG, HES7, JAG1 genes and aCGH were normal. At 15yo, she underwent surgery to correct severe scoliosis. Clinical exome was inconclusive. Recent reanalysis revealed 2 variants in apparently compound heterozygosity in NADSYN1 gene (NM_018161.5): c.1481_1484del (p.Tyr494Cysfs*5) and c.1717G>A (p.(Ala573Thr), allowing the diagnosis of NADSYN1-associated vertebral, cardiac, renal, and limb defects (VCRL) syndrome 3 with autosomal recessive inheritance. The variant c.1717G>A was inhereted from the mother. It was not possible performed segregation analysis in the father.

Discussion
The association of bi-allelic pathogenic variants in NADSYN1 with multisystemic presentation (vertebral, cardiac, renal and limb abnormalities) was described by Szot et al. (2020). Only 23 clinical cases of NADSYN1-associated VCRL syndrome 3 have been published (Szot et al., 2024). The frameshift variant c.1481_1484del has never been reported. This work expands the genetic spectrum of NADSYN1-associated VCRL syndrome 3.

POSTER PRESENTATIONS

Category: Cardiogenetics

2077 - MED24 COLLABORATING WITH YBX1 REGULATES GENE TRANSCRIPTION DURING CARDIAC DEVELOPMENT

Chen Zheng [1], Yiwei Niu [1], Sun Chen [1]
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Background / Hypothesis:
The mediator is a highly conserved protein complex in mammals, involved in gene transcription by interacting with RNA Polymerase II and specific transcription factors. MED24, located at the tail module of mediator, has been known essential for embryonic cardiac development, while its underlying molecular mechanisms remain unclear. This study aims to investigate the cofactor and targets of MED24 governing the cardiac development.

Materials and Methods:
MED24 knockout mice were generated to figure out its role during embryonic cardiac development. MED24-knockdown HUVECs were generated to elucidate its functional role in vitro. RNA sequencing, qPCR, western blot and luciferase assays were used to identify its targets. IP-MS, immunofluorescence and CoIP were used to identify the key transcription factor interacting with MED24. MED24 mutations were screened in CHDs patients by whole-exon sequencing.

Results:
MED24-/- mice exhibited embryonic lethal during E8.5~E11.5. Dissection of MED24+/- embryonic hearts revealed decreased proliferation capacity at E11.5, and atrial septal defects and ventricular septal defects at E14.5. In vitro, MED24-knockdown HUVECs showed decreased proliferation and enhanced migration ability. RNA sequencing and western blot showed that MED24 deficiency suppressed cell cycle regulators (CCNB1, MMP9), and upregulated EMT transcriptional factors (ZEB1, ZEB2). IP-MS, CoIP confirmed the direct binding of MED24 and YBX1. Luciferase assays showed MED24 inhibited the transcriptional activation of YBX1 on ZEB1/2 promoters, while MED24 and YBX1 syngenetic activated the expression of CCNB1 and MMP9 promoters. Additionally, five MED24 variants were identified in CHDs children by whole-exon sequencing. Compare with wild-type MED24, all variants showed reduced expression level and enhanced migration capacity. Our results suggest that MED24 variants are involved in the pathogenesis of CHDs.

Conclusions:
MED24 modulates the proliferation and migration ability of the cardiac cells through collaborating with YBX1. MED24 loss-of-function is the cause of CHDs in mouse and human.

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Category: Cardiogenetics

2092 - EPIDEMIOLOGIC STUDY OF PAEDIATRIC GENETIC CARDIOMYOPATHY IN SOUTH KOREA

Hye Won Kwon [1], Mi Kyoung Song [2], Eun Jung Bae [2], June Huh [3], Ja Kyoung Yoon [3], Ah Young Kim [4], Chang Sin Kim [4], Mi Jin Kim [5], Ji Eun Ban [6], Hee Joung Choi [7], Min Jung Cho [8], Hwa Jin Choi [9], Insu Choi [9], Jihye You [10], Jong Hee Byun [11], Heirim Lee [12], Jae Yoon Na [13], Luchy Youngmin Eun [14], Young-tae Lim [15], Joowon Lee [16]

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Background / Hypothesis:
Paediatric cardiomyopathy is a rare but serious condition contributing significantly to childhood morbidity and mortality. In Korea, data on hereditary forms remain limited. This study aimed to characterise the clinical and genetic spectrum of pediatric cardiomyopathy using a nationwide, multicentre cohort.

Materials and Methods:
We conducted a retrospective analysis of patients aged ≤18 years diagnosed with cardiomyopathy between 2000 and 2022 at 21 tertiary centres in South Korea. After de-duplication, 1227 patients were included. Clinical data, genetic testing results, and outcomes were analysed by cardiomyopathy subtypes.

Results:
The cohort had a male predominance (65.2%), and mean age at diagnosis was 7.8 ± 6.6 years. Subtype distribution was dilated cardiomyopathy (63.4%), hypertrophic (27.6%), restrictive (3.6%), left ventricular non-compaction (4.2%), and arrhythmogenic right ventricular dysplasia (1.2%). Of symptomatic patients, cardiac symptoms were present in only 17.2%; respiratory (31.1%), gastrointestinal (25.1%), and non-specific systemic symptoms (26.6%) were more common. Genetic testing was performed in 694 patients (56.6%) and yielded pathogenic or likely pathogenic variants in 86.5%. DCM and HCM had the highest diagnostic yield. Notably, patients with positive genetic results had a significantly higher survival (hazard ratio 2.876, $P < 0.001$). Overall, survival rate was 61%, with transplantation in 11%, death in 15%, and loss to follow-up in 13%.

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Conclusions:
This large-scale, nationwide study highlights the clinical and genetic heterogeneity of paediatric cardiomyopathy in South Korea. The findings underscore the prognostic value of genetic testing and suggest that early genetic diagnosis may facilitate timely intervention and improved outcomes. These results can inform clinical practice and guide future risk stratification and management strategies.

POSTER PRESENTATIONS

Category: Cardiogenetics

2109 - INNOVATIVE CLINICAL TREATMENT SYNERGIZED WITH CARDIAC DISEASE MODELING IN NOONAN SYNDROME

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Background / Hypothesis:
Noonan syndrome occurs in 1/1000 to 1/2500 individuals, with a variable disease spectrum that requires personalized treatment. While targeted therapies have been reported, clinical trials to evaluate their safety, efficacy, and dosing are challenging due to the rarity of the condition. This project aimed to implement novel therapies in the clinic while modelling the disease in vitro.

Materials and Methods:
A girl with Noonan syndrome (c.244T>A, p.(F82I) in the RIT1-gene) presented at birth with hypertrophic cardiomyopathy (HCM) and pulmonary stenosis. She was treated with beta-blockers, pulmonary balloon dilation, followed by a septal myectomy at age nine. By age 15-16, she developed chylothorax and thereafter abdominal chylous, unresponsive to treatments, requiring repeated drainage and prolonged hospital stays. At 17, she was cachectic, weighing only 42 kg. In June 2024, experimental treatment with trametinib targeting the RAS/ mitogen activated protein kinase pathway was started. Cardiomyocytes differentiated from a reprogrammed skin biopsy of the patient and her healthy mother were generated in parallel.

Results:
On trametinib 1 mg/day, she no longer required chylous drainage. Her well-being improved, and her weight increased to 52 kg by October. She attended school uninterruptedly from August. After a dose adjustment to 0.75 mg daily due to acne and hair loss, her side effects subsided. In March 2025 MRI showed that the cardiac wall thickness had decreased by 20%, and cardiac function was improved (echocardiographic measures, Table 1A). All pericardial, pleural, and abdominal fluids were resolved. Gene expression analysis of the disease model supports the treatment effect while organoid growth explains cardiac hypertrophy in the patient (Table 1BC).

Conclusions:
The MEK 1/2-inhibitor trametinib was effective in the treatment of HCM and chylous effusions in a patient with Noonan syndrome. Disease modelling demonstrated that treatment with Trametinib effectively reduced gene expression differences of RIT regulated genes between the patient and control samples.

POSTER PRESENTATIONS

Category: Cardiogenetics

2120 - PROGNOSTIC VALUE OF MUTATION GENES AND LGE PATTERNS IN PEDIATRIC GENETIC CARDIOMYOPATHY

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Background:
The "2023 ESC Guidelines for the Management of Cardiomyopathies" emphasized the significance of Late Gadolinium Enhancement (LGE) and genotype in diagnosing and predicting the prognosis of cardiomyopathy. However, the prognostic implications of LGE and genotype in pediatric cardiomyopathy remain unclear. This study aims to investigate the prognostic roles of mutation genes and LGE patterns in pediatric genetic cardiomyopathy.

Methods:
This retrospective study included 75 children aged 0-18 years with five common cardiomyopathy phenotypes who underwent genetic testing and enhanced cardiac magnetic resonance imaging from 2016 to 2023. Data on conventional cardiac function parameters, LGE patterns, and cardiomyopathy-related gene mutation types were collected. Mutations were classified according to the American College of Medical Genetics and Genomics (ACMG) guidelines and gene function. The presence of desmosomal gene mutations was also noted. Major Adverse Cardiovascular Events (MACE) were defined as sudden cardiovascular death, aborted sudden cardiovascular death, malignant arrhythmia, Implantable Cardioverter Defibrillator shock, and heart failure readmission within five years of follow-up. Cox regression analysis was performed for MACE.

Results:
The mean follow-up duration for the 75 children was 27.4 months. The primary MACE event was heart failure readmission (20/27). Notably, no significant association was found between ACMG-classified P/LP gene mutations and MACE. However, energy metabolism-related gene mutations emerged as a risk factor for heart failure readmission (HR=3.66, 95% CI: 1.32-10.16, p=0.013). Combinations pattern LGE (HR=2.83, 95% CI: 1.15-6.98, p=0.024) and RV insertion pattern LGE (HR=3.11, 95% CI: 1.43-6.75, p=0.004) were identified as risk factors for MACE. Upon model inclusion, LVEF ≤ 35%, desmosomal gene mutation, and RV insertion pattern LGE were independent risk factors for MACE, with a C-index of 0.710 and a C-index Standard Error of 0.048 (Figure 1 & 2).

Conclusion:
This study suggested that genotype, cardiac systolic function, and LGE patterns might collectively play predictive roles in the prognosis of pediatric cardiomyopathy.

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Category: Cardiogenetics

2124 - CLINICAL CHARACTERISTICS OF THAI FAMILIES WITH KCNQ1 C.1032 G>C MUTATION

Katenipa Sinsupan [1], Ankavipar Saprungruang [1], John Mauleekoonphairoj [2], Boosamas Sutjaporn [2], Yong Poovorawan [2], Apichai Kongphatthanayothin [1], *Sarin Lekchuensakul* [1]
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Background / Hypothesis:
The KCNQ1 c.1032 G>C mutation is the most common variant found in patients with congenital long QT syndrome (LQTS) type 1 in our cohort. This variant was identified in three unrelated Thai families. While its pathogenicity has been previously established, detailed clinical descriptions remain limited.

Materials and Methods:
This study aimed to characterize the clinical features of family members from three families carrying the KCNQ1 c.1032 G>C mutation. Family tracing was performed for all three probands, and Sanger sequencing was used to identify mutation carriers. Clinical data were collected for both genotype-positive and genotype-negative individuals. Key comparisons included the longest baseline QTc, clinical symptoms, and outcomes related to arrhythmic syncope or sudden death. The utility of QTc interval in screening for mutation carriers was also evaluated.

Results:
Twenty-seven individuals from three families were included, with 11 (40.7%) male and a mean age of 45.3±19.3 years. All families were located in the central-lower northeastern regions of Thailand. Sixteen individuals (59.3%) carried the KCNQ1 c.1032 G>C mutation. None of the carriers had a QTc below 450 msec. A QTc threshold of 460 msec identified mutation carriers with 93% sensitivity and 100% specificity. The earliest onset of syncope occurred at age 11. Symptoms suggestive of ventricular arrhythmia were observed in 7 individuals (26.0%), all were female.

Conclusions:
We identified three unrelated Thai families with the KCNQ1 c.1032 G>C mutation, geographically clustered in central-lower northeastern Thailand. A QTc cutoff of 460 msec demonstrated high diagnostic accuracy for detecting mutation carriers. Compared to classical LQTS type 1, affected individuals in this cohort experienced symptoms later in life and predominantly in females, suggesting potential genotype-specific phenotypic variation.

Category: Cardiogenetics

2190 - ECMO SAVED AN EARLY ONSET ALSTRÖM SYNDROME INFANT A CASE REPORT AND GENETIC ANALYSIS

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Children's Hospital Of Soochow University, Cardiology, Suzhou-China [1]

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Background / Hypothesis:
Alström syndrome is a rare autosomal recessive disorder caused by mutations in the ALMS1 gene, characterized by retinopathy, hearing loss, obesity, and diabetes mellitus, and classified as a ciliopathy. This study reports a case of Alström syndrome with early-onset, rapidly progressive yet reversible cardiac dysfunction to enhance clinical understanding of this disease.

Materials and Methods:
We retrospectively analyzed the clinical data of a 3-month-old infant with Alström syndrome, including medical history, physical examination, laboratory tests, echocardiography, and genetic testing results. Whole-exome sequencing was performed for genetic analysis, with parental origins verified by Sanger sequencing.

Results:
At 1 month of age, the infant presented with sudden onset of tachypnea, grunting, and cyanosis, rapidly progressing to severe respiratory failure accompanied by acute cardiac insufficiency with progressive worsening, requiring mechanical ventilation and ECMO support. After treatment, the patient improved and was discharged with normalized respiratory and cardiac function. At 3-month follow-up, cardiac enlargement and decreased cardiac function were detected, though without significant clinical symptoms.
No typical Alström syndrome features were observed.Whole-exome sequencing revealed compound heterozygous mutations in the ALMS1 gene:
1. Paternal mutation (chr2:73681101, c.7444dupG:p.Val2482Glyfs*8): A G insertion causing frameshift mutation leading to premature protein termination. 2. Maternal mutation (chr2:73718235_73718236, c.9148_9149del: p.Cys3051Serfs*9): A dinucleotide deletion resulting in frameshift mutation and protein truncation.

Conclusions:
This case presented with acute respiratory failure and unexplained cardiac insufficiency in infancy as initial manifestations, lacking typical Alström syndrome features. Subsequent follow-up revealed cardiac enlargement and functional decline, making it prone to misdiagnosis as idiopathic cardiomyopathy. This suggests that hereditary syndromes should be considered in infants with unexplained heart failure, even in the absence of typical manifestations. Both mutations were frameshift variants causing ALMS1 protein function loss, consistent with autosomal recessive inheritance. Early diagnosis of Alström syndrome facilitates monitoring of visual, auditory, metabolic, and endocrine abnormalities for optimized long-term management.

POSTER PRESENTATIONS

Category: Cardiogenetics

2266 - RARE CASES OF TWO IDENTICAL TWIN SISTERS BOTH SEVEN YEARS OLD EXHIBITING SIGNIFICANT DILATION OF THE AORTA AND PULMONARY ARTERY ASSOCIATED WITH LOEYS DIETZ SYNDROME (LDS).

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Background / Hypothesis:
Loeys-Dietz syndrome(LDS)is a rare autosomal dominant genetic connective tissue disorder. It shares features with Marfan syndrome (MS) and Ehlers–Danlos syndrome (ED). The disorder is characterized by aneurysms in the aorta, which often occur in children, and the aorta may also experience sudden dissection due to the weakened layers of its wall.

Materials and Methods:

Two 7-year-old identical twin girls presented with a prominent aortic shadow on X-rays taken prior to strabismus surgery. The twins are tall and exhibit disproportionately long, slender limbs, with thin, weak wrists and elongated fingers and toes. They also display signs of scoliosis, pectus excavatum, joint hypermobility, flat feet, strabismus, widely spaced eyes, and a split uvula. Chest CT revealed marked dilation of the sinus of Valsalva and the proximal aorta, An echocardiogram performed on the second girl showed significant dilation of the aorta and the sinus of Valsalva (z=7.67), as well as the proximal portion of the ascending aorta. Mild AR and mild MR were also noted. The first girl exhibited identical clinical findings, but with less dilation of the aortic valve (z=4.58) and greater dilation of the pulmonary valve (z=4.60).

Results:
Initially suspected of having MS, FBN1 gene analysis returned negative results. The next step involved performing a NGS gene panel under the suspicion of LDS, which revealed pathogenic variants in the TGFBR2 gene in both twins, thereby confirming the diagnosis of LDS. Currently, both patients are receiving beta blockers and ARBs to mitigate the risk of sudden death due to a high likelihood of aortic aneurysm rupture.

Conclusions:
We report rare cases of two identical twin siblings with LDS. Chest CT and echocardiography confirmed severe dilation of the aorta and pulmonary arteries, and genetic testing identified pathogenic variants in the TGFBR2 gene, confirming the diagnosis of LDS. The patients are currently being monitored.

POSTER PRESENTATIONS

Category: Cardiogenetics

2285 - CONGENITAL HEART ANOMALIES IN PATIENTS WITH DIGEORGE SYNDROME A SINGLE CENTER EXPERIENCE

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Background / Hypothesis:
DiGeorge syndrome (22q11 deletion) is one of the most common genetic mutations, occurring in approximately 1 in 4,000 live births. It presents with a wide range of clinical manifestations and is frequently associated with congenital heart anomalies. This study aimed to evaluate congenital cardiac anomalies in patients diagnosed with DiGeorge syndrome and followed up in our pediatric cardiology outpatient clinic.

Materials and Methods:
Patients diagnosed with DiGeorge syndrome based on genetic testing and examined or followed up at least once in the pediatric cardiology outpatient clinic between March 2018 and April 2025 were retrospectively reviewed through hospital records. Clinical and echocardiographic findings of the patients were analyzed.

Results:
This study included 22 patients—13 boys and 9 girls. The majority of cardiac pathologies were conotruncal anomalies (36%). Five patients had no cardiac pathology. The cardiac anomalies are shown in Table 1. Thirteen patients (50%) underwent surgery due to cardiac pathology. Other systemic pathologies and frequent infections were also observed in the cases.

Conclusions:
In patients with DiGeorge syndrome, congenital cardiac pathologies often accompany other systemic abnormalities. Some of these require cardiac intervention and continuous cardiological follow-up. Multicenter studies with larger cohorts are recommended for further investigation.

Keywords:
DiGeorge Syndrome, Congenital Cardiac Anomaly, Conotruncal Anomalies.

POSTER PRESENTATIONS

Category: Cardiogenetics

2334 - LONG QT SYNDROME IN AN ASYMPTOMATIC CHILD WITH LMNA E TTN MUTATION. A CONSTANTLY EVOLVING DISEASE

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Background / Hypothesis:
Long-QT syndrome (LQTS) frames are responsible for the majority of cases of sudden death (SD) in structurally normal hearts. The advancement of precision medicine and the greater use of Exoma increasingly highlight overlapping patterns between electrical and myocardial genetic diseases. LMNA mutations are associated with dilated cardiomyopathy, ventricular arrhythmia, bradycardia, and advanced atrioventricular block. TTN mutations are also associated with dilated cardiomyopathy. So far, these genes are not associated with LQTS.

Materials and Methods:
Report a case of a child with LQTS phenotype, high probability Schwartz score, and probably pathological mutations in the LMNA and TTN genes in the absence of dilated cardiomyopathy.

Results:
Male, 7 years old, no history of familial MS, with autism spectrum disorder, no cardiological complaints. In pre-use evaluation of medication for
autism spectrum disorder, QTc prolongation and bradycardia were observed. It showed QTc 563 ms and variable HR (70 to 100) in several electrocardiographic evaluations. The assigned Schwartz score was 3.5. The echocardiographic and electromyographic evaluation did not show cardiac or muscular disease. The genetic evaluation by Exoma showed probably pathogenic variant in LMNA (associated with dilated cardiomyopathy and muscular dystrophy) and TTN (associated with hypertrophic cardiomyopathy and muscular dystrophy). We prescribed propranolol 3 mg kg day, spironolactone 1 mg kg day and magnesium replacement 50 mg kg day. The parents were warned about alarm signals, medications that prolong QTc. They have been trained in basic life support. A family genetic evaluation is underway.

Conclusions:
1) LQTS has a broad clinical and genetic spectrum and its studies are constantly evolving;
2) New genetic variants are possible, and overlapping frames will become more frequent with the evolution and popularization of genetic tests;3) The patient approach should be multidisciplinary and include genetic orientation, pharmacological, and psychological support.
4)CPR training is essential for all people that take care of this kids

POSTER PRESENTATIONS

Category: Cardiogenetics

2413 - MECHANISM OF PDE4DIP REGULATING MITOCHONDRIA IN THE PATHOGENESIS OF LVNC

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Background / Hypothesis:
Left Ventricular Non-compaction (LVNC) is a common hereditary cardiomyopathy phenotype in children, with severe clinical symptoms and poor prognosis. We previously revealed that the mitochondria in human-induced pluripotent stem cells-cardiomyocytes (hiPSC-CMs) derived from LVNC were obviously abnormal, and the expression of newly screened susceptibility gene PDE4DIP was significantly increased, so it was suggested that the mitochondrial abnormality caused by PDE4DIP upregulation might be a key event in the pathological process of LVNC.

Materials and Methods:
Compared PDE4DIP expression (qPCR, WB, IF) and mitochondrial structure/function (TEM, live staining - JC1, MitoTracker, TMRE, DCFH; mitochondrial respiration - Seahorse) in control vs. LVNC child-derived hiPSC-CMs. Performed PDE4DIP knockdown (siRNA) in patient cells and reassessed mitochondria.

Results:
1. PDE4DIP mRNA/protein significantly increased in LVNC hiPSC-CMs.
2. LVNC mitochondria exhibited structural abnormalities (increased vacuolation, reduced matrix, sparse cristae via TEM) and functional deficits: decreased mitochondrial content (TOM20 IF), increased JC-1 monomer/polymer ratio (depolarization), reduced basal/maximal respiration, and lower ATP.
3. Knocking down PDE4DIP in patient cells improved mitochondrial function: decreased JC-1 monomer/polymer ratio & DCFH (reduced ROS), increased MitoTracker RED (content) & TMRE (membrane potential).

Conclusions:
1. PDE4DIP upregulation is implicated in LVNC pathogenesis.
2. Mitochondria in pediatric LVNC patient hiPSC-CMs are structurally and functionally impaired.
3. PDE4DIP knockdown rescues mitochondrial functional deficits, confirming its causal role.

POSTER PRESENTATIONS

Category: Cardiogenetics

2414 - STUDY OF GENETIC VARIATIONS IN PEDIATRIC DCM PATIENTS IN A TERTIARY CARE HOSPITAL IN EASTERN INDIA A POPULATION BASED STUDY

Dr Jayitri Mazumdar Jayi [1]
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Background / Hypothesis:
Familial involvement: common in DCM
>40 genes have been implicated in causing disease.
Role of genetic testing in clinical practice is not well defined.
We examined the experience of clinical genetic testing in a diverse DCM population to characterize the prevalence and predictors of gene mutations.

Materials and Methods:
We studied 16 pediatric DCM index patients referred to pediatric cardiology OPD for clinical as well as genetic evaluation.
Up to 10 genes were analyzed (MYH7, TNNT2, TNNI3, TPM1, MYBPC3, ACTC, LMNA, PLN, TAZ, and LDB3), and 70% of patients were tested for all genes. The age range was 6month to 12 years, and 10% had a family history of DCM or sudden cardiac death.
Rigorous criteria were used to classify DNA variants as clinically relevant (mutations), variants of unknown clinical significance (VUS), or presumed benign.

Inclusion criteria:
All pediatric patients with DCM (6 month to 18 yrs), within the time period of the study.
Exclusion criteria: Patients presenting outside the age range.
Study period: Sept 2018-- Aug 2021
Study intervention: No
Sample size: 16 DCM patients
Study type: Cross sectional hospital based study.

Results:
Among the 15 cases of idiopathic DCM that were analysed for genetic variation, it was observed that 25% of them are carrying pathogenic variations in one or more genes as has been tabulated in Table 1.

Conclusions:
The variation type “VOUS” of variations of uncertain significance are called as uncertain because they do not have any previous reports of any kind of significance. But, the TAF1A gene mutation producing “P.Gln1276Ter” was found as homozygous in the patient, in such cases parental segregation studies along population based studies are further required to establish the “pathogenic” status instead of “VOUS” status. Therefore, more genetic investigations are needed ultimately.

POSTER PRESENTATIONS

Category: Cardiogenetics

2439 - THE ROLE OF GENE POLYMORPHISM IN HEMOSTATIC DISORDERS IN CHILDREN UNDERGOING CARDIAC SURGERY

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Background / Hypothesis:
Thrombotic complications are more common in pediatric patients with congenital heart disease compared to healthy ones. Heart failure, chronic hypoxia and hereditary predisposition are risk factors of coagulation disorders. The porpose of the study was to evaluate the prevalence of hemostasis gene polymorphism and their role in thrombotic events in children under- going cardiac surgery.

Materials and Methods:
A prospective single center case-controlled study included 179 pediatric patients after on-pump cardiac surgery. Thrombotic events occurred in 42 patients (the main group). Polymorphism of genes F2_20210_G>A, F5_1691_G>A, F7_10976_G>A, FGB_455_G>A, ITGA2_807_C>T, ITGB3_1565_T>C, PAI-1 was investigated. Serum concentration of plasminogen activator inhibitor 1 (PAI-1) was estimated. We analyzed thrombotic events considering color changes, limb swelling, catheter dysfunction and clot verification in vena cava system, as well as blood flow velocity changes according to Doppler ultrasound data.

Results:
Serum PAI-1 concentrations were 44.99±14.52 ng/ml and 25.93±16.02 ng/ml, respectively (p=0.0001; R=0.47). Incidence of heterogeneous mutations F7_10976_G>A was 41.07% and 21.14%, respectively (R=0.207). The Spearman's rank cor- relations with regards to probability of thrombotic events for F13 were low (R= –0.047), ITGA2 — R= –0.055, ITGB3 — R= –0.187.

Conclusions:
Analysis provides obvious prospects for further research of causes of thrombotic events and their incidence in accor- dance with genetic predisposition and other risk factors in neonatal and pediatric patients with congenital heart disease.

POSTER PRESENTATIONS

Category: Cardiogenetics

2455 - TRACKING THE TWIST " A SERIES OF ARTERIAL TORTUOSITY SYNDROME

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Background / Hypothesis:
Arterial tortuosity syndrome is a rare genetic disorder inherited characterized by widespread abnormal twisting and elongation of aorta and medium sized arteries. Involves skin, joints and sometimes urogenital also. We are presenting a series of 4 cases.

Materials and Methods:
We retrospectively collected the data from our cardiac genetic clinic from January 2022 to January 2025. All the clinical details, ECHO, CT angiogram and genetic reports were collected and evaluated.

Results:
In 4 cases (F-2, M-1) one is of fetal diagnosis. Fetal case (22 weeks' gestation) was referred in view of abnormal dilatation of ascending aorta. After careful evaluation we found significant tortuous and elongated ascending aorta and transverse arch. Two females are siblings (Age- 2 years and 6 months respectively) presented with respiratory distress and significant stridor. Another case (male age- 5 years) presented with bilateral hydronephrosis and respiratory distress with skin laxity. Though there are variable presentations mainly respiratory distress due to tortuous vessels compressing airway is common. CT angiogram in all 3 postnatal cases confirmed the diagnosis. Whole exome sequencing confirmed the diagnosis of arterial tortuosity syndrome. Fetal case- EFEMP2 on EXON 5 homozygous mutation causing cutis laxa type 2 which elongates arteries, Sibilings(2nd and 3 rd case)- SLC2A10 on Exon 4 homozygous mutation and the boy had EMILIN gene positive.
Fetal case had termination of pregnancy. Remaining cases are on follow up on beta blockers and angiotensin receptor blockers. No need of any active surgical or transcatheter intervention at present.

Conclusions:
High index of clinical suspicion and detailed anatomical evaluation is needed. Genetics aids in the diagnosis. Parental counselling and family screening helps in understanding the disease pattern.

POSTER PRESENTATIONS

Category: Cardiogenetics

2469 - EPIDEMIOLOGY OF PEDIATRIC INHERITED ARRHYTHMOGENIC DISEASES UNDER REAL WORLD CONDITIONS FINDINGS FROM A TEN YEAR LONGITUDINAL STUDY IN EASTERN AUSTRIA

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Muw, Pediatric Cardiology, Vienna-Austria [1] Nuw, Pediatric Cardiology, Wien-Austria [2]

Background / Hypothesis:

Inherited arrhythmogenic diseases (IADs) such as Long QT Syndrome (LQTS), Brugada Syndrome (BrS), Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC), Catecholaminergic Polymorphic Ventricular Tachycardia (CPVT), and Laminopathies (LP) are rare conditions, in which arrhythmogenic sudden cardiac death (SCD) may occur as the first symptom. We analysed paediatric prevalence data obtained under “Real World” conditions, defined as diagnosis based on clinical symptoms, family history or incidentally written ECGs without screening or registry programmes.

Materials and Methods:
A single centre cross-sectional study was performed over a ten-year period in Eastern Austria. We collected all patients with genetically and/or clinically diagnosed IADs (LQTS, SQT, BrS, CPVT, ARVC and laminopathies) and determined prevalence and paths to diagnosis for each IAD.

Results:
At the most recent reference date (2024/12/31) 112 patients were enrolled, corresponding to a pediatric prevalence of 1:7000 of all IADs. Subgroup analysis revealed a prevalence of 1: 13 000 for LQTS, 1: 22 000 for BrS, 1: 43 000 for ARVC and 1: 368 000 for CVPT.

62% of patients with LQTS were diagnosed after incidentally written ECG, whereas BrS (79%) and ARVC (64%) were mainly diagnosed by family screening.

Conclusions:
This first study on prevalence of pediatric IADS obtained under “Real World” conditions reports significantly lower numbers compared to published data. Our findings on patients’ paths to diagnosis suggest that LQTS patients may benefit from selected age–dependent screening programmes, whereas for BrS and ARVC family screening and intensive collaboration with adult care providers are crucial for diagnosis.

POSTER PRESENTATIONS

Category: Cardiogenetics

2506 - PAEDIATRIC CARDIOMYOPATHY IN NORTHERN IRELAND FROM 2003 2025 CHARACTERISTICS AND CLINICAL OUTCOMES

Scott Kendall [1], Shannon Scott [2], Joy Mccance [2], Peter Mcclung [2], Terence Prendiville [3], Pascal Mckeown [4], Frank Casey [1]
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Background:
Paediatric cardiomyopathy is a rare condition, occurring in approximately 1 in 100,000 children per year. When present, it carries a high risk of morbidity and mortality, contributes to early childhood death, and is a leading indication for paediatric cardiac transplantation. Understanding the clinical and genetic characteristics of affected children within a local population is essential for improving care. Dilated cardiomyopathy (DCM) and hypertrophic cardiomyopathy (HCM) are most common, while restrictive cardiomyopathy (RCM) and arrhythmogenic right ventricular cardiomyopathy (ARVC) are less frequent. Left ventricular non-compaction cardiomyopathy (LVNCC) was reclassified in the 2023 ESC guidelines as a morphological feature rather than a distinct entity. Non-dilated left ventricular cardiomyopathy (NDLVC) is a more recently described subtype.

Methods:
We conducted a retrospective chart review of all paediatric cardiomyopathy cases seen at the Northern Ireland regional Paediatric Cardiology Centre between 2003 and 2025. Data collected included diagnosis, genetic findings, and clinical outcomes (implantable cardioverter-defibrillator [ICD] implantation, transplantation, and death).

Results:
Eighty-five children were diagnosed during the study period: DCM (n=24), HCM (n=39), RCM (n=2), ARVC (n=1), LVNCC (n=12), NDLVC (n=3), and unspecified cardiomyopathy (n=4). The mean age at diagnosis was 6 years. There were 7 deaths, 6 orthotopic cardiac transplants, and 18 ICD implantations. Diagnosis before 1 year of life was associated with a more severe phenotype, accounting for 65% of deaths/transplants, though this did not reach statistical significance (P=0.124). Overall, 60% of patients (n=51) had a genetic variant linked to cardiomyopathy or a phenocopy condition; including sarcomeric variants (54%), mitochondrial conditions (13%) and rasopathies (11%) .

Conclusions:
Paediatric cardiomyopathy, though rare, is associated with substantial morbidity and mortality. Greater understanding of the differing aetiologies across subtypes may support improved risk stratification and targeted management strategies.

POSTER PRESENTATIONS

Category: Cardiogenetics

2529 - HETEROGENEITY IN DESMOPLAKIN CARDIOMYOPATHY TWO CASE REPORTS

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Background / Hypothesis:
Desmoplakin (DSP) cardiomyopathy is a rare genetic disorder characterized by structural and functional abnormalities of the left ventricle, often accompanied by electrophysiological disturbances. This report explores diagnostic and therapeutic strategies by comparing the clinical courses of two adolescent patients with distinct phenotypes.

Materials and Methods:
We retrospectively analyzed two male adolescents with genetically confirmed DSP cardiomyopathy. Clinical data, imaging findings, biopsy results, treatment approaches, and outcomes were reviewed to highlight diagnostic challenges and management differences.

Results:
Case 1 (Acute Fulminant Type): A 12-year-old male who presented with acute exertional chest pain, markedly elevated troponin (TnT >10,000 pg/mL) and NT-proBNP, and increased inflammatory markers. Echocardiography revealed left ventricular (LV) dilation and hypokinesis, while cardiac MRI showed progressive LV enlargement and diffuse mid-myocardial to epicardial fibrosis. The patient rapidly progressed to cardiogenic shock with ventricular fibrillation and required ECMO, intubation, and immunosuppressive therapy. A pathogenic DSP mutation was confirmed after stabilization, but LV function continued to decline.
Case 2 (Chronic Progressive Type): A 15-year-old male with a 3-year history of recurrent chest pain and fatigue, initially misdiagnosed as myocarditis. In 2024, disease progression was noted, with elevated TnT, ST-segment elevation, and cMRI showing late gadolinium enhancement in basal to mid-LV segments. Notably, endomyocardial biopsy revealed myofibrillar disarray and partial sarcomere loss. Genetic testing confirmed the presence of a DSP mutation. The patient was commenced on anti-fibrotic and cardioprotective therapy and underwent implantation of an implantable cardioverter-defibrillator (ICD).

Conclusions:
Adolescent DSP cardiomyopathy can present as either acute fulminant or chronic progressive disease. Multimodal diagnostic approaches are essential, and treatment strategies should be tailored to disease phase and severity.

POSTER PRESENTATIONS

Category: Cardiogenetics

2551 - THE USE OF SIROLIMUS THERAPY IN NEONATE WITH TUBEROUS SCLEROSIS COMPLEX A CASE REPORT

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Background / Hypothesis:
Tuberous sclerosis complex (TSC) is a rare multisystem disease characterized by autosomal dominant mode of inheritance and variable expressivity affecting various organs. This is caused by mutations in TSC1 and TSC2 genes causing overactivation of mammalian Target of Rapamacyn (mTOR) responsible for abnormal cell proliferation. Cardiac rhabdomyoma is the most common primary cardiac tumor in children and is most often associated with TSC.

Materials and Methods:
Herein we report a case of a neonate who presented with cardiac mass on prenatal ultrasound. Post-natal echocardiography revealed multiple cardiac rhabdomyomas with no other features of TSC initially to confirm the diagnosis. The patient subsequently developed diastolic ventricular dysfunction, appearance of hypomelanotic macules and seizures hence further diagnostics were done. Cranial computerized tomography scan revealed presence of cortical tubers and subependymal nodules. Genetic testing done revealed positive for TSC2 gene. These features fulfilled the diagnostic criteria for TSC. The patient was given Sirolimus, an mTOR inhibitor, to promote regression of cardiac tumors and control of TSC-associated manifestations.

Results:
The use of Sirolimus on the patient led to significant regression of cardiac rhabdomyomas, resolution of cardiac dysfunction and control of seizures. No adverse reactions were noted while on Sirolimus therapy.

Conclusions:
Early recognition of variable manifestations of TSC can be a catalyst for facilitating early implementation of treatment strategies and establishing appropriate follow-up care. This case report adds to the evidence that, with careful monitoring, sirolimus can be considered when managing infants with significant cardiac rhabdomyomas and TSC-associated manifestations.

POSTER PRESENTATIONS

Category: Cardiogenetics

2552 - VARIANTS IN MYRF CAUSE CONGENITAL HEART DISEASE IN HUMANS AND EPICARDIAL DEFECTS IN MICE

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Background / Hypothesis:
Congenital heart defect is a complex disease with multiple genes involving in pathogenesis. MYRF (myelin regulatory factor) gene is a transcription factor and is well-known for its association of Cardiac Urogenital Syndrome (CUGS). However, the spectrum of isolated cardiac phenotype in MYRF variation carriers has not been reported.

Materials and Methods:
Co-segregation analysis was conducted in a three-generation family via whole-exome sequencing (WES), followed by targeted sequencing analysis of a 1987-sporadic CHD patient cohort and 159 CUGS patient cohort.In addition, We employed an early cardiac-specific Myrf knockout mouse model to investigate the role of Myrf in cardiac development.

Results:
A MYRF variant (c.3264C>G:p.S1088R) was initially identified in a three-generation/9-member family. Four affected individuals carried an identical missense MYRF variant (c.3264C>G:p.S1088R) in this family, which is likely resulted from one asymptomatic somatic variant carrier in generation I of the family. A frameshift MYRF variant was also identified as a de novo mutation in another family, which generated a truncated version of MYRF (c.940_944del:pI314Pfs*22), missing key functional domains, DBD and ICA. Both variants are predicted as pathogenic mutations by CADD. Additional targeted sequencing analysis was subsequently performed on a 1987-isolated CHD patient cohort and 159 CUGS patient cohort, further revealed a high frequency of genetic variants in MYRF gene associated with CHDs. Myrf CKO mice exhibited embryonic lethality between E11.5 and E12.5. Paraffin histology, together with bulk RNA-seq analysis, revealed a marked absence of the epicardium in CKO embryos at E10.5, indicating a critical role for Myrf in epicardial formation and cardiac development.

Conclusions:
Our data strongly suggested a close correlation between MYRF variants and CHDs, offering a new disease-causing gene for genetic diagnosis for CHDs.We also provided additional evidences that MYRF plays an indispensable role in epicardium formation and heart development.

POSTER PRESENTATIONS

Category: Cardiogenetics

2553 - METABOLOMIC ANALYSIS OF CONGENITAL HEART DISEASE WITH NEUROLOGICAL DEVELOPMENTAL ABNORMALITIES IN CHILDREN CARRYING CHROMODOMAIN HELICASE DNA BINDING PROTEIN 7 MUTATIONS

Xianghui Huang [1], Han Gao [2], Wei Sheng [3], Yuandan Chen [1], Xiaoying Wy [1], Deyi Zhuang [1]
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Background / Hypothesis:
Exome sequencing in Congenital heart disease (CHD)families has identified numerous de novo mutations, accounting for 20% of cases with neurodevelopmental delays or extracardiac anomalies. The mechanisms linking Chromodomain helicase DNA-binding protein 7(CHD7) mutations to concurrent cardiac and neurological defects remain unclear.To analyze the disease characteristics and related differential metabolites in children with left-to-right shunt congenital heart disease (CHD) and neurological developmental abnormalities carrying CHD7 mutations, and to further elucidate the underlying mechanisms.

Materials and Methods:
A case-control study was conducted, including 7 cases of left-to-right shunt CHD with neurological developmental abnormalities carrying CHD7 mutations (CHD7 group), 24 cases of isolated left-to-right shunt CHD (CHD group), and 9 healthy infants as controls. Gas chromatography time-of-flight mass spectrometry (GC-TOF-MS) was used to detect metabolites in the three groups.

Results:
Differential metabolites between the CHD7 and CHD groups were primarily enriched in steroid hormone biosynthesis, glyoxylate and dicarboxylate metabolism, ascorbate metabolism, and glutathione metabolism. Differential metabolites between the CHD7 and control groups were mainly associated with steroid hormone biosynthesis, riboflavin metabolism, and folate biosynthesis. Differential metabolites between the CHD and control groups were concentrated in α-linolenic acid metabolism and fatty acid biosynthesis. Key differential metabolites across all groups included 11-deoxycortisol and 2-hydroxyestrone, indicating significant involvement of steroid biosynthesis pathways.

Conclusions:
The differential metabolites in left-to-right shunt CHD with neurological developmental abnormalities associated with CHD7 mutations are predominantly linked to steroid metabolism regulated by the hypothalamic-pituitary axis. These metabolites may influence myocardial development and protection, suggesting that CHD7 mutations disrupt steroid metabolism pathways, thereby contributing to both cardiac and neurological developmental abnormalities.

POSTER PRESENTATIONS

Category: Cardiogenetics

2566 - CANDIDATE GENE VARIANTS IN PEDIATRIC BICUSPID AORTIC VALVE FINDINGS FROM WHOLE EXOME SEQUENCING

Dolunay Gürses [1], Aylin Köseler [2], Merve Oğuz [1]
Pamukkale University Faculty Of Medicine, Pediatric Cardiology, Denizli-Türkiye [1] Pamukkale University Faculty Of Medicine, Biophyscis, Denizli-Türkiye [2]

Background:
Bicuspid aortic valve (BAV) is the most common congenital cardiac malformation, with a highly variable clinical course. Although genetic factors are increasingly recognized, the underlying molecular mechanisms in pediatric cases remain incompletely defined. This study aimed to identify candidate gene variants in pediatric BAV cases with varying prognoses, contributing to the understanding of disease pathogenesis.

Materials and Methods:
Three pediatric BAV cases from the Pamukkale University Pediatric Cardiology clinic were evaluated. Comprehensive clinical assessment included medical history, family history, physical examination, electrocardiography, and transthoracic echocardiography. DNA was extracted from peripheral blood samples and subjected to whole exome sequencing (WES). Bioinformatics analysis included quality control, mapping, deduplication, base quality recalibration, and variant filtering. Variants were classified according to literature data, population frequency, and in silico pathogenicity predictors.

Results:
Probable pathogenic or suspicious variants were identified in each patient, all with distinct clinical profiles:
Case 1 (5-year-old male): Right-left coronary cusp fusion, no significant stenosis, regurgitation, or aortic dilation.
Case 2 (3-year-old female): Right-non-coronary fusion, moderate aortic stenosis, proximal aortic dilation.
Case 3 (2-year-old female): Right-left fusion, family history of sudden cardiac death.
Variants involved genes previously associated with BAV, including BMP4, NOTCH1, and TBX5, supporting the polygenic and phenotypically heterogeneous nature of the disease.

Conclusions:
WES is a valuable tool for identifying potential genetic contributors to pediatric BAV. The findings suggest that BAV arises from complex genetic interactions, highlighting the need for early genetic evaluation to guide diagnosis, risk stratification, and personalized follow-up. Larger cohort studies and functional assays are required to confirm variant pathogenicity and explore targeted therapeutic strategies.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1023 - CHARACTERIZATION OF TECRL KNOCKOUT MICE A NOVEL MODEL OF CPVT GENERATED BY CRISPR CAS9

Cuilan Hou [1], *Xunwei Jiang* [1], Tingting Xiao [1]
Shanghai Children's Hospital, Department Of Cardiology, Shanghai-China [1]

Background / Hypothesis:
Catecholaminergic polymorphic ventricular tachycardia (CPVT) has been considered as one of the most important causes of children's sudden cardiac death. Mutations in the genes for ryanodine receptor (RyR2) and calsequestrin (CASQ2), two subtypes of CPVT, have been identified. However, the mutation in the gene of trans-2, 3-enoyl-CoA reductase-like (TECRL) was rarely reported, which could be another genetic cause of CPVT.

Materials and Methods:
In this study, we evaluated myocardial contractility, electrophysiology, calcium handling in the models of Tecrl knockout (Tecrl KO) mice along with human induced pluripotent stem cell-derived cardiomyocytes (hiPSCs-CM) via CytoCypher/IonOptix MultiCell SystemTM and confocal microscopy.

Results:
Immediately after epinephrine plus caffeine injection, Tecrl KO mice showed much more multiple premature ventricular beats and ventricular tachycardia. The Tecrl KO mice demonstrate CPVT phenotypes. Mechanistically, intracellular calcium amplitude was reduced, while time to baseline of 50 was increased in acute isolated cardiomyocytes upon 1-Hz electrical stimulation. A series of calcium regulating signaling, such as CASQ2 or RyR2, were decreased, p-P38 and p-CaMKII were activated in TECRL deficiency cardiomyocytes. RyR2 protein levels decreased significantly upon cycloheximide treatment in TECRL deficiency cardiomyocytes. KN93, a CaMKII inhibitor, has a crucial role in the regulation of calcium homeostasis in TECRL deficiency cardiomyocytes. Overexpression of TECRL and KN93 could partially reverse cardiomyocytes calcium dysfunction, and this is p-CaMKII/CaMKII dependent.

Conclusions:
We successfully built a new CPVT model, which could simulate CPVT clinical phenotypes. We propose a previously unrecognized mechanism of TECRL and provide support for the therapeutic targeting of TECRL in treating CPVT.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1125 - EARLY CARDIOVASCULAR EVENTS FOLLOWING ANTICANCER TREATMENT IN CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA AND HODGKIN LYMPHOMA – RESULTS FROM A RETROSPECTIVE OBSERVATIONAL STUDY

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Background / Hypothesis:
Acute lymphoblastic leukemia (ALL) and Hodgkin lymphoma (HL) belong to the most frequent cancer diseases in children. Its treatment protocols usually include anthracyclines resulting in a relevant risk of cardiotoxic side effects. While there is increasing evidence on longterm cardiotoxicity arising from chemotherapy, limited data exist on cardiotoxic damage in the early post-chemotherapy period. Purpose of our study was to describe early cardiotoxicity expression and identify associated risk factors in children with ALL and HL.

Materials and Methods:
Data on demographics, clinical features, neoplastic diagnosis, therapeutic regimens, and cardiac evaluations were retrospectively collected from children with ALL and HL aged 0-18 yrs admitted to our hospital between January 2013 and December 2019.

Results:
109 subjects (57.8% males) were enrolled, of those 84 with ALL, 25 with HL. Mean age for ALL and HL was 7.3 years and 13.3 years, respectively. Follow-up period was 5.6 years (range 2.6 to 9.4 years).
Early cardiovascular (CV) events occurred in 69% of ALL-patients, and 68% of HL-patients, including at least one of the following: echocardiographic findings, ECG abnormalities and arrhythmias, thrombotic events, pericardial disease, and systemic hypertension. 32% of ALL- and 36% of HL-patients presented with more than one CV event.
The majority of early CV events were subclinical alterations and showed spontaneous recovery.
Risk factors for cardiotoxicity were age at diagnosis >14 years ($p<0.05$), higher ALL risk score ($p<0.05$), and recurrence of oncologic disease ($p<0.05$).

Conclusions:
According to our results, more than two thirds of all children with ALL and HL suffered at least one early CV event following anticancer treatment. Although most of the events were subclinical and self-limiting, a few patients had life-threatening cardiotoxic CV events, thus emphasizing the need for comprehensive cardiovascular work-up during and following anticancer treatment considering pre-treatment risk assessments and personalized management based on clinical risk.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1135 - SUCCESSFUL MANAGEMENT OF NEONATAL UPPER LIMB TRAUMA COMPLICATED BY ARTERIAL INJURY

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Background / Hypothesis:
Upper limb trauma in neonates can pose significant management challenges due to the small size and complex vascular anatomy of these patients. Arterial injury and compartment syndrome are serious complications that can lead to significant morbidity if not promptly recognized and treated. This case report highlights the importance of early intervention and multidisciplinary collaboration in optimizing outcomes for these patients

Materials and Methods:
case report
A 3-day-old full-term neonate was brought to our emergency department with swelling and cyanosis of the right upper limb. The patient had sustained a birth injury, resulting in a right clavicle fracture. On examination, the right upper limb was cold, pulseless, and tense on palpation. Radiographs revealed a right clavicle fracture. CT angiography demonstrated a disruption of the right axillary artery, consistent with arterial injury.
The patient was immediately taken to the operating room for emergent fasciotomy and vascular exploration. The right axillary artery was identified and repaired using a saphenous vein graft. Postoperatively, angiography showed restored flow to the right upper limb. The patient was closely monitored in the neonatal intensive care unit (NICU). Subsequent wound care was provided to promote wound healing.

Results:
The patient made a favorable recovery, with significant improvement in right upper limb perfusion. The patient was discharged home in stable condition and followed up regularly in the outpatient clinic. At the most recent follow-up, the patient had normal right upper limb function, with no vascular or neurological complications

Conclusions:
Through prompt recognition, multidisciplinary collaboration, and timely surgical intervention, we achieved a favorable outcome for the patient. The use of endovascular techniques, such as digital subtraction angiography (DSA), played a pivotal role in restoring arterial perfusion and preventing further complications.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1166 - CARVAJAL SYNDROME

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Carvajal syndrome is one of the cardiocutaneous syndromes, rare familial disorders characterized by woolly hair, palmoplantar keratoderma, and heart disease. In our study, we screened patients with DCM by generation sequencing and found a sever patient with Carvajal syndrome.We identified a 8-year-old girl presented with woolly hair since birth. The patient was admitted to hospital because of abdominal bulging and eyelid edema. Physical examination showed a lot of skin rashes with white scales on trunk and limbs, heart sounds were low, rhythmic, heart rate was 136 beats/min, no murmur; thoracic and abdominal veins were exposed, abdominal swelling, no tenderness and mass, subcostal 3cm, subxiphoid 3cm, texture II degree hard. Past history: 6 years of severe dermatitis. Previous activities were tolerant and sports activities were normal. No history of food or drug allergy. Echocardiography showed a marked increase and a decrease in the systolic function of the left ventricle. Left ventricular ejection fraction (LVEF) was 0.3, left ventricular end-diastolic dimension (LVDD) increased markedly. A homozygous missense mutation (c. 1865 (exon14) T >C, p. Leu 622 Pro) in DSP was identified.Parents and healthy siblings were found to be heterozygous for the mutation.The child was hospitalized for many times and finally died of acute heart failure.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1184 - LONG CHAIN HYDROXYACYL COA DEHYDROGENASE DEFICIENCY DILATED CARDIOMYOPATHY AND CARDIAC TRANSPLANTATION

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Background:
Long-chain hydroxyacyl-CoA dehydrogenase deficiency (LCHADD) (MIM#609016) is a rare autosomal recessive disorder affecting mitochondrial fatty acid oxidation. Clinical features of LCHADD include but are not limited to: recurrent episodes of rhabdomyolysis and cardiac involvement such as dilated cardiomyopathy (DCM), hypertrophic cardiomyopathy (HCM), and arrhythmias.

Case Report:
A 13-year-old male with history of LCHADD, rhabdomyolysis, and dilated cardiomyopathy with previous mildly depressed cardiac function presented in acute decompensated heart failure (ADHF), with an ejection fraction of 25%, necessitating inotropic support. With up-titration of guideline-directed medical therapy, he weaned off inotropic support and discharged home. In the following two months, he was admitted first for HF exacerbation without rhabdomyolysis (22-day admission) and then readmitted two weeks later with ADHF, new arrhythmia burden including torsade de pointes, and rhabdomyolysis. During that admission, he was maintained on milrinone and hyper-hydration for rhabdomyolysis. Given his inotrope dependence (INTERMACS 3), he was listed for orthotopic heart transplantation (OHT) and discharged home on milrinone after an 82-day admission. He was maintained throughout his pre-transplant course on carnitine, triheptanoin, ubiquinol, and uncooked cornstarch. Two months after listing, he underwent OHT. To minimize risk of rhabdomyolysis postoperatively, he underwent pre-operative IV hydration and received induction immunosuppression with antithymocyte globulin to reduce steroid administration. His post-operative course was unremarkable, and he did not have any significant increases in creatinine kinase (CK). He was discharged on POD14 on standard immunosuppression with tacrolimus, mycophenolate mofetil, and oral steroid taper over three months. In the 18 months following OHT, he remains with normal cardiac function. CK levels are routinely surveilled. He has had one admission for rhabdomyolysis related to physical exertion.

Summary:
This is the first reported case of LCHADD to undergo cardiac transplantation. Rhabdomyolysis can occur even after OHT but can be medically managed.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1191 - A CASE OF ACUTE LIMB ISCHEMIA IN A MALE WITH TRANSIENT ANTIPHOSPHOLIPID SYNDROME

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Background / Hypothesis:
Acute limb ischemia is a vascular emergency characterized by sudden decrease in the blood flow to an extremity, resulting to inadequate oxygen supply to the tissues. The overall prevalence is about 26 per 100,000 pediatric admissions. If appropriate revascularization is not performed within 4-6 hours from diagnosis, irreversible damage to the structures can occur. Most common cause in pediatric population is iatrogenic as a result of catheterization. Antiphospholipid syndrome is an acquired thrombophilia that manifests as arterial or venous thrombosis, often associated in pregnancy.

Materials and Methods:
We report a 16-year old boy who first presented with sudden and acute left foot pain following synchronized cardioversion for ventricular tachycardia manifested with sudden palpitations and epigastric discomfort. Laboratory analysis revealed normal echocardiogram, unremarkable genetic testing for inherited thrombophilia and a one-time positive lupus anticoagulant.

Results:
The patient was discovered with total arterial occlusion of the left common femoral, deep femoral, proximal to distal popliteal, tibio-peroneal trunk, proximal to distal anterior tibial, proximal to distal posterior tibial and dorsalis pedis arteries. He was managed as acute limb ischemia. He was given unfractionated heparin and underwent surgical arterial thromboembolectomy with fasciotomy. Recurrence of arterial occlusion on right common femoral artery prompted re-intervention.

Conclusions:
Limb survival vary according the accuracy of assessment and rapid appropriate revascularization. Morbidity and mortality may be reduced by means of efficient collaboration of medical and surgical strategies.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1192 - CARVAJAL SYNDROME A CASE REPORT ON CARDIOCUTANEOUS MANIFESTATION IN A 4 YEAR OLD FILIPINO CHILD

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Background / Hypothesis:
Carvajal syndrome is a rare form of hereditary cardiocutaneous disease presenting with dilated cardiomyopathy, palmoplantar keratoderma and wooly hair. The disease is due to mutations in the desmoplakin gene causing development of a pathological process in the heart, hair, and skin. It is rarely reported in Southeast-Asian population and more commonly seen in Caucasian and Turkish population. This case is the first reported case of Carvajal Syndrome in the Filipino population.

Materials and Methods:
We report a case of a 4 year old Filipino boy who presented with easy fatigability, pallor and dyspnea on exertion. On physical examination, the patient was noted with sparse wooly hair, palmoplantar keratosis and signs of heart failure(Ross IV, HF Stage C-D). 2Dechocardiogram of patient revealed global hypokinesia with poor right and left ventricular function (20% and 29% respectively) with biventricular enlargement. Genetic testing done were consistent with Carvajal Syndrome.

Results:
Management of the case focused on the control of cardiomyopathy symptoms, lifestyle change and monitoring with plans for possible intracardiac defibrillator placement. Control of heart failure symptoms was successfully managed using the GDMT for heart failure. Patient was discharged improved. Regular follow-up check-ups and monitoring done revealed persistence of reduced ejection fraction (Ross II, HFrEF) however improvement of symptoms were noted.

Conclusions:
It is important to recognize that cutaneous manifestations may have concomitant cardiac pathology. Early diagnosis of these cases is essential in ensuring better outcomes.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1208 - CARDIAC FINDINGS IN INFANTS WITH IN UTERO EXPOSURE TO ZIKA VIRUS – A FOLLOW UP LONGITUDINAL STUDY

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Background / Hypothesis:
Zika virus (ZIKV) is primarily known for its impact on the central nervous system in neonates, with antenatal exposure associated with congenital zika syndrome (CZS). There is emerging evidence suggesting that ZIKV may also affect cardiac development. We conducted a follow up study evaluating cardiologic findings in ZIKV antenatally exposed infants.

Materials and Methods:
Infants born to mothers with PCR-confirmed ZIKV-exposure during pregnancy between 2015-2016 received echocardiograms within the first six months of life. Those with cardiovascular (CV) abnormalities underwent repeat echocardiograms. CV abnormalities were classified as major or minor. The frequency of initial CV abnormalities was evaluated using Pearson $\chi 2$ test; frequency via repeat imaging and presence of major versus minor defects used descriptive statistics. Predictors of CV abnormalities were evaluated with multivariate logistic regression.

Results:
One hundred sixty-nine infants with ZIKV-exposure received echocardiograms in the first months of life. Most were normocephalic (NC); 1/3 were microcephalic (MC) at birth. Thirty children (17.8%) had cardiac anomalies on initial imaging. MC children had a higher frequency of CV abnormalities than NC children (26.9% vs 13.7%, p=0.04), and had nearly twice the frequency of major CV findings (25.0% vs 13.0%). Twenty-four of 30 children with CV defects (80%) returned for repeat echocardiograms; six (25.0%) continued to demonstrate defects. Frequency of persistent defects was double in MC versus NC children (33.3% vs 16.7%). MC children only had major CV findings. Presence of CV defects was associated with microcephaly (OR=3.40, 95% CI: 1.15-10.02, p=0.03).

Conclusions:
ZIKV-exposed neonates have a higher frequency of CV defects at birth (18%) compared to the general population (~1%). Most defects resolved on follow up, but often persisted in children with MC. Fetal/postnatal echocardiograms should be performed in infants with antenatal ZIKV-exposure. Congenital heart defects, given the frequent association with MC, should be considered another defining criterion of CZS.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1231 - CARDIAC AND LABORATORY ABNORMALITIES IN ADOLESCENTS WITH ANOREXIA NERVOSA A COMPARATIVE STUDY AND RISK FACTORS FOR PERICARDIAL EFFUSION

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Background / Hypothesis:
This study aims to compare clinical, echocardiographic, laboratory, and electrocardiographic findings between adolescents with anorexia nervosa and a normal control group. Additionally, we seek to identify risk factors for pericardial effusion in adolescents with anorexia nervosa.

Materials and Methods:
We analyzed 29 female adolescents diagnosed with anorexia nervosa according to DSM-IV criteria. As a control group, we selected 26 adolescents who visited an outpatient clinic for benign cardiac symptoms. Among the anorexia nervosa group, 14 patients were found to have pericardial effusion. We compared findings between the anorexia nervosa and control groups and conducted an analysis to identify risk factors for pericardial effusion in anorexia nervosa patients.

Results:
Compared to the control group, adolescents with anorexia nervosa exhibited lower systolic and diastolic blood pressure, left ventricular (LV) mass, LV mass index, mitral inflow E wave and A wave, medial mitral annular e' velocity, platelet count, phosphorus, triiodothyronine (T3), and heart rate, while showing higher levels of serum sodium, cholesterol, and QRS axis deviation.
Furthermore, the univariate analysis of risk factors for pericardial effusion in anorexia nervosa revealed that lower corrected calcium, free thyroxine (free T4), and phosphorus levels were significant, while a higher mitral valve E/A ratio and a prolonged PR interval were also identified as risk factors. In multivariate analysis, lower corrected calcium and phosphorus levels emerged as independent predictors of pericardial effusion.

Conclusions:
Adolescents with anorexia nervosa demonstrate significant alterations in laboratory and cardiac parameters compared to healthy controls. Pericardial effusion is a common finding in this population, with lower corrected calcium and phosphorus levels being independent risk factors for its development.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1232 - SERIAL CASES BALOON ATRIAL SEPTOSTOMY GUIDING BY ECHOCARDIOGRAPHY IN PATIENTS WITH TRANSPOSITION OF THE GREAT ARTERIES

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Background / Hypothesis:
Transposition of the Great Arteries (TGA) is a specific cyanotic congenital heart defects with an abnormal two major vessel that carry blood away from the heart which is the aorta and the pulmonary artery are switched (transposed). D-TGA sometimes also referred to as complete transposition of the great arteries.Early studies of the incidence of Congenital Heart Diseases, produced low incidences of about 4 to 5 per 1,000 live births5 but this figure has been rising steadily until recently when incidences of 12 to 14/1,000 live births, or higher, have been reported in the literature3. D-TGA is occurs in 5% to 7% of all congenital heart defects.

Materials and Methods:
The purpose of this report is presenting Balloon atrial septostomy with guiding by echocardiography in patient with transposition of the great arteries focusing on its emergency management.

Results:
Two babies with Transposition of the great arteries(TGA) was life saving palliative treated with balloon atrial septostomy at echocardiography room was reported in this study. BAS also as a bridge for surgical intervention.

Conclusions:
Balloon atrial septostomy was palliative procedure for this case and to get comprehensive theraphy with good prognosis must be plan for definitive treatment (surgical).

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1237 - TRAMETINIB THERAPY FOR CRITICAL LEFT VENTRICULAR OUTFLOW TRACT OBSTRUCTION IN AN INFANT WITH NOONAN'S SYNDROME

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Background:
Noonan's syndrome, with RAF-1 mutation, is high risk for developing early-onset, severe hypertrophic cardiomyopathy (HCM). For affected individuals, there are few established treatments to address the effects of left ventricular outflow tract obstruction and subsequent congestive cardiac failure (CCF). Trametinib is an established oncological agent which has been used in specific cases of severe hypertrophic cardiomyopathy associated with RAF-1 mutation. It reduces ERK1/2 phosphorylation in the RAF1 s257L/+ cardiomyocytes by binding to inactive MEK1/2 so that it cannot be activated by RAF and this rescues myofiber disarray and consequent hypertrophy.

Clinical case:
A preterm infant born at 31 weeks presented at birth with frequent atrial ectopics and episodes of atrial flutter with 3:1 block. Initial echocardiogram demonstrated a thickened, abnormal mitral valve with papillary muscle tissue extending into the left ventricular (LV) outflow tract. Genetic testing confirmed Noonan's syndrome RAF1 s257L/+ mutation.

He had a difficult neonatal course and developed CCF secondary to increasing left ventricular outflow tract obstruction and severe diastolic dysfunction. NT-proBNP >35,000ng/ml. Despite maximal medical therapy, he required invasive ventilation. He was accepted for compassionate use of Trametinib by Novartis at 6 months. After two days his tachycardia resolved, and he was extubated 11 days later. By day 14, NT-proBNP=5244ng/ml, and echocardiogram demonstrated an improvement in LV function and reduced outflow tract obstruction.
By 23 months old, on Trametinib 20mg/kg/day, NT-proBNP= 262ng/ml and echocardiogram demonstrated mild concentric LVH with mild midcavity LV turbulence and preserved ventricular function.

Unfortunately, at 24 months old, he had a prolonged seizure, was diagnosed with S.pneumoniae meningitis, and he died shortly after.

Conclusions:
Children with Noonan's syndrome RAF1 mutation are at a high risk of developing severe HCM during infancy. MEK1/2 inhibitors, including Trametinib, aid reversal of hypertrophy and obstructive complications and improve clinical outcomes for affected children who had previously limited treatment options.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1265 - A CURIOUS CASE OF SEVERE PULMONARY HYPERTENSION ASSOCIATED WITH SEVERE VITAMIN C DEFICIENCY.

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Background / Hypothesis:
Children with Autism Spectrum Disorder (ASD) and restrictive eating patterns commonly have nutritional deficiencies. Vitamin C deficiency is well known for its association with bleeding tendencies and impaired collagen synthesis but is a lesser-known cause of pulmonary hypertension (PH). Vitamin C is thought to contribute to the synthesis of the vasodilators, nitric oxide and prostacyclin, while decreasing the effects of the vasoconstrictors, thromboxane, endothelin-1 and hypoxia-inducible factor 1α.

Materials and Methods:
We describe a 5-year-old male with level 3 ASD and a severely restricted diet who presented with severe PH due to profound vitamin C deficiency.

Results:
Our patient presented with a five-day history of lethargy, followed by acute respiratory distress and shock on the sixth day. He exhibited no clinical signs of scurvy. Initial investigations demonstrated a severe metabolic acidosis. Echocardiography demonstrated severe right atrial and right ventricular dilatation, right ventricular dysfunction and moderate tricuspid regurgitation. The estimated systolic pulmonary arterial pressure (sPAp) was near systemic. He showed a significant and rapid reduction in sPAp with inhaled nitric oxide and was subsequently commenced on oral sildenafil and bosentan.
Given his restrictive diet, empirical enteral vitamin C supplementation was commenced leading to a noticeable clinical improvement within 24-hours and a return to baseline behaviour within 48-hours. Vitamin C serum levels confirmed severe deficiency (0.6 mg/L; normal range: 4.0-14.0 mg/L). He was discharged from hospital 10 days after starting Vitamin C. In the weeks following discharge, he was gradually weaned off his oral pulmonary vasodilator therapy under echocardiographic surveillance.

Conclusions:
Vitamin C deficiency is an underrecognised cause of PH. For our patient, vitamin C supplementation was essential for his recovery. This case highlights the importance of a thorough history in the diagnostic evaluation of PH, particularly in at-risk children. Although clinical scurvy is rare in Western societies, vitamin C deficiency is not.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1266 - NON TOXIGENIC CORYNEBACTERIUM DIPHTHERIAE INFECTIVE ENDOCARDITIS AN EMERGING VIRULENT THREAT IN PAEDIATRICS

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Background / Hypothesis:
Corynebacterium diphtheriae is historically known for causing toxigenic diphtheria. With the widespread use of the diphtheria toxoid vaccine, the incidence of toxigenic diphtheria has significantly declined. However, non-toxigenic Corynebacterium diphtheriae (NTCD) is increasingly recognised as a cause of invasive disease including infective endocarditis (IE). NTCD IE is rare, with limited reported cases.

Materials and Methods:
We present a case of an 11-year-old Indigenous female with native valve IE caused by a virulent NTCD despite the absence of apparent risk factors for IE.

Results:
The patient initially presented with 12 hours of fevers, abdominal pain and headaches. On examination, she had splinter haemorrhages, Janeway lesions on the plantar surface of the left foot and a 3/6 pan-systolic murmur at the apex. There was no splenomegaly, Roth spots or Osler nodes. Urinalysis revealed significant microscopic haematuria and trace proteinuria. A transthoracic echocardiogram demonstrated a 10mm intracardiac vegetation attached to the posterior leaflet of the mitral valve with associated severe mitral valve regurgitation. There were no other intracardiac vegetations and no other cardiac structural anomalies. Her initial blood culture was positive for NTCD with intermediate resistance to penicillin. Further assessment, including an MRI head and CT abdomen and pelvis, identified bilateral intracranial septic emboli, left renal and splenic emboli. On day 5, she underwent a mitral valve repair, including a modified quadrangular resection of P2 with a sliding annuloplasty. Intraoperatively, a leaflet perforation in the P2 region associated with the vegetation was suspected. Post-operatively, she had no mitral stenosis and only trace residual regurgitation. She was treated with a 6-week course of IV ceftriaxone.

Conclusions:
This case highlights the invasive potential of NTCD in a child with no apparent risk factors. Clinicians should remain vigilant for NTCD IE to ensure early recognition and timely intervention.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1268 - RIGHT VENTRICULAR SYSTOLIC FUNCTIONAL RESERVE AND RIGHT VENTRICULAR PULMONARY ARTERIAL COUPLING ARE IMPAIRED IN LONG TERM SURVIVORS OF CHILDHOOD CANCERS

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Background
Childhood cancer survivors (CCS) are at increased risk of right ventricular (RV) dysfunction due to cardiotoxicity effects of chemotherapy and radiotherapy. This study tested the hypothesis that RV systolic functional reserve and RV-pulmonary arterial (PA) coupling are impaired in CCS, particularly among those treated with radiotherapy.

Methods
Eighty-nine subjects were studied, including 26 CCS treated with radiotherapy (17 males; mean 24.9±7.1years), 31 CCS without radiotherapy (15 males; mean 22.1±4.9years), and 32 healthy controls (15 males; mean 25.0±4.8years). All subjects underwent pulmonary function testing and resting and submaximal supine bicycle stress echocardiography. RV and left ventricular function were assessed using RV fractional area change, tricuspid annular plane systolic excursion (TAPSE), longitudinal strain, myocardial acceleration during isovolumic contraction (IVA), and tissue Doppler velocities. The slope of the RV force-frequency relationship was calculated as the change in IVA relative to the change in heart rate during exercise (IVA/heart rate). RV-PA coupling was determined by the ratio between TAPSE and indexed pulmonary arterial acceleration time (TAPSE/PAATi).

Results
At rest, CCS treated with radiotherapy exhibited significantly reduced RV systolic functional indices, including TAPSE, systolic strain, IVA and tricuspid systolic velocities, compared to the other two groups. During submaximal exercise, both CCS groups demonstrated impaired RV function relative to controls. The RV force-frequency relationship slope was significantly attenuated in CCS with radiotherapy (0.033±0.002) versus CCS without radiotherapy (0.041±0.002) and controls (0.060±0.003m/sec2·beats/min; $p<0.001$). While resting TAPSE/PAATi was similar across groups, it declined significantly in CCS during submaximal exercise ($p<0.001$). Pulmonary function (FEV1 and FVC) was impaired in CCS treated with radiotherapy and was identified as a significant correlate of the RV force-frequency relationship.

Conclusions
The RV systolic functional reserve and RV-PA coupling are impaired in CCS, particularly among those treated with radiotherapy.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1288 - DILATED CARDIOMYOPATHY DUE TO RHINOVIRUS ENTEROVIRUS IN AN ADOLESCENT PATIENT.

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Background / Hypothesis:
Dilated cardiomyopathy is an acquired pathology in which there is cardiac dilatation with a significant decrease in ventricular function. It is often secundary to predominantly viral infections and is more common in infants and preschoolers.

Materials and Methods:
We present the case of dilated cardiomyopathy secondary to rhinovirus/enterovirus in an adolescent patient.

Results:
A male patient was referred due to signs of cardiogenic shock, suspected of being secondary to dengue. The patient was obese upon arrival with clears signs of cardiogenic shock. Laboratory studies were performed and were found to be positive for rhinovirus/enterovirus. During his stay, a left ventricular thrombus measuring 20x11 mm with an area of 1.5cm2 was observed, with an initial LVEF of 14% and signficant diastolic dysfunction. Echocardiograhic follow up ten days after hospitalization reported improvement in ventricular function with a LEVF of 49%, mild pericardial effusion and the presence of a left ventricular thrombus.
Currently he continues with heart failute management and anticoagulation with improvemed in his outcome.

Conclusions :
Dilated cardiomyopathy in adolescent patients is a rare entity and is often a cause of heart transplantation.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1305 - BURDEN OF CARDIAC INVOLVEMENT AND LOCAL MANAGEMENT PRACTICE IN CHILDREN AND ADOLESCENTS WITH DUCHENNE MUSCULAR DYSTROPHY IN HONG KONG

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Background / Hypothesis:
- The disease process in Duchenne Muscular Dystrophy (DMD) involves skeletal and cardiac muscles and both impact the quality of life and survival. This study reviews the burden of cardiac involvement in paediatric DMD patients and its management practice in Hong Kong.

Materials and Methods:
- A retrospective cohort study of the clinical data and cardiac surveillance scheme of paediatric DMD patients between 8 to 18 years of age managed in all paediatric departments under the Hong Kong Hospital Authority.

Results:
- 27 DMD patients were identified. Cardiomyopathy was present in 29.6% and the median age of diagnosis was 12.79 years old (IQR 10.86 to 15.23). There were no identifiable risk factors to predict the onset of cardiomyopathy. There were gaps between local management practice and international guidelines.

Conclusions:
- Paediatric onset of cardiomyopathy is not uncommon in Duchenne Muscular Dystrophy in Hong Kong. A standardized locally adapted surveillance scheme will be beneficial in the holistic care of our patients.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1327 - CLINICAL CHARACTERISTICS OF NEONATES AND INFANTS WITH LOEYS DIETZ SYNDROME

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Background:
Loeys-Dietz syndrome (LDS) is an autosomal dominant connective tissue disorder caused by mutations in the transforming growth factor-β signalling pathway.These mutations result in a spectrum of phenotypic manifestations and disruption of vascular integrity. Widespread arterial involvement with vascular tortuosity and aortic aneurysms with a high risk of dissection or rupture rarely present in neonates and infants. Few cases of neonatal/infantile presentation of LDS have been reported, almost all of which are associated with TGFBR2 mutations.

Methods:
Echocardiography, molecular analysis, and clinical presentation at diagnosis, and disease progression of one neonate and two infants with LDS and TGFBR2 and TGFB3 mutations, respectively, is described.

Results:
The first patient is a male with a TGFBR2 mutation. Neonatal examination revealed severe bilateral clubfoot, high-arched palate, malar hypoplasia, micrognathia, joint laxity, and bifid uvula. Echocardiography at three days of age showed a dilated Ao Root Z-Score of 5, dilated ASAO Z-Score of 5.6, abnormal mitral valve(without stenosis/insufficiency), functionally bicuspid pulmonic valve, and a small PDA. Patients 2 and 3 have a TGFB3 mutation and are first-degree cousins with a significant family history of LDS. Patient 2 is a male whose neonatal examination revealed isolated ectrodactyly of two limbs and a right clubfoot. Patient 3 is a female whose examination at 4 months revealed mild frontal bossing, a mildly wide nasal bridge, a highly arched but intact palate, and normal uvula. No cardiac abnormalities were identified on echocardiography and the aorta was normal for both.

Conclusions:
The patient with the TGFBR2 mutation followed the clinical findings and course described in other cases, with dilation of the aorta at birth that progressed rapidly. The two infants with TGFB3 mutations presented with no characteristic LDS phenotypic features or vascular diseases. Enrollment of more patients with this mutation is crucial to elucidate its clinical features.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1346 - A DIAMOND IN THE ROUGH – CARDIAC CALCIFIED AMORPHOUS TUMOUR (CAT) IN A CHILD WITH STEROID RESISTANT NEPHROTIC SYNDROME

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Background
Cardiac Calcified Amorphous Tumor (CAT) is a rare, non-neoplastic intracardiac mass characterized by dystrophic calcification and fibrinous deposition. Initially described in 1997, it remains an infrequent yet clinically significant entity, particularly in pediatric patients, where its presentation can mimic other intracardiac masses, including thrombi and neoplasms.

Case
An 8-year-old child with steroid-resistant nephrotic syndrome on tacrolimus, with a history of bilateral internal jugular vein and inferior vena cava thrombosis on anticoagulation, presented with abdominal pain and distension. Transthoracic echocardiography revealed a 3×2 cm right atrial mass, severe tricuspid regurgitation, and perforation of the anterior and septal tricuspid leaflets. Further evaluation demonstrated decreased Protein S and Antithrombin III levels, with genetic thrombophilia testing identifying an MTHFR 1298A>C mutation. Surgical excision of the mass was performed, along with tricuspid valve repair using autologous pericardial patches. Histopathological analysis confirmed the diagnosis of CAT. Postoperatively, the patient remained hemodynamically stable, with follow-up echocardiography demonstrating mild tricuspid regurgitation and preserved biventricular function.

Conclusion
CAT should be considered in the differential diagnosis of intracardiac masses, particularly in pediatric patients with a predisposition to thrombosis. Given its potential for embolization and hemodynamic compromise, early recognition and timely surgical intervention are imperative. This case underscores the importance of a multidisciplinary approach in managing complex cardiac masses in prothrombotic states.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1388 - A CASE OF DCM COMPLICATED BY HEPATOBLASTOMA TREATED WITH CHEMOTHERAPY CONSIDERING THE EXACERBATION OF HEART FAILURE

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Background:
The annual incidence of cardiomyopathy is estimated to be 1 in 100,000 individuals, with dilated cardiomyopathy (DCM) and hypertrophic cardiomyopathy accounting for approximately 60% and 25% of pediatric cases, respectively. Hepatoblastoma, on the other hand, accounts for about 1–2% of pediatric malignant tumors. There have been no reported cases of coexisting DCM and hepatoblastoma. Here, we report a case of hepatoblastoma complicated with DCM, successfully treated with chemotherapy without heart failure progression.

Case:
A male infant was diagnosed with fetal DCM and started on heart failure therapy after hospitalization in the neonatal period, allowing discharge at 48 days of age. He continued outpatient treatment for heart failure. At 1 year and 8 months, an abdominal mass was palpated during an outpatient visit, and further evaluation led to a diagnosis of hepatoblastoma with suspected pulmonary metastases. Standard treatment for hepatoblastoma includes chemotherapy with platinum agents and anthracyclines, followed by surgery. However, we considered anthracyclines should be avoided due to their cardiotoxicity. Given recent reports of successful treatment with platinum monotherapy, this approach was chosen. As platinum-based chemotherapy requires hydration, intravenous furosemide was administered to manage fluid balance. After two months, the tumor regressed sufficiently for surgical resection, including the pulmonary metastases. Postoperatively, two additional chemotherapy cycles were completed. The patient has been followed for 22 months with no signs of recurrence.

Conclusion:
Chemotherapy, including antitumor agents, carries risks of cardiotoxicity and fluid overload, which can exacerbate heart failure. Tailoring treatment strategies to minimize cardiac burden is crucial for successfully completing therapy without worsening cardiac function.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1437 - A COMPARATIVE STUDY OF MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN COMPLICATED WITH MYOCARDITIS AND TRADITIONAL ACUTE MYOCARDITIS

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Background:
The cardiovascular system is one of the most commonly affected systems in Multisystem inflammatory syndrome in children (MIS-C) following COVID-19 infection. The comparison of myocarditis combined with MIS-C and traditional acute myocarditis in children has seldom been documented.

Methods:
The medical records of 7 children with MIS-C complicated with myocarditis and 16 children with traditional acute myocarditis admitted to our center from January 2023 to March 2022 were retrospectively reviewed. The differences between the two groups were compared. SPSS 23.0 software was used for statistical analysis.

Results:
Three patients with MIS-C were combined with shock, and 2 of them had grade III atrioventricular block (AVB), while none in the other group. Compared with traditional acute myocarditis, leukocyte and lymphocyte counts in MIS-C patients with myocarditis were significantly higher ($P<0.01$; $P<0.001$); CRP, ESR, TNF-α , hs-TNT and NT-Pro-BNP were significantly increased ($p<0.05$), but EF was significantly decreased ($p<0.001$). All MIS-C patients were treated with IVIG and hormone; patients with grade III AVB were treated with high-dose methylprednisolone, and temporary pacemakers were installed on the second day of admission, and removed within 2 weeks, and all 7 patients were discharged with improvement. Patients with traditional acute myocarditis were mild, and the hospital stay of the former was longer than that of the latter ($p<0.01$).

Conclusion:
MIS-C children complicated with myocarditis are more severe. Active IVIG and hormone therapy, and temporary pacemaker for those children with grade III AVB can improve prognosis.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1442 - SUCCESSFUL OPEN SURGICAL REPAIR OF KOMMERELL'S DIVERTICULUM WITH LEFT SIDED AORTIC ARCH A CASE REPORT

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Background
Kommerell's diverticulum is a rare condition that occurs in association with a left aortic arch with aberrant right subclavian artery (ARSA) in 0.5%-2.0% of the population with fewer than 50 cases have been reported in the literature. Usually it's the ARSA that arises as the last branch of the aortic arch and course from the proximal descending aorta to the right arm, passing behind the esophagus. The aneurysmal diverticulum of the descending aorta at the origin of ARSA is called Kommerell's diverticulum, which consists of both an aneurysm of the thoracic aorta and an aneurysmal orifice of an ARSA. Anatomically, in a patient with ARSA, the left common carotid artery arises from the anterior of the ascending aorta, followed by the right common carotid artery, the left subclavian artery, and the ARSA that arises from Kommerell's diverticulum. Notably, 53% of Kommerell's diverticulum cases have been reported to undergo dissection or get ruptured, often resulting in death. In this case report, we describe a successful outcome achieved by resection of the Kommerell's diverticulum together with the focal saccular aneurysm and reconstructing the ARSA with Dacron in a patient with Kommerell's diverticulum and ARSA with a left sided aortic arch

We present a 40 year old male Filipino who consulted for symptoms of dysphagia. On CT, there was an incidental finding of Kommerell's diverticulum with left sided aortic arch and an aberrant right subclavian artery. The aberrant right subclavian artery courses behind the esophagus creating a vascular ring that constricts the esophagus and trachea resulting in dysphagia. The maximum diameter of the aortic aneurysm was 62 mm and the length of the diverticulum was 48 mm with a focal saccular aneurysm approximately 32 mm in size. Surgical intervention was then planned to prevent rupture.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1445 - MULTISYSTEM INFLAMMATORY SYNDROME IN NEONATE (MIS N) WITH SUCCESSFUL THROMBOLYSIS OF INTRACORONARY THROMBUS. A CASE REPORT

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Background / Hypothesis:
MIS-N is recognized as a hyperinflammatory response following a perinatal or postnatal COVID-19 exposure. Presentation varies with cardiac involvement complicated by intracoronary thrombus as a potentially fatal sequelae.

Materials and Methods:
We report a case of a newborn born term, 2.69 kg with good Apgar score. Mother had no antenatal issues and came in spontaneous labour. Child had persistent pulmonary hypertension of newborn (PPHN) with fever, severe metabolic acidosis with evidence of end organ impairment on day 2 of life, prompting workup for MIS-N.

Results:
There were elevated inflammatory markers suggestive of MIS-N with cardiac involvement. Serum ferritin raised 16,000 ng/ml, C-reactive protein (CRP) 17.5 mg/L, D-dimer 13.57µg/ml with low fibrinogen 0.86 g/L. Cardiac enzymes raised LDH 4662 U/L, CK 1044 U/L, Troponin I 447 ng/L. Initially child had severe PPHN requiring invasive ventilation and high inotropic support. Intravenous globulin (IVIG) and steroids were administered. Initial echocardiogram showed coronary ectasia, along with PPHN features which improved through the course of 3 weeks. On day 28 of life, child deteriorated, presenting with supraventricular tachycardia (SVT) and a repeat echocardiogram revealed aneurysmal left main coronary artery (LMCA) with coronary thrombus and left ventricular dysfunction, LV ejection fraction (LVEF) 24%.

Thrombolysis therapy was initiated due to ischemic changes on electrocardiogram (ECG). Tissue plasminogen activator (tPA) was administered twice followed by tirofiban and heparin infusion for another 3 days before there was complete resolution of LMCA clot with improved LV function. Concomitantly, another course of IVIG and steroids was given. The child was maintained on dual antiplatelet therapy as well as low molecular weight heparin (LMWH)with no bleeding tendencies or thrombocytopenia observed.

Conclusions:
Our MIS-N patient presented with PPHN followed by late onset intracoronary thrombus with LV dysfunction prompting aggressive treatment and thrombolytic therapy. Multidisciplinary care is vital to improve patient outcome.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1524 - A 15 YEAR OLD BOY WITH MYOTONIC DYSTROPHY DIAGNOSED FOLLOWING THE ONSET OF VENTRICULAR FIBRILLATION DURING PHYSICAL EDUCATION CLASS.

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Background / Hypothesis:
Myotonic dystrophy (DM) is an inherited muscle disorder with progressive muscle atrophy and weakness. It has an autosomal dominant inheritance pattern and is classified as DM1 and DM2, with 99% of cases in Japan being DM1. DM1 is a multisystem disease and cardiac complications can cause early and/or sudden death.

Materials and Methods:
A previously healthy 15-year-old boy had felt the stiffness of his hands and difficulty in opening the lids of plastic bottles for several years. On the day of transport, he passed out during a long distance running in physical education class, went into cardiopulmonary arrest. Chest compressions were performed and ECG analysis of the automated external defibrillator showed ventricular fibrillation. After he was defibrillated four times, his own heartbeat resumed. He was transported to our hospital and admitted to the pediatric intensive care unit. Treated withintensive care and normothermia treatment, he was extubated on the 4th hospital day, without the appearance of arrhythmia. Although cardiac ultrasonography showed no organic heart disease, hatchet face and grip myotonia raised suspicion of DM. Molecular genetic testing led to a confirmed diagnosis of DM1. We inferred that his ventricular fibrillation was due to DM1. He had no apparent neurological sequelae and an implantable cardioverter-defibrillator was placed on the 19th hospital day. He recovered well and was discharged home on the 26th hospital day.

Results:
Only a few cases of patients with an underlying DM1 condition being discharged from hospital after intensive care following emergency transport for ventricular fibrillation have been reported in Japan and abroad, especially rarely in children.

Conclusions:
Early diagnosis of DM1 based on specific facial features, grip myotonia, etc., may prevent sudden death of the patient and his/her family.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1538 - EARLY DETECTION AND MANAGEMENT OF AORTIC ROOT DILATION IN MARFAN SYNDROME A LONGITUDINAL PEDIATRIC STUDY

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Background / Hypothesis:
Marfan syndrome (MFS) is a hereditary disorder affecting connective tissue, with notable involvement of the cardiovascular system. This condition leads to various manifestations, including aortic root dilation, which can significantly impact patient outcomes. The goal of this study is to examine the clinical history and the age of onset of cardiovascular manifestations, specifically focusing on aortic root dilation in children and adolescents.

Materials and Methods:
An analytical, ambispective, longitudinal, and experimental study was conducted, involving echocardiographic follow-up of arterial measurements, which were converted into Z-scores. Patients diagnosed with Marfan syndrome, either molecularly or by the Ghent clinical criteria, were followed for 1 to 5 years. Aortic dilation was defined as Z-scores greater than +2. Data were analyzed using the Pearson chi-square test to evaluate the association between clinical variables and aortic dilation.

Results:
A total of 52 patients were studied, aged between 7 months and 17 years, with a median age of 10 years. The male-to-female ratio was 1.6:1 in favor of the male sex. 35.8% of the patients had congenital heart disease. The most common condition was mitral insufficiency (8.9%), followed by atrial septal defect (ASD) in 7.16% of cases. Aortic root dilation was observed in 21 patients (40%), with the most affected segment being the Valsalva sinuses, in 95.1% of cases (p=0.001). Aortic aneurysm was present in 7.8% of the patients, and 50% of these required surgical intervention with mitral valve prosthesis.

Conclusions:
There is a significant association between congenital heart disease and aortic root dilation in patients with Marfan syndrome. Regular clinical and echocardiographic monitoring, along with a multidisciplinary approach, is essential for the early detection of aortic dilation. Prophylactic surgery, such as aortic root replacement, is crucial for improving long-term outcomes in these patients.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1544 - USE OF TRAMETINIB AS SUCCESSFUL SALVAGE THERAPY OF MEDICALLY REFRACTORY HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY IN AN INFANT WITH RAF1 RELATED NOONAN SYNDROME

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Background
The Ras-Raf-MAPK signalling pathway has been implicated in both human cancer and RASopathy disorders. Hence, certain cancer drugs may be repurposed for the treatment of RASopathies. We report a case of medically refractory hypertrophic cardiomyopathy in a patient with RAF1-related Noonan syndrome, who responded well to trametinib, a cancer drug that targets the same MEK pathway implicated in this syndrome.

Presentation/Treatment
A term baby boy presented at 7 days old with cardiac murmur and facial dysmorphisms. Genetic testing confirmed a pathogenic variant of RAF1, diagnostic for Noonan syndrome with multiple lentigines. Echocardiography revealed hypertrophic obstructive cardiomyopathy.

Medical treatment was unsuccessful to control symptoms, despite maximal therapy with 30mg/kg/day of oral propranolol, and 12mg/kg/day of oral disopyramide. Disopyramide had to be later discontinued due to significant prolongation of QTc interval. At 5 months old, he remained symptomatic for respiratory distress and recurrent aspirations. Echocardiography showed severe left ventricular outflow tract obstruction (LVOTO), with peak gradient of 65mmHg. Serum NT-proBNP was elevated at 21,314ng/L.

His parents had agreed for a trial of therapy with oral trametinib, which was started at 0.022mg/kg/dose once daily.

Results/Outcome
Within two weeks of commencing trametinib, there was improvement in reflux and vomiting, and serum NT-proBNP had fallen tenfold to 1,866ng/L. Over the next 3 months, respiratory status and growth continued to improve, and aspiration events had stopped. Serial echocardiography showed that although left ventricular hypertrophy had remained unchanged, LVOTO gradient had improved to 48mmHg. Serum NT-proBNP at 6 months was 734ng/L. Currently, at 9 months of age, his LVOTO gradient is 33mmHg, and serum NT-proBNP is 589ng/L.

Conclusion
MEK inhibitors, such as trametinib, are a promising treatment modality for RAF1-related Noonan syndrome. Precise targeting of the underlying molecular mechanism may modify disease at a cellular level to produce a clinical effect, demonstrating a successful example of repurposing existing drugs for novel indications.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1562 - A RARE PRESENTATION OF COCKAYNE SYNDROME DILATED CARDIOMYOPATHY IN AN INFANT

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Background:
Cockayne syndrome (CS) is a rare autosomal recessive disorder affecting DNA repair, characterized by progressive multisystem involvement. Clinical features include failure to thrive, dwarfism, microcephaly, and distinctive facial characteristics (sunken eyes, beaked nose, prominent ears). While survival varies among subtypes, most patients do not survive beyond adolescence.

Case:
We present a 2-year-old female with a genetically confirmed diagnosis of Cockayne syndrome type B. She exhibited typical facial features, and her weight, height, and head circumference were all below the 3rd percentile (SDS: -5.8, -6.7, -7.6, respectively). She was admitted to the emergency department with shortness of breath, diffuse edema, and lethargy. Examination revealed tachypnea, tachycardia, hepatomegaly, and prolonged capillary refill time (4 seconds). Laboratory findings included hypoalbuminemia (2.5 mg/dL) and elevated creatinine (0.7 mg/dL), prompting nephrology and cardiology consultations. Nephrology evaluation identified nephrotic-range proteinuria and impaired renal function, consistent with disease-associated renal involvement. Transthoracic echocardiography (TTE) revealed increased left ventricular end-diastolic diameter, reduced ejection fraction (49%), and moderate mitral regurgitation due to valvular coaptation defect, resembling dilated cardiomyopathy. The patient was managed with furosemide, enalapril, spironolactone, and milrinone in collaboration with nephrology. Clinical improvement was achieved, with serial TTEs showing increased ejection fraction (65%) and reduced left ventricular dimensions and mitral regurgitation. Milrinone was later replaced with digoxin, and the patient was discharged on oral decongestive therapy with ongoing follow-up.

Conclusion:
While Cockayne syndrome is primarily associated with early atherosclerosis, hypertension, and aortic root dilation, this case highlights its potential association with dilated cardiomyopathy. Awareness of this rare manifestation is essential for early diagnosis and management in affected patients.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1567 - CONGENITAL HEART DISEASE IN PEDIATRIC PATIENTS WITH LIVER DISEASE A SINGLE CENTER EXPERIENCE

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Background / Hypothesis:
The co-existence of congenital heart disease (CHD) and liver cirrhosis in pediatrics is established primarily in Alagille syndrome and 5-15% of cases of biliary atresia. While cirrhotic cardiomyopathy, an acquired and known consequence of cirrhosis, has been described in children, there are few case reports describing CHD and non-cardiac liver cirrhosis in children. We aim to describe our experience of co-existing CHD and cirrhosis in pediatric patients and their outcomes.

Materials and Methods:
We conducted a retrospective chart review of pediatric patients listed for liver transplant (LT) or being evaluated for liver failure who were found to have CHD on transthoracic echocardiography from 2011-2024 at a single quaternary pediatric hospital. We describe the demographic and diagnostic (echocardiographic and ultrasonographic) differences and clinical outcomes, including mortality, survival to transplantation, and decompensation before transplantation.

Results:
Of 550 listed patients, 37 (24 male, 13 female) were included. The most common diagnosis was Alagille (70%), followed by biliary atresia (14%). A total of 30% of patients two or more cardiac diagnoses, (24%) with isolated pulmonary stenosis, (5%) with left to right shunts, and (5.4%) patients with single ventricle anatomy. Of the 37 patients, 14 (38%) had cardiac interventions, 5 had Kasai procedures, 25 received LT, with one patient undergoing three LT procedures. The median ICU LOS was 6.5 (4,29.5) days, while median total hospital stay was 16.5 (9,34.5) days. Waitlist decompensation (WLD), including mechanical ventilation, dialysis, plasma exchange, and transfusion, occurred in 13 (35%) patients, with 11 (30%) patients dying due to WLD. Mortality was observed in 13 patients (35%), with majority (60%) dying before transplant. One survived both TAPVR repair and LT.

Conclusions:
Coexistence of CHD and cirrhosis presents diagnostic and therapeutic challenges. This case series describes the clinical/diagnostic strategies and outcomes in this patient population, emphasizing the importance of early recognition and comprehensive management.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1582 - POSTOPERATIVE RESIDUAL PAH IN A CHILD WITH ASD A DIAGNOSTIC ODYSSEY

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Background / Hypothesis:
Pulmonary arterial hypertension(PAH) in patients with atrial septal defects (ASD) nearly always indicated secondary etiology. Approach to pediatric PAH necessitates comprehensive imaging evaluation to avoid being incorrectly labelled as idiopathic.

Case:
This case report details a 9-year-old girl diagnosed with recurrent hemoptysis and exertional dyspnea, initially attributed to an atrial septal defect. Despite undergoing ASD closure, her symptoms persisted, prompting further investigation. High-resolution computed tomography of the chest revealed diffuse ground-glass opacities and septal lines, raising suspicion for pulmonary capillary hemangiomatosis and pulmonary veno-occlusive disease. A lung biopsy ultimately confirmed PVOD, a rare condition that can lead to pulmonary arterial hypertension (PAH) in children

Conclusions:
This case underscores the diagnostic challenges associated with PCH and PVOD, particularly in pediatric patients with congenital heart defects. Both conditions share similar clinical, radiological, and histopathological features, often leading to misdiagnosis as idiopathic PAH. The persistence of symptoms post-ASD closure should raise suspicion for these rare entities. Early recognition is crucial as treatment options are limited, and the prognosis remains poor without intervention such as lung transplantation. The case emphasizes the need for heightened clinical awareness regarding PCH-PVOD in similar presentations

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1632 - CARDIAC TAMPONADE REVEALING SYSTEMIC LUPUS ERYTHEMATOSUS A CASE REPORT

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Background / Hypothesis:
Systemic lupus erythematosus (SLE) is an autoimmune condition that can affect multiple organs, leading to a wide range of clinical manifestations. Cardiac tamponade as an initial presentation is rare. Timely diagnosis and appropriate management are crucial to preventing severe complications.

Materials and Methods:
We describe the case of a 26-year-old woman with no prior medical conditions or cardiovascular risk factors who presented with a two-month history of palpitations, progressive cough, shortness of breath, fever, excessive sweating, and general fatigue. Upon admission, she was respiratory and hemodynamically stable. Cardiovascular examination revealed tachycardia and muffled heart sounds, with no signs of heart failure. Pulmonary examination showed reduced breath sounds bilaterally at the lung bases. Electrocardiography demonstrated sinus tachycardia with microvoltage. Transthoracic echocardiography (TTE) detected a large pericardial effusion compressing the right chambers. A computed tomography (CT) scan confirmed a massive pericardial effusion, bilateral pleural effusions of moderate volume, and pneumonia in the left lung.

Results:
Surgical drainage removed one liter of pericardial fluid. Laboratory results were positive for antinuclear antibodies (ANA), Sjögren's syndrome-related antigen A (SSA), Sjögren's syndrome-related antigen B (SSB), and the autoantigen Ro52. Additionally, reduced complement levels (C3, C4) and increased urinary protein levels were observed, leading to the diagnosis of SLE. The patient's postoperative course was uneventful, and she was referred to internal medicine for further evaluation and treatment initiation.

Conclusions:
Cardiac tamponade is a life-threatening condition that requires immediate intervention. It may be the first manifestation of systemic lupus erythematosus. This case highlights the necessity of considering autoimmune diseases in patients with a large pericardial effusion, particularly when accompanied by systemic symptoms. Early diagnosis and treatment may reduce complications and the risk of recurrence.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1647 - SEVERELY ELEVATED CHOLESTEROL IN A PATIENT WITH ALAGILLE SYNDROME WITH RAPID RESOLUTION POST LIVER TRANSPLANTATION

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Background / Hypothesis:
Alagille Syndrome (ALGS) is an autosomal dominant multisystem disease occurring most commonly from pathogenic variants in the JAG1 gene. It is characterized in large part by hepatic, cardiac, renal, and ophthalmologic involvement. From a cardiac perspective, it is associated with pulmonary stenosis and cholestatic hypercholesterolemia. Herein, we report on the effect of liver transplantation on profound hypercholesterolemia in a 2-year old boy with ALGS with severe cholestatic liver disease.

Materials and Methods:

Results:
The patient presented with jaundicE, with a diagnosis of ALGS made at 5-months of age. At diagnosis, his low-density lipoprotein cholesterol (LDL-C) was 18.4 mmol/L (normal <2.8 mmol/L). With advancement of his liver disease, his LDL-C continued to increase, peaking at 40.1 mmol/L. This marked elevation confounded reliable assessments of other biochemical parameters such as blood urea nitrogen and creatinine. Through this time, he developed progressive full body xanthomas with marked pruritis. The xanthomas unfortunately did not improve with maralixabat (sodium dependent bile acid transporter) treatment. Apolipoprotein B100 was also elevated, but not as profoundly as the LDL-C, peaking at 1.95 g/L (normal <0.90 g/L). Lipoprotein metabolism profiles and electrophoresis suggested that the marked hypercholesterolemia was not consistent with lipoprotein X (commonly elevated in ALGS) but was also traditionally consistent with LDL-C, despite the results observed on conventional biochemical clinical measures.

Following bilateral branch pulmonary arterioplasty, the patient underwent an uncomplicated living-donor hepatic transplantation. By post-operative day 7, significant improvements in his lipoprotein parameters were observed, with a measured LDL-C that decreased from 38.2 to 1.41 mmol/L. There were marked concurrent reductions in the first week post-transplant, which have continued to improve.

Conclusions:
This case highlights the profound and symptomatic hypercholesterolemia that occurs as a result of cholestatic live disease in ALGS. The rapid and complete resolution that occurred post-liver transplantation should provide reassurance to clinicians managing similar cases.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1663 - MULTI VALVULAR INFECTIVE ENDOCARDITIS IN A 1 YEAR OLD FEMALE A CASE REPORT

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Background / Hypothesis:
Multi-valvular infective endocarditis (IE) in children is a rare but life-threatening condition, often seen in patients with underlying congenital heart disease or predisposing factors like patients on hemodialysis and with immunodeficiency. We present a case of a previously healthy 1-year-8-month-old female diagnosed with multi-valvular IE affecting the tricuspid valve, pulmonic valve and aortic valve. This paper highlights the diagnostic, clinical course and management in a previously healthy child with infective endocarditis.

Materials and Methods:

Case report

Results:
The patient presented with a five-day history of intermittent high-grade fever (40°C), scalp lesions, irritability, poor appetite, and abdominal distention. Upon assessment at the emergency room, she was in cardiorespiratory distress (HR: 170–200 bpm, RR: 65 bpm), requiring immediate intubation and fluid resuscitation. Examination revealed multiple scalp lesions, violaceous discolorations on the hands and feet, bilateral lung crackles, subcostal retractions and abdominal distention. Notably, no cardiac murmur was appreciated. Blood cultures were positive for MRSA and 2D echocardiography showed vegetations on tricuspid and pulmonic valves fulfilling the criteria for the diagnosis of infective endocarditis. She underwent antibiotic therapy and surgical resection of the vegetation and repair of the tricuspid valve. Other diagnostic considerations include immunodeficiency work-up.

Conclusions:
Despite the absence of a known congenital heart disease, the presence of persistent fever, skin lesions, and systemic involvement raised suspicion for infective endocarditis. Blood cultures and echocardiography confirmed the diagnosis, reinforcing the need for early recognition and aggressive management.

This case highlights the atypical presentation of infective endocarditis in children, emphasizing the importance of high clinical suspicion even in previously healthy children. Early diagnosis and multidisciplinary management, antibiotic guidance, prompt referral to surgical team are crucial in improving outcomes in pediatric IE.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1724 - COMPLETE TRISOMY 8 AND TRUNCUS ARTERIOSUS A CASE REPORT OF A LIVE BORN INFANT WITH A RARE CARDIAC ANOMALY

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Background:
Complete trisomy 8 is exceedingly rare and typically lethal, with only a few reported cases of live-born infants. Most available data pertain to trisomy 8 mosaicism, a less severe condition associated with better survival. Trisomy 8 is frequently linked to urogenital abnormalities, intellectual disability, congenital heart defects, brain and skeletal anomalies. The most common cardiac findings include pulmonary stenosis, ventricular septal defect (VSD), and patent ductus arteriosus. Truncus arteriosus (TA), a rare conotruncal defect, has been previously reported in a fetus with trisomy 8 mosaicism but not in cases of complete trisomy 8.

We present the case of a live-born female with complete trisomy 8 and TA Type 2, a combination not previously documented. Prenatal ultrasound revealed clenched hands and club feet, prompting an amniocentesis, which confirmed complete trisomy 8 in 100% of evaluated cells. Fetal echocardiography identified TA with a large conoventricular VSD. The infant was delivered vaginally at 40 weeks to a 45-year-old G7P4A2 mother without systemic illnesses. APGAR scores were 6 and 8 at 1 and 5 minutes, with brief positive pressure ventilation required at birth. Physical examination revealed a grade 2 systolic murmur at the left sternal border, webbed neck, anterior creases on bilateral earlobes, posteriorly rotated ears, retrognathia, clenched hands, deep palmar creases, and bilateral club feet. Postnatal echocardiography confirmed TA Type 2 with a large conoventricular VSD. The infant initially maintained stable vital signs with peripheral oxygen saturations above 75% on room air but subsequently developed cardiorespiratory failure secondary to sepsis. Blood cultures identified Klebsiella pneumoniae. Despite intensive support, she suffered a cardiac arrest on day 5 of life, and resuscitation efforts were unsuccessful.

This case represents a previously unreported association between a live-born infant with complete trisomy 8 and TA Type 2, contributing to the understanding of its clinical spectrum and outcomes.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1755 - ACUTE ABDOMEN SECONDARY TO SEPTIC EMBOLISM IN A PATIENT WITH STAPHYLOCOCCUS LUGDUNENSIS ENDOCARDITIS

Maria Teresa Renteria Quiñones [1], Sheyla Vania Sánchez López [1], Israel García Dávalos [1], David Salazar Lizárraga [1], Horacio Márquez González [1], Diana López Gallegos [1], Carlos Riera Kinkel [2], Lucelli Yáñez Gutiérrez [1], Larissa Güereca Ortiz [1], Daniel Campuzano Martinez [3]
Imss, Pediatric Cardiology, México-Mexico [1] Imss, Surgery, México-Mexico [2] Imss, Image, México-Mexico [3]

Background / Hypothesis:
A 16-year-old male patient was diagnosed with a double aortic valve lesion at the age of 7. At that age, he underwent his first surgery with a 17 mm Saint Jude aortic valve implant; follow-up until 2024. Echocardiogram reported an aortic prosthesis with severe stenosis due to mismatch and pannus (at the age of 6). Therefore, it was decided to perform Y-shaped aortic annulus enlargement surgery (Yang procedure) with a bovine pericardial patch + 21 mm Saint Jude RG aortic valve implant + Morrow myectomy.

Materials and Methods:
He presented with fever, and vancomycin and aminoglycoside were prescribed due to blood cultures showing methylcycline-resistant S. lugdunensis. She completed treatment and was discharged home. Two weeks later, she presented with fever and abdominal pain, with a diagnosis of appendicitis. A laparoscopic appendectomy was performed; however, the fever persisted.

Results:
A simple and contrast CT scan of the chest and abdomen was performed, which revealed areas of splenic infarction secondary to septic emboli, left renal agenesis, which, together with laboratory tests, was classified as chronic kidney disease. Transesophageal echocardiogram showed a rupture of the anterior mitral valve leaflet at the hinge level of 5x5mm and a non-coronary sinus aneurysm 11x14mm, displaced 12mm. CT angiography. Mechanical prosthetic valve in aortic position, 21 mm, normofunctional. Septic aneurysms of the LV outflow tract surround the prosthetic valve. Dilatation of the sinuses of Valsalva (Z score 3.92).

Conclusions:
It was decided a perform successful Commando surgery

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1773 - MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN (MIS C) – A 24 MONTH FOLLOW UP.

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Federal University Of Minas Gerais, Pediatric Cardiology, Belo Horizonte-Brazil [1] Federal University Of Minas Gerais, Pediatric, Belo Horizonte-Brazil [2]

Background / Hypothesis:
During the COVID-19 pandemic, multisystem inflammatory syndrome (MIS-C) emerged as a novel and severe complication in children.

Materials and Methods:
This prospective study followed patients in Brazil from February 2020 to December 2022. We evaluated children discharged from reference centers with an MIS-C diagnosis and we clinically and echocardiographically monitor patients for 24 months.
The aim of the study is to describe long-term cardiac findings post MIs-C. Following a clinical and imaging procedure, children with MIS-C were followed up.

Results:
Thirty-six children during hospitalization coursed with fever; 61.1% presented with gastrointestinal symptoms, 77.7% with cardiocirculatory manifestations, and 28% with respiratory issues. Shock was observed in 37 % of patients, and the average hospital stay was 9 ± 5 days, with 54 % exhibiting severe symptoms requiring intensive care. Elevated inflammatory and cardiac markers were common; 42% of patients presented elevated troponin and D-dimer levels. During intensive care, echocardiographic abnormalities were found in 56% of the patients, including coronary dilation and pericardial effusion. All patients were hospitalized and treated with intravenous immunoglobulin, oral steroids, and acetylsalicylic acid, resulting in 86% recovery. However, 14% of the patients had persistent (mild cardiac) alterations at discharge. Sex and previous chronic conditions did not affect the persistence of cardiac findings, whereas marginal age differences indicated that older children tend to have more severe symptoms. Six months post-discharge, all patients successfully recovered from cardiac alterations. After 24 months of the disease, all patients remained stable without clinical or hemodynamic changes.

Conclusions:
Only a few case series have reported persistent MIS-C findings after 24 months of hospital discharge. This case series elicits a positive post-discharge prognosis for MIS-C over time.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1775 - OBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY IN CHILDREN

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Federal University Of Minas Gerais, Pediatric Cardiology, Belo Horizonte-Brazil [1] Biocor Instituto, Pediatric Cardiology, Belo Horizonte-Brazil [2]

Background / Hypothesis:
Hypertrophic cardiomyopathy (HCM) is a leading cause of sudden death in young athletes. Its etiology is heterogeneous, including congenital metabolic changes, neuromuscular disorders and malformation syndromes.

Materials and Methods:
We report a case of HCM in a 7-year-old child with cough and chronic fatigue. Its diagnosis, management and clinical evolution.

Results:
Child aged 7 years old complaining of tiredness on exertion and chronic cough for about 1 year. Always accompanied by the pediatrician who heard a heart murmur. After worsening of symptoms and associated with chest pain, the pediatrician referred for a cardiac evaluation. On clinical examination, he presented normophonetic sounds, holosystolic murmur grade IV, audible in 4 and 5 intercostal spaces, without unfolding. Chest inspection: slight bulging in the left hemithorax, without scars and/or signs of inflammation. ECG revealed: prolonged QT interval, ventricular pre-excitation WPW type. The echocardiogram demonstrated: asymetric HCM of the left ventricle (LV) with signs of important obstruction of the mean gradient flow in left ventricular outlet flow (LVOT) of 54 mmHg; important enlargement of the right and left atrium; LV diastolic dysfunction; pulmonary hypertension (systolic pressure in pulmonary artery 58mmHg); moderate tricuspid and mitral regurgitation.
Propranolol 10 mg every 12 hours was prescribed, against physical activity and referred for surgery. After 3 months, the child underwent myectomy, an uneventful procedure, with significant improvement in symptoms. Propranolol 10mg every 12hours, furosemide 20 mg once a day and AAS 100 mg once a day were started. Today, he remains stable under follow-up with a pediatric cardiologist.

Conclusions:
Assessment by a pediatric cardiologist and routine echocardiography are essential in the management of HCM. A specialized, rigorous and properly applied analysis optimizes patient outcomes and favorably affects the cost of care and appropriate therapy to improve the quality of life of these patients.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1778 - TWO CASES OF CATECHOLAMINE CARDIOMYOPATHY DUE TO PHEOCHROMOCYTOMA AND PARAGANGLIOMA WITH DIFFERENT CLINICAL COURSE

Koki Kiyomatsu [1], Yoshiyuki Kagiyama [1], Yuki Yamakawa [1], Keitarou Tsuda [1], Yasuto Maeda [1], Ryuta Takase [1], Yozo Teramachi [1], Kenji Suda [1]
Kurume University, Pediatrics, Kurume-Japan [1]

Background:
Catecholamine cardiomyopathy shows diverse clinical courses that is associated with the fraction, amount, and duration of catecholamine exposure.
Case 1 (Dilated cardiomyopathy): A 12-year-old girl with a history of hyperhidrosis for 1 year was admitted with dyspnea, pallor, and hypertension with systolic BP of 170mmHg. Cardiac examinations revealed negative T waves on V3 to V6 leads on electrocardiogram, elevated serum NT-pro BNP (16633 pg/mL), and LVDd 50.8mm (+2.5SD) with diffuse LV hypokinesis and LVEF of 30% on echocardiography. Her urine normetanephrine level was 14.1mg/day (normative value 0.09-0.33mg/day) and she was diagnosed with pheochromocytoma. Anα-blocker was initiated and her sBP decreased to around 120 mmHg, however, cardiac contraction did not improve and ventricular arrhythmia started. She underwent uneventful surgical tumor removal on the 41st day of admission and her arrhythmia resolved but her LV mass index unchanged from 122 to 111 g/m2. Her LVEF gradually increased to 50% one year after surgery.

Case 2 (Takotsubo cardiomyopathy): A 12-year-old girl with a history of headache on exertion for 2 years experienced a blackout during exercise and was admitted with sBP of 150mmHg. Cardiac examinations revealed ST-segment elevation from V2 to V6 leads on electrocardiogram, NT-pro BNP (4057 pg/mL), and reduced LVEF of 49% with hypokinesis at the LV apex and hypercontraction at the base on echocardiography. Her urine normetanephrine level was 10.5 mg/day and she was diagnosed with paraganglioma. The LV motion normalized after the administration of anα-blocker and she underwent uneventful tumor removal on the 64th day of admission that made LV mass index decrease markedly from 101 to 65.1 g/m2.

Conclusion:
Case 1 had more severe cardiomyopathy form even with a shorter duration of symptoms. According to the normetanephrine level and the LV mass index, the catecholamine excess might be more severe in case 1.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1825 - MASSIVE PERICARDIAL EFFUSION SECONDARY TO REFEEDING SYNDROME A RARE ASSOCIATION OF DISEASES

John Kenjie Bernardo [1], Jose Jonas Del Rosario [1]
University Of The Philippines - Philippine General Hospital, Department Of Pediatric, Division Of Pediatric Cardiology, Manila-Philippines [1]

Background / Hypothesis:

Refeeding syndrome is a multisystemic organ dysfunction brought about by sudden shift in fluid and electrolytes that may occur in malnourished patients receiving artificial feeding. Bedridden patients, regardless of etiology, have a high risk of severe chronic malnutrition brought about by poor oral intake, caregiver factors and effect of underlying disease. When they get admitted in the hospital, acute medical problems are being addressed while nutrition and diet are often neglected.

This paper highlights the importance of meticulous feeding practices and the possibility of pericardial effusion as a sequela of refeeding syndrome.

Materials and Methods:
Case report

Results:
This is a case of an early adolescent female with Leigh syndrome who was admitted due to 1 week history of fever and cough. Baseline chest x-ray and echocardiogram showed left ventricular hypertrophy due to hypertrophic cardiomyopathy associated with Leigh syndrome, no pericardial effusion. She was transferred to the wards from the emergency department on the 3rd hospital day and was immediately started on milk feeding. Afterwards she developed anasarca, tachycardia and increasing CT ratio on Chest x-ray. Electrolyte panel showed hypokalemia, hypophosphatemia, and hypomagnesemia consistent with Refeeding syndrome. She was referred back to Cardiology service on the 14th hospital day due to persistent tachycardia and development of muffled heart sounds. Echocardiography showed a massive pericardial effusion in tamponade physiology. She underwent emergency pericardiocentesis. Work up sent to rule out all common and possible causes of effusion. After all causes were ruled out, it is concluded that it is due to Refeeding syndrome.

Conclusions:
-Meticulous feeding practices should be done carefully to prevent Refeeding syndrome.
-Pericardial effusion is a possible sequela of refeeding syndrome and should be monitored in all bedridden patients.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1827 - COVID 19 ASSOCIATED MYOCARDITIS IN PEDIATRIC PATIENTS ADMITTED AT A TERTIARY GOVERNMENT HOSPITAL IN THE PHILIPPINES A DESCRIPTIVE STUDY

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University Of The Philippines - Philippine General Hospital, Department Of Pediatric, Division Of Pediatric Cardiology, Manila-Philippines [1]

Background / Hypothesis:
Myocarditis may occur in severe cases of COVID-19 infection in both children and adults, however local data on the pediatric age group have been quite scarce. The aim of this study is to determine the clinical profile, significant cardiovascular features, and outcomes of pediatric patients diagnosed with myocarditis in a tertiary hospital in the Philippines.

Materials and Methods:

This is a descriptive cross-sectional study.

Results:
Between April 2020 and December 2022, COVID-19 myocarditis was found in 16 out of 291 patients. The patients' average age was eight years old, commonly presenting with respiratory symptoms. Myocarditis was more common among those classified with severe and critical COVID infection. Pulmonary infiltrates is a common chest radiograph findings. Electrocardiogram commonly shows sinus tachycardia. On echocardiogram, left ventricular systolic dysfunction is usually observed . All have elevated NT-proBNP, troponin I and CK-MB. All patients received Methylprednisolone while thirty percent (30%) received additional treatment with intravenous immunoglobulin (IVIG). The mean length of hospital stay for all patients was 23.8 days. Mortality rate was at 31%.

Conclusions::
COVID myocarditis is more common in adolescent males presenting with respiratory symptoms. Myocarditis was seen to be more common in patients classified to have severe COVID-19 hence a high index of suspicion and thorough evaluation are necessary to be able to initiate early intervention. Cardiac troponin I, electrocardiogram, and echocardiography proved to be helpful tools in the diagnosis and management of COVID-myocarditis. Future studies on the use of steroids and other pharmacologic interventions are recommended to improve disease outcomes.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1845 - EARLY PET MR IN CHILDHOOD TAKAYASU ARTERITIS A RETROSPECTIVE STUDY ON REDUCING DIAGNOSTIC DELAYS AND PREVENTING COMPLICATIONS

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Background / Hypothesis:
Takayasu arteritis is a chronic inflammatory disease affecting large arteries, particularly the aorta and its branches, its diagnosis is often delayed due to nonspecific symptoms. This case series focuses on diagnosing TA in the pre-pulseless stage using Whole Body PET-MR/CT in patients with unexplained inflammation.

Materials and Methods:
In this observational study we examined the treatment outcomes of eight patients diagnosed with C-TA in the pre-pulseless stage.All patients presented with PUO with persistently elevated inflammatory markers and nonspecific symptomatology were diagnosed by Whole Body PET MR/CT. All subjects met the EULAR/PRINTO/PRES criteria and were analyzed by time to diagnose, ESR, and CRP. PET findings were correlated with ITAS2010 and VDI scores to assess how early imaging facilitates timely diagnosis and reduces disease severity. ITAS2010 measures disease activity based on clinical and laboratory findings, while VDI assesses cumulative vascular damage.

Results:
The median CRP and ESR were 89.2 mg/L and 106 mm/hr, respectively, with median time to diagnosis of 79 days. ITAS2010 scores decreased from a median of 9 at diagnosis to 4 at follow-up, while the median VDI remained low (1.0), indicating minimal vascular damage. A strong positive correlation (0.81) between CRP and ITAS at follow-up suggested that persistent inflammation predicted long-term disease burden. Delayed diagnosis correlated with increased disease activity (0.39). The strong association between ITAS at diagnosis and VDI (0.58) reinforced the importance of early PET-MR imaging in detecting Takayasu arteritis before complications arise.

Conclusions:
Whole Body PET-MR/CT is a valuable tool for diagnosing childhood Takayasu arteritis before significant vascular damage occurs. Its ability to detect inflammation early allows for timely intervention, reducing disease progression and long-term complications. The findings emphasize the importance of proactive imaging in minimising diagnostic delays in patients with unexplained symptoms,persistent fever without source and persistently elevated inflammatory markers, ensuring earlier treatment and better management

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

1931 - LEFT ATRIAL FUNCTION IN CHILDREN WITH RHEUMATIC HEART DISEASE A WINDOW INTO EARLY CARDIAC REMODELING

Jose Augusto Barbosa [1], Andrea Beaton [2], Antonio Mutarelli [3], Emmy Okelo [4], Joselyn Rwebembera [5], Craig Seable [6], Maria Carmo Nunes [7]
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Introduction:
Valvular abnormalities in rheumatic heart disease (RHD) are extensively studied, whereas left atrial (LA) function has received limited attention. Speckle-Tracking Echocardiography (STE) offers a sensitive method to detect subclinical LA dysfunction, even in the absence of significant valvular disease. This study explores LA function using STE and investigates its determinants in children with RHD.

Methods:
The study included 715 participants from the GOAL trial, with a mean age of 12.5 ± 3.1 years; 56.2% were female, and 8.4% presented morphological changes of the mitral valve with pathological mitral regurgitation at baseline. LA strain during the reservoir phase (LASr) was measured automatically from the four-chamber view using STE. Impaired LA strain was defined as values below the first quartile, representing the lowest 25% of the data. Logistic regression analysis was employed to identify factors independently associated with impaired LASr.

Results:
The median LASr was 48.8% (IQR 41.9–57.6%), with impaired LASr (< 41.9%) observed in 180 children (25%). Multivariate logistic regression identified age, LA volume, and global left (LV) and right (RV) ventricular longitudinal strain as associated with impaired LASr (Figure 1). LV strain emerged as a significant determinant, with its inclusion improving the model's performance (C-statistic increase from 0.631 to 0.728; p=0.0052).
Conclusion: In children with RHD and no significant valvular dysfunction, LASr is predominantly influenced by LV strain. Early identification of impaired LA function shows promise; however, its clinical implications require further investigation.

Conclusion:
In children with RHD and no significant valvular dysfunction, LASr is predominantly influenced by LV strain. Early identification of impaired LA function shows promise; however, its clinical implications require further investigation.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

2018 - ASSESSMENT OF CARDIAC FUNCTION BEFORE AND AFTER LOW DOSE ANTHRACYCLINE CHEMOTHERAPY IN CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA

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Background / Hypothesis:
The number of pediatric survivors of acute lymphoblastic leukemia (ALL) continues to increase, with chemotherapy-induced cardiotoxicity emerging as a significant complication that profoundly affects prognosis. Therefore, it is crucial to monitor cardiac function both before and during the early stages of chemotherapy to enable early detection of cardiac dysfunction and to investigate associated risk factors.

Materials and Methods:
A total of 24 children with ALL were prospectively recruited as the study group, and age- and sex-matched healthy children were selected as the control group, which received only echocardiography. Before and after low-dose anthracycline chemotherapy (cumulative dose of 120mg/m2 in the medium-high risk group and 60mg/m2 in the low-risk group about 2-3months). The study group was compared with the healthy control group, and changes in cardiac function before and after low-dose anthracycline chemotherapy were analyzed, along with the factors influencing cardiac function

Results:
Compared with the control group, the heart rate of children with ALL before chemotherapy increased (116.25±25.60 vs. 93.67±20.79, P=0.002). Study group LV GLS showed a significant difference (-19.7 ± 2.10 vs. -23.10 ± 2.26; P < 0.001), as did RV GLS (-23.63 ± 2.47 vs. -29.20 ± 3.45, P < 0.001). Patients with ALL after low-dose anthracycline chemotherapy, NT-ProBNP was decreased [156 (36.65, 315) vs. 52 (31, 82), P=0.034], and hs-TnT (0.0075±0.0089 vs. 0.0126±0.0115, P=0.037) was increased. Children with ALL demonstrate diminished cardiac function prior to chemotherapy, as evidenced by elevated heart rate, reduced myocardial movement, and impaired diastolic function. Following low-dose anthracycline chemotherapy, the absolute value of LV GLS in children with ALL further declined. Elevated NT-proBNP levels in children with ALL prior to chemotherapy may suggest an increased risk of impaired myocardial motility. Furthermore, increased LVFS before chemotherapy and prolonged PVAT after chemotherapy could serve as potential risk factors for reduced LV GLS.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

2048 - ACUTE VENTRICULAR DYSFUNCTION AFTER INDUCTION DOSE DOXORUBICIN IN CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA.

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Background / Hypothesis:
Doxorubicin is an important drug used in the treatment of acute leukemia in children and cardiotoxicity is the most serious complication due to its use. The cardiac dysfunction due to doxorubicin can be acute, early or late. Echocardiography is a non-invasive tool and can be employed to detect cardiac dysfunction and plan treatment strategies accordingly.

Materials and Methods:
Twenty-eight children with acute lymphoblastic leukemia were enrolled. Echocardiography was done at baseline and 72 hours after induction dose of doxorubicin. Conventional and tissue doppler imaging parameters were obtained and compared.

Results:
After induction dose doxorubicin, both ventricles developed systolic and diastolic dysfunction. TAPSE significantly decreased after doxorubicin (20.0 ± 4.95 vs. 19.40 ± 4.90 mm, $p < 0.01$). RV MPI and IVRT showed a significant prolongation after doxorubicin (0.38 ± 0.08 vs.0.41 ± 0.08, $p < 0.01$, 41.4 ± 1.8 vs. 43.1 ± 12.6 milli sec, $p < 0.05$, respectively). Tricuspid E velocity and E/A ratio were significantly prolonged after doxorubicin (62.3 ± 8.35 vs. 60.1 ± 7.34 cm/s, $p < 0.01$, 1.54 ± 0.26 vs. 1.40 ± 0.23, $p< 0.01$) The LV fractional shortening and ejection fraction showed significant decrease after doxorubicin (32.1 ± 2.26 % vs. 31.4 ± 2.27 %, $p < 0.01$ and 64.60 ± 4.69 % vs. 63.10 ± 4.63 %, $p < 0.01$, respectively). LV MPI and IVRT showed a significant prolongation after doxorubicin (0.44 ± 0.05 vs. 0.46 ± 0.06, $p < 0.01$, 58.6 ± 8.75 milli sec vs. 60.3 ± 10.1 milli sec, $p < 0.05$, respectively) Mitral E velocity and E/A ratio were significantly prolonged after doxorubicin (85.6 ± 11.3 vs. 83 ± 11.9 cm/s, $p < 0.01$, 1.78 ± 0.43 vs. 1.63 ± 0.39, $p< 0.01$)

Conclusions:
Doxorubicin can cause both systolic and diastolic dysfunction. Echocardiography can be utilised to diagnose sub clinical cardiac dysfunction.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

2122 - LEFT ATRIAL APPENDAGE ANEURYSM FIRST AUSTRALIAN EXPERIENCE WITH TWO CONTRASTING PEDIATRIC PRESENTATIONS

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Background / Hypothesis:
Left atrial appendage aneurysm (LAAA) is a rare cardiac anomaly that may present with a wide spectrum of clinical features. Potential complications include tachyarrhythmias, thromboembolism, and respiratory compromise. Due to its rarity and non-specific symptoms, diagnosis is often delayed. We report the first Australian experience of LAAA through two pediatric cases with contrasting presentations and management.

Case 1:
A 12-year-old male presented with a two-month history of persistent cough following a viral respiratory illness. Chest X-ray revealed cardiomegaly, and transthoracic echocardiography (TTE) demonstrated a large LAAA. This was confirmed on CT (10.0 × 9.1 × 8.9 cm), which also showed mild left lower lobe atelectasis. Transoesophageal echocardiography (TOE) identified no thrombus. The patient underwent surgical resection of the aneurysm. Post-operative imaging revealed an organized clot within the non-communicating small residual aneurysmal cavity, managed conservatively. His respiratory symptoms resolved.

Case 2:
A female infant was referred at 3 months of age for evaluation of a cardiac murmur. TTE revealed atrial enlargement and mitral regurgitation, initially raising suspicion for restrictive cardiomyopathy. A diagnosis of LAAA was confirmed at 3 years of age following ongoing follow-up. At 16 years, she developed atrial fibrillation and at 19 years underwent mitral valve repair, left atrial reduction, and epicardial pacemaker lead placement. She was commenced on bisoprolol for paroxysmal atrial flutter and remains clinically stable with regular follow-up.

Conclusions:
These cases highlight the clinical variability and diagnostic challenges of LAAA in children. While one presented with respiratory symptoms in adolescence, the other was identified after prolonged evaluation of a murmur in infancy. Both required surgical management. Long-term follow-up is essential due to the risk of arrhythmias and other sequelae.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

2158 - WHEN THE BRAIN STUNS THE HEART A CASE OF NEUROGENIC STUNNED CARDIOMYOPATHY IN SEVERE TRAUMATIC BRAIN INJURY

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Neurogenic stunned cardiomyopathy (NSC) is a transient cardiac dysfunction associated with multiple central nervous system (CNS) conditions, particularly traumatic brain injury (TBI).
A previously healthy 13-year-old boy sustained a severe TBI after a 5-meter fall.
Electrocardiogram (ECG) at admission was normal. Brain CT revealed intraventricular hemorrhage, subarachnoid hemorrhage, subdural hematoma, and a skull base fracture.
Intracranial pressure (ICP) was initially controlled with medical therapy but later became increasingly difficult to manage.
On the sixth day in the intensive care unit, during a period of elevated ICP, the patient developed monomorphic premature ventricular contractions (PVCs), which progressed to nonsustained monomorphic ventricular tachycardia. This was promptly treated with an intravenous bolus of magnesium sulfate. Sinus rhythm was restored; however, the persistence of frequent PVCs associated with hypotension prompted the initiation of amiodarone.
A subsequent 12-lead ECG revealed a prolonged QTc interval (520-574 ms) and global repolarization abnormalities (T-wave inversions and ST-segment flattening), consistent with NSC. Cardiac biomarkers (troponin and BNP) were normal, and echocardiography showed a structurally normal heart with preserved left ventricular function.
Amiodarone and all other QT-prolonging medications were discontinued, except for noradrenaline and furosemide. Persistently elevated ICP motivated decompressive craniectomy, which successfully stabilized ICP, and no further cardiac events occurred.
Noradrenaline was discontinued on postoperative day 4, and ECG normalized within a week (QTc 430 ms and resolution of repolarization abnormalities), confirming a diagnosis of NSC.
This case highlights the interplay between CNS injury and cardiac manifestations in NSC, illustrating its reversible nature, where arrhythmias may arise despite preserved cardiac function. ICP control was critical for cardiac recovery, highlighting the importance of addressing the primary CNS insult. Multidisciplinary care, including neurocritical and cardiac monitoring, was essential for recovery. Early recognition of NSC in TBI patients is crucial to prevent complications and optimize outcomes.

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2179 - HAPPY DESATURATION SINUS VENOSUS ATRIAL SEPTAL DEFECT WITH BIATRIAL DRAINING OF SUPERIOR VENA CAVA

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Background / Hypothesis:
The superior vena cava(SVC) overriding interatrial septum is a rare congenital heart disease(CHD) which resulted in biatrial drainage. Sinus venosus atrial septal defect(SV-ASD), SVC type, is also named and usually accompanied by partial anomalous pulmonary venous return(PAPVR). Clinical presentations are varied, for example, dyspnea, stroke, brain abscess, and desaturation. We report a case of a healthy child with mild desaturation because of biatrial drainage of the right SVC.

Materials and Methods:
A healthy 1-year-old boy presented with upper respiratory tract infection. His growth, development, and immunization were age appropriateness. Physical examination showed oxygen saturation at 91-95%, normal first and physiologic splitting second heart sound without heart murmur, and other systems were unremarkable. Electrocardiogram showed abnormal P wave axis at -30º with normal rhythm and chamber size(Fig1). Transthoracic echocardiogram(TTE) showed a 6.5-mm superior sinus venosus atrial septal defect which SVC overrode interatrial septum and delivered blood flow to both right and left atria with anomalous right superior pulmonary venous(RSPV) connection to distal SVC(Fig2). The cardiac chamber size and function were within normal range. Agitated saline test showed returning of bubbles to left atrium(LA) immediately after injection. The cardiac magnetic resonance imaging (MRI) confirmed the diagnosis of SV-ASD with posterior wall of SVC defect and PAPVR of right superior and middle pulmonary veins. The SVC drained to both atria(Fig3). Intraoperative findings showed a 15-mm SV-ASD with abnormal connection of RSPV to SVC at sinoatrial junction. The defect was closed. PAPVR was redirected to LA by intracaval baffle then the cavoatrial junction was enlarged with autologous pericardial patch. Post-operative course was unremarkable. TTE showed intact atrial septum and normal pulmonary venous connection. He was doing well without residual lesion at 2-year follow-up.

Conclusions:
SV-ASD with desaturation is uncommon. Early recognition and treatment should be provided to prevent further complication, morbidity and mortality.

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2180 - TRANS CATHETER MANAGEMENT OF CONGENITAL PORTO SYSTEMIC SHUNT WITH VARIABLE PRESENTATION CASE SERIES

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Background / Hypothesis:
Congenital portosystemic shunt (PSS) are abnormalities of vascular system where portal blood is shunted into the systemic circulation. Clinical manifestations ranges from cyanosis to hepatic encephalopathy. Transcatheter management of PSS depends upon the presence and adequacy of portal venous system. We present our experience of 10 cases of PSS and its evaluation for transcatheter management.

Materials and Methods:
All patients underwent catheterisation and test balloon occlusion to assess native portal vein radical and portal system pressure. Only patients with adequate native portal vein underwent closure of the shunt. All were followed serially to assess growth of portal radicals

Results:
Ten cases were diagnosed to have PSS with mean age was 60 months (15 days -13 years) .Presented with cyanosis/pulmonary AVM (n:4), severe pulmonary hypertension (n:4), bleeding haemorrhoids (n:1) and cardiac failure (n:2). 2 patients diagnosed to have intrahepatic (ductus venous, right hepatic vein to right portal vein) while 8 diagnosed to have extrahepatic PSS (4 connected to IVC, one to iliac vein, one to innominate vein and two connected to azygous/hemiazygous system). 8 patients underwent successful closure of PSS using occluder/coils. Portal venous pressure measured was mean of 12 mm Hg (range 8 -20mm Hg). One patient with pulmonary hypertension died of RV dysfunction. On follow up (mean 38 months, range 3 months-72 months) one patient had persistence of PAH while one patient found to have mild IVC obstruction. One underwent mitral valve repair for the associated organic mitral valve disease. All patient showed normal LFT and good flow across portal vein.

Conclusion
Integrity of portal venous system is the key for feasibility of preforming trans catheter closure for congenital PSS which can present in myriad way.Long term follow up is needed for liver function, portal system growth and persistence/recurrence of symptoms.

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2202 - CYSTIC FIBROSIS COMPLICATED WITH TACHYARRHYTHMIA IN A YOUNG CHILD A CASE REPORT

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Despite rare cardiac complications in Cystic Fibrosis (CF), sudden cardiac death and arrhythmias in children with CF has been documented. Here, we present a case of a young Chinese child with CF who developed myocardial fibrosis and tachyarrhythmia when the respiratory symptoms were well-relieved and pulmonary function returned to normal. This child started to experience tachyarrhythmia at 2y4m of age, 1 year after the diagnosis and treatment of CF. His cardiac function gradually deteriorated to NYHA class III (left ventricular ejection fraction [LVEF] 44%) at 4y, and radiofrequency catheter ablation (RFCA) was required to control the ectopic atrial pacing (40.6%) and incessant atrial tachycardia. At the 6-month follow-up, the patient's cardiac function gradually improved to NYHA class I (LVEF 55%), and the incidence of ectopic atrial pacing decreased (6.20%).

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2203 - CROSS MY HEART AND HOPE TO ... LIVE – A SINGLE CENTER EXPERIENCE WITH CRISS CROSS HEARTS

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Ann & Robert Lurie Children's Hospital, Cardiology, Chicago-United States [1]

Background:
Criss-cross heart is a rare congenital rotational anomaly of the ventricular mass, characterized by crossing of the inflow streams and loss of the normal parallel orientation of the atrioventricular inlets. With an estimated incidence 8 per million births, and constituting approximately 0.1% of all congenital heart disease, we sought to add to the existing body of literature by characterizing our institutional experience with this rare condition, highlighting the variable morphologic associations and postnatal surgical strategies implemented.

Materials and Methods:
A retrospective review of our cardiac imaging database (August 1995–April 2025) identified patients diagnosed with criss-cross atrioventricular connections by echocardiography at our institution. Basic anthropometric information, relevant echocardiographic studies, and surgical repairs were reviewed.

Results:
Fourteen patients were identified, nine diagnosed at our center, and five of whom were seen for postnatal care at our institution.
Twelve of 14 patients are alive, with a current median age of 19 years (IQR 10). 43% are female, 57% are male.
Dextrocardia occurred in 36% (n=5) and mesocardia in one patient. Atrial situs was solitus in 93% (n=13). Ventricular looping was evenly split between D- and L-looping. Atrioventricular connections were concordant in 53% (n=8), discordant in 36% (n=5), and double inlet (n=1). Ventriculo-arterial connections were double outlet right ventricle in 71%, and discordant in 36%. Superior-inferior ventricular orientation occurred in 64%.
All patients had a ventricular septal defect. Associated cardiac anomalies were common (Table 2 & 3), particularly pulmonary outflow tract obstruction (64%) and AV valve straddling (29%).
Single ventricle palliation was pursued in 12/14, with one taken down to 1.5 ventricular repair. Biventricular circulation was achieved in two patients.

Conclusions:
Criss-cross heart is a rare but heterogenous lesion, frequently associated with other congenital anomalies, particularly abnormal VA connections and superior-inferior ventricular orientation. Single ventricle palliation surgical strategy is often necessary.

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2220 - ADVANCED LYMPHATIC IMAGING AND INTERVENTIONS IN PATIENTS WITH SEVERE LYMPHATIC COMPLICATIONS A CASE SERIES WITH UP TO FOUR YEAR OUTCOMES

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Background / Hypothesis:
Complications related to the lymphatic system such as protein-losing enteropathy (PLE), plastic bronchitis (PB), ascites, pleural effusions, and edema can now be effectively diagnosed and treated using advanced interventional techniques. In 2021, we established a lymphatic intervention program in Copenhagen, Denmark. This abstract presents up to four years of clinical outcomes from our first 19 patients.

Materials and Methods:
Nineteen patients (age range: 10–33 years; 12 males) with severe lymphatic complications were referred (15 Fontan, 4 non-CHD). Presenting complications included PLE (n=12), PB (n=3), pleural effusions (n=2), and abdominal pain suggestive of lymphatic compartment syndrome (n=2). All patients underwent standardized lymphatic imaging, including non-contrast MR lymphangiography followed by dynamic contrast-enhanced MR lymphangiography (DCMRL) with intranodal contrast injections in inguinal, hepatic, and mesenteric lymph nodes. Thoracic duct patency was assessed via ultrasound.

Results:
DCMRL identified pathological lymphatic channels in 17 patients, connecting to the duodenum (n=11), hepatoduodenal ligament (n=1), bronchial tree (n=3), or pleural space (n=2). Identified lymphatic leaks were treated with embolization (n=16), and in cases of persistent central lymphatic flow abnormality, thoracic duct decompression was performed (n=7; surgical innominate vein turn-down in 1 and transcatheter covered stent placement in 6). Three patients had no treatable lymphatic leak identified. After intervention, all treated patients achieved partial or complete symptom resolution, including relief of diarrhea, bronchial casts, pleural effusions, and abdominal pain. Laboratory markers of PLE (albumin, immunoglobulins, electrolytes) improved or normalized, and patients were able to taper or discontinue medications. Most resumed normal daily activities (school, work, exercise). None of the patients have required reintervention to date.

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Conclusions:
Our early experience with lymphatic interventions — including embolization and venous decompression — demonstrates promising outcomes in a complex patient population. These techniques appear to restore function and significantly improve daily living in patients previously limited by severe lymphatic complications.

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2250 - A STUDY AND ANALYSIS OF CARDIAC INVOLVEMENT BEFORE AND AFTER HEMATOPOIETIC STEM CELL TRANSPLANTATION IN CHILDREN WITH MUCOPOLYSACCHARIDOSIS

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Children's Hospital Of Soochow University, Color Ultrasonic Room, Suzhou-China [1]

Background / Hypothesis:
This study analyzed the cardiac involvement of children with mucopolysaccharidosis (MPS) before and after hematopoietic stem cell transplantation.

Materials and Methods:
A total of 17 children diagnosed with MPS who were treated in the Children's Hospital of Soochow University from December 2017 to January 2024 were selected, and the 10 children with MPS who underwent HSCT treatment in our hospital were retrospectively analyzed.

Results:
All 10 pediatric patients undergoing HSCT were male, including 8 with MPS II, 1 with MPS I, and 1 with MPS IVA. The transplantation age ranged from 1 year 1 month to 5 years 10 months (median: 3 years 5 months), with follow-up durations of 6-18 months. Four patients received idursulfase beta intravenous infusion prior to HSCT, while the remaining 6 underwent HSCT alone. Successful engraftment was achieved in 9 patients initially, with 1 requiring secondary transplantation. All patients survived.Pre-HSCT echocardiography in MPS II patients revealed: mild-moderate mitral regurgitation (6), mild aortic regurgitation (1), valvular thickening (aortic-4, mitral-2, pulmonary-1), and left ventricular geometric abnormalities (4 cases: eccentric remodeling-3, concentric remodeling-1). The MPS I patient showed left ventricular dilation with eccentric remodeling and mild mitral regurgitation. Post-HSCT echocardiographic follow-up demonstrated stable valvular pathology in 7 cases and progression in 3. Left ventricular abnormalities normalized in 2 patients within 3 months post-HSCT, while 3 showed incomplete recovery (improvement in 2, progression in 1) after 1 year. Comparative analysis of echocardiographic parameters revealed statistically significant differences in LVIDd and IVS measurements pre- and post-HSCT ($P<0.05$), with no significant changes in other parameters ($P>0.05$).

Conclusions:
This study found that HSCT can improve or stabilize the cardiac disease of most children with MPS, and has positive significance for slowing down the progression to heart failure, but long-term follow-up observation is needed for these children.

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2355 - LETHAL ARTERIOPATHY SYNDROME ASSOCIATED WITH IDENTICAL HOMOZYGOUS D203A MUTATION OF EFEMP2 GENE IN A UNIQUE PATIENT COHORT FROM COASTAL SOUTH INDIA.

Mahesh Kappanayil [1], Kasthoorba Kakkuzhiyil [2], Aleena Shaji [1], Sudipta Ghosh [3], Rajender Motiani [4], Prasenjit Guchhait [4], Sheela Nampoothiri [5]
Amrita Institute Of Medical Sciences, Pediatric Cardiology, Kochi-India [1] Amrita Institute Of Medical Sciences, Pediatric Cardiac Surgery, Kochi-India [2] North Eastern Hill University, Human Anthropology, Shillong-India [3] Regional Center For Biotechnology, Molecular Genetics, Faridabad-India [4] Amrita Institute Of Medical Sciences, Pediatric Genetics, Kochi-India [5]

Background / Hypothesis:

We recently described autosomal recessive lethal arteriopathy syndrome associated with homozygous D203A mutation of EFEMP2 gene in 22 infants from a unique population cohort from northern coastal (Malabar) region of Kerala, India (Kapanaayil et al. doi:10.1186/1750-1172-7-61). Currently classified as Autosomal Recessive Cutis Laxa Type 1B, this is one of most severe and lethal arteriopathies reported.
We present novel information on updated cohort and 20-year update on manifestations and outcomes of this rare disorder.

Materials and Methods:

Prospective longitudinal study of genetically proven cases with homozygous D203A mutation of EFEMP2 gene evaluated at a tertiary center in Kerala, from 2005-2024.

Results:
61 (35 males, 26 female) homozygous mutants were studied. 58/61 belonged to Malabar Mappila community; parents were heterozygous. Median age presentation was 2 months (IQR: 0.86–9 months); 20% presented within first month. Respiratory distress, cardiac murmurs were commonest presenting features. 3/60 presented and died within first three days of life. 56/60 died at median age 14 months (IQR: 3.5–18.5 months).
Phenotype included cutis laxa (63.49%), long philtrum (25.81%), arachnodactyly (25.81%), hernia (20.97%), sagging cheeks (19.35%), joint laxity (17.74%), hypertelorism (16.13%), visible arterial pulsations (12.90%), hypotonia (11.29%), and hooded eyes (11.11%). Cardiac imaging showed severe Aortopathy with dilatation, elongation and tortuousity of Aorta and its branches; isthmic narrowing noted in 56/60 patients. Involvement of pulmonary arteries, cerebral arteries and abdominal vessels were noted in most. Severe manifestations & young age precluded surgery in most.
Surgical repair was done for four patients in whom Aortopathy was relatively localised to ascending aorta and arch. 3/4 were operated after 4 years age - oldest at 13years. Youngest age at surgery is 2 months (currently surviving at 5 months age).

Conclusions:
We provide the first comprehensive description of a unique, highly lethal aortopathy syndrome associated with D203A mutation of EFEMP2 gene. Anthropological, molecular genetic and zebrafish studies are ongoing.

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2387 - UNUSUAL PRESENTATION OF FUNGAL INFECTIVE ENDOCARDITIS AS THE FIRST MANIFESTATION OF HIV IN A CHILD WITH A STRUCTURALLY NORMAL HEART

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Dow University Of Medical And Health Sciences, Paediaric Cardiology, Karachi-Pakistan [1] Aga Khan University, Paediaric Cardiology, Karachi-Pakistan [2] Aga Khan University, Aediaric Cardiology, Karachi-Pakistan [3]

Background / Hypothesis:
Infective endocarditis (IE) is a life-threatening condition characterized by microbial infection of the endocardium, frequently involving the heart valves. We present a case of young boy underwent surgery for mitral valve perforation associated with fungal infective endocarditis. The child subsequently tested positive for HIV infection. This is rarely reported as a presentation of HIV in pediatric population.The initial presentation was very atypical reflecting challenges in diagnosis in immune-compromised.

Case Report:
9 year old child was all well 4 months back when developed high grade fever for which he continued to visit multiple local clinics and received antibiotics. However there was no improvement until he had 2 episode of generalized tonic clonic fits in 24 hours for which they presented to tertiary care hospital. On physical Examination, he was a thin lean pale looking boy with no findings of clubbing, Osler nodes or Roth Spots. Vitally he was stable. On cardiac examination he was found to have a pan-systolic murmur, 3/6 audible at the apex and radiating to axilla, coarse breath sounds were noted in both lungs with no obvious dry or wet rales. Neurologic examination was normal with no focal neurologic deficit. The child was treated with broad-spectrum antibiotics and antifungal therapy. Fever settled but the child continued to have intractable cardiac failure requiring surgical intervention. Intraoperative findings confirmed perforation of the anterior mitral leaflet and ruptured chordae in A2 and A3 zones. (Figure 3-4) .Mitral valve replacement was performed successfully with a mechanical valve.

Conclusions:
This case underscores key lessons for clinical practice that fungal IE should prompt consideration of underlying immunosuppression, early and accurate diagnosis is critical to optimizing outcomes in complex cases.

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2394 - A PCV13 SEROTYPE BREAKTHROUGH PNEUMOCOCCAL ENDOCARDITIS ASSOCIATED WITH CHRONIC AORTIC REGURGITATION

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Taichung Veterans General Hospital, Children's Medical Center, Taichung-Taiwan [1] Taichung Veterans General Hospital, Cardiovascular Center, Taichung-Taiwan [2]

Background:
Chronic regurgitant jets are well-recognized for causing endothelial injury on impacted cardiac structures, predisposing to infective endocarditis (IE).

Case Report:
A 2-year-8-month-old boy with a history of transcatheter closure of a perimembranous type ventricular septal defect (VSD) by an occluder a year ago, with the indication of eccentric aortic regurgitation (AR). There was no significant change in the direction of the eccentric AR jet on the mitral valve before and after device closure. At a routine follow-up, echocardiography revealed a large vegetation on the mitral valve, complicating new-onset severe mitral regurgitation. Blood cultures identified Streptococcus pneumoniae, serotype 15B. The patient developed progressive respiratory failure and hemodynamic shock, necessitating urgent surgery.

Discussion:
The chronic AR jet striking the mitral leaflet may predispose the patient to IE. Streptococcus pneumoniae serotype 15B, a strain not covered by the 13valent pneumococcal conjugate vaccine (PCV 13), reveals a critical gap in the patient's immunization.

Conclusions:
1.Chronic aortic regurgitation (AR) is generally not immediately dangerous but should not be ignored, especially when its jet impacts cardiac structures, potentially causing endothelial injury.
2.Ongoing surveillance of domestic epidemiological pneumococcal serotypes is essential, and adopting broader-valency vaccines such as PCV15, PCV20, or PCV21 can strengthen immunization strategies and reduce breakthrough invasive disease.

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2412 - DIFFUSE HYPOPLASIA OF THE AORTIC ARCH IN A PATIENT WITH AORTIC SYNDROME WILLIAMS ON THE PROPOSAL OF A CLINICAL CASE.

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Instituto Nacional De Cardiología Ignacio Chávez, Cardiología Pediátrica, Ixtapaluca-Mexico [1]

A patient with facial features suggestive of Williams syndrome was diagnosed at 6 months of age with a heart murmur associated with failure to thrive, and was referred to our institution. The diagnosis was confirmed as ventricular septal defect (VSD), severe hypoplasia of the arch, root, and ascending aorta; patent ductus arteriosus "Type C" of Krichenko; and hypoplasia of the right pulmonary artery branch. The patient underwent sectioning and suturing of the ductus arteriosus, extended end-to-side coarctectomy, closure of the VSD, and plasty of the right pulmonary artery branch. Postoperatively, the patient presented complete atrioventricular block, and a pacemaker was inserted, and the patient was discharged on antihypertensive drugs. Aortic arch pathologies, specifically hypoplasia, are a pathology based on the anatomical narrowing of the aortic lumen, located at different levels, and represent 5-8% of all congenital heart diseases. If the narrowing of the descending aorta is dependent on the ductus arteriosus, its patency is crucial, so measures are taken to keep it patent and stabilize the patient until surgery. Coarctation, hypoplasia, and interruptions of the aortic arch present difficulties in therapeutic decision-making; these may occur in isolation or in association with other intracardiac malformations, as well as genetic syndromes in 81%. Severe diffuse aortic arch hypoplasia is uncommon and occurs in 2% of cases associated with genetic syndromes. Therefore, the diagnosis of aortic arch hypoplasia in patients with Williams syndrome

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2416 - SUBCLINICAL CARDIAC INVOLVEMENT IN CHILDREN WITH ALKAPTONURIA MULTIMODAL ASSESSMENT WITH IMAGING AND ELECTROPHYSIOLOGICAL MARKERS

Özlem Sürekli Karakuş [1], Şule Arici [1], Fatih Alparslan Genç [1], Gülperi Yağar Keskin [1], Erkan Taş [1], Adem Karabulak [1], Şerafettin Çorbacioğlu [1], Metin Sungur [1], Ayşe Inci Yildirim [1]
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Background / Hypothesis:
Alkaptonuria is a rare autosomal recessive disorder caused by homogentisate 1,2-dioxygenase deficiency, resulting in homogentisic acid (HGA) accumulation and ochronosis. While subclinical cardiac involvement is well-documented in adults, pediatric data are limited. This study aimed to investigate subclinical cardiac involvement in children with alkaptonuria using a multimodal assessment, including echocardiography, strain imaging, tissue Doppler imaging, electrocardiography, and metabolic profiling.

Materials and Methods:
Children diagnosed with alkaptonuria were compared to age- and sex-matched healthy controls. All participants underwent conventional and strain echocardiography, tissue Doppler imaging, electrocardiographic analysis, and urinary HGA/creatinine measurement. Correlations between metabolic markers and cardiac parameters were analyzed.

Results:
The study included 10 patients and 13 controls. Conventional and strain echocardiographic parameters were similar between groups; however, right ventricular tissue Doppler systolic (RV S′: 11.69 ± 1.38 vs. 13.22 ± 1.45 cm/s) and early diastolic velocities (RV E′: 13.62 ± 2.34 vs. 15.85 ± 1.60 cm/s) were significantly lower in the alkaptonuria group ($p = 0.03$ for both). Electrocardiography revealed significantly increased P-wave dispersion, QTc dispersion, Tpe dispersion, and Tpe/QTc ratio ($p < 0.001$), along with decreased indices of cardiac electrophysiological balance (ICEB and ICEBc; $p = 0.02$ and $p < 0.001$, respectively). A significant negative correlation was observed between the Tpe/QTc ratio and urinary HGA/creatinine levels ($r = -0.75$, $p = 0.02$).

Conclusions:
Despite the absence of overt clinical symptoms, pediatric patients with alkaptonuria exhibit early subclinical impairment in right ventricular function and significant electrophysiological abnormalities suggestive of increased electrical instability. These findings highlight the importance of regular and long-term multimodal cardiac monitoring to detect potential disease progression from early childhood.

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2467 - CARDIAC TROPONINS IN NEONATES WITH CONGENITAL PARVOVIRUS B19 INFECTION A MARKER OF MYOCARDIAL INJURY

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Background / Hypothesis:
Congenital Parvovirus B19 (B19V) infection can cause myocarditis in neonates. Recent reports suggest a rising incidence of myocardial involvement. Cardiac troponins I and T (cTnI, cTnT) are established biomarkers of myocardial injury. This study describes cases of congenital B19V infection with elevated troponin levels.

Materials and Methods:
Over a three-month period, five neonates with PCR- and serology-confirmed congenital B19V infection were enrolled in the NICU of G. Rodolico Hospital, Catania. All had normal cardio-respiratory adaptation at birth. Cardiac biomarkers (cTn, proBNP, CK-MB) were measured at admission and on days 3, 7, and 15. Echocardiography and ECG were performed at each time point

Results:
Echocardiograms were normal in all cases. ECGs showed no ST-segment changes and normal QT/QTc intervals. Mean cTn levels were 50 ng/L (day 1), 70 ng/L (day 3), peaking at 120 ng/L (day 7), then declining to 60 ng/L (day 15) with normalization by one month. Other cardiac biomarkers remained within normal ranges.

Conclusions:
Elevated troponin levels in congenital B19V infection do not necessarily reflect structural myocardial damage, as confirmed by normal echocardiographic and ECG findings. In our series, initial elevations normalized spontaneously. Serial troponin measurement may aid in monitoring possible myocardial injury in these patients, but larger studies are needed to clarify its prognostic value.

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2471 - ACUTE MITRAL REGURGITATION AFTER APPENDECTOMY IN A CHILD POSSIBLE STREPTOCOCCUS PNEUMONIAE ENDOCARDITIS

Pietro Sciacca [1], Carmine Loretta Mattia [2]
Policlinico Of Catania, Pediatric Cardiology Unit, Catania-Italy [1] Policlinico Of Catania, Nicu, - [2]

Background / Hypothesis:
Streptococcus pneumoniae is an uncommon but recognized cause of pediatric infective endocarditis, usually affecting left-sided heart valves. The application of Modified Duke Criteria is crucial for early diagnosis. We report a case in which the suspicion of endocarditis arose during the postoperative course of abdominal surgery.

Case presentation
A 6-year-old boy presented to the Emergency Department with a 3-day history of fever. Laboratory tests and abdominal ultrasound suggested appendicopathy, and the patient underwent appendectomy. Forty-eight hours postoperatively, oliguria, high-grade fever, and elevated inflammatory markers (CRP, PCT) were noted. Echocardiography—previously normal—showed new-onset moderate-to-severe mitral regurgitation, left ventricular hypokinesia, and depressed systolic function (EF 45%, FS 25%). Blood cultures were negative; throat swab and gastric aspirate were obtained, with the throat swab testing positive for S. pneumoniae. Based on the Modified Duke Criteria, the presentation was consistent with possible infective endocarditis (1 major criterion: new valvular regurgitation; 2 minor criteria: fever and isolation of a compatible pathogen from a non-blood site). Empiric therapy with vancomycin and meropenem was initiated, along with diuretics and captopril. Within 12 hours, fever resolved, diuresis normalized, and echocardiography showed improved ventricular function (EF 55%, FS 30%). After 72 hours, inflammatory markers decreased further, mitral regurgitation was mild, and systolic function was normal (EF 65%, FS 35%). At discharge, the patient had discontinued all therapies and showed normal mitral flow patterns.

Conclusions:
In pediatric patients, the onset of fever and organ dysfunction after surgery should prompt consideration of infective endocarditis. Even in the absence of positive blood cultures, integration of clinical, echocardiographic, and microbiological findings can support a diagnosis of possible endocarditis, enabling early intervention and improving outcomes.

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2517 - THE CHANGE IN PEDIATRIC SUBJECT SYMPTOMS DURING THE COVID 19 PANDEMIC IN CHINA AN INCREASE IN CARDIAC CONSULTATION

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Women And Children's Hospital Affiliated To Qingdao University, /, Qingdao-China [1]

Background
It is reported that the adverse impact of nonpharmaceutical interventions on the mental health of children and adolescents may lead to psychologically related disorders during the COVID-19 period. Subject symptoms such as chest pain, chest tightness, and palpitation may be related to increased stress and anxiety in children and adolescents. The present research aimed to determine the number of pediatric consults and etiology of subject symptoms during the COVID-19 pandemic period and compared it with the same timelines in 2019 and 2024 to discuss the impact of different periods on the organic disease onset of children with subject symptoms, especially in cardiac involvement.

Methods:
Children who visited Qingdao Women and Children's Hospital between January 23 to April 30, 2019 (pre period), January 23 to April 30, 2020 (COVID-19 period), and January 23 to April 30, 2024 (post period) presenting chest pain, chest tightness, and palpitation were recruited.

Results:
A total of 891 patients were enrolled in the present study. 123 patients presented during the pre period while 130 during the COVID-19 period, nevertheless, the number substantially increased during the post-COVID-19 period (n =638). Cardiac etiology accounted for 1.68% of the patient population. There was no significant difference among groups in the distribution of organic etiology. The median time from the latest onset to the visit during the pre period was 7days compared to 10days during the COVID-19 period and 3days during the post period.

Conclusions:
During the post period, the median time from the latest onset to the visit was significantly shorter than that in the pre period or COVID-19 period. The pediatric consult of children with subject symptoms presented increased substantially during the post-COVID-19 period, while there was no significant difference in the numberof patients involving the cardiac disease.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

2554 - THE ROLE OF CHD7 GENE ABNORMALITIES IN THE OCCURRENCE OF CONGENITAL HEART DISEASE CHD7

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Fudan University, Cardiovascular Center, Children's Hospital Of Fudan University, -China [1]

Background / Hypothesis:
This study aims to investigate the role of the CHD7 gene in cardiac development using hESC-derived cardiac organoids and cardiomyocytes
. By analyzing its downstream regulatory network and mechanisms in congenital heart disease (CHD), we aim to provide a theoretical foundation for elucidating CHD pathogenesis and improving early diagnosis.

Materials and Methods:
CHD7 mutation analysis: Construct hESC lines with CHD7 knockout, assess pluripotency, and evaluate mRNA/protein expression and localization. Induce differentiation into cardiac lineages (cardiomyocytes, endothelial cells, neural crest cells) to study CHD7's role in lineage specification.
Cardiac organoid modeling: Generate contracting multi-cavity cardiac organoids via Wnt pathway modulation. Analyze organoid morphology, chamber size/number, and contractility. Characterize cellular composition using immunofluorescence and flow cytometry with lineage-specific markers.

Results:
Define CHD7's role in cardiac organoid formation.
Elucidate CHD7's mechanisms in cardiac lineage differentiation and CHD pathogenesis.

Conclusions:
CHD7 gene knockout affects the formation of cardiac organoids in vitro; CHD7 gene mainly affects the development of cardiomyocytes, which in turn leads to the abnormal formation of cardiac organoids.

POSTER PRESENTATIONS

Category: Cardiovascular Involvement in Systemic and Rare Diseases

2586 - RISK FACTORS ASSOCIATED WITH RIGHT VENTRICULAR DYSFUNCTION IN CHILDREN WITH DUCHENNE MUSCULAR DYSTROPHY

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West China Second University Hospital, Pediatrics, Sichuan-China [1]

Background / Hypothesis:
Cardiopulmonary complications are the leading cause of death in patients with Duchenne muscular dystrophy (DMD). However, due to the complexity of the anatomy of the right ventricle (RV), its functional assessment is often overlooked. This study aims to comprehensively evaluate right ventricular function in patients with DMD through multimodal echocardiography and explore potential determinants of right ventricular dysfunction.

Materials and Methods:
We conducted a case-control study of 114 patients with DMD (age 5.0-16.0 years) and 38 age-matched healthy controls. All participants underwent routine echocardiography and spot tracking analysis to assess biventricular size and systolic/diastolic function. Factors associated with right ventricular dysfunction were identified by Pearson correlation analysis

Results:
Patients with DMD had a significantly higher body mass index (BMI) and were older ($p<0.05$) compared to controls. Patients with DMD had significant right ventricular dysfunction, which was manifested by decreased right ventricular fractional area change rate (FAC), tricuspid annular plane systolic amplitude of motion (TAPSE), right ventricular global longitudinal strain (GLS), right ventricular free wall GLS, and TDI-e' index, accompanied by an increase in E/e' ratio (all $p<0.05$). Right ventricular free wall GLS was positively correlated with FEV1, PEFR, LVEF, LV-GLS, and LV-GCS (all $p<0.05$) and negatively correlated with age and BMI ($p<0.05$)

Conclusions:
RV dysfunction appears early in the progression of DMD and is associated with respiratory failure, LV dysfunction, and baseline of child weight. Proactive weight management, respiratory support, and early LV-targeted therapy may help preserve RV function.

POSTER PRESENTATIONS

Category: Catheterization

1013 - WEIGHT STRATIFIED PROCEDURE SPECIFIC BENCHMARK RADIATION DOSE LEVELS IN PEDIATRIC CARDIAC CATHETERIZATION A RETROSPECTIVE TERTIARY CENTER STUDY

Sonia El-saiedi [1], Mohamad Abu-bakr [2], Shaban Al Ramlawy [3], Mohamad Mosaad [1], Mahmoud Othman [1]
Cairo University, Pediatric Cardiology, Cairo-Egypt [1] Heart Institute, Cardiology, Cairo-Egypt [2] Cairo University, Science Faculty, Cairo-Egypt [3]

Background:
Children undergoing cardiac catheterization are potentially at greater risk of radiation-induced stochastic injuries resulting from the greater radiation sensitivity of their tissues along with the longer lifespan ahead of them in which to develop potential neoplasms. Obtaining benchmark radiation exposure data for congenital cardiac catheterization is challenging due to the wide variation in procedure complexity, varying age, weight, equipment specifications, and performer skills add to this heterogeneity. Establishing baseline values is important for assessing the impact of quality measures being undertaken to minimize exposure and for comparison.

Objectives:
Our study reports the radiation doses as Fluoroscopy time, Air kerma, Dose area product and effective dose, for children who underwent cardiac catheterization procedures, and relation to their weight. Finally, setting radiation dose benchmark and set up weight-based radiation dose percentiles.

Methods:
Retrospectively the team reviewed radiation exposure data for 1531 cases, The following measures of radiation exposure are used, Fluoroscopy time, Air kerma, Dose–area product and Effective dose to set up our dose institutional and national radiation benchmark. We studied the relationship between radiation dose parameters and (age, weight, machine system and operator). Finally, we set up weight-based radiation dose percentiles.

Results:
For the overall study, median fluoroscopy time was 14 min, median total air kerma dose was 50 mGy, median DAP was 4884 mGycm2, and median effective dose was 4.3 mSv. All radiation parameters were higher in diagnostic than interventional procedures. There was significant positive correlations between DAP & AK for age and weight.

Conclusions:
Our study setup institutional radiation benchmark, and weight-based procedure-specific radiation parameters percentile and showed that our results were less than most of international studies.

POSTER PRESENTATIONS

Category: Catheterization

1014 - COMPLICATIONS OF PERCUTANEOUS PULMONARY VALVE IMPLANTATION IN CHILDREN WE HAVE SEEN THEM ALL

Sonia El-saiedi [1], Wael Attia [1], Baher Hanna [1], Mahmoud Othman [1]
Cairo University, Pediatric Cardiology, Cairo-Egypt [1]

Over 4 years we have implanted 45 Percutaneous pulmonary valves in Cairo University Children Hospital. Five cases were pulmonary atresia intact septum s/p RF perforation at birth, seven cases were valved conduits that progressed to stenosis and calcification. Four case was post balloon valvuloplasty and otherwise cases were post Fallot repair with or without transannular patch.

We have managed several complications on table from stent displacement and damage of the tricuspid valve to Valve dislodgement that was treated by surgical placement of the PV and repair of tricuspid valve. We have also managed a case with slipping of the stent and valve downwards with decision to damage the displaced valve and place another valve higher in position. Improper valve crimping and opened in the IVC. Incomplete opening of the Valve that folds in place!

We have seen halt of one of the valve leaflets leading to regurge within 6 months from placement. On the other hand, we have seen development of severe regurge within few months from placement that recovered after increasing the anti-coagulation therapy. One case showed paravalvular leak. One case was complicated by extensive Infective endocarditis after dental abscess, managed surgically.

On table we have had several other manageable problems due to bad communication between the operator the company's technician. That debate was really interesting.
All these complications will be shown and described in details.

POSTER PRESENTATIONS

Category: Catheterization

1015 - THE EASY ABSTAIN IN TRANSCATHETER MANAGEMENT OF CRITICAL NEONATAL LEFT VENTRICULAR OUTFLOW OBSTRUCTION

Sonia El-saiedi [1], Baher Hanna [1], Sahar Shedoudy [2], Mohamad Abd El Aziz [3], Mahmoud Othman [1]

Cairo University, Pediatric Cardiology, Cairo-Egypt [1] Tanta University, Cardiology, Tanta-Egypt [2] Minstry Of Health, Pediatrics, Alexandraia-Egypt [3]

Background:
Percutaneous transcatheter angioplasty of aortic stenosis (AS) and coarctation of the aorta (CoA) might be lifesaving in the critically ill newborn. We aimed to study the short-term outcome of balloon dilatation of AS and CoA with or without stenting in the critically ill newborns and comparing different published techniques.

Materials and Methods:
This prospective study included 45 critically ill neonates with AS or CoA admitted to Neonatal Cardiac Intensive Care Unit, faculty of Medicine, Cairo University Children and Tanta university over two years.

Results:
AS was encountered among 18 neonates (40.0%) and CoA in 27 (60.0%). Antegrade approach was successful in 11 (61%) of those with AS, while retrograde approach was successful among 7 (38.1%) of the neonates with AS and all neonates with CoA (p=0.001). Angioplasty with stenting was performed in 13 cases of CoA with stenting and without in 14. The post-intervention pressure gradient was significantly lower in CoA with stenting compared to none stenting.
The rate of surgical reintervention was higher in the CoA group, where 12 cases of restenosis compared to the AS group where only 2 cases needed a second catheterization (p= 0.001).

Conclusion:
Transcatheter balloon angioplasty of AS or CoA was effective and can be performed safely in neonates. Stent placement in neonates with severe CoA was safe and could be a bridging approach to facilitate surgical management at a later stage as re-coarctation and mortality had lower rates in this two-steps management.

POSTER PRESENTATIONS

Category: Catheterization

1016 - CLOSING PDA IN PATIENTS BETWEEN 2 6 KG CAIRO UNIVERSITY EXPERIENCE

Sonia El-saiedi [1], Youmna Hosni [2], Hafza Mahdy [3], Manal Mohamad [1]
Cairo University, Pediatric Cardiology, Cairo-Egypt [1] Cairo University, Pediatrics, Cairo-Egypt [2] Minstry Of Health, Pediatrics, Cairo-Egypt [3]

Background:
The ductus arteriosus is a central vascular shunt connecting the pulmonary artery to the aorta, allowing oxygenated blood from the placenta to bypass the uninflated fetal lungs and enter the systemic circulation. Rapid closure of the ductus arteriosus after birth is essential for vascular transition to the mature, divided pattern of arteriovenous circulation. Failure of ductus arteriosus closure termed patent ductus arteriosus (PDA).
Aim and objectives: to evaluate catheter closure versus surgical closure outcome of PDA in pediatric patients weighed between 2-6 kg in Cairo University.
Subjects and methods: This was a cross sectional analytic study conducted on 43 PDA Pediatric patients weighed between 2-6 kg in cardiology department specialized pediatric hospitals of Cairo University over 10 years since (2012-2023).

Results:
There were two groups for PDA closure in our study, surgical group and catheterization group. Surgical group (n=23) and catheterization group (n=20), the weight range of the surgical group was (2.5-6) kg and catheterization group was (4.5-6) kg. There was a statistically significant difference between the two groups regarding age at intervention (days) with median and (IQR) in surgical group of 123 (96-198) and in catheterization group of 255 (188-308) with P value <0.001. There was a statistically significant difference between the two groups regarding weight (Kg) and height (cm) at procedure with median and IQR as weight in surgical group is 4.5 (3.2-5) and in catheterization group is 5.9 (5-6) with P value <0.001 and height in surgical group 59 (57-61) and in catheterization group is 64 (60-68) with P value equal 0.002. There was a statistically significant difference between the two groups regarding to hospital length of stay (days) as P value is <0.001.

Conclusion:
Our study concluded that in Pediatric patients weighed between 2-6 kg surgical repair groups included lower weights than catheterization group and both closing methods

POSTER PRESENTATIONS

Category: Catheterization

1062 - SUPRA AND SUBVALVULAR LEFT VENTRICULAR OUTFLOW TRACT STENOSIS – OWN EXPERIENCES

Jacek Kusa [1], Agnieszka Skierska [1], Krzysztof Kocot [1], Pawel Czesniewicz [2], Urszula Abramczyk [2]
Medical University Of Silesia, Pediatric Cardiology Department, Katowice-Poland [1] Regional Specialized Hospital, Pediatric Cardiology Department, Wroclaw- [2]

Background / Hypothesis:
The aim of the study is to present the results of percutaneous dilatation of sub- and supravalvular stenoses of the left ventricular outflow tract, which are rarely performed in children.

Materials/Methods:
During last 12 years, 7 balloon angioplasty procedures of subvalvular stenosis of the left ventricular outflow tract (group I) and 8 supravalvular angioplasties (group II) were performed (1 stent implantation).
The age of patients ranged between 3.6 and 14.7 years (mean 6.9).
In group I, only patients with diagnosed (suspected) membranous stenosis were qualified.
In all patients, other concomitant heart defects were diagnosed. The size of the used balloon didnt exceed the ratio of 0.9-1.0 (balloon/aortic annulus).
In group II, 4patients had congenital stenosis (3 Williams syndrome), and 4 post-surgical ones(dTGA, AS, Norwood). Only patients with fibrous or hourglass-shaped changes were qualified.

Results:
In group I, the pressure gradient decreased from 72 to 38mmHg and in 5/7pts the procedure was considered effective. The procedures were effective when stenosis was more than 10 mm from the aortic annulus. During FU, 3patients experienced recurrence of stenosis. In 2/3, cardiac surgery was performed, while in 1 (no consent for cardiac surgery) the procedure was repeated twice due to recurrence (current gradient 30mmHg).
In group II, the gradient decreased from 76 to 42mmHg and in 4/8pts the procedure was considered effective. The procedure was effective in 3 iatrogenic changes and only in 1 congenital one.
In 1 patient after arterial switch, balloon angioplasty was ineffective, therefore the lesion was dilated with stent implantation.
In no case was the development or progression of aortic regurgitation observed.

Conclusions:
Percutaneous dilatation of sub- and supravalvular left ventricular outflow tract stenosis is a possible procedure, but it can only be performed in a strictly selected group of patients. The effectiveness of the procedures depends on the location of stenosis, its origin and morphology.

POSTER PRESENTATIONS

Category: Catheterization

1066 - PERCUTANEOUS PULMONARY VALVE IMPLANTATION IN PEDIATRIC PATIENTS A RETROSPECTIVE ANALYSIS IN A SINGLE CENTER OF EAST CHINA

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Shanghai Children's Medical Center, Cardiology, Shanghai-China [1]

Background / Hypothesis:
Percutaneous pulmonary valve implantation (PPVI) is a novel option to treat pulmonary regurgitation (PI) in congenital heart disease-associated right ventricle outflow dysfunction. The clinical application of this strategy in pediatric patients has not yet reached a consensus.

Materials and Methods:
We undertook a retrospective review of PPVI patients documented at our institution between January 2015 and December 2024. The patient's clinical characteristics, catheterization, and prognosis data were analyzed.

Results:
A total of 27 patients with severe pulmonary regurgitation (PI) postoperative underwent PPVI. Procedural success was 100%. Among these patients, males accounted for 70.4% (19/27). Mean age and weight at implantation were 15.2±2.3 years and 52.3±7.2 kg, respectively. All the patients showed no or trivial PI, and no paravalvular leakage was observed during the median follow-up of 24 (range, 1-120) months. Mean RVEDVi, mean RVESVi, and mean PARF were significantly decreased [(192.5±26.1) ml/m2 vs (106.7±18.9) ml/m2; (129.3±21.3) ml/m2 vs (76.7±17.4) ml/m2; (66.4±7.1) % vs (6.8±2.3) %]. Mean left ventricular end-diastolic volume index (LVEDVi) and left ventricular end-systolic volume index (LVESVi) were both significantly increased [(84.9±13.2 ml/m2 vs (94.3±8.6) ml/m2; (39.2±15.5) ml/m2 vs (49.6±8.2) ml/m2]. The mean peak systolic pulmonary artery gradient was not significantly different from that before the operation [(14.7±5.3) mmHg vs (15.6±4.2) mmHg]. Freedom from serious adverse events was 92.6% (25/27), while there were 2 cases received surgical reintervention for infective endocarditis (IE). For most of the patients, there was no fracture, displacement, or deformation of the device, as well as other serious device-related adverse events.

Conclusions:
PPVI was a safe and effective optional strategy to treat PI in pediatric patients with congenital heart disease associated right ventricle outflow dysfunction.

POSTER PRESENTATIONS

Category: Catheterization

1076 - INVESTIGATION OF Q WAVE IN PDA BEFORE AND AFTER TRANSCATHETER CLOSURE

Toshikatsu Tanaka [1], Ryosuke Nakai [1], Yasunobu Miki [1], Shingo Kubo [1], Naoya Kamei [1], Yasuharu Ogawa [1], Sachiko Kido [1]
Kobe Children's Hospital, Cardiology, Kobe-Japan [1]

Background / Hypothesis:
Deep Q wave in ECG may show left ventricular volume overload, left ventricular hypertrophy, and myocardial ischemia. Deep Q wave is often observed in PDA patients who need treatment in infancy, however, the clinical significance is not clear.

Materials and Methods:
This study is single-center retrospective review of patients who had undergone transcatheter PDA closure using ADO family. We assessed the deepest Q wave (dQ) in ECG before PDA closure, and divided patients into two groups. Group A was dQ≧0.5mV, and group B was dQ<0.5mV. Age, PDA diameter, Qp/Qs, systolic blood pressure (sBP), diastolic blood pressure (dBP), mean blood pressure (mBP), % of normal LV diastolic dimension (%LVDd) of echocardiography at catheterization were compared in each group.

Results:
Forty-eight patients of group A and 92 patients of group B were included. The groups differed in age (1 year of group A vs 4 years of group B; P<0.01), PDA diameter (2.5mm vs 2.0mm; P<0.01), Qp/Qs (1.5 vs 1.2 ;P<0.01), dBP (36mmHg vs 44mmHg; P<0.01), mBP (57mmHg vs 62mmHg; P<0.01), and %LVDd (124% vs 107%; P<0.01). The dQ was detected in III lead (79%), V6 (13%), V5 (4%), and aVF (4%). In the patients dQ were observed more than 1 year, 39/46 (85%) patients showed improvement of dQ to less than 0.5mV.

Conclusions:
Deep Q wave in PDA patients might reflect subclinical left ventricular ischemia due to decline of diastolic blood pressure in addition to left ventricular volume overload. Early closure might be desirable for the PDA patient who present deep Q wave in ECG.

POSTER PRESENTATIONS

Category: Catheterization

1132 - TRANSCATHETER PATENT DUCTUS ARTERIOSUS CLOSURE IN PREMATURE INFANTS AT CHILDREN'S HOSPITAL CITY FROM A TO Z

Phung Tran [1]
City Children Hospital, Cardiac, Ho Chi Minh-Vietnam [1]

Background / Hypothesis:
Patent ductus arteriosus (PDA) is a common congenital heart defect in premature infants, accounting for 45% - 80% of premature, low birth weight infants. Hemodynamically significant PDA (hsPDA) causes cardiac dysfunction, other complications, and even death. Transcatheter PDA closure has been shown to be safe and effective in premature infants >500 grams. This study reports the outcomes of transcatheter PDA closure using the Amplatzer Piccolo Occluder in premature infants with hsPDA.

Materials and Methods:
This case series included all premature infants <37 weeks gestational age who underwent PDA closure with the device at Children's Hospital City between January 2024 and March 2025

Results:
A total of 12 infants (7 males, 5 females) underwent PDA closure. The mean gestational age was 29 weeks and the mean weight was 0.9 kg. All infants underwent cardiac catheterization via the femoral vein under echocardiographic and fluoroscopic guidance. The device was successfully implanted in all 12 patients (100%). Post-procedure echocardiography showed complete occlusion in all but one patient who had a trivial residual shunt. Two patients (14.2%) developed pericardial effusion during the procedure. One case was successfully treated with drainage, while the other patient died. There were no cases of atrioventricular block or tricuspid regurgitation after catheterization.

Conclusions:
Transcatheter PDA closure is a safe and effective treatment for premature infants and is being increasingly used

POSTER PRESENTATIONS

Category: Catheterization

1138 - TRANSCATHETER CLOSURE OF SECUNDUM ATRIAL SEPTAL DEFECT IN ADULT AND PAEDIATRIC POPULATION WITHOUT TRANSOESOPHAGEAL ECHOCARDIOGRAPHY GENERAL ANAESTHESIA

Sanjeev Hanumantacharya Naganur [1], Parag Barwad [1], Sachin Mahajan [1], Yash Paul Sharma [1], Abhishek Mallick [1]
Pgimer, Cardiology, Chandigarh-India [1]

Background / Hypothesis:
Transcatheter device closure is the preferred therapeutic option for ostium secundum ASD. Standard practice of utilizing transesophageal echocardiography guidance, requires general anesthesia which increases the cost, procedural duration, ICU stay, total hospital stays at risk of esophageal injury and complications of GA. Transthoracic echocardiography is an excellent alternative with comparable efficacy as shown by many studies in pediatric population.

To assess and analyze the safety and efficacy of TTE-guided device closure of OS-ASD in all comer population irrespective of age, weight, defect size.

Materials and Methods:
All patients who underwent device closure of OS-ASD between March 2017 and March 2025 were enrolled. All procedures were performed under local anesthesia in adults and conscious sedation in children. The device was placed under fluoroscopy guidance and position were confirmed on TTE. Procedural success, device:defect ratio, procedural time, fluoroscopy time, complications, intensive care unit. hospital stay duration were analyzed and compared with our own experience of 125 patients of TEE-guided ASD closure (before 2017).

Results:
463 patients underwent TTE-guided device closure of ASD. Procedure success was 97.2% with acceptable risk of major complications. Three(0.6%) had embolization into pulmonary artery, successfully operated surgically. Two had tamponade requiring drainage. In 13(2.8%) patients, device could not be deployed despite multiple attempts and approaches. All of these had defect size of > 34mm and deficient IVC rim along with another short (other than aortic) rim. Findings were compared with our own previous experience of TOE guided closure (practised before 2017). Compared to TOE group, TTE group had significantly lower total procedural duration (75±4 vs. 26 ± 2.5 min; $p < 0.01$), intensive care unit stay (24±10 vs. 10.5±1 h; $p < 0.01$), and hospital (48±12 vs. 23.5±4h; $p < 0.01$) stay duration. Fluoroscopic time was similar in both. There was no mortality in either group. Major complications were comparable

TTE-guided

POSTER PRESENTATIONS

Category: Catheterization

1142 - A LOW COST WAY FOR RADIOFREQUENCY PERFORATION OF THE PULMONARY VALVE

Phung Tran [1]
City Children Hospital, Cardiac, Ho Chi Minh-Vietnam [1]

Background / Hypothesis:
Pulmonary atresia with intact ventricular septum (PA-IVS) is a rare congenital lesion with high mortality. Therapy was exclusively surgical until recently, when the use of radiofrequency-assisted perforation of the atretic valve was introduced as a treatment option.
Assess the feasibility of using commonly available catheterization laboratory equipment for radiofrequency perforation of the pulmonary valve in patients with pulmonary atresia and intact ventricular septum

Materials and Methods:
The system consist of a 0.014" PT 2 ™ coronary guidewire, for insulation inside a 2.7-F microcatheter which has an inner lumen of 0.021". The microcatheter was passed via a standard 4-F right coronary catheter to just below the atretic pulmonary valve. Radiofrequency (RF) energy was delivered using a standard electrosurgical system. 20 W for 3 s would be sufficient for valve perforation

Results:
Radiofrequency perforation was successfully performed in all (n = 7, 100%) patients at a median age of 7 days (range: 1-20) and weight 2.9 kg (range 2.4-3.6). In one patient the pericardium was entered during the initial attempt; the guidewire was left in place while transferring to BT shunt operation because of haemopericardium. The pulmonary valve was dilated successfully in other 6 cases under both echo and fluoroscope guidance; in five patients (n = 5) the ductus arteriosus was stented during the same session

Conclusions:
It is feasible to perforate the pulmonary valve safely using this system. Availability, simplicity and cost are noteworthy benefits.

POSTER PRESENTATIONS

Category: Catheterization

1143 - CREATING A FLOW RESTRICTOR IN DUCTAL STENTING A NOVEL TECHNIQUE

Phung Tran [1]
City Children Hospital, Cardiac Ward, Ho Chi Minh-Vietnam [1]

Background / Hypothesis:
Ductal stenting has revolutionized the management of neonates with ductal-dependent critical congenital heart disease (CHD), particularly in low-income countries. However, in small infants, using a 3.5- or 4-mm stent can lead to excessive pulmonary blood flow, potentially causing pulmonary edema. This report introduces a novel technique to restrict ductal stent flow in a premature neonate with pulmonary atresia and an intact ventricular septum, following radiofrequency perforation of the pulmonary valve.

Materials and Methods:
case report. A twin male neonate, born at 36 weeks' gestation with a birth weight of 2.5 kg, was prenatally diagnosed with pulmonary atresia and an intact ventricular septum. Due to a prostaglandin shortage, trans-catheter interventions were performed on the first day of life. Radiofrequency perforation and balloon valvuloplasty of the pulmonary valve were successfully performed. To prevent pulmonary overcirculation, a novel technique was developed to restrict flow across the ductal stent. A 3.5-mm drug-eluting coronary stent was advanced, and a portion of the stent was deployed to create a "funnel," acting as a flow restrictor.

Results:
Post-procedure, the patient maintained adequate saturations and was discharged after four weeks. At follow-up, the ductal stent was obstructed, and the patient underwent a repeat balloon valvuloplasty

Conclusions:
This report is the first to describe this technique for creating a flow restrictor for a ductal stent in a small infant. The final pulmonary blood flow depends on the stent diameter and patent ductus arteriosus length. This technique helped achieve balanced circulation in this patient and may be considered for others with similar conditions.

POSTER PRESENTATIONS

Category: Catheterization

1162 - CATHETER BASED INTERVENTIONS IN PATIENTS WITH TOTAL ANOMALOUS PULMONARY VENOUS DRAINAGE A SINGLE CENTER EXPERIENCE

Mehmet Balci [1], Recep Siyar Balik [1], *Sezen Ugan Atik* [1], Erman Cilsal [1], Selman Gokalp [1], Murat Sahin [1], Alper Guzeltas [1], Pelin Ayyildiz [1]
Mehmet Akif Ersoy Thoracic And Cardiovascular Surgery Training Research Hospital, Pediatric Cardiology Department, Istanbul-Türkiye [1]

Background:
Total anomalous pulmonary venous drainage (TAPVD) is a rare congenital heart defect with an incidence of approximately 1 in 20,000 live births.Prenatal diagnosis is uncommon. While transcatheter palliation may be necessary in obstructive forms,surgical correction remains the definitive treatment. Prognosis varies by subtype; however, obstruction and associated pulmonary venous stenosis (PVS) worsen the outcomes. In patients with isomerism, particularly those with single-ventricle physiology, survival is further reduced. This study aims to summarize catheter-based procedures performed in patients with isolated or associated TAPVD.

Methods:
We retrospectively reviewed demographic and catheterization data of patients diagnosed with TAPVD who underwent catheter-angiography in the preoperative or postoperative period between December 2014 and December 2024 at our center. Data were extracted from the institutional FileMaker database.

Results:
A total of 177 patients underwent surgical repair for TAPVD during the study period.
Among them, 18 patients underwent diagnostic and 30 underwent interventional catheter procedures,corresponding to a catheterization rate of 27%. Of the patients who had interventional catheterization,16 (53%) were in the postoperative period, while 14(47%) had not yet undergone surgical repair.Of these 30 patients 8 had right atrial isomerism and the rest had situs solitus.
Among patients with obstructive supracardiac TAPVD, 12 underwent vertical vein (VV) stent implantation, one had VV balloon angioplasty, and one underwent later VV occlusion.
In patients with PVS after TAPVD repair,six underwent balloon angioplasty and seven received stent implantation in the pulmonary veins(stent diameters:5–7 mm).
Transseptal access and subsequent septoplasty were required in two patients, while interatrial stent implantation was performed in one patient due to the need for repeated interventions.

Conclusion:
In TAPVD patients with obstruction,particularly those with complex associated lesions,transcatheter palliation should be considered.Mortality remains high and management is particularly challenging in heterotaxy syndromes.Pulmonary venous stenosis,especially in the postoperative setting,often requires repeated interventions and remains a progressive,difficult-to-treat condition despite current advances.

POSTER PRESENTATIONS

Category: Catheterization

1163 - EXPANDING APPLICATIONS OF CHRONIC TOTAL OCCLUSION (CTO) WIRES IN CONGENITAL HEART INTERVENTIONS A SINGLE CENTER EXPERIENCE

Recep Siyar Balik [1], Mehmet Balci [1], *Sezen Ugan Atik* [1], Erman Cilsal [1], Selman Gokalp [1], Murat Sahin [1], Alper Guzeltas [1], Pelin Ayyildiz [2]
Mehmet Akif Ersoy Thoracic And Cardiovascular Surgery Training Research Hospital, Pediatric Cardiology Department, Istanbul-Türkiye [1] Mehmet Akif Ersoy Thoracic And Cardiovascular Surgery Training Research Hospital, Pediatric Cardiology, Istanbul-Türkiye [2]

Background:
Chronic total occlusion (CTO) wires have significantly advanced adult interventional cardiology over the past decade and are now increasingly utilized in congenital heart disease (CHD). While pulmonary valve perforation in pulmonary atresia with intact ventricular septum (IVS-PA) remains the most common indication, their use has expanded to various complex congenital pathologies. This study aims to present our institutional experience and outcomes with CTO wire applications in pediatric patients.

Methods:
We retrospectively reviewed 56 patients who underwent CTO wire–assisted procedures between December 2014 and December 2024. Data were collected from medical records and the FileMaker database.

Results:
The median age was 9 days (range: 1 day–18 years), and median weight was 3.5 kg (range: 2–54 kg). CTO wires were used for pulmonary valve perforation in 40 patients with IVS-PA (71%), pulmonary antegrade flow restoration in 2 with VSD-PA, shunt recanalization in 5 (9%), PTFE membrane perforation during transcatheter Fontan completion in 4 (7%), subatretic aortic coarctation perforation in 3 (5%), and ductal recanalization in 1 patient with left pulmonary artery disconnection. One case involved recanalization of a jailed stent.

Wires used included Asahi Pro 12 (n=36), Conquest Pro 9 (n=11), Halberd (n=5), Miracle (n=2), Progress 200T (n=1), and Whisper (n=1). Overall procedural success was 82% (46/56). Wire-specific success ranged from 50% to 100%. RF perforation was attempted in 8 patients after CTO failure, with success in 7.

Complications occurred in 11 patients (20%), including misperforation (n=5), SVT (n=2), and VT (n=1). No major complications or procedural mortality were observed. Seven patients required early additional interventions due to desaturation.

Conclusion:
CTO wires offer a valuable, minimally invasive alternative to surgery in selected high-risk congenital cases and are increasingly used in a broadening range of pediatric interventional procedures.

POSTER PRESENTATIONS

Category: Catheterization

1198 - DIAMETER OF THE CAROTID AXILLARY AND FEMORAL ARTERIES IN INFANTS LESS THAN 2.5 KG OF BODY WEIGHT

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Background / Hypothesis:
Though the establishment of catheter intervention for small infants, the normative arterial size of premature babies is not clear. We speculated the vessel sizes correlate with body size even in infants with small body of under 2.5 kg.

Materials and Methods:
From April 2021 to March 2023, neonates admitted to our institutions without any hemodynamical burden were included in the study. Using a vascular ultrasound, the carotid (CA) - axillary (AA) - and femoral arterial (FA) diameters were measured.
Results:Ninety-nine (50 females) patients of median corrected gestational age (cGA) as 36 (26 to 41) and 43 cm (28 to 49) of height (HT), 1866g (556 to 2456) of weight (BW), 30 cm (19 to 36) of head circumference (HC) were enrolled. No significant difference was seen between the AA and the FA diameter. There was significant correlation (all p-value < 0.001) between the arterial diameters and the body size parameters such as HT (r = 0.49 in CA, r = 0.38 in AA, r = 0.52 in FA), BW (r = 0.50 in CA, r = 0.44 in AA, r = 0.48 in FA), and HC (r = 0.41 in CA, r = 0.41 in AA, r = 0.41 in FA). The vessel diameter above 1.6 mm, the smallest sheath outer diameter, was predicted based on the body weight with an area under the curve (AUC) of 0.754, in cut off value of 1754 g for the axillary artery and AUC of 0.747, in cut off value of 1668 g for the femoral artery. The CA diameter was bigger than 1.6 mm in all cases.

Conclusions:
Arterial diameters correlated with the patient's body size. Under 1800 g of BW, femoral or axillary arterial access may better to be avoided.

POSTER PRESENTATIONS

Category: Catheterization

1200 - KONAR MFO – NEW DEVICE FOR PDA CLOSURE

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Background / Hypothesis:
Konar MF Occluder is a new design device dedicated for ventricular septa defect closure. Its shape (champagne cork) resemble Amplatzer Duct Occluder (ADO) type I, but with an extra disc makes the device potentially suitable for patent arterial duct (PDA) closure. There are some PDA anatomy or physiology when usually used devices(ADO I, ADO II and Piccolo) seam to not a best option for use. The aim was to evaluate usefulness of new devices in closure of PDA's of rare anatomy

Materials and Methods:
There were 8 patients with PDA closed using Konar MFO device in the period of 1 year – from 07.2023-11.2024. There were 4 females and 4 males age from 6 months to 81 years, weight from 5,7 to 75 kg. All patients had a PDA's shape A according to Krichenko nomenclature. Duct sizes were estimated from 2,5 to 4,5 in narrowest point and the length was from 4,5 to 7,4 mm. Duct ampulla was measured from 6,8 mm to 12 mm. Mean pulmonary pressure was measured from 10 to 52 mmHg and In 4 was elevated. All procedures were performed in iv sedation, and the implantation was performed from arterial in 4 cases and 4 from venous access.

Results:
All procedures were successful and uneventful and the implanted devices were in sizes 7/5 mm (6 patients) and 8/6 mm (2 patients). In two of them with pulmonary hypertension post procedure pulmonary pressure was measured – it drop significantly. There was minor residual shunt directly post procedure and disappeared in 24 hours. There were no significant turbulences/gradient in pulmonary branches or descending aorta found in periprocedural or postprocedural echocardiography. There ware no complications noted.

Conclusions:
Konar MF devise is a new device suitable for PDA closure particularly conical shape

POSTER PRESENTATIONS

Category: Catheterization

1202 - FONTAN FENESTRATION CREATION USING TRANSCATHETER ELECTROSURGERY

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Background:
The Fontan procedure is the definitive operation for palliation of complex congenital heart disease with single ventricle physiology. A fenestration between the systemic venous return and atrium has shown to improve early outcomes. Benefits include minimize pleural drainage, hospital length of stay and short term morbidity. In cases where a fenestration was not created surgically, Fontan baffle punctures and fenestration remain challenging due to the complex anatomy and prosthetic material used.
Transcatheter electrosurgery refers to procedures using radio-frequency energy to traverse or lacerate tissue despite flowing blood.

Materials and Methods:
We report a case of a 5 year old boy with single ventricle physiology who developed significant persistent high output chylothorax post Fontan surgery. He presented 3 weeks post-operatively with massive right pleural effusion, and coincidentally, the Fontan fenestration flow was not seen. He underwent cardiac catheterization which confirmed the blocked Fontan fenestration with borderline high pulmonary artery pressures and there were multiple aorto-pulmonary collaterals which were coiled.
Two weeks post procedure, he developed re-accumulation of right pleural effusion. This time, he underwent transcatheter Fontan fenestration creation and stenting of the fenestration.
The Fontan conduit was perforated with transcatheter electrosurgery, whereby the area of puncture was perforated using the distal tip of a 0.014" coronary wire (diathermy energy of 20W) with support from a microcatheter through a 6Fr JR guiding catheter. This perforation was then stented with a 8x25mm peripheral stent.
One month post second procedure, there was again re-accumulation of right pleural effusion, and there was minimal flow across the fenestration stent. The fenestration was then re-stented with a 6x18mm stent. Post procedure, his saturation was maintaining at 85-90% and no pleural effusion.

Conclusions:
Transcatheter electrosurgery is a safe and feasible option in perforating the Fontan conduit as part of creation of a Fontan fenestration.

POSTER PRESENTATIONS

Category: Catheterization

1211 - POSSIBILITY OF CATHETER CLOSURE FOR PATENT DUCTUS ARTERIOSUS LIGATED IN INFANCY AND NEONATAL PERIOD WE NEED 6MM DIAMETER PICCOLO!

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Background :
The introduction of the Piccolo Occluder has enabled transcatheter closure of PDA even in neonates and low-birth-weight infants. However, surgical ligation is still performed in some cases due to large PDA diameter.

Materials and Methods:
We retrospectively analyzed 111 patients who underwent surgical PDA ligation at our institution from September 2007 to December 2023. Excluding 5 patients over 5 kg who would be eligible for ADO-I or ADO-II, 106 cases were examined. We applied Shyam's chart to determine the assumed applicable Piccolo size, and for cases falling into the "other device" category, a size at least 2 mm larger than the minimal diameter was considered.

Results:
Median age at surgery was 9 days (range: 2–108), with body weights ranging from 0.5 to 4.3 kg (mean: 1.9 kg). Krichenko types were A (26), B (2), C (33), and F (45). Minimum diameters were 1.4–6.0 mm (mean: 3.2 mm), lengths 3.0–11.0 mm (mean: 6.3 mm). Theoretical Piccolo sizes were 3mm (23 cases), 4mm (20), and 5mm (21). In the remaining 42 cases (mean weight: 2.7 kg), the estimated suitable Piccolo sizes were 6mm (33), 7mm (7), and 8mm (2).

Conclusions:
Piccolo devices in sizes of 6–8 mm, if designed to fit through 5F–6F catheters, may allow transcatheter closure in nearly all PDA cases previously treated surgically. Expansion of device size availability could significantly reduce the need for surgical ligation.

POSTER PRESENTATIONS

Category: Catheterization

1233 - HYBRID SURGICAL CATHETER INTERVENTIONS IN CONGENITAL HEART DISEASE TEN YEAR EXPERIENCE FROM A MULTIDISCIPLINARY PEDIATRIC CARDIAC CENTER

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Mehmet Akif Ersoy Thoracic And Cardiovascular Surgery Training And Research Hospital, Pediatric Cardiology Department, Istanbul-Türkiye [1] Mehmet Akif Ersoy Thoracic And Cardiovascular Surgery Training And Research Hospital, Pediatric Cardiac Surgery Department, Istanbul-Türkiye [2]

Background:
Hybrid surgical-catheter interventions represent a transformative approach in managing congenital heart diseases by combining the strengths of interventional cardiology and cardiac surgery. This strategy allows for individualized treatment and is especially valuable in high-risk patients or those with complex anatomies, where conventional techniques may be inadequate or risky.

Aim of Study:
This study aims to present our single-center experience with hybrid cardiac interventions performed within a multidisciplinary framework, emphasizing their role in enhancing procedural safety and therapeutic success across a broad pediatric population.

Methods:
This study included patients who underwent hybrid cardiac interventions at our center between 2015 and 2025. Data were obtained through a review of the hospital's electronic medical records. Hybrid procedures were performed in selected cases based on clinical indication and anatomical considerations. The primary indications included unsuitable vascular access for percutaneous intervention, the need for concomitant surgical procedures, emergent life-saving interventions, or as supportive measures to complement surgical treatment. Each case was evaluated in a multidisciplinary setting to determine the optimal hybrid strategy.

Results:
A total of 50 hybrid procedures were performed in patients aged 0.43 to 580.43 months (median: 19.42 months) and weighing 2.2 to 110 kg (median: 9.4 kg). These interventions enabled life-saving procedures in neonates and low-weight infants and offered less invasive, more targeted approaches in older patients. The most common procedures were perventricular ventricular septal defect (VSD) closure, pulmonary valve replacement, and patent ductus arteriosus (PDA) stenting. The hybrid approach reduced cardiopulmonary bypass time, minimized surgical trauma, and provided access to anatomically complex lesions.

Conclusion:
Hybrid interventions significantly improve the management of congenital heart diseases across diverse ages and clinical scenarios. Our experience supports their expanding role in high-risk cases and highlights the need for widespread adoption of hybrid programs and multidisciplinary collaboration in advanced pediatric cardiac care centers.

POSTER PRESENTATIONS

Category: Catheterization

1245 - BESPOKE CATHETER FOR ATRIAL SEPTOSTOMY DUE TO THE SHORTAGE OF BALLON SEPTOSTOMY CATHETERS

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Background / Hypothesis:
Transcatheter enlargement of the interatrial communication is one of the most acute, maybe the most acute intervention in newborn babies with complex congenital heart disease.
During the last 8 years, several well-established and often used ballon catheters have been recalled by the manufacturer, leaving interventional cardiologists in Europe with only one CE-marked balloon catheter.
We present a case of a newborn baby with Transposition of the great Arteries who presented with preductal oxygen saturation of 45%.
Balloon septostomy with the commercially available NuMed Z-5 balloon did not succeed in creating a sufficiently large interatrial communication.
Static balloon dilation was performed using 12 and 16 mm Tyshak II balloons, with no significant interatrial communication.

Encourage by a case presentation by Hadddad et. al we decided to prepare a similar “Rashkind catheter”. A 90 cm Medtronic launcher coronary guide catheter was cut in half. The distal half of a 2 cm long 12 mm Tyshak II balloon was advanced through the cut catheter on the bench creating a mushroom-shaped balloon tip catheter. This system was advanced from the femoral vein over a 0.0018`´Abbott Steelcore Wire that was placed in the upper left pulmonary vein. The distal tip of the balloon was again exteriorized in the left atrium under echocardiographic and fluoroscopic control. The wire was removed, the balloon and launcher guide catheter were simultaneously pulled back into the right atrium, creating a sufficient 6 mm interatrial communication. Preductal oxygen saturation levels rose to 80%. No complications were noted. Arterial switch operation was performed one week later. The postoperative course was uneventful.

Conclusions:
Due to the shortage of Balloon septostomy catheters, interventional cardiologists may have to improvise to perform emergency and potentially life-saving procedures. We used a previously described off-label technique with excellent results.

POSTER PRESENTATIONS

Category: Catheterization

1247 - THE EFFICACY AND DURABILITY OF RIGHT VENTRICULAR OUTFLOW TRACT STENTING IN VARIOUS AGED CHILDREN WITH TETRALOGY OF FALLOT

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Background:
The number of children with Tetralogy of Fallot far exceeds the number of surgical repairs that can be performed in Indonesia. Late presenter is also common, complicating the problem. Right ventricular outflow tract (RVOT) stenting before total correction has given promising results. This study aims to review the outcome of RVOT stenting.

Methods:
Retrospective reviews from a single center were performed to assess the outcome (oxygen saturation, pulmonary arteries growth, and weight for age increment) of children that underwent RVOT stenting from May 2022 to March 2025 in Hasan Sadikin General Hospital, Indonesia. Indications of RVOT stenting were symptomatic TOF patients with high risk factors, such as small pulmonary arteries (z score <-2 SD), ventricular dysfunction, comorbids as malnutrition, recurrent respiratory tract infections, with syndrome or complex form of TOF. Comparisons were conducted before and after the procedure. Statistical analysis was performed with t-test.

Results:
There were 16 children that underwent RVOT stenting. Median age when the procedure occurred was 22 months (ranging 16 days to 5 years 5 months). Median weight was 7.85 kilograms (ranging 1.56 to 12 kilograms). Oxygen saturation was significantly increased (mean 72% vs 94%, CI 95%, p=0,000). There was significant increase in pulmonary arteries growth with median follow up of 1 month (mean right pulmonary artery 5.78 vs 6.80 mm, CI 95%, p=0,005; left pulmonary artery 4.99 vs 6.94 mm, CI 95%, p=0,002), but not for weight for age increment (-3.03 SD vs -2.54 SD , CI 95%, p=0,09). There were 6 children that had remaining stents even after 12 months since the procedure occurred, with no complications during follow up. The longest duration was 26 months.

Conclusion:
RVOT stenting is a durable and effective method before total correction even in late presenter that can be done at various aged children.

POSTER PRESENTATIONS

Category: Catheterization

1250 - PHILIPS HEARTNAVIGATOR SOFTWARE FOR PRE PROCEDURAL PLANNING AND REAL TIME GUIDANCE IN COMPLEX PAEDIATRIC CARDIAC INTERVENTIONS A REVIEW OF CLINICAL CASES

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Background:
Paediatric cardiac interventional procedures present unique challenges due to the diverse spectrum of congenital heart defects and genetic syndrome. These conditions often manifest with complex structural variations, anomalous vessel arrangements, and chamber malformations, making standard interventional approaches challenging. The Philips HeartNavigator software offers dual functionality in pre-procedural planning and real-time guidance through CT-fluoroscopy overlay.

Materials and Methods:
This study evaluates the HeartNavigator software's application in paediatric cardiac interventions at KK Women's and Children's Hospital. Pre-procedurally, the software generated detailed 3D cardiac models from CT scans, with manual refinement of undetected structures where necessary. These models enabled comprehensive pre-procedural planning, including precise measurements and optimal fluoroscopy angle determination. During interventions, the 3D models were co-registered with live fluoroscopy images. The study evaluates the system's impact on procedural planning efficiency, device selection accuracy, radiation exposure, and operator satisfaction.

Results:
The software demonstrated advantages in both pre-procedural planning and intra-procedural guidance. The 3D modelling capabilities facilitated precise structural measurements for device selection and enabled optimal fluoroscopy angle planning prior to intervention. During procedures, real-time CT-fluoroscopy fusion imaging enhanced catheter navigation and device positioning while reducing the need for repeated high-dose contrast fluoroscopy. Cardiologists reported improved confidence in device sizing and anatomical localisation. However, limitations were noted in the software's automatic segmentation capabilities, particularly for complex anatomical variants, necessitating additional manual adjustments. The learning curve for optimal software utilisation was also observed to be significant.

Conclusions:
Initial experience with the HeartNavigator software demonstrates significant benefits in both pre-procedural planning and real-time guidance for paediatric cardiac interventions. The ability to pre-plan fluoroscopy angles and device sizing, combined with enhanced intra-procedural visualisation, suggests potential improvements in procedural efficiency and accuracy. Limitations include the dependency on recent high-quality CT images and expertise required for manual segmentation. Further evaluation is needed to quantify its impact on procedure duration, radiation exposure, and clinical outcomes.

POSTER PRESENTATIONS

Category: Catheterization

1272 - CONGENITAL CORONARY ARTERY FISTULA; TRANSCATHETER CLOSURE BY DIFFERENT DEVICES IN LIMITED FINANCIAL RESOURCE COUNTRY (EGYPT

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Background / Hypothesis:
Coronary artery fistulas (CAF) present with various anatomic configurations and can lead to several life-threatening hemodynamic complications thus mandating transcatheter closure

Objective:
Assess feasibility, safety and outcome of trans catheter closure hemodynamic CAF with limited device availability among children

Materials and Methods:
Retrospective pediatric study of transcatheter CAF closure at Cairo university Children specialized hospital between 2014 – 2024

Results:
Nine pediatric cases most females (8cases), median age 3 years,and median weight 12 kg

Right atrium was the commonest fistula insertion site by selective coronary angiography. Fistulae cases with right atrial insertion were closed through transcatheter arteriovenous loop approach . Balloon Sizing were used in 2 cases aididng proper decision ,selecting the device size and type .

The median devices sizes used were 6 mm . Due to limited device availability ,the commonest devices used for coronary fistulas closure were Amplatzer ductal occluder II (in 3 cases) , followed by Amplatzer vascular plug (in 2 cases) , Amplatzer muscular VSD occlude (in 2 cases) , KONAR MF VSD occluder was used in (1 case) , and Cera lifetech PDA occluder was used in (1 case) .
Trans catheter closure was successful in all cases with no residual flow or ischemic changes . Only 1 case developed ventricular tachycardia during device deployment and required cardioversion.
All cases were discharged home within 48 hours . The mean radiation dose was(300 +/- 50 mGy) ,and the mean fluoroscopy time was(30 +/- 10 minutes).

Conclusion:
Coronary artery fistulas can be safely and effectively closed using different trans catheter devices among pediatric age group with limited financial resources .

POSTER PRESENTATIONS

Category: Catheterization

1321 - BALLOON ANGIOPLASTY FOR AORTIC COARCTATION IN INFANTS 3 12 MONTHS OF AGE A THIRTY FOUR YEAR EXPERIENCE

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Background:
Primary balloon angioplasty for native aortic coarctation in infants 3-12 months of age is safe and effective. Long term outcomes for reintervention and aortic wall injury (dissection/aneurysm) have been incompletely described. We provide a six-year update of our original series of cases which ended in 2017.

Methods:
Single centre retrospective review of all infants 3-12 months of age who underwent balloon angioplasty for native aortic coarctation from January 1989 to December 2023.

Results:
Eighty-one infants underwent a balloon angioplasty procedure over the 34-year study period. Demographic and procedural outcome details are outlined in Table 1. Median (IQR) age, weight and follow-up duration were 6.1 (3.6-8.5) months, 6.9 (5.6-8.0) kg and 10.3 (4.9-15.4) years. Three participants were lost to follow up. Reintervention was required in 20/78 (25.6%): 4 underwent two reinterventions, 11 had surgery. One participant with an acute aortic injury underwent surgery during the index admission. Freedom from re-intervention at 1, 5 and 10 years was 85.5% (95%CI, 78.0-93.4%), 78.1% (69.0-88.3%) and 73.9% (64.0–85.4%). A small aortic aneurysm was noted in 4/78 (5.1%) participants, none have required reintervention in long-term follow-up. Cross sectional imaging, repeat angiography, or direct visualisation of the aorta at surgical repair occurred in 36/78 (46.2%). However, 13/78 (16.7%) were <8 years of age and too young for MRI without general anaesthesia.

Conclusions:
With a median follow up of 10.3 years, the risk of reintervention was highest in the first two years after the index balloon angioplasty. Aortic wall injury requiring intervention was rare. Surveillance cross sectional imaging following coarctation balloon angioplasty was underperformed and should become a routine procedure.

POSTER PRESENTATIONS

Category: Catheterization

1324 - BEYOND THE VALVE CHALLENGES IN PERIPROCEDURAL CARE FOR ADULTS WITH CONGENITAL HEART DISEASE UNDERGOING TRANSCATHETER SELF EXPANDING PULMONARY VALVE IMPLANTATION – EXPERIENCE OF A SINGLE POLISH CENTER.

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Background / Hypothesis:
Despite ongoing advancements in transcatheter pulmonary valve implantation (TPVI) for pulmonary regurgitation (PR), standardized guidelines for periprocedural care remain lacking. The complex health status of adults with congenital heart disease (ACHD) often makes periprocedural management a key challenge. This study aims to share our experience in optimizing periprocedural care for adult TPVI patients, highlighting critical challenges that may influence clinical practice.

Materials and Methods:
We analyzed adult patients with complex congenital heart disease and PR who met TPVI eligibility criteria according to the current European Society of Cardiology guidelines and patient preference. A dedicated, multidisciplinary care protocol was implemented. Exclusion criteria included active infection, acute circulatory decompensation.

Results:
Six patients (50% female, mean age 30.7±8 years, BMI 22.7±3 kg/m^2) underwent TPVI using a self-expanding device (Table 1). As part of our standardized perioperative protocol, all patients underwent dental evaluation and, if necessary, treatment at a reference center before TPVI. The day before, each patient received 300 mg of aspirin, which was continued with 75 mg on the day of the procedure. Cefazolin was administered for 24 hours from start of the procedure. Vascular access was achieved under ultrasound guidance and secured with two ProStyle devices. In the two oldest patients, successful electrical cardioversion was performed for atrial fibrillation, with no recurrence post-TPVI.

Incomplete valve expansion in the RVOT occurred in two patients, requiring post-dilation with balloons—a technique not previously reported. Transient, asymptomatic sinus bradycardia was observed in two cases immediately post-procedure. No serious complications were noted. Post-TPVI pharmacotherapy included dual antiplatelet therapy (clopidogrel + aspirin), with anticoagulated patients receiving clopidogrel for three months before resuming oral anticoagulation alone.

Conclusions:
Our findings highlight key periprocedural challenges in TPVI and emphasize the need for standardized care protocols. Sharing experiences and clinical insights is essential to refining best practices and improving patient outcomes.

POSTER PRESENTATIONS

Category: Catheterization

1328 - CLINICAL OUTCOM IN A PATIENT UNDERGOING PERCUTANEOUS CLOSURE OF PERIPROSTHETIC PARAVALVULAR LEAKS.

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Background / Hypothesis:
Symptomatic paravalvular leak can complicates up to 12 % of surgical valve replacements. When patients present with congestive heart failure and/or haemolysis, reoperation for repeat valve replacement may be undertaken, but presents greater risk and lower likelihood of success than the initial operation. Because it is necessary to use of cardiopulmonary by pass, and it can impact on the body´s inflammatory response, due tu several factors, it also increase de risk of bleedin and other complications that increased postoperative morbitity and mortality rates. Therefore, percutaneous approaches to paravalvular leak closure have been developed, however, experience in the pediatric patients group is limited.

Materials and Methods:
We present the case of a 9-year-old female patient, who was admitted to our Institute referred from a second-level hospital with a history of infectious endocartitis due to oxacillin-resistant S. aureus, with vegetation on the aortic valve (bicuspid and dysplastic), ventricular septal defect, postoperative outside our institute for Manouguian-type aortic annulus enlargement with implantation of a 19mm biological prosthesis valve and closure of VSD, requiring broad-spectrum antibiotic therapy. She was referred to our unit with large pavalvular leak, maximum prosthesis gradient of 9 mm and a half 4 mmHg, mild insufficiency and heart failure. She presented at a session undergoing percutaneous closure, during the procedure a leak was found towards the right atrium, left ventricle, residual ventricular septal defect, closure was performed with a 12 mm AVP II device.

Results:
The patient was discharged three days after the procedure with improved functional class, and continued follow-up through outpatient consultations.

Conclusions:
Transcatheter closure of paravalvular leaks is a safe and effective alternative to surgical correction and should be used in selected patients to achieve significant improvement in heart failure symptoms and hemolytic anemia, with clinical and hemodynamic improvement. However, more experience is needed in pediatric patients.

POSTER PRESENTATIONS

Category: Catheterization

1329 - INTERVENTIONAL TREATMENT OF PULMONARY ARTERIOVENOUS FISTULA

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Background / Hypothesis:Pulmonaryarterio-venous fistula (PAVF) is anuncommoncauseof cyanosis and should besuspected whennor malcardiacexaminationisassociatedwithoutevidence ofintra-cardiacshunt.Off-label use of occluder devicesin the catheter laboratories can be helpful and safe when chosen according to the morphology, site, and the size of the fistula, and it is considered a good alternative to surgery as it selectively occludes the PAVF while preserving the normalpulmonary vessels.

Materials and Methods:

Results:Followupwithcomputedtomographypulmonary angiogram confirmed the closure results with good device position and no residual shunt.

Conclusions:

POSTER PRESENTATIONS

Category: Catheterization

1351 - MANAGEMENT CHALLENGES IN A RARE CASE OF COMPLEX CONGENITAL HEART DISEASE SECURING PULMONARY BLOOD FLOW WITH BILATERAL PDA STENTING FOLLOWED BY INSERTION OF FLOW REGULATORS TO OVERCOME PULMONARY OVER CIRCULATION.

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Background / Hypothesis:
This case report describes the management of a 4-month-old boy with complex congenital heart disease (CHD) dextrocardia, atrioventricular discordance, ventricular septal defect (VSD), pulmonary atresia, bilateral patent ductus arteriosus (PDA), and disconnected pulmonary arteries. Initially managed conservatively in his home country with oral/rectal prostaglandins and oxygen.

Materials and Methods:
Upon presentation to the emergency department with severe hypoxia and an intercurrent viral illness (oxygen saturations in the 30s), he was commenced on intravenous prostaglandin and admitted to the intensive care unit. Echocardiography and computed tomography confirmed his diagnosis. Due to a lack of surgical options, an interventional approach was pursued.

Results:
Bilateral PDA stenting (6mm*16mm Formula 418 stents) was performed successfully, improving oxygen saturation to mid 70s. Bronchoscopy revealed distal tracheomalacia and right main bronchus malacia.

Following extubation, he was managed in high-dependency care with medical therapy and non-invasive ventilation in view of evolving pulmonary overcirculation. He developed sepsis with multiple resistant organisms and required targeted antimicrobial therapy. Due to persistent overcirculation, he returned to the cardiac catheter lab where a pulmonary flow restrictors(modified micor vascular plugs) were inserted, initially causing haemodynamic instability but later stabilizing with vasoactive support.

Despite interventions, he continued to experience respiratory distress and desaturations. Multidisciplinary discussions concluded that no further surgical or interventional options were viable.

Conclusions:
This case highlights the rarity and extreme complexity of managing congenital heart disease with multiple structural abnormalities and limited circulatory support options. The need for a multidisciplinary approach, combining interventional cardiology, respiratory support, infection control, and palliative care, underscores the challenges in such cases. Despite innovative interventions, the lack of definitive surgical solutions emphasizes the difficulties in treating high-risk CHD patients, particularly when options for long-term palliation are limited.

POSTER PRESENTATIONS

Category: Catheterization

1362 - SUCCESSFUL ONE STAGE EMBOLIZATION OF ABNORMAL LEFT HILAR LYMPHATIC PERFUSION AND BALLOON ANGIOPLASTY OF THE THORACIC DUCT IN PATIENT WITH FONTAN CIRCULATION

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Background / Hypothesis:
Plastic bronchitis (PB) in patients with Fontan circulation poses significant morbidity and mortality, with limited therapeutic options. We present a novel case of simultaneous transcatheter embolization of abnormal left hilar lymphatic perfusion (ALP) and balloon angioplasty of the thoracic duct (TD) ostium. The procedural hallmark was a dual-access technique: establishment of a wire rail from venous access to deliver an angioplasty balloon to the TD ostium, followed by transabdominal percutaneous embolization of ALP. This approach addressed both lymphatic obstruction and leakage, offering a potential paradigm for refractory PB management.

Materials and Methods:
Under general endotracheal anesthesia, bilateral inguinal lymph node cannulation was performed, followed by TD lymphography. The TD was then accessed transabdominally using a 21G Chiba needle. A coronary guidewire was advanced through the needle into the TD, allowing microcatheter insertion and selective ductography. A 300-cm coronary wire was navigated retrogradely from the TD through the left subclavian vein, Glenn anastomosis, and right pulmonary artery, where it was snared and externalized via the right internal jugular vein (RIJV), establishing a continuous rail from the anterior abdominal wall to the RIJV. From the RIJV access, the TD ostium was dilated at 6 atm. Subsequently, transabdominal microcatheterization targeted abnormal lymphatic perfusion of the left hilum, which was successfully embolized with N-butyl-cyanoacrylate (NBCA) glue. Final lymphography confirmed complete occlusion of the pathologic lymphatic flow.

Results:
At 12-month follow-up, the patient remained free of PB symptoms, with no further cast formation.

Conclusions:
Correction of both lymphatic overflow (via ALP embolization) and TD obstruction (via angioplasty) may be critical to disrupting the vicious cycle of plastic bronchitis in Fontan physiology, as illustrated here.

POSTER PRESENTATIONS

Category: Catheterization

1367 - MIDTERM OUTCOMES OF TRANSCATHETER VALVE WITH POLYTETRAFLUOROETHYLENE LEAFLETS IN RIGHT SIDE VALVES REPLACEMENT IN CONGENITAL HEART DISEASE

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Background / Hypothesis:
The tricuspid valve replacement group had a higher risk of tricuspid valve reoperation (37% vs 9%; P = 0.005) compared with the cone repair group. (Boyd R. et al.) Conduits in pulmonary position, freedom from valve replacement and valve failure/dysfunction at 10 years is estimated at 51.7% and 20.2%, respectively. Young age, diagnosis of pulmonary atresia with ventricular septal defect and valve implantation without stent are among the de novo surgery risk factors (Alejandro P. et al.) Transcatheter valve replacement is a minimally invasive procedure for treatment of right ventricular outflow tract and tricuspid valve dysfunction in surgically repaired congenital heart diseases. However, available xenopericardial valves in young patients are prone to dysfunction and high risk of endocarditis. Transcatheter valve with PTFE leaflets. It is an attractive alternative to xenopericardial valves due to absence of biodegradation of polytetrafluoroethylene in the organism

Materials and Methods:
From February 2019 to June 2024 we selected 15 consecutive patients, who underwent implantation transcatheter prosthetic with PTFE leaflets due to right-side valves dysfunction.

Results:
During the study period, 12 patients underwent tricuspid “valve in valve “ implantations (TVVI) and 8 patients transcatheter pulmonary valve replacement (TPVR). Mean age was 31.2±9.20 years and mean weight 53.7±24.2 kg. The underlying cardiac conditions were anomaly Ebstein (N=12, 60 %), tetrology of Fallot (N=5, 25%), pulmonary atresia with ventricular septal defect (N=1, 5%), Ross procedure (N=1, 5%) and VSD closure and TV repair (N=1, 5%).TPVR and TVVI was successful in all patients. In all cases, valve function was restored without complications. During follow-up we didn’t observe right valve incompetence.

Conclusions:
The experience of implantation demonstrated the efficacy and safety of using the PTFE valve for right-side valves replacement. This approach is a reasonable option as alternative to redo surgical valve replacement.

POSTER PRESENTATIONS

Category: Catheterization

1375 - TWENTY YEAR EXPERIENCE IN PERCUTANEOUS MECHANICAL PERFORATION OF THE PULMONARY VALVE FOR PULMONARY ATRESIA WITH INTACT VENTRICULAR SEPTUM

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Background / Hypothesis:
Pulmonary atresia with intact ventricular septum (PAIVS) is a critical heart defect with a wide range of anatomical and morphological variants, severity of which determines the strategy and results of treatment. Pulmonary valve (PV) perforation is the preferred procedure, but successful opening of pulmonary blood flow doesn`t guarantee freedom from reoperation in numerous patients.

Materials and Methods:
This research represents a single-centre experience in mechanical perforation of PV. Between September 2004 and July 2024 PAIVS was diagnosed in 118 patients. Perforation attempt using a coronary chronic total occlusion wire was performed in 75 patients. The median patient`s age at the time of intervention was 3 [2; 4] days (5 hours - 14 days), the average weight was 3.28±0.523 (2.23-4.6) kg.

Results:
Perforation followed by balloon valvuloplasty was successful in 66 patients (88%). Concomitant PDA stenting was performed in 7 cases. Early reinterventions were required in 24 patients (36.4%) in 6 [4; 8.5] (1-16) days after procedure: systemic-pulmonary shunt (n=14), PDA stenting (n=9) or RVOT procedure (n=1). Prolonged prostaglandin infusion for 7 [5; 11] (1-30) days allowed to avoid additional procedures in 35 patients (53%). The overall mortality rate was 10.6% (early - 9.1%, late - 1.5%). Of the 59 survived patients, 22 (37.3%) didn`t require reinterventions during 10-year median follow-up. The right heart structures growth was noted in long-term follow-up: at the time of intervention the ratio of TV to MV was 82.8±16.5 (45.5-116.7)%, in one year 95.8±16.8 (65-123)% and 100.3±20.5 (64-121)% in 5 years; RV to LV length ratio was 73±9.6 (58.3-87.6)%, after one year 82.2±11.3 (51-97.5)% and 86.1±14 (50-106.8)% in 5 years. Biventricular circulation was achieved in 56 patients.

Conclusions:
Percutaneous mechanical perforation of PV is an effective procedure for patients with PAIVS, promoting growth of the right heart structures.

POSTER PRESENTATIONS

Category: Catheterization

1394 - SAFETY AND EFFICACY OF TRANSCATHETERIC DEVICE CLOSURE OF ATRIAL SEPTAL DEFECT IN CHILDREN WEIGHING LESS THAN 15 KG EXPERIENCE FROM A TERTIARY CARE CENTRE FROM EASTERN INDIA.

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Background / Hypothesis:
Transcatheteric device closure of ostium secundum atrial septal defect is the standard of care worldwide. While safety and efficacy are well established among older children, limited data is available in children below 15 kg weight.

Materials and Methods:
A retrospective review was conducted on all patients weighing less than 15 kg who were taken to the catheterization laboratory for elective transcatheter closure of ostium secundum ASD between August 2014 and March 2025. Failure to thrive, recurrent lower respiratory tract infections and hyperkinetic pulmonary arterial hypertension in cases of trisomy 21 were among the main indications for device closure.
All patients were discharged within 24-48 hours after the procedure. Follow up echo was done at 24 hours, one week, 1,3,6 and 12 months and yearly thereafter.

Results:
Out of 213 patients included, 82 were male (38.5%) and 131 were female (61.5%). Mean weight was 12.47±1.94 (5.5 -15 kg), mean age was 46.79 ± 14.72 months (12-86months). Median defect size was 14±3.94 mm (8 mm to 25mm), median device size used was 16 mm (10-30 mm). Mean PA pressure was 14.3±3. Mean Device/ defect ratio was considerably low (1.18±0.09), but device/ weight ratio was relatively high (1.42±0).4.Successful device closure was achieved in 205 cases (96.2%).8 cases (3.8%) were sent for surgical closure. In 2 cases device was retrieved and not released due to new onset mitral regurgitation and one due to junctional bradycardia. Remaining 5 cases were sent for surgery due to deficient rims. There was no case of device embolization. None of the patients showed any complications on follow up.

Conclusions:
Transcatheteric ASD device closure in small children was found to have high procedural success rate. Before considering device closure in symptomatic patients weighing less than 15 kg, indications of closure must be carefully evaluated and exclusion

POSTER PRESENTATIONS

Category: Catheterization

1405 - MAJOR AORTOPULMONARY COLLATERAL ARTERIES STENTING FOR RESERVE SEVERE HEART FAILURE REDUCED EJECTION FRACTION IN UNOPERATED CYANOSIS CONGENITAL HEART DISEASE.

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Background:
Pulmonary atresia with ventricular septal defect is a serious cyanosis congenital heart defect present at birth and requires early management. Unoperated patients can face many life-threatening problems.

Case description:
A 12-year-old boy presents with severe cyanosis and NYHA class IV heart failure. Echocardiography shows a pulmonary atresia with ventricular septal defect with hypoplastic native pulmonary artery and major aortopulmonary collateral arteries. In addition, the biventricular systolic function was severely reduced, with a left ventricular ejection fraction of 20%, a global longitudinal strain of -6.3%, and a right ventricular free wall strain of -16.1%. Aggressive treatment of heart failure is initiated immediately. Then, computed tomography angiography confirms the diagnosis and documents an 11mm major aortopulmonary collateral artery with severe distal stenosis originating from the descending aorta and communicating with the native pulmonary artery. A 7x18mm BeSmooth Peripheral stent (Bentley InnoMed, Germany) was directly implanted at 12 atm, followed by an NC Emerge 6x15 mm balloon (Boston, U.S.A.) inflated up to 20 atm. The angiogram was rechecked, and pulmonary perfusion improved. He is stable and discharged after 48 hours. On a series of follow-up echocardiograms, biventricular systolic function fully recovered 3 months after the intervention. Currently, he has NYHA class I heart failure.

Conclusions:
Severe left ventricular systolic dysfunction is one of the complications of unrepaired cyanosis congenital heart disease. Major aortopulmonary collateral artery stenting is a safe and life-saving palliative intervention procedure.

POSTER PRESENTATIONS

Category: Catheterization

1415 - FIRST EXPERIENCE WITH THE PULSTA® TRANSCATHETER PULMONARY VALVE A NOVEL SELF EXPANDING SOLUTION FOR RIGHT VENTRICULAR OUTFLOW TRACT DYSFUNCTION

Pavel Charnahlaz [1], Yury Linnik [2], Konstantin Drozdovski [2], Aliaksei Zhuk [1], Nikolay Shevchenko [1]

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Background / Hypothesis:
Transcatheter pulmonary valve replacement has emerged as the preferred therapeutic modality for managing right ventricular outflow tract (RVOT) dysfunction in congenital heart disease. While first-generation balloon-expandable valves revolutionized treatment for conduits and bioprostheses, their fixed dimensions preclude use in progressively dilating native RVOTs. Self-expanding valve technologies, such as the Pulsta® transcatheter pulmonary valve (TPV), may address this unmet need. This study evaluates early and midterm outcomes of the Pulsta® TPV in consecutive patients with RVOT dysfunction.

Materials and Methods:
From April 2024 to October 2024, 10 patients (mean age of 17.4 ± 6.4 years; 70% male) underwent TCPVR with the Pulsta® TPV at our institution. The cohort included isolated regurgitation in 9 cases (90%, ≥severe) and mixed lesions in one case. (10%; mean peak gradient 17.0 ± 9.45 mmHg, ≥moderate regurgitation). Eight patients had prior surgical correction of Tetralogy of Fallot with transannular patch and two had Double-outlet right ventricle correction. All patients underwent standardized postoperative care with serial echocardiographic follow-up (mean 9.2 ± 3.8 months).

Results:
In all cases valves were successfully implanted, with one instance of valve dislocation occurring shortly after implantation. Early postoperative assessment revealed significant hemodynamic improvement , with mean peak gradients 10.56±4.74 mmHg and only trivial or no regurgitation in all cases. No conduction abnormalities requiring pacemaker implantation occurred. During follow-up, these outcomes remained stable with mean peak gradients of 14.56±5.94 mmHg, freedom from significant (>mild) regurgitation, and 100% freedom from both reoperation and mortality. The technique proved particularly effective for regurgitation-predominant disease, achieving complete resolution of severe insufficiency while maintaining physiological gradients.

Conclusions:
The Pulsta® TPV achieved excellent technical success, hemodynamic improvement, and safety in this initial experience, offering a promising option for native RVOT dysfunction—particularly in regurgitation-predominant disease. While the early outcomes are promising, long-term studies are imperative to assess durability in growing patients.

POSTER PRESENTATIONS

Category: Catheterization

1436 - INITIAL EXPERIENCE WITH THE NEW PERCUTANEOUS PULMONARY SELF EXPANDABLE VENUS P VALVE IN NORTHEASTERN MEXICO

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Background:
Percutaneous pulmonary valve implantation is currently a common procedure in patients with congenital heart disease with a dysfunctional right ventricular outflow tract. The self-expandible Venus P-valve (Venus MedTech, China), present the initial experience with this new percutaneous pulmonary valve in our center.

Materials and Methods:
Description of the valve implants with the new self-expandible valve performed between January a March 2025.

Results:
Six valve implants have been performed, all successful and without severe complications during the procedure. All patients had severe pulmonary regurgitation with a dilated right ventricle and severe dilatation of the pulmonary trunk and were not good candidates for percutaneous balloon-expandable valves. The six patients had a tetralogy of Fallot, in 5 patients, the implant was performed through the femoral vein and in one through jugular access. The mean hospital stay was 3-day.

Conclusions:
Valve implantation with the new self-expandible Venus P-valve was, in our preliminary experience, a safe and feasible procedure, allowing us to treat very dilated right outflow tracts, not suitable for the current balloon-expandable valves.

POSTER PRESENTATIONS

Category: Catheterization

1444 - IMPACT OF PERCUTANEOUS PULMONARY VALVE IMPLANTATION ON EXERCISE CAPACITY PATHOPHYSIOLOGY SPECIFIC DIFFERENCES IN RVOT DYSFUNCTION

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Background / Hypothesis:
Percutaneous pulmonary valve implantation improves exercise capacity in patients with repaired congenital heart disease and right ventricular outflow tract dysfunction. This study aims to assess the impact of PPVI on exercise capacity, identify factors associated with favorable outcomes, and evaluate recovery kinetics.

Materials and Methods:
A retrospective analysis was conducted on 112 patients who underwent PPVI at Sejong General Hospital (December 2017–November 2024). Patients were categorized into three groups: isolated pulmonary regurgitation(PR), isolated pulmonary stenosis(PS), and mixed pathology(PSR). Cardiopulmonary exercise testing, cardiac magnetic resonance imaging, and invasive pressure measurements were analyzed. Recovery kinetics was assessed with relative decrease in VO2 and minute ventilation from peak exercise to 1-minute recovery.

Results:
In PR group, patients with exercise intolerance showed lower right ventricular stroke volume (RVSV; 70.20±17.35 vs. 82.76±14.36 mL/m^2, p=0.002), whereas in PSR group, it was linked to a higher RVOT gradient (31.65±9.57 vs. 24.00±7.85 mmHg, p=0.031). After PPVI, peak VO2 improved in the PR group (29.01±7.35 to 30.97±6.43 mL/kg/min, p=0.006). RVSV ≥85 mL/m^2 predicted normalization of exercise capacity after PPVI in the PR group (AUC=0.760, CI 0.556–0.964). Recovery kinetics correlated with RVSV (r=0.254, p=0.038) and RVOT gradient (r=-0.259, p=0.034).

Conclusions:
PPVI enhances exercise capacity, particularly in PR patients. RV dysfunction is a key determinant of exercise intolerance in PR, whereas pressure overload limits exercise in PSR. Early PPVI, before irreversible RV dysfunction occurs, may improve outcomes, with RVSV serving as a predictive marker.

POSTER PRESENTATIONS

Category: Catheterization

1458 - VALIDATION OF AORTIC REGURGITATION INDEX FOR SEVERITY OF AORTIC REGURGITATION IN CHILDREN UNDERGOING AORTIC VALVE BALLOON DILATATION

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Background / Hypothesis:
Aortic regurgitation (AR) is a significant complication following aortic valve balloon dilatation (AVBD) in pediatric patients with aortic stenosis (AS). The Aortic Regurgitation Index (ARI), a novel parameter used to quantify AR severity in adults, has not been validated in pediatric populations. This study aims to assess the ARI's role in evaluating AR severity and its correlation with clinical outcomes in children undergoing AVBD

Materials and Methods:
This retrospective study included 59 patients under 12 years old who underwent AVBD for severe AS between January 2022 and February 2024. Patient data, including clinical, echocardiographic, angiographic, and hemodynamic parameters, were analysed. AR severity was assessed using Seller's grading on angiogram. A ROC analysis was performed to identify a cut-off value for ARI to predict severe AR.

Results:
Post-procedural aortic regurgitation (AR) was observed in 86.4% of patients, compared to 27% who had mild AR before the procedure. Additionally, 5.3% of patients developed severe AR post-procedure. The mean ARI values were significantly different across severity grades: 46.6 for no AR, 41.8 for mild AR, 38 for moderate AR, and 18.3 for severe AR ($P<0.0001$). A cut-off value of 33.5 for ARI predicted severe AR with 100% sensitivity and 70% specificity. Lower ARI values were associated with poorer clinical outcomes, including prolonged hospital stays and increased mortality

Conclusions:
The ARI is a reliable tool for assessing AR severity in pediatric patients after AVBD. It correlates with clinical outcomes, providing a valuable, quantitative measure for risk stratification. Further prospective studies are needed to validate its long-term prognostic value in this population.

POSTER PRESENTATIONS

Category: Catheterization

1499 - SHORT AND MID TERM OUTCOMES OF CARDIAC CATHETERIZATION RELATED FEMORAL VASCULAR THROMBOSIS IN CHILDREN A PROSPECTIVE STUDY

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Background:
Children undergoing cardiac catheterization are at risk of access-related vascular thrombosis, the outcome of which is not well-known. In this prospective study, we aimed to examine the short—and mid-term outcomes of catheterization-related femoral vascular thrombosis in children.

Materials and methods:
All consecutive children with vascular thrombosis following cardiac catheterization from December 2022 to July 2024 were enrolled. The patients were followed up with clinical examination, ankle-ankle index (AAI), and USG Doppler examination at 24 hours, two weeks, 1 month, 3 months, and 6 months post-procedure.

Results:
During the study period, 32 patients out of 999 children developed cardiac catheterization-related femoral vascular thrombosis. Of these, 25 had arterial thrombosis while 7 had venous occlusion. We were able to follow up on 23 patients with arterial thrombosis and all patients with venous thrombosis. At 2-week, 1-month, and 3-month follow-ups complete recanalization of femoral arterial thrombosis was seen in 59%, 85%, and 95% respectively. All patients with femoral venous thrombosis had complete resolution at 2 weeks follow-up. The median time to resolution was 5 days and 3 days among the femoral arterial and venous groups respectively. Among the arterial thrombosis cohort, at 2 weeks, those with persistent occlusion had a higher % occlusion at 24 hours compared to those with complete resolution. An AAI > 0.91 measured at the 1-month follow-up visit correlated with complete resolution of arterial thrombosis. Only one patient had persistent arterial thrombosis at 6-month follow-up and there were no long-term complications of arterial and venous thrombosis including limb growth difference and chronic pain.

Conclusion:
Cardiac catheterization-related femoral artery and vein thrombosis are infrequent. With contemporary thrombolytic, anticoagulation, and antiplatelet therapy, almost all patients have complete recanalization. These findings have implications for optimal management of children with cardiac catheterization-related femoral vascular thrombosis.

POSTER PRESENTATIONS

Category: Catheterization

1506 - TRANSCATHETER MANAGEMENT OF ACQUIRED ATRESIA OF AORTA CASE SERIES

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Background / Hypothesis:
Aortic arch atresia (AAA) is one of the rarest obstructive defects. The presence of this anomaly in adult age is uncommon. The typical anatomic feature consists of a complete occlusion of the membranous obstruction resulting in an acquired atresia without flow continuity between the proximal and distal segments. This feature is important in determining the feasibility of percutaneous intervention.

Materials and Methods:
From 2020 to 2024 we selected 5 consecutive patients, who diagnosed and treated with of acquired atresia of aorta. All patients underwent percutaneous recanalization. All procedures were subsequently followed by covered stent implantation.

Results:
In all cases, aorta discontinued was restored without complications. Over a median follow-up of 2 years, three patients were able to be weaned from medications for hypertension. All the patients underwent reassessment for recurrence or restenosis during the follow-up. One patient underwent successful stent dilatation with a balloon.

Conclusions:
Percutaneous treatment of acquired atresia of aorta using the three available standard catheter-based techniques is a safe, feasible and effective procedure as per our long-term follow-up outcome data.

POSTER PRESENTATIONS

Category: Catheterization

1521 - AN ENCOURAGING APPROACH TO COMPLEX ASDS A MULTICENTER STUDY

Rasit Aktas [1], *Nazmi Narin* [2], Kaan Yildiz [3], Sedef Oksuz [3], Muhammed Akif Atlan [3], Abdullah Ozyurt [4], Serkan Fazli Celik [5], Firat Kardelen [6], Onur Tasci [1], Cem Karadeniz [2]
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Background / Hypothesis:
Although percutaneous atrial septal defect closure is widely used, the surgical method may be preferred in cases with conditions that complicate transcatheter closure (large defect, rim deficiency or floppy rim, presence of septal aneurysm, multifenestrated defects, low age, and weight).

Materials and Methods:
This retrospective study evaluated data from patients with complex atrial septal defects who underwent transcatheter closure between January 2021 and August 2024. The parameters assessed included age, weight, defect size, rim size, septum characteristics, success rates, and complication rates.

Results:
Transcatheter atrial septal defect closure was performed in 51 patients with complex defects. Two patinets had multifenestrated defects, five had multiple defects, and 15 had an aneurysmal septum. Six patients were under one year old, and 21 had defects >20 mm. In 25 patients, the stretched balloon size/total septum ratio was >50%, in 44 patients, the balloon diameter/body surface area ratio was >15 mm/m^2, and one had a malalignment defect. Among the patients with rim deficiency, six had isolated aortic, six had isolated inferior vena cava, five had isolated superior vena cava, and one had isolated posterior rim deficiency. Three patients had combined aortic and inferior vena cava deficiencies, and one had combined aortic and superior vena cava deficiency.The study revealed no complications except in two cases of device embolization. The success rate was 96.08% across all procedures.

Conclusions:
Percutaneous closure can be successfully performed in patients with complex atrial septal defects with low complication rates, similar to other atrial septal defects, with good results in experienced centers.

POSTER PRESENTATIONS

Category: Catheterization

1522 - SIZE SELECTION OF AMPLATZER® PICCOLO OCCLUDER FOR EXTRADUCTAL PLACEMENT IN SMALL PDA

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Background:
In Japan the only device available for small PDA is the AMPLATZER® Piccolo Occluder (APO). In most of small PDA, both discs of the APO can be placed within the PA and the Ao side without deformation (extraductal placement: ED). We conducted experiments using a tube model and measured the longest length that both discs could extend outside the tube without deformation for each APO size (3/2, 4, 6: 3.5/5.5/9.0 mm, 4/2, 4, 6: 5.0/7.0/9.0 mm, 5/2, 4, 6: 7.0/9.0/11.0 mm), and since October 2022, we have been selecting APO size based on this sizing chart (SC). The purpose of this study is to evaluate the usefulness of the SC.

Materials and Methods:
Since June 2020, 31 patients (71% female, median age 2 y) who underwent ED were divided into 16 patients before the SC use (early period: EP) and 15 patients after use (late period: LP), and the difference between the SC and the actual selected size and the success rate was investigated. Successful placement was defined as when both discs were in contact with the PA and Ao walls, respectively, without deformation.

Results:
The size matching rate was 56% in EP and 100% in LP, and the success rate was 94% in EP and 93% in LP. One unsuccess in EP was placed with 5/6 resulting in protruding into Ao, though the SC size was 5/2. The other unsuccess in LP was an appropriate device size 5/2 selected, however the body of the device was placed in PA. Five of 6 unmatched cases to the SC in EP, except for the unsuccess case, were successful placement, though the PDA lengths were a median +0.6 mm (+0.5- +1.1 mm) longer than the SC.

Conclusion:
Size selection based on the SC resulted in success in all cases except for one case of procedural failure.

POSTER PRESENTATIONS

Category: Catheterization

1526 - UNEXPECTED COMPLICATION DURING TRANSCATHETER PDA CLOSURE SUBENDOTHELIAL PULMONARY ARTERIAL HEMATOMA

Rasit Aktas [1], *Nazmi Narin* [2], Onur Tasci [1], Melih Er [1], Cuneyt Zihni [1], Oguzhan Ay [3], Ali Rahmi Bakiler [1]
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Background / Hypothesis:
Transcatheter PDA closure is the gold standard due to its low complication rate and short hospital stay. Complications such as embolization,aortic stenosis,left pulmonary artery stenosis, tricuspid regurgitation, cardiovascular injuries, and mortality have been reported with the Amplatzer Piccolo Occluder.We present a case where a complication developed after performing a transcatheter PDA closure.

Materials and Methods:
Amplatzer Piccolo occluder was used in this case. Transcatheter PDA closure was performed in the cardiac catheterisation laboratory under general anaesthesia using the retrograde method.

Results:
A patient with a pulmonary artery diameter of 2.4 mm measured on echocardiography was planned for transcatheter PDA closure.Access was obtained via the right femoral artery using a 4F radial sheath.A right Judkins catheter and a hydrophilic guide wire were used to localize the PDA beneath the subclavian artery. After the administration of contrast, measurements were taken, and the PDA was approximately 2 mm in size.The pulmonary artery was accessed through the PDA, and the Amplatzer Piccolo Occluder was advanced over a 4-2 delivery system, with the pulmonary end being deployed first, followed by the aortic end. The device placement was confirmed under both echocardiographic and fluoroscopic guidance. During deployment, a slight tension was observed on the device due to inadvertent pushing of the pusher wire, although no embolization occurred. After the device was fully deployed, contrast was injected for follow-up, revealing a hematoma in the pulmonary artery. A stenosis gradient was measured across the pulmonary artery. Using the delivery catheter, suction was applied to evacuate the hematoma. Following an evacuation procedure, follow-up on day 7 showed resolution of both the hematoma and the stenosis.

Conclusions:
Although rare, complications can occur during transcatheter PDA closure with the Piccolo Occluder,including PDA rupture from even a small movement during device deployment. Prompt and calm management of the complication, along with regular follow-up,is essential.

POSTER PRESENTATIONS

Category: Catheterization

1532 - AN INNOVATIVE APPROACH TO VSD CLOSURE LOWER RADIATION AND REDUCED USE OF RADIOPAQUE SUBSTANCES

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Background / Hypothesis:
Transcatheter VSD closure has become more common, but it exposes both patients and the operating room staff to radiation, and the use of radiopaque substances can harm the patient's health. This study aimed to reduce the adverse effects of radiation and contrast agents in percutaneous VSD closure by using a different technique.

Materials and Methods:
In our study, transcatheter VSD closure was performed on 47 patients with hemodynamically significant defects between January 2023 and March 2025. The patients were divided into two groups: 30 in the classical group and 17 in the group with the new technique. In the new technique group, the defect location and positions of the guide and catheter were confirmed by echocardiography to reduce fluoroscopy time and contrast agent usage. The defect crossing procedure was performed with a floppy guide, and contrast agent was given only before device deployment. All patients underwent the procedure with the Konar-MF VSD Occluder.

Results:
The success rate was 100% in both the classical technique group (17 female, 13 male; 13 perimembranous, 3 mid- muscular,1 high- muscular) and the new technique group (10 female, 7 male; 24 perimembranous, 5 mid - muscular, 1 high - muscular), with a balanced distribution of VSD types. One patient in the classical group developed mild aortic regurgitation, which resolved after one month. No regurgitation occurred in the reduced contrast agent group. Additionally, one patient in each group developed temporary left bundle branch block during the procedure.

Conclusions:
Reducing radiation exposure helps protect both patients and the angiography team from radiation-related health risks. Our study shows that transcatheter VSD closure can achieve the same success rate as the classical method for all VSD types, with lower fluoroscopy time and minimal contrast agent, supported by high operator experience and good echocardiographic guidance. Further studies with larger patient populations are needed.

POSTER PRESENTATIONS

Category: Catheterization

1552 - SINGLE CENTER EXPERIENCE OF PERCUTANEOUS CLOSURE OF FONTAN FENESTRATION

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Background / Hypothesis:
During Fontan completion, the fenestration created between the Fontan circuit and the atrial cavity is beneficial for the single ventricle to maintain cardiac output in immediate post-operative period. However in the long run there may be persistent desaturation and increase risk of systemic thromboembolism. Therefore, the suitability of fenestration closure should be assessed beyond 1 to 2 years of Fontan completion.

Materials and Methods:
Medical records were assessed of all patients that underwent Fontan fenestration closure from 2015 to 2025. Out of total 66 patients who underwent Fontan completion, fenestrations were created in 35 patients(53%). 27 patients(77%)had persisting fenestration, two years after Fontan completion and were considered for percutaneous fenestration closure. The median time of closure: 30.4 months, range 26.7 to 40.2 months. Fontan hemodynamics was assessed in all including fenestration occlusion test by device/balloon. 1 patient had borderline hemodynamics and 3 did not meet the criteria for fenestration closure. 23 patients(65%) underwent the procedure. We used Amplatzer septal occluder and Amplatzer duct occluder depending on the fenestration size.

Results:
The mean increase in Fontan circuit pressure after fenestration occlusion test was 2+/-2 mmHg ($p< 0.5$). Mean saturation improves 96+/-2 % from 88+/-3% ($p<0.01$) after fenestration closure. All patients were put on warfarin for 6 months after the procedure, followed by Aspirin and Clopidogrel, on maintenance. There was significant improvement in exercise capacity as assessed by 6 minute walk test (From mean 353.33+/-7.23 meter to 415.33+/-7.5 meter; $P <0.001$) on follow up. No deaths within 1 year after the procedure.

Conclusions:
Fontan fenestration closure should be considered in all patients with persistent fenestration 2 years after Fontan completion in view of risk of thromboembolism and persistent desaturation. Percutaneous fenestration closure should be attempted only after careful assessment of Fontan hemodynamics.

POSTER PRESENTATIONS

Category: Catheterization

1556 - ENDOVASCULAR OCCLUSION OF AN AORTIC PSEUDOANEURYSM AFTER A BENTALL PROCEDURE IN A CHILD WITH CUTIS LAXA SYNDROME

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Background / Hypothesis:
Some postoperative changes are expected after a Bentall procedure, however, some comorbidities can cause major complications like a large aortic pseudoaneurysm secondary to a connective tissue aortopathy.

Case presentation:
This case report describes a 12 year-old male with an aortic root aneurysm, bicuspid aortic valve, systemic arterial hypertension, and cutis laxa (CL) type B syndrome that underwent Bentall procedure. 2 months after the procedure, the patient presented with chest pain and swallowing difficulty. Echocardiogram showed an hyperechoic anterior mass. Thoracic angiotomography (CT-Angio) was made concluding that there was a large, partially thrombosed peri-prosthetic pseudoaneurysm of the ascending aorta with a 5 mm shunt, measuring approximately 14.8 x 12.6 cm which extends in the caudo-cranial direction, that compressed the right atrium (RA) and right pulmonary artery (RPA). Evaluating the risk of reintervention in a patient with a recent cardiac surgery and connective tissue disorder the heart team opted to close the leak with a 6mm septal occluder device.

Results:
The final angiography in the catheterization lab (Cath Lab) showed no residual shunt or obstruction of any vascular structure from the aorta and normal flow in the Bentall conduit. During the 3 months follow up the CT-Angio demonstrated no residual shunt and mild reduction of the pseudoaneurysm. Currently, clinically the patient is asymptomatic.

Conclusions:
This report emphasizes the importance of a frequent postsurgical follow up of patients that can potentially present these types of complications for an early detection and intervention in cases where it is needed. Furthermore, The endovascular option should always be considered as a collaborative approach for post-surgical patients, with complications, to avoid the high surgical risk of reoperation.

POSTER PRESENTATIONS

Category: Catheterization

1570 - TRANSCATHETER CLOSURE OF LARGE PDAS (>3.4 MM) IN PREMATURE INFANTS A MULTI CENTER ANALYSIS

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Background:
Transcatheter closure of patent ductus arteriosus (PDA) in premature infants has become increasingly feasible, including in cases with large ductal anatomy. However, data on anatomical predictors of device selection and procedural success in this subgroup remain limited.

Methods:
We conducted a retrospective, multi-center analysis of 19 premature infants who underwent transcatheter closure of large PDAs. PDA measurements included aortic end, minimum luminal diameter, and ductal length. Device sizes, deployment patterns, and need for secondary devices were recorded. Correlation analysis was used to explore associations between ductal dimensions and device selection.

Results:
The cohort had a minimum luminal diameter of 3.4 mm, mean aortic end diameter of 3.9 mm and ductal length of 10.5 mm—consistent with large PDA profiles for this population. The majority of closures utilized a 5 mm device (79%), while larger devices (6 mm) were used selectively for larger ducts. Device One Size showed moderate to strong correlation with minimum luminal diameter (r = 0.53) and aortic end diameter (r = 0.61). All devices were successfully deployed and released without need for retrieval. Device Two was deployed in 3 cases, all resulting in successful outcomes.

Conclusions:
In premature infants with large PDAs, ductal dimensions—particularly at the aortic and PA ends—are key predictors of device size selection. This analysis highlights the feasibility and safety of transcatheter closure in this challenging subgroup and underscores the need for individualized anatomical assessment to guide successful device implantation.

POSTER PRESENTATIONS

Category: Catheterization

1573 - ARRHYTHMIA AND VALVE REGURGITATION FOLLOWING RETROGRADE APPROACH TRANSCATHETER CLOSURE OF VENTRICULAR SEPTAL DEFECT

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Background / Hypothesis:
Transcatheter closure of ventricular septal defect (VSD) has been widely performed. Adverse outcomes like arrhythmia and valve regurgitatation can occurred.

Materials and Methods:
Medical record of children with VSD underwent closure retrogradely using VSD ocluder device, evaluated for arrhytmia and valve regurgitation.

Results:
Medical record of 46 patients in period of Januari 2017 – November 2024 were evaluated. Twenty seven male and 19 female. Median age 37.5 month. VSD type: perimembranous 34, muscular 4, subarterial 8. VSD size: small 5, moderate 30, big 11. Arrhythmia: 1st degree AV block 1 (2,2%), incomplete RBBB 2 (4,3%), LBBB 1 (2,2%). Valve regurgitation, aortic: mild 2/46 (4,3%), moderate 2/46 (4,3%), severe 1/46 (2,2%). Tricuspid: mild 9/46 (19,6%), moderate 5/46 (11%). Incidence arrhythmias in this series was lower than found by Tang C et al 2022 (35,6% vs 8,7%). Most of this arrhythmia short, transient. 1st degree AVB usually mild and reversible. LBBB potentially leading to septal dyssynchrony and left ventricular dysfunction, requiring close follow-up and potentially cardiac resynchronization therapy. Risk factor for CLBBB were oversized ocluder and longer operation time. Incidence of RBBB in our series was lower than found by Jiang D et al 2022 (4,3% vs 74,8%). Aortic regurgitation can occur or worsen, especially in cases of perimembranous or subaortic VSDs, due to proximity to the aortic valve. Li Qiuman et al 2023 found new-onset mild AR in 16% (8/50) of the patients. Tricuspid regurgitation can be related to device-related issues or right ventricular overload. It is rare, may reveal only mild tricuspid regurgitation.

Conclusions:
Transcatheter closure of VSD retrogradely is safe and effective.

POSTER PRESENTATIONS

Category: Catheterization

1593 - A STUDY ON CLINICO EPIDEMIOLOGICAL PROFILE AND OUTCOME OF NEONATES UNDERGOING PDA STENTING AS A FIRST STAGE PALLIATION FOR COMPLEX CONGENITAL HEART DISEASE

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Background / Hypothesis:
Patent ductus arteriosus (PDA) stenting has emerged as an alternative to Blalock-Taussig Shunt (BTS) in infants with duct dependent pulmonary circulation as first stage palliation to secure pulmonary blood flow until definitive surgery is performed. This study explores the practical aspects of PDA stenting in the catheterisation laboratory.

Materials and Methods:
A hospital-based longitudinal study was performed in the Pediatric Cardiology unit of our Institute between January 2017 and December 2024. Procedural and mid-term follow-up data of babies undergoing PDA stenting was analyzed.

Results:
60 infants with a median age of 28 (47.5) days and weight of 2.97 (0.79) kg were taken up for PDA stenting, of which 54 (90%) were successful. Complication and in-hospital mortality rate was 11.6% and 8.3%, respectively. No patient underwent rescue surgical shunt but elective BTS was needed in 6 (10%) patients. 25 (41.6 %) of these infants eventually underwent single ventricle palliation pathway while the rest had complete intracardiac repair. Over time, favourable trends towards lower procedural time, risk, and post-procedure hospital stay were recorded.

Presurgical computed tomography pulmonary aortogram (n = 24) showed significant and balanced pulmonary artery growth with increase in Nakata Index from 90.80 (69.51) mm^2/m^2 to 122.61 (93.68) mm^2/m^2 (p = 0.01). There was no significant change in right pulmonary artery (RPA) and left pulmonary artery (LPA) growth {RPA 2.05 (2.08) mm vs LPA 1.20 (2.3) mm} (p = 0.06). However, 11 (45.8%) infants showed inadequate LPA growth with RPA growth significantly more than LPA {RPA 1.30 (3.05) mm vs LPA 0.10 (1.00) mm} (p = 0.02), indicating jailing of LPA. These patients were successfully recruited during surgery.

Conclusions:
PDA stenting is a safe, feasible and less invasive first stage palliation in infants with duct dependent pulmonary circulation. Vigilance about preventable complications is necessary.

POSTER PRESENTATIONS

Category: Catheterization

1600 - PERCUTANEOUS CLOSURE OF A LEFT VENTRICULAR PSEUDOANEURYSM USING AN ADO II OCCLUDER IN AN ADULT PATIENT SHORTLY AFTER MITRAL VALVE REPLACEMENT

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Background / Hypothesis:
A pseudoaneurysm may occur following myocardial infarction or as a complication of cardiac surgery. Surgical repair remains the treatment of choice for this condition. However, in certain patients, the fragile nature of the ventricular wall can render surgical intervention particularly challenging. If left untreated, a pseudoaneurysm may be associated with significant morbidity and increased mortality. Therefore, the possibility of closure should be carefully evaluated in each case. In selected cases, percutaneous device closure offers a viable treatment option, potentially avoiding surgical intervention.

Materials and Methods:
A 65-year-old woman with Ebstein's anomaly, who had undergone tricuspid valve repair at the age of 36, was scheduled nearly 30 years later for tricuspid valve replacement and mitral valve repair due to significant regurgitation of both valves. Ultimately, both valves were replaced with biological prostheses. During surgery, a small perforation of the left ventricular wall was noted and subsequently closed. Two weeks later, a cardiac CT was performed and revealed a pseudoaneurysm at the site of the previous LV- perforation.

Results:
The patient was scheduled for percutaneous closure, which was successfully performed using an Amplatzer Duct Occluder II 6/4 (ADO II) via aortic access. The occluder was implanted using a 6 F guiding catheter. Immediately after the procedure, a small residual shunt was detected. However, there were no signs of hemolysis, and hemoglobin levels remained stable. Follow-up echocardiography in the subsequent days confirmed a stable device position with no evidence of a residual shunt. The procedure was uneventful, and no complications occurred.

Conclusions:
Percutaneous closure of a left ventricular pseudoaneurysm using an ADO II occluder in an off-label setting appears safe and feasible, and should be considered in selected patients during the early postoperative period, with favorable outcomes.

POSTER PRESENTATIONS

Category: Catheterization

1602 - RETROSPECTIVE COHORT STUDY ON TRANSCATHETER PDA CLOSURE IN NEONATES ≤4KG ADVANCING OUR UNDERSTANDING THROUGH CLINICAL INSIGHTS

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Background / Hypothesis:
Closing patent ductus arteriosus (PDA) in neonates ≤4kg has unique challenges. This study evaluates our practice to better understand this cohort, focusing on device selection, safety, efficacy, and outcomes.

Materials and Methods:
Retrospective review conducted of neonates ≤4kg, undergoing PDA device closure, in UK-based centre between March 2017- March 2025. Data on demographics, procedural details, device selection, and complications were collected.

Results:
There were 44 patients (28 female, 16 male); mean weight 2.66kg (range 800g - 4.04kg) and average age at intervention 91.1 days (range 16–226 days). Comorbidities included prematurity <32 weeks (n=30), lung disease (n=25), and pre-procedural mechanical ventilation (n=14).

Devices used were the Amplatzer Vascular Plug II (AVP II) (n=28), Amplatzer Piccolo Device (APD) (n=14)/ Amplatzer Duct Occluder II (ADO II) (n=2) and Amplatzer Duct Occluder I (ADO I) (n=1). 1 case used AVP II initially but switched to ADO II. All APD cases were extreme pre-terms; mean weight 1.86kg, mean age 58 days, with no procedural complications. Procedure time averaged 58 minutes, with fluoroscopy averaging 8.3 minutes. AVP II/ADO II in comparison were used in bigger (mean weight 3.1kg) and older (mean age 115 days) patients; average procedural time was 86.1 minutes, with fluoroscopy averaging 14.4 minutes.

Complications occurred in 4 patients (mean weight 3.2kg, mean age 132 days) and all involved initial sizing issues with AVP II: one device embolisation, two failed implants, and one with partial aortic obstruction requiring hybrid-surgery. One early post-procedural death occurred secondary to co-morbidities and sepsis.

Conclusions:
PDA closure in neonates >4kg or <2kg appears more predictable in relation to device selection, while the intermediate range remains challenging, as evidenced by our complications. This data will guide efforts to improve our practice and outcomes for this vulnerable group.

POSTER PRESENTATIONS

Category: Catheterization

1604 - "FULL METAL JACKET" DUCTAL STENTING IN A NEONATE WITH A LONG TORTUOUS ARTERIAL DUCT

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Background / Hypothesis:
Patent ductus arteriosus (PDA) stenting is an established alternative to surgical shunt placement in neonates with congenital heart disease. We describe successful stenting in a neonate of a PDA originating from the base of the left brachiocephalic artery using four stents in a "full metal jacket" technique.

Materials and Methods:

Case-Report.

Results:
A 36+4 week-old neonate with antenatally diagnosis of unbalanced atrioventricular septal defect with a dominant left ventricle, Double-outlet right ventricle with malposed great vessels, and pulmonary atresia was commenced on prostaglandin infusion at birth and transferred to our centre. In addition, the neonate also had dextrocardia and right sided aortic arch with mirror image branching pattern. Cardiac Computed Tomography confirmed a 38mm-long, tortuous PDA arising from the base of the left brachiocephalic artery and inserting near the left pulmonary artery, with no branch pulmonary artery narrowing. A multidisciplinary decision was made to proceed with PDA stenting on day 16 at a weight of 3.54 kg.

Prostaglandin was stopped pre-procedure. Aortic angiography via 4Fr right femoral arterial access showed a mildly tortuous 38mm duct. Stenting was performed using a 4.5mm x 22mm Onyx Frontier for the pulmonary end, followed by Onyx Frontier 4.5mm x 18mm, Architect 4.5mm x 19mm, and Onyx Frontier 4.0mm x 8mm to cover the entire duct length. Post-procedure angiography confirmed good stent opposition, complete ductal coverage, and unobstructed flow into arch branches. The patient was extubated early post-procedure, and oxygen saturations improved. At three-month follow-up, the patient remained well, with saturations above 75 percent and continued stent patency.

Conclusions:
This case demonstrates the feasibility of PDA stenting in rare anatomic variants. The flexibility of modern stents allows adaptation to ductal curvature. Understanding anatomical nuances and precise procedural planning are crucial for success and optimal outcomes.

POSTER PRESENTATIONS

Category: Catheterization

1611 - FRACTURE OF BIOPROSTHETIC VALVE IN THE PULMONARY POSITION TIMING AND CONSIDERATIONS FOR SUBSEQUENT VALVE IMPLANTATION

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Background / Hypothesis:
Intentional fracture of bioprosthetic valve (BVF) in pulmonary position is a relatively new technique to create larger landing zone for subsequent valve-in-valve implantation. The optimal strategies for revalvulation after BVF remain unknown.
To analyze outcomes of BVF in pulmonary position and propose potential approaches for revalvulation.

Materials and Methods:
Retrospective analysis of all patients who underwent BVF in pulmonary position at single center in 2018-2024. Study analyzed procedure indications, execution, revalvulation, early- and midterm outcomes, and final hemodynamic effects. Follow-up was 3.5 years (range 0.5–6).

Results:
The study included 7 patients with median age of 17 years (range 10–37): 5 with tetralogy of Fallot and 2 with pulmonary atresia. All patients had corrective surgery with transannular patch and median 2 re-do surgeries, including bioprosthetic valve implantation (Edwards Magna). Indications for fracture were isolated pulmonary stenosis (PS) in 5, PS with pulmonary artery bifurcation stenosis in 1, and PS with severe right ventricle dysfunction in 1 patient. Atlas balloons 3 mm larger than inner diameter (ID) of Magna valve at 14-18 atmospheres were successfully used. PS gradient decreased from 48.2±14.3 to 19.8±3.5 mmHg in 5 patients (p=0.007). No gradient change was observed in patient with right ventricle failure and in one patient who developed significant, permanent subvalvular PS (awaiting elective surgery). No worsening of pulmonary regurgitation or complications were observed. Five patients underwent successful revalvulation after 0.5 year (range 0-3). One patient died after 7 days due to multiorgan failure. BVF ID increased by 3.5 mm (range 3–4). The post-implantation gradient was 21.8±12 mmHg. One patient has been awaiting revalvulation for 2 years, as the PS gradient remains low and there are no other indications.

Conclusions:
Despite the suboptimal hemodynamic effects of BVF, this approach offers a reliable opportunity to reduce the need for re-do surgeries. Revalvulation can be postponed in selected patients.

POSTER PRESENTATIONS

Category: Catheterization

1634 - DIAGNOSIS AND INTERVENTIONAL MANAGEMENT OF PULMONARY ARTERIOVENOUS MALFORMATION PRESENTING AS NEW ONSET CYANOSIS IN A PRE ADOLESCENT FEMALE

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Background / Hypothesis:
An arteriovenous malformation is a vascular aberrancy leading to the loss of the capillary intermediary between connecting arteries and veins. Presenting signs and symptoms highly depend on the location of the AVM, ranging from recurrent hemorrhages to thromboembolic strokes. Pulmonary AVMs (PAVM) are rare and underreported, sometimes with new onset respiratory distress gradually progressing to unexplained cyanosis as the only presenting symptom. Determining the presence of PAVMs is challenging and requires a high index of suspicion especially in the presence of a strong family history of signs and symptoms related with other visceral AVMs. Timely diagnosis is necessary, since PAVMs can be treated definitively with transcatheter embolization, reducing physiologic burdens of chronic cyanosis.

Materials and Methods:
Case report

Results:
A 10 year-old female presented with a two-year history of gradual-onset cyanosis. Patient has no cardiac or respiratory co-morbidity. Cyanosis was eventually associated with clubbing, easy fatiguability, and dyspnea at rest. She presented at the emergency room bed-bound with oxygen saturation at around 65-70%. Chest x-ray and CT Scan showed a mass on the right middle lung field representing the pouch of the PAVM. The patient was brought to the catheterization lab where the angiographic study confirmed the presence of a PAVM with pulmonary arteries feeding a pouch being drained by pulmonary veins. The arteries were then subsequently embolized with the use of transcatheter vascular plugs. Post-procedure, the oxygen saturation of the patient improved to 85-90% with resolution of the respiratory distress. Work-up for sporadic causes of PAVMs turned out negative. Genetic testing for hereditary hemorrhagic telangiectasia was facilitated. Patient was sent home ambulatory with well perfused mucosa and extremities.

Conclusions:
- PAVMs have subtle presentations
- High index of suspicion is necessary to guide diagnostic approach
- Timely diagnosis lead to definitive intervention via transcatheter embolization

POSTER PRESENTATIONS

Category: Catheterization

1648 - NOVEL TRANSCATHETER VSD CLOSURE FOR ANTEGRADE FLOW OCCLUSION IN HIGH RISK FONTAN CANDIDATE WITH TRICUSPID ATRESIA A CASE REPORT

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Introduction:
The Fontan procedure represents the final palliative stage for patients with single ventricle physiology, with successful outcomes heavily dependent on optimal pulmonary artery (PA) pressures. Elevated PA pressures secondary to antegrade pulmonary blood flow pose a significant challenge in patient selection. We present a novel approach to optimize hemodynamics prior to definitive palliation.

Case Report:
18 year old boy, with tricuspid atresia type 1B (post-Glenn shunt 10 years prior) presented with pulsatile Glenn circulation. Cardiac catheterization revealed a 4mm restrictive muscular VSD causing significant antegrade flow without pulmonary stenosis with elevated mean PA pressures of 22mmHg, prohibitive for Fontan completion. We decided to occlude the VSD by device with an aim to reduce PA pressures. Via right internal jugular access, we crossed the pulmonary valve with a 0.032" wire, advanced through the VSD into the LV, and positioned a 0.035" stiff wire in the LV cavity. A 10/8mm Konar occluder was deployed through a 7F JR guide under fluoroscopic and echocardiographic guidance.PA pressures dropped to 13 mmHg with conversion to passive Glenn flow. Five days later, successful Fontan completion was achieved using a 20mm Dacron graft (post-op pressure: 16 mmHg), followed by an uncomplicated recovery.

Discussion:
Our case introduces a novel application of VSD closure to eliminate antegrade flow in single ventricle physiology. Unlike previous reports of PA flow occlusion [1-3], we specifically targeted the VSD as the flow source. The immediate pressure reduction (22→13 mmHg) avoided need for PA banding and enabled safe Fontan completion. The preserved ventricular function highlights the technique's safety in this high-risk population.

Conclusions:
VSD closure represents an effective, minimally invasive bridge to Fontan completion in select patients with VSD-mediated antegrade flow. This approach expands therapeutic options for optimizing hemodynamics in complex single ventricle physiology.

POSTER PRESENTATIONS

Category: Catheterization

1680 - TRANS CATHETER SURGICAL PREPARATION OF TETRALOGY OF FALLOT PATIENTS WITH EXTREME HYPOXIA

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Background / Hypothesis:
Open-heart surgery in patients with longstanding hypoxia is fraught with challenges from their compromised multi-system function (worse re-perfusion injury, post-operative organ dysfunction, peri-operative bleeding, stroke, thrombosis, prolonged recovery). Recently, we adopted a strategy of catheter-based palliation followed by corrective surgery in the same admission. Preliminary experience with this strategy is shared here.

Materials and Methods:
Review of institutional database. A strategy of stepwise dilation with progressively larger balloon sizes, was adapted for balloon pulmonary valvotomy. Sizing for right ventricular outflow (RVOT) stent was such as to allow controlled increase in pulmonary blood flow. PA pressures were monitored, to prevent reperfusion pulmonary oedema

Results:
8 patients [June 2024- March 2025, age 4(1-15) years, weight 10(6-35) kg, 6 with TOF and 2 pulmonary atresia] underwent treatment following the above-mentioned strategy. All were severely hypoxic at presentation, SPO2 65 (55-75)%, Hb 18 (14-23.8)g. Coagulation was deranged in 5, 2 had thrombocytopenia; 2 had hepatic dysfunction, 1 had renal dysfunction. Palliative procedures were : Balloon pulmonary valvotomy-4; Pulmonary Valve perforation-1; RVOT stenting-02; Ductal stenting-01. Fluoroscopy time 17.4(0.82-44 min), procedure time 60(25-90)min. SPO2 improved to 85%(78-95%). Prior to surgery, hepatic and renal functions normalized. Corrective surgery 10(8-17) days later included TOF repair (valve sparing-3; conduit repair-3; trans-annular patch-2) [CPB time 96-154 min; Cross-clamp 29-106 min]. Duration of Ventilation 8 hrs to 4 days, duration of ICU stay 2-12 days. There were no instances of excessive post operative bleeding.

Conclusions:
Preliminary experience suggests trans-catheter surgical preparation followed by expedited corrective surgery enables mitigation of some of the surgical challenges posed by chronic long standing hypoxia, particularly hematological and other organ functions.

POSTER PRESENTATIONS

Category: Catheterization

1683 - EARLY DETECTION OF OCCULT DIASTOLIC DYSFUNCTION IN A FONTAN CIRCULATION USING A RAPID VOLUME EXPANSION TEST

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Background / Hypothesis:
To understand the prevalence and implications of occult diastolic dysfunction (ODD) or occult pulmonary vascular disease (OPVD) in the Fontan cohort, we performed a invasive 'ventricular stress testing' using rapid volume expansion test in Fontan patients without evidence of overt DD.
To understand and distinguish between pulmonary or ventricular factor for tailored targeted medical therapy

Materials and Methods:
Study period: From Feb 2019 to June 2022
Study candidates: Patients with functional single ventricle physiology were underwent Fontan procedure.
Exclusion Criteria
Baseline EDP ≥ 15 mm Hg or mean Fontan pressure ≥ 18 mm Hg
Severe ventricular systolic dysfunction (MRI EF <40% and EchoCG EF <40%)
52 cardiac catheterizations with rapid volume expansion test (RVET) were performed in Fontan patients during the study period in our center.
Finally, 45 patients were enrolled in this study
3 patients was excluded due to high baseline EDP (≥ 15 mmHg)
4 patients was excluded due to severe ventricular systolic dysfunction (MRI EF <40% and EchoCG EF <40%)

Method:
Baseline hemodynamic assessment and contrast angiography were completed before RVET.
15mL/kg bolus of warm normal saline administered rapidly (within 5min) via venous sheath (6Fr)
Immediate and after 5 min equilibration period, repeated hemodynamic assessment were performed
Definition of Occult diastolic dysfunction :
Baseline EDP <15 mmHg and Post-RVET EDP ≥ 15 mmHg
Definition of Occult pulmonary vascular disease :
Baseline CVP <18 mmHg and CVP > EDP and Post-RVET CVP ≥ 18mmHg
Results:
In our single cardiac center, 49 % of patients had ODD

Conclusion:
The early detection and identification of ODD and OPVD are a necessary first step to improving long-term outcomes undergoing targeted therapies in Fontan group.
Therefore, ventricular stress testing by rapid volume expansion is feasible, safe and identifies a subgroup of Fontan patients with ODD and OPVD

POSTER PRESENTATIONS

Category: Catheterization

1718 - USE OF TRANSCATHETER VALVES IN THE TRICUSPID AND MITRAL POSITIONS

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Introduction:
Transcatheter heart valves have been used safely in the pulmonary position for years in children and adolescents.Although still limited, their use in the mitral and tricuspid positions is increasing.This study presents our experience with transcatheter valve use in the atrioventricular(AV) position.

Methods:
This study evaluated the demographic, clinical, diagnostic, and angiographic data of six patients who underwent transcatheter valve replacement for atrioventricular valve positions between 2020-2024.All procedures were performed in the catheterization laboratory under general anesthesia and guided by transesophageal echocardiography(TEE).All patients had previously undergone surgical bioprosthetic valve replacement.The selection of appropriate valve types to be implanted within the existing bioprosthetic valves was guided by the ViV Aortic mobile application (KRUTSCH©, supported by the Minneapolis Heart Institute Foundation).Following diagnostic catheterization, high-pressure balloons were inflated at the level of the valve to localize the stenotic region and determine the appropriate valve size.A 14F sheath of suitable length was advanced, and valve deployment was performed. Post-deployment pressure measurements and contrast injections were used to evaluate valve function.To prevent bleeding from the femoral vein, a purse-string suture was placed and tamponade was applied upon removal of the long sheath.Following post-procedure evaluation with TEE, all patients were extubated and transferred to the ward.One patient, diagnosed with Hemophilia A, underwent a surgically assisted hybrid valve replacement via anterior thoracotomy.

Results:
Of the six patients, four underwent tricuspid and two underwent mitral valve implantation. Five procedures were performed via the transvenous route, and one patient underwent hybrid mitral valve implantation with paravalvular leak closure(Table 1).

Conclusion:
Our findings suggest that transcatheter valve-in-valve implantation is a feasible alternative to reoperation in high-risk pediatric and adolescent patients with prior AV bioprosthetic valve replacement. The absence of major complications and preserved valve function during follow-up supports its potential as a safe and effective option.

POSTER PRESENTATIONS

Category: Catheterization

1720 - CLINICAL BENEFITS OF MAPCAS EMBOLIZATION PRIOR TO FONTAN COMPLETION

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Background / Hypothesis:
The aim of the study was to analyze the impact of percutaneous embolization of major aortopulmonary collateral arteries (MAPCAs) on the hemodynamic parameters of patients undergoing cardiac catheterization before Fontan surgery.

Materials and Methods:
The study included 106 patients who had undergone the Glenn procedure and subsequently underwent cardiac catheterization prior to Fontan surgery. The data were collected over a period of seven consecutive years. We analyzed the effect of MAPCAs closure on hemodynamic parameters.

Results:
A total of 203 cardiac catheterization procedures (mean 1.92 ± 1.1) and 385 various interventional procedures (mean 3.6 ± 2.4) were performed prior to Fontan surgery. Of these, 158 cardiac catheterizations and 330 interventional procedures (mean 2.09 ± 1.14) were conducted after the Glenn procedure. Embolization of MAPCAs was one of the most common interventional procedures (n = 141); at least one MAPCA was closed in 75.5% of patients (n = 80). Following percutaneous MAPCAs embolization, a subsequent catheterization was performed in 26 patients. In this group, the following results were observed:
- A significant decrease in mean pulmonary artery pressure (mPAP) was observed (16.19 mmHg vs. 13.23 mmHg; p = 0.000022)
- A significant decrease in mean transpulmonary gradient (TPG) was observed (3.27 mmHg vs. 2.19 mmHg; p = 0.0297)
- A significant decrease in mean pulmonary capillary wedge pressure (PCWP) was observed (12.93 mmHg vs. 11.04 mmHg; p = 0.003172)
- No significant decrease in arterial oxygen saturation (SaO_2) was observed after MAPCAs embolization (82.68% vs. 85.02%; p = 0.0858).
Additionally, it was demonstrated that patients who underwent MAPCAs closure were more frequently qualified for the Fontan operation (p = 0.03113) and had a lower mortality rate (p = 0.00943).

Conclusions:
Embolization of MAPCAs improves hemodynamic parameters, does not adversely affect arterial oxygen saturation, and may contribute to improved prognosis in patients with a functionally univentricular heart prior to Fontan surgery.

POSTER PRESENTATIONS

Category: Catheterization

1752 - TRANSCATHETER FONTAN COMPLETION IN SURGICALLY UNPREPARED CASE FOLLOWING GLENN REVOLUTIONISING PAEDIATRIC CARDIOLOGY

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Aster Medcity, Pediatric Cardiology, Kochi-India [1]

Background / Hypothesis:
Fontan completion has been the surgeons forte and the interventionists role till recently was only to do pre-operative evaluation. There are a few case reports of transcatheter Fontan completion in children who were surgically prepared during bidirectional glenn surgery. Recently however, surgically unprepared cases are also being taken for transcatheter fontan completion. We would like to share two such cases.

Materials and Methods:
Two children about 5 years old with univentricular heart post bidirectional Glenn shunt, who were not previously prepared surgically were selected for the procedure. CT pulmonary angiogram and cardiac catheterisation were done for pre procedural evaluation. Right internal jugular vein(RIJV) and femoral vein (RFV) access were obtained. Through the RIJV access, using an 014 Astato wire and 50 amp electrocautery , the base of right pulmonary artery and roof of atrium was perforated and the wire was snared out through the RFV. The wire was exchanged to a Lunderquist wire which was exteriorised from RFV to the RIJV. Using this support wire, a combination of covered and uncovered stents were used in the first case and two covered stents were used in the second case to complete the fontan. Fenestration of the circuit was not done in view of normal pulmonary artery pressures. Pulmonary artery end of the stent was dilated more towards left pulmonary artery to promote better flow dynamics.

Results:
Both the procedures could be done successfully with no complications and the patients could be discharged before five days and are doing well on follow up. Oxygen saturations on follow up was around 90%.

Conclusions:
Transcatheter Fontan completion for univentricualar physiology in surgically unprepared cases can be safely accomplished. Needs further studies and longer follow up to recommend the same.

POSTER PRESENTATIONS

Category: Catheterization

1754 - TWO BIRDS AND A STONE TRANSCATHETER TREATMENT OF SVC TO PV FISTULA AND SVC STENOSIS

Annu Jose [1], Edwin Francis [1]
Astermedcity, Paediatric Cardiology, Ernakulam-India [1]

Background:
A 3 year old boy presented with facial puffiness and desaturation. He had undergone repair of total anomalous pulmonary venous drainage (TAPVC) to low superior venacava (SVC) at one month of age. The RUPV was draining separately to low SVC which was left as such by the surgeon.

Materials and Methods:
Child was taken for cardiac catheterisation procedure with a plan to balloon dilate the SVC. SVC angiogram however showed additional channel from SVC to the heart. In view of the surprise on table, the procedure was deferred after a detailed study including angiogram with balloon occlusion of low SVC. A CT PA was done done and angiogram reviewed. On reviewing , we understood the child developed collaterals from RUPV to the pulmonary vein due to worsening SVC stenosis. Right Pulmonary artery injection showed unobstructed pulmonary venous drainage on balloon occlusion. We came up with the idea of putting a covered stent in a way that the SVC stenosis is abolished as well as the communication with the RUPV was also occluded

Results:
A 14x39mm covered Begraft stent was deployed across the low SVC with good result. A pre-procedure SVC gradient of 20mmHg reduced to 3mmHg post stenting. The communication between SVC and PV was also occluded with the same stent

Conclusions:
A deep hemodynamic and anatomic knowledge helped us in avoiding a surgical procedure in this case

POSTER PRESENTATIONS

Category: Catheterization

1756 - STENTING OF OBSTRUCTED FONTAN CONDUIT

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Background / Hypothesis:
Obstruction of Fontan pathway is a common late complication. Progessive stenosis of Fontan anastomosis accelerates liver fibrosis. Different materials used in Fontan conduit have different mechanisms of obstruction.
The aim of the study was to evaluate usefulness and safety of obstructed Fontan conduit stenting.

Materials and Methods:
Retrospective, single-center analysis of Fontan patients with conduit obstruction.

Results:
51patients -38 (74%) male with Fontan conduit stenosis underwent Fontan pathway stenting. Mean age during procedure was 16 years (7-26 years), mean time from Fontan operation was 10 years (1-21 years). Mean age at Fontan procedure was 6 years (2-12 years).
All patients had extracardiac conduit, 25 (49 %) fenestrated. In 16 patients homografts (17-22mm), in 33 Gore- Tex (18-21mm), were used to create Fontan conduit, two patients had direct cavopulmonary connection.
Homografts had diffuse calcification leading to focal stenosis, Gore-Tex were obstructed by stretching during patients growth. Fontan patway stenting was the most common intevention in adult Fontan patients.
20 (39 %) patients had hypoplastic left heart syndrome (HLHS), 13 (25%)tricuspid atresia, 9 (17 %) double inlet left ventricle (DILV), remaining 9 patients had different forms of univentricular heart.
All patient had liver fibrosis, 3 of them had cirrhosis, 3 patients had history of protein losing enteropathy (PLE), 2 of plastic bronchitis (PB)
Covered Cheatham-Platinum stents were placed in 43 patients, in 8 patients Bentley BeGraft
In all patients intevention was successful. Mean conduit diameter before procedure was 14 mm (9- 16mm), after procedure 18 mm (17-23mm).

Conclusions:
1 Fontan patients need accurate and methodical follow-up including hemodynamic data.
2. Obstruction of Fontan pathway is a common late complication
3. Percutaneous stenting is a safe and effective method relieving Fontan obstruction,
4. Different materials used in Fontan conduit have different mechanisms of obstruction.

POSTER PRESENTATIONS

Category: Catheterization

1761 - SINGLE CENTRE USE OF AMPLATZER VASCULAR PLUG II IN DEVICE CLOSURE OF PDA IN SMALL BABIES.

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Background / Hypothesis:
Percutaneous device closure of patent ductus arteriosus (PDA) is the standard treatment for children. There has been significant progress particularly focussed in premature babies where new device(s) have been designed. The Amplatzer vascular plug II (AVP II) has shown to be versatile in patients with variable and diverse PDA morphology where standard devices are not suitable.
AVP II has an advantage for rapid vessel occlusion particularly in smaller babies

Materials and Methods:
Objective
Review the use of AVP II in PDA device closure in children less than 6kg
Method
Single centre retrospective observational study of all patients who underwent PDA closure using AVP II device from 2015 to 2025.

Results:
Total 538 patients underwent PDA closure during the study period, amongst AVP II was used in 202, of them 64 patients were less than 6kg (Table 1). Extreme prematurity (28 weeks or below) was present in 43 patients (67%). Median procedural weight 4.13kg (1.5-6kg) and average age was 4.9 months.
AVP II size range from 4 to 12mm and most common size was 8mm. Fluoroscopy time was less compared to previous literature (mean 12min). The mean PA pressure before procedure was 30mmHg.
The PDA morphology demonstrating type-E the most common type. Occlusion of PDA was successful in 87.5% of our cases with no residual shunts and other patients required different devices and some needed surgical closure for LPA stenosis (Table 2).
Follow-up echocardiogram was satisfactory except 2 showed mild LPA stenosis and 1 showed mild descending aorta flow acceleration (DAo). Two patients died during follow-up due to co-morbidities associated with prematurity.

Conclusions:
AVP II is a versatile and safe device for PDA closure in smaller babies (<6kg) . It is particularly advantageous in non-typical ductal morphology. Our experience showed high success rate with very few devices related procedural complication.

POSTER PRESENTATIONS

Category: Catheterization

1780 - THE EFFECT OF TRANSCATHETER CLOSURE IN CHILDREN WITH SMALL PERIMEMBRANOUS VENTRICULAR SEPTAL DEFECT (VSD) ON VENTRICULAR STRUCTURE AND FUNCTION AND ITS CORRELATION TO MATRIX METALLOPROTEINASE 9 AND TISSUE INHIBITOR OF METALLOPROTEINASE 1

Rahmat Budi Kuswiyanto [1], Putria Rayani Apandi [1], Dany Hilmanto [1], Muhammad Hasan Bashari [2], Sri Endah Rahayuningsih [1]
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Background / Hypothesis:
Impaired contractility and cardiopulmonary function due to cardiac structure and function changes later in life has been reported in small VSD. The role of MMP-9 and TIMP-1 in those changes in small VSDs is unknown. The aim is to investigate any involvement of MMP-9 and TIMP-1 in cardiac remodeling in small perimembranous (pm) VSD.
Materials and Methods:

The one group pre-post test design study was conducted in children with small pmVSD, who underwent transcatheter closure at our center, consecutively. Echocardiography was performed pre- and 1-month after closure to assess ventricular dimensions and function, along with measurement of MMP-9 and TIMP-1 level (ELISA). Children with acute infection, other lesions, genetic, syndrome, hereditary disorder, or other chronic diseases, or on medications or flow ratio > 1.5, PARI > 2 WU were excluded. Paired T-test or Wilcoxon was used to assess differences and Pearson or Spearman's test to assess correlation.
Results:

Of 35 suitable subjects, mean defect size was 2.75±1.3 mm; mPAP 18.9±6.8 mmHg, flow ratio 1.10 (1.01-1.49), and PARI 1.9±0.8 WU. Complete closure was achieved in all at last follow-up. MMP-9 level, LVEDD and E wave peak velocity decreased significantly after closure (p=0.018; p=0.03; p=0.03). MMP-9 correlated significantly to TIMP-1 level before and after closure (r=0.99; p<0.0001; r=0.98; p<0.0001). Decreasing MMP-9 level correlated to TIMP-1 level (r=0.89; p<0.0001), LVPWS (r=0.46; p=0.006), LV mass (r=0.51, p=0.002), LA/Ao ratio (r=-0.56; p=0.001) and E/A ratio (r=-0.43; p=0.01). TIMP-1 level correlated to LVPWS (r=0.47; p=0.004), LA/Ao ratio (r=-0.56; p=0.001) and LV mass (r=0.42; p=0.01). Decreasing TIMP-1 level correlated to LA/Ao ratio (r=0.40; p=0.02), LV mass (r=0.51; p=0.002) and E/A ratio (r=-0.42; p=0.01).
Conclusions:MMP-9 is decreased after transcatheter closure in small pmVSD and may have a role in cardiac remodeling through the changes of LVPWS, LV-mass, LA/Ao ratio and E/A velocity

POSTER PRESENTATIONS

Category: Catheterization

1790 - INTERVENTIONAL RESCUE OF CRITICAL LEFT PULMONARY ARTERY STENOSIS AFTER TETRALOGY OF FALLOT REPAIR IN AN INFANT

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Imss Umae 34, Pediatric Cardiology, Monterrey-Mexico [1] Imss Umae 34, Pediatric Cardiac Surgery, Monterrey-Mexico [2]

Background / Hypothesis:
Branch pulmonary artery (BPA) stenosis is a recognized complication following Tetralogy of Fallot (TOF) repair, particularly in patients undergoing transannular patch (TAP) procedures. The left pulmonary artery (LPA) is the most commonly affected, and a small LPA diameter at the time of repair is a known risk factor for reintervention. Early detection and prompt catheter-based management are crucial for restoring pulmonary perfusion and improving clinical outcomes

Materials and Methods:
We present the case of a 1-year-old female infant (9.2 kg, BSA 0.42 m^2) with TOF and bilateral BPA hypoplasia who underwent complete surgical repair with ventricular septal defect closure and right ventricular outflow tract reconstruction using an autologous pericardial patch. Postoperatively, the patient developed hemodynamic instability and persistent hypoxemia. Transthoracic echocardiography revealed suspected LPA obstruction, and emergent cardiac catheterization was performed. Angiography confirmed near-complete occlusion of the proximal segment of the LPA (1.4 mm). After balloon angioplasty, a 7 x 23 mm balloon-expandable stent was successfully

Results:
Post-stent angiography demonstrated complete restoration of anterograde flow through the LPA with homogenous distal perfusion. Right ventricular pressures decreased from 66/10/17 mmHg to 45/12/18 mmHg, and the RV/LV pressure ratio improved from 0.82 to 0.6. Prior to discharge, echocardiography showed sustained LPA stent patency (peak gradient 28 mmHg), mild residual ventricular septal defect, and preserved right ventricular function. The patient was discharged in stable condition with normal oxygen saturation.

Conclusions:
Critical LPA stenosis after TOF repair can lead to significant hemodynamic compromise. Early diagnosis and catheter-based stent implantation offer an effective and safe solution, even in critically ill infants. This case highlights the importance of vigilant postoperative surveillance and timely intervention to optimize outcomes in congenital heart disease.

POSTER PRESENTATIONS

Category: Catheterization

1794 - EFFICACY AND SAFETY OF MUSCULAR VSD CLOSURE USING KONAR MF™ INSIGHTS FROM A PEDIATRIC MULTICENTER COHORT

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Background / Hypothesis:
Ventricular septal defect (VSD) is the most common congenital heart disease, with muscular VSDs accounting for 10–15% of cases. Moderate-to-large VSDs require intervention to prevent heart failure, growth retardation, and pulmonary hypertension. Transcatheter closure is a minimally invasive alternative to surgery, especially for muscular VSDs. We report a multicenter Indian experience of transcatheter closure of muscular VSDs using the KONAR-MF™ occluder, including techniques, safety, and short- to mid-term outcomes.

Materials and Methods:
A retrospective analysis was conducted across three tertiary pediatric cardiac centers between July 2018 and July 2024. Fifty patients (54 devices) underwent transcatheter closure of muscular VSDs. Data on demographics, defect characteristics, procedural details, and follow-up outcomes were collected. Device deployment was performed via retrograde, antegrade, hybrid, or trans-septal routes under fluoroscopic and echocardiographic guidance.

Results:
The median age and weight of patients were 48 months (IQR: 12–96) and 12 kg (IQR: 7.5–23), respectively; 14 patients were infants, including nine weighing less than 7 kg. Indications included heart failure (28%), failure to thrive (46%), recurrent lower respiratory infections (12%), and postoperative residual VSD (14%). The mean VSD size was 5.8 mm (range 3–10 mm). Retrograde crossing and deployment was the most common approach (50%). Immediate post-procedure mild residual shunt occurred in 18%, which resolved by three months. Mild transient tricuspid regurgitation was noted in 14% but resolved on follow-up. No patient experienced heart block, significant hemolysis, or mortality. One patient had device embolization. Pulmonary artery pressures decreased significantly postprocedure.

Conclusions:
Transcatheter closure of muscular VSDs using the KONAR-MF™ occluder is safe, feasible, and effective, even in young infants. The bidirectional screw and low profile of the device provides procedural flexibility and avoids AV looping in majority. We found excellent procedural success, minimal complications, and good short- and mid-term outcomes.

POSTER PRESENTATIONS

Category: Catheterization

1826 - TRANSCATHETER DEVICE CLOSURE OF INDIRECT GERBODE DEFECT PROCEDURAL OUTCOMES AND INTERMEDIATE TERM FOLLOW UP

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Background / Hypothesis:
A perimembranous(Pm) VSD associated with an indirect communication between Left Ventricle(LV) and Right Atrium(RA) through the tricuspid valve is called an Indirect Gerbode defect. With increasing experience of device closure of PmVSDs, there have been sporadic reports of transcatheter closure of Gerbode defect .

Materials and Methods:
A prospective observational was study conducted from Jan 2022 through April 2025, in 17 patients with Pm VSD associated with indirect Gerbode defect who underwent transcatheter closure. Three children had failure to thrive ,others were asymptomatic . Konar MFO (Lifetech, Schezen,PRC) was the device of choice in all cases. Antegrade technique of device deployment was preferred in all cases .Post-procedural outcome was assessed on ECG and echocardiography. The patients were followed up for a median period of 1year (range :3month to 2 years) with ECG and echo .

Results:
A total of 17 patients underwent transcatheter closure of indirect Gerbode defect during the study period .Median age of 6 years (range 11 months to 33 years) ; M: F= 0.8:1. Median weight: 24 kg ; range 5.1 kg to 69 kg . The median size of the VSD measured in trans-thoracic echo(TTE) in apical 5-chamber view was 4.5mm (range 2.5 to 6 mm) The mean fluoroscopic time was 30 minutes. Successful closure of the defects was achieved in all cases with no residual shunting on TTE at 24 hours. 2D echo showed decrease in tricuspid regurgitation by at least one grade in all cases. All patients maintained normal sinus rhythm on follow up and there was no residual shunt.

Conclusions:
Transcatheter device closure of indirect Gerbode defect is safe and effective and is associated with excellent outcomes in intermediate term, making it an attractive alternative to surgical correction in the current era.

POSTER PRESENTATIONS

Category: Catheterization

1828 - MANAGEMENT OF HEART BLOCK AFTER TRANSCATHETER CLOSURE OF VENTRICULAR SEPTAL DEFECT

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Background / Hypothesis:
Left bundle branch block and complete atrioventricular block (CAVB) are rare but important complications after transcatheter closure of PMVSDs that can adversely affect left ventricular function.

Materials and Methods:

Results:
Our first case was admitted to the emergency department 4 days after the procedure with fainting and tremors throughout the body. ECG showed complete AV block. A transvenous temporary pacemaker was placed and the child was hospitalized in the intensive care unit. Dexamethasone 0.6 mg/kg/g was started. Sinus rhythm was observed on the 3rd day of hospitalization. Dexamethasone was completed for 10 days. The patient was discharged with sinus rhythm on Holter ECG and discharge ECG.
In our second and sixth patients, LBBB was detected during the procedure after device implantation and the device was retrieved before release. In our third and fourth patients, LBBB was observed early after the procedure. Dexamethasone 0.6 mg/kg/g was started. While the ECG of the third patient returned to normal at the third week, the other patient's left bundle branch block persisted and the device was surgically removed.
Four years after the procedure, we found that our patient, whose previous ECG was normal, had LBBB. We planned to closely monitor our patient's ventricular function and ECGs for CAVB in late LBBB.

Conclusions:
Blocks may occur immediately or later after percutaneous defect closure due to mechanical compression, inflammation, or fibrosis. Risk factors include young age, low body weight, ventricular septal aneurysm, and large device selection. To minimize risk, procedures should be performed by experienced operators using appropriately sized, flexible devices and avoiding large sheaths. If a block occurs during the procedure, abandonment is advised. Post-procedure, high-dose IV steroids followed by oral steroids for three weeks are recommended. Device removal depends on symptoms, parental preference, and clinical experience.

POSTER PRESENTATIONS

Category: Catheterization

1829 - TWINS WITH CRITICAL CONGENITAL HEART DISEASE DOUBLE TROUBLE AND TWICE THE BENEFIT

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Background / Hypothesis:
We report PA/IVS in monochorionic twins presenting D5, were admitted to NICU on prostaglandin infusion and underwent simultaneous transcatheter intervention on D6.

Materials and Methods:
Twin1 (2.25kg, SpO2 60%), had a bipartite RV (TV z-score -2.19; PV z-score 1.15). underwent radiofrequency perforation and dilatation of PV plus ductal stenting, SpO2 rose to 91%; he was extubated and transferred to NCICU.
Twin2 (2.5kg, SpO2 80%), with reasonable RV size (TV z-score -1.14; PV z-score –0.81), had no appreciable antegrade pulmonary flow, however, a coronary wire could pass through the pulmonary valve to the RPA indicating that it was a case of critical pulmonary stenosis. so PV was dilated with immediate improvement of SpO2 to 90%. He was extubated and transferred to the NCICU.

Results:
Twin1 had pulmonary overflow initially, required furosemide in addition to heparin infusion that was shifted to oral aspirin, and was discharge after 5 days (SpO2~75%) on aspirin and propranolol. Twin2 ran a stormy post-operative course: desaturation with reinfusion of PGE2 plus propranolol for infundibular hyperdynamism. His ICU stay was complicated by DVT, pneumonia and sepsis, necrotizing enterocolitis, and elevated renal functions. He was discharged after 24 days with SpO2 90%.
On follow up, both twins were doing well: gaining weight with stable saturations in the *0s. However, after 8 months of the procedure, twin1 had SCD 2 weeks following an URTI without any preceding manifestations. After 14 months of the procedure, twin2 required repeat balloon pulmonary valvuloplasty for recurrent severe valvular pulmonary stenosis.

Conclusion:
- Genetic aetiology is suggested in PA/IVS spectrum
- Phenotypic variability in the degree of RVOTO & RV hypoplasia might be due to intra-uterine / placental factors.
- By studying factors that regulate the expression of genetically-determined morphology, a critical lesion could be ameliorated if these factors could be reversed.
- The degree of RV hypoplasia remains the main prognostic determinant

POSTER PRESENTATIONS

Category: Catheterization

1846 - HOW MUCH CAN BE UNDONE! A LATE TRANSCATHETER RETRIEVAL OF OVERSIZED PDA DEVICE CAUSING LPA OCCLUSION AND COARCTATION WITH RECLOSURE OF THE SAME WITH OPTIMAL DEVICE

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Astermedcity, Paediatric Cardiology, Ernakulam-India [1]

Background / Hypothesis:
Transcatheter device closure is an accepted modality of treating Patent ductus arteriosus. Both oversizing and under sizing of device can be disastrous. We present a 5 month old who presented to us a week after PDA device closure done at another center with left pulmonary artery (LPA) occlusion and severe coarctation

Materials and Methods:
A 5 month old infant was referred a week after PDA device closure with tachypnoea and fever. On evaluation he was noted to have sepsis , left lung collapse with a thrombus in LPA, aortic obstruction and a 12 mm AVP device in PDA which was the culprit. Transcatheter retrieval opted as surgeon was unwilling to take for immediate surgery in the presence of sepsis. Device was snared and retrieved successfully through a 7Fr long sheath at the cost of the left femoral venous access as the device failed to be completely pulled into the sheath and hence had to be pulled out en-mass.The arch obstruction was immediately relived and child was put on heparin and chest physiotherapy which helped in clot removal and expansion of the left lung. After improvement ,he was taken for recath and PDA closed with a smaller 8mm AVPII device through the right femoral venous access with good result

Results:
The device could be successfully retrieved through transcatheter method even after a delay of 1 week and with appropriate planning a more optimal sized device was used to close the same

Conclusions:
Transcatheter interventions in infants can be challenging.
Choosing appropriate sized device is crucial to prevent complications
Retrieval of device can be possible even after a moderate time gap of 1 week

POSTER PRESENTATIONS

Category: Catheterization

1852 - STENTING THE BLIND DUCTS A CASE SERIES OF USE OF LOCAL PROSTAGLANDIN INSTILLATION TO OPEN CLOSED DUCTUS PRIOR TO STENTING

Annu Jose [1], Edwin Francis [1]
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Background / Hypothesis:
Neonatal PDA stenting is now considered superior to BT shunt in duct dependent pulmonary circulation. Prostaglandin infusion is used to maintain the patency of ductus till procedure. We present three cases where direct local instillation of PGE1 has resulted in opening up of closed ductus during stenting procedure

Materials and Methods:

Case 1: 9 days old with near pulmonary atresia and intact ventricular septum. Echocardiogram revealed a closed off ductus with minimal pulmonary antegrade flows. A blind nipple of the ductus was visible. In cathlab a direct instillation of PGE1 1-2 MCG/Kg was done resulting in opening up of the ductus to allow an 014 wire to pass through. Successful PDA stenting could be done

Case 2: 5 days old with VSD , Pulmonary atresia and disconnected pulmonary artery with bilateral PDA. The right PDA was tightly constricted and nearly closed off. Local PGE1 instillation opened up the ductus and stenting done successfully
Case 3: Pulmonary atresia in complex heart disease with significant desaturation and suboptimal response to PGE1 infusion. Ductus responded to local PGE1 and successful PDA stenting done

Results: Three cases where local PGE1 instillation at a higher dose of 1-2 mics/kg has helped to open the ductus to an extent enough to allow passage of an 014 wire and subsequent stenting

Conclusions: A higher dose of local PGE1 instillation into the ductal mouth can help in opening up ductus that do not respond to the usual peripheral infusion of the same.

POSTER PRESENTATIONS

Category: Catheterization

1855 - BALLOON AORTIC VALVULOPLASTY IN A PATIENT WITH SEVERE AORTIC STENOSIS POST OZAKI PROCEDURE

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Background / Hypothesis:
Children and young adults with aortic valve pathology have limited surgical options. Ozaki procedure which involves aortic reconstruction with autologous pericardium has been considered as a promising alternative to aortic valve replacement. Aortic regurgitation has been reported in long term follow up of patients who have undergone Ozaki procedure. Though the incidence of aortic stenosis is lower, there are instances of aortic stenosis reported in literature. We report one such case who underwent balloon aortic valvuloplasty.

Materials and Methods:
An 8 year old male with history of bicuspid aortic stenosis underwent balloon aortic valvuloplasty during infancy followed by Ozaki procedure at 5 years of age for severe aortic stenosis. He presented with dyspnea on exertion class II and excessive fatigue with exertion. Echocardiography revealed severe aortic stenosis with a peak gradient of 75 mmHg and a mean gradient of 40 mmHg. Aortic valve was calcified with restricted mobility of the leaflets. After careful thought, considering his young age and potential need for multiple surgeries in future, it was decided to perform balloon aortic valvuloplasty.

Results:
He underwent balloon aortic valvuloplasty with 14 mm Tyshak II balloon. The peak to peak transaortic pressure gradient decreased from 30 mmHg to 10 mmHg. There was no significant aortic regurgitation post balloon aortic valvuloplasty. The child reported improvement in symptoms on follow up.

Conclusions:
Balloon aortic valvuloplasty may be considered as a temporary relief measure in young children with aortic stenosis without aortic regurgitation, who will potentially need multiple surgeries in future to prolong the time until next surgery.

POSTER PRESENTATIONS

Category: Catheterization

1881 - COARCTATION OF THE AORTA IS PERCUTANEOUS TREATMENT A GOOD OPTION IN NEONATES

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Background:
Coarctation of the aorta (CoAo) is a congenital heart defect accounting for 5% to 7% of all congenital heart diseases. While surgery remains the standard treatment for native CoAo in infants, percutaneous balloon angioplasty is an alternative approach in neonates.

Materials and Methods:
This retrospective, single-center study analyzed 10 neonates (<1 month old) who underwent transcatheter balloon angioplasty for native CoAo over a 5-year period. Inclusion criteria included neonates with membranous or short-segment stenosis, while those with a hypoplastic aortic arch (z-score < -2.5) or requiring simultaneous surgical intervention were excluded.

Results:
Balloon angioplasty was effective in 8 of 10 patients, with 4 requiring reintervention. Two neonates had ineffective angioplasty and required surgical correction. No deaths or aneurysm formation occurred. Minor complications included transient loss of pulse (n=1), while a serious adverse event (aortic dissection) occurred in one patient who was successfully treated surgically.

Conclusions:
Balloon angioplasty presents a minimally invasive and safe option for select cases of CoAo, particularly those with membranous or short-segment stenosis. While the procedure significantly reduces procedural risks and avoids surgical scars, its applicability is limited, and the risk of re-coarctation remains a concern. Careful patient selection and long-term follow-up are essential to optimize outcomes.

POSTER PRESENTATIONS

Category: Catheterization

1912 - "ECHO GUIDED VASCULAR PUNCTURE A NIGHTMARE OF PITFALLS"

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Background:
Echo-guided vascular puncture has become widely recommended for vascular access in procedures such as cardiac catheterization. However, it introduces new complications and concerns that require attention.

Case:
A 22-year-old male with a history of TOF (Tetralogy of Fallot) surgery (10 months old, ICR with transannular patch) and 22q11.2 deletion syndrome underwent Harmony™ Transcatheter Pulmonary Valve Implantation (TPVI) for severe pulmonary valve regurgitation (NYHA II). Vascular access was secured with 26Fr in the right femoral vein, 7Fr in the left femoral vein, and 5Fr in the left femoral artery. TPVI was performed successfully, and pulmonary regurgitation was resolved. After sheath removal, a sudden drop in blood pressure occurred. Initially, bleeding from the 26Fr punctured right femoral vein was suspected, but no abnormalities were found. The patient was later diagnosed with shock due to intra-abdominal bleeding from the 5Fr punctured left femoral artery. Vascular access was promptly secured in the contralateral right femoral artery, and a balloon catheter was advanced to perform emergency hemostasis. A VIABAHN self-expandable covered stent was then placed to successfully stop the bleeding.

Discussion & Conclusion:
Echo-guided vascular puncture may lead to steeper puncture angles and more central puncture sites, which can increase the risk of vascular complications. Awareness of potential complications and preparedness for vascular damage are crucial. The use of covered stents for iatrogenic vascular injury should be anticipated. Additionally, while mastering echo-guided vascular puncture techniques is important, a thorough understanding of vascular anatomy and basic blind puncture skills, along with physical examination, is essential. Echo-guided vascular puncture should be used to complement these skills to minimize puncture errors and complications. A key pitfall is that the vessel that can be punctured may not always be suitable for hemostasis.

POSTER PRESENTATIONS

Category: Catheterization

1939 - COIL EMBOLIZATION OF AORTO PULMONARY COLLATERAL SUPPLYING THE SEQUESTRATED RIGHT LUNG SEGMENT USING MULTIPLE COOKS EMBOLISATION COILS

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Background / Hypothesis:
Pulmonary sequestration is a rare congenital lung disease characterized by nonfunctioning pulmonary tissue that does not have normal communication with the bronchial tree and is supplied by a nonpulmonary systemic artery. It accounts for only 0.15% -6% of all congenital lung malformations. There are two types based on pleural coverage, including intralobar and extralobar. 75 % of pulmonary sequestration are intralobar. Majority of patients manifest as recurrent chest infection or haemoptysis in young adult or older children. Usually it is suspected condition in paediatric population. Haemoptysis may be lifethreatening. It receive systemic arterial supply from descending thoracic aorta, abdominal aorta, celiac trunk or from intercostal arteries.Venous drainage is mainly to pulmonary vein or rarely azygous or hemiazygous veins. CT chest is useful in diagnosis. Usually Surgical resection of non functioning lung tissue is the main therapy. Life threatening haemorrhage is the one of serious complication during surgery. To overcome this problem, embolization of aberrant systemic artery with vascular plug or metallic coils is a useful alternative therapy. Several case reports have shown that coil embolization is feasible and safe with a good late outcome. This case report describes a 6 years old child evaluated for recurrent lower respiratory tract infection found to have right lower lobe lung sequestration has undergone successful coil embolization of aorto-pulmonary collateral supplying the sequestrated right lung segment from abdominal aorta.

Materials and Methods:

Results:

Conclusions:

POSTER PRESENTATIONS

Category: Catheterization

1950 - LEFT VENTRICULAR DYSFUNCTION AFTER TRANSCATHETER CLOSURE OF PATENT DUCTUS ARTERIOSUS IN ADULTS A SINGLE CENTER EXPERIENCE

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Background / Hypothesis:
Left ventricular (LV) dysfunction is a known complication of patent ductus arteriosus (PDA) closure. Studies in the pediatric age group are abundant but are not generalizable to the adult population, warranting dedicated research.

Materials and Methods:
A retrospective analysis was done on all adult patients who underwent PDA closure from January 2014 to June 2024.

Results:
50 subjects were included in the study. The mean age was 30 years. 56% were asymptomatic. The average PDA size was 5.3 ± 2.3mm with mean pulmonary artery pressure of 31.6 ± 23.6mmHg on average. The occlusion rate was 100%. There was a decrease in LV end-diastolic diameter (LVEDD) ($p<.001$) and left atrial to aortic diameter ratio (LAd/AOd) ($p<.001$) post-occlusion. LV dysfunction was identified in 24% at 24h post-procedure and was associated with increased pre-occlusion LVEDD and decreased LV ejection fraction (EF).

Conclusions:
Adults undergoing PDA occlusion are often asymptomatic with small PDAs and mild flow-related pulmonary hypertension. LA and LV enlargement are reversible. PDA closure has a high success rate but LV dysfunction is common early post-procedure. The determinants of post-occlusion LV dysfunction include a large LVEDD and decreased EF.

POSTER PRESENTATIONS

Category: Catheterization

1960 - DIAGNOSTIC AND INTERVENTIONAL CARDIAC CATHETERIZATION PERFORMED WITHIN THE FIRST 72 HOURS OF THE POSTOPERATIVE PERIOD IN CONGENITAL HEART SURGERY

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Background / Hypothesis:
Cardiac catheterization in the postoperative period emerges as a primary tool, providing effectiveness and safety in diagnosis, treatment guidance, and resolution of major residual lesions.

Materials and Methods:
This is a retrospective case-control study. We collected the clinical records of patients who underwent cardiac catheterization between January 2003 and December 2022 within the initial 72 hours after surgery in the Pediatric Cardiac Intensive Care Unit (PCICU) of a national referral hospital in Mexico City. Descriptive, univariate, and multivariate analyses were performed.

Results:
A total of 6,243 surgeries were performed in the initial postoperative 72 hours, of which 264 were cardiac catheterizations; these included 73 diagnostic procedures and 191 interventional procedures. One hundred and thirty-five (135) catheterizations targeted recent suture intervention sites. The primary indications for cardiac catheterization included low cardiac output and the suspicion of major residual lesions. Approximately 65% of interventions occurred within the first 24 hours and solved 426 residual lesions. No significant associations were found between mortality, complications, and the need for surgical reintervention in patients who underwent interventional catheterization at recent suture sites (OR 1.93; 95% CI 0.94-4.07: p=0.076). Seventeen patients (17) were extubated in the initial 24 hours post-catheterization. Two major complications were identified: rupture of the systemic-to-pulmonary shunt in the anastomosis, and a pulmonary artery laceration requiring emergency surgery. One patient died.

Conclusions:
Cardiac catheterization has evolved into a vital instrument to diagnose and resolve abnormalities and significant residual lesions without increasing the morbidity and mortality risks.

POSTER PRESENTATIONS

Category: Catheterization

1961 - LEFT PULMONARY VEINS AGENESIS PRESENTATION OF TWO UNCOMMON CASES IN PEDIATRICS

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Background / Hypothesis:
Pulmonary vein agenesis is a rare entity. Embryologist Luis Muñoz describes that a vessel that receives continuous and adequate blood flow develops, the opposite occurs when blood flow progressively decreases within the vessels, which reduce their size until they become atretic and disappear. There are few case reports described in the literature on pulmonary vein agenesis.

Materials and Methods:
Two cases of left pulmonary vein agenesis in pediatric patients were documented at the Ignacio Chávez National Institute of Cardiology in 2024. The main clinical manifestation was hemoptysis, with no significant clinical findings identified during the physical examination. Radiological evaluation revealed hypoplasia of the left lung. Both patients underwent echocardiography, cardiac computed tomography, and cardiac catheterization, studies that confirmed the diagnosis of left pulmonary vein agenesis.

Results:
After the diagnosis of left pulmonary vein agenesis, the approach and treatment were performed in conjunction with pediatric pneumology. One of the patients has a history of cystic fibrosis and has required multiple hospitalizations due to complications associated with cystic fibrosis. However, repeated episodes of hemoptysis prompted the clinician to inquire about another associated pathology. The second patient remains under observation without pharmacological treatment. He has had one more episode of hemoptysis, which was self-limited and did not compromise his hemodynamic status.

Conclusions:
Pulmonary vein agenesis is a rare entity that should be suspected in patients with recurrent hemoptysis. The approach should be comprehensive, with the help of imaging studies to confirm the diagnosis.

POSTER PRESENTATIONS

Category: Catheterization

1967 - PATENT DUCTUS ARTERIOSUS CLOSURE AFTER INTIMAL DISRUPTION IN PREMATURE INFANTS

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Background:
In premature infants, a hemodynamically significant patent ductus arteriosus (hsPDA) can inhibit clinical progress and contribute to pulmonary vascular disease. Transcatheter PDA closure is a safe, validated and efficacious method to eliminate the shunt. Potential complications that would warrant device removal include obstruction of the left pulmonary artery and/or aorta, and device embolization. A previous study demonstrated that intimal disruption stimulates closure of small PDAs (<1mm). We hypothesized that in premature infants with large PDAs, substantial manipulation and intimal disruption resulting from device deployment and removal may similarly lead to effective PDA closure.

Methods:
We describe four premature infants (22w2d-27w5d gestation, weighing 1.07-2.77kg) who underwent cardiac catheterization between September 2022 and September 2024. Each had echocardiographic and clinical findings of a large hsPDA, warranting PDA closure. Procedures were performed with fluoroscopy and echocardiography. PDAs were assessed as clinically indicated post-procedure for size and hemodynamics.

Results:
By angiography, the PDAs measured 2.5-4.5mm in diameter and 5-9mm in length. Three Piccolo Occluders and one Amplatzer Vascular Plug II were deployed. All four patients demonstrated aortic or pulmonary artery obstruction; one patient also had moderate residual flow through the Piccolo Occluder. All four devices were removed. On post-procedure day one, echocardiograms revealed significant reduction in PDA size and hemodynamic significance. Further intervention, such as PDA ligation, was not clinically indicated. Subsequent echocardiograms were performed when clinically warranted with complete PDA closure by two to nine weeks after the procedure.

Conclusions:
Four premature infants with large hsPDAs experienced successful PDA closure without an implanted closure device, but rather from device deployment and removal causing intimal disruption. This novel technique has not been previously reported for premature infants or those with large PDAs.

POSTER PRESENTATIONS

Category: Catheterization

2002 - PERCUTANEOUS CLOSURE OF RUPTURED SINUS OF VALSALVA ANEURYSM AND ASSOCIATED VENTRICULAR SEPTAL DEFECT

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Background / Hypothesis:
A ruptured sinus of Valsalva aneurysm (RSOVA) is a rare but potentially life-threatening cardiac anomaly, often associated with ventricular septal defects (VSDs). RSOVAs can lead to complications such as heart failure, endocarditis, and aortic regurgitation if left untreated. Surgical repair has been the gold standard for RSOVA and VSD closure. However, transcatheter closure has emerged as an alternative in select cases. The following report describes the percutaneous closure of a RSOVA coexisting with a VSD in a young adult, highlighting the feasibility and efficacy of this technique.

A 19-year-old male, diagnosed to have a subpulmonic VSD since infancy, presented with progressive dyspnea and palpitations. On examination, a continuous murmur was heard at the right upper sternal border and a systolic murmur at the left sternal border. Xray revealed LV enlargement and increased pulmonary vascularity. Echocardiography showed a subpulmonic VSD with RCC prolapse associated with severe AI. There was a SOVA suspicious for rupture into the RV. The family opted for a minimally invasive approach thus the patient was scheduled for cardiac catheterization. An angiogram revealed a classical windsock deformity from the aortic root into the RV in keeping with a RSOVA measuring 4 mm. A small 2.3 mm subpulmonic VSD was also found. The RSOVA was closed using a 7/5 mm Lifetech KONAR MF occluder and the VSD was occluded using a 6/4 mm Lifetech KONAR MF occluder, both done retrogradely. Echocardiography confirmed firm attachment of the devices without residual shunting. There was no worsening of the AI. Electrocardiogram showed sinus rhythm. The patient was discharged on aspirin and an echocardiogram done on follow up 3 months post-occlusion showed both devices in place without residual shunting.

Conclusion:
Early repair of RSOVA is recommended to prevent complications. Transcatheter closure is a feasible alternative to surgery but long-term follow-up evaluation is necessary.

POSTER PRESENTATIONS

Category: Catheterization

2028 - COMPARISON OF SINGLE STEP VS. TWO STEP TPVR WITH ALTERRA ADAPTIVE PRESTENT IN TETRALOGY OF FALLOT PATIENTS WITH SEVERE PULMONARY REGURGITATION.

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Background / Hypothesis:
Repaired Tetralogy of Fallot (TOF) patients with native right ventricular outflow tracts (RVOTs) often develop significant pulmonary regurgitation (PR). Transcatheter pulmonary valve replacement (TPVR) offers effective treatment. While single-step TPVR using balloon (Melody, Edwards SAPIEN 3) - or self-expandable (Pulsta, Venus P) valves is common, patients with large RVOTs may benefit from a two-step approach using the Alterra Adaptive Prestent with Edwards SAPIEN 3 to create a suitable landing zone (LZ).

Methods:
We retrospectively reviewed TOF patients with native RVOTs who underwent TPVR between 2020–2024. Outcomes and anatomical characteristics were compared between those treated with single-step TPVR and those who received the Alterra prestent.

Results:

Variable	Single-Step (n=68)	Alterra Group (n=18)	p-value
Age TPVR (yrs)	25.9 ± 13.4	34.6 ± 12.0	0.012
PR RF (%)	40.8 ± 13.5	52.9 ± 9.0	<0.001
CT LZ (mm)	26.2 ± 3.3	34.8 ± 4.2	<0.001
Cath LZ (mm)	27.9 ± 2.7	35.3 ± 2.9	<0.001
Valve Size (mm)	29.1 ± 2.7	29.4 ± 1.6	0.568
Post Grad (mmHg)	14.1 ± 5.9	10.3 ± 6.4	0.182

One case of valve embolization requiring surgical intervention occurred in the single-step group. One coronary compression patient was found in Alterra group.

Conclusion:
The two-step TPVR using the Alterra Adaptive Prestent with Edwards SAPIEN 3 is a safe and effective approach for patients with large RVOTs. It provides a significantly larger landing zone without increasing procedural risk or requiring larger valve sizes, making it a valuable option in selected TOF patients.

POSTER PRESENTATIONS

Category: Catheterization

2035 - RVOT STENTING IN UNCONVENTIONAL CIRCUMSTANCES IN THE PEDIATRIC AGE GROUP A CASE SERIES

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Background / Hypothesis:
Right ventricular outflow tract stenting (RVOTS) has emerged as an acceptable alternative to Blalock-Taussig-Thomas shunt surgery. This approach is indicated for patients with Tetralogy of Fallot (TOF) and unfavorable pulmonary artery anatomy. This study was performed to analyze the utility of RVOTS in unconventional circumstances and reintervention following RVOTS.

Materials and Methods:
This was a retrospective analysis performed in a tertiary care pediatric cardiac center. The details of all patients who underwent RVOTS were analyzed. All patients who underwent RVOTS under unconventional circumstances and who underwent RVOT reintervention were included in this analysis. The patients' immediate outcomes and last follow up visit were analyzed.

Results:
Of the 56 patients who underwent RVOTS at our center, 5 patients were included in this analysis; the median age was 3 years (range = 1 – 13 years). A total of 7 RVOT interventions (including one re-stenting and one balloon dilatation) were performed in these 5 patients. Four patients underwent RVOTS under unconventional circumstances and one patient underwent re-stenting. All 5 patients had excellent immediate outcomes, and all were discharged in satisfactory condition.

Conclusions:
RVOTS can be utilized in unconventional situations with good immediate and short-term outcomes as shown in this case series.

POSTER PRESENTATIONS

Category: Catheterization

2072 - SUCCESSFUL PERCUTANEOUS RETRIEVAL OF DISTALLY EMBOLIZED UMBILICAL VENOUS CATHETER

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Background / Hypothesis:
Umbilical catheters are often used in critically ill neonates in resuscitation room and in preterm neonate in intensive care unit. There are various complications that may occur with insertion of the umbilical catheters. Catheter breakage is an uncommon but very challenging complication which can be retrieved by surgical or percutaneous techniques.

Materials and Methods:
A 16-day old preterm neonate was referred to our centre for removal of a fragmented umbilical venous catheter.

Results:
Percutaneous retrieval of fragmented and embolized umbilical venous catheter to LA appendage was done on 19days of life successfully.

Conclusions:
An embolized umbilical venous catheter fragment to LA appendage can be retrieved percutaneously which is often possible for late presentation and thus need for open heart surgery can be avoided.

POSTER PRESENTATIONS

Category: Catheterization

2078 - LONGTERM OUTCOME OF DEVICE CLOSURE OF SUB PULMONIC VENTRICULAR SEPTAL DEFECT – A SINGLE CENTER EXPEREIENCE

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Background / Hypothesis:
Subpulmonic location is an unlikely site for the ventricular septal defect (VSD) to close spontaneously and known to have complications such as aortic valve prolapse and regurgitation even if it is a small defect. Conventionally sub pulmonic VSDs are closed by surgery. We report 106 cases of sub pulmonic VSDs who underwent successful device closure and its long term follow up.

Materials and Methods:
From 2013 to 20125, 124 children (male 78 and female 36) with age group of 6 months to 24 years (median 4 years) and the weight ranged from 6.7 kg to 72 kg (median 15.5 kg) were included in our study population. Symptomatic children with dilated left heart and prolapse of aortic cusp with not more than trivial aortic regurgitation were taken as criteria for the device closure. We used lateral view Left Ventricular angiogram to define VSD. Devices were deployed under Tranasthoracic echocardiography and Fluoroscopy guidance without using Transesophageal echocardiograpghy for all our cases. All the devices were deployed through mostly right femoral artery.

Results:
Out of 124 cases we attempted, 8 had unsuccessful deployments due to failure in crossing the VSD. We had two cases of trivial AR before deployment but they did not increase after the device was deployed. We had 94 % of acute procedural success rate. None of our cases had any major complications like significant AR, right ventricular or left ventricular tract obstruction, device embolization, heart blocks or vascular complications. No major complications observed during our 12 years follow up.

Conclusions:
We conclude that device closure of sub pulmonic VSD are feasible, relatively safer, and shorter procedure and Fluro time in all age groups. Our study showed low risk of complications with experienced operator

POSTER PRESENTATIONS

Category: Catheterization

2081 - RETROGRADE DEVICE CLOSURE OF VENTRICULAR SEPTAL DEFECT IN LESS THAN 2 YEARS OLD CHILDREN A SINGLE CENTRE EXPERIENCE

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Background:
Device closure of VSD in small children by retrograde technique is a challenging task in view of small sized femoral artery through which larger sized sheaths and devices to be taken compare to older children. Here, we wanted to share our experience of device closure of VSD by retrograde technique in small children done over 15 years.

Materials and Methods:
From 2010 to 2025, 216 children (male 124 and female 92) with age group of 6 months to 24 months (median 16 months) and the weight ranged from 3.2 kg to 14 kg (median 8.4 kg) were included in our study population. Symptomatic children with dilated left heart, prolapse of aortic cusp with not more than trivial aortic regurgitation (AR) and right ventricular outflow tract (RVOT) hypertrophy with no significant obstruction were taken as criteria for the device closure. Devices were deployed under transthoracic echocardiography and Fluoroscopy guidance without using Transoesophageal echocardiography for all our cases. All the devices were deployed mostly through right femoral artery.

Results:
Out of 216 children taken up for the device closure of VSD, 10 children did not undergo device closure due to malposition of device, significant residual shunt and femoral artery spasm. Among 206 patients who had successful device closure, 6 cases had trivial AR before the procedure, remain trivial AR in 3 and no AR in 3 after the procedure. 3 cases developed trivial AR after the procedure.One case of femoral artery injury needed surgery. No device embolization, heart block or progression of trivial AR observed during 15 years follow up.

Conclusions:
We conclude that device closure of VSD by retrograde technique are feasible, relatively safer, and shorter procedure and Fluro time in children less than 2 years of age compare to antegrade technique. Our study showed high success rate and low risk of complications with experienced operator.

POSTER PRESENTATIONS

Category: Catheterization

2088 - SAFETY PROFILE OF PEDIATRIC CARDIAC CATHETERIZATION AT A SINGLE REFERRAL CENTER IN THAILAND

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Background / Hypothesis:
Although pediatric cardiac catheterization has advanced significantly, it remains associated with risks of hemodynamic instability and adverse events. The Catheterization Risk Score for Pediatrics (CRISP) was developed to predict such risks, yet validation studies are limited, especially in developing countries. This study evaluates risk factors and the predictive validity of the CRISP score for adverse events in a referral center in the Southern of Thailand.

Materials and Methods:
A retrospective review was conducted on all pediatric cardiac catheterizations at Hatyai Hospital from September 2016 to June 2024. Patient and procedural characteristics, adverse outcomes, and revised CRISP scores were recorded and stratified into five CRISP score categories. Multivariate analysis was used to identify predictors of clinically meaningful adverse events (CMAEs) and assess CRISP score validity.

Results:
Of 185 catheterizations analyzed, 62.16% were interventional procedure. Median patient age was 48 months; 38.92% were male, and 43.78% had cyanotic congenital heart disease. CMAEs occurred in 12.97% of cases and were significantly associated with higher CRISP score categories ($p < 0.05$). Multivariate analysis identified CRISP score category ≥3 (OR 3.41) and cyanosis (OR 3.17) as independent predictors of CMAEs ($p < 0.05$).

Conclusions:
This study supports the CRISP score as a valid predictive tool for clinically meaningful adverse events in pediatric cardiac catheterization. Cyanosis and higher CRISP score categories are key risk indicators, underlining the importance of thorough pre-catheterization assessment to enhance patient safety and procedural outcomes.

POSTER PRESENTATIONS

Category: Catheterization

2098 - PDA STENTING VERSUS BTT SHUNT IN INFANTS WITH PULMONARY ATRESIA WITH INTACT VENTRICULAR SEPTUM A 30 DAY OUTCOME COMPARISON

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Background / Hypothesis:
Infants with pulmonary atresia with intact ventricular septum (PA-IVS) require prompt intervention to ensure survival. While the Blalock-Thomas-Taussig (BTT) shunt has been the standard procedure to maintain pulmonary blood flow before a Glenn procedure, patent ductus arteriosus (PDA) stenting offers a less invasive option. This study sought to compare clinical outcomes at 30 days following the PDA stenting and BTT shunt procedure in infants with PA-IVS.

Materials and Methods:
This retrospective cohort study included infants diagnosed with PA-IVS who underwent either PDA stenting or BT shunt between 2018 and 2023 at the National Cardiovascular Centre Harapan Kita, Jakarta, Indonesia. Data analysis was conducted using SPSS version 26.

Results:
A total of 28 infants with PA-IVS were included, comprising of 19 who underwent PDA stenting (mean age 48.9±38.9 days; weight 3,690±568.4 grams) and 9 who received BTT shunt surgery (mean age 58.8±35.7 days; weight 3,694.5±481.2 grams). At 30 days, PDA stenting showed lower rates of mortality (10.5% vs 33.7%; p=0.290), complications (52.6% vs 88.9%; p=0.098), rehospitalization (5.3% vs 22.2%; p=0.234), and reintervention (5.3% vs 11.1%; p=1.00) compared to BTT shunt, though differences were not statistically significant. Additionally, among the infants admitted to the intensive care unit (ICU), length of ICU stay was also shorter in the PDA stent group (3.7 vs 12.1 days; p=0.094).

Conclusions:
PDA stenting demonstrated favorable trends in short-term outcomes for infants with PA-IVS, including lower rates of mortality, complications, reintervention, rehospitalization, and shorter ICU stays in this single center study. Although these differences were not statistically significant, they may reflect clinical advantages that warrant further investigation in larger, adequately powered studies.

POSTER PRESENTATIONS

Category: Catheterization

2101 - JUGULAR VENOUS ACCESS FOR CARDIAC INTERVENTIONS IN CHILDREN WITH CONGENITAL HEART DISEASES

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Background / Hypothesis:
Cardiac interventions in children are typically performed via the femoral route. However, conditions like interrupted IVC or post-bidirectional Glenn surgery necessitate alternate access through jugular, axillary, or radial routes. Jugular access is rarely used for pediatric interventions but can offer advantages in select cases. We report our experience with jugular venous access in five pediatric CHD cases where femoral access was unfeasible, suboptimal or jugular route provided better access to structure of interest.

Materials and Methods:
The first case involved a 5-year-old boy with a coronary cameral fistula from the right coronary artery (RCA) to the right atrium near the SVC. An 8–10 mm Konar MFO device was deployed into the fistula via the right internal jugular vein (RIJV) using an AV loop created with arterial and venous access. The procedure was successful, though complicated by a right hemothorax requiring drainage and transfusion. The child remained asymptomatic afterward.

The second case was a 3-year-old with a large mid-muscular VSD and interrupted IVC with azygous continuation. An 18 mm Lifetech device was successfully delivered via the right RIJV to close the VSD.

The third patient, an 8-year-old girl with a PDA, bilateral IVC with interruption, underwent successful closure using a 10–8mm PDA device through RIJV access without complications.

The fourth was a 7-year-old boy post-TOF repair with severe LPA stenosis and blocked bilateral femoral veins. LPA stent was successfully placed via jugular route.

The fifth case, a 20-year-old woman with tricuspid atresia, VSD, PS, post right modified BTT shunt, bilateral BDG and fenestrated Fontan surgeries at ages one, six and 15 years, now presented with desaturation. Jugular access with better alignment enabled successful device closure of Fontan fenestration, improving her saturation.

Results:
Except for one complication, all procedures were completed successfully.

Conclusions:
Jugular venous access is a viable alternative in selected pediatric cases.

POSTER PRESENTATIONS

Category: Catheterization

2113 - "INTERVENTIONAL CATHETERIZATION APPROACH TO PULMONARY SEQUESTRATION EXPERIENCE AT A TERTIARY CARE CENTER"

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Background / Hypothesis:
Historically, the standard treatment for pulmonary sequestration has been surgical resection. However, catheter embolization has recently gained ground as a less invasive alternative, we present our institutional experience in the management of pulmonary sequestration using interventional techniques, highlighting outcomes, benefits, and clinical considerations of this therapeutic approach.

Materials and Methods:
Retrospective review.

Results:
A retrospective analysis of 25 clinical cases was performed: 83.3% were under 18 years of age, 60% were women. In all cases, pulmonary sequestration was diagnosed incidentally, 76% had failure to thrive and 68% respiratory symptoms, mainly in children under 10 years of age. Varied previous clinical diagnoses included complex congenital heart disease and Scimitar syndrome, 64% had pulmonary hypertension. The catheterization was performed under sedation, vascular access was both arterial and venous in 76% of cases, exclusively arterial in 12%, and exclusively venous in 12%. Devices used during the interventional procedures: Vascular Plugs (68%), Amplatzer devices (20%) and Coils (12%). Pulmonary sequestration feeding arteries were identified in the following order of frequency: originating from the celiac trunk in 8 (32%), from the diaphragmatic aorta in 11 (44%), and from abdominal aorta in 6 (24%). All cases were intralobar PS, with a predominance in the right lung (24 of 25). Subsequently, 28% received corrective or palliative cardiac surgery after embolization. There were no complications related to the interventional procedure.
Some postoperative complications included pneumothorax (14%), superior vena cava obstruction (29%), and one case of lung abscess. No deaths were reported.

Conclusions:
Endovascular embolization of pulmonary sequestration has proven to be an effective and safe therapeutic alternative in our study, with a minimal incidence of periinterventional complications.

POSTER PRESENTATIONS

Category: Catheterization

2118 - CONVERSION OF FEMORAL VENO ARTERIAL EXTRACORPOREAL MEMBRANE OXYGENATION TO LEFT ATRIAL VENO ARTERIAL SETUP BY TRANSCATHETER MEANS FOR LEFT HEART DECOMPRESSION IN A PAEDIATRIC PATIENT WITH FULMINANT MYOCARDITIS A CASE REPORT

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Background:
A 10-year-old boy presented with cardiogenic shock, ventricular tachycardia and severe left ventricular (LV) dysfunction. Fulminant myocarditis was diagnosed. Peripheral venoarterial (VA) extracorporeal membrane oxygenation (ECMO) was initiated via right femoral cannulation. Reassessment 12 hours post-cannulation showed evidence of inadequate left heart decompression with pulmonary oedema, persistent QRS widening and intermittent atrioventricular block, hence decided for transcatheter LA decompression.

Methods:
Clinical, echocardiographic and angiographic information of the case was retrieved.

Results:
Cardiac catheterization was performed 24 hours post-ECMO cannulation via left femoral vein (LFV). Atrial septostomy was achieved with radiofrequency assisted trans-septal puncture under trans-oesophageal echocardiogram (TOE) guidance followed by sequential dilation with 10x20mm Metacross and 16x20mm Atlas Gold balloons. Left atrial (LA) mean pressure decreased from 22mmHg to 16mmHg post-septostomy. Trans-atrial gradient was 8mmHg.

Given concerns about insufficient decompression with septostomy alone, conversion to left atrial-veno-arterial (LAVA) ECMO was contemplated. The first attempt was to reposition the existing 21Fr venous cannula into LA. A 5Fr sheath access was obtained via ECMO tubing close to the 21Fr venous cannula. A wire-catheter combo was navigated along the venous cannula, across atrial septostomy and positioned at left upper pulmonary vein which act as a rail to attempt cannula repositioning. However the venous cannula failed to negotiate across the septostomy despite multiple attempts.

Attention was turned to LFV access. An additional 15Fr multi-stage cannula was inserted positioning into LA. A Y-connector joined both venous cannulas to the ECMO circuit, successfully establishing LAVA ECMO. TOE confirmed adequate LA and LV decompression. ECG showed QRS narrowing. Patient demonstrated clinical improvement with gradual myocardial recovery, ultimately decannulated from ECMO on day 7.

Conclusion:
Balloon atrial septostomy combined with LAVA ECMO is an effective strategy for LV decompression in paediatric patients with fulminant myocarditis on VA ECMO, though technical challenges must be anticipated.

POSTER PRESENTATIONS

Category: Catheterization

2156 - IS IT TIME TO MOVE BEYOND THE GRADIENT NT PROBNP AS A DECISION MAKING TOOL IN AORTIC COARCTATION STENTING FOR SMALL PATIENTS WITH SINGLE VENTRICLE AND BIVENTRICULAR PHYSIOLOGY

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Background / Hypothesis:
Percutaneous stent implantation has emerged as a less invasive alternative to surgical repair for aortic coarctation in small children, including those with functionally univentricular hearts after complex arch reconstructions such as the Norwood procedure. In this high-risk group, surgical reinterventions carry substantial morbidity, while elevated systemic afterload may further compromise ventricular function and long-term outcomes. However, current guidelines lack clearly defined cutoff values for treatment indications in this patient population, and the available evidence remains limited to small, heterogeneous case series.

Materials and Methods:
Patients from both the univentricular and biventricular circulation groups were scheduled for cardiac catheterization due to suspected re-coarctation of the aorta. NT-proBNP values and corresponding age-adjusted z-log NT-proBNP values prior to stent implantation were retrospectively collected, when available. In addition, data on invasive pressure gradients across the area of narrowing were retrospectively analized. In addition, the frequency of re-dilatation in both groups was evaluated.

Results:
A total of 96 small children(<15kg) underwent stenting of the aortic isthmus. The median age at the time of the procedure was 5.0 months (range:0.4–44.8), with a median weight of 6.0kg(range:0.9–15.0) and a median height of 65cm(range:38–103).
Among the 56 patients with available NT-proBNP data, both absolute median NT-proBNP values and age-adjusted log-transformed z-scores were significantly higher in the univentricular circulation group(n=32) compared to the biventricular group (n=24), with $p<0.003$.
In contrast, the median pressure gradient across the stenosis (n=91) was significantly higher in patients with biventricular circulation (n=55) compared to those with univentricular physiology, with $p<0.001$. Freedom from reintervention was higher patients with biventricular circulation (Figure 1).

Conclusions:
Estimating NT-proBNP levels and corresponding age-adjusted z-log NT-proBNP values may serve as a valuable tool in the decision-making process for stenting of aortic arch obstruction. This is particularly relevant in patients with reduced cardiac output, where the measured pressure gradient may underestimate the true hemodynamic severity.

POSTER PRESENTATIONS

Category: Catheterization

2168 - 7 YEAR EXPERIENCE WITH VENUS PERCUTANEOUS PULMONARY VALVE IMPLANTATION IN AN ONLY CENTER IN ARGENTINA

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Background / Hypothesis:
Surgical enlargement of the right ventricle outflow tract (RVOT) frequently develops with pulmonary regurgitation and consequent RV dilation.
Pulmonary valve replacement, whether surgical or percutaneous, reduces RV dilation and improves tolerance to physical activity.

Materials and Methods:
Retrospective observational analysis of a cohort of patients with surgical RVOT enlargement who underwent percutaneous implantation of the Venus (MedTech) pulmonary valve between 2018 and 2025, in a single center, Hospital Universitario Austral, Buenos Aires, Argentina.

Results:
16 Venus pulmonary valve implants were performed (13 Venus P-Valve and 3 Venus Vitae). Technical success was achieved in 100%; male 62.5%; mean age 22.9 years; mean weight 58.8 kg; Tetralogy of Fallot 69%; Pulmonary Regurgitation as the primary lesion was found in 82% of cases; 56% were in NYHA Functional Class II.
The preimplant cardiac MRI data showed a mean RV end-diastolic volume of 168 ml/m2, with a mean pulmonary regurgitation rate of 55.8%.
Regarding the procedure, all cases were negative in coronary balloon compression test; the mean duration was 159 minutes; an average of 275 ml of non-ionic contrast was used; the mean radiation time was 28.62 minutes.
In the immediate course, 1 patient (6%) presented pulmonary bleeding requiring positive pressure for 48 hours with good subsequent evolution; 1 patient (6%) presented mild valvular regurgitation without changes in the follow-up; 2 patients (12%) presented mild perivalvular leak and 75% of the patients progressed without complications. Fifteen patients (94%) were discharged from the hospital within 24 hours after procedure.

Conclusions:
Transcatheter pulmonary valve implantation is a safe, effective, and reproducible procedure with successful outcomes. The use of both the Venus P-Valve and Vitae valves showed excellent results in the different types of heart disease in our series. A more extensive series of cases will further support our experience.

POSTER PRESENTATIONS

Category: Catheterization

2175 - PALLIATIVE RADIOFREQUENCY ABLATION FOR MUSCULAR RVOT OBSTRUCTION IN REPAIRED TETRALOGY OF FALLOT A NOVEL STRATEGY TO DEFER RE DO SURGERY

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Residual subvalvar right ventricular outflow tract (RVOT) obstruction may develop in a subset of patients following tetralogy of Fallot (TOF) repair and may require surgical re-intervention. However, redo surgical resection of the RVOT muscle bundle carries substantial risk. We report a novel palliative use of radiofrequency ablation (RFA) to reduce RVOT obstruction in a child with repaired TOF. An eight-year-old girl presented with exertional breathlessness and was found to have a peak RVOT gradient of 118 mmHg due to a discrete subvalvar muscular bundle. Given the isolated nature of the obstruction and absence of other surgical indications, she underwent RFA guided by 3D CARTO mapping, fluoroscopy, and intracardiac echocardiography (ICE). The initial procedure involved 29 ablations, reducing the gradient to 80 mmHg at discharge. At four months follow-up, she reported symptomatic improvement, with the RVOT gradient falling to 56 mmHg. A second RFA was performed six months later for persistent obstruction; the gradient was 70 mmHg pre-procedure and reduced to 45 mmHg post-procedure. This case highlights the feasibility and safety of RFA as a palliative option in selected patients with isolated muscular RVOT obstruction, offering symptomatic relief and the potential to defer high-risk redo surgical resection of the RVOT muscle bundle. Further experience is needed to define its long-term utility and durability.

POSTER PRESENTATIONS

Category: Catheterization

2192 - TREATMENT OF SEVERE PULMONARY VALVE STENOSIS COMPLICATED WITH LARGE PATENT DUCTUS ARTERIOSUS A CASE SHARING

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Background / Hypothesis:

Pulmonary valve stenosis (PVS) refers to the narrowing of the pulmonary valve, which is a common congenital heart disease. The clinical manifestations of PVS vary depending on the severity of valve stenosis. Children with severe PVS show clinical symptoms early, some cases may endanger life due to severe insufficiency of pulmonary blood flow,rely heavily on blood flow of ductus arteriosus, and require early intervention. Currently, percutaneous balloon pulmonary valvuloplasty (PBPV) has become the main treatment method for PVS.

Materials and Methods:

A newborn presented with shortness of breath and cardiac murmurs after birth, echocardiography and CTA showed moderate-severe pulmonary valve stenosis and a gigantic ductus arteriosus. At the beginning, the shortness of breath was improved and blood oxygen saturation was stable with low-flow oxygen inhalation, thus there were no indications for early intervention. As the ductus arteriosus gradually closed, the child presented with cyanosis and shortness of breath,re-examination of echocardiography showed aggravated pulmonary artery stenosis.After throughout evaluation, PBPV was successfully performed on the child.

Results:
The narrowed pulmonary valve was significantly improved, and the child recovered well.

Conclusions:
PBPV is a safe and effective treatment for neonate with severe PVS, but the operation is somewhat difficult and complications such as arrhythmia or and pulmonary valve tear are prone to occur. Thus, adequate preoperative preparations are required, and proficient operation skills are needed to avoid complications.

POSTER PRESENTATIONS

Category: Catheterization

2208 - ENDOVASCULAR REPAIR OF TRAUMATIC PSEUDOANEURYSMS 2 CASE REPORTS

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Background:
South Africa has high rates of accidents and interpersonal violence contributing to the burden of disease. The incidence of traumatic aortic injuries and left ventricular pseudoaneurysms is rare. The standard of care of traumatic left ventricular pseudoaneurysms and childhood aortic aneurysms is surgical repair but endovascular repair is an option in high risk surgical cases. We report on 2 cases, a 13 year old girl with polytrauma including grade III aortic pseudoaneurysm post motor vehicle accidents that was successfully managed with covered stents and a 35 year old male with a left ventricular pseudoaneurysm post stab heart that was successfully treated with a septal occluder device.

Case Report:
A 13 year old girl with polytrauma and a grade III blunt traumatic descending aortic aneurysm 5mm distal to the left subclavian artery was referred to our institution. The aortic diameters proximal and distal to the pseudoaneurysm were 13.8mm just adjacent to the left subclavian artery and 13mm distally with the length of 49mm. She was successfully stented with a 14 X 59mm with a top up of 14 X 39mm covered stents (Bentley's BeGraft). The second patient is a 35 year old male with a stab heart, he was managed conservatively and referred with a left ventricular pseudoaneurysm for device closure. The neck measured 4mm with low velocity flow into the large blind ending aneurysm. He underwent successful device closure of the aneurysm with a 8mm Amplatzer muscular septal occluder. Endovascular repair was presumed a safer therapeutic intervention to open repair in both our patients.

Results:
Both our patients underwent successful endovascular repair of their traumatic pesudoaneurysms.

Conclusions:
Left ventricular pseudoaneurysms post stab heart and childhood traumatic aortic injuries are uncommon and endovascular repair using and occluder device and covered stents may be safer alternatives in certain patients.

POSTER PRESENTATIONS

Category: Catheterization

2219 - TRANSCATHETER MANAGEMENT OF MECHANICAL VALVE THROMBOSIS IN CHILDREN DIFFERENT APPROACHES FOR DIFFERENT CLINICAL SCENARIOS.

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Background:
Transcatheter release has emerged as a treatment option for mechanical valve thrombosis. However, the procedure remains unstandardized with limited pediatric case reports. Methods: We report two pediatric cases of transcatheter stuck valve release employing different procedural approaches.

Case 1:
A 9-day-old girl with functional single ventricle morphology post bilateral pulmonary artery banding and atrioventricular valve replacement with severe ventricular dysfunction. One mechanical valve leaflet was found stuck while on ECMO support. Given her condition, valve replacement and thrombolysis were deemed unsuitable. For the procedure, a 4-French JR catheter was advanced antegradely through the femoral vein to the atrium, and a 0.035" Terumo wire was advanced to push open the stuck leaflet. Immediate release was achieved with improved leaflet opening confirmed by echocardiography the following day. The valve remained functional until the patient's death from heart failure three months later.

Case 2: An 11-month-old boy with congenital mitral insufficiency who had undergone mechanical valve replacement and subsequent re-replacement due to thrombosis presented with an asymptomatic stuck leaflet. After multidisciplinary consultation, transcatheter release was performed. Using a retrograde approach, a 4-French JR catheter was positioned in the left ventricle. A 2.7-French Progreat microcatheter and 0.014" Vassallo GT wire were advanced through the gap between the stuck leaflet and annular ring to the left atrium. Initial balloon inflation across the valve with a 4×15mm Emerge coronary balloon was unsuccessful. The balloon was then inflated in the left atrium and pulled through the valve to the left ventricle, achieving immediate release. Echocardiography the next day confirmed improved leaflet mobility.

Conclusion: Transcatheter stuck valve release requires careful evaluation of methodology on a case-by-case basis, with procedural approach tailored to each patient's specific anatomy and clinical condition.

POSTER PRESENTATIONS

Category: Catheterization

2231 - DOUBLE BALLOON ATRIAL SEPTOSTOMY IN INFANTS OVER TWO MONTHS WITH TRANSPOSITION OF THE GREAT ARTERIES A MULTICENTER EXPERIENCE IN VENEZUELA

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Background / Hypothesis:
Balloon atrial septostomy (Rashkind procedure) is the preferred palliative approach for patients with transposition of the great arteries (TGA) awaiting surgical correction. After two months of age, however, the atrial septum becomes more rigid, limiting the effectiveness of conventional balloon techniques. In low-resource settings with delayed access to surgery, there is a growing need for improved septostomy methods in older infants. We hypothesized that the double-balloon technique may offer a more effective and lasting interatrial communication in this population.

Materials and Methods:
We conducted a retrospective multicenter analysis of patients with TGA over two months of age who underwent atrial septostomy using a double-balloon technique. Data were collected from four pediatric cardiology centers in Venezuela. Procedural success was defined by the creation of an effective atrial communication, confirmed by echocardiography, and improvement in systemic oxygenation. Complications and need for reintervention were also evaluated.

Results:
A total of 8 patients (median age: 78 days; range: 65–120 days) underwent the double-balloon septostomy. All procedures were successful, resulting in a stable and adequate atrial septal defect with improved oxygen saturation (mean pre-procedure SaO_2: 58%, post-procedure: 78%). No major complications occurred. No patient required a second septostomy. The technique was feasible under local constraints and allowed stabilization of patients awaiting surgery.

Conclusions:
Double-balloon atrial septostomy appears to be a safe, effective, and technically feasible alternative to classic Rashkind in patients over two months with TGA. It provides better interatrial communication and may be particularly useful in countries with limited or delayed access to surgical repair. Further prospective studies are recommended to validate its long-term benefits.

Keywords:
Transposition of the great arteries, balloon atrial septostomy, double-balloon technique, interventional cardiology, congenital heart disease

POSTER PRESENTATIONS

Category: Catheterization

2240 - PERCUTANEOUS CLOSURE OF AORTO LEFT VENTRICULAR TUNNEL IN A PEDIATRIC PATIENT USING A VASCULAR PLUG A CASE REPORT

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Background/Hypothesis:
Aorto-left ventricular tunnel is a rare congenital anomaly characterized by an abnormal communication between the ascending aorta and the left ventricle. This condition leads to continuous left ventricular volume overload, posing a risk of congestive heart failure if left untreated. While surgical correction has historically been the standard of care, recent advances in catheter-based therapies suggest that percutaneous closure may offer a less invasive alternative in selected patients. We hypothesized that a transcatheter approach could be both feasible and effective in pediatric cases with favorable anatomy.

Materials and Methods:
A pediatric patient presented with signs of heart failure. Transthoracic echocardiography identified an abnormal tunnel originating from the ascending aorta and draining into the left ventricular outflow tract, consistent with a diagnosis of aorto-left ventricular tunnel. There were no associated structural anomalies. The patient underwent cardiac catheterization, and percutaneous closure of the tunnel was performed using a self-expanding nitinol-based vascular occluder device (Vascular Plug II). Device size was selected based on tunnel measurements obtained via echocardiography and angiography.

Results:
The vascular occluder was successfully deployed across the aorto-left ventricular tunnel without any intra- or post-procedural complications. Post-deployment imaging confirmed complete occlusion of the tunnel with no residual flow. The patient showed immediate hemodynamic improvement and was discharged with a favorable clinical course. At one-month follow-up, echocardiography demonstrated sustained device position and no evidence of residual shunt or valvular dysfunction.

Conclusions:
Percutaneous closure of an aorto-left ventricular tunnel using a vascular occluder device is a safe and effective alternative to surgery in pediatric patients with suitable anatomy. This approach offers the advantages of reduced procedural morbidity, shorter recovery time, and avoids the need for cardiopulmonary bypass.

POSTER PRESENTATIONS

Category: Catheterization

2244 - DUCTUS ARTERIOSUS STENTING IN DUCT DEPENDENT PULMONARY CIRCULATION IN LOW BIRTHWEIGHT NEONATES IN LIMITED RESOURCES SETTING

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Background / Hypothesis:
Ductus arteriosus (DA) stenting in duct-dependent pulmonary circulation is a palliative technique and an alternative to surgical shunting in neonates weighing more than 2.5 kg. This study aimed to evaluate the feasibility and outcomes of DA stenting in neonates with a birthweight of less than 2.5 kg.

Materials and Methods:
This retrospective study included neonates with birthweight below 2.5 kg, underwent DA stenting at Dr. Sardjito Hospital, Yogyakarta, Indonesia, between 2018 -2024.

Results:
Eleven neonates underwent DA stenting. The mean age at procedure was 27.2 days (range: 1–90 days), and mean birthweight was 2.14 kg (range: 1.45–2.4 kg). Five patients did not receive prostaglandin E1 (PGE1) due to national unavailability. All procedures were performed under general anesthesia via femoral artery access using 4 Fr or 5 Fr sheaths. A 5 Fr Judkins right (JR) guiding catheter was used in most cases; however, in neonates <2 kg, stents were advanced without a guiding catheter due to unavailability of 4 Fr JR guiding catheteter. Drug-eluting coronary stents were used ((3.5–4 mm diameter, 12–18 mm length) were positioned to span from the aortic end across the ductus to proximal part of the pulmonary artery branches. There were three deaths (27.2%): one intra-procedural due to ductal spasm without PGE1 administration, and two died from neonatal sepsis at three weeks post-procedure.
One major complication—acute limb ischemia—occurred in a neonate weighing 1.5 kg and was successfully managed with heparin infusion. Post-procedure, heparin infusion was administered for 24 hours, followed by aspirin. NICU care continued for weight gain and stabilization. At three-month follow-up, eight surviving neonates had oxygen saturations of 70–85%, with satisfactory weight gain and echocardiographic evidence of patent stents and well-developed pulmonary arteries.

Conclusions:
Despite technical challenges and resource limitations, DA stenting in low birthweight is still a feasible and effective palliative technique for critical congenital heart diseases.

POSTER PRESENTATIONS

Category: Catheterization

2245 - TRIALS OF A TINY HEART MANAGING POST ROSS PULONARY CONDUIT STENOSIS

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Background / Hypothesis
The Ross procedure, despite being a preferred surgical option for aortic valve replacement in children due to its growth potential and physiological advantages, is not without complications. One of the notable late complications is conduit stenosis at the pulmonary valve site, which can lead to right ventricular pressure overload, tricuspid regurgitation, and right-sided heart failure. This case describes a child with recurrent aortic stenosis who underwent the Ross procedure and subsequently developed severe conduit stenosis, with successful recovery following transcatheter stent implantation.

Materials and Methods
A four-year-old girl with severe aortic stenosis and a bicuspid aortic valve underwent two balloon aortic valvuloplasties at ages 3 and 4, with only minimal improvement. She was referred for and underwent the Ross procedure, with conduit placement using a pericardial patch. Four months postoperatively, the patient developed signs of right-sided heart failure, including generalized edema and moderate-to-severe tricuspid regurgitation. Echocardiography and computed tomography angiography confirmed severe stenosis of the right ventricular outflow tract conduit. Two attempts at balloon dilatation were unsuccessful. Due to financial limitations precluding surgical re-intervention, transcatheter stenting using a self-expanding stent (donated) was performed.

Results
Following conduit stenting, the patient demonstrated immediate hemodynamic improvement. Over the next few weeks, there was marked clinical recovery, including resolution of edema, improved exercise tolerance, and normalization of tricuspid regurgitation. At three-month follow-up, she was thriving, asymptomatic, and had achieved significant weight gain. Follow-up imaging confirmed satisfactory stent position and unobstructed conduit flow.

Conclusions
Conduit stenosis following the Ross procedure can pose significant morbidity. While surgical re-intervention remains the gold standard, transcatheter stent implantation offers a viable, minimally invasive alternative in selected cases, especially in resource-limited settings. Prompt recognition and appropriate intervention can significantly improve outcomes.

POSTER PRESENTATIONS

Category: Catheterization

2246 - OUTCOME OF TRANSCATHETER PATENT DUCTUS ARTERIOSYS IN PEDIATRIC PATIENTS WITH PULMONARY HYPERTENSION

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Background / Hypothesis:
Trans-catheter closure of patent ductus arteriosus (PDA) has been routinely performed in the majority of pediatric cardiac care center. Large PDA naturally progress to pulmonary hypertension, which resulted in vascular damage. The objective of this study is to determine a short-term outcome of trans-catheter closure of PDA with pulmonary hypertension.

Materials and Methods:
Data was retrieved retrospectively from medical records at Dr Sardjito General Hospital, Yogyakarta in 1st January, 2016 to 31st December, 2022.

Results:
We recruited 201 children underwent trans-catheter PDA closure with pulmonary hypertension under general anesthesia. The median age was 33.42 (1.9-211.4) months. The median diameter of PDA was 4.13 (1.0-13.5) mm. There was significant decrease of systolic pulmonary artery pressure before and after procedure, from 52.7 ± 17.2 mmHg to 41.2 ± 15.0 mmHg respectively (p=0.001). The mean procedure time was 62.3 ± 31.0 minutes and fluoroscopy time 10.2 ± 7.5 minutes. There was immediate complete closure of the defect in 157 (78.1%) patients and 44 (21.9%) had smoky residual shunt. After a 6-month follow up, only nine patients (4.5%) remained having smoky residual shunt. There was no complication during procedural time in all patients. The persistent pulmonary hypertension was 13.9% after 6-months follow up.

Conclusions:
Trans-catheter PDA closure with pulmonary hypertension with PDA device is effective and safe.

POSTER PRESENTATIONS

Category: Catheterization

2247 - EXPERIENCE OF USING MFO IN PDA A MULTI CENTER STUDY

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Background / Hypothesis:
Patent Ductus Arteriosus (PDA) is a common congenital heart defect with established transcatheter closure techniques. The multifunctional occluder (MFO) is a relatively new device designed for versatility in closing various cardiovascular defects. We hypothesized that the MFO would demonstrate favorable outcomes, including high closure rates and acceptable complication profiles, in PDA closure across multiple centers.

Materials and Methods:
A retrospective analysis of 58 pediatric patients who underwent PDA device closure using the MFO was conducted at three tertiary cardiac centers from January 2023 to March 2024. Patient demographics, PDA characteristics, device sizes, procedural details, and post-procedural complications were analyzed. Follow-up data was collected at 1 week, 1 month, and 3 months using echocardiographic parameters.

Results:
The cohort included 58 patients (63.8% female), aged between 3 months and 13 years (median: 2 years). The mean PDA diameter was 3.6 ± 1.2 mm. The most commonly used device sizes were 06/04 mm (27.6%) and 08/06 mm (24.1%). Complete device deployment was successful in 98.2% of patients. One patient required conversion to a conventional PDA device due to anatomical unsuitability. Complications included two cases of left pulmonary artery (LPA) stenosis, one device embolization managed successfully with retrieval, and two residual shunts which resolved on follow-up. No cases of hemolysis, femoral arterial injury, or device migration were observed. At 3-month follow-up, 96.5% of patients showed complete closure with no residual shunt. The device demonstrated favorable handling, low profile deployment, and excellent endothelialization.

Conclusions:
Our multi-center experience suggests that the MFO is a safe and effective device for PDA closure in the pediatric population, with high success rates and minimal complications. Its versatility and retrievability make it particularly suitable for varied PDA morphologies. Larger prospective studies with longer follow-up are warranted to validate these findings.

POSTER PRESENTATIONS

Category: Catheterization

2272 - FEASIBILITY AND IMMEDIATE OUTCOMES OF PATENT DUCTUS ARTERIOSUS STENTING IN CHILDREN BEYOND ONE YEAR OF AGE A CASE SERIES

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Background / Hypothesis:
Patent ductus arteriosus (PDA) stenting has become an established palliative strategy in neonates with duct-dependent pulmonary circulation. However, data on its feasibility and outcomes in children beyond one year of age remain limited. This study presents our experience with PDA stenting in this older age group

Materials and Methods:
We retrospectively analyzed 6 patients beyond infancy who underwent PDA stenting from 2018 to 2024. The cohort included 4 males and 2 females with a mean age of 33.2 ± 7.6 months and mean weight of 10.5 ± 3.2 kg (median = 6.6 kg). Diagnoses included Tetralogy of Fallot with pulmonary atresia (n=4), atrioventricular septal defect with pulmonary atresia (n=1), and tricuspid atresia with pulmonary atresia (n=1), all with PDA-dependent pulmonary blood flow.

Results:
Access was achieved via femoral artery (n=3), axillary artery (n=2), and carotid cut-down (n=1). Mean fluoroscopy time was 42.8 ± 23.8 minutes. Pre-procedure mean SpO_2 was 58.9 ± 20.56%, which significantly improved to 90.89 ± 4.83% post-procedure.
There were no cases of stent embolization or mortality. However, four patients had prolonged ICU stay and two experienced local vascular complications. The mean ICU and hospital stay were 46.18 ± 13.7 hours and 51.45 ± 42.9 hours respectively.

Conclusions:
PDA stenting in children beyond one year of age is technically feasible and provides effective palliation with good immediate outcomes. It offers a safe alternative to shunt surgery in older children who presented late, beyond infancy.

POSTER PRESENTATIONS

Category: Catheterization

2288 - TEVAR PLUS BALLOON EXPANDABLE STENT A NOVEL HYBRID ENDOVASCULAR APPROACH FOR COMPLEX COARCTATION OF AORTA REPAIR.

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Background / Hypothesis:
In rare cases, coarctation of the aorta (CoA) can lead to complex aortic aneurysms and dissections, presenting challenges for balloon expandable stents. While surgery has been the primary treatment for such cases, advancements in interventional cardiology offer minimally invasive options. A hybrid approach combining thoracic endovascular aortic repair (TEVAR) with conventional balloon expandable stents may serve as a viable alternative for such cases.

Materials and Methods:
A single-center descriptive study of two consecutive patients that performed a hybrid endovascular repair of complex CoA. Demographic, clinical, laboratory, echocardiographic, imaging, and interventional data are reported.

Results:
Patient 1: A 36-year-old male with severe uncontrolled hypertension was found on TTE to have a gradient of 89 mmHg. Cardiac CT confirmed critical CoA (5.2×5 mm) 40 mm distal to the left subclavian artery, with a calcified post-CoA aneurysm (43×36 mm). After Heart Team discussion, a percutaneous intervention was performed (Figure 1A). A hybrid endovascular approach included implantation of a Zenith Alpha Thoracic Endograft (39×15 mm) for aneurysm exclusion, followed by a BeGraft stent (37×22 mm) for CoA correction. Final angiography showed no stenosis, endoleaks (Figure 1B), or residual gradient.

Patient 2: An 18-year-old female with prior CoA angioplasty was referred for reCoA and a suspected aneurysm. Angiography revealed a 17-mm aneurysm and a 32-mm long CoA with multiple dissections between the left subclavian artery and aortic isthmus (Figure 1C). After Heart Team approval, she underwent a hybrid endovascular intervention. A TEVAR Zenith (24×24×10 mm) was placed, followed by a BeGraft stent (16×18 mm) for the CoA. Final angiography showed no stenosis, endoleaks (Figure 1D), or residual gradient.

Conclusions:
We present two complex CoAo cases treated with a hybrid endovascular approach using self-expanding stents for aneurysm exclusion and balloon-expandable stents for stenosis. With no complications, this minimally invasive technique offers a promising option for challenging cases.

POSTER PRESENTATIONS

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2290 - RVOT STENTING AS A PALLIATIVE STRATEGY IN ADULT TETRALOGY OF FALLOT WITH BIVENTRICULAR DYSFUNCTION.

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Background / Hypothesis:
In a developing country like India, uncorrected Tetralogy of Fallot (TOF) in adulthood is not uncommon due to delayed diagnosis or limited access to health care. A fair number of these patients present with severe biventricular dysfunction, making them poor candidates for corrective surgery. We present a similar case of Adult TOF with severe biventricular dysfunction, who was managed by palliative RVOT stenting.

Materials and Methods:
A 26-year-old male presented with cyanosis since early childhood, progressive dyspnea over the past 5 years, worsening to NYHA class IV in the last 4–6 months, and episodes of hemoptysis. On examination, he was deeply cyanosed (oxygen saturation 45% on room air) and dyspneic at rest. Echocardiography revealed TOF with severe biventricular dysfunction: LVEF = 10–15%, LV-GLS = −6%, RVFAC = 15%, and TAPSE 8 mm.

Given the high surgical risk, a decision was made to perform palliative RVOT stenting and coil embolization of MAPCAs. RV angiography showed severe infundibular stenosis without valvular or supravalvular obstruction. A 10 × 40 mm bare-metal stent was deployed across the infundibular region and a single MAPCA was also identified and coiled.

Results:
Post-procedure, saturation improved to 85%. The patient experienced significant symptomatic relief and was discharged on anti-failure drugs and oral aspirin. At 3-month follow-up, he was in NYHA class II with saturation of 82%. Echocardiography continued to show severe biventricular dysfunction, but the patient remained clinically stable without further episodes of hemoptysis. Our plan is to keep on follow up to wait for improvement in ventricular function.

Conclusions:
RVOT stenting can serve as an effective palliative strategy in adults with uncorrected TOF and severe biventricular dysfunction. It offers meaningful symptomatic improvement and good immediate outcome.

POSTER PRESENTATIONS

Category: Catheterization

2292 - TRANSCATHETER VSD CLOSURE IN THAMMASAT UNIVERSITY HOSPITAL AN 8 YEAR EXPERIENCE

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Background / Hypothesis:
Ventricular septal defect (VSD) is the most common congenital heart defect. While surgical repair has long been the standard treatment, transcatheter closure has emerged as a less invasive alternative in selected patients. This study aims to review the outcomes and complications of transcatheter VSD closure at Thammasat University Hospital over a 8-year period.

Materials and Methods:
A retrospective review was conducted on patients who underwent transcatheter VSD closure at Thammasat University Hospital between November 2016 and November 2024. Demographic data, VSD type, device used, procedural success, complications, and follow-up outcomes were analyzed.

Results:
A total of 76 patients underwent transcatheter VSD closure during the study period. The median age at intervention was 8 years (range: 3–16 years). The majority of VSDs were perimembranous, followed by muscular type. The most commonly used devices were the Cocoon VSD occluder and Amplatzer™ Duct Occluder II. Procedural success was achieved in 90% of cases. Major complications occurred in 5 patients (6.5%), including severe TR, transient AV block, and residual shunt. No procedure-related mortality was observed. During 0.5-8 years follow-up, 80% of patients remained asymptomatic with stable device position and no significant residual shunt.

Conclusions:
Transcatheter closure of VSDs at Thammasat University Hospital over the past decade demonstrated a high success rate and acceptable complication profile. With careful patient selection and technical expertise, this approach offers a safe and effective alternative to surgery in appropriately selected cases.

POSTER PRESENTATIONS

Category: Catheterization

2307 - TRANSCATHETER MANAGEMENT OF CORONARY ARTERY FISTULAE IN CHILDREN A 25 YEAR SINGLE CENTER EXPERIENCE

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Background / Hypothesis:
Coronary artery fistulae (CAF) are rare congenital anomalies defined by abnormal connections between coronary arteries and cardiac chambers or great vessels, bypassing the myocardial capillary network. While the majority of coronary artery fistulae in children are asymptomatic, large or hemodynamically significant fistulae may occasionally result in complications such as chamber dilatation, myocardial ischemia due to coronary steal, heart failure, or infective endocarditis. Transcatheter closure (TCC) offers a less invasive alternative to surgery, but pediatric outcome data are limited.

To evaluate the clinical characteristics, anatomical subtypes, management strategies, and outcomes of pediatric CAF patients assessed by catheter-based coronary angiography over 25 years at a single tertiary center.

Materials and Methods:
We retrospectively analyzed 42 pediatric patients with angiographically confirmed CAF from 2000 to 2025. Data included demographics, symptoms, echocardiographic and angiographic findings (origin, drainage, Sakakibara type, complexity), and procedural details (device type, access route, AV loop use). Outcomes were assessed via follow-up imaging and clinical evaluations.

Results:
The cohort comprised 42 patients (26 males, 16 females) with a median age of 75 months (range: 1–220). Most fistulae (30/42) originated from the left coronary artery and drained into right-sided chambers (36/42). Fourteen patients (33%) had large fistulae, and 24 (57%) exhibited complex anatomy. Approximately one-quarter were symptomatic, mainly with exertional chest pain or fatigue.

TCC was attempted in 31 patients and succeeded in 22. Device selection (coils, plugs, occluders) was based on fistula size and anatomy. In nine patients, closure failed due to anatomical constraints; one subsequently underwent surgical repair. Follow-up imaging in 15 patients revealed residual flow in two, with no major morbidity or mortality.

Conclusion:
Transcatheter closure is a safe and effective strategy for pediatric CAF when anatomical features are carefully assessed. Morphologic classification and tailored device selection enhance procedural success and support early intervention in appropriate cases.

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2329 - TRANSCATHETER CLOSURE OF HEPATIC LESIONS PRESENTED WITH CARDIOPULMONARY SYNDROME IN NEONATES

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Background / Hypothesis:

Hepatic lesions causing cardiopulmonary syndrome in absence of liver failure and cholestasis are rare in neonates. Presenting three structural hepatic lesions of different etiology successfully treated with chemo or coil embolization.

Case 1: Hepatic Tumor With Cardiopulmonary Syndrome
Term neonate developed cardiac failure and gross hepatomegaly till right iliac fossa on day one of life. Diagnosed to have Hepatic angioendothelioma causing high output failure with poor response to medical management. Deliberate partial closure of the intralesional lakes was done using ONYX (Ethylene Vinyl Alcohol- Micro therapeutics- Irvene USA) and embolization coils (Cook-Bloomington- USA) through right femoral artery access. 5 years follow up showed normal liver function with complete regression of hepatic tumour.

Case 2: Hepatic AVM Causing High-Output Cardiac Failure and Pulmonary Hypertension
15 days old weighing 1.7 kg presented with poor feeding and breathing difficulty. Evaluation showed high hepatic venous return due to large hepatic AVM involving entire left lobe of liver. Hepatic AVM was closed partially using multiple injections of ONYX using right femoral artery access. Baby was discharged on beta blocker and diuretics. 48 months follow up showed asymptomatic status with small insignificant AVM.

Case 2: Hepatic AVM Causing High-Output Cardiac Failure and Pulmonary Hypertension

15 days old neonate with severe pulmonary hypertension and cardiomegaly revealed intrahepatic shunt between left portal vein and left hepatic vein connected through an aneurysm (Type 3 Park- rarest of all portosystemic shunt). After securing right internal jugular vein access, the aneurysm was packed and closed using multiple V Trek Microplex 18 coils (Terumo Corporation, Japan) and 0.035 Embolization coils. 6 years follow up showed asymptomatic status with no evidence of pulmonary hypertension.

Conclusions:
Variety of structural hepatic lesions including tumour, AVM or postosystemic shunt causing cardiopulmonary syndrome in neonates can be treated with multidisciplinary approach using variety of embolisation agents.

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2335 - TRANSCATHETER MANAGEMENT OF COARCTATION AND ACQUIRED INTERRUPTION OF AORTA USING INTRAVASCULAR STENTING WITH INTERMEDIATE FOLLOW UP

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Background / Hypothesis:
Endovascular stenting is an established treatment modality to manage aortic coarctation (CoA). This study aimed to report the single-centre experience of managing simple and complex CoA including functional/acquired atresia using endovascular stenting.

Materials and Methods:
All the patients who got treatment with endovascular stenting using different types of stents for the management of CoA between 2008 and 2024 were included in the study. All the patients underwent pre-procedural imaging. All the patients were followed periodically after procedure

Results:
A total of 48 patients (71% males, mean and median age 23.5 and 21 years) who got treatment for CoA/acquired aortic interruption by endovascular stenting are analysed. Either femoral or radial and femoral routes were accessed to implant the stent. In six patients with acquired/functional interruption successful stent placement was done after crossing the lesion using CTO wire/Brockenbrough needle. In 2 patients stent was placed across transverse arch. In 2 patients aortic aneurysm was present which was treated using covered stent. All procedures were successful except two where the femoral artery was injured and required urgent surgical repair and due to small vessel size due to poliomyelitis. Post-operatively, the mean pressure gradient reduced from 75 mmHg (range 30-200 mm Hg) to 10 mmHg (range 0 – 35 mmHg).. The mean follow-up period was 70 months. A total of 9 patients had significant gradient on follow up of which seven patients underwent successful balloon dilatation of the stent with decrease in gradient to acceptable limit. One of the interesting finding observed was drop in severity of regurgitation by atleast one degree in all the patients with initial severe regurgitation.

Conclusions:
The results of the study reinstate the fact that endovascular stenting is a safe and effective way of managing simple or complex coarctation including functional atresia

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2336 - PERCUTANEOUS DEVICE CLOSURE FOR THE TREATMENT OF A VESTIBULAR ATRIAL SEPTAL DEFECT A CASE REPORT

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Background / Hypothesis:
Vestibular atrial septal defect (ASD) is a rare type of interatrial communication and most are traditionally managed with surgical repair. Here, we present a case of a large vestibular ASD that was successfully closed via transcatheter intervention, highlighting the feasibility of device closure in this uncommon and anatomically challenging defect.

Materials and Methods:
Case report.

Results:
A 13-year-old female patient, weighting 45kg, was admitted to hospital due to incidental finding of an atrial septal defect (ASD).
Transesophageal echocardiography (TEE) revealed an ASD measuring 6 × 18 mm, located near the coronary sinus (CS) with an almost absent CS rim and a short atrioventricular valve rim (2.3 mm). The defect demonstrated a left-to-right shunt. The coronary sinus was dilated (16 mm). Computed tomography (CT) imaging, along with three-dimensional (3D) modeling, confirmed the ASD's dimensions (6 × 18 mm) and its location—anterior and superior to the coronary sinus, closer to the mitral valve and farther from the tricuspid valve. The defect was positioned between the antero-inferior rim of the oval fossa and the tricuspid valve hinge point, identified as a large vestibular ASD in close proximity to the CS. Notably, the defect was positioned with a small but enough (5 mm) distance to the apex of the triangle of Koch, and the prominent Todaro ligament was visible—both potentially protective for the AV node.
Due to the mild right ventricular dilatation and pulmonary hypertension (Qp/Qs = 2:1), the patient was sent for a cath lab procedure. Angiography confirmed the ASD's size (8 × 18 mm), and balloon sizing estimated it at 20 mm. A 24 mm OCCLUTECH ASD OCCLUDER was initially used, but mitral regurgitation (MR) occurred. A second attempt with an 18 mm OCCLUTECH OCCLUDER using a balloon-assisted technique was successful, with no MR, no AV block, and no coronary sinus obstruction.

POSTER PRESENTATIONS

Category: Catheterization

2380 - LIFE SAVING PERCUTANEOUS BALLOON AORTIC VALVULOPLASTY IN A NEONATE WITH CRITICAL AORTIC STENOSIS AND CONGENITAL TRACHEAL STENOSIS A CASE REPORT

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Background / Hypothesis:

Critical aortic stenosis (AS) in neonates can lead to severe left ventricular (LV) dysfunction and cardiogenic shock. When combined with airway anomalies such as congenital tracheal stenosis, management becomes particularly complex. This case highlights the role of percutaneous intervention in a high-risk setting. We report a case of emergency percutaneous balloon aortic valvuloplasty (PBAV) performed due to poor LV function with borderline LV size, complicated by cardiogenic shock and concomitant long-segment congenital tracheal stenosis (from C7 to the carina, Figue 1)

Materials and Methods:
A late preterm neonate weighing 2,500 grams underwent emergency PBAV. The procedure was performed via the right femoral artery using a retrograde approach with right Judkins coronary catheters and a hydrophilic polymer-coated guidewire (Terumo wire). A 6 x 20 mm TMP Ped balloon was used, with manual inflations performed four times until the waist was no longer visible (Figure 2). Post-procedure, there was a significant improvement in hemodynamic status, allowing for the weaning of inotropic support.

Results:
This clinical scenario posed significant challenges, but successful PBAV was performed as a life-saving intervention to promote LV growth, resulting in stabilization of the patient's condition. Due to the high surgical risk associated with both critical AS and tracheal stenosis, surgical options were deemed unfeasible during the neonatal period. Remarkably, follow-up at one year post-procedure showed significant improvements, including LV growth leading to biventricular physiology. The patient has survived and grown despite not having undergone surgical correction for the tracheal stenosis.

Conclusions:
This case underscores the potential of percutaneous interventions in managing complex congenital heart conditions, especially when surgical options are limited. Continued monitoring and supportive care remain essential in such patients.

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Category: Catheterization

2385 - OUTCOMES OF BALLOON DILATATION IN ISOLATED VS. RISK ASSOCIATED PULMONARY STENOSIS A COMPARATIVE STUDY

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Background / Hypothesis:
Pulmonary stenosis (PS) is obstruction between the right ventricle and the pulmonary artery at the level of the pulmonary valve, and its prevalence ranges between 0.6-0.8/1000 live-births. Pulmonary valve stenosis (PVS) is usually congenital and caused by a malformed or dysplastic valve leaflet. we compare the outcomes of balloon dilatation in isolated versus risk-associated pulmonary stenosis.

Materials and Methods:
This cross-sectional study was conducted from January to December 2024 at the Pediatric Cardiology Department of NICVD, Karachi. Patients of any age and gender with echocardiographicaly confirmed pulmonary valve stenosis (PVS) undergoing balloon pulmonary valvuloplasty (BPV) were included. Isolated PS was defined as severe doming valves without additional risk factors; risk-associated PS included dysplastic valves, critical PS, multilevel obstruction, or RV/valvular hypoplasia. Pre- and post-procedural clinical, echocardiographic, and hemodynamic data were recorded. Follow-up echocardiography was performed on day one and at one month. Data were analyzed using IBM-SPSS Statistics. For all inferential statics, $p<0.05$ was considered statistically significant.

Results:
Of 61 patients, 36 (59%) had isolated, and 25 (41%) had risk-associated pulmonary stenosis. Risk-associated cases had lower median age (1.5 vs 7.0 years; $p=0.015$), smaller annulus diameter (8.0 vs 15.0 mm; $p<0.001$), and higher cyanosis (64.0% vs 19.4%; $p<0.001$). Day-1 RVSP was higher (74.0 vs 65.5 mmHg; $p =0.016$), and cardiac arrest occurred only in the risk group (16.0%; $p=0.013$). By day-30, restenosis occurred exclusively in risk-associated cases (21.1% vs 0%; $p=0.010$). At day-30, mortality occurred in 2 cases (risk-associated PS).

Conclusion:
Balloon pulmonary valvuloplasty remains an effective therapeutic option for pulmonary stenosis. Patients with risk-associated features are more likely to experience

POSTER PRESENTATIONS

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2410 - PALLIATIVE INTERVENTION FOR PULMONARY ATRESIA WITH VENTRICULAR SEPTAL DEFECT PATIENTS IN A TERTIARY CARE HOSPITAL AND FOLLOW UP GIVING SOME RAYS OF HOPE

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Background / Hypothesis:
Major aortopulmonary collateral arteries (MAPCAs) in patients with pulmonary atresia and ventricular septal defects (PA-VSD) often have progressive stenosis resulting in pulmonary hypoperfusion. The natural history of MAPCAs is, however, quite variable:
The aim of this study was to assess the feasibility and safety of dilatating stenoses in MAPCAs and to assess the clinical effects on cyanosis, exercise ability, and facilitation of further surgical procedures.

Materials and Methods:
• Study Period: January 2018- June 2019
• Study population: 8 patients with Pulmonary atresia with VSD/ MAPCA dependent pulmonary circulation with absent or hypoplastic PA confluence with severe MAPCA stenosis.
• Selection criteria: Not suitable for surgical correction
Room air Spo2 <70%
Symptoms NYHA III or IV
• Cardiac catheterisation done for all: to profile MAPCA anatomy and to assess feasibility of surgical correction.

Results:
All the patient showed some improvement in clinical symptoms & all of them were in NYHA class II following the procedure during 1 month follow-up.Mean room air saturation improved from 62.3% to 80.4%.Exercise capacity improved by 49% assessed by 6MWT.There was significant amount of desaturation during 6MWT during follow-up.No significant reduction in exercise capacity observed by 6MWT in between 1st , 6th & 12th post procedure month follow up Percutaneous stenting of stenosed MAPCAs can be considered as a palliation

Conclusion:
Pulmonary blood flow can be improved using balloon angioplasty or stents in patients with stenotic MAPCA; however, 17% of the lesions

POSTER PRESENTATIONS

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2411 - STENTING THE DUCTUS ARTERIOSUS AS A SHORT TERM STRATEGY TO MAINTAIN PULMONARY CIRCULATION AT THE EXPENSE OF SYSTEMIC CIRCULATION IN UNIVENTRICULAR HEART DISEASE.

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Background / Hypothesis:
Patient who since the neonatal stage presented tachypnea and pauses during feeding associated with distal cyanosis, oxygen saturation of 65% with an expulsive murmur at the right parasternal border and a single S2. During his initial approach, a chest x-ray was performed, which showed cardiomegaly with dextrocardia, central liver, right bronchial isomerism and pulmonary hypoflow. The electrocardiogram showed right ventricular hypertrophy and overload. He was referred to pediatric cardiology at 8 months of age, with an echocardiogram detailing dextrocardia with atrial and abdominal dextromorphism with ambiguous atrioventricular connection. Lateralized systemic and pulmonary return. Rastelli type C canal with double outlet right ventricle. Right aortic arch with mirror-image supra-aortic vessels exiting. Mixed pulmonary stenosis (valvular and infundibular). A 19.5-mm wide atrial septal defect and a 23.5-mm muscular inflow ventricular septal defect affecting the common ventricle. CT findings of asplenia and a Krichenko type C ductus arteriosus in the process of closure were also present.

Materials and Methods:
Angioplasty with a 4.5x26 Resolute Onyx stent was performed on the ductus arteriosus the patient progressed well, with oxygen saturation at 92%. He was discharged home under outpatient supervision, which documented improvement in functional class and decreased cyanosis.

Results:
The association of a type C atrioventricular canal with ventricular inversion, double outlet right ventricle, and mixed pulmonary stenosis constitutes a highly complex anatomical combination, rare, and with limited surgical options. In this patient, his heart disease precludes conventional anatomical correction, ruling out the possibility of biventricular correction or univentricular palliation. Angioplasty with stenting of the ductus arteriosus for pulmonary artery fistula has emerged as a safe technique for ensuring effective pulmonary flow in the short term with a lower risk of complications and shorter hospital stays. This case underscores the critical role of interventional intervention in settings where anatomy precludes corrective surgery

POSTER PRESENTATIONS

Category: Catheterization

2421 - LONG TERM OUTCOMES FOLLOWING BALLOON PULMONARY VALVULOPLASTY IN ISOLATED PULMONARY VALVE STENOSIS A 20 YEAR REVIEW FROM A LARGE ACADEMIC TERTIARY CENTER

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Background / Hypothesis:
Balloon pulmonary valvuloplasty (BPV) performed via cardiac catheterization serves as an effective primary treatment of isolated valvular pulmonary stenosis (PS). However, pulmonary regurgitation (PR) remains a significant complication that may eventually necessitate pulmonary valve replacement. This study aimed to evaluate the incidence of moderate and severe PR, as well as to identify associated factors. It also assessed the incidence of re-intervention, which included pulmonary valve replacement, repeat balloon pulmonary valvuloplasty (BPV), and surgical valvulotomy.

Materials and Methods:
This single-center retrospective cohort study analyzed data from patients aged 0–15 years with isolated pulmonary valve stenosis who underwent balloon pulmonary valvuloplasty via cardiac catheterization at King Chulalongkorn Memorial Hospital between January 2003 and December 2023.

Results:
Seventy-three patients were included (median age, 83 days; range, 2 days–14.8 years; IQR, 9–607 days). The median follow-up duration was 5.2 years (IQR: 2–13.5 years, range 0.5-21.7 years). Five developed severe PR and underwent pulmonary valve replacement more than 10 years after initial BPV. Eight required re-intervention. Univariate analysis showed moderate or severe tricuspid regurgitation (TR) on pre-balloon echocardiography was associated with moderate or severe PR (HR, 3.20; 95% CI, 1.25–8.17; p = 0.015). An >80% reduction in the Right ventricle-to-pulmonary artery (RV-PA) gradient was independently associated with moderate or severe PR (aHR, 5.52; 95% CI, 1.36–22.43; p = 0.017). Patients in the reintervention group were younger (median age 7 vs. 148 days, P < 0.001) and had smaller BSA (0.21 vs. 0.32; P = 0.005) compared to the non-reintervention group.

Conclusions:
BPV is an effective treatment for isolated valvular PS, with low re-intervention rates and mortality. A common complication is PR, which worsens over time and may lead to RV dysfunction, emphasizing the need for long-term follow-up.

POSTER PRESENTATIONS

Category: Catheterization

2438 - IMMEDIATE OUTCOME OF PERCUTANEOUS MITRAL BALLOON COMMISSUROTOMY USING INOUE BALLOON IN CHILDERN INSIGHT FROM LOW INCOME SETTING

Hussain Bux [1], Abdul Sattar Shaikh [2], Veena Kumari [3]
Nicvd Karachi Pakistan, Paediatric Cardiology, Karachi-Pakistan [1] Nicvd Karachi, Paediatric Cardilogy, Karachi-Pakistan [2] Nicvd Karachi, Paediatric Cardiology, Karachi-Pakistan [3]

Background / Hypothesis:
Rheumatic mitral stenosis is very common in children and young adults in Pakistan.
Percutaneous mitral balloon Commissurotomy (PMBC)/ PTMC in children has been done at NICVD Karachi for decades with multi track and double balloon technique.
But these balloon systems are no more available in recent past.
So we left with no choice in our patients and switched to Inoue balloon.
PMBC with Inoue balloon is method of choice in adults but reports of this technique in children have been rather scarce.
Very few countries in the world are using this technique in children.
MS in children is different from adults because of
Small LA size and volume
MV in children is more pliable and often without calcium.
Materials and Methods:Our objective was to see how Inoue Balloon works in children.
Study conducted in Pediatric Cardiology Department of National Institute of Cardiovascular Disease (NICVD), Karachi.
Data analyzed using SPSS version-21 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp).
Data was summarized as mean ± SD or Frequency and percentages appropriately.
Any bivariate association was assessed with the help of either Chi-squared test or independent sample t-test.
Two sided p-value of ≤ 0.05 was taken as significant in all analysis. All procedures were done under conscious sedation and as per the institutional/standard protocol.
Septal puncture a crucial step done both under Fluoroscopy and Echo guided.
Balloon size selection done by using HUNG formula.
Results: Total cases done50. MV Area (cm^2) increased from 0.7 ± 0.1 to 1.7 ± 0.5
Mean Gradient Across MV reduced from 23± 6.4 mmHg to 7.3± 3.1 mmHg.
Pulmonary Pressure mean (mmHg) 54.2 ± 13.2 to 35.6 ± 6.7

Mitral regurgitation (MR) outcomes:
POST PMBC MR seen in 53.1%.
Mild in 34.4%.
Moderate MR Reported in 12.5%
conclusion.Inoue balloon is safe and effective.

POSTER PRESENTATIONS

Category: Catheterization

2443 - SAFETY AND MID TERM OUTCOMES OF TRANSCATHETER PERIMEMBRANOUS VSD CLOSURE USING THE OCCLUTECH® DEVICE A POST APPROVAL MULTICENTER STUDY

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Background / Hypothesis:

Percutaneous closure of pmVSD carries risks of conduction disturbances and valvular complications. This multicenter study aimed to evaluate the safety and efficacy of The Occlutech® PmVSD occluder. To evaluate procedural success, mid-term closure effectiveness, and device-related adverse events using the Occlutech® PmVSD occluder.

Materials and Methods:
This multicenter, prospective and retrospective post-market study enrolled 50 patients (median age 7 years; IQR 4–12; 48% female) with clinically significant pmVSDs treated between March 2017 and October 2023. The point of enrollment was defined as the successful deployment and release of the Occlutech® PmVSD occluder. Device implantation was performed according to standard clinical protocols, with scheduled follow-up at 1, 30 and 60 days, 6 months, 1 year, and 3 years post-procedure. Primary endpoints were successful device implantation with trivial or no residual shunt at 1 year and incidence of serious adverse device effects (SADEs).

Results:
There were no acute complications during deployment and release (n=50). At 1-year follow-up (n=44), successful VSD closure was apparent in all patients, a persistent trivial residual shunt was present in 9%. Overall, 21 adverse events were reported in 14 patients (28%), with 12 events possibly device/procedure-related. SADEs occurred in 3 patients (6%): ischemic stroke (n=1), intravascular hemolysis requiring prolonged hospitalization (n=1), and infective endocarditis requiring surgical device removal (n=1). Mild adverse events occurred in 9 patients (18%), including mild aortic regurgitation, incomplete right bundle branch block, transient hemolysis, and femoral pseudoaneurysm, all resolving without sequelae. No deaths, complete AV block, or device embolizations were observed. Younger age and smaller angiographic VSD diameter were non-significantly associated with higher complication rates.

Conclusions:
The Occlutech® PmVSD occluder demonstrates high procedural success, effective mid-term closure, and a favorable safety profile. Most device-related complications were mild and self-limiting with a low incidence of SADE and no mortality at latest

POSTER PRESENTATIONS

Category: Catheterization

2507 - TRANSCATHETER MANAGEMENT OF POST PA BANDING FOR SWISS CHEESE VSDS

Rajesh Kumar Ramaswamy [1]
Mgm Health Care, Pediatric Cardiology, Chennai-India [1]

Background:
Although primary definitive repair of congenital heart disease has become the preferred management approach, pulmonary artery banding (PAB) remains a valuable palliative procedure used to restrict pulmonary blood flow in conditions with Swiss Cheese VSDs and large Muscular VSDs . However, when the band is to be removed and close the residual VSD , another surgical intervention is usually required.

Methods:
To describe Background:Although primary definitive repair of congenital heart disease has become the preferred management approach, pulmonary artery banding (PAB) remains a valuable palliative procedure used to restrict pulmonary blood flow in conditions with Swiss Cheese VSDs and large Muscular VSDs . However, when the band is to be removed and close the residual VSD , another surgical intervention is usually required.
Methods:To describe percutaneous removal of pulmonary artery band and device closure of residual muscular VSDs.

Results:
Between 2019 and 2023, 15 patients underwent PAB. Of these, we attempted balloon debanding of the pulmonary artery in four patients. At the time of the procedure, the average age of patients was 60 ± 6.24 months, and their average weight was 12.37 kg. Band removal via catheter was successful in all cases and was associated with an adequate reduction in pressure gradient across the pulmonary artery band site (average of 71.67 ± 12.58 to 23.67 ± 2.89 mm Hg). 3 patients post band removal showed significant Qp/Qs due to muscular VSDs and underwent device closure. None of the patients experienced complications during or after the procedure. Follow-up data after discharge provides reassuring and satisfactory results.

Conclusion:
Based on our findings, we suggest that transcatheter mamnagent of post PA banding for swiss chess VSDs with percutaneous removal of the pulmonary artery band and device closure of residual VSDs might be a safe and effective alternative to redo surgery However, studies with a larger sample are required for further clinical

POSTER PRESENTATIONS

Category: Catheterization

2508 - TRANSCATHETER CLOSURE OF RESIDUAL ABERNATHY SHUNT WITH SIGNIFICANY NEURODEVELOPMENTAL OUTCOME

Rajesh Kumar Ramaswamy [1]
Mgm Health Care, Pediatric Cardiology, Poonamallee-India [1]

Background:
Abernethy malformation is a rare vascular anomaly of the portal venous system, which is also known as congenital portosystemic shunts (CPSS). The clinical manifestations of this anomaly can be serious, including Pulmonary hypertension, mental subnormality which can lead to significant deterioration in quality of life in children.

Case Presentation:
Our case was a 12-year-old boy diagnosed as Type 2 Abernathy malformation with severe PAH,high ammonia levels and mental subnormality, underwent device closure in one institution. On 3 months follow up, it was found to have device position was altered with large residual flows. Multiple attempts were failed to retrieve the device and advised for surgical correction. Patient referred here for further management. After detailed evaluation and consent, we have decided for balloon occlusion followed by device closure of residual defect. After balloon interrogation, 18mm-diameter, 12mm-long Vascular Plug (SHSMA Inc, Shanghai, China) was used to occlude the shunt.

Results:
On follow up patient had significant decrease in ammonia levels, mild reduction in PA pressures and marked improvement in mental development.

Conclusion:
The results indicate that children with residual defect or migration of device after initial procedure, require special attention since these patients may have persistent symptoms. If device could not be retrieved, its worth closing the residual defect which can have significant improvment in neurodevelopmental scales.

POSTER PRESENTATIONS

Category: Catheterization

2510 - TPVI WITH LPA STENTING IN CASE OF POST ICR WITH HYPOPLASTIC LPA A DIFFICULT SUBSET IN TERMS OF VALVE POSITIONING.

Rajesh Kumar Ramaswamy [1]
Mgm Health Care, Pediatric Cardiology, Poonamallee-India [1]

Introduction:
Transcatheter pulmonary valve replacement (TPVR) is increasingly used to treat complications related to dysfunctional right ventricular outflow tracts (RVOT). Candidacy is limited by coexistent hypoplastic branch PA. We present the case of Difficult Positioning of Transcatheter PV With Associated Hypoplastic LPA

Clinical case:
The patient is a 16-year-old with a history of TOF who underwent ICR at 6 years of age. He presented with NYHA class III heart failure symptoms. After an extensive workup, he was advised to undergo TPVR with LPA stenting.

Initially, the LPA was stented using a 23 mm Zephyr XL, followed by deployment of a 24.5 mm Myval valve in the prestented RVOT. During deployment, there was mild downward displacement of the valve due to inadequate space in the LPA during balloon expansion. Angiography showed good valve function with mild PVL.

Discussion:
This case demonstrates that a “TPVI With LPA Stenting in a Case of Post-ICR With Hypoplastic LPA: A Difficult Subset in Terms of Valve Positioning”

POSTER PRESENTATIONS

Category: Catheterization

2511 - TRANSJUGULAR ASD DEVICE CLOSURE IN CASES OF INTERRUPTED IVC SINGLE CENTRE STUDY

Rajesh Kumar Ramaswamy [1]
Mgm Health Care, Pediatric Cardiology, Poonamallee-India [1]

Background:
Percutaneous atrial septal defect (ASD) closure is the preferred treatment for patients with suitable ASD anatomy. The safety and effectiveness of transcatheter closure have been established. However, reports on percutaneous closure of ASD via the right internal jugular vein (RIJV) are limited. The study aims to discuss the safety and effectiveness of percutaneous trans-jugular vein closure of ASD in cases of Interrupted IVC.

Methods:
We conducted a retrospective analysis of patients (n=10) with secondary ASD with IVC interruption who underwent Percutaneous Transjugular ASD device closure in the Department of pediatric cardiology between July 2019 to July 2022. The article is a cross-sectional study.

Results:
Transjugular closure of ASD via the RIJV in cases of IVC interruption was successfully performed in 10 out of 10 (100%) cases. The average procedure time was 34.48±13.06 min, and the mean age at the time of the procedure and ASD size were 9-60 months and 15.45±5.82 mm, respectively. On analyzing medical records and echocardiographic images, no major complications happened during the procedure. No pericardial effusion, thrombosis, atrioventricular block, or other complications were observed during the procedure and in follow up.

Conclusions:
Transjugular ASD Device closure in cases of Interrupted IVC is a safe and effective therapeutic approach. The initial results are satisfactory, but further studies with large sample sizes and long-term follow-up are warranted to assess the long-term outcomes.

POSTER PRESENTATIONS

Category: Catheterization

2527 - COMPUTATIONAL SIMULATION FOR PREOPERATIVE PLANNING FOR HARMONY™ VALVE IN A PATIENT WHO DO NOT MEET RECOMMENDED OVERSIZING CRITERIA ON THE SCREENING PERIMETER PLOT

Giuliano Giusti [1], Liam Swanson [2], *Claudio Capelli* [2]
Asst Grande Ospedale Niguarda, Pediatric Cardiologist Unit, Milan-Italy [1] University College London, Institute Of Cardiovascular Science, London-United Kingdom [2]

Background:
Severe pulmonary regurgitation is a common sequela of Tetralogy of Fallot (TOF) repair, causing right ventricular (RV) dilatation, dysfunction, and arrhythmias. Transcatheter pulmonary valve implantation (TPVI) with self-expanding devices, such as the Harmony™ valve (Medtronic, Minneapolis, MN), enables treatment of large native right ventricular outflow tracts (RVOT). Pre-procedural CT perimeter plot analysis determines suitability, with adequate device oversizing in inflow and outflow segments essential for stability. However, in patients not meeting these morphological oversizing criteria, perimeter plots alone may be insufficient to guide procedural decisions.

Material and Methods:
A 29-year-old woman with Goldenhar syndrome and repaired TOF (transannular patch, pulmonary monocusp valve) developed severe pulmonary regurgitation, RV dilatation, and symptomatic arrhythmias. ECG-gated CT revealed insufficient oversizing per manufacturer criteria. Patient-specific computational simulation based on finite element analysis were carried out to simulate Harmony implantation. A virtual reality platform, VheaRts, was used to assess the simulation results and decide on procedural feasibility.

Results:
TPVI with a TPV 25 Harmony™ valve was performed via right femoral venous access under general anesthesia. Initial deployment at the pulmonary bifurcation was followed by early proximal migration, with loss of the distal position. The valve remained stable in the distal main pulmonary artery. Angiography confirmed a competent, well-seated valve and no residual gradient. The computational simulation accurately anticipated the difficulty in maintaining a stable distal position, which was subsequently confirmed during the procedure.

Conclusion:
This case demonstrates that TPVI with the Harmony™ valve may be feasible in borderline anatomies not fulfilling oversizing thresholds. Patient-specific computational simulation accurately anticipated procedural challenges and supported planning. Incorporation of simulations into the procedural planning may improve safety and expand treatment options in complex or borderline RVOT anatomies, although validation in larger patient cohorts is still required.

POSTER PRESENTATIONS

Category: Catheterization

2535 - WHERE DID THE MURMUR GO WAS IT THE ANAESTHETIST

Alistair Hustig [1], Cameron Ward [2]
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Case Summary
A 2-year-old, 8.7kg ex-23-week premature twin, initially identified with soft continuous murmur and moderate patent ductus arteriosus (PDA) presented for elective device closure. On admission she was found to have thrill and 4/6 machinery murmur. Repeat echocardiogram demonstrated a 3.5mm PDA.
Anaesthesia was induced with inhalational induction (Nitrous Oxide with Sevoflurane), cannulated and intravenous propofol/alfentanil infusion commenced. She was intubated without neuromuscular blockade. Anaesthesia and electrophysiology monitoring were placed. Subsequent precordial examination confirmed persistence of the thrill murmur. Total intravenous anaesthesia (propofol/alfentanil based) was then utilised to maintain anaesthesia.

Unexpected hypertension (non-invasive blood pressure measurements 153/92mmHg) preceded interventional femoral access (arterial 4fr & venous 7fr) with subsequent correlating invasive arterial blood pressure measurements. The PDA was not instrumented prior to initial angiography which demonstrated a 1.4 mm PDA which was not consistent with the clinical signs. Repeat auscultation and palpation demonstrated resolution of the thrill and the murmur.

Over 20-30 minutes with increased depth of TIVA anaesthesia, the invasive blood pressure receded to 100/30mmHg. Repeat clinical assessment demonstrated a return of palpable thrill and murmur. Subsequent angiography confirmed the presence of a large 5mm PDA. The pulmonary artery pressure (PAP) was 59/14 mmHg.

A 10/8 Amplatzer PDA occluder was successfully deployed. The PAP was 17/6 mmHg and the systemic pressure 110/60 mmHg post deployment.

This case illustrates the importance of correlation of pre-catheter clinical and echocardiographic assessment with angiography. We hypothesise the dynamic state of anaesthesia affecting cardiac and respiratory dynamics may result in transient vasospasm of the ductus arteriosus.

POSTER PRESENTATIONS

Category: Catheterization

2537 - PERCUTANEOUS FONTAN WENT WRONG SUCCESSFULLY BAILED OUT

Bijesh Viswambaran [1], Annu Jose [1], Edwin Francis [1]
Astermedcity, Paediatric Cardiology, Cochin-India [1]

Background / Hypothesis:
Transcatheter Fontan is a revolutionary innovation as an alternative for surgical Fontan completion. As it gains popularity, one must learn from mistakes and techniques to overcome it.

Materials and Methods:
We present a case of 5 years old boy with DILV and hypo plastic arch who had undergone PA banding and arch repair in the neonatal period. At 6 months of age, he underwent BDGS with DKS surgery. His baseline saturation was 80% and hemodynamic data was suitable for Fontan completion. Percutaneous Fontan completion was done without surgical preparation with two overlapping Zephyr stents with minimal protrusion into IVC and PA. Child was discharged with saturations of >90% but got readmitted with severe desaturation up to 70% 2 weeks later. On evaluation it was identified that the lower end of the stent had partly slipped into left hepatic vein causing significant right to left shunt. To stabilise the covered stents another uncovered stent was deployed into IVC across the hepatic veins. Immediate post procedure saturations improved to 95 %. But again after 4 weeks saturations again dropped to 80 % due to some right to left shunting through the right hepatic vein which was not fully draining into the covered stents. So, for better apposition of the covered stents to the lower IVC simultaneous balloon dilatation was done with one balloon inserted from SVC into the hepatic vein and another balloon from IVC. Two balloons with an effective diameter of 23 mm was used for diverting right hepatic venous blood also to the Fontan circuit without leaking into right atrium. Follow up after 3 months showed good flows and saturations of 95%.

Results:
Transcathter fontan was successfully accomplished finally for this patient in three stages
Conclusions:Meticulous evaluation,awareness of haemodynamics bailed us out

POSTER PRESENTATIONS

Category: Catheterization

2539 - TRANSCATHETER CLOSURE OF GERBODE DEFECT

Bijesh Viswambaran [1], Annu Jose [2], Edwin Francis [3]
Astermedcity, Paediatric Cardiology, Cochin-India [1] Astermedecity, Paediatric Cardiology, Cochin-India [2] Astermedcity, Paediatric Cardoology, Cochin-India [3]

Background / Hypothesis:

Gerbode defect is a rare form of ventricular septal defect(VSD) that allows communication from left ventricle(LV) to right atria(RA).It can be congenital or acquired often resulting form complications after surgical procedures like VSD closure.Traditionally this is corrected surgically but device closure is the comfortable new method.

Materials and Methods:
A 5 year old girl had undergone VSD closure surgically for large perimembranous VSD in infancy.She has small to moderate sized residual VSD with significant shunt from left ventricle to right atria (direct gerbode) with resulting in significant RA dilatation. This defect was closed non surgically by transcatheter method via retrograde approach after forming an arteriovenous loop though defect was crossed retrogradely with some difficulty. Eventually defect was closed with 4/4 ADO2 device .

Results:
This gerbode defect was closed successfully with out any complications with an Amplatzer duct occluder 11.

Conclusions :
With proper case selection there should be minimal risk of immediate and long term complications in the hands of experienced operators.

POSTER PRESENTATIONS

Category: Catheterization

2557 - TRANSCATHETER CLOSURE OF SEVERE MITRAL PARAVALVULAR LEAK IN A PATIENT WITH LONG STANDING BALL AND CAGE VALVE FOLLOWING INFECTIVE ENDOCARDITIS

Abdul Malik Sheikh [1], Asma Kanwal [1], Hina Sattar [2]
Rawalpindi Institute Of Cardiology, Pediatric Cardiology, Rawalpindi-Pakistan [1] Rawalpindi Medical University, Pediatric Medicine, Rawalpindi-Pakistan [2]

Background :
Paravalvular leak (PVL) is a recognized complication of prosthetic valve endocarditis, often leading to heart failure and hemolysis. Transcatheter closure has emerged as an alternative to high-risk reoperation.

Materials and Methods:
We report the case of a 47-year-old male who underwent mitral valve replacement with a ball-and-cage prosthesis 30 years earlier. Six months prior to presentation, he developed infective endocarditis involving the prosthetic valve, treated successfully with medical therapy. Subsequently, he developed severe PVL with progressive dyspnea. Given the high surgical risk, transcatheter closure was performed using a multifunctional occluder (MFO) device via a transseptal approach. The procedure was technically successful with immediate hemodynamic improvement and no interference with valve function.

Results:

Conclusions:
This case highlights the feasibility of transcatheter PVL closure using an MFO device in a patient with an older-generation mechanical mitral prosthesis. Careful patient selection and infection control are paramount for procedural success.

POSTER PRESENTATIONS

Category: Catheterization

2559 - EMERGENCY PACING THROUGH UMBILICAL VENOUS ROUTE IN NEONATE WITH COMPLETE HEART BLOCK

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Background / Hypothesis:
Complete congenital heart block (CCHB) is a rare but life-threatening condition in newborns, often linked to maternal autoimmune disease. Standard pacing in neonates is usually epicardial, but in emergency situations with difficult vascular access, alternative routes may be needed.

Materials and Methods:

Results:
We report a preterm female infant (35+4 weeks, 2200 g) born to a mother with undiagnosed systemic lupus erythematosus and positive anti-SSA/Ro and anti-SSB/La antibodies. Fetal echocardiography at 28 weeks showed atrioventricular dissociation without structural heart defects. At birth, the infant developed profound bradycardia (38 bpm) unresponsive to medical therapy. ECG confirmed complete heart block. Repeated attempts at femoral venous access failed due to vessel size and poor perfusion. Emergency temporary pacing was achieved via the umbilical vein using a 6F bipolar pacing wire advanced into the right ventricle and connected to an external generator (VV1 mode, 120 bpm). Hemodynamic stability was restored, and the infant remained stable until transfer for permanent pacemaker implantation.

Conclusions:
The umbilical venous route is a rapid, minimally invasive alternative for temporary transvenous pacing in neonates when conventional access is not possible. This approach may be lifesaving, particularly in low-birth-weight infants or resource-limited settings.

POSTER PRESENTATIONS

Category: Catheterization

2582 - PERCUTANEOUS PULMONARY VALVE IMPLANTATION WITH VENUS P VALVE WITHOUT LONG SHEATH

Alper Guzeltas [1], Selman Gokalp [1], Erman Cilsal [1], Sezen Ugan Atik [1], Serdar Kertmen [1], Mehmet Akin Topkarci [2], Murat Sahin [1]
Mehmet Akif Ersoy Thoracic And Cardiovascular Surgery Training Research Hospital, Pediatric Cardiology, Istanbul-Türkiye [1] Mehmet Akif Ersoy Thoracic And Cardiovascular Surgery Training Research Hospital, Anesthesia, Istanbul-Türkiye [2]

Background / Hypothesis:
Free pulmonary valve insufficiency is a common late sequela after right ventricular outflow tract (RVOT) surgery. In appropriately selected patients, percutaneous pulmonary valve implantation (PPVI) provides a less invasive alternative to repeat surgery. While balloon-expandable valves have been widely used, self-expanding devices such as the Venus P-valve have expanded treatment options, particularly for dilated RVOT anatomies. The Venus P-valve can be implanted without a long delivery sheath, potentially simplifying the procedure and reducing costs.

Materials and Methods:
This retrospective single-center study included 20 patients (median age 15.1 years) who underwent Venus P-valve implantation between February and August 2025 for free pulmonary insufficiency following prior RVOT surgery. Most had repaired tetralogy of Fallot (TOF). In all but one case, the valve was delivered over a guidewire without a long sheath. Demographic, imaging, and procedural data were reviewed.

Results:
Of the cohort, 70% were male; the median interval since last surgery was 13.5 years. Cardiac MRI showed a median RVEDVi of 151 mL/m^2 and pulmonary regurgitation fraction of 46.5%. CT classified RVOT morphology primarily as Type 2 (60%). Mean RVOT diameter was 33 mm; balloon sizing revealed a mean waist diameter of 26 mm. Valve sizes ranged from 28/25 mm to 36/25 mm. All 19 attempted sheathless implantations were successful; one case required a 24F DrySeal sheath. Three complications occurred: one ventricular fibrillation resolved with defibrillation, one groin hematoma, and one pulmonary artery injury managed with device closure. Median hospital stay was 4 days. Trivial regurgitation was noted in three patients; no significant arrhythmias occurred during 15-day to 5-month follow-up.

Conclusions:
Venus P-valve implantation without a long delivery sheath is technically feasible and appears safe in selected pediatric and young adult patients with RVOT dysfunction. This simplified approach may broaden PPVI applicability. Larger, long-term studies are warranted to confirm durability and long-term outcomes.

POSTER PRESENTATIONS

Category: Catheterization

2612 - TRANSCATHETER PATENT DUCTUS ARTERIOSUS CLOSURE IN PREMATURE NEONATES A LARGE SINGLE CENTER EXPERIENCE AT A COMMUNITY DELIVERY HOSPITAL

Amanda Lucas [1], *Craig Sable* [2], Dhaval Patel [1], Ivory Crittendon [3], Victor Lucas [3]
Univeristy Of Queensland-ochsner School Of Medicine,, Pediatric Cardiology, New Orleans-United States [1] Ochsner Children's Hospital, Pediatric Cardiology, New Orleans-United States [2] Chsner Children's Hospital, Pediatric Cardiology, New Orleans-United States [3]

Background:
Premature infants with a hemodynamically significant patent ductus arteriosus (PDA) have increased morbidity and mortality. However, there are only a small number of single center studies and none that include procedures performed at a community hospital. Our objective was to compare our experience in transcatheter PDA closure between premature infants and older patients.

Methods:
We performed a retrospective review of patients who underwent transcatheter PDA occlusion between January 2019 and May 2025 at Ochsner Main Campus (tertiary center) and Baptist Hospital (community delivery hospital).

Results:
There were 323 transcatheter PDA closures during the study period, 192 in premature infants (181 of which were performed at Baptist) and 131 in older children. All cases were performed by the same 2 providers (VL, IC). Table 1 shows demographics. Mean gestational age was 25.0 weeks and mean age at procedure was 1.20 months. The smallest patient weighed 0.5 kg with 16 patients < 0.7 kg. Table 2 shows procedural data. A Piccolo device was used in 98% of premature babies. Procedure time, fluoroscopy time, contrast use and blood less were all significantly less in premature patients. There was one procedure-related mortality in a premature patient with device embolization into the right pulmonary artery. Embolization occurred in 2 other premature patients; the embolized devices were retrieved and a second device was successfully placed. Coil closure was not successful in one older patient; the coil embolized to the dorsalis pedis artery (without compromise in circulation). Technical success was achieved in all other patients. Table 3 shows follow-up data; no patients had hemodynamically significant residual disease.

Conclusions:
Transcatheter PDA occlusion in low birth weight/premature neonates can be successfully performed at a community delivery hospital, mitigating the need for transport of critically ill neonates. More investigation is needed to better characterize specific practices that can be replicated.

POSTER PRESENTATIONS

Category: Echocardiography

1034 - ETIOLOGICAL AND MORPHOLOGICAL INSIGHTS INTO LEFT VENTRICULAR NONCOMPACTION AND EXCESSIVE TRABECULATION IN PEDIATRIC PATIENTS A RETROSPECTIVE COHORT STUDY

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Children's Hospital Affiliated To Chongqing Medical University, Cardiology, Chong Qing-China [1]

Background / Hypothesis:
Left ventricular noncompaction (LVNC) or excessive trabeculation is a rare but significant myocardial disorder, particularly affecting pediatric populations. It is associated with severe cardiac complications such as heart failure and arrhythmias. However, controversies remain regarding its diagnostic thresholds, particularly the NC/C ratio, and its etiological classification. This study investigates myocardial structural differences among primary and secondary LVNC patients and evaluates the diagnostic applicability of NC/C ratio thresholds in pediatric populations.

Materials and Methods:
A retrospective cohort study analyzed 280 pediatric LVNC patients (primary, n = 164; secondary, n = 116) and 128 controls at Chongqing Medical University Affiliated Children's Hospital (2014–2025). Myocardial compacted thickness (C) and noncompacted thickness (NC) were measured via echocardiography, with NC/C thresholds >1.4 and >2 applied. Statistical analyses included Mann-Whitney U tests, propensity score matching, and inverse probability weighting.

Results:
LVNC patients showed significantly reduced C thickness compared to controls ($p < 0.001$), with secondary < primary < controls. NC thickness was significantly higher in primary LVNC patients (7.00 [6.07, 8.30]) than secondary LVNC patients (6.80 [5.90, 7.93], $p = 0.040$). The stricter NC/C >2 threshold failed to differentiate between primary and secondary groups, indicating its potential to miss cases.

Conclusions:
This study highlights structural differences between primary and secondary LVNC, with primary LVNC showing more pronounced trabeculation. The NC/C >1.4 threshold demonstrates greater sensitivity in pediatrics, but the limited discriminative capacity of NC/C alone suggests a need for integrating genetic and functional assessments. Standardized diagnostic criteria and multicenter validation are essential to improve pediatric LVNC management.

POSTER PRESENTATIONS

Category: Echocardiography

1043 - DIAGNOSTIC VALUE OF MYOCARDIAL CONTRAST ECHOCARDIOGRAPHY IN 8 CHILDREN WITH ABNORMAL CORONARY ORIGIN

Jingjing Ye [1], Lanxin Song [1], Jingjing Qian [1], Jin Yu [1], Zhuo Shi [2], Liyang Ying [2], Xiwang Liu [2], Weize Xu [2]
Children, Ultrasound Department, Hangzhou-China [1] Children, Heart Center, Hangzhou-China [2]

Objective:
To investigate the application value of transvenous (myocardial contrast echocardiography MCE) in pediatric congenital coronary artery malformation surgery, and to providing a new clinical reference for early and accurate evaluation of the success rate of the surgery.

Materials and Methods:
From December 2019 to December 2024, 8 children (aged 4 months to 13+ years) with abnormal origin of coronary artery were treated with the ultrasound contrast agent SonoVue (off-label use of medication, approved by the Ethics Committee, at a dose of less than 0.03 ml/kg intravenously) in the Pediatric CICU to evaluate cardiac function and myocardial perfusion. The clinical characteristics and MCE results of these patients were analyzed, compared and summarized.

Conclusions:
CE utilizing microbubbles can evaluate the integrity of the microvascular system that maintains myocardial viability in children with coronary artery abnormalities postoperatively, provide information on myocardial viability rapidly at the bedside, and may offer sensitive and accurate diagnostic information. Furthermore, MCE represents an innovative monitoring method for children with abnormal origins of the coronary arteries.

POSTER PRESENTATIONS

Category: Echocardiography

1070 - THE IMPACT OF STEROID TREATMENT ON LEFT VENTRICULAR GEOMETRY IN PRETERM INFANTS

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Background / Hypothesis:
Altered left ventricular (LV) geometry is linked to cardiovascular risks and poor outcomes in preterm infants. Steroid therapy, commonly used in neonatal intensive care units (NICUs), may influence LV geometry, but the mechanisms remain unclear. This study aims to investigate the risk factor of altered LV geometry associated with steroid treatment in preterm infants.

Materials and Methods:
A retrospective cohort study analyzed 133 preterm infants (<37 weeks gestation, <2 kg birth weight) admitted to a NICU between 2018 and 2023. Data on demographics, steroid regimens, echocardiographic findings, and outcomes were assessed. Altered LV geometry was defined as relative wall thickness (RWT) above the 80th percentile. Logistic regression identified predictors, and mixed-effects models evaluated the relationship between cumulative steroid dose and RWT.

Results:
Altered LV geometry was observed in 39 infants (29.3%), which was associated with lower birth weight and higher cumulative steroid doses. Early steroid therapy showed a non-significant trend toward an increased risk of altered LV geometry. Within 33 days, 74.4% of cases regressed to normal LV geometry. Despite being transient, altered LV geometry correlated with higher mortality and more severe bronchopulmonary dysplasia (BPD).

Conclusions:
Low birth weight and high cumulative steroid doses are significant predictors of altered LV geometry in preterm infants. Close monitoring and further research are essential to optimize steroid therapy and minimize cardiac risks in preterm infants.

POSTER PRESENTATIONS

Category: Echocardiography

1078 - APPLICATION OF MYOCARDIAL CONTRAST ECHOCARDIOGRAPHY IN EVALUATING MYOCARDIAL PERFUSION IN CHILDREN WITH ANOMALOUS ORIGIN OF THE CORONARY ARTERY

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Background:
Anomalous origin of the left coronary artery from the pulmonary artery (ALCAPA) is an extremely rare and life-threatening congenital coronary anomaly. Without timely diagnosis and treatment, it can lead to irreversible cardiac damage, heart failure, or even death. Early surgical intervention is critical to prevent long-term cardiac complications. Echocardiography remains the primary imaging modality for this condition. Current assessments of coronary perfusion rely mainly on coronary CT angiography (CTA) or cardiac magnetic resonance imaging (CMR). Myocardial contrast echocardiography (MCE), an emerging imaging technique, uses intravenous ultrasound-enhancing agents (UEAs) to significantly improve image quality, enabling more accurate evaluation of myocardial structure and function. Studies have demonstrated that microbubble transit rates in MCE can effectively assess myocardial perfusion.

Method:
In this case report, we present a 3-month-old infant diagnosed with ALCAPA. MCE was employed preoperatively and postoperatively to evaluate coronary perfusion.
Result: Preoperative MCE revealed significant perfusion defects in the left coronary artery territory. Follow-up MCE examinations on postoperative days 2 and 20 demonstrated gradual restoration of myocardial perfusion.

Conclusion:
Our findings highlight the potential of MCE as a non-invasive, real-time, and radiation-free tool for monitoring myocardial perfusion in ALCAPA patients, guiding clinicians in postoperative management. MCE may become the preferred method for assessing myocardial perfusion in this population.

POSTER PRESENTATIONS

Category: Echocardiography

1089 - ECHOCARDIOGRAPHIC FOLLOW UP OF PEDIATRIC PATIENTS WITH TOTAL CORRECTION OF TETRALOGY OF FALLOT OVER A 10 YEAR PERIOD

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Background / Hypothesis:
Tetralogy of Fallot is the main cyanogenic heart disease in infancy and preschool, it is a common heart disease with an incidence of 0.28 per 1000 live births . The aim of this study was to evaluate pediatric patients with Fallot repair form the echocardiographic point of view.
Materials and Methods:Tetralogy of Fallot is the main cyanogenic heart disease in infancy and preschool, it is a common heart disease with an incidence of 0.28 per 1000 live births . The aim of this study was to evaluate pediatric patients with Fallot repair form the echocardiographic point of view.

Results:
A total of 70 patients were admitted, of which 53% were female, the mean age of correction was 6 years, patients who underwent surgery more than 5 years corresponded to 30%, the 20% required palliative surgery. Echocardiographically, patients in the group more than 5 years postoperative are those who present sever PR, dilatation of the right cavities, however only 2 presents decreased RVEF

Conclusions:
Follow up in these patients is important to decide when pulmonary valve replacement is required. Although echocardiography is an accessible, safe and low cost method to better assess the right ventricle, follow up with magnetic resonance imaging is required.

POSTER PRESENTATIONS

Category: Echocardiography

1095 - ANOMALOUS DRAINAGE OF THE SUPERIOR VENA CAVA TO THE LEFT ATRIUM AN UNUSUAL CAUSE OF NEONATAL CENTRAL CYANOSIS

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Background / Hypothesis:
Anomalous drainage of the superior vena cava (SVC) to the left atrium (LA) is an extremely rare cardiac anomaly that is challenging to diagnose. We report this condition in a neonate who presented with central cyanosis.

Materials and Methods:
A term male newborn with an unremarkable antenatal history presented with central cyanosis (SpO2 80% on room air) without respiratory distress. Physical examination showed no differential cyanosis, and the cardiac examination was normal. A chest radiograph demonstrated mild cardiomegaly and normal pulmonary blood flow without congestion. An EKG revealed left QRS axis deviation (abnormal for age).

Results:
Echocardiography showed a small secundum ASD with a left-to-right shunt, no PDA, and mild left atrial and left ventricular enlargement. There was evidence of anomalous drainage of the SVC to the LA and a suspected superior defect at the atrial septum with a left-to-right shunt. Normal saline administered via the peripheral vein in the left arm showed small bubbles filling the SVC, then entering both the LA and RA simultaneously. Focused cardiac CTA confirmed the anomalous drainage of the SVC to the LA. Intraoperative findings revealed an anomalous connection of the SVC to the LA, partial anomalous of the right superior pulmonary vein draining to the SVC, a small secundum ASD, and a membrane defect connecting the SVC to the RA. Successful surgical correction was performed using the Warden technique (translocation of the SVC to the right atrial appendage), along with ASD and membrane defect closure.

Conclusions:
The diagnosis of anomalous drainage of the SVC to the LA is challenging due to its rarity as a cardiac anomaly. Awareness of this condition is important when approaching a newborn presenting with central cyanosis, other than that caused by common cyanotic congenital heart disease.

POSTER PRESENTATIONS

Category: Echocardiography

1189 - TIME TO DIAGNOSIS OF CONGENITAL HEART DISEASE IN A TEACHING HOSPITAL IN GHANA WEST AFRICA

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Background / Hypothesis:
Studies have found a lack of timely congenital heart disease (CHD) diagnosis in Africa compared to their Western counterparts. We aimed to determine how long it takes to diagnose CHD in Ghanaian children and investigate the associated challenges involved with delayed diagnosis.

Materials and Methods:
We conducted the study at Korle-Bu Teaching Hospital, Ghana's largest tertiary center. This was a cross-sectional descriptive study. We retrospectively reviewed the attendance records of children under 19 at the pediatric cardiology clinic from January 2022 through April 2024. One pediatric cardiologist performed all the echocardiographies. Analysis was performed using Microsoft Excel statistical software supplemented by R statistical software. The relationship between the timing of CHD diagnosis and the distance traveled in kilometers to the clinic was investigated via a scatter plot. A p-value less than 0.05 was considered statistically significant.

Results:
A total of 664 individual patients were evaluated at the clinic over the study period (Table 1). The median age was 17.98 months, with an age range of 1 day to 19 years. The majority of the patients (490/664; 73.8%) were under 5, with infants (281/490; 57.4%) being the majority (Table 2). The overall mean age of CHD diagnosis was 40.63±48.63 months. The overall top 3 indications for echocardiography were evaluation of a cardiac murmur (16%), follow-up after a previous exam (11%), and tachypnea (9%). Figure 1 shows the distribution of echocardiographic diagnoses for the under-5 age group. A subgroup analysis (n=361) showed that the distance traveled to the clinic did not correlate with the timing of CHD diagnosis (Pearson correlation coefficient r: 0.077; P=0.157) (Figure 2).

Conclusions:
There is a need to increase symptom awareness through education to reduce the overall timeframe of initial CHD diagnosis. The high number of echocardiographies in infants suggests the importance of early screening for congenital heart disease.

POSTER PRESENTATIONS

Category: Echocardiography

1217 - TWO DIMENSIONAL SPECKLE TRACKING ECHOCARDIOGRAPHIC ASSESSMENT OF DYSSYNCHRONOUS VENTRICULAR CONTRACTION IN CHILDREN AND ADOLESCENTS WITH WOLFF PARKINSON WHITE SYNDROME

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Background / Hypothesis:
The presence of accessory pathway (AP) in Wolff Parkinson White syndrome (WPW) is associated with early contraction of the ventricles at the site of atrioventricular AP. We use longitudinal 2D-STE to evaluate ventricular contraction synchronicity in paediatric and adolescent patients with WPW syndrome before and after transcatheter ablation. We study the concordance between longitudinal 2D-STE and endocardial mapping or electrocardiographic algorithm in pathway localization. We also assess the effect of accessory pathway location and QRS duration on left ventricular function, regional strain and LV dyssynchrony.

Materials and Methods:
17 patients with WPW syndrome underwent baseline conventional and LV and RV longitudinal 2D-speckle tracking echocardiography. Global and regional ventricular function and ventricular dyssynchrony parameters were compared before and after electrophysiology study (EPS) and pathway ablation. Echocardiography performers were blinded to the endocardial mapping and electrocardiographic pathway localization algorithm results in order to assess the concordance of the pathway localization methods.

Results:
Speckle tracking study accurately matched with endocardial localization of AP in all 6 patients who had EPS. For the other 11 patients, speckle tracking data matched with the ECG AP localization in 10 patients. Patients with septal pathway had significant reduction in global longitudinal strain while patients with right and left free wall pathways did not. Also, patients with septal and right side pathways showed significant asynchronous LV contractions with controls while patients with left free wall pathways did not.

Conclusion:
In our study, 2D longitudinal speckle tracking echocardiogram accurately matched with endocardial localization of pathways in patients who had EPS and matched with most other patients with ECG pathway localization algorithm.
In this young cohort, patients after ablation of pathways showed evidence of improvement in ventricular dyssynchrony.

POSTER PRESENTATIONS

Category: Echocardiography

1225 - "ANOMALOUS LEFT CORONARY ARTERY FROM LEFT PULMONARY ARTERY ASSOCIATED WITH PARTIAL ANOMALOUS PULMONARY VENOUS RETURN THROUGH A SCIMITAR VEIN WITH EARLY ATYPICAL CLINICAL PRESENTATION A CASE REPORT AND REVIEW OF CURRENT LITERATURE"

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Hereby presented is the case of an atypical early clinical presentation of anomalous origin of the left coronary artery from the left pulmonary artery with an associated anomalous drainage of the right pulmonary veins.
A full term infant was born from an uneventful pregnancy with a spontaneous delivery. When one month and a half of age, he began experiencing failure to thrive, crying spells when feeding ad polypnea. He was referred to the emergency department for evaluation multiple times by his family pediatrician and finally an echocardiography was performed, which showed an abnormal left ventricular function. He was then transferred to our institution's PICU in overt heart failure with signs of ongoing subendocardial ischemia and successfully surgically treated with an optimal outcome. An anomalous drainage of the right pulmonary veins to the inferior vena cava through a scimitar vein was discovered during surgery, but left untreated.

Given the rarity of the association of these twho lesions, a brief review of the existing literature is also provided.

The different embryological origin of the structures involved in these two malformations suggests that such an association is totally sporadic, rather than syndromic. To the best of our knowledge, seven cases have been described so far. In most cases either ALCAPA or scimitar syndrome were diagnosed first, while the associated malformation was a late incidental discovery, obtained during catheterizations, CT scan or surgery.
This case reinforces the idea that segmental analysis is fundamental to highlight possible associated anomalies accompanying the main malformation and therefore to assess the patient in the most complete possible manner.

POSTER PRESENTATIONS

Category: Echocardiography

1254 - CLINICAL COURSE DIAGNOSTIC AND SURGICAL APPROACHES IN PATIENTS DIAGNOSED WITH SITUS AMBIGUUS L LOOP VENTRICULAR ALIGNMENT AND INVERTED RELATIONSHIP OF GREAT ARTERIES (ALI)

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Background:
Situs ambiguus with L-loop ventricular alignment and inverted great arteries (ALI) is a rare and complex congenital condition frequently accompanied by diverse cardiovascular anomalies. Left atrial isomerism (polysplenia syndrome), interrupted IVC with azygos/hemiazygos continuation, and other heterotaxy-associated findings present significant diagnostic and surgical challenges. This study aims to evaluate the anatomical, clinical, and surgical characteristics of patients diagnosed with ALI.

Methods:
We retrospectively reviewed the data of 14 patients diagnosed with ALI between 2010 and 2024. Demographic characteristics, imaging findings (echocardiography, computerized tomography (CT), catheterization), and surgical procedures were analyzed. Anatomical assessments were performed by using the combination of echocardiography, CT, and intraoperative findings.

Results:
Among the 14 patients (7 males, 7 females), the median age and weight at admission were 3.5 months and 4.25 kg, respectively. The cardiac apex was right-sided in 64.3% of patients. All patients exhibited left atrial isomerism. The ventriculoarterial connection was concordant in 42.9%, double outlet right ventricle (DORV) in 42.9%, and double outlet left ventricle (DOLV) in 14.2%. Pulmonary venous return anomaly was observed in 6 patients; 2 had septum primum malposition. Hepatic venous drainage to the right atrium was seen in 50% of patients. Bilateral SVC was present in 9 patients. Surgical interventions included pulmonary artery banding, modified BTT shunt, Ventricular Septal Defect/Atrial Septal Defect closure, intracardiac baffle redirection, right ventricular outflow tract (RVOT) enlargement, pulmonary stenosis relief, and Kawashima operation. One patient underwent Glenn anastomosis. Two patients underwent single-ventricle palliation, while biventricular repair was planned for 12 patients. The median follow-up period was 12 months. No mortality occurred during follow-up.

Conclusion:
ALI patients demonstrate a wide range of anatomical variations and clinical courses, requiring tailored surgical strategies. Early-stage palliation followed by delayed definitive repair appears effective. Long-term follow-up and individualized planning are essential in managing this complex group.

POSTER PRESENTATIONS

Category: Echocardiography

1285 - A RARE CASE OF PERSISTENT LEFT SUPERIOR VENA CAVA WITH RETROGRADE FLOW AND ARTERIAL DOPPLER PULSATION

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Background / Hypothesis:

Persistent Left SVC (LSVC) is a common entity reported up to 0.5% of general population and is associated with congenital heart disease (CHD) in 3-10% of cases. LSVC usually drains into the coronary sinus (CS) with antegrade flow. There are reported cases with retrograde LSVC venous flow, in situations like associated CS defects, rarely atresia of CS ostium with or without associated anomalies like pulmonary venous anomalies or hemiazygos drainage. LSVC may also be confused with levoatrial cardinal ascending vein (LACV), decompressing vein that contrary to LSVC runs posteriorly to pulmonary artery.

Materials and Methods:
6-weeks-old complex CHD male infant presented with recurrent desaturations. The primary anatomy showed Double inlet left ventricle (DILV), VSD, hypoplastic right ventricle, transposed great vessels (TGA), unobstructed anterior aortic valve and sub-aortic large VSD, posterior smaller bicuspid pulmonary valve with moderate sub-pulmonary obstruction and PFO shunting right to left. The tricuspid valve (TV) was dysplastic, with moderate-severe regurgitation directed toward the CS. The mitral valve was patent without leak. The pulmonary veins were connecting to LA. There was dominant RSVC with retro-aortic innominate bridging vein and smaller LSVC towards CS, but unusual pulsatile retrograde flow was noted, which initially posed a diagnostic challenge.

Cardiac CT angiography confirmed the typical LSVC-CS connection and excluded additional anomalies as partial pulmonary venous connections or arterial aberrancy malformation.

On further analysing, the possible explanation for the retrograde pulsatile LSVC flow was the significant TV regurgitation jet direct towards CS.

Results:
The patient underwent successful surgery, including a right modified Blalock-Taussig shunt, TV repair, ligation of pulmonary artery and ligation of LSVC, with plans for a staged Glenn operation.

Conclusions:
While persistent LSVC is relatively common, retrograde pulsatile flow is rare and can be misdiagnosed. A careful echocardiographic evaluation including associated CHD abnormalities, haemodynamic and excluding other abnormalities by CT is essential for accurate diagnosis.

POSTER PRESENTATIONS

Category: Echocardiography

1295 - EVERYTHING IS NOT WHAT IT SEEMS SUBMITRAL VALVE ANEURYSM IN AN ADOLESCENT FILIPINO FEMALE

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Background / Hypothesis:
Submitral aneurysm is a rare condition with racial predilection and due to secondary inflammatory causes. There is separation of posterior mitral valve annulus from left ventricle, producing saccular outpouching at left ventricle(LV), which distorts mitral valve and subvalvular supporting apparatus, resulting in restriction of mitral valve leaflet motion, poor coaptation, and significant mitral regurgitation(MR). It occurs near the posterior mitral leaflet due to area of potential weakness, submitral membranous curtain. It presents as congestive heart failure with severe MR.
Echocardiography is primary modality, shows localized saccular bulge of mitral leaflet toward the left atrium, with systolic expansion and diastolic collapse, communicating with LV.
Treatment includes heart failure medications, and urgent surgical repair (repair of the aneurysm and MV repair or replacement).
This case report presents a 14-year old adolescent, diagnosed using 2D, 3D transthoracic and trans-esophageal echocardiography with 3D.

Materials and Methods:

Results:
A 14-year old, female, arrived due to difficulty of breathing, with two-year history of easy fatigability, orthopnea, palpitations and abdominal pain. She was initially diagnosed RHD and IE however no improvement hence repeat echocardiography, and showed redundant posterior mitral valve leaflets bulging towards LA in systole, collapses in diastole, communicating with LV, signifying submitral aneurysm, with rupture to LA. Trans-esophageal echocardiography confirmed diagnosis, showing non-thickened MV leaflets, tethered, redundant posterior mitral valve leaflet, with saccular outpouching bulging to LA, defect measuring 0.8 cm, with regurgitant flow to LA during systole, occupying almost whole LA. Underwent MV replacement with bioprosthetic valve and submitral aneurysm repair. Histopathology of MV leaflet showed chronic rheumatic valvulitis hence continued RHD prophylaxis.

Conclusions:
Submitral aneurysm on echocardiography shows redundant posterior mitral valve leaflet, and saccular outpouching bulging to LA. A good description of the valves, its apparatus, and motion during cardiac cycle is necessary to arrive at correct diagnosis and give urgent management.

POSTER PRESENTATIONS

Category: Echocardiography

1323 - EVALUATION OF LEFT VENTRICULAR FUNCTIONS BY SPECKLE TRACKING ECHOCARDIOGRAPHY IN PEDIATRIC PATIENTS AFTER SUCCESSFUL REPAIRED AORTIC COARCTATION.

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Background / Hypothesis:
This study aimed to use 2D-STE to assess left ventricular strain and non-invasive myocardial work in pediatric patients after successful repaired coarctation of the aorta (rCoA).

Materials and Methods:
Patients under 18 years old with rCoA who underwent an echocardiogram 2022 -2024 at our clinic. Patients who had significant differences in blood pressure between the upper and lower extremities, mean pressure gradient at isthmus higher than 20 mmHg, and there are significant valve disease, pacemaker, or other congenital heart diseases (except bicuspid aortic valve and patent ductus arteriosus) were excluded. Global longitudinal strain with 2D-STE analysis and Myocardial work (MW) were obtained GLS value was compare with the normal GLS in healthy children (mean LV GLS was –20.2% (95% CI, –19.5% to –20.8%)1. Quantification of MW was performed using GE Vivid system and available software package (ECHOPAC v.206), and the details of MW were compared with a normal range in parameter pediatric age2.

Results:
34 patients included with median age 50.0(19.0–101.0) months, 70.6% males and median 19.0(9.0 – 59.0)months after surgery. 55.9%hypertension and 20.6% elevated blood pressure. 50% concomitant bicuspid aortic valve. After rCoA had normal LVEF by Teicholz 71.5± 4.8(64.0– 82.0) and Simpson biplane 61.7±2.4 (57.0 – 72.0). The GLS is -19.6±1.7 % in the range of healthy children (-19.5 to -20.8%); 47.1% in the borderline (-16.5% to -19.5%) and different between hypertension and normotension -19.3± 1.7% and -20.6 ± 1.3%), p=0.058. The MW components, interestingly, rCoA 94.1% GCW and 32.3% GWI lower than the healthy group. 70.6% increasing GWW, especially in hypertension, higher GWW than the normotension (123.1± 34.7 mmHg% and 74.4± 12.4 mmHg%, p<0.001). The GWE becomes preserved to low (93.8± 1.7%).

Conclusions:
After successful rCoA, the lower GCW, GWI, and preserved GWE, although LVEF and GLS are normal in pediatrics in our study.

POSTER PRESENTATIONS

Category: Echocardiography

1325 - REFINING DECISION MAKING IN RIGHT DOMINANT UNBALANCED ATRIOVENTRICULAR SEPTAL DEFECT TO OPTIMIZE SURGICAL RESULTS.

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Background / Hypothesis:
Unbalanced forms of atrioventricular septal defect continue to be challenging and present poor surgical outcomes. Several anatomic features must be evaluated at different levels to predict outcomes of surgical repair. Our purpose is to introduce a new echocardiographic metric and combine it with already validated indexes into a single geometric model with the ability to guide surgical decision-making.

Materials and Methods and results:
Our geometric model is completed including the evaluation of the left ventricular inflow. A new metric called “indexed secondary annulus” is defined as the ratio between the true entrance to the left ventricle and total atrioventricular valve diameter. We describe the equations that help explain the interplay between the main echocardiographic variables and set precise limits to each parameter based on risk of mortality.

Conclusions:
Stratified echocardiographic evaluation is useful to identify the most appropriate surgical strategy. Degree of unbalance at the atrioventricular valve is used as first level of stratification. Then, size of the VSD and obstruction at left ventricular inflow are assessed. One-stage biventricular repair can be achieved with low risk of mortality only in those cases displaying the proper combination of values of the different indexes. Univentricular palliation is recommended in presence of severe unbalance, obstruction at left ventricular inflow that cannot be relieved or a too large ventricular septal defect. If left ventricular inflow derangements are identified, efforts must be made to relieve obstruction and achieve biventricular repair. This strategy might also be attempted as a staged approach in selected cases.

POSTER PRESENTATIONS

Category: Echocardiography

1330 - EXPLORING INTERACTIONS OF LEFT ATRIAL STRAIN AND CONVENTIONAL DIASTOLIC FUNCTION PARAMETERS IN PEDIATRIC CARDIOMYOPATHIES

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Background / Hypothesis:
Left ventricular diastolic dysfunction (DD) in cardiomyopathy, is associated with poor outcomes but is often diagnosed late. Echocardiographic left atrial (LA) strain as a marker of diastolic dysfunction in pediatric cardiomyopathy has not been evaluated. Our goal was to determine whether LA strain is abnormal in pediatric patients with cardiomyopathy and explore its association with conventional diastolic parameters.

Materials and Methods:
The study included pediatric patients (ages 0-18 years) with primary cardiomyopathy, with restrictive cardiomyopathy (RCM) serving as a model for diastolic heart failure. Functional echocardiographic measurements and speckle-tracking analysis were conducted until the last reported follow-up or censoring event (mechanical circulatory support, heart transplant or death). Diastolic function parameters were compared across cardiomyopathy subtypes (Table 1), and associations with LA strain were evaluated using Spearman's correlation test.

Results:
The study included 317 children with primary cardiomyopathy (mean age 10.3±6.4 years); 111 with hypertrophic, 175 with dilated, 10 with arrhythmogenic cardiomyopathy, and 21 with RCM. Compared to reference ranges and other cardiomyopathies, RCM patients had significant LA dilation with higher LA diameter z-score (3.1±1.7) and indexed LA volume (LAVi) (68.5±36.1 ml/m^2), higher mitral E/A ratio (2.7±1.1), and lower mitral deceleration time (112±43 msec) ($p<0.001$). LA strain was markedly lower in RCM patients, during the reservoir phase (13.6±9.3%) and conduit phase (9.1±7.1%) compared to other cardiomyopathies and reference ranges ($p<0.001$). Strong inverse correlations were observed between the reservoir phase LA strain and LAVi ($r=-0.46$, $p<0.001$), as well as with the average E/e' ($r=-0.51$, $p<0.001$).

Conclusions:
LA strain is significantly reduced in pediatric patients with RCM and correlates with average E/e' and LAVi. Further studies are needed to determine if abnormal LA strain precedes the development of LA dilation and other diastolic abnormalities as an early marker of LV diastolic dysfunction.

POSTER PRESENTATIONS

Category: Echocardiography

1347 - UTILITY OF THREE DIMENSIONAL ECHOCARDIOGRAPHY FOR EVALUATING VENTRICULAR SIZE AND FUNCTION AND MYOCARDIAL DEFORMATION IN REPAIRED TETRALOGY OF FALLOT A COMPARATIVE ANALYSIS OF ECHOCARDIOGRAPHY AND CARDIOVASCULAR MAGNETIC RESONANCE IMAGING

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Background / Hypothesis:
Repaired Tetralogy of Fallot (rTOF) patients have long-term sequelae affecting right ventricular (RV) and left ventricular (LV) function. The global longitudinal strain (GLS) value provides valuable insights into subclinical myocardial dysfunction. This study aims to compare ventricular size and functional parameters using two and three-dimensional (2D and 3D) echocardiography and cardiovascular magnetic resonance imaging (CMR)

Materials and Methods:
This retrospective study enrolled children and adults with rTOF who underwent an echocardiogram and CMR the same day. LV and RV, global longitudinal strains (GLS) values were recorded by 2D and 3D echocardiography and CMR. Pearson correlation was used to assess the relationship between cardiac parameters. Parameters from echocardiogram and CMR were also assessed for their ability to discriminate patients with RVEF < 48% using the area under the receiver operating characteristic

Results:
We included 30 patients (age 18.2 ±6.3years, 70% (21/30) male). TOF with pulmonary stenosis was common (86.7%). Total correction with the transannular patch was found in 76.7%.
The RV size by 3D echocardiography was significantly smaller than by CMR but had strong correlation (RVEDVi 133.2 ±37.5 VS. 142.1 ± 37.7, P < 0.001, r = 0.93; RVESVi 69.2 ±23.5 VS. 72.1 ±24.0, P 0.120, r = 0.91). Two-dimensional RV GLS by echocardiography values were lower than 3D GLS values. Two-dimensional RV and LV GLS values by CMR were higher than 3D GLS values. The patients with the RV dysfunction group had lower 2D and 3D RV-GLS values by echocardiography and CMR and lower 2D and 3D LV-GLS values by CMR than the normal RV systolic function group (P <0.005).

Conclusions:
2D and 3D RV GLS assessments by echocardiography can be considered for routine f/u of rTOF patients. 2D biventricular GLS parameters by echocardiography and CMR have a good ability to discriminate RV systolic dysfunction

POSTER PRESENTATIONS

Category: Echocardiography

1382 - DOUBLE CHAMBERED LEFT VENTRICLE FROM CLINICAL TO BASIC

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Background / Hypothesis:
Double-chambered left ventricle (DCLV) is a particularly rare congenital cardiovascular malformation that is difficult to diagnose. It is characterized by the subdivision of the left ventricle into two chambers by an abnormal septum or muscle band. Compared to double-chambered right ventricle (DCRV), DCLV is an extremely rare anomaly with few cases having been previously reported.

Materials and Methods:
From January 2012 to November 2023, 12 patients, including five males and seven females, ranging from 2 to 41 years, were diagnosed with DCLV using echocardiography in our hospital. The clinical manifestations included cyanosis, cough, fatigue, palpitations, and dyspnea. Physical examination revealed tachypnea, decreased breath sounds, and wheezing. Cardiac examination revealed enlarged heart borders, decreased heart sounds, and grade 3/6 systolic ejection murmurs in the left 3–4th intercostal space.

Results:
All patients underwent chest radiography, electrocardiogram, and echocardiography; nine patients underwent cardiac magnetic resonance imaging (CMRI). Among the patients in this group, one died of multiple organ failure 1 year after the diagnosis. The remainder was followed up at our hospital. Familial aggregation was observed in these cases. Five individuals in the family were diagnosed with DCLV. We discovered a novel rare variant of MYH7, the causative gene for several heart diseases, in the patients from this family.

Conclusions:
DCLV is a rare cardiac disease in which the LV is divided
into two chambers. Echocardiography plays an important role in the diagnosis of DCLV and in differentiating it from other diseases. This is the first report of familial DCLV and identification of MYH7 as its genetic cause. Additionally, our results provide useful information of MYH7-associated diseases.

POSTER PRESENTATIONS

Category: Echocardiography

1387 - A RARE ANOMALY A CASE REPORT OF A LARGE POSTERIOR PERICARDIAL CYST IN A 5 YEAR OLD BOY

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Background / Hypothesis:
Pericardial cysts are rare congenital lesions with incidence of 1 in 100,000. Commonly found in the third to fourth decades of life, rarely in paediatrics, with equal occurrence rate in genders. Most commonly located in the right cardiophrenic angle measuring between 1 to 5cm. Most are asymptomatic however can present as cough, dyspnoea, chest pain. They are usually managed with close surveillance, rarely requiring intervention.

Materials and Methods:
We present a 5 year old boy presenting with a three week history of cough alongside a new murmur. Echocardiogram showed a large posterior, circumscribed pericardial collection around the left ventricle, impinging on left ventricular function and causing moderate mitral regurgitation. Extensive blood work negative except for ASOT 400 (units). CXR showed cardiomegaly, CT chest revealed a large pericardial cystic lesion measuring 5.5cm x 8.8cm x 5.3cm. Cardiac MRI confirmed a large cyst measuring 5.2cm x 8.7cm x 6.4cm positioned along the left lateral aspect of the mediastinum within the pericardial layers showing mass effect on left ventricular wall.

Results:
The cyst was successfully drained - percutaneously and a pericardial drain insertion. Pericardiodesis was performed 24 hours later. Following drain removal there was a 6mm residual cyst. Eight days later echocardiogram showed a large 28mm pericardial cyst. This was conservatively managed and had regressed to 13mm 6 weeks later. Echocardiogram 15 months later showed no reaccumulation, mild mitral regurgitation and good function.

Conclusions:
Pericardial cysts are rare in paediatrics, with diagnosis usually made by CT/MRI. Management depends on clinical symptoms alongside cyst location. Majority of cysts spontaneously regress however require echocardiography follow up.

POSTER PRESENTATIONS

Category: Echocardiography

1402 - USE OF PORTFOLIO TO EVALUATE EXPOSURE TO ECHOCARDIOGRAMS IN PEDIATRIC CARDIOLOGY FELLOWS DURING THE PANDEMIC

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P. Universidad Católica De Chile, Pediatric Cardiology, Santiago-Chile [1]

Background:
Portfolios are valuable for assessing fellows' exposure to procedures. The AHA recommends 250 surface echocardiograms in pediatric cardiology training. The COVID-19 pandemic may have reduced this exposure due to restrictions. This study aimed to investigate the exposure to echocardiograms among pediatric cardiology fellows during the pandemic versus non-pandemic years.

Methods:
A longitudinal, non-concurrent cohort study analyzed echocardiograms performed by 17 pediatric cardiology fellows (2015-2024) using Portfolio data. We recorded the number, setting (in/outpatient), patient age, diagnosis, saturation, and sedation use to assess complexity. Pandemic periods were defined as April-August 2020 (reduced attendance) and March-July 2021 (quarantine). Non-parametric statistics, specifically Mann-Whitney U tests, compared pandemic (n=6) versus non-pandemic (n=11) fellow groups for exam volume and complexity.

Results:
The median number of echocardiograms per fellow was 365 (range 234-452). Among all the echocardiograms, 16% were performed on newborns, 39% in inpatient settings, and 12% due to suspected heart murmurs. All fellows except one met (non Pandemic group) the AHA's requirement. The median number of echocardiograms performed by pandemic fellows was 376 (IQR 350-417), compared to 362 (IQR 234-452) for non-pandemic fellows (p=0.40). There were no significant differences in patient age or complexity distribution, except for Fontan patients. Pandemic fellows had significantly greater exposure to Fontan circulation studies (median 11, IQR 9-13) compared to non-pandemic fellows (median 5, IQR 4-11, $p<0.01$) (Table 1).

Conclusion:
Most fellows met the AHA's echocardiogram requirements, unaffected by the pandemic. Portfolio data effectively quantified exposure and complexity, demonstrating a well-balanced experience and highlighting program strength.

POSTER PRESENTATIONS

Category: Echocardiography

1420 - SHOULD WE TREAT PATENT DUCTUS ARTERIOSUS IN EXTREMELY PREMATURE NEWBORNS

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Background / Hypothesis:
Patent ductus arteriosus in premature infants has been associated with various complications in the neonatal period. Pharmacological treatment is frequently used, either electively or prophylactically, occasionally requiring surgical or interventional closure. Echocardiography has been increasingly used in neonatology to guide the hemodynamic management of various pathologies, including ductus arteriosus. The objective of this study was to define the percentage of pharmacological and surgical closure of the ductus arteriosus in extremely premature newborns (<32 weeks and/or <1500 g) over the past five years.

Materials and Methods:
Echocardiography record databases from the Neonatal Unit of Barros Luco Hospital (tertiary center) were reviewed from 2020 to 2024. The use of prophylactic indomethacin, pharmacological therapy and the drug employed, as well as the number of patients with surgical or interventional closure were described. Hemodynamic significance was defined in echocardiogram as patients with an LA/Ao ratio >1.5; Left Ventricle Cardiac Output >350 ml/kg/min and absence or reversal of flow in the mesenteric artery.

Results:
In the years studied, it was found that between 2020 and 2024, 588 premature infants were born <1500 grams and/or 32 weeks. All underwent an echocardiogram between 48 and 72 hours of life. Of the total, only 36 (6,1%) patients were treated pharmacologically. None of them used prophylactic indomethacin. All were treated with paracetamol. Of this group, only 3 (0,5%) required surgical closure. At the same time, the rates of bronchopulmonary dysplasia and mortality did not show significant changes.

Conclusions:
The use of prophylactic indomethacin has been discontinued for several years, and the proportion of patients currently receiving drug therapy or surgical closure for ductal closure is extremely low, raising the real need to actively pursue closure. Conservative management appears to be a reasonable alternative with no evidence of increased complications associated with prematurity or mortality.

POSTER PRESENTATIONS

Category: Echocardiography

1422 - MYHRE SYNDROME ECHOCARDIOGRAPHIC DELINEATION OF THE CARDIOVASCULAR PHENOTYPE

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Background / Hypothesis:
Myhre syndrome is an ultrarare syndrome caused by recurrent gain-of-function mutations in SMAD4 and characterized by short stature, dysmorphic facies, stiff joints, neurodevelopmental disabilities, and cardiovascular features including aortic hypoplasia, pericardial disease, and restrictive cardiomyopathy. We report our institutional experience of Myhre syndrome patients with associated transthoracic echocardiographic (TTE) findings.

Materials and Methods:
Myhre syndrome is an ultrarare syndrome caused by recurrent gain-of-function mutations in SMAD4 and characterized by short stature, dysmorphic facies, stiff joints, neurodevelopmental disabilities, and cardiovascular features including aortic hypoplasia, pericardial disease, and restrictive cardiomyopathy. We report our institutional experience of Myhre syndrome patients with associated transthoracic echocardiographic (TTE) findings.

Results:
Median age at time of first TTE was 8 years of age (range 2-51y). Eleven of 23 (48%) subjects demonstrated at least mild aortic annular hypoplasia, with 26% (4/15) demonstrating at least mild transverse arch hypoplasia. One-third (7/21) of subjects had borderline to mildly diminished left ventricular (LV) end-diastolic dimensions (7/21) as well as half (10/20) having increased lateral mitral E wave velocities. Five of 23 subjects had borderline abnormal LV measurements by the Chin criteria for non-compaction appearance. There were no significant abnormalities in systolic or diastolic function, hypertension, pulmonary venous velocities, or aortic velocities measured in the subjects.

Conclusions:
The cardiovascular abnormalities associated with Myhre syndrome span structural abnormalities in congenital heart disease to progressive disease including aortic hypoplasia and restrictive cardiomyopathy. Observed aortic outflow hypoplasia and diminutive LV size are consistent with the restrictive nature of left sided structures in the condition, expanding our understanding of cardiac anomalies in patients with Myhre syndrome. Ongoing echocardiographic surveillance may be an important aspect of cardiac care for the condition.

POSTER PRESENTATIONS

Category: Echocardiography

1482 - THE PREDICTIVE VALUE OF ELECTROMECHANICAL WINDOW IN DIFFERENTIATION OF LONG QT SYNDROME

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Background / Hypothesis:
Congenital Long QT (LQT) syndrome is a life-threatening disease. The differentiation of LQT syndrome from other acquired LQT syndrome is a challenge. Electromechanical window (EMW) is reported to be a valuable index for risk stratification of LQT syndrome. This study aims to explore the predictive significance of EMW in congenital LQT syndrome.

Materials and Methods:
This is a case-control study. Eleven patients with congenital LQT syndrome as case group and 4 patients with acquired LQT syndrome as control group were recruited. EMW was calculated as the temporal difference between the QT interval (electrical systole) and left ventricular outflow ejection time (mechanical systole) by echocardiography. The EMW and clinical data, including the presence of QT interval prolongation and its implications for Long QT Syndrome (LQTS), were compared between the two groups.

Results:
There were 6 patients with LQT1 and 5 with LOT2 in the case group, while 2 with hypokalemia and 2 with bradycardia in control group. The EMW of case group was significantly negative than those of control group ($p<0.05$). In the case group, the EMW in patients with LQT2 was more negative than those with LQT1 ($p<0.05$). The EMW was negative associated with QTc interval and Schwartz score($p<0.05$).

Conclusions:
The EMV could potentially serve as a diagnostic tool for differentiating between congenital and acquired forms of long QT syndrome. The patients with LQT2 may have more obvious electromechanical mismatch.

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1509 - ANALYSIS OF VENTRICULAR AND CLINICAL OUTCOME OF NOVEL TERTIARY COHORTS USING A DISCRIMINATORY CALCULATOR FOR PULMONARY ATRESIA WITH INTACT VENTRICULAR SEPTUM

Edward Justo [1], Adrian Tarca [2], Andrew Osborne [3], Katie Maslin [1], Scott Harris [2], Elizabeth Mckinnon [4], Robert Justo [3], *Deane Yim* [1]
Perth Children, Paediatric Cardiology, Perth-Australia [1] Starship Hospital, Paediatric Cardiology, Auckland-New Zealand [2] Queensland Children, Paediatric Cardiology, Brisbane-Australia [3] The Kids Research Institute, Biostatistics, Perth- [4]

Background / Hypothesis:
A discriminatory echocardiographic calculator developed using a Western Australian (WA) pulmonary atresia with intact ventricular septum (PAIVS) cohort had a specificity of 93% and sensitivity of 96% in identifying biventricular surgical management, when using a combined right to left ventricular length ratio and tricuspid to mitral valve annulus ratio at birth. We aimed to describe PAIVS tertiary cohorts within Australasia, from the Queensland Children's Hospital (QCH) and Starship Hospital and evaluate the calculator in identifying surgical management pathway.

Materials and Methods:
Children born within Queensland between June 2006 and June 2022; and in New Zealand between January 2007 and May 2024 with a diagnosis of PAIVS were analysed. Demographic, echocardiographic and clinical data were collated at birth and latest follow up.

Results:
109 patients were included for analysis. Total mortality was 18.2% (n=20) with 8 cases of early mortality. 31.8% of patients had right ventricular dependent coronary circulation (RVDCC; n=35), and 17.2% had absent tricuspid regurgitation (n=19). These patients all proceeded to univentricular palliation. 10.9% of surviving patients achieved biventricular circulation (n=12) and 89.1% required either univentricular or one-and-a-half ventricular palliation (n=98). Patients within the New Zealand biventricular cohort had significantly lower right ventricular to left ventricular length ratios (p=<0.001). The calculator had 95% specificity and 33.3% sensitivity in identifying a biventricular outcome, noting that with only 12 patients achieving biventricular repair, sensitivity was susceptible to the low volume of cases.

Conclusions:
In a cohort with comparable outcomes, absent tricuspid regurgitation and RVDCC remained exclusionary to biventricular repair. The WA cohort-based calculator had specificity of 95% in identifying biventricular management of PAIVS patients, but poor sensitivity, potentially due to increased distributional variation between cohorts limiting diagnostic accuracy.

POSTER PRESENTATIONS

Category: Echocardiography

1528 - EARLY ECHOCARDIOGRAPHIC DIFFERENCES BETWEEN PATIENTS WITH TETRALOGY OF FALLOT UNDERGOING SURGICAL PALLIATION AND PRIMARY REPAIR A TWENTY YEAR REVIEW.

Darren Tan [1], Hayley Sadler [1], Katie Maslin [1], Elizabeth Mckinnon [2], Siyang Zhang [1], Cameron Seaman [1], Jelena Saundankar [1], Deane Yim [1]
Perth Children, Paediatric Cardiology, Perth-Australia [1] Telethon Kids Institute, Telethon Kids Institute, Perth-Australia [2]

Background:
Patients with tetralogy of Fallot (TOF) are at risk of hypercyanotic episodes due to significant right ventricular outflow tract (RVOT) obstruction. An aortopulmonary shunt such as the modified Blalock-Taussig-Thomas shunt, may be required as an interim, palliative procedure prior to complete repair. Identifying patients who may require palliation aids in counselling and optimising monitoring. Our objective was to identify echocardiographic measurements that predicted the clinical need for an interim shunt.

Materials and Methods:
All patients with TOF from 2003 to 2023 were reviewed. Patients who underwent aortopulmonary shunt placement were compared to those who had primary repair.
The echocardiogram prior to the shunt procedure (median age 16 days, IQR 25,50) and comparatively timed echocardiograms in patients undergoing primary repair (median age 40 days, IQR 31,53) were analysed. An age-adjusted multivariate logistic regression model was used.

Results:
A total of 119 patients met the inclusion criteria. Forty-four patients had an aortopulmonary shunt (median age 43 days, IQR 16.5, 80) and 75 patients had primary repair (median age 195.5 days, IQR 132.75, 282). The group that required an interim shunt had an increased infundibular length to RVOT intraluminal dimension ratio, compared to the non-shunted group (2.01 vs 1.30, p=0.002). The shunted group also had an increased end-diastolic anterior RVOT to end-systolic RVOT intraluminal dimension ratio, compared to non-shunted patients (6.66 vs 4.50, p<0.001). This parameter was found on multivariate logistic regression to be an independent predictor for shunt placement (OR 1.69, 95% CI 1.25 – 2.47, p=0.003).

Conclusions:
Identifying echocardiographic parameters that predict the need of an interim shunt due to hypercyanotic episodes, holds significant clinical value. We found that the ratio between end-diastolic anterior RVOT versus end-systolic RVOT intraluminal dimensions independently predicted the need for an interim shunt. Early prediction can help guide frequency of monitoring for high-risk patients likely to require surgical palliation.

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Category: Echocardiography

1539 - CHANGES IN LEFT VENTRICULAR DIASTOLIC FLOW DYNAMICS IN THE NEONATAL TRANSITION PERIOD AND BEYOND

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Norwegian University Of Science And Technology (ntnu), Department Of Circulation And Medical Imaging, Ålesund-Norway [1] The Hospital For Sick Children, Cardiology, Toronto-Canada [2]

Background / Hypothesis:
Assessment of intracardiac flow dynamics can enhance knowledge and comprehension of the hemodynamic changes during neonatal transition and further maturation of the cardiovascular structures. Blood speckle tracking (BST) echocardiography permits non-invasive assessment of left ventricular (LV) flow dynamics. In this study we describe qualitative and quantitative evolvement of LV inflow dynamics in healthy infants in early life using BST.

Materials and Methods:
Healthy term newborns were prospectively enrolled and studied at five timepoints from birth until six months of age (Table 1). Apical four-chamber BST images were acquired using a clinical ultrasound-scanner with research software. Analysis of diastolic kinetic energy (KE), energy loss (EL), vorticity (VO) and intraventricular pressure difference (IVPD) were performed using a custom-made analysis software.

Results:
Mean birth weight and gestational age in the 36 babies were 3531 ± 371 g and 40.3 ± 1.2 weeks respectively. Analysis of 177 BST acquisitions demonstrated feasibility of quantitative LV flow dynamics of 99.4%. IVPD, reflecting early diastolic suction, increased significantly between all examinations one to five (Table 1). KE, EL, and VO increased significantly from birth until six-eight weeks of age while no further significant change in these parameters was detected beyond six-to-eight weeks (Table 1). Diastolic vorticity was predominantly located at the anterior mitral valve leaflet until six-eight weeks of age. At six months of age, vorticity was similar at the anterior and posterior mitral valve leaflet.

Conclusions:
Non-invasive assessment of LV flow dynamics using BST is highly feasible in infants. LV flow dynamics describes changes in cardiac physiology contributing to normal postnatal cardiovascular adaption, maturation and function. IVPD increases significantly both during transition and with further maturation suggesting the impact from multiple factors on the evolvement of suction in early life.

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1547 - BEHAVIOR OF DIFFERENT ECHOCARDIOGRAPHIC CARDIAC STRUCTURES AND Z SCORES NOMOGRAMS ACCORDING TO NUTRITIONAL STATUS IN PEDIATRIC PATIENTS

Guillermo Larios [1], Claudia Trincado [1], Rodolfo Amstein [1], Metcalfe Valentina [1]
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Background:
Accurate interpretation of cardiac structure (CS) size and growth in children via echocardiography relies on Z-score nomograms. The obesity epidemic may impact the behavior of these Z-scores. This study aims to assess the behavior of echocardiographic Z-scores in children as influenced by nutritional status (NS).

Methods:
A retrospective, single-center observational study was conducted from 2016-2021 on 1882 children aged 5-18 years (55.2% male) with structurally normal echocardiograms and no genetic conditions. CS diameters, including left ventricular end-diastolic dimension (LVEDD), left atrium (LA), valve annuli, and aortic root, were measured. Z-scores were calculated using the Italy, Pediatric Heart Network (PHN), Detroit, and Toronto nomograms. NS was classified using WHO Body Mass Index Z-scores (zBMI) into underweight, normal weight, overweight, and obese. Linear and multinomial log-linear models compared Z-scores across NS groups.

Results:
Of the 1882 children, 485 (25.8%) were overweight, and 297 (15.8%) obese. No age differences were observed across NS groups. Significant differences in Z-scores were found across NS groups for all CS. All absolute diameters of the evaluated CS increased significantly with increasing excess malnutrition ($p < 0.001$). Weak positive correlations were observed between all CS diameters and zBMI (Pearson correlation coefficients from 0.140 to 0.343 for LA). Significant differences in Z-scores were found across NS groups for all assessed CS. Specifically, for LVEDD, LA, valves annuli, and aortic root, differences emerged depending on the nomogram used. There is an association of Z-Score as zBMI increases in LVEDD, valve annuli, and aortic root Z-Scores, with B values between -0.16 and -0.29, $p < 0.001$.

Conclusion:
Nutritional status significantly influences echocardiographic Z-scores in children, with variations observed across different nomograms. The choice of nomogram impacts the interpretation of CS measurements across nutritional categories. This highlights the importance of considering NS and nomogram selection in pediatric echocardiography.

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1550 - ULTRASONIC CLASSIFICATION DIAGNOSIS OF KAWASAKI DISEASE COMPLICATED WITH CORONARY ANEURYSMS BASED ON CBAM ALEXNET

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Background / Hypothesis:
Early diagnosis and treatment for kawasaki disease complicated with coronary aneurysms(KDCA) are crucial for the progression and severity of the disease. Transthoracic echocardiography plays a crucial role in the diagnosis of KDCA, but it is easy to be affected by the level of technical personnel, equipment. At present, the application of artificial intelligence technology in the medical field is also increasing, this objective of this research is to investigate the feasibility of KDCA ultrasound image classification diagnosis based on the fusion of the Convolutional Block Attention Module(CBAM) and AlexNet for improving the insufficient diagnostic effect of the traditional diagnosis method under the influence of noise interference and human factors.

Materials and Methods:
Materials: The selected cases' echocardiography images were collected by qualified ultrasound physicians from Fudan University Affiliated Children's Hospital. A total of 500 images are used as the research materials, including 250 images of KDCA and 250 images of normal coronary arteries.

Methods:
Firstly, the research materials are divided as the training set and the test set according to 80% and 20% respectively. Next, the Convolutional Block Attention Module is designed to be embedded in the network AlexNet for extracting the spatiotemporal and channel characteristics of CAA in the ultrasound images. Then, the KD classification diagnosis models based on CBAM-AlexNet, AlexNet, LeNet, VGG16, ResNet-18, ResNet-50, Swin-Transformer network are trained for the best KDCA classification diagnosis. Finally, the optimal diagnostic model is identified by five metrics, including accuracy, precision, sensitivity, F1-score, and Youden's index.

Results:
Compared to ALexNet, LeNet, VGG16, ResNet-18, ResNet-50, and Swin-Transformer, the CBAM-AlexNet-based diagnosis model achieves the best classification results (93% accuracy) for ultrasound images of KDCA. In addition, the model demonstrates marked performance across the other four evaluation metrics.

Conclusions:
The ultrasonic classification diagnosis of Kawasaki disease complicated with coronary aneurysms based on

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1560 - A COMPARATIVE STUDY TO EVALUATE RADIATION EXPOSURE IN PATENT DUCTUS ARTERIOSUS DEVICE CLOSURE BY CONVENTIONAL METHOD AND ECHOCARDIOGRAPHY GUIDED METHOD AN EXPERIENCE FROM EASTERN INDIA

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Background / Hypothesis:
Patent ductus arteriosus (PDA) accounts for 5–10% of congenital heart defects, with a symptomatic prevalence of 0.5 per 1,000 live births. While percutaneous PDA device closure offers early discharge and fewer anesthesia-related complications, it typically involves radiation exposure. Utilizing transthoracic echocardiography (TTE) during transcatheter PDA closure can minimize radiation exposure, procedural time, and complications from femoral arterial access.
Purpose:
i) To compare radiation exposure and procedural time between TTE-guided PDA device closure with minimal fluoroscopy (case) and the conventional fluoroscopy-guided method (control).
ii) To evaluate complications in both groups.

Materials and Methods:
A single-center, prospective randomized case-control study was conducted on 106 children aged 6 months to 12 years, undergoing PDA device closure from July 2018 to January 2020. The first patient was selected through lottery who underwent the procedure under echocardiographic guidance with minimal fluoroscopy use and thereby every alternate patient was selected as case (n=51). 51 patients underwent closure following the conventional method(control). Four patients in the case group requiring aortograms were excluded. Both groups were matched for age and other baseline characteristics. A six-month postoperative follow-up was performed.

Results:
Patients were equally distributed in both groups. The TTE-guided group demonstrated significantly lower procedural time, fluoroscopy duration, and radiation dose (total kerma, dose area product and dose area product/kg) compared to the control group. The minimum values recorded in the case group were 43 seconds of fluoroscopy, 1 mGy radiation, and a 20-minute procedure. Only one complication, groin hematoma occurred in the control group which was conservatively managed.

Conclusions:
In both the groups the patient characteristics, defect size and device used was comparable. TTE-guided PDA device closure is safe, effective, and significantly reduces fluoroscopy time, procedural duration, and radiation exposure. It also avoids the use of contrast and prevents arterial access complications, making it a preferable alternative to the conventional approach.

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1566 - INTERVENTIONAL NUTRITIONAL REHABILITATION REGIMEN IMPACT ON MYOCARDIAL FUNCTION INDICES IN INFANTS WITH INTER VENTRICULAR SEPTAL DEFEC (VSD)T

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Background / Hypothesis:
VSD is the commonest congenital cardiac malformations .Nutrition is crucial in the treatment of VSD. It's one of the most important factors affecting patients' recovery after surgery

Materials and Methods:
A cohort study including 100 infants aged 0-6 months old diagnosed with VSD,at pediatric cardiology department at Cairo University Specialized Children Hospital(14 infants had large VSD were excluded as they couldn't adhere to the outpatient nutrition regimen)
Infants were assessed by thorough cardiac and nutritional history, Full clinical examination including anthropometric measurements and their myocardial function was assessed by Tissue Doppler Echocardiography before and after our high caloric nutritional intervention for 3 months duration

Results:
Study revealed significant reduction of VSD size and pulmonary artery pressure, improvement of both left and right ventricular systolic and diastolic function as well as significant improvement of anthropometric measurements

Conclusions:
Improvement of the quantitative and qualitative nutritional regimen received by VSD infants has great positive effect on their cardiac function, VSD size,pulmonary artery pressure as well as their growth parameters (weight and length for age, BMI, & head circumference) that will surely have great effect on their postoperative recovery

POSTER PRESENTATIONS

Category: Echocardiography

1614 - VENA CONTRACTA TO MITRAL ANNULUS DIAMETER RATIO A NOVEL PARAMETER FOR ASSESSING MITRAL REGURGITATION SEVERITY IN PEDIATRIC PATIENTS

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Background / Hypothesis:
Mitral regurgitation (MR) in the pediatric population presents a diagnostic challenge due to the lack of validated, age specific criteria. While vena contracta (VC) is a commonly used parameter in adults, its direct application in children is limited. This study proposes the use of the vena contracta to mitral annulus diameter ratio (VC/MA) as a feasible and accurate tool to classify MR severity in pediatric patients, potentially overcoming the limitations of conventional methods.

Materials and Methods:
A cross sectional diagnostic accuracy study was conducted at a national pediatric cardiology referral center in Mexico. A total of 146 patients aged 0 to 18 years with echocardiographic diagnosis of moderate or severe MR were included. The VC/MA index was calculated and compared with established quantitative parameters: regurgitant volume (RV), regurgitant fraction (RF), and effective regurgitant orifice area (EROA), all indexed to body surface area. Receiver operating characteristic (ROC) curves were used to assess diagnostic performance, and cut-off values were established according to the presence or absence of mitral annular dilation. Logistic regression was applied to identify variables associated with severe MR, including Z-scores for left heart chamber volumes and pulmonary artery systolic pressure.

Results:
The VC/MA index demonstrated good overall discriminative capacity (AUC = 0.72), with improved performance in non-dilated annuli (AUC = 0.82; cut-off: 0.20) compared to dilated annuli (AUC = 0.74; cut-off: 0.16). It correctly classified 83% of severe and 79% of moderate cases. Significant correlations were observed with RV ($\rho = 0.22$), RF ($\rho = 0.29$), EROA ($\rho = 0.32$), left ventricular volume ($\rho = 0.22$), and left atrial volume ($\rho = 0.29$). Optimal thresholds were identified for RV (70 ml/m^2, AUC = 0.73) and RF (78%, AUC = 0.65).

Conclusions:
The VC/MA index offers a reliable, anatomically adjusted tool to improve MR severity stratification in pediatric practice.

POSTER PRESENTATIONS

Category: Echocardiography

1615 - COMPARISON OF 3D ECHOCARDIOGRAPHIC VENTRICULAR VOLUME AND FUNCTION WITH CARDIAC MRI IN PATIENTS WITH CONGENITAL HEART DISEASE

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Background:
Accurate measurement of ventricular volume and function is crucial for determining treatment indications and evaluating therapeutic efficacy. Three-dimensional echocardiography (3DE) is increasingly used in adult cardiology but remains limited in congenital heart disease (CHD). This study compared 3DE-derived ventricular volume and function measurements with those obtained from cardiac magnetic resonance imaging (CMR) in pediatric CHD patients.

Materials and Methods:
Patients who underwent both 3DE and CMR at our institution were included. 3DE images were analyzed using the Philips EPIQ CVx QLAB system. Left and right ventricular end-diastolic volumes (LV/RVEDV), stroke volume (LV/RVSV), and cardiac index (LV/RVCI) were compared with CMR values using Spearman and Bland-Altman analyses.

Results:
Among 22 patients (age: 1–42 years, median: 18 years; weight: 10.0–67.3 kg, median: 47.7 kg), 11 had biventricular circulation, and 11 had a single ventricle. Strong correlations were observed between 3DE and CMR for LVEDV and RVEDV (both $R=0.87$, $P<0.001$). However, 3DE values tended to be lower than CMR values (LVEDV: 97.7±40.6 mL vs. 106.1±46.1 mL; RVEDV: 113.8±47.8 mL vs. 140.0±75.3 mL). The regression equations were LVEDV: $y=0.80x+12.2$ mL and ESV: $y=0.59x+22.8$ mL. Significant correlations were also found for stroke volume and cardiac index (LVSV/RVSV: $R=0.58/0.75$, both $P<0.05$; LVCI/RVCI: $R=0.58/0.58$, both $P<0.05$).

Conclusions:
3DE-derived ventricular volume measurements correlated well with CMR in pediatric CHD patients, though they tended to be lower. This discrepancy should be considered when using 3DE in clinical practice.

POSTER PRESENTATIONS

Category: Echocardiography

1618 - TRICUSPID VALVE LEAFLET MORPHOLOGY IN HYPOPLASTIC LEFT HEART SYNDROME COMPARISON TO THE NORMAL HEART AND IMPACT OF MORPHOLOGY ON VALVE FUNCTION

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Background and Hypothesis:
Tricuspid valve (TV) regurgitation in Hypoplastic Left Heart Syndrome (HLHS) increases the risk of death/transplantation by 2 to 3 times. Abnormalities in TV annular shape, leaflets expansion and subvalve apparatus position have been associated in HLHS with subsequent tricuspid regurgitation (TR). As TV morphological variation is increasingly recognized, its role in tricuspid valve function remains unknown. To date, no study has described the TV morphological variation in children with HLHS or healthy children in a surviving population.

Hypothesis
Congenital variations of TV morphology in HLHS contribute to TV dysfunction in HLHS.
There is greater variability from the classical trileaflet morphology of the TV in children with HLHS than in healthy infants and children.

Materials and Methods:
A cross-sectional study of all “classic” HLHS patients from a prospective longitudinal 3DE study of HLHS TV (2007-2025) and retrospective analysis of 100 healthy children from a 3D database.
TV leaflet morphologies from 3DE datasets were reviewed (S.Z and N.S.K) and blinded to TR grade in the HLHS group. We modified a previously proposed nomenclature to describe the TV leaflets.
Statistical analysis: Using the Chi-squared test, we compared the frequencies of TV morphological types with the degree of regurgitation at the latest follow-up and before valve repair.

Results:
The follow-up period ranged from 0 to 18 years (median: 3 years, 10 months). There is a significant difference in TV morphology distribution between HLHS and healthy cohorts (p-value = 0.0014). There is no statistically significant association between TV morphology types and TV regurgitation (p-value = 0.631).

Conclusions:
The distribution of TV leaflet morphology between HLHS and healthy cohorts differs, with bi-leaflet tricuspid valves being more common in HLHS. TV leaflet morphology may not directly influence the presence or severity of tricuspid regurgitation in children with HLHS; however, awareness of TV morphological variations remains essential for the precise localization and description of regurgitation sites.

POSTER PRESENTATIONS

Category: Echocardiography

1654 - ANALYSIS OF LEFT ATRIOVENTRICULAR MECHANICS IN THE PEDIATRIC POPULATION WITH HYPERTROPHIC CARDIOMYOPATHY

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Background / Hypothesis:
Hypertrophic cardiomyopathy (HCM) is the leading cause of sudden cardiac death in young patients. Structural alterations, including myocardial fiber disarray and fibrosis, can result in intraventricular conduction disorders and life-threatening arrhythmias. Current risk stratification for primary and secondary therapy relies on clinical, electrocardiographic, and echocardiographic markers, which may be insufficient. The evaluation of left atrioventricular mechanics provides insight into regional and global cardiac function by detecting subclinical alterations in left ventricular contractility. Unconventional echocardiographic parameters, such as mechanical dispersion and post-systolic longitudinal shortening, have been proposed as predictors of arrhythmic events in adult HCM patients. Myocardial strain analysis is a reliable and reproducible tool for assessing myocardial mechanics which can also be useful in pediatric population.

Materials and Methods:
We conducted a retrospective study of 38 pediatric patients with HCM and 38 healthy controls. Conventional and advanced echocardiographic parameters including atrioventricular strain, mechanical dispersion, and post-systolic longitudinal shortening were analyzed. Apical four-chamber, three-chamber, and two-chamber views were used to evaluate cardiac function.

Results:
The demographic characteristics were similar between both groups. Left ventricular longitudinal strain was significantly reduced in HCM patients (-12.8%) compared to controls (-20.6%, $p < 0.001$). Left atrial strain analysis revealed significant impairment in the reservoir and conduit phases ($p < 0.001$). Mechanical dispersion was markedly increased in HCM patients, with a median of 88 ms versus 38.4 ms in controls ($p < 0.001$). Post-systolic contraction peaks were present in 89.47% of HCM patients (34/38) and only 18.4% of healthy controls (7/38).

Conclusions:
Mechanical dispersion and post-systolic longitudinal shortening are valuable parameters for risk stratification in pediatric HCM patients, as increased values indicate myocardial fibrosis and a higher risk of fatal arrhythmias. These easily measurable and highly reproducible markers could enhance early intervention strategies. Further studies are needed to establish reference values and normal ranges in the pediatric population.

POSTER PRESENTATIONS

Category: Echocardiography

1674 - THE IMPACT OF STAGE II PALLIATION ON TRICUSPID REGURGITATION AND REVERSE RIGHT VENTRICULAR REMODELING IN HYPOPLASTIC LEFT HEART SYNDROME A SINGLE VENTRICLE RECONSTRUCTION TRIAL ANALYSIS

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Background:
Significant tricuspid valve regurgitation (TR) is associated with increased morbidity in patients with hypoplastic left heart syndrome(HLHS). Bidirectional superior cavopulmonary anastomosis (BSCPA)serves to volume unload the right ventricle in HLHS patients. We sought to determine TR severity trends following BSCPA.

Methods:
We analyzed data from the Single Ventricle Reconstruction (SVR) I and II trial. Among 337 patients, 4 groups were defined; those that had no/mild TR at BSCPA and either progressed to severe TR at 14-months (Group 1, n=29) or had stable no/mild TR at 14-months (Group 2, n=222), those that had moderate/severe TR at the time of BSCPA and either improved to no/mild TR at 14-months(Group 3, n=25) or had persistent moderate/severe TR at 14 months (Group 4, n=34). Patients with tricuspid valve intervention between the pre-BSCPA and 14-month were analyzed separately (Group 5, n=27). Demographics, echocardiographic, and catheterization data were compared, using Group 2 as reference.

Results:
At BSCPA, Group 4 had significantly larger tricuspid annular dimension than Group ($p<0.001$). At 14 months, Groups 1,3, and 4 all had larger annuli than Group 2 and groups 1, 3 and 4 had a larger tricuspid valve annulus compared to Group 2 at the 14-month time point ($p = 0.016$, $p = 0.016$, $p < 0.001$). Hemodynamics, Qp:Qs ratio and need for bypass were similar among the different groups. By the 6-year visit, 77% of patients had mild TR. At that time point, Tricuspid valve annular dimension of Groups 1, 3, and 4 were no longer significantly different from Group 2.

Conclusion:
Many patients have improvement in TR following BSCPA and the Fontan procedure suggesting benefit from these volume unloading interventions. A subset of patients exhibit persistent or worsening TR, suggesting other mechanisms such as tricuspid valve maladaptation or intrinsic valve pathology despite volume unloading.

POSTER PRESENTATIONS

Category: Echocardiography

1725 - EVALUATION OF CARDIAC FUNCTION IN FUNCTIONAL SINGLE VENTRICLE BY SPECKLE TRACKING IMAGING AND VENTRICULAR ARTERIAL COUPLING

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Background / Hypothesis:
Non-invasive evaluation of cardiac function in functional single ventricle (FSV) still remains challenging using routine transthoracic echocardiography(TTE). We explore the value of myocardial strain, myocardial work, and ventricular artery coupling indexes in patients with FSV by TTE.

Materials and Methods:
39 patients with FSV were selected and categorized into left ventricular, right ventricular, and indeterminate single ventricle according to the main ventricular morphology. Risk stratification was performed according to NYHA classification and NT-proBNP levels. Baseline data, echo data, cardiac magnetic resonance (CMR), and cardiac catheterization-related data were collected from these patients. Differences between groups were compared. Correlations between echocardiographic indices and CMR and cardiac catheterization indices were performed.

Results:
In all FSV patients, S'/VESP correlated with CMR-EDVi, and 2D-STI-measured GLS and myocardial work indices (GWI, GCW, GWW, GWE) showed weak to moderate correlation with VEDP.
There were significant differences in the pattern of association of echocardiographic indices with CMR-EF and VEDP in different subtypes of FSV. In SLV, APSE, GLS, GWI, GCW, and GWE were associated with VEDP. In SRV, E/E' ratio and FAC correlated with CMR-EDVi and CMR-EF. In indeterminate single ventricle, E', GLS, GWW, and GWE correlated with CMR-EF.
Lower CI and higher GWW were identified in group C (high risk group) than in group A and group B. In group A, E' and FAC/VESP correlated with CMR-EF and E' correlated with VEDP.

Conclusions:
This study evaluated the value of echocardiographic indices in patients with FSV. Among them, myocardial strain, myocardial work, and ventricular arterial coupling indices showed potential in assessing the status of cardiac function in patients with FSV.Correlation study in different subtypes showed significant heterogeneity, suggesting that a subtype-specific assessment system should be established in clinical practice to select the optimal combination of assessment parameters for patients with different subtypes of FSV.

POSTER PRESENTATIONS

Category: Echocardiography

1786 - CARDIAC MANIFESTATIONS IN PEDIATRIC HYPEREOSINOPHILIC SYNDROME MULTIMODAL ECHOCARDIOGRAPHY DELINEATES THE PERICARDIAL MYOCARDIAL INJURY SPECTRUM

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Background / Hypothesis:
Hypereosinophilic syndrome (HES), a rare multisystem disorder characterized by persistent eosinophilia (≥1.5×10^9/L for >6 months), carries significant cardiac morbidity due to eosinophilic myocarditis. This study delineates the cardiac clinical and echocardiographic features of pediatric HES.

Materials and Methods:
A retrospective analysis of 6 pediatric HES patients was conducted. A systematic diagnostic protocol was implemented, encompassing: (1)Hematologic confirmation: Bone marrow aspiration with eosinophil lineage quantification (2)Cardiac evaluation included biomarkers profiling, electrocardiography and echocardiography examination.

Results:
The cohort comprised 6 patients (2 males, 4 females) with a median age of 8.5 years (interquartile range [IQR] 4-12; full range 2-15 years). Cardiovascular involvement presenting as chest pain was observed in 16.7% of cases (1/6). Extracardiac manifestations predominated, including maculopapular rash, dysuria abdominal distension, and poor feeding. Peripheral hypereosinophilia was 20–70% (median 58%, IQR 32–68) and bone marrow eosinophils: ≥15% (5/6 cases) in laboratory investigations. And in myocardial injury biomarkers, TNI was elevated in 83.3%(5/6), and BNP was also increased in 83.3%[5/6, median 856 pg/mL (IQR 324–1452)]. Electrocardiogram findings were unremarkable in 1 case, while 5 cases exhibited ST-segment or T-wave abnormalities, and 2 cases presented with low voltage complexes in limb leads. Echocardiographic findings demonstrated a spectrum of cardiac pathology:(1)Pericardial effusion (100% massive 33.3%, moderate 33.3%, mild 33.3%); (2) Right ventricular thrombi: 33.3% (2/6), with 1 case progressing to apical obliteration Subclinical dysfunction and reduced LV GLS(-15.8%) .(3)Reversible pulmonary hypertension: 1 case (peak TR velocity 3.5 m/s, normalized post-treatment).

Conclusions:
In pediatric HES, cardiac involvement often lacks specific clinical manifestations and exhibits an insidious onset. Therefore, when peripheral blood eosinophil levels are significantly elevated in HES, cardiac evaluation is essential. Early diagnosis and treatment correlate with favorable prognoses, while delayed management of thrombotic complications yields suboptimal outcomes.

POSTER PRESENTATIONS

Category: Echocardiography

1799 - LONG TERM FOLLOW UP OF RIGHT AORTIC ARCH DIAGNOSIS MANAGEMENT AND OUTCOMES AT "BAMBINO GESÙ" HOSPITAL IN 30 YEARS.

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Background / Hypothesis:
Right aortic arch (RAA) is variably present as isolated or in association with other malformations. The aims of the study were to describe RAA different types and their incidence, association with complete vascular ring (CVR), congenital heart disease (CHD) or extracardiac malformations and its long-term follow-up.

Materials and Methods:
Clinical and instrumental data were collected from 550 patients with RAA referred to our tertiary center since January 1995.

Results:
162 patients (29%) had a fetal diagnosis (mean follow-up of 8.6 years). 350 patients (63%) had CHD, and 95 (17%) had genetic anomalies, with DiGeorge syndrome being the most frequent (9.5%). Genetic disorders were significantly more common in those with CHD (23% vs. 7.5%, $p < 0.001$). 59 patients (11%) had extracardiac anomalies. Among those with RAA not forming CVR, 29 patients had left anterior ductus arteriosus with a mirror-image (MI) branching pattern of epiaortic vessels (RAA/LADA/MI), 100% of whom had CHD (75% with conotruncal anomalies). Right ductus arteriosus (RAA/RDA/MI) was found in 9 patients, 4 of whom had complex CHD. CVR was present in 262 patients (48%); the most frequent types were RAA with left posterior ductus arteriosus and aberrant left subclavian artery (RAA/LPDA/ALSA – 179 cases, 68%) and double aortic arch (DAA – 68 cases, 26%). CVR was most often associated with minor CHD (26% vs. 17% with major CHD). 73 patients (28%) had respiratory symptoms. At CT, the mean tracheal compression was 46%. 113 patients (43%) underwent surgery (median age 30.8 months). Only 4 patients were re-operated for persistent symptomatic compression, most of them being DAA cases.

Conclusion:
RAA is commonly associated with CVRs, which are asymptomatic in 2/3 of cases but requiring surgery in almost 50%. Symptoms resolve almost completely, and reoperations are mostly for DAA. RAA is present with major CHD in half of the cases and these patients

POSTER PRESENTATIONS

Category: Echocardiography

1806 - OSTIAL MORPHOMETRY BY ECHOCARDIOGRAPHY PREDICTS ADVERSE OUTCOMES IN CHILDREN WITH ANOMALOUS RIGHT CORONARY ARTERIES

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Background / Hypothesis:
Anomalous aortic origin of coronary artery (AAOCA), occurring in 0.1-0.3% of pediatric populations, carries a lifetime risk of sudden cardiac death. This study aims to define echocardiographic characteristics for risk stratification by correlating ostial anatomical parameters with ischemia-sensitive biomarkers.

Materials and Methods:
This retrospective cohort study analyzed 150 patients diagnosed with anomalous aortic origin of coronary artery (AAOCA) in our echocardiography laboratory from January 2023 to February 2025. After excluding 88 cases due to loss to follow-up or incomplete data, 62 patients were included as the study cohort. Patients were stratified into two groups based on coronary ostial diameter Z-scores:Stenosis group (Z-score > -2) and Non-stenosis group(Z-score≤-2).

Results:
The cohort comprised 62 pediatric patients (41 males, 21 females; male-to-female ratio 1.95:1) with a mean age of 6.5±4.4 years (range: 1 month to 17 years). Patients were stratified into non-stenotic (n=37) and stenotic (n=25) groups based on coronary ostial parameters. Absolute diameter in coronary ostial morphology has significant intergroup disparities [(non-stenotic group (1.81 ± 0.29 mm) vs stenotic group (1.51 ± 0.49 mm), $p<0.05$], and also Z-Score [non-stenotic (-0.87 ± 0.27) vs stenotic (-2.44 ± 0.32), $p<0.001$]. Cardiac-specific symptoms such as chest pain were present in only 5 cases (8.1%, 5/62), while the majority exhibited non-cardiac manifestations. Electrocardiographic abnormalities was observed only in stenotic group: 20% (5/25) exhibited ST-segment depression. Surgery intervention was only finished in stenotic group: 16% (4/25).

Conclusions:
Echocardiography serves as the first-line modality for AAORCA risk stratification. Ostial hypoplasia (Z≤-2) with concomitant hemodynamic derangements warrants CTA-guided surgical planning to mitigate SCD risk in pediatric populations.

POSTER PRESENTATIONS

Category: Echocardiography

1814 - PERINATAL EVALUATION OF LEFT VENTRICULAR DIASTOLIC FUNCTION IN NEONATES WITH COARCTATION OF THE AORTA

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Background:
Patients with CoAo are exposed to myocardial remodeling due to chronic pressure overload manifesting as Left Ventricular Diastolic Dysfunction (LVDD). However, LVDD is reported also in patients early corrected, suggesting either the preexistence of this condition or a post-surgical persistent causative agent. We therefore decided to investigate LV diastolic function in perinatal period of patients with different forms of CoAo.

Materials and Methods:
We analysed main Doppler and TDI parameters of diastolic function from echocardiograms performed within the first 72 hours of life in 41 neonates with suspected CoAo. Patients were classified as having diastolic dysfunction, normal function, or indeterminate function according to the 2016 guidelines. All data were compared according to postnatal diagnosis of iCoAo, cCoAo and control group.

Results:
Significantly higher E wave, septal and mean E/e' ratios were observed in both iCoAo and cCoAo subgroup (Figure 1). The prevalence of both diastolic dysfunction (iCoAo=5,45.5%;cCoAo=8,53.3%;Control=6,40%;p=0.002) and indeterminate diastolic function (iCoAo=4,36.4%;cCoAo=7,46.7%;Control =0, 0%; p = 0.002) was significantly higher in the cCoAo group. The diagnosis of iCoAo (IRR 2.05; IC95%1.03-4.07.0; p=0.041 and cCoAo (IRR 2.50; IC95%1.33-4.68; p=0.004) significantly increases the risk of diastolic dysfunction, being this effect even more pronounced when adjusted for other risk factors.

Conclusions:
Based on our findings, we speculate that LVDD may be congenital in neonates with CoAo. Further research is required to determine whether this condition results from intrauterine myocardial remodeling or represents an intrinsic myocardial disease.

POSTER PRESENTATIONS

Category: Echocardiography

1818 - RELIABILITY OF LEFT ATRIAL SPECKLE TRACING ANALYSIS IN THE EVALUATION OF LEFT VENTRICULAR DIASTOLIC FUNCTION IN NEONATES

Maria Carolina Colucci [1], Marco Masci [1], Cosimo Marco Campanale Campanale [1], Luciano Pasquini [2], Anteo Di Napoli [3], Patrizio Moras [1], Serena Ventrella [1], Alessandra Toscano [1]
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Background:
Left Atrial Strain (LAS) is currently considered the gold standard for evaluating left ventricular (LV) filling pressure and LV diastolic dysfunction (LVDD) in adults. Recent evidence suggests that LAS measurements can also be applied to neonates, offering improved diagnostic accuracy and reproducibility compared to conventional echocardiographic parameters. In this study, we aimed to assess perinatal LV diastolic function in our cohort of neonates using both traditional TDI and speckle-tracking analysis, focusing on the reliability of this method.

Materials and Methods:
We evaluated key Doppler and TDI parameters of diastolic function from echocardiograms performed within the first 72 hours of life in 41 neonates. Digitally stored images were reviewed for analysis, and 2D LAS was measured using the QRS onset as the reference point. LAS values were calculated for the reservoir phase (LASr), conduit phase (LAScd), and atrial contraction (LASct). To examine the relationships between LAS measurements and other echocardiographic parameters of LV diastolic function, Pearson's correlation coefficients were computed.

Results:
The overall mean values for LA strain parameters were as follows: LASr = 24.0 ± 8.0, LAScd = -10.2 ± 6.9, and LASct = -13.9 ± 7.1. As illustrated in the figure, we observed a statistically significant positive correlation between e' and LASr, a negative correlation between e' and LAScd, and a borderline statistically significant positive correlation between E/e' and LAScd.

Conclusions:
LAS is a promising and reproducible technique for assessing diastolic function even in the perinatal period, as it minimizes the angle dependence associated with traditional TDI parameters. Further studies are required to establish specific cut-off values and explore its clinical applications.

POSTER PRESENTATIONS

Category: Echocardiography

1856 - BENIGN IDIOPATHIC TRANSIENT SEVERE ISOLATED RIGHT VENTRICULAR HYPERTROPHY (BITSI RVH) IN NEONATES A CASE SERIES.

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Background / Hypothesis:
Isolated severe right ventricular hypertrophy (RVH) is rare in neonates, with limited published cases. This study introduces and characterizes Benign Idiopathic Transient Severe Isolated Right Ventricular Hypertrophy (BITSI RVH), a distinct clinical entity in neonates that presents with severe RVH without discernible cause, lacks major hemodynamic complications, and resolves spontaneously within 6-12 weeks of life.

Materials and Methods:
We analyzed 62 neonates diagnosed with isolated RVH from 4,836 neonatal echocardiography studies performed at a pediatric cardiac referral center between February 2011 and December 2022. Neonates with structural heart defects or known causes of RVH were excluded. Antenatal history, birth details, clinical presentation, echocardiographic findings, management, and follow-up data were collected and analyzed.

Results:
The cohort showed male predominance (49:13) with most being full-term (58/62). Cyanosis with oxygen dependency was the predominant presenting symptom (80%). Echocardiographic findings included severe RV free wall and interventricular septal hypertrophy with obliterated RV apex, right-to-left or bidirectional interatrial shunting, mild-to-moderate tricuspid regurgitation, normal pulmonary artery pressures, and preserved biventricular function. Fourteen cases were antenatally diagnosed. Most neonates (48/62) required minimal oxygen support for 3-7 days. Follow-up echocardiography in 50 neonates between 3-8 weeks showed significant reduction or complete normalization of RVH. The remaining eight patients with persistent apical hypertrophy normalized by 12 weeks. No deaths occurred.

Conclusions:
BITSI RVH represents a clinically significant and likely underdiagnosed entity causing transient neonatal cyanosis. Its benign course and self-limited nature distinguish it from more severe conditions requiring intervention. The pathophysiology may involve variable fetal ductal flow resistance during the third trimester, rather than complete ductal closure. Recognition of this entity can prevent unnecessary interventions and reduce parental anxiety. We propose diagnostic criteria to aid clinicians in identifying and managing this condition.

POSTER PRESENTATIONS

Category: Echocardiography

1888 - PRENATAL DIAGNOSIS AND MULTIDISCIPLINARY MANAGEMENT OF TETRALOGY OF FALLOT WITH ABSENT PULMONARY VALVE

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A woman was referred to our fetal echocardiography clinic following the detection of multiple congenital anomalies on a congenital anomaly scan performed by a perinatologist. Fetal echocardiography at 31 weeks' gestation identified Tetralogy of Fallot with Absent Pulmonary Valve (TOF/APV). Key echocardiographic findings included an outlet ventricular septal defect with aortic override, normally related great arteries, and an absent pulmonary valve with a markedly dilated main pulmonary artery. Given the poor prognosis, the mother received comprehensive prenatal counseling, including discussions on palliative care options, but she opted for full resuscitative efforts.

At 35 weeks gestation, the mother was admitted for preterm labor, and the multidisciplinary care team was immediately mobilized. She delivered via spontaneous vaginal delivery, and the neonate exhibited severe respiratory distress, necessitating intubation. Postnatal transthoracic echocardiography confirmed TOF/APV, with severe main pulmonary artery dilation causing bronchial compression and right upper lung atelectasis. A computed tomography (CT) scan was planned to evaluate bronchial obstruction, but the infant succumbed before imaging could be performed.

This case underscores the crucial role of fetal echocardiography in diagnosing TOF/APV, allowing for early parental counseling and coordinated perinatal care planning. It also highlights the importance of a multidisciplinary team in guiding prenatal decision-making and optimizing postnatal management for neonates with complex congenital heart disease.

POSTER PRESENTATIONS

Category: Echocardiography

2005 - ECHOCARDIOGRAPHIC FINDINGS OF INFANTILE AP INDUCED CARDIOMYOPATHY A CASE REPORT AND LITERATURE REVIEW

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Background / Hypothesis:
To summarize the echocardiographic manifestations and clinical characteristics of a rare case of ap-induced cardiomyopathy, improve the accuracy of clinical diagnosis, and provide a basis for clinical timely intervention.

Materials and Methods:
The echocardiographic features, electrocardiographic features and clinical manifestations of a case of AP-induced cardiomyopathy diagnosed by echocardiography and confirmed by clinical and electrocardiogram in our hospital were retrospectively analyzed, and the echocardiographic features, diagnosis and differential diagnosis of this disease were summarized combined with literature review.

Results:
The echocardiography of pre-excited cardiomyopathy showed enlargement of the left ventricle. Decreased left ventricular systolic function: decreased ejection fraction (LVEF), decreased cardiac output; Ventricular mechanical dyssynchrony: the contraction of the basal segment of the ventricular septum was significantly out of sync with the left ventricular lateral wall. Abnormal motion of the ventricular septum was observed by ultrasound, indicating electromechanical dyssynchrony.

Conclusions:
AP-induced cardiomyopathy has typical echocardiographic manifestations, which can assist the clinical diagnosis and differential diagnosis, dynamic evaluation of cardiac function and ventricular wall motion, and evaluation and follow-up of clinical treatment effect.

POSTER PRESENTATIONS

Category: Echocardiography

2043 - CHANGES IN LEFT VENTRICULAR FUNCTION DURING REPAIR OF VENTRICULAR SEPTAL DEFECTS IN CHILDREN A TWO DIMENSIONAL SPECKLE TRACKING ECHOCARDIOGRAPHY ASSESSMENT

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Background / Hypothesis:
Ventricular septal defects (VSDs) are the most common congenital heart condition in children and are prone to complications requiring prompt surgical intervention. Evaluating cardiac function is crucial for determining the optimal timing of VSD surgery and postoperative care. This study examined changes in left ventricular (LV) function before and after VSD surgery in children, focusing on the impact of defect size.

Materials and Methods:
43 children with VSDs who underwent surgical correction and 43 healthy controls were studied. The patients were categorized into three groups based on the ratio of the defect diameter to the aortic diameter: small group (ratios < 1/3), medium group (ratios between 1/3 and 1/2), and large group (ratios > 1/2). Preoperatively, one week and one month postoperatively evaluations of LV function were conducted using echocardiography. LV dyssynchrony and global peak longitudinal strain (GLS) were obtained through two-dimensional speckle tracking echocardiography.

Results:
The study included 18 small-VSD patients, 11 medium-VSD patients, and 14 large-VSD patients. Preoperatively, the medium and large groups had significantly lower GLS than those in the control group ($P < 0.05$). One week postoperatively, the children with VSDs had notably lower GLSs than did the children in the control group ($P < 0.001$). Even after one month, children with VSDs had decreased GLS compared with children in the control group ($P < 0.001$), the medium and large groups showing worse LV synchrony than children in the control group ($P < 0.001$). Additionally, the small group had higher GLSs than did those with the medium and large groups ($P < 0.001$) and better synchrony than did children with medium and VSDs ($P < 0.05$).

Conclusions:
Children with larger VSDs exhibit reduced LV function, requiring a longer postoperative recovery period.

POSTER PRESENTATIONS

Category: Echocardiography

2065 - HEMODYNAMIC IMPACTS OF NON INVASIVE VENTILATION MODALITIES ON VERY PRETERM INFANTS A RANDOMIZED CROSS OVER STUDY

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Background / Hypothesis:
Non-invasive ventilation (NIV) supports respiratory function in preterm infants while minimizing lung injury. Its synchronized form (S-NIPPV) may enhance effectiveness by aligning with patient-initiated breaths. This study aimed to compare the cardiorespiratory effects of different NIV modalities, as their short-term hemodynamic impact remains unclear.

Materials and Methods:
In this pilot randomized crossover study, preterm infants (<32 weeks' gestation or <1,500 grams) receiving CPAP were randomized to receive either non-synchronized (NS-NIPPV) or synchronized NIPPV (S-NIPPV) for 2 hours, with a CPAP washout period before crossover. Echocardiography was used to assess cardiac output and function, while respiratory phenotype was evaluated using diaphragm electrical activity (Edi) and 12-region lung ultrasound scores (LUS). Data were analyzed using linear mixed-effects models.

Results:
Thirty infants (mean gestational age: 29.9 ± 2.0 weeks) were enrolled (Table 1). No significant differences were observed in right or left ventricular output (RVO, LVO) across respiratory modes (Table 2). Significant changes in left ventricular global longitudinal strain (LV GLS) (-4.2 [95% CI; -7.7 to -0.8; p=0.02] and strain rate (SR) were found with NS-NIPPV compared to CPAP (-0.5 [95% CI; -0.9 to -0.01] p= 0.04) (Table 3). For respiratory outcomes, S-NIPPV demonstrated the highest mean airway pressure (MAP) compared to NS-NIPPV and CPAP (p<0.001) (Table 4). Diaphragm activity was lowest with S-NIPPV (Edi: 7.1 ± 5.1, p<0.01). LUS score was significantly improved with both NS-NIPPV and S-NIPPV compared to CPAP (CPAP vs. NS-NIPPV: −2.4 [95% CI; −3.5 to −1.3], and CPAP vs. S-NIPPV: −2.4 [−3.5 to −1.2]; both p<0.001).

Conclusions:
In preterm infants, NIV modes did not significantly impact estimated cardiac output. However, S-NIPPV improved LUS scores and reduced diaphragmatic effort, likely due to its higher generated MAP. Further studies are needed to determine whether these benefits stem from the elevated MAP or the unique properties of the S-NIPPV mode itself.

POSTER PRESENTATIONS

Category: Echocardiography

2079 - STRUCTURAL AND FUNCTIONAL CARDIAC ASSESSMENT AND ANALYSIS IN CHILDREN WITH RENAL TRANSPLANT STATUS

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Background / Hypothesis:
The objective of this study is to assess and cross-check analyse cardiac structure and function in children with normal renal function one year after renal transplantation. This will be achieved by collecting and analysing data from their medical history and echocardiograms. This will inform clinical decision-making.

Materials and Methods:
Retrospective analysis was performed in children with normal renal function within one year after allogeneic renal transplantation who were hospitalized in the Department of Cardiovascular Pediatrics at the First Affiliated Hospital of Sun Yat-sen University from February 2021 to December 2024. These subjects were assessed and analysed for cardiac structure and function in comparison with age- and gender-matched healthy children using echocardiographic techniques such as speckle tracking.

Results:
The final study population comprised 50 children who had undergone renal transplantation (25 male and 25 female). Echocardiographic findings in children with renal transplant status after renal transplantation revealed significant differences in cardiac structure (e.g. IVS/BSA, LVPW, LVMI) and assessment of systolic and diastolic function (e.g. LV GLS, TAPSE, RV GLS, mitral valve mean E/A, mitral annulus E/e', mitral annulus Tei index, and tricuspid valve Tei index). However, the EF values were all within the normal range. Left ventricular hypertrophy was observed in 42% (21/50) of the children in the renal transplant group, accompanied by left ventricular centripetal remodelling in 52% (26/50).

Conclusions:
The results of this study demonstrate that cardiac structure and systolic and diastolic dysfunction remain present in the majority of children with renal transplant status. Speckle-tracking echocardiography has been shown to be more sensitive than conventional ultrasound indices in evaluating cardiac function in children following renal transplantation. Consequently, it is recommended that renal transplant status children undergo regular monitoring using echocardiography, as this is beneficial for the early detection of cardiovascular damage, thus improving prognosis and quality of survival.

POSTER PRESENTATIONS

Category: Echocardiography

2085 - ASYMPTOMATIC TRICUSPID VALVE DYSPLASIA TO WORRY OR NOT TO WORRY

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Levine Children's Hospital, Pediatrics, Charlotte-United States [1] Levine Children's Hospital, Pediatric Cardiology, Charlotte-United States [2]

Background / Hypothesis:
The development of the tricuspid valve (TV) is understudied as compared to the aortic or mitral valve. We have observed spontaneous regression of the dysplastic neonatal TV but found no reports of such a phenomenon in the literature.

Materials and Methods:
We completed an extensive chart review of two pediatric patients.

Results: Patient
A is full term male born without complications. Maternal history was significant for deep vein thrombosis managed on enoxaparin and aspirin. An echocardiogram (ECHO) was obtained shortly after birth for assessment of a systolic murmur. ECHO was significant for a homogenous, echogenic mobile mass on the anterior leaflet of the TV with mild insufficiency and no stenosis. Further evaluation did not support a thrombus, vegetation or tumor. He was followed by serial ECHOs with complete regression at 12 months of age. Patient B is a term male born without complications. Shortly after birth, a loud, systolic click was auscultated, and ECHO demonstrated a thickened, dysplastic TV without stenosis or significant regurgitation. One month later, ECHO showed complete resolution of TV thickening. Both patients remained asymptomatic.

Conclusions:
Asymptomatic tricuspid valve dysplasia in the neonatal period spontaneously regresses over time, as seen in both these patients. This is likely explained by continued endothelial differentiation in postnatal valves. This knowledge can possibly prevent invasive diagnostic evaluation in an otherwise clinically stable patient. These cases increase clinician awareness of this benign neonatal TV finding, encouraging further contribution to the literature and understanding of neonatal valvular development.

POSTER PRESENTATIONS

Category: Echocardiography

2086 - SHORT TERM ECHOCARDIOGRAPHIC ASSESSMENT OF VENTRICULAR FUNCTION IN PATIENTS UNDERGOING PERCUTANEOUS PULMONARY VALVE IMPLANTATION WITH VENUS P VALVE®

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Background / Hypothesis:
In our hospital, most patients with repaired Tetralogy of Fallot present with native right ventricular outflow tract. This new type of valve could be well adapted. The aim of this study was to evaluate pulmonary regurgitation and right ventricular function in patient post-implantation of Venus P Valve® at Ricardo Gutiérrez Children's Hospital

Materials and Methods:
Thirteen patients (mean age 22 years, range 14-40) were prospectively evaluated. The mean time from percutaneous pulmonary valve placement to the last Doppler echocardiogram was 21 months. Insufficiency and pulmonary gradient were assessed. Tricuspid and mitral annular excursions were measured in millimeters, S' with tissue Doppler in cm/sec, and global ventricular and atrial strain in percentages. Student's t-test was used, with significant differences established at $p<0.001$

Results:
Regarding diagnosis, 10 patients had Tetralogy of Fallot, 1 patient had pulmonary atresia with ventricular septal defect, and 2 patients had double outlet right ventricle. In 11 patients, replacement was indicated due to severe pulmonary insufficiency with right ventricular dilation, and in 2 due to severe pulmonary stenosis (both with surgical pulmonary valve replacement). In the last follow-up echocardiogram, 8 patients had no pulmonary regurgitation, 3 had trivial insufficiency, and 1 patient with a leak showed moderate insufficiency (the first patient to receive the valve). Regarding pulmonary gradient, 11 patients had no stenosis, and 2 had mild gradient. No significant differences in short-term ventricular function were observed (see Table 1

Conclusions:
In the short term, the Venus P Valve demonstrated benefits by resolving pulmonary insufficiency and pulmonary stenosis in the majority of cases. Ventricular function showed no significant changes; long-term studies are needed to verify if functional values improve over time

POSTER PRESENTATIONS

Category: Echocardiography

2148 - THE LONE RANGER ALCAPA IN A 9 YEAR OLD GIRL

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Background / Hypothesis:
Bland-White-Garland described a syndrome associated with autopsy findings of anomalous left coronary artery arising from the pulmonary artery (ALCAPA) in 1933.They estimated that ALCAPA is present in 1 in 300000 live births or 0.5% of children in congenital heart disease. The syndrome in infancy presents with congestive heart failure, myocardial infarction and mitral regurgitation. The objective of this case report is to provide clinicians with the diagnostic pathway for Anomalous Origin of the Left Coronary Artery.

Materials and Methods:
A 9-year-old girl, was seen in our clinic who had been treated as a patient with Rheumatic Heart Disease on antifailer medication and Injection Prophylaxis Benzathine Penicillin. She had a history of long-standing cough, difficulty in breathing, failure to thrive and for recurrent chest infections.
On General examination she was clinically stable with stable vitals, ill-looking, cachexic, pale. On cardiovascular system, Precordial hyperactivity, the apex was palpable 6th ICS mid clavicular line with a thrill, grade three systolic murmur Mitral area radiating to the apex.
An echocardiogram was done showing an enlarged LV size, Echo enhancement in the LV papillary muscle, antero-lateral and posterior wall which was hypokinetic with reduced LV function, Severe Mitral regurgitation with the left coronary artery arising from the Main pulmonary artery and retrograde flow with numerous collaterals. Chest Xray showed increased pulmonary markings in both lung fields and ECG showed Q waves in lead 1 and AVL, ST-T segment changes in lateral anterior lead V4-V6

Results:
The Echo findings were diagnostic of ALCAPA, complimented by the Chest Xray and ECG findings.

Conclusions:
The role of Multimodality non-invasive imaging, especially in low-middle income countries, should be emphasized. Echocardiography being the gold standard in this case for diagnosing an ALCAPA in a misdiagnosed case of Rheumatic Heart disease in a 9-year-old.

POSTER PRESENTATIONS

Category: Echocardiography

2286 - REDUNDANT CHIARI NETWORK AND CYANOSIS IN NEWBORN CASE REPORT

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Background / Hypothesis:
The Chiari Network (CN) is a remnant of the embryonic venous sinus valve that helps direct blood from the inferior vena cava to the foramen ovale (FO) during fetal life. When it persists in a redundant form, it is usually benign but can lead to complications such as patent FO, paradoxical embolism, and right-to-left shunt—potentially causing cyanosis in newborns.

Materials and Methods:
We report the case of a newborn with redundant CN and cyanosis.

Results / Case Report:
A full-term male newborn, weighing 3118g, presented with Apgar scores of 9/9. Neonatal screening revealed hypoxemia (O_2 saturation: 81% right arm, 80% left leg), prompting admission to the ICU. Vital signs were stable except for O_2 saturation (82%). The infant was otherwise asymptomatic. Chest X-ray, ECG, and laboratory tests were normal.

Echocardiography showed a right-to-left shunt through the FO, a slightly restrictive tricuspid valve, and a mobile, filamentous membrane in the right atrium consistent with a Chiari Network, extending into the right ventricular inflow tract without obstruction. Mild pulmonary hypertension was noted (mean pulmonary artery pressure: 42 mmHg). After 48 hours, follow-up echocardiography confirmed the same findings, with normalization of pulmonary pressure.

The newborn remained stable and was discharged after 7 days with O_2 saturation between 85–88%, and follow-up was arranged. At 15 days of life, clinical and echocardiographic findings persisted without signs of worsening. Due to the absence of severe symptoms, conservative management was maintained.

Conclusion:
Although typically benign, a redundant Chiari Network can contribute to neonatal cyanosis by facilitating right-to-left shunting. It should be considered in the differential diagnosis of unexplained hypoxemia in newborns. Conservative or surgical management will be defined according to the degree of complication: obstruction in the inflow tract and degree of cyanosis. Echocardiography plays a key role in diagnosis and monitoring, with management decisions guided by the degree of functional compromise.

POSTER PRESENTATIONS

Category: Echocardiography

2295 - EFFECTS OF GESTATIONAL DIABETES MELLITUS AND HYPERTENSION ON ARTERIAL STIFFNESS AND ECHOCARDIOGRAPHIC FINDINGS IN NEONATES

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Background / Hypothesis:
Pulse wave velocity (PWV),as a measure of arterial stiffness,is a reliable predictor of coronary heart disease,stroke and cardiovascular mortality in adults.Increased PWV values are associated with increased arterial stiffness.Although data are conflicting,certain perinatal factors may influence arterial stiffness later in life.Increased PWV has been reported in children born small for gestational age or exposed to alcohol in utero.However,studies on PWV in the neonatal period are scarce and this remains an area requiring further investigation.

Materials and Methods:
A total of 67 neonates aged 12 to 29 days were included in the study,consisting of 15 infants born to hypertensive mothers,26 to diabetic mothers and 26 controls.Among the diabetic group, five mothers had both diabetes and hypertension.Carotid-femoral pulse wave velocity(cfPWV) was used as an indicator of arterial stiffness and measurements were performed using echocardiography with the same device at similar times of day.In addition to cfPWV,basic echocardiographic evaluations as well as atrial and ventricular strain analyses were conducted.

Results:
Infants born to diabetic mothers had significantly higher mean cfPWV values(6,34 m/s) compared to both the hypertensive(4,65 m/s) and control groups(4,56 m/s).According to multivariate linear regression analysis,maternal age and presence of diabetes were the only significant predictors of cfPWV.Maternal BMI,number of pregnancies,mode of delivery,birth weight,maternal hemoglobin level and conception via IVF were not found to influence cfPWV. Echocardiographic evaluation revealed increased interventricular septal thickness in both diabetic and hypertensive groups compared to controls.Strain echocardiography analysis showed higher right ventricular free wall longitudinal strain values in the hypertensive group; no significant differences were observed in other strain parameters.

Conclusion:
There is a limited number of studies on arterial stiffness in neonates. In our study, infants of diabetic mothers exhibited higher cfPWV values, indicating increased arterial stiffness. Long-term prospective studies are needed to investigate the potential cardiovascular implications of this finding later in life.

POSTER PRESENTATIONS

Category: Echocardiography

2308 - UNUSUAL CONGENITAL CORONARY ABNORMALITIES IN PAEDIATRIC AGE GROUP DETECTED BY SIMPLE CLUES ON ECHOCARDIOGRAPHIC EXAMINATION

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Background / Hypothesis:

Detection of coronary artery abnormalities needs high suspicion. Presenting series of four unusual coronary artery abnormalities diagnosed by taking clues on echocardiography.

Case 1: Congenital LMCA Stenosis
15 months old case of dilated cardiomyopathy, on echocardiography showed normal left coronary origin with aliasing at LMCA origin on high scales. Aortogram revealed severe ostioproximal stenosis of LMCA. Underwent successful LMCA stenosis repair using pulmonary artery patch augmentation. 4 years follow up showed normal LV function with good flow in LMCA.This case highlights the importance of colour interrogation to suspect unusual coronary artery disease.

Case 2: Proximal LAD Atresia
6 months old infant with perimembranous VSD revealed normal left coronary origin with unusual branching pattern and pulmonary artery reversal. Aortogram revealed normal LMCA origin, cut off proximal LAD (LAD atresia) and distal LAD filling though RCA. Unusual branching pattern and presence of collaterals are simple clues to suspect coronary abnormalities.

Case 3: LAD From PA (ALADPA)
4 years old with normal ECG showed diastolic reversal in pulmonary artery, normal LMCA origin, multiple collaterals across IVS and prominent RCA. Angiogram revealed normal LMCA continuing as LCX and retrograde filling up of PA through LAD via collaterals suggestive of ALADPA. Surgical implantation of LAD was done. Collateral in IVS with normal LMCA origin suggest abnormal LAD origin.

Case 4: Congenital Hypoplastic LMCA
8 years old case of DORV -VSD -PS underwent successful pulmonary root translocation surgery. Developed severe LV dysfunction with poor inotropic response. Cardiac catheterization showed congenital hypo plastic LMCA with retrograde filling of LCX and LAD from RCA. While planning for surgical correction she succumbed due to ventricular tachycardia.

Conclusions:
Simple clues like prominent RCA, diastolic reversal in pulmonary artery, collaterals visualisation, aliasing at high scales, abnormal branching pattern and fixed cardiac output sufficient to suspect structural congenital coronary abnormalities.

POSTER PRESENTATIONS

Category: Echocardiography

2426 - POSTNATAL OUTCOMES IN CONGENITAL AORTIC VALVE ABNORMALITIES ARE PREDICTED BY ASCENDING AORTIC MEASUREMENTS AND AORTIC VALVE MORPHOLOGY.

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Background:
To identify predictors of postnatal outcomes in fetuses with congenital aortic valve abnormalities.

Materials and Methods:
This retrospective study (2020-2025) assessed fetuses from 20 weeks' gestation to term with abnormal aortic valve morphology, ascending aortic dilatation, or abnormal valve flow. Measurements included aortic annulus, root, ascending aorta, valve area in parasternal short axis, and LV dimensions. 4D spatiotemporal image correlation (STIC) imaging evaluated ascending aorta flow. Exclusions were fetuses under 20 weeks, those with other major heart defects, or without measurable valve area.

Results:
Among 12 fetuses with abnormal aortic valves, 10 had bicuspid aortic valve (BAV): 5 type 0 (no raphe), 2 type 1 (one raphe), 3 type 2 (two raphe); 2 had unicuspid acommissural (three raphe) valves. Type 0 BAV fetuses had normal ascending aortic dimensions but also showed anomalies such as persistent LSVC, abnormal ductus venosus, VSD, ventricular disproportion, and, in one case, coarctation. BAV with a normal valve area (n=9/10), compared with 31 age-matched controls, showed similar immediate postnatal outcomes and did not require interventions. The valve area in normal fetuses was measured as 0.07 ± 0.04 <25 weeks, 0.15 ± 0.03 at 25-30 weeks, and 0.23 ± 0.05 >30 weeks. Two fetuses with unicuspid acommissural aortic valve developed critical aortic stenosis, absent forward flow, severe left ventricular dysfunction, and progressed to fetal hydrops and in-utero demise. A fetus with type 1 BAV required balloon dilatation at 6 months of age. Type 0 BAV was associated with normal aorta size and flow, while types 1 and 2 were linked to aortic dilation and abnormal helical flow. Lack of forward flow did not affect aortic dimensions.

Conclusions:
Ascending aortic size, valve area, and flow characteristics predict in-utero and postnatal outcomes. Types 1 and 2 BAV show abnormal ascending aorta size and flow patterns compared to type 0.Unicuspid acommissural valves have the worst prognosis.

POSTER PRESENTATIONS

Category: Echocardiography

2446 - ECHOCARDIOGRAPHIC FINDINGS IN PATIENTS WITH TETRALOGY OF FALLOT PRIOR TO TOTAL CORRECTIVE SURGERY ADMITTED AT A TERTIARY CARE HOSPITAL.

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Nicvd, Pediatric Cardiology, Karachi-Pakistan [1]

Background / Hypothesis:
Tetralogy of Fallot (TOF) is the most prevalent cyanotic congenital heart disease, and outcomes largely depend on early diagnosis and timely surgical intervention. Transthoracic echocardiography (TTE) plays a central role in the evaluation of TOF anatomy and associated anomalies. Despite its clinical importance, limited echocardiographic data is available from Pakistan. This study aimed to analyze the echocardiographic characteristics, severity of anatomical defects, and common associated anomalies in TOF patients, thereby bridging the existing gap in local literature.

Materials and Methods:
A cross-sectional study was conducted at the Pediatric Cardiology Department, NICVD Karachi, between January and December 2021, following ethical approval (ERC-1027-2021). A total of 197 patients with echocardiography-confirmed TOF were included using non-probability convenience sampling. Patients of any age and gender were enrolled, while those unwilling or unable to undergo TTE were excluded. Standardized physical examination, chest X-ray, ECG, and TTE were performed. Echocardiography was conducted by an experienced echocardiographer under the supervision of a consultant pediatric cardiologist. Severity of RVOTO and ventricular dysfunctions were assessed using age- and gender-specific nomograms. Data were recorded using a structured proforma and analyzed using SPSS version 26.0.

Results:
Among 197 TOF patients, 61.4% were male (mean age 8.36±10.12 years), with over half from rural areas. Severe RVOTO was observed in 85.8% of cases. Common findings included hypoplastic pulmonary arteries (15.2%), thickened and domed pulmonic valves (45.2%), PDA (42.1%), and ASD (23.9%). Additional anomalies included persistent left superior vena cava (17.3%) and right-sided aortic arch (7.6%). Mild RV and LV dysfunctions were seen in 10.7% and 18.3% of patients, respectively. Only 6.1% were referred directly for surgery.

Conclusions:
TOF was more prevalent in males and frequently diagnosed at a later age in Pakistan. Echocardiography remains a critical, safe, and effective tool in identifying TOF-related anatomical and functional abnormalities.

POSTER PRESENTATIONS

Category: Echocardiography

2533 - ASSESSING THE EFFECTS OF WEIGHT TRUNCATED BODY SURFACE AREA ON CARDIAC STRUCTURE STANDARDIZATION IN OVERWEIGHT AND OBESE CHILDREN

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Background:
Standardization of cardiac structures (CS) using body surface area (BSA) systematically underestimates their size in overweight and obese children. We aimed to characterize the impact of a BSA adjustment, based on weight truncation, on the standardization of cardiac structure sizes in this population.

Methods:
We retrospectively reviewed structurally normal echocardiograms performed between 2015 and 2025 on children aged 2-18 years with a body mass index Z-score (Z-BMI)>+1. Children with genetic or systemic conditions were excluded. Diameters of the sinuses of Valsalva (SOV), aortic (AA), mitral (MA), pulmonary (PA), and tricuspid annulus (TA) were recorded. For each subject, an adjusted BSA was calculated using a truncated weight that would yield a Z-BMI of +1. Z-scores for each CS were generated using both the actual and adjusted BSA(PHN 2017). Z-score differences were compared, and generalized additive mixed models (GAMMs) were used to estimate the adjusted model's effect. We identified patients whose CS reclassified from normal to dilated and assessed the frequency of this change by Z-BMI, age, and sex.

Results:
A total of 1,803 patients were analyzed, comprising 65.6% overweight and 34.4% obese individuals. The difference between Z-scores calculated with actual versus adjusted BSA increased with higher Z-BMI and older age. The GAMM analysis showed the largest estimated effect on the SOV, followed by the AA and MA. Overall, 9.9% of patients had at least one structure reclassified from normal to dilated using the adjusted model. This reclassification was more frequent in males, in patients with a Z-BMI>+3, and in the 5–12 year age range. This pattern was consistent across all measured structures.

Conclusions:
While adjusting BSA by truncating weight is not a definitive solution, this method effectively elucidates the magnitude of underestimation in cardiac structure measurements for overweight and obese children. It also successfully identifies the populations most significantly affected by this bias.

POSTER PRESENTATIONS

Category: Echocardiography

2543 - "TURNING BACK THE CLOCK HOW EARLY MUST WE INTERVENE FOR FUNCTIONAL RECOVERY IN A PEDIATRIC PATIENT WITH CCTGA AND ADVANCED AV BLOCK AFTER TIMELY DUAL CHAMBER PACING"

Paola Maria Martinez Alvarenga [1], Jose Arturo Portillo Hernandez [2], Gabriela Andrea Bustillos Garcia [3], Lenin Rene Bulnes Garcia [4]
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Background / Hypothesis:
Congenitally corrected transposition of the great arteries (ccTGA) is a rare cardiac malformation characterized by atrioventricular and ventriculoarterial discordance, resulting in physiologically "corrected" circulation. Despite initial stability, the morphologic right ventricle functions as the systemic ventricle and is prone to progressive hypertrophy, dilation, and dysfunction over time. Conduction disturbances, including high-grade atrioventricular (AV) block, are common and may accelerate ventricular dysfunction. Early identification and timely intervention are essential to optimize outcomes.

Materials and Methods:
We report the case of a 16-year-old male with a known diagnosis of ccTGA referred for follow-up evaluation due to suspected ventricular dysfunction and recent conduction abnormalities. A comprehensive transthoracic echocardiogram (TTE) was performed with M-mode, two-dimensional imaging, pulsed, and continuous Doppler. Speckle-tracking strain imaging was used to detect subclinical systolic impairment. Electrocardiographic monitoring confirmed an advanced second-degree AV block. The patient was managed according to ccTGA with systemic right ventricular involvement.

Results:
TTE demonstrated situs solitus with levocardia, concordant atrioventricular and ventriculoarterial connections, intact atrial and ventricular septa, and normal systemic and pulmonary venous return. The morphologic right ventricle, positioned to the left, served as the systemic ventricle and showed marked hypertrophy (interventricular septum 34 mm, free wall 36 mm, Z score +3.7). Mild tricuspid and mitral regurgitation were present. Both ventricles had preserved qualitative systolic function (LVEF 59–60%, TAPSE 29 mm), normal diastolic indices, and estimated pulmonary artery systolic pressure of 18 mmHg. Strain analysis revealed reduced global longitudinal strain of the systemic ventricle. Given the advanced second-degree AV block and early systolic impairment, a dual-chamber pacemaker was implanted, resulting in improved synchrony, symptom relief, and increased systemic ventricular diastolic dimension on follow-up.

Conclusions:
This case highlights the role of advanced echocardiographic techniques and rhythm monitoring in ccTGA. Detection of early systemic right ventricular dysfunction and high-grade AV block can guide timely device therapy, potentially preserving.

POSTER PRESENTATIONS

Category: Echocardiography

2556 - RESEARCH ON MYOCARDIAL MOTION CHARACTERISTICS IN CHILDREN WITH (ATYPICAL) COMPLETE LEFT BUNDLE BRANCH BLOCK ABSTRACT

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Background:
To evaluate the applicability of speckle-tracking echocardiography (STE)-derived Complete left bundle branch block (CLBBB) strain pattern classification in pediatric populations and atypical LBBB conditions (type B Wolff-Parkinson-White syndrome (B-WPW), right ventricular apical pacing (RVAP)), and to compare myocardial motion characteristics and treatment responses.

Materials and Methods:
This prospective study enrolled 73 pediatric patients (77 echocardiograms: B-WPW=35, RVAP=20, cardiomyopathy with LBBB=6, transcatheter closure of per imembranous ventricular septal defect with LBBB (PmVSD)=12) and 25 matched controls (2020-2025). Patients were classified into LBBB types 0-4 using 2D-STE mid-septal strain patterns in the apical four-chamber view.

Results:
1. Overall and subgroup analyses (B-WPW, PmVSD) showed progressive deterioration from LBBB-0 to LBBB-4: significant decreases in ejection fraction, global longitudinal/circumferential strain, work efficiency/index, and constructive work; increases in left ventricular volume, peak strain dispersion, and wasted work (all $p<0.05$). RVAP showed no significant functional differences across patterns.
2. B-WPW group exhibited predominant basal septal impairment, demonstrating the lowest strain, myocardial work efficiency (MWE), and constructive work (MCW), but the highest wasted work (MWW). PmVSD group showed primary mid-septal involvement with the lowest MWE and highest MWW. RVAP group had significant apical septal and apical lateral wall impairment (lowest strain, myocardial work index (MWI), MWE, MCW; highest MWW), with additional mid-lateral wall damage (lowest MCW). (All $p<0.05$)
3. Treatment: Strain classification and cardiac function improved concurrently post-intervention.

Conclusion:
1. STE-based LBBB classification is applicable to most pediatric atypical LBBB subtypes (B-WPW, PmVSD, cardiomyopathy) but requires cautious interpretation in RVAP.
2. Etiology-specific myocardial motion patterns exist: B-WPW predominantly affects the basal septal segmental,PmVSD with CLBBB primarily involves mid septal segmental, RVAP specifically involves the apex and mid-free wall segments.
3. This classification system enables monitoring of high-risk myocardial remodeling and evaluation of therapeutic efficacy in pediatric patients.

POSTER PRESENTATIONS

Category: Echocardiography

2576 - INTRACARDIAC ECHOCARDIOGRAPHY OUTPERFORMS CONVENTIONAL IMAGING IN PROSTHETIC PULMONARY VALVE ENDOCARDITIS THREE CASE REPORTS

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Background / Hypothesis:
Transesophageal echocardiography (TEE) is effective for valve evaluation and remains the imaging modality of choice for the screening of infective endocarditis (IE). However, visualization of the pulmonary valve (PV) can be limited with TEE, particularly in patients with prosthetic PVs, due to acoustic shadowing from prosthetic materials. We hypothesized that intracardiac echocardiography (ICE) could provide superior visualization for diagnosing prosthetic PV vegetations.

Materials and Methods:
We retrospectively reviewed three patients with suspected IE involving a prosthetic PV who underwent ICE for diagnostic clarification. Clinical presentations, conventional imaging results, ICE findings, microbiological data, and subsequent management were analyzed.

Results:
Case 1: A 13-year-old male with repaired tetralogy of Fallot (TOF) using a pulmonary homograft presented with fever, hallucinations, and suspected septic emboli. TEE suggested residual PV vegetation; ICE confirmed it, leading to surgical PV replacement.
Case 2: A 7-year-old female with pulmonary atresia and VSD, post-Rastelli operation with Contegra conduit, had recurrent unexplained fever. CT and transthoracic echocardiography (TTE) were negative, but ICE identified PV vegetation, later confirmed as Abiotrophia defectiva IE; symptoms resolved with antibiotics.
Case 3: A 42-year-old male post-TOF repair and Melody valve-in-valve implantation presented with prolonged fever and H. parainfluenza bacteremia. CT revealed a low-attenuation lesion, but ICE confirmed prosthetic PV leaflet vegetation, prompting surgical PV replacement.

Conclusions:
ICE provided definitive visualization of prosthetic PV vegetations in cases where TEE, TTE, and CT were inconclusive. Given its superior imaging of right-sided structures and dynamic evaluation capability, ICE should be considered when conventional imaging fails to clarify suspected prosthetic PV IE.

POSTER PRESENTATIONS

Category: Echocardiography

2602 - ONE CASE OF MEMORY DEGRADABLE ABSORBABLE PFO OCCLUDER FOLLOWED UP BY ULTRASOUND AFTER INTERVENTIONAL OCCLUSION

Jun Gao [1]
Wuhan Children Hospital, Echocaigraphy, Wuhan-China [1]

Background / Hypothesis:
To follow up the changes of the ultrasound image of the absorbable PFO occluder after interventional occlusion.

Materials and Methods:
he ultrasonic image changes and clinical data of the absorbable PFO occluder were reviewed before and after the occluder at 1, 3, 5 and 7 months.

Results:
he 15-year-old female patient underwent preoperative echocardiography revealing patent foramen ovale (PFO) and patent ductus arteriosus (PDA), with the PFO size 1.8mm, PDA2.0mm. During surgery, a memory-guided 24-24mm PFO occluder was used for interventional closure, while a 5-4 mmADOII occluder was employed for PDA closure. Immediate postoperative imaging showed strong echogenicity at the PFO occluder sites with normal positioning and no residual shunting. Similarly, the PDA occluder demonstrated proper placement without residual flow. Follow-up echocardiograms at 1, 3, 5, and 7 months post-operation revealed gradual fusion of the PFO occluder's strong echo with atrial septal tissue. By 7 months post-surgery, the PFO occluder was nearly indiscernible, though residual echogenicity could be observed at the central steel cable rivet site of the right atrial disc. The PDA occluder's strong echo persisted during follow-up, with no residual shunting detected.

Conclusions:
The occluder became virtually undetectable on echocardiographic images, aligning with animal trial results and providing crucial insights for future clinical applications of bio-degradable occluders.

POSTER PRESENTATIONS

Category: Electrophysiology

1099 - ARRHYTHMIA FOLLOWING CONGENITAL HEART DISEASE SURGERY IN OMAN INCIDENCE AND RISK FACTORS – A PROSPECTIVE STUDY.

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Background / Hypothesis:
Arrhythmia is a common complication after congenital heart disease (CHD) surgeries, with varying incidence rates. It places a significant burden on healthcare systems, particularly intensive care units. In Oman, the incidence and characteristics of post-surgical arrhythmias in pediatric patients undergoing CHD repair have not been thoroughly documented.
The study's objectives are to determine the incidence, types, and outcomes of arrhythmias in patients undergoing CHD surgery in Oman. It also seeks to identify risk factors for the development of arrhythmias in the early postoperative period.

Materials and Methods:
This prospective cohort study was conducted at the National Heart Centre in Oman, involving pediatric patients post CHD repair from 2023 to 2024. Out of the 360 patients operated on within the specified timeframe, 346 met the inclusion criteria for this study. Patients excluded were those who have underlying arrhythmia or who have a pacemaker. Data, including patient demographics and preoperative, perioperative, and postoperative parameters, were collected for each patient from the hospital information system. Univariate and multivariate logistic regression analyses were performed to identify risk factors for the development of postoperative arrhythmia.

Results:
Among the 346 patients, 49 (14.2% with a 95% CI of 10.6% - 18.3%) developed arrhythmias postoperatively. Junctional ectopic tachycardia (JET) was the most common, observed in 28 cases (57%), followed by atrioventricular block in 10 cases (20%), and supraventricular tachycardia (SVT) in 9 cases (18%). Among the patients with atrioventricular block, 5 (10%) required permanent pacemaker implantation for persistent complete heart block. Analysis revealed that patients with arrhythmias experienced longer bypass times ($p = 0.005$) and cross-clamp times ($p = 0.040$) and were predominantly infants ($p = 0.041$).

Conclusions:
Early postoperative arrhythmia was identified in 14.2% of our population, with JET being the most common, occurring in 57% of patients with arrhythmia. Prolonged bypass time, cross-clamp time and younger age were potential

POSTER PRESENTATIONS

Category: Electrophysiology

1127 - PROGRESSIVE CARDIAC CONDUCTION DEFICIENCY WITH HISTORY OF FETAL VENTRICULAR TACHYCARDIA DUE TO SCN5A CHANNELOPATHY

Ken Nakano [1], Aya Miyazaki [2], Hiroki Uchiyama [2], Nao Inoue [2], Yasumi Nakashima [2]
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Background / Hypothesis:
SCN5A mutations are known to cause progressive cardiac conduction disease (PCCD) but are not typically associated with fetal ventricular tachycardia (VT).

Materials and Methods:
We report a case of PCCD with a history of fetal VT, later identified as carrying the SCN5A p.D1595N mutation.

Results:
A 21-week-old fetus was diagnosed with VT and hydrops. Although maternal therapy achieved rate control, cardiac failure and hydrops worsened, necessitating delivery at 33 weeks. At birth, electrocardiography (ECG) showed VT at 150 bpm. Cardioversion was ineffective, and lidocaine infusion on day 1 resulted in complete atrioventricular (AV) block. By day 2, the rhythm spontaneously returned to sinus.
At age 3, ECG showed left anterior fascicular block, progressing to bifascicular block at age 9. Genetic testing identified a de novo SCN5A p.D1595N mutation. Myocardial SPECT and MRI showed no myocardial degeneration. Over 11 years of follow-up, the patient has remained free from VT or other arrhythmias.

Conclusions:
SCN5A mutations alter the gating properties of voltage-dependent sodium channels. The p.D1595N mutation has been reported to cause conduction block by impairing recovery from inactivation during the slow phase of depolarization. The mechanism underlying VT occurrence in the perinatal period remains unclear and warrants further investigation.

POSTER PRESENTATIONS

Category: Electrophysiology

1190 - SUCCESSFUL IMPLANTATION OF MICRA AV IN III°ATRIOVENTRICULAR BLOCK CHILD DUE TO FULMINANT MYOCARDITIS A CASE REPORT

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Background / Hypothesis:
Fulminant myocarditis is a common but life-threatening inflammatory disease, which usually present various type of arrhythmia. The incidence of high-degree atrioventricular block is not high, but usually need mechanical support such as ECMO and pacemaker. Leadless pacemakers were proved to be effective with less complications, both in children and adults. However, few research reported the implantation of leadless pacemaker in fulminant myocarditis children.

Materials and Methods:
Retrospective clinical case analysis. One child diagnosed with fulminant myocarditis combined with III ° atrioventricular block at the Children's Hospital Affiliated to Zhejiang University School of Medicine in November 2024 was selected as the research subject. Inclusion criteria: Clinical symptoms, signs, and laboratory tests meet the diagnosis of fulminant myocarditis, and the electrocardiogram shows III ° atrioventricular block. Collect general information, clinical manifestations, physical signs, laboratory tests, and imaging results of patients.

Results:
The patient was successfully implanted with a leadless pacemaker, Micro AV. the process went smoothly, there were no obvious complications after surgery.
Conclusions:this case demonstrates the safety and effectiveness of Micra AV implantation in pediatric patients, expands the indications to include fulminant myocarditis children with AVB.

POSTER PRESENTATIONS

Category: Electrophysiology

1199 - CLASSIFICATION DIAGNOSIS FOR ECG SIGNALS BASED ON ATTENTION BIGRU NEURAL NETWORK

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Background / Hypothesis:
Arrhythmia is a representative type of cardiovascular disease. The traditional ECT signal diagnosis methods mainly rely on the observation and analysis of electrocardiogram by experienced doctors, and subjective factors and experience have great influence. In order to improve the diagnostic accuracy, ECG diagnosis method based on artificial intelligence has become a research hotspot. This objective of this research is to investigate the feasibility of ECG signal classification diagnosis based on the fusion of the Attention and BiGRU for improving the insufficient diagnostic effect of the traditional diagnosis method under the influence of noise interference and human factors.

Materials and Methods:
Materials: The ECG signal dataset comes from the 12-lead ECG signal database jointly released by Chapman University and Shaoxing People's Hospital in 2020, and three kind of arrhythmia datasets with 6675 images including GSVT 2225, SB 2225 and SR 2225 are used as the research materials.
Methods: Firstly, the research materials are divided as the training set and the test set according to 80% and 20% respectively. Next, the attention mechanism was used to extract the spatiotemporal characteristics of ECG signals. Then, BiGRU is used to achieve spatio-temporal feature fusion. Finally, the global average pooling (GAP) is applied to the reduction of data dimensionality and the classification of arrhythmia signal.

Results:
The diagnostic accuracy of the classification diagnosis method based on Attention-BiGRU reaches 96.33%, it outperforms the typical deep neural network models including BiGRU, AlexNet, VggNet16 and ResNet18 for the classification of GSVT, SB and SR arrhythmia signals. And the performance of the proposed method is also excellent in the indicators including Accuracy, Recall, F1, Jorden Index.

Conclusions:
The classification and diagnosis of ECG signals based on Attention-BiGRU is feasible and effective.

POSTER PRESENTATIONS

Category: Electrophysiology

1243 - EVALUATION OF VENTRICULAR EXTRASYSTOLE AND VENTRICULAR TACHYCARDIA ABLATIONS IN CHILDREN A RETROSPECTIVE DUAL CENTER EXPERIENCE

Hasan Candaş Kafali [1], Aslihan Karaman [1], Merve Maze Aydemir [1], Gülhan Tunca Şahin [2], Celal Akdeniz [1], Yakup Ergül [3], Ülkü Aydin [4], Volkan Tuzcu [4]
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Background / Hypothesis:
This study aims to evaluate pediatric patients who underwent ablation for ventricular extrasystole (VES) and ventricular tachycardia (VT) at two centers: University of Health Sciences Mehmet Akif Ersoy Thoracic and Cardiovascular Surgery Training and Research Hospital and Medipol Mega University Hospital.

Methods:
A retrospective analysis was conducted using the electronic arrhythmia follow-up system (FileMaker EP Clinic/EP Procedure). Among 2336 patients diagnosed with VES/VT from 2010 to 2024, 466 who underwent EPS ± ablation were included. Data collected included demographics, ablation energy source, VES-VT type and localization, procedural outcomes, complications, recurrence, procedure and fluoroscopy times, and follow-up duration. Descriptive statistics and subgroup analyses were performed.

Results:
The median age was 13.6 years (range: 0.6–21), and median weight was 43.7 kg (range: 7.5–101). Most were male (60.8%). VES-VT classification showed 40.2% had VES, 31.8% had both VES and VT, and 28% had sustained VT. Thirteen patients had cardiomyopathy (ARVD: n=7, DCM: n=3), and 21 had congenital heart disease (e.g., TOF: n=12, VSD: n=6); acute success in this subgroup was 64.7%. Seven had tachycardia-induced cardiomyopathy; five improved post-ablation. Ablation was performed in 355 (76.2%) of 466 patients. General anesthesia was used in 39.3%; in 6%, ablation wasn't performed due to insufficient inducibility. Overall, 21.6% did not undergo ablation. VES/VT localization was right ventricular in 52.9%, left in 47.1%. RF was used in 63%, irrigated RF in 28.5%, and cryoablation in 8.5%. Acute success was 81.7%. Recurrence occurred in 19% during a mean follow-up of 37 months. Mean procedure time was 153.2 minutes; in patients needing fluoroscopy (61.7%), mean duration was 5.66 minutes.

Conclusion:
Ablation is a safe and effective treatment for pediatric VES and VT. Careful patient selection, procedural planning, and regular follow-up are key to favorable outcomes.

POSTER PRESENTATIONS

Category: Electrophysiology

1244 - IMPLANTABLE CARDIOVERTER DEFIBRILLATOR (ICD) THERAPY IN PEDIATRIC AND YOUNG ADULT PATIENTS A RETROSPECTIVE DUAL CENTER EXPERIENCE

Aslihan Karaman [1], *Hasan Candaş Kafali* [1], Merve Maze Aydemir [1], Samet Paksoy [1], Celal Akdeniz [1], Ülkü Aydin [2], Ahmet Şaşmazel [3], Sertaç Haydin [4], Volkan Tuzcu [2], Yakup Ergül [5], Alper Güzeltaş [1]
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Background / Hypothesis:
Implantable cardioverter-defibrillator (ICD) implantation is a key strategy in preventing sudden cardiac death in pediatric and young adult patients with cardiomyopathy, ion channelopathies, and congenital heart disease (CHD). This study evaluates the long-term efficacy, safety, complications, and survival outcomes of ICD therapy in this population.

Materials and Methods:
This retrospective dual-center study included 388 patients who underwent ICD implantation between 2010 and 2024—262 at Mehmet Akif Ersoy Thoracic and Cardiovascular Surgery Training and Research Hospital and 126 at Medipol University Hospital. Demographics, device type, indication (primary vs. secondary prevention), and acute and long-term complications were analyzed.

Results:
Of the 388 patients, 61.8% were male. The mean age at implantation was 152 months (range: 20 months–36 years), and the mean weight was 44.4 kg. Underlying diagnoses included cardiomyopathy (39.6%), ion channel defects (47.4%), CHD (9.8%), and others (6.1%). Transvenous ICDs were used in 73.2%, epicardial in 25.9%, and hybrid approaches in 5 patients. ICDs were implanted for primary prevention in 64.9% and secondary prevention in 35%. Over a median follow-up of 7.5 years, 156 patients received appropriate therapy (ATP: 65, shock: 89). Appropriate therapy rates were highest in ion channel defects (55.5%), followed by cardiomyopathy (35.6%) and CHD (8.9%).

Early complications occurred in 4.9% (infections, pneumothorax, hematoma, perforation), while long-term complications were seen in 20.1%, including lead dysfunction (7.47%) and inappropriate shocks (7.22%). Thirteen patients (3.35%) died, mostly due to heart failure.

Conclusion:
ICD therapy is effective in preventing sudden cardiac death in young patients with structural and electrical heart diseases. Despite device-related complications, long-term outcomes are favorable with multidisciplinary management and close follow-up in specialized centers.

POSTER PRESENTATIONS

Category: Electrophysiology

1274 - IDENTIFICATION OF SINO ATRIAL NODE LOW VOLTAGE AREAS USING UNIPOLAR AND OMNIPOLAR MAPPING IN PEDIATRIC PATIENTS WITH CONGENITAL HEART DISEASE

Mathijs Van Schie [1], Jiahao Zheng [1], Manouk Linderhof [1], Lixia Dai [1], Can Zhang [1], Yannick Taverne [2], Annemien Van Den Bosch [1], Natasja De Groot [1]
Erasmus University Medical Center, Cardiology, Rotterdam-The Netherlands [1] Erasmus University Medical Center, Cardiothoracic Surgery, Rotterdam-The Netherlands [2]

Background / Hypothesis:
Sinus node dysfunction (SND) commonly occurs in pediatric patients with congenital heart disease (CHD). Unipolar and omnipolar mapping techniques are available to explore the degree of electrical remodeling in the sino-atrial node (SAN). While each technique offers specific advantages and disadvantages, their roles in SAN mapping in pediatrics are not yet fully understood. We therefore performed epicardial high-resolution voltage mapping of the SAN to investigate the interrelationship between unipolar and omnipolar low-voltage areas.

Materials and Methods:
Intra-operative unipolar mapping was performed in 45 patients (0.6 [0.4-3.1] years). Potential morphology characteristics were computed, including peak-to-peak voltages and relative R/S ratios. Omnipolar electrograms (EGM) were constructed from orthogonal bipolar EGM pairs. Potential characteristics were compared between unipolar and omnipolar techniques. Low-voltage areas (LVA) were defined as unipolar voltage <1mV and omnipolar voltage <0.5mV.

Results:
Omnipolar voltages surrounding the SAN area were larger than unipolar voltages (6.2 [4.8-7.6] vs 5.2 [3.6-6.3] mV, p<0.001). There was also a strong linear correlation between techniques (r=0.890, p<0.001). Omnipolar LVAs near the SAN were identified in only 9 patients (20%), while unipolar LVAs were present in 34 patients (76%); 8 patients had combined unipolar and omnipolar LVAs. Unipolar LVAs were larger than omnipolar LVAs (6.5 [4.6-10.5] vs 0.7 [0.5-2.2] %, p<0.001). At the SAN exit site, the morphology of unipolar potentials consistently consisted of full S-wave potentials, while the morphologies of omnipolar potentials were highly variable (peak dominance ratio: 0.92 [0.89-0.95] vs 0.38 [0.18-0.52], p<0.001).

Conclusions:
At the SAN area, a considerable amount of LVAs could be identified using unipolar voltage mapping. These unipolar potentials typically consisted of full S-wave potentials, which were easily recognizable but led to an overidentification of unipolar LVAs. By utilizing combined omnipolar voltage mapping, LVAs near the SAN may be more accurately identified and used to identify patients at risk for developing SND.

POSTER PRESENTATIONS

Category: Electrophysiology

1342 - THE SUBCUTANEOUS IMPLANTABLE CARDIOVERTER DEFIBRILLATOR IN CLINICAL PRACTICE A REPORT OF TWO CASES IN CHILDREN AND LITERATURE REVIEW

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Children's Hospital, Zhejiang University School Of medicine, Cardiology Department, Hangzhou-China [1]

Background / Hypothesis:
To explore the efficacy of subcutaneous implantable cardioverter-defibrillator (S-ICD) in the prevention of sudden cardiac death (SCD) in pediatric patients, and to evaluate its potential in reducing complications and improving treatment outcomes

Materials and Methods:
Clinical observation of two pediatric cases undergoing S-ICD implantation was conducted. Preoperative automatic screening, individualized implantation strategies, and postoperative follow-up were used to assess the clinical application and adverse reactions of S-ICD, along with a literature review.

Results:
Both patients successfully underwent S-ICD implantation without significant postoperative complications. Preoperative automatic screening ensured optimal lead placement and successful defibrillation thresholds. No inappropriate shocks were observed during follow-up, and treatment outcomes were favorable.

Conclusions:
S-ICD demonstrates significant advantages in preventing sudden cardiac death in pediatric patients, particularly in avoiding complications associated with traditional transvenous leads. Although long-term safety and efficacy of S-ICD in pediatric patients require further investigation, the technology shows promising clinical potential.

POSTER PRESENTATIONS

Category: Electrophysiology

1377 - MECHANISMS OF DROWNING IN CHILDREN INFLUENCE OF COLD SHOCK RESPONSE ON REPOLARIZATION PATTERNS AND ARRHYTHMIA BURDEN IN HEALTHY CHILDREN

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Background / Hypothesis:
While drowning plays a particularly important role in children, the data on the physiology of drowning in this population is scarce. Both the cold shock response and the development of arrhythmias appear to be of particular significance during drowning. This study aims to provide a more detailed examination of the rhythmic effects of cold shock response in healthy children, focusing on changes in repolarization patterns and the development of arrhythmias. It seeks to fill the existing data gap regarding swimming physiology in healthy children and establish a structured data foundation for future studies involving children with cardiac preconditions.

Materials and Methods:
Inclusion criteria were age of 8-14 years, ability to swim and overall health. Anthropometric data were measured. The aquatic protocol, which was conducted in both a warm (34°C) and a cold (11°C) pool, included 1 minute in warm and 1 minute in cold water and 2 minutes of dry monitoring, respectively. Skin temperature, heart rate and respiratory rate were measured and Holter-ECG was conducted continuously.

Results:
Heart rate variability parameters were lower in cold water compared to warm water. The QT interval did not adequately adapt to the sudden increase in heart rate (QT hysteresis) during cold water immersion. Except for a few isolated extrasystoles unrelated to immersion, no arrhythmias were recorded. No participant reported symptoms. No adverse events were seen.

Conclusions:
The current study presents first data on rhythmological effects of cold shock response including repolarization patterns and arrhythmia burden in healthy children during the immersion into 11°C cold water. Data showed, that cold water immersion represents a strong sympathetic stressor, while an inadequate adjustment of the QT interval to the increasing heart rate (QT hysteresis) was observed. However, no significant changes in repolarization parameters or arrhythmias were detected during cold water exposure in healthy children.

POSTER PRESENTATIONS

Category: Electrophysiology

1411 - IMPACT OF PROPAGATION WAVE COLLISION MAPPING ON ATRIOVENTRICULAR NODAL REENTRANT TACHYCARDIA ABLATION OUTCOMES IN CHILDREN

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Background / Hypothesis:
Atrioventricular nodal reentrant tachycardia (AVNRT) is a supraventricular tachycardia originating from the AV node and perinodal tissue. Cryoablation, or freezing the target slow pathway tissue, is frequently used for pediatric patients. Historically the site of ablation is targeted anatomically within the Triangle of Koch, but propagation wave collision mapping (PWCM) has been increasingly used to further localize the slow pathway. We hypothesized that PWCM would better identify the target tissue for ablation and improve patient outcomes.

Materials and Methods:
Patients who underwent AVNRT cryoablation at a tertiary pediatric referral center between 2012 and 2024 were analyzed. Patients with other arrhythmia substrates addressed during the procedure were excluded. Patient factors, procedure characteristics, and outcomes were compared between primary mapping type (anatomic versus PWC).

Results:
Among 176 patients analyzed, 137 had primary anatomic mapping (age=14.1±3.5 years, female=61%) and 21 had primary PWCM (age=13.1±4.0 years, female=62%). All procedures were performed under anesthesia. The anatomic mapping cohort had more cryoablation applications (16(IQR 10-25) versus 11(IQR 9-16), $p<0.01$), longer cryoablation time (68.2±36.8 versus 47.5±32.6 minutes, $p<0.01$), longer procedure time (254±77 versus 176±43 minutes, $p<0.01$) and increased fluoroscopy exposure (15.0 (IQR 0.40-105.0) versus 0 (IQR 0-3) cGycm2, $p<0.01$) compared to the PWCM cohort. The anatomic mapping cohort had 7 recurrences (5.1%), 5 re-interventions (3.6%), and 1 residual SVT at end of case. The PWCM cohort had no recurrences, re-interventions, or residual SVT at end of case.

Conclusions:
Compared to a primary anatomic approach, PWCM may allow operators to better localize the slow pathway for cryoablation in pediatric patients leading to less cryoablation applications, decreased time under anesthesia, and decreased exposure to radiation. PWCM may lead to less recurrence and re-intervention but requires prospective validation in a larger cohort.

POSTER PRESENTATIONS

Category: Electrophysiology

1417 - A NIGHTMARE CASE OF VENTRICULAR ARRHYTHMIA IN A NEWBORN CHALLENGES IN DIAGNOSIS AND MANAGEMENT

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Heart Centre Leipzig, Pediatric Cardiology, Leipzig-Germany [1]

Background / Hypothesis:
Cardiac rhythm disturbances in newborns can present diagnostic and therapeutic challenges, particularly when associated with genetic mutations affecting mitochondrial function.

Results:
We report a female newborn who experienced cardiac arrest at 28 days, successfully resuscitated by her parents. Echocardiography revealed good biventricular function, mild left ventricular (LV) hypertrophy, and non-compaction signs. ECG showed sinus rhythm with pre-excitation. At five weeks, a transesophageal EP study induced only non-sustained atrial tachycardia (AT), there was no change in QRS morphology during incremental atrial pacing, programmed stimulation, or adenosine administration suggesting the cardiac arrest was due to rapid AT with 1:1 AV conduction and pseudo-delta wave due the LV hypertrophy. Amiodarone, beta-blockers, an implantable loop recorder (ILR), and an external automatic defibrillator (EAD) were initiated. Two months later, ILR detected non-sustained ventricular fibrillation (VF), leading to epicardial VVI ICD implantation. Post-extubation, >30 ICD shocks occurred within two hours due to VF. Many combinations of antiarrhythmic drugs were attempted, with flecainide unexpectedly abolishing pre-excitation but causing impaired AV node conduction, bradycardia, subsequent need for pacing and two-days-ECMO-requiring dyssynchrony induced low cardiac output. Ablation of left-sided accessory pathways (AP) was performed, incessant VT from the aorto-mitral continuity emerged, requiring additional ablation. Ten days later, VF and ICD shocks recurred, with evidence of AP reoccurrence and re-ablation was necessary via a transhepatic approach due to bilateral femoral vein occlusion. One month later, another VF episode occurred despite absent pre-excitation on ECG. Genetic testing identified a likely pathogenic variant in NDUFB11 Gene. After initiating a ketogenic diet, VF episodes significantly decreased, though short slow non-sustained VT persisted. The child is two years old and is developing normally.

Conclusion:
This case underscores the complexity of managing ventricular arrhythmias. Genetic evaluation and metabolic therapy, alongside aggressive arrhythmia management, were crucial for stabilizing the patient.

POSTER PRESENTATIONS

Category: Electrophysiology

1424 - CHARACTERIZATION OF ARRHYTHMIAS AND ELECTROCARDIOGRAPHIC ABNORMALITIES IN PEDIATRIC PATIENTS WITH RASOPATHIES

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Background / Hypothesis:
RASopathies, including Noonan syndrome (NS), are genetic syndromes with known cardiac manifestations including hypertrophic cardiomyopathy (HCM) and valve abnormalities; however, there is limited data on electrophysiologic abnormalities. This knowledge gap is reflected in current RASopathy management guidelines with limited information on electrophysiologic surveillance. This study aimed to characterize arrhythmias and ECG findings in a pediatric RASopathy population.

Materials and Methods:
This was a single-center retrospective cohort study. Participants 0-18 years of age with a genetic diagnosis of a RASopathy syndrome followed at SickKids Hospital between 2001-2023 were included. Patients without cardiac testing (i.e. echocardiogram, ECG) performed were excluded. Descriptive statistics was used to characterize participants including type of arrhythmias, ECG abnormalities, and anti-arrhythmic therapies.

Results:
Seventy-six participants were included in this study. Sixty-seven (88%) had NS, 7 (9.2%) had NS with multiple lentigines, and 2 (2.6%) had another RASopathy syndrome. Sixty-two (82%) had congenital heart disease (CHD), 25 (33%) had HCM, and 62 (82%) had non-cardiac co-morbidities. Abnormal ECG findings included 45 participants (61%) with any axis deviation, 34 (46%) with a bundle branch block or nonspecific interventricular conduction delay, and 44 (59%) with QTc prolongation. Of those with abnormal ECG findings, 4 (5.4%) did not have CHD or HCM. Five (6.6%) participants experienced arrhythmia(s), all of which had either CHD or HCM. Types of arrhythmias included atrial flutter (n=3), atrial fibrillation (n=1), ectopic atrial tachycardia (n=3), ventricular tachycardia (n=3), and ventricular fibrillation (n=2).

Conclusions:
Electrophysiologic abnormalities are common in RASopathy patients with heart disease, with almost two-thirds having at least one ECG abnormality. Arrhythmias occurred less frequently; however, this may be underrepresented due to practice variability in arrhythmia screening in this patient population. Future directions include exploring the impact of ECG abnormalities and arrhythmias on health outcomes, such as hospitalizations, electrophysiologic interventions, medication use, and transplant-free survival.

POSTER PRESENTATIONS

Category: Electrophysiology

1449 - OUTCOMES OF LQTS THE EVOLVING PATIENT PROFILE OVER 20 YEARS IN A QUARTERNARY SINGLE CENTRE CLINIC

Ngai Lam Woo [1], Karen Robinson [2], Claire Lawley [1], Christian Turner [1], Janine Smith [3], Jonathan Skinner [1], *Hiroko Asakai* [1]
The Children, Paediatric Cardiology, Westmead-Australia [1] The Childrens, Paediatric Cardiology, Westmead-Australia [2] The Children, Clinical Genetics, Westmead-Australia [3]

Background / Hypothesis:
Long QT syndrome (LQTS) is one of the most common cardiac channelopathies that carries significant morbidity and mortality when unrecognized and untreated. Since the advent of genotyping and family screening through a dedicated inherited arrhythmia clinic service, the rates of complications due to LQTS has considerably diminished. Therefore, the LQTS patient paradigm is increasingly one of minimal initial symptomatology with excellent risk control while on appropriate treatment.

Materials and Methods:
A retrospective cohort study was conducted to identify 181 patients with a primary diagnosis of LQTS seen at the Children's Hospital Westmead (CHW) between 2004-2024. Patients were then grouped into proband cases and non-proband cases. Symptomatology prior to initial review, treatment regimen, and breakthrough symptoms/events during follow-up were then collated and compared between both groups.

Results:
Between 2004-2024, there has been a general uptrend in the LQTS patient population, with LQTS increasingly identified due to family screening. 39 proband cases were identified, with 17 referred due to abnormal ECGs (44.7%) and 12 for symptoms (31.6%). The median age for diagnosis was 6.91 years (IQR 0.69 – 11.5) in proband cases, and 3.7 years (IQR 0.39 – 10.2)) in non-proband cases ($p > 0.05$). Proband cases were more likely to require ICD insertions (23% vs 5.2%, $p<0.05$), with both patient populations having equal uptakes of beta-blocker therapy (82% vs 80.4%, $p>0.05$). Gene testing was completed in proportionately equal rates (92% vs 86%), with positive gene identification being proportionately equal (74% vs 90%, $p>0.05$). Proband patients were more likely to have symptoms during follow-up (32% vs 5.6%).

Conclusions:
A dedicated clinic with genetic and family screening has significantly reduced the morbidity of LQTS, with more patients identified at a younger age and commenced on therapy earlier, as well as a decrease in symptoms during follow-up. Beta-blockers remain the primary mainstay of therapy follow-up.

POSTER PRESENTATIONS

Category: Electrophysiology

1481 - EFFICACY OF RADIOFREQUENCY ABLATION FOR PEDIATRIC TACHYCARDIA INDUCED CARDIOMYOPATHY PREDICTIVE FACTORS FOR SUCCESS AND RISK OF RECURRENCE

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Background / Hypothesis:
To evaluate the therapeutic efficacy of radiofrequency catheter ablation (RFCA) in pediatric patients with tachycardia-induced cardiomyopathy (TIC).

Materials and Methods:
A retrospective analysis was conducted on 31 pediatric patients diagnosed with TIC who underwent RFCA at our institution between July 2019 and July 2024. Clinical manifestations and outcomes of RFCA were summarized, supplemented by a review of relevant literature.

Results:
Among the 31 patients (17 males [54%], 14 females [45%]), the median age was 11 years and 7 months (range: 3–15 years), with a median body weight of 45 kg. Presenting symptoms included palpitations (17 cases), chest tightness/pain (12), fatigue (1), lethargy (1), syncope (1), and abdominal pain/hiccups (1). Primary RFCA success was achieved in 25 patients (80.6%). One patient experienced recurrence 4 months post-ablation and achieved success after repeat RFCA. Five patients (19.3%) required pharmacological therapy after ablation failure. Notably, one case of atrial tachycardia (AT) originating from the low right atrial free wall was complicated by transient paroxysmal atrial fibrillation during mapping; electrical cardioversion restored sinus rhythm intraoperatively. Postoperative cardiac function normalized, but AT recurred the following day, necessitating oral antiarrhythmic therapy.

Conclusions:
TIC, driven by persistent tachyarrhythmias, requires prompt arrhythmia control. RFCA offers high efficacy but poses pediatric-specific risks (e.g., perforation, thromboembolism) due to thinner atrial walls and smaller chambers. Surgical intervention may be considered for refractory cases. Misdiagnosis risks exist for AT mimicking sinus tachycardia on ECG, particularly in dilated cardiomyopathy. Challenges include limited arrhythmia inducibility under anesthesia and epicardial/intramural substrates. Precise intraoperative mapping correlates with success. RFCA remains safe and effective when targetable.

POSTER PRESENTATIONS

Category: Electrophysiology

1502 - LEFT VENTRICULAR DYSFUNCTION IN INFANT – WHAT IS THE CAUSE CASE PRESENTATION

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Background:
Pediatric dilated cardiomyopathy (DCM) is defined as the presence of left ventricular (LV) dilatation and systolic dysfunction. Rare combination of DCM with ventricular preexcitation raise a question about the real cause of left ventricular dysfunction – true DCM, tachycardia-induced cardiomyopathy (TIC) or preexcitation-induced dyssynchrony. We present a case of infant with DCM and WPW pattern.

Materials and Methods:
A 4-month-old infant boy was admitted with the signs of heart failure (HF) of unknown origin. In his medical history there was a mild upper respiratory infection month ago. Echocardiography showed extremely dilated LV with decreased ejection fraction (EF) of 20 % and severe mitral regurgitation (MR). NT-pro BNP level was 16000 ng/l. Coronarography confirmed normal anatomy of coronary arteries. In the next few days WPW pattern appeared. Morphology of delta wave with LBBB-like pattern indicated right lateral accessory pathway (AP).

Results:
Despite conservative HF treatment there was no LV function improvement. Based on the hypothesis of probable preexcitation-induced dyssynchrony we carefully titrated anti-arrhythmic (AA) therapy. The goal was to achieve the AP block, but there was progression of LV dysfunction despite the preexcitation disappearance and we decided for pulmonary artery banding based on Schranz's protocol. After surgery we observed gradual LV function increase. The child was discharged home with the LV EF of 36 % and mild to moderate MR. Later obtained genetic and metabolic results were negative.

Conslusions:
In our patient with DCM and WPW pattern, there was no improvement of LV function with AP block achieved on AA therapy. We concluded it is an idiopathic DCM with bystanding AP and with the progression of HF we decided for surgical management. Pulmonary artery banding in infants with DCM and end-stage HF (with preserved RV function) is an alternative therapeutic option to heart transplant in the acute situation and donor shortage.

POSTER PRESENTATIONS

Category: Electrophysiology

1542 - ENHANCING SAFETY IN PEDIATRIC ROBOTIC ABLATION THE ROLE OF 3D MAPPING IN REDUCING RADIATION EXPOSURE

Sip Wijchers [1], Gert Van Den Berg [2], Janneke Kammeraad [2], Thomas Krasemann [2], Sing-chien Yap [1]
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Background / Hypothesis:
Minimizing radiation during catheter ablation is critical in pediatric patients due to long-term risks and tissue vulnerability. This study evaluated the impact of introducing routine 3D electro-anatomical mapping on fluoroscopy time in children undergoing robotic ablation using the Stereotaxis Niobe system.

Materials and Methods:
We retrospectively analyzed 146 consecutive procedures in patients under 18 years, performed between 2022 and 2024 using robotic magnetic navigation. Procedures were classified as pre- (n = 82) or post- (n = 64) the introduction of routine 3D mapping (28 September 2023). Mapping was typically performed using EnSite X (86%) or CARTO (14%). Subgroups included transseptal puncture (TSP) status. Differences in fluoroscopy time were analyzed using the Mann-Whitney U test. After the introduction of routine mapping, fluoroscopy was still used during TSP to minimize risk without significantly increasing procedure time.

Results:
Overall, the total fluoroscopy time decreased significantly from a median of 5.60 minutes (IQR 3.65–9.50) pre-mapping to 0.00 minutes (IQR 0.00–4.00) post-mapping ($p < 0.001$).
In procedures without TSP, fluoroscopy time significantly decreased from a median of 5.60 minutes (IQR 3.65–9.50) pre-mapping to 0.00 minutes (IQR 0.00–0.95) post-mapping ($p < 0.001$). In procedures with TSP, fluoroscopy time decreased from 7.15 minutes (IQR 4.45–16.3) to 4.00 minutes (IQR 2.40–6.15) ($p = 0.005$). Before the introduction of 3D mapping, there was no significant difference in fluoroscopy time between procedures with and without TSP (7.15 [IQR 4.45–16.3] vs. 5.60 [IQR 3.65–9.50] minutes, $p = 0.10$). After mapping was introduced, procedures with TSP had significantly higher fluoroscopy time than those without (4.00 [IQR 2.40–6.15] vs. 0.00 [IQR 0.00–0.95] minutes, $p < 0.001$).

Conclusions:
Routine 3D mapping significantly reduces radiation exposure during pediatric robotic ablation. Its use is especially impactful in procedures without transseptal access and supports safer workflows in pediatric electrophysiology.

POSTER PRESENTATIONS

Category: Electrophysiology

1565 - DEVICE INDUCED SUSTAINED TACHYCARDIA IN PERCUTANEOUS CLOSURE OF ASD

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Background:
Atrial septal defect (ASD) is one of the most common congenital heart defects and percutaneous closure can be the treatment of choice. Sustained tachyarrhythmia during the procedure is rare and may preclude this approach. This case illustrates a rare situation in which the ASD occluder induces sustained tachyarrhythmia at the time of its placement, requiring an unusual approach.

Case report:
A 13 year-old female was diagnosed with Ostium Secundum ASD and Wolff-Parkinson-White (WPW) syndrome. Previously submitted to electrophysiological study and successful ablation of the right lateral accessory pathway. The patient remained asymptomatic with normal electrocardiogram.
She was then referred for percutaneous closure of the ASD. While implanting the device, she had three episodes of supraventricular tachycardia (SVT), which required adenosine. The procedure was then aborted and the patient was referred for 24-hour Holter monitoring and exercise stress testing, which did not show significant changes. She remained asymptomatic throughout the year and under regular outpatient follow-up.
In 2025, a joint approach between the hemodynamics and arrhythmology teams was chosen. The procedure was initiated by occlusion of the ASD. The first attempt to implant the prosthesis triggered an episode of Nodal Reentrant Tachycardia (NRT), reversed with adenosine. With the patient in sinus rhythm, the positioning of the prosthesis in the left atrium induced a new episode of intermittent NRT. It was decided to release the ASD occluder. With the patient in device-induced tachyarrhythmia, it was possible to perform ablation and modification of the slow pathway. The procedure was completed without complications and the patient was discharged home the following day, with no residual shunt through the prosthesis and a normal electrocardiogram.

Conclusion:
The integrated approach between the hemodynamics and arrhythmology teams was essential for the successful management of sustained SVT, a rare complication that was triggered exclusively by the positioning of the device.

POSTER PRESENTATIONS

Category: Electrophysiology

1606 - PRETERM BIRTH IS ASSOCIATED WITH LONG TERM AUTONOMIC CARDIAC DYSFUNCTION EVIDENCE FROM 24 HOUR ELECROCARDIOGRAM HEART RATE VARIABILITY

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Background / Hypothesis:
Prematurity is associated with reduced parasympathetic activity, suggesting altered autonomic regulation throughout life. Heart rate variability (HRV) reflects autonomic nervous system (ANS) function. This study examines HRV differences between preterm (PT) and full term (FT) born young adults to assess long-term autonomic function.

Materials and Methods:
The study included 37 PT (≤32 gestational weeks or ≤34 weeks with birth weight <1500g) and 36 FT born young adults. Ambulatory 24-hour electrocardiogram recordings were analyzed to assess HRV using spectral analysis, time-domain measures, and nonlinear dynamics. Spectral analysis included ultra-low (ULF), very-low (VLF), low (LF) and high frequency (HF) components. Time-domain measures included the standard deviation of normal-to-normal RR intervals (SDNN) and the root mean square of successive differences (RMSSD). Nonlinear analysis was based on detrended fluctuation analysis (DFA-α1 and DFA-α2). HRV parameters were evaluated for 24 hours and a nighttime (00:00-06:00) period.

Results:
Gender-specific differences were particularly pronounced in the PT subgroup. PT males exhibited significantly lower RMSSD (72.7±23.6 vs. 51.5±13.9 ms, p=0.024), SDNN (260.8±45.3 vs. 213.1±61.4 ms, p=0.040), VLF-power (8.39±0.32 vs. 7.86±0.60 ln ms^2, p=0.009) and DFA-α2 (1.04±0.06 vs. 0.99±0.06, p=0.038) values compared to their FT peers in 24-hour recordings. LF-power was also lower in PT males though the difference was not statistically significant (7.38 ± 0.44 vs. 7.52 ± 0.52 ln ms^2, p = 0.11).

Across the entire cohort, ULF-power was significantly lower in PT young adults (9.98±0.63 vs. 10.33±0.43 ln ms^2, p = 0.039) compared with FT peers. Additionally, DFA α-2 was significantly reduced in PT participants during both 24-hour (1.00±0.07 vs. 1.03±0.05, p = 0.047) and night-time recordings (1.01±0.08 vs. 1.06±0.07, p = 0.023). No other significant differences were observed between PT and FT young adults in other measured HRV parameters.

Conclusions:
Prematurity was associated with altered long-term ANS regulation in preterm born young adults. In addition, these changes are particularly pronounced in males.

POSTER PRESENTATIONS

Category: Electrophysiology

1649 - INTRAVENOUS SOTALOL IN PEDIATRIC INTENSIVE CARE PATIENTS WITH AND WITHOUT CONGENITAL HEART DISEASE HEMODYNAMIC AND ANTIARRHYTHMIC EFFECTS

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Background:
Sotalol is an antiarrhythmic with both class II and III properties, available intravenously since 2015. While its use in adults is well-documented, there is limited pediatric data. It has been used in pediatric patients for reentrant atrial arrhythmias, focal and ectopic atrial arrhythmias, atrial flutter, atrial fibrillation, and ventricular tachycardia. This study aimed to examine hemodynamic and antiarrhythmic changes following the first dose of intravenous sotalol.

Methods:
This single-center retrospective study included pediatric patients under 18 who received intravenous sotalol for the first time. Data collected included age, CHD status, univentricular circulation, electrophysiologic diagnosis, sotalol dose, dose discontinuation, QTc interval change, and arrhythmia termination. Hemodynamic variables, including heart rate, mean arterial pressure, pulse oximetry, near infrared spectroscopy (cerebral and renal), central venous pressure, and vaso-inotropic score, were recorded at multiple hourly time points (1 hour before to 8 hours after dosing). Hemodynamic data were analyzed using the Friedman test, and longitudinal changes were assessed with a linear mixed effects model.

Results:
The study included 112 patients with a mean age of 31.3 months. Of these, 50 (53.6%) had CHD and 15 (13.3%) had univentricular circulation. Of the 66 patients (59%) with active arrhythmias when receiving sotalol, 46 (70%) experienced arrhythmia termination. Heart rate significantly decreased from baseline at all time points ($p<0.01$), with a 16% reduction within 2 hours and an 18% reduction at 8 hours. Arterial saturation increased by 1-1.4% at 6-8 hours ($p<0.05$). These findings were not influenced significantly by other variables. The baseline QTc interval was 420.7 ± 65.4 ms and increased to 441.1 ± 46.7 ms post-dose ($p<0.01$). Other hemodynamic variables showed no significant change.

Conclusion:
Intravenous sotalol appears to effectively restore sinus rhythm without hemodynamic instability.

POSTER PRESENTATIONS

Category: Electrophysiology

1701 - SEIZURES THAT WEREN'T UNCOVERING HIDDEN CARDIAC CHANNELOPATHY

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Introduction:
Recurrent seizures in children are often attributed to neurological conditions like epilepsy, but in some cases, they are secondary to anoxia caused by abnormal cardiac rhythms, which are frequently overlooked. A thorough history, physical examination, and appropriate investigations are crucial to prevent diagnostic delays and potentially life-threatening outcomes. This case series highlights two children, initially misdiagnosed with a seizure disorder, later diagnosed with an underlying cardiac channelopathy, emphasising the importance of considering arrhythmias in children with atypical, refractory seizures.

Case Series:
Case 1: A 3.5-year-old girl with recurrent loss of consciousness and tonic-clonic movements was initially diagnosed with refractory epilepsy and treated with anticonvulsants. However, she continued to experience Torsades de Pointes, which had been missed earlier. After further evaluation, EEG revealed no epileptic discharges, indicating arrhythmias. Oral anti-arrhythmic agents were added, and she underwent Bilateral VATS cervical sympathectomy and a permanent DDDR pacemaker. Genetic testing identified mutations in the CACNA1E and KCNE genes, confirming Early Repolarization/Long QT 5 syndrome. Despite treatment, the child succumbed to refractory arrhythmia.
Case 2: A 1-year-old girl with abnormal movements since 4 months was diagnosed with Long QT 3 syndrome after genetic testing revealed a mutation in the SCN5A gene. ECG showed bifid T waves and borderline QTc prolongation. After discontinuing antiepileptic drugs and starting oral mexiletine, the child has remained seizure-free for 6 months.

Discussion:
These cases highlight the challenge of distinguishing between seizures and arrhythmias, particularly in life-threatening cardiac channelopathies. Identifying the underlying cardiac cause can prevent misdiagnosis and guide effective interventions.

POSTER PRESENTATIONS

Category: Electrophysiology

1702 - DUAL TROUBLE OF TACHY BRADYARRHYTHMIA IN BRUGADA SYNDROME

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Introduction:
Brugada syndrome is a cardiac channelopathy associated with life-threatening ventricular arrhythmias. Though sinus node dysfunction (SND) is rare, it has been linked to SCN5A gene mutations, manifesting as bradycardia, sinus arrest, or chronotropic incompetence, often requiring ICD placement. We present a case of a boy with recurrent palpitations, syncope, and prolonged pauses observed on Holter monitoring.

Case Report:
A 14-year-old boy presented with recurrent palpitations and chest pain for a year, including a previous episode of ventricular tachycardia leading to syncope and hospitalization. ECG revealed sinus bradycardia with a Type I Brugada pattern. Holter monitoring showed frequent prolonged pauses (maximum 7.36 seconds) and infrequent ventricular premature complexes (<2% burden). Cardiac MRI was normal. He was classified as high-risk (63%) for sudden life-threatening events (Corcia et al. Score ≥6) and underwent emergency dual-chamber ICD implantation, with oral sotalol prescribed. Whole exome sequencing revealed a heterozygous mutation in the SYNE2 gene, associated with Emery-Dreyfus muscular dystrophy Type 5.

Discussion:
Brugada syndrome, caused by sodium channel mutations, primarily affects the His-Purkinje system and right ventricle, leading to arrhythmias and conduction abnormalities. These mutations can also affect the sinus node and atrium, causing SND. Diagnosis involves ECG, Holter monitoring, and electrophysiological studies. SND is a significant risk factor for sudden death, and the Corcia et al. score helps predict this risk in Brugada patients. Emery-Dreyfus dystrophy is linked with Brugada syndrome, though this specific mutation is novel.

Conclusion:
Dual-chamber ICD with antiarrhythmia pacing is essential for managing both SND and ventricular arrhythmia in Brugada syndrome, improving quality of life and preventing complications. The role of genetics, especially the SYNE2 gene, in Brugada syndrome warrants further study.

POSTER PRESENTATIONS

Category: Electrophysiology

1717 - GROWING INTO AVNRT EPIDEMIOLOGIC EVOLUTION OF PEDIATRIC ARRHYTHMIAS BY AGE

Sip Wijchers [1], Gert Van Den Berg [2], Janneke Kammeraad [2], Thomas Krasemann [2], Sing-chien Yap [1]
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Background / Hypothesis:
In pediatric electrophysiology, age critically influences clinical presentation and procedural strategy. Our center implements advanced robotic navigation (Stereotaxis Niobe) to enhance procedural safety during ablations, particularly in pediatric or more vulnerable patients. This study investigates how arrhythmia distribution shifts across pediatric age groups, emphasizing implications for age-tailored care.

Materials and Methods:
We retrospectively reviewed 155 pediatric patients undergoing electrophysiologic evaluation. Arrhythmias were classified as No (Inducible) Arrhythmia , Accessory Pathway (WPW/AVRT), AVNRT, Ventricular, or Other Supraventricular. Four age ranges were defined: 0–5, 6–11, 12–15, and 16–18 years. Distribution differences were analyzed using Fisher's exact test.

Results:
Of the 155 patients, 5 were 0–5 years, 49 were 6–11 years, 64 were 12–15 years, and 37 were 16–18 years. Arrhythmia type differed significantly across age groups (Fisher's p=0.014). In the youngest age group only patients with incessant, therapy-resistant arrhythmias or secondary LV dysfunction were treated, all involving accessory pathways, often with decremental conduction. Accessory pathways dominated in younger children from six to eleven years old. AVNRT was virtually absent in the 0–5 group but increased to nearly half of all arrhythmias in those 16–18 years. Ventricular arrhythmias (n=5) were treated only in patients ≥12 years and preferably in mature hearts.

Conclusions:
Pediatric arrhythmia patterns shift notably with age, with AVNRT emerging as a major arrhythmia in adolescence. Electrophysiologic management should be tailored according to developmental stage—reserving ablation in the very young to critical cases, and deferring ventricular ablation when feasible until adolescence.

POSTER PRESENTATIONS

Category: Electrophysiology

1719 - PULSED FIELD ABLATION FOR ACCESSORY PATHWAY IN A GIANT RIGHT ATRIAL APPENDAGE ANEURYSM A FIRST IN CHILD CASE

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Background / Hypothesis:
Giant right atrial appendage (RAA) aneurysms are rare congenital anomalies, occasionally associated with accessory conduction pathways. Such pathways, particularly from the extensive RAA surface connecting broadly to the underlying right ventricle (RV), complicate pediatric arrhythmia management. We report one of the first pediatric cases using pulsed field ablation (PFA) for treating a high-risk accessory pathway within a giant RAA.

Materials and Methods:
An 11-year-old boy with long-standing Wolff-Parkinson-White syndrome and recurrent supraventricular tachycardias (SVTs) despite beta-blocker therapy underwent two ablation procedures. Cardiac MRI revealed a giant RAA and moderately reduced RV function. Initial radiofrequency ablation at the tricuspid annulus was unsuccessful. Given the thin-walled structure of the aneurysmal RAA, PFA (Galvanize Medical, USA) was selected to minimize collateral damage. High-density electroanatomical mapping and extensive PFA were performed during both procedures.

Results:
The first PFA procedure resulted in transient resolution of pre-excitation. A second procedure revealed a broad accessory pathway between the RAA and RV with a refractory period <250 ms and inducible orthodromic atrioventricular reentry tachycardia (AVRT). A total of 75 PFA applications were delivered within the RAA. While complete elimination of conduction was not achieved, significant modification of the pathway was obtained, with delayed conduction parameters (SPERRI 409 ms) and absence of rapid antegrade conduction. The patient remained free of overt preexcitation during follow up, but had infrequent episodes of AVRT.

Conclusions:
This case highlights one of the earliest pediatric experiences with PFA and underscores the challenges presented by extensive accessory pathway anatomy associated with a giant RAA aneurysm. Although complete pathway elimination was challenging due to the broad RAA-to-RV contact, PFA effectively modified conduction properties while preserving fragile atrial structures. In such anatomically complex pediatric arrhythmias, PFA emerges as a promising alternative to conventional techniques. Surgical resection may be indicated if definitive ablation is necessary.

POSTER PRESENTATIONS

Category: Electrophysiology

1766 - SUCCESSFUL CARDIAC RESYNCHRONIZATION THERAPY WITH UNIVENTRICULAR PACING IN A PATIENT WITH INTRAVENTRICULAR DYSSYNCHRONY OF A SINGLE VENTRICLE A CASE REPORT

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Background:
There is no standardized approach for cardiac resynchronization therapy (CRT) in congenital heart disease due to anatomical and electrical heterogeneity. We report a case in which univentricular pacing was used as CRT for a patient with a single ventricle and right bundle branch block (RBBB), resulting in improved cardiac function.

Case:4-years male
The patient was diagnosed with mitral valve atresia, hypoplastic left ventricle, double outlet right ventricle, transposition of the great arteries, subaortic stenosis, and coarctation of the aorta.
The patient underwent ASD creation and bilateral pulmonary artery banding on day 3, followed by the Norwood procedure at 4 months and bidirectional Glenn procedure at 8 months. RBBB appeared at 2 months, leading to intraventricular dyssynchrony in the right ventricle (RV) and heart failure refractory to medical therapy. CRT was considered to improve dyssynchrony.

Methods:
An acute CRT study was performed, identifying the latest activated site in the RV using intracardiac electrograms. Pacing at this site fused with the own QRS, resulting in improved RVEF and dp/dt, and reduced RV end-diastolic volume (RVEDV) on right ventriculography. An epicardial lead was surgically placed at this site and in the right atrium.

Results:
After CRT, QRS duration shortened from 108 to 84 msec. RVEF improved from 30 to 39%, and RVEDV index decreased from 97 to 92 ml/m2. The Fontan procedure was later completed successfully.

Discussion
In this case, CRT was achieved by pacing a single site—the latest activated site within the ventricle—and fusing it with the own QRS, allowing resynchronization with just one pacing lead. In single-ventricle patients, multiple open-heart surgeries make epicardial lead placement technically challenging, and postoperative complications such as threshold elevation and infection are more likely. This approach reduces the number of epicardiac leads and mitigates these issues.

Conclusions:
Univentricular pacing may offer a less invasive and safer CRT option in single ventricule with intraventricular dyssynchrony.

POSTER PRESENTATIONS

Category: Electrophysiology

1797 - TRANSHEPATIC ACCESS FOR RADIOFREQUENCY ABLATION IN A PATIENT WITH COMPLEX CARDIAC ANATOMY A CASE REPORT

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Introduction:
Electrophysiology (EP) studies and catheter ablation have become critical interventions in pediatric patients with congenital heart disease (CHD), particularly those with single ventricle physiology. Venous access can be challenging in these patients due to prior surgeries, vascular anomalies, and altered anatomy. This case report highlights the successful use of percutaneous transhepatic venous access for radiofrequency ablation (RFA) in a 3-year-old girl with complex CHD and obstructed femoral and jugular veins, providing a valuable alternative when traditional venous access is unavailable.

Case Report:
A 3-year-old female with complex CHD, including unbalanced atrioventricular septal defect, single ventricle with left ventricular morphology, and transposition of the great vessels, developed supraventricular tachycardia (SVT) shortly after birth. Despite receiving multiple and variable antiarhhythmics and undergoing the Norwood and Glenn procedures, her SVT persisted. An EP study and catheter ablation were considered for definitive management.

Initial attempts to access the femoral veins were unsuccessful due to blockages, leading to the decision to utilize transhepatic venous access. The procedure was performed under general anesthesia using a 21-gauge needle and guidewire to access the middle hepatic vein. A vascular sheath was introduced, and EP studay and RFA were carried out using the Carto mapping system. The accessory pathway was successfully identified and ablated. To prevent hemorrhagic complications, the hepatic tract was sealed with microfibrillar collagen hemostat. Post-procedural ultrasound showed no bleeding, and the patient had an uneventful recovery.

Conclusion:
This case illustrates that transhepatic venous access is a safe and effective alternative for catheter ablation in pediatric patients with complex CHD and blocked femoral and jugular veins. As experience with this technique grows, it may become the preferred access method in similar cases. Early ablation of arrhythmias before the Fontan procedure is crucial, as it can optimize long-term outcomes and reduce the risk of future complications.

POSTER PRESENTATIONS

Category: Electrophysiology

1841 - FROM SEIZURES TO SUDDEN CARDIAC ARREST UNMASKING AN INHERITED ARRHYTHMIA

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Background / Hypothesis:
Inherited cardiac arrhythmias can present with diverse and misleading symptoms, often leading to delayed or incorrect diagnoses. This case illustrates the diagnostic challenges of a patient initially treated for epilepsy for 6 years before experiencing a life-threatening cardiac arrest, ultimately revealing an underlying genetic arrhythmia.

Materials and Methods:
An 11-year-old male with a history of recurrent collapses, initially diagnosed as seizures and treated with levetiracetam, was admitted following an out-of-hospital cardiac arrest due to ventricular fibrillation. During hospitalization, an exercise test induced torsades de pointes, necessitating defibrillation. Elevated transaminases were noted, likely secondary to transient hypoxia. Given the clinical picture of an inherited arrhythmic condition, genetic testing was pursued, and the patient was initiated on a beta blocker.

Results:
Whole genome sequencing identified a KCNQ1 variant deemed likely pathogenic, confirming a diagnosis of long QT syndrome (LQTS). The patient underwent an implantable cardioverter-defibrillator (ICD) placement. He discontinued his antiepileptic medications and hasn't had any further 'seizure' episodes. He has remained stable, with careful activity recommendations in place.

Conclusions:
This case highlights the complexity of diagnosing inherited arrhythmias, which may masquerade as neurological disorders. The progression from a suspected seizure disorder to a confirmed LQTS diagnosis with a pathogenic KCNQ1 variant underscores the need for thorough cardiac evaluation in patients with unexplained syncope with high suspicious mind of possible fatal arrhythmias. It also reinforces the importance of genetic testing in guiding management. This case serves as a compelling demonstration of the variable presentation of inherited cardiac conditions and the critical role of early recognition in preventing sudden cardiac death

POSTER PRESENTATIONS

Category: Electrophysiology

1843 - THE RAREST OF THE RARE A CASE OF ATRIAL TACHYCARDIA IN A PEDIATRIC PATIENT.

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Background / Hypothesis:
This is a 15-year-old female patient, who does not have a family, perinatal or pathological personal history, who begins her cardiovascular history at the age of 14, with palpitations and syncope, referred to a third-level hospital, where an electrocardiogram shows tachycardia of up to 180 bpm, narrow QRS (80ms), regular R-R interval,
with warming and cooling phenomenon, suggestive of atrial tachycardia, requiring management with adenosine without response, but control after administration of amiodarone, subsequently followed up by the electrophysiology service, who performed an electrophysiological study for ablation purposes, in which a right atrial activation map was performed with evidence of greater precocity at the level of the inferoseptal region of right atrial, performing radiofrequency ablation with an irrigated catheter, guided with impedance drop, subsequently without evidence of atrial extrasystole or clinical tachycardia, the procedure being successful, showing sinus rhythm.

Material and Methods
We present a 15- year-old female patient with a diagnosis of atrial tachycardia that was asymptomatic until adolescence and without significant history.

Results:
Literature comment that currently the incidence of supraventricular tachycardias in pediatric patients is 1 case per 1,000 children, however, atrial tachycardia corresponds to 5% of all cases of supraventricular tachycardia, so it is a rare disorder, however, scientific evidence comments that it is a treatable pathology with radiofrequency ablation, having a success rate of 90% and a complication rate of 3%.

Conclusions:
The importance of this clinical case is to show that our patient's course until adolescence was asymptomatic or perhaps with symptoms that in the context of an adolescent may go unnoticed, in addition to the fact that she presented a variant of the group of supraventricular tachycardias that is rare in the general population, however, in the pediatric population it is slightly more frequent, but that has an adequate response to treatment with radiofrequency ablation.

POSTER PRESENTATIONS

Category: Electrophysiology

1847 - EXTREME QTC PROLONGATION WITH HEART BLOCK IN NEONATES WITH ANTENATAL MATERNAL SARS COV 2 EXPOSURE – A CASE SERIES.

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Background / Hypothesis:
Emerging evidence links maternal SARS-CoV-2 exposure to neonatal inflammatory syndromes, yet cardiac conduction abnormalities in neonates remain underrecognized. This study investigates a novel presentation of extreme QTc prolongation (600–750 ms) with atrioventricular block (AVB) in neonates born to SARS-CoV-2-exposed mothers. We hypothesize that transplacental transfer of maternal anti-SARS-CoV-2 IgG antibodies triggers inflammation in neonatal cardiac conduction tissue, leading to transient, treatable rhythm disturbances.

Materials and Methods:
In this multicenter, observational study, 30 neonates (17 female) admitted to three NICUs in India (September 2020–May 2023) were retrospectively analyzed. Inclusion criteria comprised symptomatic neonates with prolonged QTc, hyperinflammation markers, maternal SARS-CoV-2 exposure (infection, vaccination, or IgG positivity), and exclusion of congenital/structural cardiac anomalies. Maternal histories, neonatal ECGs, serology (IgG/IgM), inflammatory markers (CRP, IL-6, D-dimer), and outcomes were assessed. Treatment included immunomodulatory therapy (IVIG, steroids) and anticoagulants.

Results:
Of 28 mothers, 75% had SARS-CoV-2 exposure (21/28: 14 asymptomatic/undocumented, 3 PCR-confirmed, 8 vaccinated). Neonatal median QTc at presentation was 650 ms (600–750 ms), with 2:1 or higher AVB in all cases. Anti-SARS-CoV-2 IgG was positive in 82.1% (23/28); IgM was universally negative. Inflammatory markers were elevated (median CRP: 30 mg/L, IL-6: 100 pg/mL). AVB resolved within 48 hours post-treatment (IVIG: 92.8%, steroids: 96.4%), and QTc normalized by median day 4. One mortality (3.3%) occurred due to prematurity-related necrotizing enterocolitis. At discharge and follow-up (1–12 months), all survivors exhibited normal sinus rhythm and QTc.

Conclusions:
Maternal SARS-CoV-2 exposure is associated with transient, inflammatory-mediated QTc prolongation and AVB in neonates, responsive to immunomodulatory therapy. This condition, distinct from congenital long QT syndrome, underscores the need for heightened vigilance in neonates of SARS-CoV-2-exposed mothers. Early recognition and anti-inflammatory intervention may prevent life-threatening arrhythmias. Further research is warranted to elucidate antibody-mediated mechanisms and cytokine roles in neonatal cardiac conduction pathology.

POSTER PRESENTATIONS

Category: Electrophysiology

1868 - THE HEART MIND CONNECTION ARRHYTHMIAS AND SEIZURES IN A 2 YEAR OLD PATIENT

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History:
A 2-year old male with a history of ventricular tachycardia (VT) receiving sotalol presented in unstable refractory VT following a gastrostomy tube insertion. Rhythm control was attempted with esmolol, amiodarone, and lidocaine before transfer to a quaternary hospital.

Case Presentation:
Sinus rhythm and hemodynamic stability was achieved with lidocaine (40 mcg/kg/min) and esmolol (400 mcg/kg/min), but he experienced 2 generalized tonic-clonic seizures that were successfully aborted with benzodiazepines and levetiracetam. He developed transient decreased spontaneous left arm movement and progressive encephalopathy.

Differential diagnosis included channelopathies, drug toxicity, infection, inflammatory, and metabolic disorders. CT revealed no acute intracranial pathology. EEG demonstrated diffuse encephalopathy. No diffusion restriction or abnormalities were noted on MRI and spectroscopy demonstrated a lactate peak. Baseline ECG and cardiac MRI were normal. Echocardiogram showed mildly depressed left ventricular systolic function and mild mitral regurgitation. Blood, urine, and cerebrospinal fluid testing were unremarkable.

The lidocaine was discontinued due to concern for toxicity. With titration his encephalopathy resolved and he remained seizure free. He was transitioned to oral mexiletine therapy. Lidocaine level was reported within normal range (5.2 µg/mL, toxicity >6 µg/mL). Whole exome sequencing revealed a paternally-inherited GPD1L gene variant not typically associated with Brugada syndrome (BrS). Father was diagnosed in his 20s with atrial flutter.

Discussion:
Concern for a heart-brain channelopathy was raised due to presence of arrhythmias and neurologic compromise. GPD1L regulates sodium currents and variants have been associated with BrS. GPD1L mutations have not been described with a neurologic phenotype. However, despite therapeutic lidocaine levels, our patient's improvement with decreasing lidocaine delivery supports drug toxicity in a vulnerable host. Thorough characterization of GPD1L variants is imperative to understand its phenotypes.

Conclusion:
Patients with channelopathies present unique phenotypes including cardiac and neurologic manifestations. Early awareness and recognition may impact therapeutic decision making and diagnosis.

POSTER PRESENTATIONS

Category: Electrophysiology

1873 - CLINICAL CHARACTERISTICS GENETIC FINDINGS AND ARRHYTHMIC OUTCOMES IN PATIENTS WITH CATECHOLAMINERGIC POLYMORPHIC VENTRICULAR TACHYCARDIA EXPERIENCE FROM TWO CENTERS

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Background / Hypothesis:
Catecholaminergic polymorphic ventricular tachycardia (CPVT) is a rare inherited arrhythmia, typically presenting in childhood or adolescence, characterized by bidirectional or polymorphic ventricular tachycardia and a risk of sudden cardiac death. This study evaluates the clinical, genetic, and arrhythmic outcomes of CPVT patients.

Materials and Methods:
Between January 2012 and January 2025, 115 patients presenting to two pediatric cardiology centers with syncope, family history of CPVT, or polymorphic VT were retrospectively reviewed.

Results:
After excluding patients with alternative diagnoses, incomplete data, or death before diagnosis, 84 CPVT patients were analyzed. Median age at symptom onset was 9 years, and diagnosis at 10.8 years. Syncope was the most common symptom (61.8%). A family history of sudden cardiac death was found in 33%. Diagnosis was based on a positive exercise test (bidirectional or polymorphic VT) in 78% of cases. Among 79 patients with genetic data, RYR2 mutations were most frequent (48%), followed by CASQ2 (27%) and TRDN (6%); 14% had no detectable mutation. Propranolol and flecainide combination was used in 87% of patients. Cardiac sympathetic denervation (CSD) was performed in 59%, often due to appropriate ICD shocks (22%) or recurrent syncope (16%). ICDs were implanted in 43 patients; 55% received appropriate shocks, while 3 experienced inappropriate shocks. One patient developed ICD pocket infection requiring device removal; three required lead replacement due to fracture.

Conclusions:
Despite advances in CPVT management, challenges remain in diagnosis, treatment, and risk stratification. Multicenter experience, particularly regarding genetic background and arrhythmic outcomes, may help guide therapy decisions, especially concerning ICD and CSD strategies.

POSTER PRESENTATIONS

Category: Electrophysiology

1882 - CARDIOPULMONARY FITNESS AND PHYSICAL ACTIVITY AMONG CHILDREN AND ADOLESCENTS WITH INHERITED CARDIAC DISEASE

Pascal Amedro [1], Luc Souilla [2], Sophie Guillaumont [3], Frederic Sacher [4], Oscar Werner [5], Antoine Deliniere [6], Constance Beyler [7], Mathieu Andrianoely [8], Paul Padovani [5], Lauriane Cornuault [1]
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Background / Hypothesis:
To evaluate cardiopulmonary fitness and physical activity among children with inherited cardiac disease and identify the factors associated with maximum oxygen uptake (VO2max) in this population.

Materials and Methods:
Cross-sectional, multicenter, prospective controlled study conducted in 7 centers in France. Participants included 100 children and adolescents aged 6 to 17 years with inherited cardiac arrhythmia or cardiomyopathy, compared with 107 sex- and age-matched controls. VO2max was assessed using cardiopulmonary exercise testing, and results were expressed using pediatric reference z-score values. The main determinants of VO2max included clinical (New York Heart Association [NYHA] functional class, treatment, echocardiographic, and electrocardiogram variables), functional (cardiopulmonary exercise test parameters), sociodemographic (sex, schooling, and parents' education), and behavioral (physical activity and motivation) characteristics.

Results:
A total of 100 patients (mean [SD] age, 12.7 [3.1] years; 52 boys [52.0%]) and 107 controls(mean [SD] age, 11.7 [3.3] years; 54 boys [50.5%])were included. The VO2max was lower in patients than controls, expressed as z-scores (mean [SD] score, −1.49 [1.48] vs −0.16 [0.97];P<0.001) or raw values (mean [SD] value, 32.2 [7.9] vs 40.2 [8.5] mL/kg/min;P<0.001). Moderate to vigorous physical activity levels were lower in patients than in controls (mean [SD] level, 42.0 [23.6] vs 48.2 [20.4] min/d;P=0.009). The final multivariable model explained 80% of the VO2max by integrating clinical(lower NYHA functional class, absence of ventricular dilatation, and absence of implantable cardioverter-defibrillator), functional (higher forced vital capacity and ventilatory anaerobic threshold), sociodemographic (male sex, normal progression of schooling, and higher maternal educational level), and behavioral (higher self-reported physical activity and motivation toward physical activity) parameters.

Conclusions:
Cardiopulmonary fitness and physical activity are lower in youths with inherited cardiac disease than in healthy controls, even after adjusting for use of β-blockers and using modern pediatric reference models. Assessing cardiopulmonary fitness among children with inherited cardiac disease can contribute to engaging in a shared decision-making.

POSTER PRESENTATIONS

Category: Electrophysiology

1883 - SUCCESSFUL LEFT LATERAL AP ABLATION WITH TRANSSEPTAL PUNCTURE IN A PATIENT WITH SITUS INVERSUS TOTALIS AND DEXTROCARDIA

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Background / Hypothesis:
Dextrocardia is a congenital heart malformation with a low incidence, occurring in 1 in 10,000–12,000 individuals. Wolff-Parkinson-White (WPW) syndrome, on the other hand, is a congenital condition characterized by accessory pathways between the atrium and ventricle, with a global prevalence of 3 per 1,000 individuals. Due to the rare combination of WPW syndrome and dextrocardia, the experience with radiofrequency catheter ablation in patients with these conditions is limited.

Case:
We present a case of a patient with situs inversus-dextrocardia and WPW syndrome who underwent successful catheter ablation using 3D mapping with the EnSite Precision® Mapping System. Adjustments were made to the procedural setup to accommodate the mirror-image cardiac anatomy, including reversed ECG electrode placement, Ensite patch positioning, and fluoroscopic views. Catheters were navigated to the high right atrium, right ventricle, and coronary sinus (CS). Maneuvers for CS access required counterclockwise techniques, opposite to conventional approaches. Mapping revealed an eccentric atrial pattern in the CS, with the earliest signals distally, indicating a left-sided accessory pathway. Transseptal puncture was performed after confirming the absence of a patent foramen ovale. The transseptal needle orientation and fluoroscopic positions were adjusted as mirror-image reversed configuration. Following successful puncture and left atrial access, ablation was performed at the site of optimal unipolar signals identified via delta mapping.

Conclusion:
This case demonstrates that catheter ablation for tachycardia in patients with dextrocardia is feasible and effective. Procedural success hinges on adapting projection angles, imaging techniques, and catheter manipulation to the unique anatomy.

POSTER PRESENTATIONS

Category: Electrophysiology

1891 - PREDICTORS OF REDO PROCEDURES AFTER ACCESSORY PATHWAY ABLATION IN CHILDREN

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Background / Hypothesis:
Risk factors for redo ablation of accessory pathways in children remain incompletely defined. We hypothesized that specific clinical and procedural factors are associated with increased risk of recurrence following initial ablation.

Materials and Methods:
This retrospective, single-center study included 665 consecutive pediatric patients who underwent first-time AP ablation between January 2013 and May 2024. A total of 61 patients required redo procedures. Patient characteristics and procedural parameters were analyzed, including age, body surface area, learning curve, ablation energy, catheter type, AP location, and direction of AP conduction. All procedures were guided by 3D electroanatomical mapping. Nonirrigated RF was the first-line energy source; irrigated-tip catheters were used when energy delivery proved ineffective, and cryoenergy was applied near the AV node.

Results:
Mean age was 12.3±3.6 years; 63.3% were male. Acute procedural success was 95%. Radiofrequency ablation was used in 86% of cases, while cryoenergy was applied in the remainder. Irrigated-tip catheters were used in 35.6% of procedures. The majority of ablations (89.5%) were performed with zero or near-zero fluoroscopy. The complication rate was 2%. Redo procedures were required in 9.2% of patients. On multivariable analysis, cryoenergy use independently predicted the need for redo ablation, while sole use of radiofrequency energy significantly reduced recurrence risk (OR=0.32, 95% CI:0.16–0.63, p=0.0011). Use of irrigated-tip catheters was also associated with higher redo rates (OR=2.1, 95% CI:1.1–3.97, p=0.0267). Age, BSA, AP conduction direction, learning curve and AP location were not significant.

Conclusions:
Multivariable analysis demonstrated that both cryoenergy and the use of irrigated-tip catheters are independent predictors of redo ablation in the pediatric population. The need for requiring redo procedures appears to be primarily influenced by the effectiveness of lesion formation, rather than by demographic factors and pathway location.

POSTER PRESENTATIONS

Category: Electrophysiology

1913 - RECOMMENDED SERUM VITAMIN D LEVELS FOR CHILDREN WITH RVOT PREMATURE VENTRICULAR CONTRACTIONS

Gabriel Cismaru [1], Cecilia Lazea [2], Daniela Iacob [2], Simona Cainap [2]
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Background / Hypothesis:
Ventricular premature contractions exhibiting an RVOT morphology might respond to vitamin D supplementation, making catheter ablation unnecessary. The International Endocrine Society advocates for an optimal range of 40 to 60 ng/ml vitamin D levels. The present investigation aimed to identify the ideal serum vitamin D concentration that decreases PVC burden.

Materials and Methods:
We examined 57 patients (mean age 11.2+/-3.6 years, 32% females) showing high burden of PVCs > 5000 on 24 hours. The PVCs exhibited an RVOT morphology with an LBBB pattern, inferior axis, and precordial transition occurring after V3. All patients showed vitamin D deficiency, with levels below 30 ng/ml. We divided the patients into four groups based on the vitamin D levels achieved post-supplementation: group 1 < 30 ng/ml, group 2 30-49.9 ng/ml, group 3 50-69.9 ng/ml, and group 4 > 70 ng/ml.

Results:
The initial PVC burden was: 22,154 in group 1, 28,892 in group 2, 19,988 in group 3, and 22852 in group 4, resulting in a mean PVC burden of 21,654 ± 11,869 / 24 hours. The average vitamin D levels were 22.6±6.8 ng/ml. Following treatment for 3 to 6 months with vitamin D, levels increased to 44.6±18.1 ng/ml, while PVC burden decreased to 5128±3254 per 24 hours. ROC curves indicated a threshold of 41.2 ng/ml that optimally predicts a drop in PVC to < 500/24 hours (AUC=0.68, 95% CI 0.56-0.84, p=0.08). The minimal PVC load was observed in individuals with vitamin D levels exceeding 70 ng/ml: PVC burden=104±203 / 24 hours.

Conclusions:
Vitamin D was unable to eliminate the PVC burden. The levels that most reliably predicted a decrease of PVC burden to < 500 beats per 24 hours was 41.2 ng/ml. Patients with vitamin D levels exceeding 70 ng/ml exhibited the lowest PVC burden.

POSTER PRESENTATIONS

Category: Electrophysiology

1924 - RECURRENT SUDDEN CARDIAC ARREST DUE TO POLYMORPHIC VENTRICULAR TACHYCARDIA AND MULTIPLE FAILURE OF PHARMACOLOGICAL AND DEVICE THERAPY

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Background:
Polymorphic ventricular tachycardia (pVT) is a common cause of sudden cardiac arrest in children when it deteriorates to ventricular fibrillation.

Case:
We present the case of a 14-year-old girl who was receiving carbamazepine therapy for epilepsy and who had a sudden cardiac arrest at breakfast in her home. Primary ECG was diagnosed as torsade-de-pointes tachycardia (TdP) and suggested channelopathy, although the ECG after successful resuscitation did not show QT prolongation, and ajmalin as well as isoproterenol tests were negative. Regarding the cardiac arrest of unknown origin in a structurally normal heart confirmed by cardiac MRI, propranolol therapy and genetic testing were initiated, and subcutaneous ICD implantation was performed. Genetic test proved a variant of unknown significance in KCNH2 and AKAP9 genes. 2 months later, appropriate shock delivery occurred during sinus bradycardia, so AAI-PM was implanted for suspected bradycardia-dependent TdP. 2 weeks later, despite the prior AV node Wenkebach point of 130 bpm, intermittent AV block occured and resulted in pVT and 7 ICD shocks. Therefore DDD-PM upgrade was performed. Based on PM interrogation, one month later, 5 appropriate shocks were delivered for short-coupled pVT due to fusion of accidental intrinsic AV conduction and VVI-PM pacing during paroxysmal atrial fibrillation (AFib). Mexiletin and procainamide combination with nadolol therapy for paroxysmal AFib proved ineffective, but quinidine plus nadolol therapy provided for sustained sinus rhythm. At one and a half year follow-up, the patient is free of complaints, performs 2.7 MET on exercise testing, and does not require antiepileptic therapy. PM readings show 50% ventricular and 30% atrial pacing, but no AFib is seen. Effectiveness of quinidine and short-coupled TdP raises suspicion of Purkinje VT.

Learning point:
Defining the etiology of polymorphic VT is of utmost importance because different types of arrhythmias with similar electrocardiographic characteristics respond to different forms of therapy.

POSTER PRESENTATIONS

Category: Electrophysiology

1959 - CHANGES IN LEFT VENTRICULAR EJECTION FRACTION ASSOCIATED WITH DUAL CHAMBER EDOCARDIC PACEMAKER PACING IN PEOPLE UNDER 18 YEARS OF AGE WITH SURGICAL CLOSURE OF THE INTERVENTRICULAR SEPTAL DEFECT

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Background / Hypothesis:
Pacing -induced cardiomyopathy is defined as a reduction in left ventricular ejection fraction in the context of chronic, high-load right ventricular pacing. Defining pacing-induced cardiomyopathy is a real challenge in adult patients, and even more so in pediatric patients with congenital heart disease.

Materials and Methods:
This study is a analytical study. A total of 27 patients under 18 years of age who underwent dual-chamber endocardial pacemaker implantation indicated for complete postoperative atrioventricular block following closure of a ventricular septal defect during the years 2009–2022 at the Ignacio Chávez National Institute of Cardiology were included. To obtain a homogeneous population, only patients who had undergone ventricular septal defect closure as the sole surgical procedure and who did not have another associated intracardiac lesion were followed. We considered a decrease of ≥10% in left ventricular ejection fraction, regardless of baseline, to be a significant change after pacing. Left ventricular diastolic volume indexed by body surface area was monitored in the entire population.
Left ventricular ejection fraction, including measurement of left ventricular diastolic volume, was monitored using transthoracic echocardiograms.

Results:
There is a weak association between a decrease in left ventricular ejection fraction ≥10% and an increase in indexed left ventricular diastolic volume in patients with dual-chamber endocardial pacing; however, the association was not statistically significant.

Conclusions:
There are few studies assessing pacing-induced cardiomyopathy in pediatric patients with congenital heart disease who have undergone surgical treatment. Further analytical studies are needed to make a comparison with greater statistical value.

POSTER PRESENTATIONS

Category: Electrophysiology

1986 - A CASE OF SUCCESSFUL CONDUCTION SYSTEM PACING IN A CHILD WITH ATRIOVENTRICULAR BLOCK AFTER CONGENITAL HEART DISEASE REPAIR

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Background / Hypothesis:
Conduction system pacing (CSP) is becoming an alternative to right ventricular septal pacing not only in adults but also in children. CSP prevents intra- and interventricular dyssynchrony, and reduces the risk of pacemaker-induced cardiomyopathy development. We present the successful case of CSP in a child with atrioventricular (AV) block after radical tetralogy of Fallot repair.

Materials and Methods:
We observed an 11-year-old child who underwent radical TOF repair in 2014 at the age of 1 year. A 12-mm subaortic ventricular septal defect was closed with a patch. Due to postoperative complete AV block in 2014, an epicardial pacemaker was implanted. In December 2024, the patient was admitted due to malfunction of the atrial and ventricular leads and battery depletion. Examination revealed moderate cardiac chamber dilation and mildly reduced left ventricular (LV) systolic function (LVEDD - 68 mm, LVESD - 31 mm, EF - 53%), paced QRS of 160 ms. During the implantation of the endocardial pacing system, a lumenless ventricular lead was placed in the interventricular septum distal to the patch under fluoroscopic and transesophageal echocardiographic guidance. Left bundle branch capture was confirmed with programmed stimulation, QRS width of 97 ms, stimulus to R-wave peak time in V6 of 41 ms, and R-wave interpeak time V1/V6 of 40 ms.

Results:
At the 3-month follow-up, a cardiac chamber size reduction and LV systolic function improvement were observed (LVEDD - 55 mm, LVESD - 24 mm, EF - 57%), with optimal pacing parameters maintained (R-wave amplitude 8 mV, pacing threshold 0.5 V at 0.4 ms, impedance 602 Ω).

Conclusions:
Due to physiological LV contraction with CSP and the associated reduction in the risk of heart failure development, LBBA pacing may be considered an effective alternative pacing method in children with postoperative AV block following repair of congenital heart disease.

POSTER PRESENTATIONS

Category: Electrophysiology

2017 - RADIOFREQUENCY ABLATION OF RIGHT ATRIAL VENTRICULAR DUAL ACCESS PATHWAY ASSOCIATE WITH SMALL CARDIAC VEINS A CASE REPORT AND LITERATURE REVIEW

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Background / Hypothesis:
Electrophysiological study and optimal ablation strategies for atrioventricular reentrant tachycardia (AVRT) associated with the small cardiac vein and presenting with right-sided dual accessory pathways.

Materials and Methods:
Retrospective analysis of the diagnosis and treatment process of radiofrequency ablation for a pediatric case with small cardiac vein-associated right-sided dual atrioventricular accessory pathways.

Results:
This report presents a pediatric case of AVRT associated with the coronary sinus vein and the presence of dual right-sided accessory pathways. The coronary sinus vein is a rare anatomical substrate for atrioventricular accessory pathways. The dual accessory pathways functioned both as participants in the tachycardia circuit and as passive bystanders. Comprehensive electrophysiological evaluation and the implementation of a tailored ablation strategy provides an evidence-based approach to the management of this patient.

Conclusions:
In summary, the dual right-sided accessory pathways associated with the small cardiac vein represent a rare and atypical form of atrioventricular accessory pathway, likely related to myocardial sleeve extensions along vascular structures. Surface ECG localization in such cases is often inaccurate, necessitating meticulous intraoperative mapping and selective venography for precise localization. Ablation targeting these pathways should focus on sites within the right atrium near the ostium of the small cardiac vein, with careful impedance monitoring to ensure both efficacy and safety.

POSTER PRESENTATIONS

Category: Electrophysiology

2022 - ON THE CUSP OF A RESOLUTION AN UNUSUAL PEDIATRIC CASE OF MONOMORPHIC VENTRICULAR TACHYCARDIA LOCALIZED AT THE LEFT CORONARY CUSP

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Background / Hypothesis:
Incessant ventricular tachycardia (IVT) is sustained and usually refractory to medical management. In children, IVT is uncommon, and tends to originate from the right ventricular outflow tract (RVOT). Rarely, IVT originates from coronary cusp, and when identified, the right coronary cusp is usually involved. We report a case of a 14-year-old male with structurally normal heart presenting with palpitations. Electrocardiogram revealed the ventricular tachycardia (figure 1) with right axis deviation and left bundle branch block. Medical management with sotalol was unsuccessful; ambulatory monitoring showed 80% ventricular rhythm.

Materials and Methods:
Electrophysiologic study (EPS) noted the posterior RVOT exhibited the earliest site of VT activation (- 10 msec before QRS onset). Radiofrequency ablation (RFA) failed to permanently terminate IVT. Retrograde left ventricular mapping showed late activation in LVOT compared to his RVOT. Mapping at the coronary cusps showed early activation (-25 msec before QRS onset) in the left coronary cusp. Successful RFA was noted in one second of RF initiation (figure 4&5). Follow up echocardiography showed patent left main coronary artery and normal systolic function. Telemetry post ablation showed no recurrence of ventricular ectopy. Ambulatory monitoring performed two weeks after the procedure showed <0.01% of ventricular ectopy with no consecutive ventricular beats.

Results:
It was initially considered that VT mapped in the aortic cusp did not originate in the cusp itself, but in the subjacent ventricular myocardium. The prevailing hypothesis is that in most of these patients, VT arises from extensions of muscle bundles above the aortic valve. The posteromedial surface of the RVOT is adjacent to the medial aspect of the left coronary cusp (figure 2 and 3). Ablation in the left coronary cusp can cause collateral damage to the left main coronary ostium because of its proximity.

POSTER PRESENTATIONS

Category: Electrophysiology

2029 - TRANSESOPHAGEAL ELECTROPHYSIOLOGY STUDY FOR CHILDREN WITH ASYMPTOMATIC WPW

Gabriel Cismaru [1], Cecilia Lazea [2], Simona Cainap [2]
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Background / Hypothesis:
Risk stratification for pediatric patients with asymptomatic Wolff-Parkinson-White syndrome using intracardiac electrophysiological study include risks associated with vascular catheterization owing to small blood vessel sizes. We describe our experience with transesophageal electrophysiological studies (TE-EPS) in children with asymptomatic WPW syndrome

Materials and Methods:
The pediatric electrophysiology database has been reviewed for children with WPW and no palpitations who underwent risk assessment with non-invasive TE-EPS from March 2024 to March 2025.

Results:
Among 24 patients who had TE-EPS, 8 were identified as having an indication for ablation (IC-EPS). The indications were inducible supraventricular tachycardia (observed in 25%), or a short effective refractory period of the accessory pathway (75%). In the eight individuals experiencing both TE-EPS and IC-EPS, no significant difference was observed in the baseline minimum 1:1 antegrade conduction through the accessory pathway, measured at TE-EPS compared to IC-EPS (320 ± 50 ms vs 330 ± 60 ms, P = 0.46) and n o significant difference was seen between the baseline antegrade AP-effective refractory period measured at TE-EPS and IC-EPS (310 ± 30 ms vs 300 ± 40 ms, P = 0.28). No complications associated to TE-EPS or IC-EPS occurred in our cohort.

Conclusions:
TE-EPS is a rapid, safe, and cost-effective alternative to IC-EPS for risk stratification in asymptomatic WPW patients and should be prioritized before IC-EPS in children with asymptomatic WPW. In some children, PSVT can manifest asymptomatically.

POSTER PRESENTATIONS

Category: Electrophysiology

2042 - AVEIR IMPLANTATION IN AN 8.7 YEAR OLD 25 KG PEDIATRIC PATIENT WITH MITOCHONDRIAL DISEASE VIA INTERNAL JUGULAR VEIN

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Background / Hypothesis:
Mitochondrial disorders frequently precipitate progressive conduction system degeneration, with complete heart block representing a critical therapeutic challenge in pediatric populations, which ultimately requires permanent pacemaker implantation. However transjugular venous implantation of the Aveir leadless pacemaker in a pediatric patient with mitochondrial disease has not been previously reported.

Materials and Methods:
We performed a retrospective review of a retrievable, 38 mm leadless pacemaker implantation in an 8.7-year-old, 25-kg pediatric patient with mitochondrial disease via internal jugular vein.

Results:
An 8.7-year-old, weighing 25kg, female patient with genetically confirmed mitochondrial disease presented with cardiac syncope secondary to the complete atrioventricular block. Comorbidities included insulin-dependent diabetes and pocket infection from a conventional permanent pacemaker four months after implantation. Given the previous device-related complications and restricted venous access, she implanted a retrievable leadless pacemaker (Abbott Aveir) via internal jugular vein access under fluoroscopic guidance, without complication. Stability testing confirmed adequate fixation and electrical testing confirmed stable parameters. At 1-month follow up, the catheter insertion site was well-healed,with a pacing threshold of 1.0V@0.2 ms, impedance of 610Ω.

Conclusions:
Aveir leadless pacemaker can be implanted safely via the internal jugular vein approach in pediatric patients with mitochondrial disease.

POSTER PRESENTATIONS

Category: Electrophysiology

2068 - ASSESSING ECG ABNORMALITIES IN TEEN ATHLETES A RETROSPECTIVE STUDY ON INCIDENCE AND IMPLICATIONS FOR SCREENING PROTOCOLS ARKADEEP GHOSH B.A.; MARK GELATT M.D.; LINDSEY MALLOY WALTON D.O.; ASHLEY SHERMAN M.S

Arkadeep Ghosh [1], *Mark Gelatt* [2], Lindsey Malloy-walton [2], Ashley Sherman [3]
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Background / Hypothesis:
Electrocardiogram (ECG) screening in teenage athletes is controversial. The American Heart Association (AHA) has not supported use of mandatory ECG screening but supports use of ECGs as a follow-up to an abnormal screening questionnaire. This study examines the incidence, ECG abnormalities, and associated risk factors in healthy teen athletes.

Materials and Methods:
A single-center retrospective cohort study was conducted on a local male soccer program, aged 11-18. Exempt status was approved by the local IRB. Data was obtained from physical exam evaluation forms.
The primary outcome was the incidence of ECG abnormalities. The secondary outcomes were persistence or new occurrences and type of ECG abnormalities. Covariables were age, race, family history, and current medications. SAS was used for data analysis.

Results:
• 367 ECGs reviewed from 2021-2024; 68(18.5%) had at least one abnormality.
• 182 unique patients were screened. ECG abnormalities were more common in multi-racial and African American p <0.02).
• There were 92 patients with multi-year data; 16(17%) had no abnormality the first year, but did with follow up screening, 8(9%) had an abnormality only in the first year. 4 subjects (4%) had abnormalities every year.
31(17%) patients at initial screening were found to have at least one ECG abnormality based on standard criteria (LVH=19; RAD=6; LAD=4; RBBB=1; SVE =1)

Conclusions:
• In our sample of healthy athletic male teenagers, ECG abnormality incidence was minimal. Yearly screening yielded new abnormal findings. Most importantly, there were no significant findings noted after further evaluation on any of the patients with an abnormal ECG finding.

• Our data supports that universal ECG screening in healthy teen athletes is of limited value. Future research is needed to identify independent predictive risk factors for ECG abnormalities and identify if sport-specific ECG screening should be implemented.

POSTER PRESENTATIONS

Category: Electrophysiology

2123 - FAVORABLE OUTCOMES OF CRYOABLATION WITHIN THE CORONARY SINUS FOR DIFFERENT ARRHYTHMIA SUBSTRATES USING A ZERO FLUOROSCOPIC TECHNIQUE

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Background / Hypothesis:
The coronary sinus (CS) is involved in the pathophysiology of focal atrial tachycardia (AT), atypical atrioventricular nodal reentrant tachycardia (AVNRT), and CS-associated accessory pathways (AP). Ablation in this region can be challenging due to complex anatomy. This study evaluated the feasibility, safety, and outcome of zero-fluoroscopic cryoablation for arrhythmogenic substrates within the CS.

Materials and Methods:
A retrospective review was conducted on eight patients who underwent successful CS cryoablation between January 2018 and April 2025. Diagnoses included focal AT (n = 3), atypical AVNRT (n = 2), and CS-AP (n = 3). All procedures were guided by a three-dimensional electroanatomical mapping system without fluoroscopy. The procedural and electrophysiological data was analyzed.

Results:
The mean age of the patient was 13.96 ± 20.57 years; five were male. All ablations were completed successfully without fluoroscopy. Six substrates were located in the proximal CS and two in the mid-CS. All focal ATs arose from the proximal CS, with characteristic P wave morphology (negative in inferior leads; biphasic or positive in V1), and were terminated immediately after ablation. The AVNRT cases were ablated in the proximal (n = 1) and mid-CS (n = 1), suggesting a slow pathway left side extension. Among CS-APs, two were ablated in the proximal CS and one in the mid-CS. One case involved a CS diverticulum with multiple pathways; ECG showed negative delta waves in leads II, III and aVF, indicating epicardial insertion. No major complications occurred and no recurrences were observed during a mean follow-up of 3.1 ± 1.6 years.

Conclusions:
Zero-fluoroscopic cryoablation within CS is a safe and effective treatment for selected cases of focal AT, atypical AVNRT, and CS-AP. This radiation-free technique, when guided by 3D mapping and ECG interpretation, is particularly valuable in anatomically complex scenarios.

POSTER PRESENTATIONS

Category: Electrophysiology

2141 - A CASE OF MALIGNANT ARRHYTHMIA OVERLAP SYNDROME CAUSED BY SCN5A GENE MUTATION IN A CHILD WITH CRT D IMPLANTATION

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Background / Hypothesis:
To explore the treatment of malignant arrhythmias associated with SCN5A gene mutation in children.

Materials and Methods:
A retrospective analysis was conducted on the clinical data of a 12-year-old male patient admitted to the Department of Pediatric Cardiology at Guangdong Provincial People's Hospital. The patient presented with malignant ventricular arrhythmias caused by SCN5A gene mutation, manifesting as sick sinus syndrome (SSS) combined with long QT syndrome type 3 (LQTS3).

Results:
The child experienced sudden syncope and cardiac arrest after exercise. Electrocardiogram (ECG) revealed significant sinus bradycardia, and echocardiography showed global cardiac enlargement. Electrophysiological studies indicated a sinus node recovery time (SNRT) of 20 seconds with sinus arrest. During an atropine challenge test, the corrected QT interval (QTc) prolonged to 523 ms at a heart rate of 100 bpm, accompanied by persistent sinus arrest. The patient underwent cardiac resynchronization therapy defibrillator (CRT-D) implantation and was prescribed oral mexiletine. Post-treatment follow-up demonstrated a shortened QTc interval and reduced cardiac size.

Conclusions:
SCN5A gene mutations can lead to malignant arrhythmia overlap syndromes, such as SSS combined with LQTS3. Clinicians should remain vigilant for SCN5A-related overlap syndromes in children with SSS, even in the absence of prior cardiac arrest. CRT-D implantation may be necessary for optimal management.

POSTER PRESENTATIONS

Category: Electrophysiology

2171 - HIGH DENSITY ELECTROANATOMIC LATE ACTIVATION MAPPING VERSUS CONVENTIONAL MAPPING FOR SLOW PATHWAY MODIFICATION IN PAEDIATRIC AV NODAL RE ENTRANT TACHYCARDIA

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Background:
Catheter-based slow pathway (SP) modification offers curative option to children with AVNRT. We recently described a novel 3-dimensional electroanatomic mapping (3D EAM) technique based on local activation timing maps to delineate the SP substrate. However, long-term success and safety of this technique have not been previously assessed. We compared the outcomes of AVNRT ablation using our 3D EAM mapping using CARTO3 with conventional fluoroscopy guided SP ablation.

Methods:
This is a single centre retrospective study between 2016 and 2023. For EAM of the SP, ablation targets were identified using the following criteria: 1) an area with the latest activation in the right atrial septum 2) multi-component atrial electrogram, and 3) adjacent to a deceleration zone. Data were presented using descriptive statistics and comparisons between groups were performed using paired t-test. The significance threshold was set at $p< 0.05$.

Results:
86 children underwent 90 procedures for AVNRT. 32 patients underwent the conventional method and 54 underwent 3D EAM method. Their median age was 15 (range 9-16) and 14 (range 5-17) respectively.

There was no significant difference in the mean procedure time between the conventional group versus 3D EAM group (122.7+/- 36.0 min versus 114 +/-6.3 min, respectively; p=0.196). Acute success rate for the conventional group was 94.3%. All 3D EAM guided ablation had successful SP modification without inducible tachycardia post ablation. Cryotherapy was used more frequently in the conventional group (72.7%) whereas radiofrequency ablation was used more frequently (78.2%) in the 3D EAM group. There were no procedural complications.

12-month recurrence free rate was significantly higher in the 3D EAM group at 94.5% versus 80% in the conventional group (p= 0.012).

Conclusion:
High-density 3D EAM late activation mapping is superior to conventional mapping for SP ablation in children, with higher acute and long-term success, without detriment to procedure times or safety.

POSTER PRESENTATIONS

Category: Electrophysiology

2189 - MORE THAN A VARIANT LONG QT SYNDROME IN A CHILD WITH KCNQ1 P.G29D MUTATION

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Background / Hypothesis:
Long QT Syndrome (LQTS) is a cardiac channelopathy characterized by delayed ventricular repolarization, predisposing to syncope, arrhythmias, and sudden cardiac death. We report a case of a young female patient with symptomatic LQTS associated with KCNQ1 p.G29D (c.875G>A) variant, which is classified as a Variant of Uncertain Significance (VUS).

Materials and Methods:
An 11-year-old girl presented after a syncopal episode at rest. Initial evaluation attributed the event to neurocardiogenic syncope, but her baseline electrocardiogram (ECG) revealed a prolonged corrected QT interval (QTc) of 488 msec. She was on fluoxetine and hydroxyzine, both known to prolong QT, which were discontinued. There was no family history of LQTS, and parental ECGs were normal. An exercise ECG showed persistently prolonged QTc (488 msec) at peak exertion. Echocardiography was normal. Genetic testing via the CardioNext® panel revealed a heterozygous KCNQ1 p.G292D (c.875G>A) variant, classified as a VUS. Although previously reported in sudden death and LQTS cohorts, functional studies suggest minimal impact on IKs current, and co-segregation data are limited. However, the clinical phenotype and lack of QTc shortening with exercise raised suspicion for pathogenicity. Given the compelling phenotypic presentation of this VUS and the patient's desire to participate in sports, Nadolol was initiated, and she was counseled on sports participation with access to an automated external defibrillator (AED).

Results:
The KCNQ1 gene encodes the α-subunit of the delayed rectifier potassium channel (IKs), essential for QT shortening during sympathetic activation. The absence of QTc adaptation during exercise suggests impaired IKs function. This case underscores the importance of integrating genotype with clinical and ECG data in managing patients with VUS, particularly in active pediatric patients.

Conclusions:
This is the first pediatric case linking the KCNQ1 p.G292D VUS with clinical LQTS. It highlights the potential pathogenicity of this variant and reinforces the need for reclassification as further evidence emerges.

POSTER PRESENTATIONS

Category: Electrophysiology

2229 - A TALE OF TWO HEART BEATS PERMANENT PACEMAKER IN A 12 YEAR OLD

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Background / Hypothesis:
Cardiac pacing in the Paediatric population typically results from bradycardia produced by sinus node dysfunction or atrioventricular block. The common causes in Paediatrics being maternal antibodies from SLE, viral infections and Post Cardiac surgery. The endocardial pacing in comparison to epicardial lead implantation has more concern about vascular obstruction, AV valve integrity, and the limitations of lead accommodation in relation to somatic growth especially in early childhood. Hence permanent epicardial pacing is often chosen in early age groups, which this case report highlights.

Materials and Methods:
A 12-year-old boy, post TOF repair at the age of 2 years developed Complete Heart block with pacemaker Epicardial end was installed in the abdomen. The patient had been active, able to play sports and growing well. He later presented in our clinic with easy fatiguability and dizziness.
On examination he was clinically stable. However, he had bradycardia HR 48 beats/min, normal tensive.
A 12 lead ECG and a Holter ECG were done, showed complete heart block. An Echo was done showed good result post TOF repair. The patient was planned for Permanent Epicardial pacemaker due to End of life battery.

Results:
A permanent pacemaker (MEDITRONIC sphera SR MRI) was implanted below the left pectoral muscle transvenously , single chamber pacemaker was inserted with single lead advancement to the Right ventricle, with interrogation parameters Amplitude 3.5v, PW 0.4ms, Sensitivity 2.8 Mv, Polarity Bipolar, Capture Adaptive. The patient was discharged asymptomatic and attends regular yearly follow up clinic.

Conclusions:
Complete heart block post Cardiac surgery is common in Tetralogy of Fallot. Cardiac surgery services in low to middle income countries is not widely practiced. The need for permanent pacing in a growing child, presents a new set of challenges that need multidisciplinary care with a focus on Electrophysiology in the young.

POSTER PRESENTATIONS

Category: Electrophysiology

2274 - LONG QT SYNDROME IN A TODDLER AN ICD IMPLANTATION CHALLENGE

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QTc interval prolongation, whether inherited or acquired, predisposes to malignant ventricular arrhythmias and sudden cardiac arrest. Clinically, it may manifest as syncope, palpitations, or seizure-like episodes.
A previously healthy 2-year-old boy (15 kg) was admitted for evaluation after a syncope while playing near a river. Initially suspected as an afebrile seizure, both neurological examination and brain CT were unremarkable. During hospitalization, he experienced another syncopal episode with pulselessness. Monitoring revealed ventricular fibrillation, requiring two shocks. After recognition of torsades de pointes (TdP), isoprenaline infusion was started.
ECG showed a QTc of 552 ms, T-wave inversion in precordial and inferior leads, and no T-wave alternans. Echocardiography demonstrated a structurally normal heart with mild biventricular dysfunction. He maintained recurrent polymorphic ventricular tachycardia and anarchic rhythm, requiring further defibrillation. A lidocaine bolus yielded a good response, and continuous infusion was initiated.

Nadolol was started on day five. 24-hour Holter monitoring revealed no ventricular arrhythmias but a persistent QT prolongation (mean 652 ms), prompting the introduction of mexiletine.

Family history was positive for long QT syndrome (LQTS), and molecular testing confirmed a likely pathogenic heterozygous variant in the KCNH2 gene (c.785del, p.(Gly262Alafs*98)), consistent with LQTS type 2.

An implantable cardioverter-defibrillator (ICD) was indicated for secondary prevention. Given the patient's low weight, the multidisciplinary team opted for a combined extravascular approach. The defibrillation coil was tunneled and positioned subcutaneously in the left hemithorax, a bipolar epicardial pacing lead was placed on the right ventricle (mini-sternotomy), and the generator was implanted in the right flank.

At four-month follow-up, monitoring showed no recurrence of TdP or ICD shocks. The patient remains stable on nadolol (1 mg/kg/day) and mexiletine (10 mg/kg/day), with a QTc of 464 ms and age-appropriate growth and development.

This case underscores the importance of early diagnosis and tailored ICD strategies in pediatric LQTS.

POSTER PRESENTATIONS

Category: Electrophysiology

2291 - CARDIOINHIBITORY SYNCOPE 2B WITH 48 SECOND PAUSE IN PATIENT WITH DOWN SYNDROME AND AV SEPTUM DEFECT IN THE LATE POSTOPERATIVE PERIOD DESCRIPTION OF THE CASE AND THERAPEUTIC PLAN

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Background / Hypothesis:
Syncope symptoms usually begin in adolescence. Approximately 20% of the population experiences the first episode of fainting between 10 and 20 years. Only 25 to 50% of patients are evaluated in health services. However, some cases deserve treatment for the risk of events and need specialized follow-up, including monitoring of the indication of pacemaker in case of refractoriness to clinical treatment. This occurs in some cases of neuromodulated pattern syncope.(Cardiac-Inhibitory Syncope 2b to the Tilt Test).

Materials and Methods:
Describe the case of a patient with Down syndrome and recent onset repeat syncopes with a positive tilt test (pattern 2b).

Results:
Female patient 13 years, Down syndrome with defect of total AV septum in phase postoperative total correction with good surgical result. Concomitant menarche started recurrent syncope with prodromes (abdominal pain and pallor). Presents Holter without arrhythmic events, and an echocardiogram presents right ventricular function at the lower limit of normality.

Analysis of the ECG with signs of right bundle block and divisional block. It was submitted to evaluation by IT. Carried out passive tilt protocol at 70 degrees. After 5 minutes of rest, the patient was tilted and remained stable for 7 minutes, and in the eighth minute presented abdominal pain, followed by syncope with 2b response and pause of 48 seconds (Fig 1) despite the return to the position of Trendelenburg (-30 degrees). There was a return of the heartbeats with immediate recovery of consciousness. Started clinical treatment with increasing water intake, avoiding triggering factors and strict monitoring to evaluate the refractoriness.

Conclusions:
1) Neuromodulate syncope is particularly common during adolescence, 2) Cardioinhibitory responses can be installed suddenly and be large repercussion. Despite this fact, the clinical treatment should always be prioritized; 3) The patient should be monitored for recurrences and refractoriness to clinical treatment for precise indication of pacemaker.

POSTER PRESENTATIONS

Category: Electrophysiology

2301 - UNMASKING OF MANIFEST PREEXCITATION FOLLOWING SUCCESSFUL ABLATION OF A CONCEALED ACCESSORY PATHWAY IN AN ADOLESCENT A CLINICAL PARADOX

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Children's Mercy Hospital, Cardiology, Kansas City-United States [1]

Background / Hypothesis:
Orthodromic atrioventricular reentrant tachycardia (AVRT), a common mechanism of supraventricular tachycardia (SVT) in pediatric patients, may be mediated by concealed accessory pathways (APs) that conduct retrogradely only. Catheter ablation is considered definitive therapy; however, the emergence of manifest preexcitation following ablation of a retrogradely conducting concealed AP is exceptionally rare and poorly understood.

Materials and Methods:
An 18-year-old female with documented paroxysmal SVT underwent an electrophysiological (EP) study. Baseline 12-lead electrocardiogram (ECG) showed no evidence of ventricular preexcitation. EP mapping demonstrated orthodromic AVRT utilizing a concealed left posterolateral AP with eccentric ventriculoatrial conduction. Successful ablation was achieved via a transseptal approach using irrigated radiofrequency energy. Post-ablation, ventriculoatrial and atrioventricular block were confirmed with adenosine. No inducible arrhythmias or antegrade conduction were observed. Surprisingly, the patient subsequently developed a novel ECG pattern consistent with left lateral manifest preexcitation. Ambulatory Holter monitoring revealed intermittent preexcitation predominantly at lower sinus rates (<80 bpm) without recurrence of SVT. The patient remains asymptomatic and has deferred further intervention.

Results:
This case represents a paradoxical phenomenon of new-onset manifest preexcitation following successful ablation of a concealed AP. Potential mechanisms include unmasking of antegrade conduction in a previously dormant AP, or the recruitment of a distinct, adjacent pathway not appreciated during the initial EP study. The case highlights the complexity of AP physiology, including dynamic conduction properties that may evolve post-intervention.

Conclusions:
Recognition of latent or adjacent accessory conduction post-ablation is critical. This case underscores the importance of comprehensive post-procedural assessment and long-term follow-up in pediatric patients with SVT, even when ablation of a concealed pathway appears successful and complete.

POSTER PRESENTATIONS

Category: Electrophysiology

2324 - EARLY OUTCOME OF CONDUCTION SYSTEM PACING IN CHILDREN SINGLE CENTRE EXPERIENCE.

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Background / Hypothesis:
Conduction system pacing involving either His bundle pacing (HBP) or left bundle branch pacing (LBBP) is a modality that has been introduced as a safe and effective alternative to right ventricular (RV) pacing to help prevent pacemaker-associated cardiomyopathy.

Materials and Methods:
Between Januray 2024 and April 2025, we performed 13 conduction system pacing in 13 children, age ranged from 4.5 years to 12 years old, weight ranged from 12 to 55 kgs with complete heart block (congenital 7 cases post-operative 5 cases, Post ablation one case) , 11 patients had received RV apical pacing with pacing burden ranging from 75-99%. Speckle tracking Echocardiography showed significant degrees of spetal and lateral wall dys-synchrony with lateral wall activation delays reaching up to 280 msec.

Results:
We Implanted Dual chamber pacing for 12 out of the 13 patients
Only one case received single LBB area pacing lead because venography showed narrow veins with fear of total obstruction
The Patients ECG post implant showed average QRS duration of 85-95msec with PLVAT of 55 to 80 msec
Thresholds ranged from 0.5 up to 1.2V
Impedance ranged from 580ohm up to 1200ohm
All patient showed significant improvement of ventricular desynchrony by speckle tracking.

Conclusions:
Conduction system pacing is feasible and safe in paediatric patients with or without CHD.
Speckel tracking Echocardiography is useful tool for detection of improvement of ventricular desynchrony Future long-term studies should be considered

POSTER PRESENTATIONS

Category: Electrophysiology

2328 - RETROAORTIC ACCESS IN ATRIAL FLUTTER ABLATION USING THE CAVOTRICUSPID ISTHMUS IN THE LATE POSTOPERATIVE PERIOD OF SENNING SURGERY. WHEN THE UNUSUAL IS THE SIMPLEST.

Rogerio Andalaft [1], Bruno Valdigem [1], Gabriela Berbert [1], Luciana Armaganijan [2], Carla Almeida [3]

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Background:
D-Transposition of Great Arteries(D-TGA) is characterized by the presence of ventricular arterial discordance. In cases operated in the past, a palliative procedure of atrial switch (Senning or Mustard) was performed. These procedures are closely related to atrial arrhythmias, mainly atrial flutter (AFL) dependent on the cavotricuspid isthmus (CTI). These factors leads to systemic RV failure. Performing control of AFL with antiarrhythmics usually fails. Thus, ablation can mean a viable exit for prognostic improvement.

Materials and Methods:
Describe the retro aortic approach of CTI in 3 patients with Senning associated with AFL and ventricular dysfunction.

Results:
We performed ablation in 3 patients(males) with DTGA and Senning surgery 32, 35 and 50 years old and AFL associated with worsening of ventricular function and NYHA functional classification.Due to the risks of transeptal puncture the retroaortic access of the RV was chosen. Conventional and electroanatomical mapping and transesophageal (TE) echocardiography were used for CTI mapping. We constructed both atrial maps using a high density catheter (HDGRID by Abbott) or a decapolar catheter. The therapeutic catheter (8 mm catheter, or irrigated 3.5 mm catheter) was introduced in the RV by retroaortic route passing through the aortic valve. The retroaortic approach was performed with TE echocardiography support. We positioned the therapeutic catheter at the posterior part of the systemic atrium and built a blockage line between the primitive inferior vena cava insertion and the tricuspid valve. In all cases, we reach success with tachycardia rupture and no posterior reinduction. Follow-up of 8 years(1 patient) and 1 year (2 patients) did not show new episodes of AFL.

Conclusions:
1) Atrial arrhythmias worsen ventricular function in patients with systemic RV and Senning. 2) Retroaortic ablation is an option for the CTI approach. 3) Sinus rhythm and heart rate control improve NYHA functional classification and allow postponing the cardiac transplantation.

POSTER PRESENTATIONS

Category: Electrophysiology

2383 - INCESSANT VENTRICULAR TACHYCARDIA IN INFANT WITH STRUCTURALLY NORMAL HEART IS IT TRULY BENIGN OR A OLD WIVES' TALE

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Background / Hypothesis:
Idiopathic ventricular tachycardia (VT) is a rare form of arrhythmia in neonates that can be life-threatening prompting its timely diagnosis and importance of treatment to avoid serious complications i-e; heart failure.

Materials and Methods:
We describe a neonate with an incessant idiopathic ventricular tachycardia presented with heart failure and severe left ventricular dysfunction. This infant presented with poor feeding, irritability, increase work of breathing, and heartbeat of 260/min. The electrocardiogram (ECG) showed wide complex tachycardia and the echocardiogram showed a structurally normal heart with dilated cardiomyopathy. The clinical signs and chest X-ray changes were consistent with cardiac failure but preserved peripheral perfusion.

Results:
The patient was started on an amiodarone infusion (10 mcg/kg/min) for rhythm control along with anti-failure medications. After 48 hours, echocardiography showed some improvement in ventricular function (LVEF 32%), and the patient showed clinical improvement with no signs of heart failure. Amiodarone was switched from IV to oral after 72 hours, and the QTc interval remained within normal limits. After 10 days of hospitalization, the patient was discharged on oral amiodarone (8 mg/kg/day) and anti-failure medications, with plans to adjust medications during follow-up. At discharge, the patient was in an accelerated ventricular rhythm (140/min), but at follow-up 10 days later, ECG showed a return to sinus rhythm

Conclusions:
Ventricular tachycardia in young population is rare with overall good prognosis. However, it can be life threating if it remains unnoticed and undiagnosed for longer period. The risk is substantially high in resource limited countries because of paucity of health facilities and personnel who can diagnose it. Moreover, the choice of medications is limited for management in acute situations.

POSTER PRESENTATIONS

Category: Electrophysiology

2386 - TACHYARRHYTHMIA IN PAEDIATRIC POPULATION PRESENTING TO EMERGENCY DEPARTMENT AND ITS IMMEDIATE OUTCOME A SINGLE CENTRE STUDY

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Background / Hypothesis:
To determine the frequency of tachyarrhythmia in paediatric population presenting to emergency department and its immediate outcome

Materials and Methods:
Patients who visited the pediatric cardiology ER department of the National Institute of Cardiovascular Diseases, Karachi from July 2022 to July 2023 were enrolled in this observational study. A total of 132 patients were enrolled with medical history, demographic, and clinical parameters. Complete general and cardiac examinations including 12 leads ECG, 2-D Echo study, and the Holter study for those with unexplained arrhythmias, syncope were performed. The treatment approaches were vagal maneuver, rate-controlling/anti-arrhythmic medication (amiodarone, beta-blockers, flecainide, lidocaine, ivabradine, digoxin, and calcium channel blockers), other medication (warfarin and anticoagulants), and DC cardioversion

Results:
A total of 132 arrhythmic with a mean age of 10 [4.5-13] participants enrolled in this study. Out of these, there were 112 with narrow complex tachycardia [atrial tachycardia (10.6%), AVNRT (6.1%) AVRT (5.3%) flutter (5.3%), JET (1.5%), AF (9.1%)], and 20 with wide complex tachycardia [VT (8.3%) VF (0.8%)]. There were 63 (46.6%) male and 69 53%) female. Patients presented with palpitation (95%), chest pain (18.9), syncope (6.1%), respiratory distress (1.5%), heart failure and irritability (0.8%). Echo findings revealed that 14 patients had cyanotic, 28 had acynotic and 35 had acquired heart diseases while the remaining patients had no cardiac complaints.

Conclusion:
This study concluded that patients presented with arrhythmias are linked with cardiac issues and SVT is more prevalent in this population.

POSTER PRESENTATIONS

Category: Electrophysiology

2428 - RECURRENCE OF PAROXYSMAL TACHYCARDIA AFTER ABLATION IN PATIENTS WITH WOLFF PARKINSON WHITE SYNDROME

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Background / Hypothesis:
Objective
To determine the incidence of recurrence of paroxysmal tachycardia in patients undergoing radiofrequency ablation of accessory pathways in the context of Wolff-Parkinson-White (WPW) syndrome.

Materials and Methods:
Methodology
This was a retrospective observational descriptive study conducted in the electrophysiology department at UNICAR. It included all patients diagnosed with WPW syndrome who underwent an electrophysiological study (EPS) and accessory pathway ablation between 2011 and 2020.

Results:
A total of 122 patients with WPW syndrome who underwent accessory pathway ablation were evaluated. Regarding demographic characteristics, 55.7% of the patients were male and 44.3% female. The majority of patients (41.8%) were aged between 10 and 19 years, followed by those aged 20 to 29 years (19.7%).
Notably, 90.2% of patients had no associated structural heart disease. Among those with cardiopathies, Ebstein's anomaly was the most frequently observed, accounting for 67% of the cardiac anomalies. The incidence of first recurrence of paroxysmal tachycardia after ablation was 14.8%, with a 95% confidence interval. The most common location of accessory pathways was the left lateral region, observed in 34.4% of the cases.

Conclusions:
This study highlights the importance of considering both sex and the presence of associated cardiopathies as potential risk factors for recurrence of tachycardia in patients with WPW syndrome treated with radiofrequency ablation.

POSTER PRESENTATIONS

Category: Electrophysiology

2429 - ATRIAL FIBRILLATION AS A CLINICAL MANIFESTATION OF NEONATAL WOLFF PARKINSON WHITE SYNDROME

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Background / Hypothesis:
To analyze the clinical presentation of atrial fibrillation (AF) associated with Wolff-Parkinson-White (WPW) syndrome in a neonate.

Materials and Methods:
We present a case report of a neonate with a prenatal diagnosis of AF. Cardiac arrhythmias are relatively uncommon conditions that may present during the fetal period or postnatally. Atrial fibrillation accounts for approximately 32% of all neonatal arrhythmias.

Results:
The patient is the male newborn of a 21-year-old mother, referred from UNICAR at 36.6 weeks of gestation due to fetal AF. Delivery was performed via cesarean section. Postnatal electrocardiographic evaluation confirmed AF with a heart rate of 276 beats per minute, accompanied by hemodynamic instability. Mechanical ventilation was initiated, and synchronized electrical cardioversion was attempted at 1 Joule/kg without success. A second cardioversion at 2 Joules/kg was effective, resulting in improved hemodynamic parameters. The ECG revealed a reentrant conduction pattern characterized by visible P waves, a delta wave in the QRS complex, and abnormal T waves—findings consistent with WPW syndrome. Pharmacological cardioversion was initiated with an intravenous infusion of amiodarone at 25 mcg/kg/min over four hours, followed by beta-blocker therapy.

Conclusions:
Wolff-Parkinson-White syndrome is a disorder of the cardiac conduction system characterized by the presence of an accessory electrical pathway between the atria and ventricles. Infants and children with WPW syndrome exhibit a higher incidence of supraventricular tachycardia, atrial fibrillation with rapid ventricular response, and, in some cases, ventricular tachycardia or fibrillation. Common clinical manifestations include poor feeding, respiratory distress, irritability or lethargy, poor peripheral perfusion, metabolic acidosis, hypoglycemia, congestive heart failure, hypotension, hypothermia, hypotonia, shock, non-palpable pulses, and, though rare, sudden cardiac death.

POSTER PRESENTATIONS

Category: Electrophysiology
2430 - NEONATAL LONG QT SYNDROME
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Background / Hypothesis:
To characterize neonatal LQTS presentation.

Materials and Methods:
Case report of a neonate with LQTS diagnosed after prenatal detection of fetal bradycardia.

Results:
Results: The mother was noted to have fetal bradycardia in the third trimester, confirmed by fetal echocardiography. The neonate was delivered via cesarean section and admitted for evaluation. ECG showed a QTc of 600 ms. A three-generation pedigree revealed three maternal first cousins with a diagnosis of long QT syndrome in the U.S. and one maternal cousin with sudden cardiac death. Physical exam was unremarkable. The newborn's ECG demonstrated sinus rhythm with QTc of 534 ms and T-wave morphology suggestive of LQTS type 3 (LQT3). Maternal ECG showed QTc of 445 ms. Holter monitoring recorded torsades de pointes. The patient was started on propranolol.

Conclusions:
LQTS is an inherited cardiac channelopathy characterized by delayed ventricular repolarization and prolonged QT interval, predisposing to malignant ventricular arrhythmias and sudden cardiac death, particularly torsades de pointes. Fetal bradycardia may be an early sign. Clinical manifestations range from asymptomatic to recurrent syncope, seizures, or sudden death as the initial event. LQT3 has a higher association with bradycardia and sleep-related sudden death. ECG often shows late-onset, peaked T waves with marked ST segment prolongation. Beta-blockers reduce the risk of events by up to 64%. Pacemaker therapy may benefit LQT3 patients due to higher bradycardia prevalence. The combination of beta-blockers and implantable cardioverter-defibrillators (ICDs) is effective in reducing sudden death incidence.

POSTER PRESENTATIONS

Category: Electrophysiology
2435 - NONCOMPACTION CARDIOMYOPATHY
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Background / Hypothesis:
OBJECTIVE. To analyze noncompaction cardiomyopathy (NCCM) as a cause of sudden death

Materials and Methods:
Case report of a patient with syncope as a manifestation of NCCM. In studies involving pediatric populations with primary cardiomyopathies, it represents 9.2% and is the third most common cause, following dilated cardiomyopathy and hypertrophic cardiomyopathy.

Results:
A 15-year-old patient with a history of precordial pain, palpitations, and syncope with full recovery. Physical exam and ECG were normal. Holter monitoring revealed early repolarization abnormalities with ST segment elevation. Echocardiogram showed hypertrophy of the left ventricular apex with trabeculation suggestive of NCCM. Cardiac MRI was requested to confirm the diagnosis, revealing hypertrabeculation in the anterior, lateral, and inferior mid and apical thirds, as well as in the apex—meeting the criteria for noncompacted left ventricle. Treatment with carvedilol was initiated, considering the syncope to be arrhythmogenic in origin.

Conclusions:
NCCM is a rare condition representing a morphological abnormality of the myocardium with a genetic etiology. It is characterized by a myocardial structure divided into two distinct layers:
a) A thick endocardial layer with a spongy appearance, prominent trabeculations, and deep recesses that communicate with the ventricular cavity but not with the coronary circulation, and
b) A compact, uniform epicardial layer that is typically thinner than the first.
Although it usually affects the left ventricle (LV), it can involve both ventricles or, in rare cases, exclusively the right ventricle. Its natural course includes LV systolic dysfunction and heart failure, thromboembolic events, arrhythmias, and sudden death. The implantation of an automatic implantable cardioverter-defibrillator is recommended in all patients with noncompaction cardiomyopathy to reduce the risk of sudden death.

POSTER PRESENTATIONS

Category: Electrophysiology

2531 - DIAGNOSTIC AND THERAPEUTIC APPROACH TO FASCICULAR TACHYCARDIA IN PEDIATRICS DESCRIPTION OF A 10 CASE SERIES

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Background:
Fascicular tachycardias (FTs) are the most common ventricular arrhythmias arising from the left ventricle in structurally normal hearts. In pediatric emergency settings they are often misdiagnosed as supraventricular tachycardias, delaying restoration of sinus rhythm and appropriate therapy. In young children, episodes may be precipitated by sinus tachycardia (crying/exertion). Non-dihydropyridine calcium-channel blockers are not always feasible at this age, and invasive treatment can be limited by the mismatch between vasculature and catheter size.

Materials and Methods:
To describe the clinical course and the diagnostic and therapeutic features of 10 children with fascicular ventricular tachycardia (FVT) managed at a pediatric electrophysiology center, emphasizing longitudinal follow-up. Observational case series of 10 ECG-documented FVT patients; gender, electrocardiographic, therapeutic, and outcome data were collected.

Results:
Ten children (6 boys, 4 girls) were evaluated. Mean age was 104.9 months (0–216); mean follow-up, 36 months. On ECG, 90% showed involvement of the left posterior-inferior fascicle, with right bundle-branch block morphology, left-axis deviation, and left anterior fascicular block. The initial diagnosis was re-entrant supraventricular tachycardia in 90%. Amiodarone was used in 70%; 80% also received a beta-blocker. Verapamil was prescribed in 70% in the specialty clinic and was used in all patients >2 years old. Catheter ablation was performed in 60%, with an overall success rate of 83.3% (100% in those >4 years). There was one death (10%), related to multiple drug combinations and failure of invasive management.

Conclusions:
(1) In pediatrics, FTs are often triggered by sinus tachycardia and recur; in children <2 years who cannot receive verapamil, adding a beta-blocker is reasonable. (2) Ablation is a definitive treatment with high success, even in children, despite the lack of pediatric-specific catheters. (3) Disseminating ECG recognition and training pediatricians/pediatric cardiologists may reduce misdiagnosis and ineffective antiarrhythmic therapy.

POSTER PRESENTATIONS

Category: Electrophysiology

2571 - RADIOFREQUENCY CATHETER ABLATION FOR SUMMIT REGION VENTRICULAR PREMATURE CONTRACTIONS IN A PEDIATRIC PATIENT A CASE REPORT

Yao Lin [1], He Jiang [1], Lijun Wang [1], Yanyan Liu [1], Lin Shi [1]
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Background / Hypothesis:
The ventricular summit region poses significant challenges for arrhythmia ablation due to its complex anatomy and proximity to coronary arteries, particularly in pediatric patients. This report details the clinical characteristics, management, and outcomes of a child who developed coronary artery injury during radiofrequency catheter ablation (RFCA) for summit-origin ventricular premature contractions (VPCs).

Materials and Methods:
A retrospective analysis was conducted using electronic medical records, encompassing demographic data, electrocardiographic (ECG) features, laboratory investigations, and procedural documentation. Postoperative symptoms, serial ECGs, Holter monitoring results, and 1-year follow-up data (including symptom resolution and ECG normalization) were analyzed.

Results:
A 17-year-old female presented with a 3-year history of recurrent chest tightness and pain. Echocardiography showed no structural or functional abnormalities. ECG demonstrated frequent VPCs with right ventricular outflow tract (RVOT)-origin morphology. 24-hour Holter monitoring documented 16,425 VPCs (15% burden), indicating high-load ectopy. After failed pharmacological therapy, RFCA was indicated. Electrophysiological mapping reconstructed RVOT and summit anatomy. Sequential ablation at RVOT, supravalvular pulmonary artery, and left coronary cusp yielded partial efficacy with residual VPCs. Low-power ablation within the great cardiac vein (GCV) eliminated VPCs but induced ST-T changes, suggestive of coronary injury, prompting immediate cessation. Post-procedurally, VPCs resolved but the patient developed chest pain with anteroseptal ST depression (V1-V3) and echocardiographic wall motion abnormalities. Management included intravenous nitroglycerin infusion, heparin anticoagulation, and aspirin antiplatelet therapy. Symptoms resolved by the 2nd day postoperation with normalization of ECG and echocardiography. Aspirin was continued for 3 months. At 1-year follow-up, the patient remained asymptomatic with normal cardiac evaluations.

Conclusions:
Catheter ablation within the anatomically complex summit region carries high technical difficulty and risk of coronary injury in pediatric patients. Coronary angiography guidance should be considered when feasible to delineate spatial relationships between ablation targets and coronary vasculature, thereby optimizing ablation strategy safety.

POSTER PRESENTATIONS

Category: Electrophysiology

2579 - AN UNUSUAL CASE OF PROGRESSIVE CARDIAC CONDUCTION DISORDER ONSET WITH WIDE QRS WAVE TACHYCARDIA

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Background / Hypothesis:
Progressive Cardiac conduction disorder (PCCD), is a kind of bradycardiac arrhythmia, and may occur during infancy or progress to third degree atrioventricular block during adolescence, with syncope and even sudden death. While, tachycardiac arrhythmia with wide-QRS tachycardia, are rarely documented.

Materials and Methods:
A 9-year-old boy was first admitted to our center in June 2021 due to syncope twice within 1 day. After syncope, the electrocardiogram during syncope showed Wide-QRS tachycardia. After intravenous administration of amiodarone, the boy's heart rhythm was spontaneously reversed to sinus rhythm, but the ECG indicated complete left Bundle branch block and intermittent junctional escape rhythm. To avoid the recurrence of tachycardia, amiodarone was prescribed with the dose of 50mg and 25mg q12h by oral. The 24h dynamic electrocardiogram monitoring indicated frequent 2:1 AV block and junctional escape. Therefore, amiodarone was gradually decreased and stopped. In July 2023, the patient experienced syncope again with fever and vomiting. And the ECG indicated high grade atrioventricular block (3:1 AV block) with the ventricular rate of 35 bpm. After syncope, the ECG indicated wide QRS wave tachycardia, which suggested that syncope might be caused by AV block. Whole exome sequencing indicated a SCN10A variation, which originated from his mother. The boy was diagnosed as Progressive Cardiac conduction disorder (PCCD) and wide QRS tachycardia.

Results:
Permanent pacemaker (dual-chamber AAIR→DDDR mode) was implanted, and sotalol was prescribed for anti-tachyarrhythmia. After 2-year follow-up, the patient was free from syncope. ECG showed a atrial pacing rhythm, device interrogation confirmed normal pacemaker function, without recurrence of tachyarrhythmia.

Conclusions:
Progressive cardiac conduction disorder (PCCD) may present with tachyarrhythmia. The combination of permanent pacemaker implantation and antiarrhythmic drug therapy has proven effective.

POSTER PRESENTATIONS

Category: Electrophysiology

2590 - ARRHYTHMIC STORM IN AN INFANT WITH SARS COV 2 INFECTION FROM ECMO TO PACEMAKER

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Amidst the COVID-19 pandemic, we report the case of a previously healthy 12-month-old boy, with no personal or family history of congenital heart disease or immunodeficiency, admitted with confirmed SARS-CoV-2 infection (positive PCR and IgG). He presented with respiratory distress, tachycardia, and cardiomegaly on chest radiography before transfer.
On admission to our hospital, he was in sustained tachycardia (230 bpm) with a wide QRS complex, consistent with supraventricular tachycardia with aberrant conduction and/or ventricular tachycardia (VT) with pulse. Adenosine was ineffective, and three attempts at electrical cardioversion also failed. A bolus of amiodarone resulted in transient heart rate reduction (115 bpm) in junctional rhythm. Echocardiography revealed a structurally normal heart with thin pericardial effusion and biventricular dysfunction (LVEF 40%, TAPSE 6 mm). The patient rapidly became hemodynamically unstable, with recurrent episodes of anarchic wide-complex tachyarrhythmia, bradycardia, and pulseless VT requiring repeated adrenaline boluses and defibrillation. Mechanical ventilation and inotropic/vasoactive support (adrenaline, milrinone, noradrenaline) were initiated and escalated. Given refractory arrhythmia and cardiogenic shock, venoarterial extracorporeal membrane oxygenation (ECMO-VA) was started.

Amiodarone infusion was escalated and discontinued by day 3. ECMO was successfully weaned on day 5 following cardiac function recovery. Peak troponin I was 302.7 ng/mL and BNP 3838.9 pg/mL. Serial ECGs and 24-hour Holter monitoring showed atrioventricular dissociation and frequent junctional extrasystoles (mean heart rate 76 bpm). Cardiac MRI on day 10 demonstrated normal ventricular volumes and function, without myocardial fibrosis or edema. The patient was discharged on day 25.

During follow-up, progressive left ventricular dilation and worsening bradycardia (mean heart rate 49 bpm) prompted permanent epicardial pacemaker implantation at 26 months (12 kg). He remains clinically stable, with normalized ventricular dimensions, appropriate development, and consistent pacing at 70 bpm.

This case highlights a rare but life-threatening SARS-CoV-2-associated arrhythmic storm, likely junctional ectopic tachycardia evolving to complete heart block, with unclear pathophysiology.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1039 - ISOLATED BILATERAL CONGENITAL CORONARY ARTERIES ECTASIA UNKNOWN TO KNOWN A CASE REPORT

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Background / Hypothesis:
Case report: describing a neonate who presented with respiratory distress in the first few hours of life. With further work up an echocardiogram was done and showed significant left and right coronary arteries dilatation without any other cardiac anomaly with normal biventricular systolic function.
He was discharged home after symptomatic treatment in stable condition without any evidence of heart failure or myocardial ischemia
In this case report we are describing a case presentation of neonate with query congenital Kawasaki disease

Introduction:
Congenital heart disease is most common congenital disorder affecting 0.8 to 1.2 % of live births globally.1,2. Coronary artery dilatation is one the rarest entity defined as dilatation of any segment of coronary artery 1.5 times of adjacent non affected segment.3 In paediatric population Kawasaki disease is a well-known cause for coronary artery aneurysm and ecctazie but in neonatal population aetiology and presentation is variable so a different approach is needed for treatment.

Conclusions:
To conclude Still there is no evidence about congenital Kawasaki disease and benefits of treatment in neonates with no obvious criteria of Kawasaki disease. One must weigh the risks Versus benefits to decide individually for each patient keeping in view the presentation, lab parameters and clinical condition.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1126 - FETAL HYPOPLASTIC LEFT HEART SYNDROME AND FOLLOW UP AFTER NORWOOD SURGERY IN POLISH MOTHER'S MEMORIAL HOSPITAL RESEARCH INSTITUTE REPORT FROM JANUARY 2023 TO JANUARY 2024 AN IMPROVEMENT OF SURVIVAL RATE

Maria Respondek-liberska [1], Iwona Strzelecka [1], Maciej Slodki [1], Michal Krekora [2], Mariusz Grzesiak [3], Ewa Gulczynska [4], Iwona Maroszynska [5], Tomasz Moszura [6], Katarzyna Januszewska [7], Edward Malec [7]

Polish Mother, Prenatal Cardiology, Lodz-Poland [1] Polish Mother, Obstetrics Department, Lodz-Poland [2] Polish Mother, Parinatology Department, Lodz-Poland [3] Polish Mother, Neonatology Department, Lodz-Poland [4] Polish Mother, Neonatal Intensive Care, Lodz-Poland [5] Polish Mother, Pediatric Cardiology, Lodz-Poland [6] Polish Mother, Pediatric Cardiac Surgery, Lodz-Poland [7]

Background / Hypothesis:
Prenatal diagnosis of HLHS and in utero transfer to obstetrical/cardiology center may speed the day of Norwood surgery and improve an early outcome

Materials and Methods:
Group of 39 fetuses from 2023/2024 was primary study group and we excluded twins and terminations of pregnancy, so final group was 34 cases. The mean gestational age at the detection 19 weeks (+/-6 weeks), extracardiac malformations present in 7 fetuses, genetic syndromes were present in 3 cases

Results:
Norwood surgery was performed in 32 newborns:in survivors, at a mean age of 12+/-5 days, and in the non-survivors at a mean of 17+/-5 days (t-test p=0.027). The overall survival rate 87% for liveborns.

Conclusions:
Prenatal diagnosis and transfer in utero were helpfull to speed the day of Norwood procedure, which may be an additional important risk factor for improvement an early outcome

POSTER PRESENTATIONS

Category: Foetal Cardiology

1140 - RESULTS OF COLLABORATION BETWEEN CHILDREN'S HOSPITAL CITY AND HUNG VUONG HOSPITAL IN THE TREATMENT OF FETAL CONGENITAL HEART DISEASE

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Background / Hypothesis:
We conducted this study to determine the characteristics of fetal congenital heart disease (CHD), the frequency of genetic disorders, the rate of treatment adherence in pregnant women with fetuses with CHD, and pregnancy outcomes of these anomaly groups.

Materials and Methods:
A cross-sectional descriptive study was conducted on pregnant women with fetuses with CHD who underwent obstetrics and pediatrics consultation between Hung Vuong Hospital and Children's Hospital City from June 2018 to June 2021.

Results:
402 pregnant women were included in the study.

Characteristics of the study population: The average age of pregnant women was 27 ± 4.6 years. The majority of fetuses with CHD belonged to the group without risk factors, accounting for 69%. The average gestational age when fetal CHD was detected was 22 ± 4.6 weeks.
Characteristics of fetal congenital heart disease: The most common types of fetal CHD, in order, were: heterotaxy syndrome, Tetralogy of Fallot, hypoplastic left heart syndrome, cardiomegaly, and single ventricle. The rate of fetuses with concomitant non-cardiac abnormalities was 5.6%, of which brain abnormalities accounted for the highest proportion. The rate of fetuses with chromosomal abnormalities was 1.7%. The rate of fetuses undergoing prenatal treatment intervention was 3.2%. The rate of fetal death during the fetal period was 25%. The CHD defects with the highest rates of fetal death, in order, were: hypoplastic left heart syndrome, heterotaxy syndrome, Ebstein's anomaly, and pulmonary atresia with ventricular septal defect.
Treatment adherence characteristics of the study population: The overall treatment adherence rate was 79%. Of which, the rates of adherence to follow-up visits, tests, pregnancy management, mode of delivery, place of delivery, timing of delivery, and hospital to be transferred to after birth were 87%, 81%, 94%, 92%, 98%, 87%, and 82%, respectively

Conclusions:
Obstetrics and pediatrics collaboration between two major hospitals in obstetrics and pediatrics has improved the CHD treatment quality

POSTER PRESENTATIONS

Category: Foetal Cardiology

1203 - FAMILIAL PRENATAL TOTAL ANOMALOUS PULMONARY VENOUS DRAINAGE GENETIC IMPLICATIONS AND MULTIMODAL ECHOCARDIOGRAPHIC AND MRI ASSESSMENT

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Background:
Total anomalous pulmonary venous drainage (TAPVD) is a rare congenital heart defect associated with significant neonatal morbidity, particularly when pulmonary venous obstruction is present. Familial recurrence, though uncommon, carries clinical importance. This report highlights the critical role of prenatal multimodal imaging in timely diagnosis and strategic perinatal management of familial TAPVD.

Materials and Methods:
We describe two cases of TAPVD identified prenatally in sequential pregnancies of the same patient. Detailed visualisation of the pulmonary venous pathway was performed using 2D and 3D fetal echocardiography, as well as third-trimester fetal cardiac MRI, which also assessed for fetal pulmonary lymphangiectasia. Genetic evaluations included trio whole-exome sequencing and chromosomal array.

Results:
In the first pregnancy, supracardiac TAPVD was diagnosed at 20 weeks, with clear evidence of pulmonary venous obstruction. Third-trimester fetal MRI confirmed narrowing of the ascending vein and suggested secondary pulmonary lymphangiectasia. The baby was delivered in cardiac theatres and underwent successful surgical repair at four hours of age. In the subsequent pregnancy, infracardiac TAPVD was identified at 15 weeks. Despite the absence of prenatal evidence of pulmonary venous obstruction and normal fetal lung MRI findings, early surgical repair was also indicated at four hours of age due to evolving postnatal compromise. Genetic testing revealed no pathogenic variants.

Conclusions:
Multimodality imaging, including 2D and 3D echocardiography and fetal MRI, can help quantify the risk of early postnatal compromise in fetal TAPVD, ensuring optimal postnatal outcomes and effective resource provision. More objective means of interpreting prenatal imaging findings, particularly in the context of the transitional circulation, may help to improve risk stratification in the future. Familial TAPVD is well-described, and careful exclusion of TAPVD by fetal echocardiography is recommended in all subsequent pregnancies following an index case. Clinical genetics consultation also plays an important role in familial cases.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1228 - NEONATAL THYROTOXICOSIS ASSOCIATED WITH MATERNAL BASEDOW'S DISEASE A CASE REPORT

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Background:
Pregnancy complicated by Basedow's disease occurs in approximately 0.2% of cases, with 1–13% developing fetal or neonatal hyperthyroidism. Neonatal thyrotoxicosis can cause severe respiratory and circulatory failure, sometimes leading to death. We report a case requiring intensive care immediately after birth.

Case Report:
A 27-year-old pregnant woman, who had a long history of treatment for Basedow's disease, was noted to have fetal tachycardia at 12 weeks of GA. Her Basedow's disease was treated with oral methimazole but discontinued due to a rash. She was switched to oral potassium iodine, and required radioactive iodine therapy that made her hypothyroidism requiring supplemental levothyroxine. When she became pregnant, she still kept showing extremely high TRAb and TSAb (>50 IU/mL, 4000–5000%).
Since the first visit, FHR had been higher than > 175 bpm and fetal echocardiography at 24 weeks showed thyroid enlargement and high-output heart failure appreciated by cardiomegaly (46% of CTAR) and significant valvular regurgitation. Although the mother was added on methimazole to control FHR around 160 bpm, a fetus kept showing cardiomegaly and was delivered at 34 weeks with 1845g of birth weight.
Postnatally, the infant exhibited signs of hyperthyroidism and suffered from cardiorespiratory failure (26% of LVEF) with persistent pulmonary hypertension of the newborn. He required multiple medications including NO inhalation, milrinone, and nitroglycerine. Laboratory tests confirmed neonatal thyrotoxicosis with 2.6 ng/dL of fT4, 4.5 pg/mL of fT3 and >50 IU/mL of TSAb. He was initially place on rectal methimazole but required additional oral potassium iodine the improved tachycardia. With these medications, his condition recovered gradually and was discharged at 2 months.

Conclusion:
Regardless of maternal thyroid function, high TRAb / TSAb levels require fetal screening. Elevated TRAb / TSAb may increase the risk of cardiorespiratory failure necessitating early recognition and intensive management.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1310 - AN ANALYSIS OF THE RESULTS OF PRENATAL CONSULTATION FOR 119 FETUSES WITH CONGENITAL HEART DEFECTS LED BY PEDIATRIC CARDIAC SURGEON

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Background / Hypothesis:
The results of 119 fetuses of prenatal consultation for congenital heart defects led by pediatric cardiac surgeon were summarized.

Materials and Methods:
A retrospective analysis was performed for 119 fetuses with congenital heart defects from August 2017 to February 2019. All fetuses received antenatal consultation of the pediatric cardiac surgeon. The prenatal screening was performed routinely and the nuchal translucency(NT) was measured at 11-13weeks of gestational age, NT>2.5mm is thickened. Systemic ultrasound screening was taken in mid-pregnancy. Every fetus with congenital heart defects was checked every 2 weeks by echocardiography, and the results of two times were positive as the diagnostic criteria. Repeat echocardiography was performed within 3 days after birth to confirm the diagnosis. Cardiac CT or MRI is done if necessary for diagnosis.

Results:
119 fetuses had received antenatal consultation of the pediatric cardiac surgeon, 118 pregnant women had chosen to continue the pregnancy (99.2%,118/119). (Table 1). One pregnant woman had chosen to terminate pregnancy for the fetus of pulmonary atresia with right ventricular dysplasia.55 cases were successfully surgically corrected after delivery in one year after birth and no post-operative death (Table 2). The neonatal cardiac tumor is benign teratoma histologically. 63 cases had no surgery indication, 2 cases of aortic coarctation had no coarctation, 61 cases had small membranous and muscular ventricular septal defects, of which 28 cases spontaneously closed before birth. Among 33 diagnosed cases, 25 cases were self-healing, and 8 cases were not followed-up. The follow-up time was 3-5 years.

Conclusions:
The prenatal consultation for fetal congenital heart defect was led by pediatric cardiac surgeon, which can provided more accurate guidance and greater confidence to pregnant women to continue their pregnancy.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1350 - EVALUATION OF FETAL HEMODYNAMICS USING COMBINED CARDIAC OUTPUT IN CONGENITAL COMPLETE ATRIOVENTRICULAR BLOCK

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Background:
Congenital autoimmune complete atrioventricular block (CAVB) has a poor prognosis. While fetal heart rate (FHR) <55 bpm indicates heart failure risk, some cases worsen regardless of FHR. This study assesses fetal combined cardiac output (cFCO)/estimated fetal body weight (EFBW) as a hemodynamic marker to improve risk evaluation beyond FHR alone.Objective: To investigate whether cFCO/EFBW can serve as a hemodynamic assessment parameter in CAVB fetuses.

Methods:
A retrospective chart review was conducted on 5 fetuses diagnosed with CAVB and assessed for cFCO at our institution over the past 10 years.

Results:
One case (Case 1) with valvular heart disease (AS, PS) had fetal hydrops and resulted in neonatal death, while the remaining 4 fetuses (Case 2-5) were born without hydrops, but had endocardial fibroelastosis in 3. Maternal anti-SSA antibodies were positive in all cases, and all received maternal steroid therapy. The mean gestational age at diagnosis was 24 weeks. All but 1 (Case 1) were born prematurely at 35 weeks with 1,919 g of mean birth weight. From diagnosis to delivery, FHR (bpm) changed from 56→56, 66→60, 62→42, 54→52, and 48→40 in each fetus and cardiothoracic area ratio (%) changed from 44→42, 38→37, 39→50, 35→40, and 46→43 in each fetus, respectively. The lowest fetal cFCO /EFBW (ml/min/kg with normal 400) was 115, 400, 346, 437, and 495, while pre-delivery values were 140, 845, 442, 489, and 697 in each fetus. Though Case 3 and 5 showed bradycardia with FHR <55, both fetuses could maintain cFCO/EFBW >400 without signs of hydrops. Pacemaker implantation was required on day 0 in 4 cases (Case 1, 3, 4and 5), but at 8 months in 1 (Case 2).

Conclusion:
Measuring combined cardia output in CAVB fetuses with severe bradycardia is useful for fetal hemodynamic assessment, in addition to the signs of hydrops.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1413 - MATERNAL HYPEROXYGENATION TEST IN FETUSES WITH SIMPLE TRANSPOSITION OF THE GREAT ARTERIES A RETROSPECTIVE STUDY

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Chu Bordeaux, Pediatric Cardiology Unit, Bordeaux-France [1] Chu Poitiers, Pediatric Cardiology, Bordeaux-France [2] Chu Bordeaux, Pediatric Cardiologue Unit, Bordeaux-France [3]

Background / Hypothesis:
Fetuses with simple transposition of the great arteries (d-TGA) are at risk of postnatal hypoxemia, pulmonary hypertension, and death. Postnatal oxygenation depends on the persistence of fetal shunts, particularly an adequate patent foramen ovale (PFO). A restrictive PFO may necessitate an urgent (<6h) atrial septostomy, making prenatal risk stratification crucial. Conventional fetal echocardiographic parameters are often insufficient to predict the need for urgent intervention. Maternal hyperoxygenation (MH), by simulating postnatal physiology, may improve the assessment of fetal hemodynamics, PFO function, and overall neonatal risk.

Our goal is to evaluate hemodynamic changes induced by MH in fetuses with d-TGA, identify the most sensitive echocardiographic parameters, and assess their correlation with severe neonatal cyanosis requiring urgent septostomy.

Materials and Methods:
A retrospective, single-center observational study was conducted at Bordeaux University Hospital. Fetuses with simple d-TGA undergoing MH testing between 2023 and 2025 were included. Echocardiographic parameters analyzed included the pulsatility index (PI) of the pulmonary arteries, time-velocity integral (TVI) in pulmonary veins, diastolic flow pattern in the ductus arteriosus, and PFO width. Outcomes were categorized as Rashkind within 6 hours, Rashkind within 24 hours, or no Rashkind.

Results:
Seventeen fetuses were analyzed. Eleven neonates underwent atrial septostomy, six within the first 6 hours of life. No significant changes in pulmonary artery PI or ductal flow direction were observed with MH. However, a statistically significant increase in left pulmonary vein TVI was noted, suggesting enhanced transpulmonary flow. This change seems to correlate with the need for Rashkind but did not reach statistical significance. PFO width analysis was inconclusive due to limited data.

Conclusions:
Our findings support the hypothesis that MH induces hemodynamic changes mimicking postnatal circulation in d-TGA fetuses, potentially aiding in neonatal risk stratification. Larger studies could confirm its clinical utility. MH testing should be integrated into 3rd trimester evaluation of TGA fetuses.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1488 - THE RELATIONSHIP BETWEEN CONGENITAL HEART DISEASES AND PLACENTAL ABNORMALITIES CORRELATION BETWEEN PLACENTAL WEIGHT AND DEGREE OF MALPERFUSION

Marco Masci [1], Luciano Pasquini [2], Maria Carolina Colucci [1], Alessandra Stracuzzi [3], Cosimo Marco Campanale [1], Patrizio Moras [1], Serena Ventrella [1], Alessandra Toscano [1]
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Background / Hypothesis:
Placental anomalies are common during pregnancy and can significantly impact fetal health. Congenital heart defects (CHDs) are among the most prevalent congenital anomalies, affecting fetal cardiac development. Recent studies have suggested a potential link between placental anomalies and the development of CHDs, raising the possibility of an interaction between these two conditions. This study aimed to assess placental weight (PW) and microscopic placental abnormalities in a cohort of pregnancies.

Materials and Methods:
In total, 96 placentas from fetuses with complex CHDs were analyzed. The PW was classified according to a constructed table and related to gestational age (GA), dividing placentas into Appropriate (pAGA), Large (pLGA), or Small (pSGA) for GA. An abnormal PW may indicate initial placental maldevelopment. Microscopic examination revealed maternal vascular malperfusion (MVM), fetal vascular malperfusion (FVM), and combined maternal-fetal vascular malperfusion (MFVM).

Results:
Our results showed a 40.2% prevalence of LGA placentas in the cohort. Using PW adjusted for GA as an independent variable, we evaluated the presence of placental malperfusion across the three groups. Statistical analysis revealed a significant difference among the groups ($p=0.049$). A logistic regression analysis was then performed to examine the frequency of placental malperfusion (PM) in the pAGA group compared to the pLGA and pSGA groups. The findings indicate that in pAGA cases, the presence of placental malperfusion was significantly higher than in pLGA patients and approached significance when compared to the pSGA group. However, stratifying by pathophysiology did not show statistical significance.
Of the 96 placentas, 76 (71%) exhibited features of vascular malperfusion: 44 showed MVM, 25 showed MFVM, and only 2 showed FVM.

Conclusion:
In conclusion, more than half of the analyzed placentas showed abnormalities related to maternal and fetal malperfusion. However, no specific patterns of placental abnormalities were identified in fetuses with CHDs. Additionally, PW did not correlate with the degree of placental malperfusion.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1510 - POSTNATAL CLINICAL COARSE IN PATIENTS OF FETAL TETRALOGY OF FALLOT AND DOUBLE OUTLET RIGHT VENTRICLE WITH COMPLETE DUCTUS ARTERIOSUS CLOSURE

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Background/Hypothesis
In tetralogy of Fallot (TOF) or double-outlet right ventricle with pulmonary stenosis (DORV-PS), prenatal ductus arteriosus (DA) closure may occur. These cases require early postnatal surgical intervention due to the inability to maintain DA patency, potentially impacting right ventricular outflow tract (RVOT) management. This study examines mid-to-long-term outcomes in prenatally diagnosed TOF/DORV-PS cases with DA closure.

Materials and Methods
From January 2021 to December 2024, 21 fetal TOF/DORV-PS cases were retrospectively analyzed. Cases were divided into prenatal absent DA group (ADA group, n=8) and patent DA group (PDA group, n=13). Fetal echocardiographic parameters and postnatal clinical courses, including shunt operations and surgical outcomes, were compared.

Results
Among 21 cases (14 TOF, 7 DORV-PS), the ADA group showed significantly smaller pulmonary valve z-scores (-3.1±1.2 vs. -1.4±1.7; p=0.03) compared to the PDA group. No differences were observed in pulmonary-to-aortic annulus ratio (0.66±0.10 vs. 0.73±0.10; p=0.16) or main pulmonary artery-to-aorta diameter ratio (0.66±0.09 vs. 0.70±0.11; p=0.43). Shunt operations were more frequent in the ADA group (4/8 vs. 2/13; p=0.09). Valve-sparing repair was achieved in 4/6 ADA cases and 8/10 PDA cases (p=0.58).

Conclusions
TOF/DORV-PS cases with prenatal DA closure demonstrated greater RVOT obstruction severity, correlating with higher shunt operation rates during first hospitalization. Competing antegrade pulmonary flow and retrograde DA flow may contribute to DA closure in moderate RVOT stenosis. Despite anatomical challenges, valve-sparing repair remained feasible in most cases, suggesting tailored postnatal management strategies for this subgroup.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1518 - RELATIONSHIP BETWEEN MACROSCOPIC PLACENTAL ABNORMALITIES FLOWMETRIC AND BIOMETRICS DATA THE ROLE OF TRANSPOSITION OF GREAT ARTERIES HEMODYNAMIC DURING THE FETAL LIFE

Marco Masci [1], Luciano Pasquini [2], Maria Carolina Colucci [1], Alessandra Stracuzzi [3], Serena Ventrella [1], Cosimo Marco Campanale [1], Patrizio Moras [1], Milena Viggiano [4], Alessandra Toscano [1]
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Background / Hypothesis:
Placental anomalies during pregnancy can greatly affect fetal health, including congenital heart defects (CHD) like Transpositions of Great Arteries (TGA). TGA has distinct fetal pathophysiology. Recent studies indicate a possible link between placental anomalies and CHD, suggesting an interaction. Examining placental features in TGA pregnancies offers insights into the placenta-heart development relationship.

Materials and Methods:
A total of 112 fetuses with CHD were diagnosed prenatally at the Perinatal Cardiology Unit. We analyzed 96 placentas from fetuses with complex CHDs. Biometric and flowmetric data were collected during obstetric ultrasounds performed in the third trimester of pregnancy. Placentas were weighed and examined by a single pathologist.

Results:
We analyzed a total of 39 with TGA. Newborns with TGA had a significantly higher birth weight (BW) compared to the rest of the population (mean BW TGA+ 3073 ± 342.6 g vs. TGA- 2816 ± 571 g, p = 0.01).
Similarly, placental weight (PW) was significantly higher in fetuses with TGA. Additionally, LGA placentas were more frequent in TGA fetuses. An increased BW/PW ratio correlated with a lower incidence of TGA (OR 0.78, p = 0.07).
The cranial circumference/Abdominal Circumference ratio was significantly lower in TGA+ than in TGA-. Doppler studies showed a significantly reduced umbilical artery pulsatility index (PI) in percentile and z-score. Conversely, the cerebroplacental ratio (CPR) was significantly higher in TGA fetuses. (Table&Figures)

Conclusions:
Interpreting our data is complex but confirms the dynamic relationship between the fetal heart, brain, and placenta in the context of severe CHD. Our speculation suggests that TGA fetuses may have normal or reduced cerebral blood flow without a compensatory mechanism of vasodilation. Alternatively, cerebral vasodilation may respond to placental growth factors that, in TGA physiology, could be preferentially directed through the foramen ovale and ductus arteriosus towards the lower part of the body. This hypothesis could explain our findings in TGA fetuses

POSTER PRESENTATIONS

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1541 - IN UTERO NATURAL HISTORY AND POSTNATAL OUTCOMES OF FETUSES WITH AORTIC VALVE ABNORMALITIES.

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Background:
To study the natural history of fetuses with bicuspid aortic valve (BAV) and its immediate postnatal outcomes.

Materials and methods:
Retrospective study (2020-2025) included fetuses (20 weeks gestation till term) with abnormal aortic valve excursion, increased flow velocities across the valve, ascending aortic dilatation, and abnormal flow patterns. Aortic annulus, root, ascending aorta, aortic valve area (AVA) and LV dimensions were measured. 4D spatiotemporal image correlation (STIC) imaging was used to study ascending aorta flow pattern. Fetuses without AVA and postnatal outcomes were excluded.

Results:
Of 12 abnormal aortic valves, 10 had BAV: type 0 (no raphe)-5, type 1 (one raphe)-2, type 2(two raphe)-3. Postnatally, 2 of these were found to have normal aortic valves. Fetuses with type 0 BAV had normal ascending aortic dimensions but showed additional anomalies like persistent LSVC, abnormal ductus venous, VSD, and ventricular disproportion (one of which developed coarctation). BAV with a normal AVA (9/10) compared with 31 age matched controls generally had good immediate postnatal outcomes without interventions. The AVA in normal fetuses was measured as 0.07 ± 0.04 <25 weeks, 0.15 ± 0.03 at 25-30 weeks, and 0.23 ± 0.05 >30 weeks. One fetus with type 1 BAV with small AVA progressed to critical aortic stenosis, fetal hydrops, and in-utero demise. Type 0 BAV correlated with normal ascending aortic dimensions and laminar flows, while types 2 and 3 BAV were associated with ascending aortic dilatation and abnormal helical flow patterns observed in 4D STIC imaging.

Conclusions:
AVA predicts in-utero and immediate postnatal outcomes in fetuses with BAV. Abnormal ascending aorta flow pattern is seen in type 1 and 2 BAV when compared to type 0.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1559 - SPONTANEOUS REGRESSION OF A LARGE PERICARDIAL EFFUSION ASSOCIATED WITH FETAL VENTRICULAR DIVERTICULUM AND VENTRICULAR SEPTAL ANEURYSM

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Background:
Large pericardial effusions detected antenatally present a management conundrum – to drain or not to drain? There is a risk of intrauterine death either way. We describe a case with an associated ventricular diverticulum that was successfully managed conservatively.

Methods:
The patient was referred to cardiology at 20 weeks' gestation for fetal hydrops. The initial fetal echocardiogram showed an outpouching at the base of the right ventricular outflow tract with a ventricular septal aneurysm and a large circumferential pericardial effusion. At 24 weeks, a hyperechoic mass was seen around the diverticulum over the right ventricular free wall. The large pericardial effusion remained unchanged. The patient was followed-up on a 2-weekly basis and the Cardiovascular Profile Score was tracked. By 30 weeks, there was minimal pericardial effusion. And by 33 weeks, the pericardial effusion had resolved. A small out-pouching remained over the right ventricular free wall and a ventricular septal aneurysm was noted. Baby had no significant respiratory issues or cardiovascular compromise during the perinatal period. Post-natal echocardiogram confirmed the antenatal findings of an interventricular septal aneurysm and a small right ventricular free-wall diverticulum. CT angiogram at 4 months of life showed normal coronary arteries. Cardiac MRI showed right ventricular dilatation at mid chamber level with globally preserved biventricular systolic function (RVEF 37% and LVEF 55%). There was prominent RV wall trabeculation and an interventricular septal aneurysm.

Discussion:
With this case, we hypothesize that the fetal characteristics are due to a fundamental developmental anomaly of the fetal myocardium, resulting in abnormalities of both the septal and the ventricular free walls. As this is isolated to the heart, the abnormality would be specific to cardiomyocyte arrangement and connection.

Conclusion:
We describe an unusual case of ventricular septal aneurysm and ventricular diverticulum. We postulate that the etiology is a developmental anomaly of myocardium.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1563 - PAEDIATRIC EMERGENCY CARDIAC TRANSFERS INFLUENCE OF ANTENATAL DIAGNOSIS AND CHANGING DIAGNOSTIC SPECTRUM WITH AGE.

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Background / Hypothesis:
Paediatric cardiac emergencies are a leading cause of transfer to tertiary Paediatric intensive care units.

With increased antenatal diagnosis, the majority of infants with critical congenital heart disease (CHD) can be transferred in a stable condition to tertiary centres for postnatal care but there remain some infants who are not diagnosed before birth. We aimed to describe the spectrum of non-antenatally diagnosed cardiac emergencies presenting across different age groups that required emergency transfer.

Materials and Methods:
Retrospective review of all cardiac transfers from network by our regional Children's Acute Transfer Service to Great Ormond Street Hospital from January 2022 - October 2024. Patients were identified from the transfer database and outcome data from electronic patient records.

Results:
308 cardiovascular transfers were analysed across three age groups: 208 neonates (<1 month), 58 infants (1 month–1 year), and 42 children (>1 year).
157/208 (75%) neonates had an antenatal diagnosis of CHD. Of the 51 without antenatal diagnosis, the most prevalent conditions were: Persistent Pulmonary Hypertension 15/51 (29%), Aortic Coarctation 6/51 (12%), Supraventricular tachycardia 6/51 (12%) and TGA 6/51 (12%).

2 patients (1%) who had a final cardiac diagnosis of duct dependent lesion did not receive Prostin on transfer. Conversely, n=20/59 (34%) of non-duct dependent neonates received Prostin on transfer.
In infancy the most prevalent conditions were: Ventricular Septal Defect 6/58 (10%), Supraventricular tachycardia (SVT) 6/58 (10%), Cardiomyopathy 4/58 (7%), Myocarditis 4/58 (7 %), Atrioventricular Septal Defect 3/58 (5%).
Most prevalent conditions children > 1 year were: Cardiomyopathy 9/42 (21 %), Myocarditis 6/42 (14%), SVT 4/42 (10%), Heart Block 2/42 (5%), Pulmonary Hypertension 2/42 (5%), and Broad Complex Tachycardia 2/42 (5%).

Conclusions:
Despite improving antenatal detection, CHD remains an important cause of collapse in neonates. We have demonstrated the change in spectrum of cardiac diagnosis with age that may help guide diagnosis and guideline development

POSTER PRESENTATIONS

Category: Foetal Cardiology

1613 - PRENATAL DIAGNOSIS OF A GIANT LEFT VENTRICULAR DIVERTICULUM A CASE REPORT

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Congenital ventricular aneurysms or diverticula are rare cardiac malformations characterized by an outpouching of the ventricular wall. In fetal presentation, these may be associated with an abnormal four-chamber view, fetal arrhythmias, and pericardial effusion. The natural course of these conditions is poorly understood.

A 34-year-old patient, in her second pregnancy with a monochorionic diamniotic twin pregnancy, presented at 22 weeks of gestation with severe pericardial effusion and intrauterine growth restriction (IUGR) type I, leading to a referral for a fetal echocardiogram. The echocardiogram confirmed severe pericardial effusion and a mass with hyperechoic walls and anechoic content measuring 20 x 17mm. Blood flow entered the mass through a vessel, possibly communicating with the left ventricle (LV). Cardiac function was preserved, and fetal Doppler was normal. Weekly monitoring was performed due to a 19% growth difference between the fetuses. Over time, the mass increased in size, the pericardial effusion decreased, and pulmonary parenchyma expanded.

At 31 weeks of gestation, the pericardial effusion increased and the diverticulum grew, prompting transfer to a higher-complexity center. At 37 weeks, a scheduled cesarean section was performed. The affected fetus weighed 1400 grams and had severe pericardial effusion. Pericardiocentesis was performed, with evacuation of the effusion. Expectant management was maintained regarding the diverticulum, which showed a reduction in size without arrhythmias in follow-up visits.

Ventricular diverticula are rare congenital defects diagnosed by fetal echocardiography. Regular monitoring is essential to assess progression and signs of cardiac decompensation. Postnatal management depends on size, location, and impact on cardiac function. The role of surgery remains uncertain due to the unclear natural history in asymptomatic children.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1616 - FETAL ECHOCARDIOGRAPHY UTILIZATION FOR DETECTING FETAL CONGENITAL HEART DISEASES IN ASSISTED CONCEPTION PREGNANCIES A SINGLE CENTRE EXPERIENCE FROM EGYPT

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Background / Hypothesis:
Assisted Conception techniques (ARTs) are linked to various congenital anomalies, particularly congenital heart diseases (CHD). There are vast discrepancies among different studies regarding the prevalence and subtypes of CHDs with limited data from Arab countries. Therefore, the study aimed to detect fetal CHDs using fetal echocardiography in ART pregnancies.

Materials and Methods:
The study was a prospective observational study conducted from June 2019 to June 2023. Pregnant females who conceived using one of the ARTs were recruited for demographic data collection, ultrasound anomaly screening, and detailed fetal echocardiography

Results:
148 pregnant cases with ART were included in the study with 151 fetuses; 50% of pregnancies were conceived via conventional IVF. Fetal CHD prevalence was 39/151 (25.83%); most of the diagnosed cases had a minor CHD 23/39 (58.7%) of CHD cases. Isolated VSD was the most detected CHD in the studied ART cohort. Of major CHD, 9/39 (23.08%) had ductus arteriosus dependent CHD with the most diagnosed lesions hypoplastic left heart syndrome and transposition of great arteries. No statistically significant difference was detected between cases with or without cardiac anomalies in terms of maternal demographics, consanguinity, and modality of IVF. Moreover, non-statistically significant differences were detected regarding major CHD when comparing traditional IVF and ICSI (p=0.33).

Conclusions:
A high prevalence of CHD is detected in the ART-resulted conceptions in the current series using fetal echocardiography. Nearly one-quarter of the detected fetal cardiac anomalies are critical, predominantly duct-dependent, requiring urgent neonatal cardiac interventions. Therefore, fetal echocardiography should be integral to IVF/ICSI antenatal workup. The current data should be a part of comprehensive family counseling in preparation for IVF/ICSI.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1622 - UNDERSTANDING CURRENT NATIONAL PRACTICES VARIATIONS AND ATTITUDES ACROSS PEDIATRIC SUBSPECIALTIES IN FETAL CARDIAC COUNSELING

Joanne Chiu [1], Sinead Brady [2], Cassandra Duffy [3], Stephanie Dukhovny [10], Kelly Harris [4], Elvira Parravicini [2], Amy Porter [1], Marti Soffer [5], Caitlin Haxel [6], Christina Ronai [7]
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Background / Hypothesis:
Detection of congenital heart disease at earlier gestational ages has improved in recent decades. Despite this, a lack of formalized medical curriculum can result in inconsistent and potentially biased and ineffective guidance. We aimed to assess prenatal counseling content provided by maternal-fetal medicine specialists (MFM), neonatologists, cardiothoracic surgeons (CTS), and palliative medicine specialists (PM), hypothesizing that there is variation in fetal cardiac counseling practice among providers, potentially influenced by subspecialty training and practice, geopolitical environment, and personal perspectives.

Materials and Methods:
Survey administered included: (1) demographics, training, and practice setting; (2) attitudes towards the fetus, pregnant patient, termination of pregnancy (TOP), and palliative care; (3) description of individual provider counseling practices; and (4) a clinical scenario of a fetus diagnosed with hypoplastic left heart syndrome assessing counseling content, options provided to families, and professional versus personal support of those options.

Results:
Preliminary analysis (data collection ongoing) demonstrates the following: of 133 respondents, 69% were female (92/133), 40% >15 years of practice (54/133), and 89% practiced at an academic medical center (118/133). MFM were more likely to include TOP in counseling a fetus with single ventricle physiology as compared to CTS, PM and neonatology (91% v 43%, 83%, and 77%). CTS were least likely to include supportive/comfort care in counseling than MFM, PM, and neonatology (71% v 95%, 96%, and 93%). Providers in CTS (29%) and neonatology (30%) were more likely to agree with the statement "some life is always better than no life at all" as compared to MFM (19%) and PM (13%).

Conclusions:
Providers differ in their fetal counseling content by subspecialty training and practice. Further understanding of counseling variation can inform future development of educational interventions to improve family outcomes in the context of a shifting political and legal climate.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1623 - THEMATIC ANALYSIS OF SELF REPORTED PEDIATRIC CARDIOLOGY PRENATAL COUNSELING CONTENT

Christina Ronai [1], Caitlin Haxel [2], Laura Cohen [3], Amy Hughes-lansing [3], Madison Siegel [3], *Joanne Chiu* [4]
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Background / Hypothesis:
Approximately 1% of all live births in the United States are affected by congenital heart disease (CHD), the leading cause of congenital defect-related illness and infant death. The counseling session following prenatal CHD diagnosis is complex, and the content of this practice may vary by physician. Our study aimed to evaluate thematic content of fetal cardiology physician counseling.

Materials and Methods:
An anonymous survey was distributed to pediatric cardiologists who perform prenatal cardiac counseling to understand fetal cardiologist beliefs around counseling a prenatal diagnosis of critical CHD. The survey included 50 items and the opportunity to provide free text comments. We performed a thematic analysis of the comments to understand how counseling is impacted by state laws and physician comfort and beliefs regarding discussion of postnatal interventional and/or surgical treatment, postnatal palliative care, or termination of pregnancy (ToP).

Results:
Of 138 respondents, 30 responses included comments. Thematic analysis demonstrated that almost half of respondents (43%, 13/30) discuss how state laws impact current practice (for example, "prior to restrictive laws regarding abortions, I had previously counseled on ToP"). Approximately one quarter of respondents (26%, 8/30) report trying to include all pregnancy options in counseling (for example, "I believe it is part of my job to offer termination or palliative/comfort care as a reasonable option [regardless of my opinion or bias]…this should always be part of my counseling") (Table 1). Importantly, variation exists in the topics discussed depending on whether those same respondents did or did not discuss how current state laws impact clinical practice (Table 2).

Conclusions:
Prenatal cardiology counseling varies based on physician free text report. Notable differences in counseling content exists between those physician respondents that did and those that did not discuss how current state laws impact clinical practice, raising concern given the changing political and legal landscape.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1639 - INSIDE OUT A RARE CASE OF THORACIC ECTOPIA CORDIS

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Background / Hypothesis:
Ectopia cordis (EC) is a rare congenital cardiac malformation with a defect in the anterior chest and/ or abdominal wall with abnormal placement of the heart outside the thoracic cavity. There may either be complete or partial depending on the displacement of heart outside the thoracic cavity. It may be associated with defects in the parietal pericardium diaphragm, sternum, and in majority of cases cardiac malformations.
This paper presents a case of a newborn female from Bulacan, Philippines who was delivered term with thoracic ectopia cordis alongside multiple congenital anomalies. Patient underwent examinations and diagnostic procedures. Multidisciplinary approach and referrals to subspecialty consultants were made with to manage the patient. Patient underwent series of chest wall closures, given antibiotics, and was successfully discharged at the 5th month of life.

Conclusions:
Ectopia cordis can be diagnosed prenatal through ultrasonography and congenital anomaly scan, hence the importance of a good prenatal care is of utmost importance. However, despite adequate prenatal consultations, our case had only 1 prenatal ultrasound and was not able to detect ectopia cordis. If diagnosed early, parents can be advised on antenatal care and referral to a higher center for delivery so that early multidisciplinary intervention can be made available.
Life expectancy of patients with ectopia cordis depends on the type and co-existing illness or genetic syndromes alongside with availability of early intervention for corrective measures.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1662 - DOES 3D 4D FETAL ECHOCARDIOGRAPHY IMPROVE DIAGNOSTIC ACCURACY IN FETUSES WITH CONGENITAL HEART DISEASE COMPARED TO CONVENTIONAL 2D FETAL ECHOCARDIOGRAPHY

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Background:
This study aims to evaluate whether 3D/4D fetal echocardiography in fetuses with congenital heart disease enhance the diagnostic accuracy compared to conventional 2D fetal echocardiography.

Materials and methods:
This retrospective study, conducted from March 2023 to March 2025, included fetuses (18 weeks to term) diagnosed with congenital heart disease. After identifying the heart defect using conventional fetal echocardiography, 3D/4D fetal echocardiography was employed. The diagnostic accuracy of each method was compared. Fetuses without pre- or post-natal confirmation of fetal echocardiography findings were excluded. The gold standard sequential segmental analysis of the fetal heart was applied to both imaging modes.

Results:
This study encompassed 71 cases, with imaging findings confirmed through autopsy, postnatal echocardiography, CT pulmonary angiogram, or intraoperative assessment. The cases included were as follows: DORV with intact ventricular septum (3), bicuspid aortic valve (5), idiopathic pulmonary artery dilatation (1), right atrial appendage aneurysm (2), isomerism (5), situs abnormalities (3), ductal origin of the right pulmonary artery (1), D-TGA (10), CCTGA (2), aortic arch anomalies (10), systemic venous anomalies (10), tricuspid valve anomalies (3), TAPVC (3), VSD (10) and rhythm disorders (3).

Conclusions:
Conventional fetal echocardiography is more accurate than 3D/4D STIC echocardiography. However, 3D/4D STIC excels at visualizing great artery relationships in conotruncal anomalies, atrial appendage morphology, situs abnormalities, aortic arch, and systemic venous anomalies. The main advantage of 3D/4D STIC is the ability to retrospectively analyse missed prenatal findings.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1698 - ASSOCIATIONS OF PRENATAL METAL EXPOSURE WITH FETAL CONGENITAL HEART DEFECTS AND MEDIATION BY RED BLOOD CELL FOLATE

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Background / Hypothesis:
Prenatal exposure to multiple metals may influence congenital heart disease (CHD) risk in offspring, their combined effects and interactions vary among geographic populations. No studies have investigated the potential mediating role of red blood cell (RBC) folate. This study examines the impact of individual and combined metal exposures on fetal cardiac development and the mediation by RBC folate.

Materials and Methods:
Based on the Shanghai Preconception Cohort (SPCC) (N=1427; CHD=241, Non-CHD=1186), maternal serum concentrations of six metals were measured preconceptionally and in early pregnancy. Logistic regression and restricted cubic splines (RCS) assessed linear and nonlinear associations between individual metals and CHD risk. Weighted quantile sum (WQS) regression, Bayesian kernel machine regression (BKMR), and Bayesian Kernel Machine Regression Causal Mediation Analysis (BKMR-CMA) were applied to evaluate metal mixture effects and the potential mediation by RBC folate.

Results:
After covariates adjustment, logistic regression showed that higher maternal levels of Mg, Zn, and Se were significantly associated with a lower CHD risk in offspring [OR (95% CI): Mg, 0.889 (0.851–0.930); Zn, 0.620 (0.478–0.804); Se, 0.991 (0.985–0.997)], while As was associated with an increased risk [OR: 1.069 (1.045–1.093)]. RCS analysis confirmed a nonlinear dose-response relationship for As and Pb (P-nonlinear < 0.05). WQS regression indicated a significant positive association between the WQS positive index and CHD, with Pb (43.9%) and As (29.1%) as key contributors, while the WQS negative index was inversely associated with CHD, primarily driven by Mg (63.3%) and Zn (30.8%). These findings aligned with BKMR results, and BKMR-CMA confirmed a direct effect of metal mixtures on CHD, independent of RBC folate mediation.

Conclusions:
Reducing periconceptional exposure to metal mixtures, particularly Pb and As, while ensuring adequate intake of Mg and Zn may be critical for developing preventive strategy for reducing CHD risk in offspring.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1700 - A FOUR YEAR RETROSPECTIVE ANALYSIS OF FOETAL CARDIOLOGY REFERRALS BASED ON NATIONAL FOETAL ANOMALY SCREENING CRITERIA IN WALES

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Background / Hypothesis:
The National Health Service (NHS) Foetal Anomaly Screening Programme (FASP) implemented in Wales in 2016 aims to standardize prenatal screening between 10+0 and 20+6 weeks of gestation to detect congenital heart disease (CHD) early. Effective antenatal diagnosis influences clinical management, parental counselling, and outcomes. This study hypothesized that structured implementation of FASP referral criteria significantly enhances antenatal detection of CHD and improves clinical decision-making.

Materials and Methods:
This retrospective analysis evaluated foetal echocardiography referrals made according to FASP criteria at a tertiary centre in Wales from January 2020 to December 2023. Data were obtained from clinic letters, and maternal-fetal unit (MFU) records. Referrals were categorized by maternal, foetal, or familial criteria, each further subdivided as per FASP guidelines. Annual trends, timing relative to 20-week anomaly scans, echocardiographic findings, associated chromosomal abnormalities, and pregnancy outcomes were analyzed.

Results:
During the study period, 1,563 patients underwent foetal echocardiography. The majority (64%) were referred under foetal indications, predominantly due to suspected cardiac abnormalities identified on the routine 20-week anomaly scans. Inclusion of maternal diabetes as a referral criterion in 2021 significantly increased maternal referrals from 4 cases in 2020 to 115 cases in 2023, exceeding familial referrals for the first time. Importantly, 14% of referrals with initially normal anomaly scans revealed significant cardiac abnormalities on echocardiography, including Tetralogy of Fallot, transposition of great arteries, hypoplastic left heart syndrome, and tricuspid atresia. Associated chromosomal anomalies were documented, and several cases resulted in pregnancy termination following diagnosis. Additionally, 49% of referrals initially suspected of CHD were found to have normal echocardiography results.

Conclusions:
Adherence to FASP criteria markedly improved prenatal CHD detection in Wales, underscoring the importance of structured screening programs. The inclusion of maternal diabetes significantly increased detection rates, suggesting continual updates of these criteria could further optimize antenatal management strategies and parental counselling effectiveness.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1716 - THE ASSOCIATION BETWEEN PERICONCEPTIONAL PARENTAL FOLATE STATUS AND OFFSPRING CONGENITAL HEART DISEASE A PROSPECTIVE COHORT STUDY

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Background / Hypothesis:
Current evidence has supported higher maternal red blood cell (RBC) folate levels in preventing offspring congenital heart disease (CHD), while the role of paternal RBC folate is unclear. This study investigates the association between periconceptional parental RBC folate levels and offspring CHD risk.

Materials and Methods:
This study used data from the Shanghai Preconception Cohort to analyze 10,043 couples with singleton pregnancies between 2016 and 2023. Parental RBC folate levels were all measured at preconception, with a sub-cohort (N=4473) maternal levels also assessed in early pregnancy. Paternal RBC folate levels were assumed to be constant, while a linear model was applied to estimate maternal folate levels at conception. CHD cases were identified through prenatal ultrasounds, neonatal screening, and postnatal follow-up. Adjusted generalized linear models were used to estimate risk ratios (RRs) for CHD per 100 nmol/L increase in RBC folate.

Results:
Among 10,043 offspring, 105 (10.5‰) were diagnosed with CHD (86 simple and 19 complex defects). Maternal RBC folate at conception was inversely associated with CHD risk (RR: 0.94 per 100 nmol/L; 95% CI: 0.91–0.97), while no significant association was found for paternal folate levels (RR: 0.98; 95% CI: 0.90–1.06). The maternal protective effect was consistent for simple CHD (RR: 0.94; 95% CI: 0.91–0.97). Sensitivity analyses confirmed the robustness of the findings. No CHD cases occurred when both parents had sufficient folate levels (≥906 nmol/L), and a reduction in risk of 37% (95% CI, 27%-59%) was observed when only the mother met the threshold.

Conclusions:
The protection effect of maternal RBC folate in preventing offspring CHD is independent of paternal folate levels. Ensuring periconceptional maternal folate sufficiency is critical for preventing CHD, particularly for simple defects. Public health strategies should prioritize optimizing maternal folate levels.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1737 - INCIDENCE OF FETAL AND NEONATAL CONGENITAL HEART DISEASE IN SHANGHAI A RETROSPECTIVE COHORT STUDY

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Background / Hypothesis:
Congenital heart disease (CHD), the leading birth defect in China, necessitates robust screening strategies. This study evaluates the incidence of fetal and neonatal CHD in Shanghai, a pilot region implementing CHD screening guidelines, to address gaps in prenatal and postnatal diagnosis.

Materials and Methods:
A retrospective cohort study was conducted at the Obstetrics and Gynecology Hospital of Fudan University (2018-2020). Among 25,663 pregnant women enrolled at 8-14 weeks' gestation, 21,372 (83.5%) were followed until delivery, yielding 21,920 neonates. Mid-trimester fetal echocardiography (20-24 weeks) and postnatal dual-index screening within 6-72 hours (pulse oximetry and cardiac auscultation) were systematically performed. Multivariable logistic regression was conducted to investigate the potential risk factors with neonatal CHD incidence.

Results:
Of 398 CHD cases identified (incidence: 18.2/1,000), 134 were detected prenatally and 264 postnatally. Simple CHD accounted for 88.2% (n = 351), primarily ventricular septal defect (VSD), atrial septal defect (ASD), and patent ductus arteriosus (PDA). Complex CHD (11.8%, n = 47) included tetralogy of Fallot and aortic coarctation. Prenatal detection rates were 25.9% for simple CHD and 91.5% for complex CHD, respectively. Multivariable regression analysis identified preterm birth (adjusted odds ratio [aOR] = 1.6; 95% confidence interval [CI]: 1.0-2.5) and low birth weight (<1500 g) (aOR = 9.4; 95% CI: 4.6-18.7) as significant independent predictors of neonatal CHD risk.

Conclusions:
While mid-trimester ultrasound effectively identifies severe CHD, systematic neonatal dual-index screening remains critical for detecting simple defects-particularly in preterm/low-birth-weight infants. These findings advocate for integrated prenatal and postnatal screening protocols to optimize CHD management, particularly in regions with high policy-driven screening compliance.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1762 - A RARE CASE OF EBSTEIN'S ANOMALY AND DOWN'S SYNDROME DIAGNOSED INTRA UTERO

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Background / Hypothesis:
Ebstein's anomaly (EA) is a rare congenital heart defect (CHD) that occurs approximately 1:20.000 live births and is characterized by significant apical displacement of septal tricuspid leaflet (STL). An increased risk of CHDs, about 40–50%, has been reported among children with Down syndrome (DS).

Materials and Methods:
We relate a rare case of severe EA and DS diagnosed intrautero and its outcome.

Results:
39 years old woman was referred at 24 weeks of gestation due to cardiomegaly. Fetal echocardiogram showed a giant right atrium, STL had downward displacement (>12mm) with severe regurgitation by color Doppler. There was huge right ventricular atrialization with a very hypoplastic effective cavity. The trunk and branches of the pulmonary artery were importantly reduced with functional pulmonary atresia and retrograde flow through the ductus arteriosus (DA). Chorionic villus sampling showed trisomy 21. No systemic signs of hemodynamic decompensation or arrhythmia were observed. At 38 weeks, baby was delivered by caesarean section. DS severe EA were confirmed after birth. Prostaglandin-E1 was administrated continuously to keep the DA. The Starnes operation was performed at first week of life with success (closed the TV and pulmonary blood flow was supplied by a right Blalock-Taussig shunt). There were no postoperative complications and the baby was discharged from hospital with 20 days of life. The patient has being followed up carefully without complications and with 4years old underwent Glenn´s surgery. She is currently 10 years old and remains clinically stable with baseline oxygen saturation of 80%.

Conclusions:
Severe EA can lead to fetal cardiomegaly, heart failure, pulmonary hypoplasia, hydrops, tachyarrhythmia with an overall mortality rate as high as 85%. Surgical treatment must be performed to salvage this fatal state. This rare case emphasizes the important role of fetal echocardiography. Prenatal diagnosis and the promptly treatment may improve the prognosis of these patients.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1764 - PRENATAL DIAGNOSIS OF TACHYARRHYTHMIAS AND POSTNATAL OUTCOMES

Carolina Capuruco [1], *Cleonice Mota* [1]
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Background / Hypothesis:
Fetal arrhythmias (FA) are detected in 2% of pregnancies during routine obstetrical scans. Most common are transient or premature atrial contractions (PAC). Less common are prolonged / persistent abnormalities such as complete atrioventricular block (CAB), supraventricular tachycardia (SVT) and atrial flutter (AF) which may lead to low cardiac output, fetal hydrops (FH) and demise. The aim of this study is review the diagnosis, treatment and outcome of FA.

Materials and Methods:
This was cross-sectional observational study between 08/2011 and 01/2025. Fetal Doppler echocardiograms were performed in high-risk pregnancies (HRP). 721 gestants with HRP were referred with gestational age 25 ± 4.5 weeks (range 17 to 39) and maternal age 32 ± 3.7 years (range 15 to 45). 103 (14.3%) of the indications was about FA.

Results:
Among the arrhythmias, we observed 26 (25.2%) PAC less than 11/min, 18 (17.5%) PAC (bi or trigemism) with hemodynamic repercussion, 19 (18.4%) SVT, 6 (5.8%) AF, 7 (6.8%) CAB, 27 (26.2%) transient slow or fast heart rate. FH was reported in 42.8% and 50.0% of fetuses with SVT or AF, respectively. Digoxin treatment resulted in a higher conversion rate in non-hydropic fetuses with fetal tachyarrhythmias (FTA) than in FH. 9 cases was necessary combination of 2 antiarrythmic drugs. FH were reported in 11 cases, 8 SVT and 3 AF, respectively. Digoxin treatment resulted in higher conversion rate in non-hydropic fetuses with FTA than in HF. Those with PAC < 11/min or transient arrhythmia didn´t need any treatment after birth. 9 newborns (4 AF and 5 SVT) presented hemodynamics repercussions and needed treatment with drugs.

Conclusions:
The prevalence of benign FA is more common than tachycardia with 1:1 conduction. There was no difference between the response rate to digoxin in fetus with AF or SVT. Mortality was similar in the two types of tachyarrhythmia.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1767 - BORDERLINE RIGHT VENTRICLE IN DICHORIONIC AND DIAMNIOTIC TWINS PRENATAL DIAGNOSIS AND PREDICTORS OF BIVENTRICULAR REPAIR.

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Background / Hypothesis:
The definition of the borderline RV includes a wide spectrum of complex CHDs, such as pulmonary artery (PA) with intact ventricular septum (IVS), critical pulmonary stenosis (CPS) or severe Ebstein's anomaly.
We describe a remarkable case of borderline right ventricle (BRV) due to critical pulmonary valve (PV) stenosis in dichorionic and diamniotic twins.

Materials and Methods:
A 41 year old woman, was referred at gestational age of 17 weeks due to with cardiomegaly (in both twins) detected at routine anomaly scan at 17 weeks of gestation.

Results:
Detailed fetal Doppler echocardiogram (FDE) detedcetd giant right atrium (RA), moderate regurgitation tricuspid valve (TV), hypertrophic right ventricle tripartide (RV) and CPS.
The trunk and branches of PA were great. The fetuses were followed up and PV obstruction get worse avoiding the blood flow forward the RV to PA. Also TV regurgitation gets huge with giant RA and functional PV atresia with retrograde flow through the ductus arteriosus (DA). The twins were delivered by caesarean section at 38weeks. CPS was confirmed after birth. Prostaglandin-E1 left the DA patent. Balloon dilatation valvuloplasty by cardiac catheterization with DA stent was performed at first week of life. The results were excellents, the discharged from hospital occurs with a month of life. Now, with 12 years old, they have normal life and are followed up without complications.

Conclusions:
CPS occurs due to abnormal development of the heart during the first 8 weeks of fetal growth. In this case, the twins were dichorionic and diaminiotic. PV stenosis may be present in varying degrees and could be estimated by Doppler echocardiogram. In newborns BRV due to CPS could be lethal and must be promptly treat with balloon valvuloplasty and DA stent. FDE is essential to diagnose and follow up these fetuses allowing improvement of their outcome.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1768 - ECHOCARDIOGRAPHIC PRENATAL PREDICTORS FACTORS OF COARCTATION OF AORTA

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Background / Hypothesis:
Prenatal diagnosis of fetal coarctation of aorta (CoAo) is still challenging and suspected by cardiac ventricular or great vessels disproportion. The sensitivity and specificity of several criteria have high false positive rate. Prenatal diagnosis of CoAo is important because the delivery can be arranged in a center with a pediatric cardiac intensive care and reduces postnatal morbidity. We aim to establish echocardiographic (ECHO) predictor's parameters of fetal CoAo.

Materials and Methods:
The study included pregnant women referred for fetal ECHO due to ventricular and/or great vessels asymmetria, between 06/2011 and 01/2025. The fetuses were scanned at median GA of 31±0 weeks (26 to 38 ± 3 weeks). Fetal ECHO parameters for suggestive cases were: right / left ventricular diameters ratio ≥1.7, main pulmonary artery / ascending aorta (MPA/AAo) ratio ≥1.7, z-score of ascending aorta (AAo) ≤ −1.5 and z-score of aortic isthmus ≤ −1.5. Multivariable analysis and logistic regression were used to assess the interdependence of significant variables.

Results:
A total of 173 were scanned and 94 had criteria for prenatal suspicion of CoAo. The CoAo was confirmed postnatally in 64 fetuses (68.1%). The isthmal Z-score ≤ −1.5 and MPA/AAo ratio ≥1.7 demonstrated a high sensitivity (88% and 82%) and positive predictive value (79 and 77%). Although ventricular asymmetria and AAo Z-score had great sensivity (74% and 76%) they had poor specificity (34% and 32%). The association of two or more parameters showed 94% of accuracy. Nine patients with mild/moderate hypoplastic ascendant or arch aortic were surveilled for a year and didn't develop CoAo. They're considered false-positive diagnoses.

Conclusions:
Antenatal diagnosis CoAo is important for improved preoperative hemodynamic stability and reduced mortality. Prenatal diagnosis CoAo suffers from high false-negative rates at screening and poor specificity by fetal ECHO. A combination of echocardiographic features can improve the correct diagnostic.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1769 - FETAL BRADYARRHYTHMIAS PERINATAL MANEGEMENT AND CARDIAC OUTCOME

Carolina Capuruço [1], *Cleonice Mota* [1]
Federal University Of Minas Gerais, Fetal And Pediatric Cardiology, Belo Horizonte-Brazil [1]

Background / Hypothesis:
Fetal bradyarrhythmia (FBA) is generally defined as a sustained heart rate less than 110 beats per minute. FBA can range from mild to serious, depending on gestational age, underlying cause, each baby's condition, including any complications.

Materials and Methods:
We aim to evaluate the prevalence and outcome of FBA; conventionally defined by a decrease in heart rate (HR) <110 bpm. Brief HR deceleration of less than 1–2 min is common without clinical relevance. Bradyarrhythmias mechanisms are: sinus bradycardia (SB) and complete heart block (CHB). There are two distinct groups: fetuses with complex structural heart disease (SHD) and those with immune complex-related damage to fetal conduction tissue secondary maternal autoantibodies. This was cross-sectional observational study including 2318 fetuses at 17–40 weeks of gestation from 08/2011 to 01/2025. They were subdivided into SB and CHB.

Results:
The prevalence of FBA was 3.5% (81/2318). SB (53/81, 65.4%) arise from fetal hypoxia or immaturity of cardiac conduction system and were benign. The 28 cases of CHB were associated with complex SHD and left isomerism (10 fetuses) or with transplacental passage of maternal anti-Ro autoantibodies (18/28, 64.3%) between 17-22 weeks. Fetal CHB with SHD had worse prognosis: 9 patients with complex SHD died and the only survivor needed pacemaker just after birth. All of those with CHB by autoantibodies anti-Ro survived, but 8/18 (44.4%) needed pacemaker.

Conclusions:
Transient or SB were benign and need no fetal treatment. CHB without SHD develops primarily in anti-Ro positive antibody, especially into 17-24 weeks of gestation. Regular screening by fetal echocardiography and transplacental treatment could prevent this risk factor. There's a high risk of perinatal demise with fetal hydrops, structural defects, poor ventricular function and HR<55 bpm. Delivery in a tertiary center is necessary with expertise in the perinatal management of cardiac patients.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1771 - FETAL ECHOCARDIOGRAPHY FOR DETECTION OF CONGENITAL HEART DISEASES PREVALENCE AND IMPACT ON FETUS OUTCOME

Carolina Capuruço [1], *Cleonice Mota* [1]
Federal University Of Minas Gerais, Fetal And Pediatric Cardiology, Belo Horizonte-Brazil [1]

Background / Hypothesis:
Congenital heart defects (CHD) are an important cause of morbimortality. It's thus important to determine their spectrum and identify risk factors associated with development of heart defects. We aim to evaluate the prevalence of major and minor CHD in a high risk gestation (HRG) and its impact on fetus outcome.

Materials and Methods:
Pregnant women with HRG were prospectively examined between 06/2011 and 01/2025 at two referral centers of fetal cardiology. A detailed cardiac exam was made by fetal cardiologists: evaluation of situs, position of heart, four chamber view, inflow / outflow tracts, three vessel and trachea view with B-mode, M-mode and Color Doppler. Digital clips were obtained and stored from the initial scan for offline analysis.

Results:
There were made 3042 fetal echocardiography exams in pregnant women. The mean age of the patients were 28.9 years ± 3.7 (range 16 - 45) with gestational age (GA) 29.4 weeks ± 2.3 (range 17-39). A total of 881 (28.9%) of the exams were abnormal. Among the abnormalities 416 (46.5%) had major anomaly (atrioventricular defect, tetralogy Fallot, transposition of great arteries, hypoplastic left heart syndrome, right heart obstacle pathologies and other complexes CHD, 353 (39.5%) cases screen as minor anomaly and 112 (12.5%) cases of malignant arrhythmia. Diagnosis of cardiac abnormalities had high accuracy (specificity 97.3%). The fetuses with major CHDs were referred to a tertiary center with a team of specialists in cardiac fetal and neonatal group great long-terms outcome.

Conclusions:
These results demonstrate that with adequate training, fetal echocardiography is a highly accurate tool to diagnose CHDs. A detailed examination of the fetal heart in second trimester is feasible and could be practicable as part of a screening level examination, in order to provide a better outcome in cases of suspected anomalies or disordered cardiac function.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1776 - PRENATAL ATRIAL FLUTTER A SUCCESSFULLY PROPAFENONE TREATMENT

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Background / Hypothesis:
Fetal atrial flutter (AF) is a tachyarrhythmia with high risk of hydropic fetuses (HF) (40-60%) and sometimes demise. In HF digoxin treatment has low conversion rate and association of 2 or 3 drugs becomes necessary to revert to sinus rhythm (SR).

Materials and Methods:
We present a case of successful treatment with digoxin, sotalol and propafenone in HF with AF.

Results:
A primipara women were referred from 26 weeks of gestation. Fetal echocardiogram showed AF with atrial rate of 600 bpm with 2:1 AV block and ventricular rate of 300bpm, without structural cardiac defects. At first, a loading dose of digoxin was given (1.5mg/kg/day), followed by maintenance dose (0.75mg/kg/day) without any change in the heart rate (HR). The fetuses became hydropic and after 10 days, sotalol was started (320 mg/day) unsuccessful and dosage was increased to 480mg/day, and also failed to correct HR. The pregnant developed hypotension and had thyroid disease, so couldn't take amiodare or flecainide. We started propafenone (600 mg/day). HR was gradually coming down and AF was reverted to SR. There were a premature delivery (34-35 weeks) because of FH. Postnatally, AF was controlled by antiarrhythmic drugs: digoxin, amiodarone and propafenone with reverted back to SR. At 3 years of age, the suspension of medications was progressive until their total withdrawal. Today, the patient is 15 years old, undergoes annual control with echocardiogram and Holter ECG and remains in SR, without clinical or hemodynamic repercussions.

Conclusions:
Fetal AF is a lethal tachyarrhythmia with a 10% mortality rate. Diagnosis is made with echocardiography, and management should be multidisciplinary. The commonly used antiarrhythmic drugs include digoxin as first choice and sotalol, flecainide, amiodarone as second or third choice. But in this case propafenone had a significantly better response to SR prenatally in hydropic fetuses with AF.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1779 - PRENATAL DIAGNOSIS OF TUMOURS AND POSTNATAL OUTCOMES

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Background / Hypothesis:
Primary cardiac tumours are rare, the prevalence is 0.001 to 0.03% at autopsy series. They're usually benign and may induce life-threatening symptoms in the pre and postnatal periods. The cardiac manifestations are dependent on location and extension of the masses. The aim of this study was to evaluate the morphologic/ hemodynamic/ functional findings by fetal echocardiography as well as the postnatal outcomes.

Materials and Methods:
The study consisted 32 fetuses with cardiac tumours followed from 08/1998 to 02/2025. The tumours were classified in small (<30 mm2), medium (> 30 and < 100mm2) and large (> 100mm2).

Results:
Maternal age ranged from 17 to 39 years (=24.5±3.1y) and gestational age at diagnosis ranged from 22 to 34 weeks (=29.1±3.8w). The majority (78.1%) were small (=11.0 mm2); 15.6% were large (= 272.7mm2) and 6.3% had medium sized (= 60.5mm2). Rhabdomyoma accounted 22/32 (68.8%) and tuberous sclerosis in 17/32 (53.1%). There were no histological diagnosis in five patients; mixoma was confirmed in four and teratoma in one. 28 fetuses had intracardiac tumours and four had pericardial tumour. According to the location, 62.5% were seen in right chambers, 31.2% in left chambers and 6.3% in pericardium. The large tumours were associated with blood flow obstruction (p=0.01), ventricular dysfunction (p=0.00), arrhythmia (p=0.03), congestive heart failure, pericardial effusion, cardiomegaly, hydrops (p=0.01) and death (p=0.00). There were five deaths, three patients developed arrhythmia and five had large tumours.

Conclusions:
All the identified tumours were benign, rhabdomyoma was the most common. Hemodynamic/ functional disturbances and death were correlated with large tumours and location of the masses at the ventricular outlets or inlets flows. The widespread use of fetal echocardiography has significantly contributed to earlier diagnosis and treatment and improved postnatal survival in this population.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1782 - FETAL DIAGNOSIS TO NEONATAL RESCUE SURGICAL RESECTION OF A GIANT CARDIAC TUMOR WITHIN HOURS OF BIRTH

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Background / Hypothesis:
Pericardial teratomas are rare tumors, accounting for less than 2% of cardiac tumors in childhood. Although histologically benign, they may lead to severe complications due to their size and location, including cardiac compression, arrhythmias, heart failure, and death. Fetal diagnosis allows for careful planning of delivery and postnatal management. Surgical resection in the neonatal period is rarely reported and even less so within the first hours of life. We present a case of pericardial teratoma diagnosed during the third trimester, with rapid growth and postnatal hemodynamic compromise requiring emergency surgery shortly after birth.

Materials and Methods:
A 28-year-old primigravida with normal prenatal exams up to the second trimester was found to have a left-sided paracardiac cystic mass at 26 weeks gestation. Fetal echocardiography and MRI revealed a growing solid-cystic tumor with mediastinal shift, discrete pericardial effusion, and compression of the left lung, suggestive of a pericardial teratoma. Delivery was planned by cesarean section in a tertiary cardiac center. The preterm neonate (3650g) presented with respiratory distress and echocardiographic evidence of cardiac chamber compression and hemodynamic restriction. Emergency surgery was indicated within hours of life.

Results:
Through median sternotomy, a large, lobulated mediastinal mass (155g; 9×5×4.3 cm) was completely resected without cardiopulmonary bypass. The tumor was adherent to the pericardium and adjacent structures. The left lung was hypoplastic due to extrinsic compression. Postoperative evolution was uneventful: extubation occurred on postoperative day 1, ICU discharge on day 4, and hospital discharge on day 9 in good clinical condition.

Conclusions:
This case highlights the critical role of fetal diagnosis and the rarity and feasibility of emergency neonatal cardiac surgery in the first hours of life. Timely surgical intervention in specialized centers can be life-saving in pericardial teratomas with early hemodynamic compromise.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1804 - ABSENT PULMONARY VALVE SYNDROME IN FETUSES ANATOMICAL VARIANTS AND PERINATAL OUTCOMES

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Background / Hypothesis:
Absent pulmonary valve syndrome (APVS) is a very rare CHD. Two different types of APVS are diagnosed: with (APVS-VSD) or without (APVS-IVS) ventricular septal defect. The aim of study was to analyze the anatomical features of these two types with an assessment of their perinatal outcomes.

Materials and Methods:
From 2010 to 2024, 42 fetuses with APVS were identified in the UCCC prenatal database. We retrospectively reviewed all echocardiographic data and perinatal outcomes.

Results:
All 42 fetuses were divided into two groups: I group – APVS-VSD (n=35; 83,3%) and II group – APVS-IVS (n=7; 16,7%). In the APVS-VSD group, 31 (88,6%) fetuses had a ductus arteriosus (DA) and 14 (40,0%) had a right aortic arch (RAA) with thymic hypoplasia/agenesis in 11 (31.4%) cases. Conversely, in the APVS-IVS group DA was present in all cases (100%), but there were no RAA and thymic hypoplasia. Analyzing cases with absence (n=31) or presence (n=11) of DA, a significant increase in Z scores of pulmonary artery (PA) branches was found in the group without DA: RPA (5,6±1,9 and 3,4±1,9; p<0,01) and LPA (5,4±1,6 and 3,5±1,5; p<0,01). There were 13 (40,0%) terminations of pregnancy, and 3 (7,1%) cases of intrauterine death. Twenty-three (54,8%) children were born, but 5 (11,9%) of them died in the pre-operative period, and 14 (33,3%) patients were operated on with a mortality rate 7,1% (1 death).). There were 6 (46,2%) surgical or interventional reoperations in the first postoperative year. In total, 17 patients (73.9% of all children born) were alive after 1 year of life.

Conclusions:
Two types of APVS have different anatomical features and the presence of DA significantly reduces the diameters of the PA branches. Perinatal outcomes remain controversial, with high level of pregnancy termination at early diagnosis, perinatal death and early reoperation in the APVS-VSD group.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1822 - COLLECTGV OVERVIEW OF PERINATAL MANAGEMENT OF FETUSES WITH ISOLATED TRANSPOSITION OF THE GREAT ARTERIES – A FRENCH MULTICENTER RETROSPECTIVE STUDY

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Background / Hypothesis:
Transposition of the great arteries (TGA) is a cyanotic congenital heart defect requiring specialized management from the prenatal period onward. While antenatal diagnosis improves outcomes, perinatal practices vary depending on local resources and organization. The objective of this study is to describe current perinatal management strategies for fetuses diagnosed with isolated TGA across French tertiary centers and highlight inter-center variability.

Materials and Methods:
This retrospective multicenter observational study included 648 fetuses with prenatally diagnosed isolated TGA, born between January 1, 2016, and December 31, 2023, across 12 French reference centers. Data were collected from fetal cardiology, obstetric, and neonatal records. The study focused on prenatal imaging, delivery planning, immediate neonatal care, prostaglandin use, atrial septostomy (Rashkind), and timing of surgical correction.

Results:
Antenatal assessment includes evaluation of cardiac anatomy and fetal shunts (foramen ovale and ductus arteriosus). Practices differ among centers: some rely on detailed prenatal characterization due to remote pediatric cardiology teams, while others prioritize postnatal evaluation when cardiologists are present at delivery. Induction of labor around 39 weeks is common to optimize team availability and neonatal stabilization, but spontaneous labor remains acceptable in certain settings. At birth, a multidisciplinary team is mobilized for immediate care. The need for prostaglandin infusion or urgent atrial septostomy is guided by echocardiographic assessment of shunt efficiency. Timing of the arterial switch operation varies by center and neonatal condition, typically occurring within the first few days of life.

POSTER PRESENTATIONS

Conclusions:
The CollecTGV study highlights significant variation in the perinatal management of isolated TGA in France, reflecting differences in center-specific organization and access to specialized teams. These findings support the need for national recommendations to harmonize practices and ensure equitable, high-quality care for all affected neonates.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1844 - AORTIC COARCTATION IN TRANSPOSISTION OF THE GREAT ARTERIES FETAL ECHOCARDIOGRAPHIC PARAMETERS.

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Background / Hypothesis:
Fetal ventricular disproportion can predict aortic coarctation (CoAo) and mitral to tricuspidal valve ratio (MV/TV)is a good indicator.
Our hypothesis is that in patients with TGA and CoAo the right ventricle (RV) is smaller than the left ventricle (LV) and MV/TV ratio higher than TGA without CoAo.

Materials and Methods:
we retrospectively reviewed all the fetal and neonatal echocardiograms of patients with TGA with or without VSD since 2011 through 2024 and we excluded all those with associated lesions except CoAO. MV and TV annulus were measured at the best fetal 4-chamber view and the MV/TV ratio was calculated. Surgical reports were examined for diagnostic confirmations.

Results:
a total of 188 patients with TGA were collected. Of those 34 (18%) were TGA/VSD and 154 (82%) TGAIVS. 18 patients (9,6%) had confirmed CoAO of which 7 TGAIVS (39%) and 11 TGAVSD (61%), all requiring repair at the time of surgery or later. Of the 134 fetal diagnosis, 11 (8.2%) had CoAo which was confirmed at birth. In TGA noCoAO fetal MV measured 0.77 ± 0.16 and TV 0.9 ± 0.2 mm while in TGA-CoAO MV measured 0.81 ± 0.37 and TV 0.58 ± 0.7 mm ($p=0.7$ for MV and $p<0.0001$ for TV comparison between groups). MV/TV ratio was significantly different among groups (0.86 ± 0.12 in TGA-no-CoAO and 1.39 ± 0.18 in TGA-CoAO ($p<0.001$)). Similar trends were observed in the TGAVSD group alone.

Conclusions:
in TGA with CoAo the RV is significantly smaller than the LV as indicated by the MV/TV ratio, which is higher than TGA. MV/TV ratio could be a useful indicator of those TGA patients who will require strict neonatal aortic arch evaluation. Since CoAo repair might be needed at the time of arterial switch operation or later adequate prenatal counselling is recommended.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1850 - MATERNAL INTRAVENOUS AMIODARONE FOR FETAL SVT WITH SEVERE HYDROPS

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Sri Jayadeva Institute Of Cardiology, Pediatric Cardiology, Bangalore-India [1]

Background / Hypothesis:
Fetal SVT when prolonged leads to hydrops and may cause fetal demise. Transplacental therapy can be ineffective in hydropic fetus.

Materials and Methods:
24 year female at 25 weeks of gestation presented with fetal tachycardia with hydrops. Heart rate was 220 bpm with severe biventricular dysfunction. M-mode and LVOT-MV doppler showed 1:1 conduction, regular tachycardia probably SVT. There was large pleural effusion and ascites. Mother was started on digoxin with full digitalising dose along with fleicainide 100mg twice a day. Heart rate remained same at the end of 48hours. Fleicainide was increased to 100mg thrice a day. After 24 hours, fetal heart rate reduced to 197 per minute but arrhythmia persisted. Mother had extreme fatigue and vomiting due to fleicainide. Fleicainide was replaced by Sotalol at 80 mg thrice daily dose. Maternal ECG after 48 hours showed QT prolongation of 500ms. FHR remained at 200 per minute. The pericardial effusion increased and severe dysfunction persisted. Hence maternal intravenous amiodarone was given at 150 mg loading dose followed by 650 mg over 24 hours.

Results:
Within one hour of loading dose, sinus rhythm was achieved. Baby had recurrences and intravenous therapy was continued for 48 hours and changed to oral tablets. At the end of which stable sinus rhythm of 120 beats per minute was achieved. Hydrops resolved over 7 days. At 31 weeks of gestation, fetus had reduced movements with sinus rate of 100 per minute. Emergency LSCS was performed and 1.5 kg baby was delivered. Baby had hypothyroidism requiring treatment. At 15 days of life baby had 1 episode of SVT for which propranolol was started. At 3months follow up baby is doing well with no recurrences.

Conclusion:
Maternal intravenous amiodarone can be a safer option than intrauterine therapy for fetal tachycardia in emergent situations

POSTER PRESENTATIONS

Category: Foetal Cardiology

1860 - BILATERAL DUCTUS ARTERIOSUS AND ISOLATED PA OR SUBCLAVIAN ARTERY IN FETAL LIFE.

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Rainbow Children Heart Institute, Pediatric Cardiologist, Hyderabad-India [1]

Background / Hypothesis:
Isolation of pulmonary artery or subclavian artery is very rare entity. Diagnosis before birth is extremely rare and also it helps in post birth management more efficient way.

Materials and Method:
This is a retrospective study, done at tertiary level Pediatrics Cardiologist department between 2020-2024.Fetal echo cases were evaluated where branch pulmonary artery (PA) not visualised or there was suspicious of neck vessel abnormalities. Their physiology during fetal life was studied. Total 7 cases were identified, out of which 2 had isolated RPA, 1 had isolated LPA and 2 had isolated subclavian artery. 2 cases had RPA originated from Ascending aorta in case of left aortic arch.Isolation of vessel was always contralateral to aortic arch. In case of Isolated LPA, right arch was associated with right duct. In case of isolated RPA there was left arch and left ductus arteriosus. Fetal circulation was uninterrupted due to presence of contralateral ductus arteriosus. In case of aortic origine of PA, Doppler was higher than normal origin PA. 3D rendered images helped in vessel coarse and thereby identification of abnormal origine.

Results:
Post delivery, findings were confirmed by contrast CT angiography and 2D echocardiography. Isolated RPA and RPA from Ascending aorta underwent surgical correction at 3 weeks and 4 weeks respectively. They had pulmonary artery hypertension which warranted early surgery. Isolated LPA, got disconnected from AO after birth once ductus was closed. This baby remains asymptomatic. Similarly isolated subclavian got disconnected post delivery once ductus was closed. Both the babies remain asymptomatic.

Conclusions:
Isolation of pulmonary artery, aortic origine of pulmonary artery or isolated subclavian artery are very rare entity. Fetal life identification helps in proper planning and timely treatment. Isolation of PA or subclavian is due to ductal origine and closes after birth. Therefore it is associated with bilateral ductus arteriosus.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1866 - PRENATAL DIAGNOSIS OF ARTERIOVENOUS MALFORMATIONS AND OUTCOME A CASE SERIES

Sri Phani Bhargavi Dhulipudi [1], Shwetha Bhakru [2], Nageswra Rao Koneti [2]
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Background / Hypothesis:
Arteriovenous (AV) malformations in fetal life presents as only cardiomegaly to severe hydrops. We present our series of AV malformations from placenta to cranium.

Materials and Methods:
The study was retrospective analysis of our data from May 2019 to August 2022. 6 cases of AV malformations were diagnosed antenatally during this period. All cases were diagnosed on GE Voluson E 10 machine except one. In 3 cases 3D image acquisition done using e-STIC.

Results:
The analysis of AV malformations in our study.
S.No Case Gestational(weeks) CTR(%) TVZ score MVZ score Any dilated vessel Effusion Outcome
1 Chorioangioma 32 58 +1.43 +0.67 IVC+2.1. No Fetal transfusion delivered at term
2 Hepatic AVM 19 67 +1.36 +1.1 IVC +2.65 Mild pericardial effusion Terminated
3.Aortopulmonary collateral24 50 +0.9 +1.0 NormalIVC and SVC No Closure ofusing AVP 4
4.Coronary AV fistula to RA 25 60 +1.8 +0.7 RA dilated No Closed at 18 mths KONAR MFO 8/6
5.Cervical AVM(Twins) 25 75 +0.9 +0.21 SVC +2.55 Hydrops IUD
6. Vein of Galen 32 60 +3.0 +1.3 SVC +2.8 Mild pericardial effusion Terminated
7 Vein of galen 30 60 +2.5 +1.2 SVC
+2.7 NO Deliverd at 36 weeks
Vein of galen closed transcatheter approach.
8 CAVF LCX to Coronary sinus 28 60 +2.7 +1.0 Dilated RA/RV No Closed at 16 days using KONAR MFO 9/7

Conclusions:
AV malformations can be diagnosed by using subtle clues like cardiomegaly and inappropriate dilatation of draining vessels or chamber. HD Color doppler and e-STIC will aid in diagnosis. Fetal counselling and level of understanding the problem by parents decide

POSTER PRESENTATIONS

Category: Foetal Cardiology

1870 - DIAGNOSIS AND OUTCOMES OF TAPVC IN FETAL LIFE.

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Background / Hypothesis:
This is a report on a series of 24 fetuses with prenatally diagnosed isolated TAPVC, focusing on echocardiographic markers leading to diagnosis, features of obstruction, and postnatal outcome.

Materials and Methods:
Systematic retrospective review of the sonographic features of antenatally diagnosed isolated TAPVC at our institution from 2019 till date. The fetal echocardiograms were performed on a GE Voluson E10 ultrasound machine using 2D, colour flow mapping, spectral Doppler, and 3D imaging. Exaggerated fetal right heart dominance in supradiaphragmatic TAPVC, increased posterior LA walldescending aorta distance, inability to image direct pulmonary vein entry to LA, unusual pulmonary vein Doppler, and identification of a vertical vein or a dilated coronary sinus (with/without left cava), were the markers used to make the diagnosis. The parents were informed about the fetal CHD and counselled in detail about the corrective surgical management available.

Results:
Twenty-four patients had prenatal diagnosis of isolated TAPVR (gestational age range 18 weeks-34+6 weeks). Most commonly encountered abnormal pulmonary venous connections were supracardiac in 12 cases (50%), followed by infradiaphragmatic in 7 (29%), and cardiac TAPVC in 5 (21%). Notably abnormal pulmonary vein Doppler as continuous flow as seen in 79% of cases.Evidence of pulmonary venous obstruction (flow aliasing with high continuous flow Doppler) was antenatally detected in 38% of cases.
On outcome analysis, 11 of these babies have undergone TAPVC re-routing, one preterm baby with unobstructed supracardiac TAPVC is awaiting elective surgery, intra-uterine death occurred in two fetuses with obstructed supracardiac TAPVC, two patients died post-surgery, and parents chose to terminate pregnancy in 8 cases.

Conclusions:
Fetal diagnosis of isolated TAPVC is challenging but abnormal loss of continuous waveform is predictive of TAPVC. Early identification and planned surgical
management of this treatable congenital heart disease has largely gratifying result.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1890 - PERINATAL AND POSTNATAL OUTCOMES IN FETUSES WITH PULMONARY ATRESIA AND INTACT VENTRICULAR SEPTUM (PAIVS)

Roland Axt-fleidner [1], Kevin Klebe [1], Aline Wolter [1], Ivonne Bedei [1], Lara Freiberger [1], Elydda Widriani [1], Domitilla Polidori [1], Justus Reitz [1], Andrii Kurkevych [1]
Ukgm, Department Of Obstetrics And Gynecology, Giessen-Germany [1]

Background / Hypothesis:
This study aims to evaluate the postnatal outcomes of fetuses diagnosed with PAIVS.

Materials and Methods:
This retrospective single-center study analyzes 30 fetuses born between January 2008 and January 2025.

Results:
The mean maternal age was 30.8 ± 5 years. Perinatal outcomes included 2 intrauterine fetal deaths (IUFD) (6.7%), 2 terminations of pregnancy (TOP) (6.7%), 1 lost follow-up (3.3%) and 25 live births (83.3%). The mean gestational age at birth was 37.3 ± 2.7 weeks. The 30-day survival rate among live births was 18 out of 25 (78.3%).
Pre-interventional death occurred in 4 (16.0%) cases, of which 2 cases occurred in the perinatal period, and 2 cases occurred in the neonatal period during hospitalization. The early postoperative mortality was 8.0% (2 of 25). The 6 neonates who died postnatally had a mean survival time of 11.5 ± 14.0 days (range: 0–39.0). Prostaglandin E1 treatment was administered to 21 neonates, while 1 did not receive treatment, and 8 either died before treatment or had no available records. A catheter-based PDA stent implantation was documented in 16 neonates. The mean number of cardiac catheterizations per neonate was 1.6 ± 0.9. Cardiac surgery was performed in 15 neonates (60.0% of live births) during hospitalization, with 2 dying perioperatively and 1 dying 27 days postoperatively. In-center follow-up data were available for 16 cases. The 30-day survival rate among live births was 18 out of 25 (78.3%).

Conclusions:
This study highlights the significant perinatal morbidity and mortality associated with PAIVS, despite advancements in prenatal diagnosis and interventions.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1895 - 2D SPECKLE TRACKING ECHOCARDIOGRAPHY IN FETUSES WITH PULMONARY ATRESIA AND INTACT VENTRICULAR SEPTUM (PAIVS) THROUGHOUT THE COURSE OF GESTATION

Roland Axt-fliedner [1], Kevin Klebe [1], Aline Wolter [1], Ivonne Bedei [1], Lara Freiberger [1], Elydda Widriani [1], Domitilla Polidori [1], Justus Reitz [2], Andrii Kurkevych [1]
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Background / Hypothesis:
To assess both atrial and ventricular strain using two-dimensional speckle tracking echocardiography (STE) in fetuses with pulmonary atresia and intact ventricular septum (PAIVS).

Materials and Methods:
30 fetuses were analyzed. Apical or basal 4-chamber views were evaluated using two-dimensional STE between January 2008 and January 2025. Both the left and right ventricles (LV, RV), as well as the left and right atria (LA, RA), were systematically assessed wherever possible

Results:
The mean maternal age was 30.8 ± 5.0 years, and the mean gestational age at birth was 37.3 ± 2.7 weeks. Echocardiographic data showed prenatal RV morphology as unipartite in 2 (6.7%) cases, bipartite in 14 (46.7%), and tripartite in 14 (46.7%).
A total of 95 STE examinations were performed, with 45 assigned to the second trimester and 50 to the third trimester. The global LV contractility (LV_EndoGLS) increased (mean values −23.5 ± 8.1%, $p < 0.01$), and global RV contractility (RV_EndoGLS2) decreased slightly (−15.4 ± 19.1%, $p < 0.01$), compared to the control group. Whereas the mean values for global LA and RA contractility (LA_EndoGLS3 and RA_EndoGLS33, respectively) were significantly decreased (28.5 ± 15.8% and 28.8 ± 12.5%, $p < 0.01$). Linear regression analysis showed a progressive decline in left atrial speckle-tracking parameters with advancing gestation, most notably in global LA longitudinal contractility.

Conclusions:
Fetuses with PAIVS showed increased global longitudinal LV contractility, unchanged or slightly reduced RV contractility, and significantly reduced LA and RA contractility, compared to the control group.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1901 - NORM BASED Z SCORE ANALYSIS OF FETAL CARDIAC DIMENSIONS IN PULMONARY ATRESIA WITH INTACT VENTRICULAR SEPTUM (PAIVS)

Roland Axt-fliedner [1], Kevin Klebe [1], Aline Wolter [1], Ivonne Bedei [1], Lara Freiberger [1], Elydda Widriani [1], Domitilla Polidori [1], Justus Reitz [2], Andrii Kurkevych [1]
Ukgm, Department Of Obstetrics And Gynecology, Giessen-Germany [1] Ukgm, Department Of Cardiac Surgery, Giessen-Germany [2]

Background / Hypothesis:
This study aims to analyze fetal cardiac dimensions using norm-based Z-scores.

Materials and Methods:
In this retrospective study, echocardiographic data from 30 fetuses with PAIVS (153 examinations) were analyzed. Z-scores were calculated for six cardiac parameters: aortic valve opening (AoVA), left and right ventricular length (LVL, RVL), and mitral, tricuspid, and pulmonary valve openings (MVA, TVA, PVA).

Results:
The mean Z-score for PVA was –3.13 (SD 3.66), with 62.7% of values outside ±2 SD. TVA was also significantly reduced (mean –1.97; SD 3.45); 67.4% were outside the normal range. RVL showed significantly lower Z-scores (mean –2.94; SD 3.36), with 60.4% abnormal values. LVL was less affected (mean –0.53; SD 1.31), with only 17.8% outside the normal range. The mean Z-score for MVA was –0.50 (SD 1.63), while AoVA was in the upper normal range (2.16; SD 1.43).
A comparison between the second and third trimester showed a slowed increase in LVL (mean –0.05 vs. –0.88; $p < 0.001$; $d = 0.73$) and TVA (mean –0.68 vs. –1.95; $p = 0.038$; $d = 0.38$).
Doppler ultrasound revealed no signs of relevant placental insufficiency; values for the umbilical artery, middle cerebral artery, and cerebroplacental ratio were mostly within normal ranges. The mean maximum regurgitation velocity of the TV increased slightly between the second and third trimester (354.8 cm/s vs. 410.9 cm/s; $p = 0.053$; $d = 0.40$).

Conclusions:
As expected, fetuses with PAIVS show significant morphological changes in the RV, reflected in strongly reduced Z-scores for PVA, TVA, and RVL. The slowed LV growth highlights the impact of RV morphology on LV development. The increasing tricuspid regurgitation may indicate preserved RV contractility and warrants further investigation.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1930 - NOVEL USAGE OF MATERNAL HYPEROXYGENATION TO DIAGNOSE FETAL FORAMEN OVALE RESTRICTION

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Baylor College Of Medicine / Texas Children, Cardiology, Houston-United States [1] Texas Children, Cardiology, Houston-United States [2]

Background:
Fetal foramen ovale restriction can present with echocardiographic findings similar to critical congenital heart disease, making accurate prenatal diagnosis challenging. Currently, there are limited adjunct maneuvers to improve the diagnostic yield. We present a case of fetal foramen ovale restriction and demonstrate the potential utility of maternal hyperoxygenation testing as a novel diagnostic aid.

Case Presentation:
A pregnant mother was referred at 37w3d for left heart hypoplasia. Fetal echocardiography revealed mild hypoplasia of the mitral valve, left ventricle and aortic valve, with detectable prograde flow. The atrial septum appeared thickened and aneurysmal with qualitatively reduced right to left flow. The aortic arch was of normal size but filled with retrograde systolic flow, supporting left heart hypoplasia. To better understand left heart size and flow dynamics, maternal hyperoxygenation was performed, administering 100% oxygen at 10 liters per minute via a non-rebreather mask for 10 minutes. Post-hyperoxygenation, the fetal echocardiogram demonstrated increased pulmonary blood flow, neutral position of the atrial septum, increased left heart dimensions, and prograde flow across the arch. These findings strongly suggested restrictive flow through the foramen ovale. The mother was counseled to deliver at a tertiary care center in case of need for congenital heart surgery, but umbilical lines and postnatal prostaglandins were deemed unnecessary. The baby was born at 39w4d with postnatal echocardiogram demonstrating normal anatomy and near normal left heart dimensions. The baby was monitored for coarctation and discharged on day of life 9 with a closed ductus arteriosus and normal arch dimensions.

Conclusions:
Maternal hyperoxygenation has been used in fetal echocardiography for risk stratifying patients with certain congenital heart diseases such as hypoplastic left heart syndrome and transposition of the great arteries. Our case presents a novel application of this diagnostic tool, demonstrating its utility in diagnosing fetal foramen ovale restriction.

POSTER PRESENTATIONS

Category: Foetal Cardiology

1971 - CHANGES IN NEONATAL RISKS OF CONGENITAL ANOMALIES DURING THE COVID 19 PANDEMIC

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Background / Hypothesis:
Although most studies suggest maternal SARS-CoV-2 infection and COVID-19 vaccination are not associated with neonatal congenital anomalies, it is relevant to public health to update knowledge on the disease burden, since other influencing factors of congenital anomalies might have also changed during the COVID-19 pandemic.

Materials and Methods:
Selected congenital anomalies among live-born infants, identified from the U.S. standard certificate of live birth (2003 revision), including anencephaly, meningomyelocele/ spina bifida, cyanotic congenital heart disease (CCHD), congenital diaphragmatic hernia, omphalocele, gastroschisis, limb reduction defect, cleft lip, cleft palate, Down syndrome, chromosomal disorder, and hypospadias.

Results:
A total of 26,345,765 live-born infants in 2016-2022 were included. The overall risk of congenital anomalies peaked in 2018 (3.51‰, 95%CI 3.45-3.57‰) and has since shown a decreasing trend (3.38‰ [3.32-3.44‰] in 2019, and 3.35‰ [3.29-3.41‰] in 2022). Using 2019 as a reference, the risk did not differ in 2020 and 2021 (odds ratio [OR] 1.01 [0.98-1.03] and 1.00 [0.98-1.03], respectively, adjusting for maternal age, ethnicity/race, and socioeconomic status), but it was significantly lower in 2022 (OR 0.97 [0.95-0.99]). For most specific types of congenital anomalies, their risks during the pandemic (2020-2022) remained constant or showed a decreasing trend (i.e., gastroschisis, Down syndrome, and hypospadias) when comparing to 2019. However, CCHD risk has significantly increased since 2019 (59 [57-62] per 100,000) and peaked in 2021 (68 [65-71] per 100,000; OR 1.12 [1.05-1.18]). At general population level, the peak in monthly CCHD risk in 2021 occurred approximately three months after the peak in monthly COVID-19 caused death. These results were consistently observed when stratifying by gestational age (≥37 or <37 weeks).

Conclusions:
In this nationwide population-based study, neonatal risks of congenital anomalies did not worsen during the COVID-19 pandemic, except for an increased CCHD risk, which warrants further investigation and monitoring.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2007 - PRENATALLY DIAGNOSED CONGENITAL HEART DISEASE IN A WESTERN CAPE TERTIARY FACILITY OUTCOMES AND DIAGNOSTIC DISCREPANCY

Damian Smith [1], *Thomas Aldersley* [2], Ayesha Osman [3], John Lawrenson [2], Alison Boutall [3], Liesl Zühlke [2]
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Background / Hypothesis:
Diagnostic discrepancy (DD) measures congruency between pre- and postnatal CHD diagnoses. Accurate prenatal diagnosis informs prenatal counseling, termination, mode and site of delivery, and immediate neonatal management - improving outcomes. We aimed to describe the cohort prevalence of prenatal CHD, outcomes in affected pregnancies and neonates, the DD rate, and associated factors.

Materials and Methods:
A retrospective observational study of structural CHD cases diagnosed at the Groote Schuur Hospital (GSH) Maternal Fetal Medicine Unit (MFMU), WC South Africa, between January 2018 and December 2019.

Results:
Structural CHD was identified in 106/7177(1.4%) pregnancies. Median gestation at presentation was 21 weeks (IQR:19–25 weeks), maternal BMI was 28.1(± 6.8). Predominant CHD-subtypes were AVSDs 27/106(25.5%), septal defects 20/106(18.9%), conotruncal lesions 20/106(18.9%), and LVOTO lesions 11/106(10.4%). Amniocentesis was performed in 43/106(40.6%) cases, with genetic abnormality detected in 23/43(53.5%). There were 62/106(58.5%) live births, with postnatal echo results available in 47/62 cases. The overall diagnostic discrepancy rate was 34%(16/47) and was highest for AVSD's and LVOTO's (both 57.1%) (Table 1).

Conclusions:
The distribution of CHD sub-types in this cohort is consistent with published literature, although with a lower prevalence of conotruncal lesions and a higher prevalence of AVSDs. This likely reflects selective referral patterns, where routine referral of pregnancies with advanced maternal age, may contribute to an over-representation of AVSDs. The discrepancy rate observed is in line with published reports; however, comparisons are limited by varying definitions of DD across studies. The relatively higher discrepancy rates for Septal defects, AVSD's and LVOTO highlight the need for caution when establishing these diagnoses prenatally.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2060 - SIMPLE TRANSPOSITION OF THE GREAT ARTERIES INFLUENCE OF PRENATAL DIAGNOSIS ON POSTNATAL OUTCOME

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Background / Hypothesis:
Simple transposition of the great arteries with an intact ventricular septum (TGA-IVS) has a critical course after birth, especially with restrictive foramen ovale. The aim of this two-center study was to evaluate the impact of prenatal diagnosis on perinatal outcome in TGA-IVS.

Materials and Methods:
All 163 patients with TGA-IVS, diagnosed and treated between 2010 and 2023 at two tertiary referral centers, were divided into 2 groups: I - prenatal (n=71 fetuses) and II – postnatal (n=92 neonates) diagnosed. Postnatal outcome was retrospectively analyzed.

Results:
All neonates with confirmed TGA-IVS were admitted to the cardiac ICU. There was no significant difference in pH (7.28±0.11 vs. 7.29±0.8, p=0.62) and SaO2 (63±19% vs. 62±15%, p=0.19) at admission between the two groups. In the preoperative period, newborns from prenatal group had a significantly shorter ventilation time (0.76±1.33 vs. 1.84±3.00 days, p=0.005) and a lower need for inotropic support (14.1% vs. 30.4%, p=0.016). Balloon atrial septostomy (BAS) in the prenatal group was performed mainly on the first day of life with restrictive foramen ovale in a significantly smaller number of newborns than in the postnatal group (40.8% vs. 60.9%, p=0.012). The average patients' age at the time of arterial switch operation (ASO) (3.5±5.1 vs. 12.9±26.1, p<0.001) and ICU stay (15.2±12.3 vs. 17.7±13.4, p=0.024) were significantly lower in the prenatal group. Preoperative mortality was non-significantly higher in postnatal group (2.2% vs. 1.4%, p=1) as was early postoperative mortality (4.4% vs. 1.4%, p=0.39). Overall survival in the prenatal group was 97.2%, and in the postnatal group – 93.5%.

Conclusions:
Prenatal diagnosis of simple TGA-IVS allows for early BAS in restrictive foramen ovale and reduces the overall need for this procedure due to earlier ASO. Preoperative and postoperative course is easier in the prenatal group with shorter ICU stay and higher survival rate.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2089 - THE ROLE OF AORTIC OUTFLOW (LEFT CARDIAC OUTPUT) IN PREDICTING POST NATAL OUTCOME AMONG FOETUSES WITH TETRALOGY OF FALLOT PHYSIOLOGY

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Background:
Various variables have been reported to predict the post-natal outcomes among fetuses with tetralogy of Fallot (TOF). The role of aortic outflow (left cardiac output, LCO) has not been reported. This study aimed to explore if LCO predicts the postnatal outcomes of fetuses with TOF physiology.

Methods:
Thirty-four foetuses with TOF physiology were retrospectively reviewed. Morphological variables including pulmonary valve annulus (PVA), pulmonary artery (MPA), aortic valve annulus (AVA), and ascending aorta (AsAo) were measured, and z-scores were obtained. Pulmonary valve peak systolic velocity (PV-PSV) was measured. Aortic outflow (LCO) was calculated using the formula: AVA x aortic velocity time integral (AV-VTI) x heart rate, and was indexed (LCOi) to the estimated foetal weight. These measurements at 2nd trimester (t2) were compared to those of 17 control foetuses. Among TOF foetuses, the parameters at 2nd trimester (t2) and 3rd trimester (t3) were compared between dichotomous groups of different post-natal outcomes including prostaglandin E use, shunt operation, and approach during TOF repair (transannular vs annulus-sparing) respectively.

Results:
Compared to control, TOF foetuses have smaller PVA-z, small MPA-z, larger AVA,-z larger AsAo-z, smaller PVA/AVA and MPA/AsAo (all $p<0.001$). PV-PSV, AV-VTI, and LCOi (all $p<0.01$) were significantly greater (table 1). PV-PSV was negatively correlated with LCOi ($r2=0.45$, $p<0.01$).
Seven cases required intravenous prostaglandin E after birth and palliative intervention. They had smaller PVA/AVA at t2, smaller MPA/AsAo at t2 & t3, greater PV-PSV at t3 and greater LCOi at t3.
Twelve cases required transannular patch during TOF repair, and have significantly smaller PVA/AVA, smaller MPA/AsAo, greater AV-VTI at t2 and greater LCOi at t3, when compared to those with annulus-sparing approach.

Conclusion:
Other than conventional parameters, greater aortic outflow was associated with more complicated post-natal course and transannular repair among fetuses with TOF physiology.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2100 - HEN TWO STEPS ARE BETTER THAN ONE IMPACT OF AN ACQUISITION–SUPERVISION MODEL ON THE QUALITY OF FETAL ECHOCARDIOGRAPHY

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Background / Hypothesis:
Fetal echocardiography requires both technical precision and expert interpretation. In high-volume centers, a two-step approach—image acquisition by a trained operator followed by deferred review by a pediatric cardiologist—may enhance quality while optimizing medical time.

Objective :
To assess the impact of a structured two-step model (acquisition by a trained echographer + supervision by a pediatric cardiologist) on the quality of fetal cardiac ultrasound examinations.

Materials and Methods:
A protocol was implemented involving a midwife trained over 6 monts in fetal cardiac imaging. The pediatric cardiologist then reviewed the loops and Doppler tracings, completed the scan in case of difficulty (e.g., ductus venosus, sagittal aortic arch), and provided final interpretation and parental counselling.

Two groups were compared: Group 1 (n=53), exams performed by the pediatric cardiologist alone; and Group 2 (n=47), exams performed using the acquisition–supervision model. All exams were blindly reviewed by an independent expert using a standardized evaluation grid, yielding a global quality score. Univariate and multivariate analyses were performed.

Results:
The global quality score was significantly higher in Group 2 (133 ± 26.4) compared to Group 1 (89.8 ± 27.5; $p<0.001$), including in cases with congenital heart defects ($p<0.001$). View-by-view analysis revealed better completeness in Group 2, especially for complex planes such as the three-vessel tracheal view, ductus venosus, umbilical arteries, and transverse arches. No maternal factor (BMI, diabetes, multiple pregnancy) was significantly associated with the score. The presence of a congenital heart defect tended to be associated with lower scores in Group 2 ($p=0.055$).

Conclusions:
A structured two-step model involving standardized acquisition by a trained operator followed by pediatric cardiologist supervision improves the quality of fetal echocardiography. This approach enhances efficiency, supports operator training, optimizes medical time for counselling, and ensures high-quality data for research.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2107 - EFFICACY AND SAFETY OF FETAL MAGNETOCARDIOGRAPHY IN DETECTING FETAL CARDIAC ELECTROMAGNETIC SIGNALS A MULTI CENTER SELF CONTROLLED SUPERIORITY DESIGNED CLINICAL TRIAL (FAMILY)

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Background / Hypothesis:
Fetal arrhythmias are a significant cause of fetal morbidity and mortality, highlighting the need for accurate and timely diagnosis. Fetal magnetocardiography (fMCG) has emerged as a promising non-invasive technique capable of precisely measuring fetal cardiac time intervals (RR, P, PR, QRS, T, QT and QTc), which are essential for detecting rhythm disorders. This study aimed to evaluate the efficacy and safety of fMCG in detecting fetal cardiac electromagnetic signals.

Materials and Methods:
FAMILY was a multi-center, self-controlled, superiority-designed trial that enrolled 342 pregnant women aged 18 years or older, with gestational ages exceeding 18 weeks. Each participant underwent both fetal electrocardiography (fECG) and fMCG examinations. The primary outcome was the detection rate of fetal cardiac electromagnetic signals, including the detection rates of specific cardiac time intervals.

Results:
In the full analysis set (n = 342), the fMCG device demonstrated a significantly higher detection success rate compared to the fECG device (88.0% vs. 78.9%, p = 0.002). The rate difference was 9.03% (95% CI: 3.50%-14.56%), confirming the superiority of fMCG. In the per-protocol set (n = 340), fMCG continued to outperform fECG (87.9% vs. 79.4%, p = 0.003), with a rate difference of 8.53% (95% CI: 3.01%-14.05%). Analysis of fetal cardiac time intervals showed that fMCG had higher success rates for key features, including RR interval (88.0% vs. 78.9%, p = 0.002), QRS complex (88.0% vs. 78.9%, p = 0.002), PR interval (87.7% vs. 0%) and QTc interval (79.8% vs. 0%). Safety outcomes in the safety set (n = 342) showed a low incidence of adverse events (n = 3, 0.9%), all unrelated to the device.

Conclusions:
The FAMILY trial demonstrated that fMCG was superior to fECG in detecting fetal cardiac electromagnetic signals. Furthermore, fMCG exhibited a favorable safety profile, supporting its potential as a reliable and promising tool for fetal cardiac monitoring.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2128 - ANTENATAL ASSESSMENT OF DIFFERENT TYPES OF DUCTUS ARTERIOSUS AND THEIR LINK TO CONGENITAL HEART DISEASE AND GENETIC ANOMALIES.

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Background / Hypothesis:
This study examines various types of ductus arteriosus (DA) and their links to congenital heart disease (CHD) and genetic anomalies.

Materials and Methods:
This retrospective study, conducted from October 2019 to March 2025, included fetuses (18 weeks to term) diagnosed with different types of aortic arch and DA abnormalities. Its associations with CHD and genetic anomalies were studied. Fetuses having LAA and usual left ipsilateral DA were excluded.

Results:
This study found 31 cases with abnormal DA morphology in relation to the sidedness of the aortic arch. RAA with left posterior DA/mirror image branching in 12 (3/12 had DiGeorge syndrome), left posterior DA/aberrant left subclavian artery in 10 (1/10 had DiGeorge syndrome; 1/10 had critical pulmonary stenosis), left anterior DA in 3 (All had DiGeorge syndrome/ TOF pulmonary atresia), right ipsilateral DA in 1(Downs syndrome/TOF) and bilateral DA(Right ipsilateral DA and left anterior DA-ductal origin of left pulmonary artery) in 1. LAA with right posterior DA in 2 (All had complex CHD), bilateral DA (Left ipsilateral DA and right anterior DA- ductal origin of right pulmonary artery) in 1 and anomalous left DA insertion in 1(DiGeorge syndrome). RAA (9/27-Genetic; 6/27-CHD) LAA (1/4 had genetic and 4/4 CHD). Postnatal outcomes: 18/27 RAA cases (16 had asymptomatic vascular ring, 1 required ductal stenting for pulmonary atresia; 1 TOF pulmonary atresia had tracheal stenosis and expired) and 1/4 LAA cases (Ductal stenting followed by surgical preimplantation of right pulmonary artery) were delivered. 9/21 RAA cases who underwent invasive genetic testing had genetic anomalies (8-DiGeorge and 1-Trisomy 21).

Conclusions:
Abnormal Abnormal DA morphology in both RAA and LAA were associated with CHD and genetic anomalies. In our cohort RAA or LAA forming complete vascular ring is also associated with complex congenital heart disease but less frequent when compared to RAA not forming a vascular ring.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2169 - LONGITUDINAL ECHOCARDIOGRAPHIC ASSESSMENT OF FETUSES WITH TRANSPOSITION OF THE GREAT ARTERIES – NOVEL HEMODYNAMIC OBSERVATIONS AND PREDICTION OF NEONATAL CONDITION

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Background / Hypothesis:
Transposition of the great arteries (TGA) significantly impacts prenatal cardiovascular physiology due to increased oxygenation in the pulmonary circulation. Longitudinal assessment of TGA fetuses may allow for better understanding of hemodynamic changes and more effective prediction of neonatal condition.

Materials and Methods:
Fetuses diagnosed with simple TGA (including small VSD) in a single tertiary center between 2018-2022 were prospectively followed with echocardiography until delivery. Cardiac evaluation included detailed foramen ovale (FO) morphology and flow assessment, and hemodynamic calculations (ventricular outputs, aortic, pulmonary and ductus arteriosus (DA) flows). Selected parameters were compared in patients depending on their need for urgent balloon atrial septostomy (BAS) and symptoms of persistent pulmonary hypertension (PPHN) after birth.

Results:
293 studies were performed in 60 fetuses with TGA (16 TGA-VSD) aged 18-40 weeks. Signs of decreased pulmonary resistance (bidirectional FO and/or DA flows) were common already in the second trimester (earlier in BAS group), other hemodynamic changes included: reduced diameter and flow through the DA, increased total cardiac output and LV output. Progressive limitation of FO flow was observed in the majority of TGA fetuses, therefore BAS prediction was the most reliable at 38 weeks, and the best predictors were: FO/IAS <0.4 or atrial septal excursion <0.38, "fixed septum" morphology and subjective impression of absent FO flow. MCA and pulmonary veins assessment had additional predictive role. Proposed algorithm for BAS prediction was more effective than previous subjective methods (sensitivity 88% vs. 86%, specificity 93% vs. 82%). PPHN may be related to decreased vasoreactivity in late pregnancy, however the best predictor was significant DA restriction. Spontaneous, dynamic changes in pulmonary resistance may occur in fetuses with TGA, yet of unknown clinical importance.

Conclusions:
TGA prenatal physiology is complex and highly dynamic, both in short- and long-term. Effective BAS prediction requires detailed, late-pregnancy assessment of FO morphology and flow by experienced clinician.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2176 - SUPEROINFERIOR VENTRICLES WITH SUPERIOR LV AORTA FROM RIGHT VENTRICLE AND PULMONARY ATRESIA PRENATAL DIAGNOSIS AND MORPHOGENETIC INSIGHTS

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Background / Hypothesis:
Superoinferior ventricles, being rare, is a marked by vertical ventricular alignment often accompanied by outflow tract malformations. Historically, most cases exhibited superior right ventricle (RV) and inferior left ventricle (LV) both prenatally and postnatally. We report the first prenatally diagnosed superoinferior ventricles with a superior LV and inferior RV, and proposed the morphogenetic mechanism.

Materials and Methods:
Case report

Results:
A 29-year-old woman was referred at 22 weeks' gestation for suspected truncus arteriosus. Fetal echocardiography revealed situs solitus with superoinferior ventricles (LV superior to RV), a horizontal septum, aortic origin from the RV, pulmonary atresia, hypoplastic pulmonary arteries, a ventricular septal defect (VSD), right aortic arch and a persistent left superior vena cava. The infant was delivered at 38 weeks and 4 days via emergency cesarean section following failed labor induction. Examination revealed cyanosis with oxygen saturation of 88% in room air and he was started on prostaglandin E2 (PGE2). Postnatal echocardiography confirmed the diagnosis, showing situs solitus, superoinferior ventricles with atrioventricular concordance (morphological LV superior and RV inferior), aorta arising from the RV with valvular stenosis, pulmonary atresia, and a tortuous patent ductus arteriosus supplying confluent but hypoplastic pulmonary arteries. Computed tomography corroborated these findings and additionally showed a superoinferior atrial arrangement with left atrium being superoposterior to the right atrium. A central aortopulmonary shunt was successfully performed, stabilizing oxygen saturation at 85%. The infant remains under surveillance for staged surgical palliation.

Conclusions:
This case highlights the pivotal role of detailed fetal echocardiography in diagnosing cardiac malformation with complex ventricular alignment and facilitating timely postnatal interventions. Furthermore, combining with post-natal imaging, our case may be due to two morphogenetic mechanisms: (1) counterclockwise rotation of ventricular septum resulting in superoinferior ventricular alignment, and (2) hemodynamic disruptions caused by abnormal ventricular alignment together with VSD contributing to abnormal outflow development.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2182 - THE LANDSCAPE OF EARLY FETAL ECHOCARDIOGRAPHY IN THE CURRENT ERA

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Background / Hypothesis:
Traditionally, fetal echocardiography is offered between 18-22 weeks gestation. With the development of high-frequency transducers and experience, there has been increasing interest in diagnosing cardiac disease earlier in gestation. The aim of this study was to survey the practices of fetal cardiologists with respect to early fetal echocardiography (EFE), performed at <16 weeks, and identify institutional barriers to establishing such programs.

Materials and Methods:
The survey was conducted using REDCap and distributed through the Fetal Heart Society and PediHeart membership databases, both widely used platforms for fetal cardiologists. Answers were compiled and displayed as percentages. No identifying data was collected to protect the privacy of respondents.

Results:
There were 77 participants in the survey. Of respondents, 32(41.6%) lived in a state that either had banned or was considering banning pregnancy termination. Of those respondents in locations where termination was permitted, 10/67(15%) had a gestational age cutoff permitting termination <6 weeks, 14/67(21)% between 6-23 weeks, 34/67(51%) at 24 weeks exactly, and (9/67)13% had a cutoff of >24 weeks or no gestational age cutoff. Thirty-nine(51%) respondents offered EFE at their centers. Only 2 centers routinely offered EFE prior to 12 weeks gestation with the majority(56%) offering routine EFE from 14 weeks gestation on. The components of the echocardiogram showed some variation between institutions(Table 1) and indications for which providers would perform EFE differed from standard fetal echo(Table 2). Ten(26%) respondents offered trans-vaginal scanning whereas the majority(74%) offered trans-abdominal only. Later gestational age at referral, lack of trained personnel or technology, and concerns about accuracy and utility were the primary reasons provided for not offering EFE.

Conclusions:
The performance of EFE is still not routine, particularly at a gestational age of less than 14 weeks. Lack of early referrals, trained personnel and technology as well as concerns regarding accuracy and utility represent barriers to incorporating EFE

POSTER PRESENTATIONS

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2210 - ANTENATALLY DIAGNOSED RIGHT PULMONARY ARTERY TO LEFT ATRIUM FISTULA A CASE SERIES AND REVIEW OF LITERATURE

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Background:
Right pulmonary artery to left atrium (RPA-to-LA) fistula is a rare form of congenital heart disease with approximately 100 reported cases worldwide. Most cases are diagnosed postnatally, and antenatal predictors of outcome are unknown.

Materials/methods:
Case series of two antenatally diagnosed RPA-to-LA fistula and literature review of the eight previously reported cases.

Results:
Fetal echocardiography in case 1 (diagnosed at 18/40) demonstrated cardiomegaly, normal systolic function, normal umbilical arterial/venous Dopplers and no evidence of hydrops fetalis. Term delivery was uncomplicated, with initial oxygen saturations of 88-92%, increasing to 96% at one-month-old. The fistula was surgically ligated without cardiopulmonary bypass at 6-weeks-old. One-month post-surgery, they were clinically well, with normal oxygen saturations, no residual fistula and unobstructed pulmonary venous drainage.

Case 2 (diagnosed at 35/40) had normal umbilical artery Dopplers and no evidence of hydrops fetalis. Whilst stable initially, gradual oxygen desaturation to 75% necessitated surgical ligation at 7-days-old. Follow-up for 15 years demonstrated no pulmonary venous/arterial abnormalities.
Literature review identified a further eight cases of antenatally diagnosed RPA-to-LA fistula; two underwent termination of pregnancy. Four received urgent intervention (<48-hours-old) due to desaturation (n=3) or planned exit procedure (n=1). One required surgical intervention at 25-days-old due to cardiac failure. Another had spontaneous closure by 15-months-old. No consistent fetal predictors of early postnatal deterioration were found. In one case of early deterioration, fetal mitral and tricuspid valve regurgitation, absence of umbilical artery end-diastolic flow, abnormal ductus venosus flow and reversed ductus arteriosus flow occurred.

Conclusions:
Antenatal counselling for RPA-to-LA fistula is challenging due to limited literature and variability in outcomes. Our two cases demonstrated absence of cardiac dysfunction, atrioventricular valve regurgitation or abnormal umbilical artery/umbilical vein/ductus venosus Doppler assessments, which we associated with initial stability and good outcomes. Ongoing study of this rare presentation is required to identify better predictive markers.

POSTER PRESENTATIONS

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2217 - MATERNAL OZONE EXPOSURE DISRUPTS FETAL HEART DEVELOPMENT VIA MITOCHONDRIAL DYSFUNCTION AND ERK1 2 SIGNALING INHIBITION

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Background:
Epidemiological studies have suggested that prenatal exposure to ozone is significantly associated with an increased risk of congenital heart disease (CHD) in offspring. However, direct experimental evidence from animal models is limited, and the underlying molecular mechanisms remain to be elucidated.

Methods:
A murine model of prenatal ozone exposure was established by exposing pregnant C57BL/6J mice to 2.0 ppm ozone daily from embryonic day 0.5 to 18.5. Cardiac morphology and structural changes in the offspring were evaluated through histopathological staining. Mitochondrial ultrastructure and function were assessed using transmission electron microscopy and energy metabolism assays. Transcriptomic profiling, ELISA, quantitative PCR (qPCR), and Western blotting were employed to examine the expression of relevant genes and key molecular markers.

Results:
Ozone exposure significantly suppressed maternal weight gain during pregnancy, reduced placental efficiency, increased embryo resorption rates, and led to fetal growth restriction. Histological analysis revealed 4 atrial septal defects (ASD) and 9 ventricular septal defects (VSD) in the ozone group (n = 56), compared to 1 VSD and no ASD in the filtered air group (n = 31). Additionally, these fetuses showed an increased non-compacted to compacted myocardium ratio and reduced cardiomyocyte proliferation. Further investigations showed a reduced number of mitochondria in cardiac tissue, accompanied by swelling, disrupted cristae, and blurred sarcomere structures, along with diminished ATP production. Moreover, oxidative stress was evident, as indicated by elevated levels of reactive oxygen species (ROS), decreased antioxidant enzyme activity, and increased lipid peroxidation. At the molecular level, ERK1/2 phosphorylation in cardiac tissue was markedly inhibited, and the expression of cell cycle regulators (p27 and Cyclin D1) and mitochondrial apoptosis-related proteins (Bax and Bcl-2) was significantly altered.

Conclusions:
This murine study suggests a correlation between maternal ozone exposure and CHD in offspring. Mitochondrial oxidative stress and suppression of ERK1/2 suppression represent critical mechanisms of ozone-induced fetal cardiac impairment.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2320 - FETAL CARDIAC RHABDOMYOMAS PRENATAL DIAGNOSIS PHARMACOLOGIC MANAGEMENT WITH SIROLIMUS AND LONGITUDINAL FOLLOW UP – A CASE REPORT

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Introduction:
Cardiac rhabdomyomas are the most frequent primary cardiac tumors in fetuses and are strongly associated with tuberous sclerosis complex (TSC). While often benign and self-limiting, large or multiple lesions may lead to arrhythmias or ventricular outflow obstruction. mTOR inhibitors like sirolimus have shown benefit in selected cases.

Case Presentation:
A 31-year-old primigravida was referred at 28+6 weeks' gestation after fetal echocardiography (Figure 1) revealed two large intracardiac masses, suggestive of rhabdomyomas: 30×20 mm in the left ventricle (LV) and 14×11 mm in the right ventricle (RV), with preserved function and no outflow obstruction. At 36+5 weeks, the masses had enlarged, with mild pericardial effusion and isolated supraventricular ectopy.

Due to risk of left ventricular outflow obstruction and arrhythmia progression, maternal sirolimus was initiated. The infant was delivered at 38 weeks, stable, but with multiple ventricular tumors and persistent arrhythmias. Postnatal echocardiography and CT (Figure 2) confirmed tumor burden, including a 32.7 mm lesion in the LV encasing >50% of the right coronary artery, without luminal narrowing. Neonatal sirolimus (0.2 mg/kg/day) was started, alongside amiodarone and later metoprolol, with improvement in rhythm and tumor regression.
Neurological MRI confirmed subependymal nodules suggestive of TSC. The infant remained stable and was discharged for multidisciplinary follow-up.

Conclusion:
This case highlights the importance of early fetal diagnosis of cardiac rhabdomyomas and the potential role of sirolimus in reducing tumor size and managing arrhythmias. Integration of prenatal and postnatal imaging with targeted therapy enabled successful clinical stabilization and long-term planning in a high-risk setting.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2321 - VARIED ETIOLOGY OF RESTRICTION OF INTRAUTERINE DUCTAL ARTERIOSUS OUR EXPERIENCE OF 10 FETUSES

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Background / Hypothesis:
Ductus arteriosus (DA) is a normal and essential structure in fetal circulation. As the lungs are nonfunctioning, most of the right ventricle(RV) output is carried through DA to the descending aorta. DA patency is actively maintained by factors such as prostaglandin E2, endothelial nitric oxide synthase, and low oxygen tension of the blood. Restriction of DA leads to acute pressure load over the RV and causes fetal cardiac failure.Reported causes of ductal restriction are related to maternal use of medications like NSAIDS and other substances like fluoxetine and even polyphenol-rich foods. However, in some cases, no culprit could be identified. Symptoms of ductal restriction may vary from critical symptoms such as fetal hydrops to mild symptoms and this depends upon severity and rapidity of ductal restriction.

Materials and Methods:
Analysis of fetal echocardiogram done at a tertiary care centre diagnosed with restriction of DA. Over 3 years (March 2022- March 2025), total of 3150 fetal echocardiography were done and ductal restriction was noted in 10 fetuses .

Results:
Table 1 presents various factors found as culprits for ductal restriction, interventions done, and outcomes.
Gestational age was 27-38 weeks, and the commonest reason for referral was tricuspid regurgitation and dilated right heart on routine antenatal USG scan

Conclusions:
DA restriction is a known and serious cause of fetal cardiac failure. DA velocity should be checked in all fetal cardiac scan.If there is unexplained dilatation of the right heart or tricuspid regurgitation ,it is imperative to rule out DA restriction.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2331 - THE IMPORTANCE ROLE OF PRENATALLY ECHOCARDIOGRAPHY FOR SUCCESAFULLY SURGICAL MANAGEMENT OF DEXTROCARDIA WITH LARGE VENTRICULAR SEPTAL DEFECT AND PATENT DUCTUS ARTERIOSUS

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Background / Hypothesis:
Prenatally diagnostic has an important role in complex congenital heart disease (CHD). Fetal echocardiography could achieve around 80% accuracy for particular CHD. Planning and parent counselling are beneficial to succesfully management of staged repair of complex CHD

Materials and Methods:
A 26-year old women of 32 gestational week reffered to a tertiary level hospital with fetal heart anomaly. The prenatally diagnosis was dextrocardia. Mirror image, moderate sexundum atrial septal defect, large perimembranous ventricular septal defect and right aortic arch. We gave a comperhensif information to parent about the complexity of CHD and a plan of intervention of the baby. Unremarkable delivery of a baby boy with 2848 gram wieght and 45 cwntimeter length. The Apgar score was 9 and 10, then send to NICU for stabilization. The baby was discharged at 5 day old after parental education of home care and warning signs. His weight was 2805 gram and physical examination revealed mild cyanosis of 87 until 90 % Oxygen saturation. Post natally echocardiography result was the same with fetal echocardiography. Additional diagnosis was large ductus arteriosus. We gave diuretic, spironolactne and ace inhibitor.

Results:
The pulmonary artery banding and pda ligation performed at 2 month an 3 week old. During hospitalization, the chest physiotherapy was needed due to thick mucous that causw upper lobe lung atelectsis. After antibiotics administration using cefoperazone sulbactam, continue to carbapenem, the lung problem resolved. Baby discharged after day 16 of surgical procedure.

Conclusions:
An integrated management of complex CHD since prenatal was the key of successfully neonatal outcome. Plan for palliative surgery has planned and parental counselling were beneficial gor a better management of complex CHD.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2361 - LARGE FETAL CARDIAC RHABDOMYOMAS IN TUBEROUS SCLEROSIS COMPLEX AN EFFECTIVE FETAL THERAPEUTIC OPTION WITH EVEROLIMUS

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Background / Hypothesis:
Tuberous Sclerosis Complex (TSC) is a genetic disorder characterized by benign tumor growth in a number of organ systems, primarily in the brain, the kidneys and the heart. Other sites of manifestations are skin, liver and lung. Cardiac rhabdomyomas are frequently diagnosed in the fetus as the first organ involvement. The underlying cause is an abnormal cell proliferation and differentiation due to the tuberous sclerosis complex. This complex can be influenced by mTOR Inhibitors.

Materials and Methods and Results::
A primigravida presented at GW 32 with a large cardiac rhabdomyoma in the left ventricle (LV) and the septum, in addition there were multiple small tumors in the left ventricle. Biventricular function was drastically reduced and there was apical pericardial effusion.
A fetal MRI was performed on the next day and revealed the typical features for tuberous sclerosis complex. Due to the severity of the cardiac findings treatment with Everolimus was started. After a few weeks time cardiac function improved and treatment led to a significant and progressive reduction in the cardiac mass volume. There were no significant maternal side effects noted. A week before planned delivery Everolimus was paused. A boy was delivered at term with a cesearian section. Postnatally a genetic test revealed TSC Complex II. In the initial postnatal period no arrhythmias or seizures occurred, nor did the patient have any skin involvement typically for TSC. Everolimus treatment was started again on day 1. Over the course of the first months cardiac rhabdomyomas regressed again.

Conclusions:
mTOR inhibitors such as Everolimus can be effectively used in the fetus to reduce huge cardiac rhabdomyomas. A long lasting therapy according to the postnatal guidelines is necessary.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2388 - MATERNAL AND FETAL RISK FACTORS FOR COMPLETE ATRIO VENTRICULAR BLOCK AN INDONESIA TERTIARY HOSPITAL BASED STUDY

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Background / Hypothesis:
Association between CHD with maternal and risk factors has been well recognized. Little is known these risk factors' correlation with fetal and neonate complete AV block (CAVB) especially in Indonesia as a low-middle outcome country. This study was conducted to analyzed CAVB with maternal, fetal and neonatal risk factors.

Materials and Methods:
A retrospective cohort study was conducted among pregnant women referred to paediatric cardiology clinic from January 2013 to January 2025. Demographic, maternal risk factors, fetal extracardiac anomalies, and neonatal outcomes were evaluated from March 2024 to January 2025. Bivariate and multivariate logistic regression analyses were performed using IBM SPSS version 20 to identify independent risk factors, with odds ratio (ORs) and 95% confidence interval (CI)s reported. Statistical significant was set at $p<0.05$.

Results:
A total of 350 pregnant women aged 18 to 45 years, gestation age 20–40 weeks and 361 fetuses were included. Fetal and thoracic echocardiography revealed CHD in 242 (67%) fetuses, while 119 (33%) had normal findings. Maternal risk factors were identified in 119 cases (33%) and fetal extracardiac anomalies were observed in 64 (17.7%) cases. Significant risk factors for CAVB included grand multiparity (OR 4.32 95% CI 1.12–16.69 ; p=0.02), maternal autoimmune disease (OR 26.75; 95% CI 4.2–170.31; p=0.01), hypothyroid albuminemia (OR 5.56; 95% CI 1.05–29.42; p=0.02), dysmorphic and genetic (OR 6.73; 95% CI 1,21-18.46; p=0.01) and low birth weight (OR 6.82 95% CI 2.72–17.12; p=0.01). Multivariate analysis demonstrated that maternal autoimmune disease, hypothyroid and low birth weight were significantly associated with CAVB

Conclusions:
Among risks factors, maternal autoimmune disease, hypothyroid and neonatal low birth weight were independently associated with CHD. These findings underscore the importance of early risk stratification, enabling timely interventions and prevention to reduce its incidence and neonatal mortality.

POSTER PRESENTATIONS

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2418 - DEVELOPING AN INTERVENTION TO SUPPORT PARENTAL WELLBEING FOLLOWING A FETAL CONGENITAL HEART DISEASE DIAGNOSIS

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Background / Hypothesis:
An antenatal diagnosis of congenital heart disease (CHD) can cause emotional distress for expectant parents, including anxiety, depression, and feelings of helplessness (Mangin-Heimos et al., 2023). These experiences impact not only parental mental health, but also early bonding and fetal neurodevelopment (Wu et al., 2020). Despite growing recognition of the importance of psychological support in fetal cardiology, antenatal interventions remain limited. This research aimed to inform the development of a support intervention during pregnancy following a CHD diagnosis.

Materials and Methods:
This research used a multi-phase design. Phase 1 involved reflexive thematic analysis of qualitative interviews with parents (n=14) and health professionals (n=10). Phase 2 was a scoping review (n=12 studies) examining antenatal interventions for any fetal abnormality to identify transferable components. Phase 3 was a Delphi study using the RAND/UCLA Appropriateness Method (Fitch et al., 2001) with parents and international multidisciplinary experts (Round 1: n=39) to assess the importance and feasibility of proposed intervention components.

Results:
Parents described uncertainty, cumulative losses, and challenges in coping and adjustment. Psychological safety was identified as a critical need, with participants emphasising the importance of emotional support during pregnancy. Health professionals echoed the importance of psychological safety in antenatal care, noting gendered and cultural variations in coping, and socioeconomic barriers to equitable support. The scoping review identified promising components, including psychological frameworks for emotional support, and emphasised flexible delivery and multidisciplinary collaboration. The Delphi study showed strong support for proposed intervention content, with mixed views around delivery format and setting. Findings across phases informed the co-design of a novel intervention model.

Conclusions:
This research highlights the need for psychological support following fetal CHD diagnosis and lays the groundwork for a co-designed, evidence-informed antenatal intervention. Integrating such support into fetal cardiology services could improve outcomes for both parents and infants.

POSTER PRESENTATIONS

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2425 - A CASE OF FETAL JUNCTIONAL ECTOPIC TACHYCARDIA DIAGNOSED WITH THE AID OF FETAL ELECTROCARDIOGRAPHY

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Junctional ectopic tachycardia (JET) is one of the rarest forms of fetal tachycardia. With slow rate of tachycardia, it is difficult to distinguish the other type of tachycardia such as slow ventricular tachycardia (VT). Fetal electrocardiography (fECG) is helpful to evaluate these arrythmia.

Case:
A 27-year-old woman, G2P1, conceived naturally. Her first child was diagnosed with a duplication of the long arm of chromosome 16. At 20 weeks of gestation, fetal screening revealed tetralogy of Fallot (TOF) with mild pulmonary stenosis (PS). At a prenatal check-up at 25+3 weeks, fetal tachycardia was noted with a fetal heart rate (FHR) of 178 bpm, prompting further evaluation. Although 1:1 atrioventricular conduction was observed, SVC/Ao Doppler demonstrated started near-simultaneous atrial and ventricular contractions. Venous waveforms of the ductus venosus and inferior vena cava showed prominent A-wave reversal. The cardiothoracic area ratio was 34%, and although no tricuspid regurgitation (TR) was seen at that time, decreased cardiac contractility was evident. Based on these findings, JET and slow VT were considered as differential diagnoses. The following day, the FHR decreased to 150 bpm, consistent with sinus rhythm, although TR was worsened. On 25+5 weeks, the fetus developed recurrent tachycardia, which was intermittent. Fetal ECG showed narrow QRS complexes followed by P waves (Fig.), which led to suspicion of JET. Since cardiac function remained stable without progression, the condition was managed expectantly. Within approximately one week, the rhythm spontaneously returned to sinus rhythm. At 39 weeks, a vaginal delivery was achieved the same day. A male infant weighing 3242g was born with Apgar scores of 8 and 9, umbilical artery pH of 7.392, and a stable heart rate of 130–140 bpm. No recurrence of tachycardia was observed postnatally.

Conclusion: fECG is a potential useful tool to evaluate fetal arrythmia.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2441 - PRENATAL DETECTION OF RIGHT PULMONARY ARTERY TO LEFT ATRIUM COMMUNICATION– FIRST EVER LARGE CASE SERIES OF THIS RARE CONGENITAL VASCULAR MALFORMATION

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Background:
Congenital RPA-LA communication is a rare anomaly with very few prenatally reported cases. Paucity of data makes it difficult to diagnose and counsel prospective parents. Our case series of 7 patients is the largest reported in literature and aims to describe antenatal ultrasound features and outcomes of RPA-LA communication and identify features associated with a favorable postnatal outcome.

Methods:
Retrospective analysis of records, ultrasound images and autopsy or postnatal findings. Outcome data was collected by telephonic interview after obtaining consent.

Results:
Out of the 7 patients, majority(5) were detected in the second trimester and 2 in the third trimester. Ultrasound features included cardiomegaly(7/7) with left atrium showing a saccular posterior extension(5/7), left axis deviation(4/7), dilated main(6/7) and right pulmonary artery(7/7) with color doppler demonstrating a mosaic high velocity jet(>170 m/s) from the right pulmonary artery communicating to the left atrium(7/7). Marked pulmonary hypoplasia was appreciated in 2/7 cases.
All families were counselled and offered pediatric cardiology consultation. 4 patients underwent termination of pregnancy, of which one fetus underwent autopsy which confirmed our prenatal findings. 1 fetus suffered IUFD at 36 weeks and 2 fetuses resulted in livebirths at term with an uneventful postnatal course. On follow up, the 2 livebirths are doing well, one underwent percutaneous device closure at 4 years and the other is on regular follow up. It is of interest to note that these two fetuses had only mild cardiomegaly and did not show sustained flow reversal in the ductus.

Conclusion:
Postnatal course of congenital RPA-LA communication can vary from asymptomatic to severely hypoxic neonates with cardiac failure requiring urgent intervention. In our series, two cases who had excellent outcomes had only mild cardiomegaly with no flow reversal in ductus. Careful antenatal planning is required to optimize delivery conditions and to ensure good postnatal outcomes.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2450 - PREDICTORS OF SUCCESSFUL CLOSURE OF HEMODYNAMICALLY SIGNIFICANT PATENT DUCTUS ARTERIOSUS (HSPDA) WITH IBUPROFEN AMONG NEONATES IN A TERTIARY HOSPITAL FROM 2018 2023 A RETROSPECTIVE COHORT

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Background / Hypothesis:
Patent ductus arteriosus is common in preterm neonates, but rare in term. The current first line treatment for PDA closure is standard-dose ibuprofen regimen, with overall response rate that varies among different neonatal age groups. This study aims to determine the predictors of successful PDA closure in neonates with HsPDA after ibuprofen treatment.

Materials and Methods:
This is a retrospective cohort study covering a 6-year chart review to identify and evaluate the demographic, clinical and echocardiographic characteristics of 49 neonates with HsPDA who received 2-cycle oral standard-dose ibuprofen regimen given for six consecutive days, with a repeat 2D echocardiogram post-treatment. Chi-square test was used to test relationship for categorical variables, while correlation was used to test relationship for continuous variables. A Binomial Logistic Regression was used to test the significant predictors and to calculate the Odds Ratio.

Results:
This study retrospectively reviewed 49 neonates with HsPDA who received 2-cycle oral standard-dose ibuprofen regimen. Among the different demographic, clinical, and echocardiographic variables, only the birthweight and the PDA size are associated with PDA closure after oral ibuprofen treatment. Specifically, a higher birthweight and a smaller PDA size of < 2 mm are significantly associated with PDA closure.

Conclusions:
Based on this study, PDA size of < 2 mm is the only significant predictor of ductal closure among neonates with HsPDA who received a 2-cycle oral standard-dose ibuprofen regimen.

POSTER PRESENTATIONS

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2464 - AN UNUSUAL CAUSE OF DILATED CORONARY SINUS IN A FOETUS ILLUSTRATED BY STIC IMAGE CASE REPORT AND LITERATURE REVIEW

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Introduction:
Dilated coronary sinus (CS) of the foetus detected by antenatal ultrasound is usually due to persistent left superior vena cava draining to the coronary sinus. Less common cause is intracardiac anomalous pulmonary venous drainage (APVD). We reported a rare cause of dilated coronary sinus, and presented the findings of the literature review.

Case description:
A 36-years old gravida 1 was referred for suspected APVD to dilated CS in the foetus detected by mid-gestation anomaly scan. This was a spontaneous pregnancy from a non-consanguineous couple. Non-invasive prenatal screening showed low risk. There was no other structural anomaly.
Foetal echocardiogram performed at gestational age of 23week 2days showed normal intra-cardiac anatomy except the dilated CS. There was no persistent left superior vena cava and the pulmonary veinous drainage was normal. There was no significant tricuspid regurgitation and the ventricular function was normal.
Colour Doppler echocardiography showed unusual flow signal within the coronary sinus on transverse view. On parasagittal view, umbilical vein draining to ductus venosus which appeared draining directly to the coronary sinus instead of the hepatic segment of inferior vena cava. The anatomy of the aberrant ductus venosus draining to coronary sinus was reconstructed with STIC technique.

Literature review
Twenty-four cases were identified since 2014. Our case was diagnosed at the earliest gestation age among the series. All cases showed dilated coronary sinus, absence of persistent left superior vena cava, and normal pulmonary venous drainage. One case was found to have tetralogy of Fallot, 3 showed aortic arch anomalies. All showed no extra-cardiac anomalies. All have unremarkable antenatal course. There was no problem reported in postnatal period up to 7 weeks of life.

Conclusion:
Aberrant ductus venosus drainage into coronary sinus is a rare benign cause of dilated coronary sinus. While other congenital heart defects may be concomitantly present, but is usually not associated with extra-cardiac anomalies.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2476 - PRENATAL CARDIOVASCULAR ASSESSMENT BY FETAL CARDIAC MAGNETIC RESONANCE IMAGING USING DOPPLER ULTRASOUND GATING A PRELIMINARY STUDY

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Background / Hypothesis:
Fetal cardiac magnetic resonance imaging (CMR) using doppler ultrasound (DUS) gating was supposed to be beneficial to the assessment of fetal cardiovascular structure and function.

Materials and Methods:
A prospective analysis was performed on 41 fetuses who underwent fetal CMR using DUS gating from November 2023 to May 2024. B-SSFP sequences using DUS gating were employed to obtain cine images (figure 1) of fetal heart in axial, coronal, sagittal, two-chamber, four-chamber, short-axis, and three-chamber views. Cardiovascular structure of the 41 fetuses were assessed based on DUS-gated b-SSFP cine sequences and conventional SSh-TSE sequences. Diameters of the great vessels and LV volumes and function were quantitatively evaluated in 32 fetuses without lesions affecting cardiovascular development based on cine sequences. Comparison was performed using t-tests or Mann-Whitney tests, and correlation was analyzed using Pearson or Spearman correlation.

Results:
Among the 41 fetuses (16 in mid-pregnancy and 25 in late-pregnancy, table 1), fetal CMR revealed cardiovascular abnormalities in 9 fetuses (7 with CHD, 1 with multiple malformations including ventricular septal defect, and 1 with cardiac rhabdomyoma associated with cerebral tuberous sclerosis). End-diastolic and systolic diameters of the ascending aorta, descending aorta, main pulmonary artery, and arterial duct, as well as LV end-diastolic and systolic volume, stroke volume, and myocardial mass, were all significantly smaller in mid-pregnancy compared to late pregnancy (all $p<0.05$, table 2 and 3), while there was no significant difference in LV ejection fraction (EF). LV volume, stroke volume, myocardial mass, and the diameters of the great vessels all showed positive correlations with gestational age($p<0.05$, table 4).

Conclusions:
DUS-gating facilitates the use of fetal CMR in comprehensive prenatal assessment of cardiovascular structure and function, which is beneficial for prenatal diagnosis and counseling of CHD, postnatal therapy planning, and the evaluation of prognosis.

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Category: Foetal Cardiology

2516 - CORRELATION ANALYSIS BETWEEN THE INCIDENCE OF PATENT DUCTUS ARTERIOSUS AND NECROTIZING ENTEROCOLITIS IN PRETERM INFANTS

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Background
Patent ductus arteriosus(PDA)associated with hemodynamic changes can be found in nearly 70% of preterm infants. PDA leads to insufficient tissue perfusion and hemodynamic-related adverse reactions, including necrotizing enterocolitis(NEC). The purpose of this study was to analyze the correlation between the presence and intervention of PDA in preterm infants and the incidence of NEC, as well as to discuss the correlation between abnormal maternal conditions during pregnancy and the incidence of PDA/NEC in preterm infants.

Methods:
A retrospective collection of cases of infants with a gestational age at birth <32 weeks from our hospital over the past three years was conducted. Inclusion criteria: All newborns with a gestational age at birth <32 weeks admitted between January 1, 2023, and July 1, 2025.

Results:
A total of 769 cases of preterm infants were collected. For infants with a birth weight>1000g, the drug closure rate reached 77.77%($P<0.05$). 266 infants with PDA received drug treatment, with a drug closure rate of 74.06%. The incidence of NEC in the PDA group was significantly higher than that in the non-PDA group($P<0.05$). The incidence of NEC stage II or above in untreated PDA infants was significantly higher than that in treated infants($P<0.05$). The number of infants with PDA born to mothers with gestational diabetes mellitus was significantly higher than that in mothers with normal blood glucose levels($P<0.05$). The incidence of PDA in infants born to mothers who underwent assisted reproductive technology was significantly higher than that in natural conception infants($P<0.05$).

Conclusion:
Our results indicate that the presence of PDA in preterm infants increases the risk of NEC stage II or above. The number of infants with PDA born to mothers with gestational diabetes mellitus and mothers who underwent assisted reproductive technology is significantly higher than that in mothers with normal blood glucose levels and mothers who did not undergo assisted reproductive technology.

POSTER PRESENTATIONS

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2555 - PREGNANCY WITH MATERNAL AND FETAL LEFT VENTRICULAR NON COMPACTION

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Background
The pregnancy course of a pregnant woman with Ebstein's anomaly and left ventricular non-compaction (LVNC) and the prenatal fetal diagnosis of LVNC was presented.

Materials
A 31 years old lady in her first pregnancy was seen since 12 weeks of gestation. She has known Ebstein's anomaly with inferior displacement of the septal leaflet of the tricuspid valve, atrialisation of right ventricle and left ventricular trabeculation. She was asymptomatic with good exercise tolerance. There were increased trabeculation in both left and right ventricles but their sizes and function were preserved. Genetic workup revealed a heterozygous variant in MYH7 gene.

During the fetal anomaly scan at 20 weeks, the apical region of left ventricular myometrium appeared thick. There was mild tricuspid regurgitation arising close to the septal leaflet of tricuspid valve. Cardiothoracic ratio was 0.55 and there were no features of fetal anaemia. This raised the suspicion of LVNC and possibly Ebstein's anomaly. The patient declined amniocentesis as she would keep the pregnancy irrespective of the diagnosis.

Further reviews by paediatric cardiologist showed similar findings and the trabeculation in the left ventricle became more obvious as gestation advanced.

Results
The maternal cardiac function remained stable. The fetus had mild to moderate tricuspid regurgitation and moderate biventricular impairment. A baby girl was delivered at 38 weeks 4 days by caesarean section for breech presentation. Postnatal echocardiogram confirmed the diagnosis of mild Ebstein anomaly and LVNC. There was bilateral systolic and diastolic dysfunction but the growth remained satisfactory up to 18 months old. The baby also inherited the same MYH7 mutation which was classified as variant of unknown significance.

Conclusions
A close monitoring of maternal LVNC is essential for favourable pregnancy outcome. Prenatal diagnosis of LVNC is possible with high index of suspicion.

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2560 - OUTCOME OF ANTENATALLY DETECTED ISOLATED INTERRUPTION OF INFERIOR VENA CAVA

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Background / Hypothesis:
Interrupted inferior vena cava (IVC) with azygos continuation is a rare congenital anomaly with a prevalence of < 0.3% in general population. It typically occurs in patients with left isomerism and can be associated with significant cardiac or extracardiac abnormalities. Isolated IVC interruption is generally thought to have a good prognosis although these babies can develop malrotation or biliary atresia requiring surgery. This study aims to document postnatal outcomes of such fetuses at a tertiary fetal medicine center in Southern India.

Materials and Methods:
Retrospective survey of fetuses with IVC interruption based on our institutional database. A total of 90 fetuses were diagnosed with IVC interruption during a 5-year-period. 53 (59%) exhibited major cardiac anomalies while 16 (18%) had extra-cardiac anomalies and were excluded. The remaining 21 fetuses with isolated IVC interruption were included in our analysis. Data was collected through database/telephonic interviews.

Results:
Of 21 fetuses with isolated IVC interruption diagnosed at a median gestational age of 22-weeks, 7 (33.3%) had minor abnormalities; including aberrant right subclavian artery, persistent left superior vena cava and right aortic arch. 5 (23.8 %) showed features of abdominal heterotaxy.
Follow up data was obtained in 19 (90%) at a median age of 3.5years. 1 pregnancy is ongoing, 14/18(78%) were live births (median birth weight 2.8kg) and 4 (22%) were terminated. 12/18 were females and none of the babies required resuscitation at birth with 2 needing NICU for unrelated causes.
Postnatal abdominal scans done electively in 5/17 revealed abdominal heterotaxy in 2 patients with 2 scans being inconclusive. None of the babies had malrotation or biliary atresia during the follow up period nor reported frequent infections. There was no mortality in our patient subset.

Conclusions:
Isolated IVC interruption has a good prognosis and a positive approach to counselling families with antenatal isolated IVC interruption is recommended.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2565 - PRENATAL DIAGNOSIS AND MANAGEMENT OF FETAL VENTRICULAR TACHYCARDIA ASSOCIATED WITH HEMODYNAMIC COMPROMISE

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Background / Hypothesis:
Although ventricular tachycardia constitutes a small proportion of prenatally detected arrhythmias, it can lead to fetal heart failure, preterm delivery, and increased perinatal mortality. It is usually related to congenital long QT syndrome (LQTS) and requires early detection and proper management to avoid hemodynamic compromise and improve perinatal outcomes.

Materials and Methods:
This is a description of the diagnosis and intrauterine management of ventricular tachycardia related to LQTs.

Results:
A 23-year-old G2P1 patient with no relevant history, was admitted at 31 weeks' gestation for newly diagnosed gestational hypertension. An obstetric ultrasound revealed an irregular fetal heart rhythm with atrioventricular dissociation. The patient was referred for a fetal cardiology consultation.
Fetal echocardiography demonstrated complex ventricular arrythmia: intermittent runs of ventricular tachycardia at 280 bpm with atrioventricular dissociation, degenerating into torsade de pointes. Intermittent 2:1 atrioventricular conduction block was also observed. Doppler studies showed abnormal peripheral flows, and holosystolic tricuspid regurgitation. Cardiomegaly with decreased ventricular function and ascites were also present. A multidisciplinary cardiac-obstetrics team initiated transplacental therapy with intravenous magnesium sulfate, oral propranolol (~ 2.2mg/kg) and oral mexiletine (increasing to ~8mg/kg). This pharmacotherapy slightly reduced the arrhythmia burden and allowed the pregnancy to continue for additional six weeks. During this period the fetus gained approximately 1kg and reached early-term maturity. The baby was born at 37+2 weeks' gestation. Genetic testing confirmed LQTs type 3. Initially the therapy was continued with intravenous propranolol and lidocaine, the baby underwent sympathectomy. Currently, the patient is three months old, and the arrhythmia is well-controlled with mexiletine.

Conclusions:
Fetal ventricular tachycardia related to congenital long QT syndrome is a rare finding with a poor prognosis. Early diagnosis and intrauterine therapy may stabilize the fetus, prolong the gestation, and enable to plan perinatal management thereby improving postnatal outcomes. Coordinated multidisciplinary care is essential in the process.

POSTER PRESENTATIONS

Category: Foetal Cardiology

2591 - FETAL DETECTION OF A CORONARY ARTERY FISTULA BETWEEN THE LEFT MAIN CORONARY ARTERY WITH THE RIGHT ATRIUM A CASE REPORT.

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Background:
We report a rare case of a CAF originating from the left main coronary artery and draining into the right atrium (RA).

Case description:
A pregnant woman was referred at 21 weeks of gestation with suspected congenital heart disease (CHD) on ultrasound. Fetal echocardiography revealed a large distal CAF arising from the Left coronary artery (LCA) and draining into the right atrium (RA). The left CAF (diameter 2.6 mm) draining into the RA was visualized by color Doppler ultrasound. Pulsed Doppler recordings revealed characteristic bidirectional flow in the fistula, with turbulent diastolic reversed flow from the blood steal phenomenon via CAF into the RA. The left ventricle function and heart rate were within normal range.
At 28 weeks of pregnancy, the fistula increased to 3.6 mm. However, LV function remained normal. At 38 weeks of gestation, the woman gave birth. After birth, on ECHO, CAF. A fistula with a diameter of 0.55 cm from the left coronary artery system communicating with the RA. Moderate LV dilatation, FS 26%.
In the first week of life, percutaneous distal total closure of the fistula was performed in the cardiac catheterization laboratory. Follow-up echocardiogram the day after the procedure showed continued transformation into the LCA and RCA with a decrease in LV size and improvement in ventricular function.

Discussion:
Our case report suggests that antenatal diagnosis of a CAF may aid in early intervention. Unfortunately, not all cases are identifiable before birth, and many of them are diagnosed after birth or later in life when symptoms become apparent.

Conclusion:
Early prenatal diagnosis important of CAF to plan transcatheter or surgerical intervention and total closure of the CAF

POSTER PRESENTATIONS

Category: Foetal Cardiology

2599 - PRENATAL TREATMENT FOR ISOLATED IMMUNE MEDIATED SECOND DEGREE ATRIOVENTRICULAR BLOCK

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Background / Hypothesis:
To determine the effectiveness of dexamethasone on the prognosis of immune-mediated second-degree AVB and explore risk factors associated with the non-response to the prenatal dexamethasone treatment.

Materials and Methods:
27 fetuses with isolated AVBII and the presence of maternal anti-SSA/SSB antibodies were prospectively enrolled between 2014 and 2022. These fetuses were categorized into the dexamethasone treated group (n=19) and untreated group (n=8). The former was further divided into the response group (n=8) and non-response group (n=11). Maternal and fetal basic characteristics, intrauterine and postnatal outcomes were compared between groups.

Results:
The rate of regression to normal sinus rhythm or AVBI in the dexamethasone treated group was significantly higher than that in the untreated group (42.1% vs 0.0%, p=0.006). Higher serum levels of SSA(≥100U/ml) , SSB (≥100U/ml) antibodies and late gestional week at the treatment onset (p=0.031) as well as the one weekly delay in intreatment initiation (p=0.012) were identified as risk factors for intrauterine unresponsiveness after dexamethasone treatment in fetuses with immune-mediated AVBII.

Conclusions:
Fetal immune-mediated AVBII could benefit from the prenatal dexamethasone treatment with a dosage of 4.5 mg/d. Higher levels of SSA/SSB antibodies and the delayed treatment might be associated with intrauterine unresponsiveness for dexamethasone treatment for immune-mediated AVBII.

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Category: Foetal Cardiology

2608 - PRENATAL INTERVENTION STUDY OF FETAL SUPRAVENTRICULAR TACHYCARDIA.

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Background / Hypothesis:
Fetal supraventricular tachycardia (SVA) is a rare but highly disabling fetal heart disease. Although some research centers have reported relatively standardized prenatal treatment regimens, there is still controversy over different drug treatment options and their effectiveness.

Materials and Methods:
The clinical data of 35 SVA fetuses including supraventricular tachycardia (SVT, n=16) and atrial flutter (AFL, n=19) were collected, and follow-up assessments were conducted on fetal echocardiography, CVPS scores, and fetal arrhythmia outcomes.

Results:
Compared to SVT group, fetuses with AFL presented with later diagnostic gestational age (p=0.010), lower fetal CVPS (p=0.019) and higher cardiothoracic ratio (p=0.008). Two cases of SVT and one case of AFL were initially treated with sotalol, and the remaining 32 cases were initially treated with digoxin. Ten cases (10/32, 31.3%) received additional treatment with sotalol during the later stages of treatment.Among the 3 fetuses treated with first-line sotalol therapy, 2 fetuses with SVT did not achieve sinus rhythm or control of ventricular rate, and 1 fetus with AFL achieved conversion after 28 days of treatment. Among the fetuses treated with digoxin monotherapy, 7 of 14 (50.0%) fetuses with SVT achieved intrauterine conversion or control of ventricular rate within 2-7 days, and 8 of 18 (38.9%) fetuses with AFL achieved intrauterine conversion within 3-7 days. Ten fetuses (6 with SVT and 4 with AFL) received combination therapy with sotalol, and 2 of 6 (33.3%) fetuses with SVT and 4 of 4 (100%) fetuses with AFL achieved intrauterine conversion. Throughout the treatment period, no serious adverse maternal or fetal reactions were observed.

Conclusions:
Compared with fetal SVT, the diagnosis of AFL occurs later in gestation, but it causes more obvious hemodynamic changes in the fetal heart. The overall conversion rate with digoxin monotherapy is relatively low, especially for AFL fetuses, but the overall conversion rate is higher with digoxin in combination

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1007 - FIFTY YEAR OUTCOMES AFTER PEDIATRIC HEART TRANSPLANTATION A PEDIATRIC ADULT CENTER LINKED ANALYSIS

Seth Hollander [1], Stephanie Hsiao [2], Anubodh Varshney [2], Helen Luikart [2], Daniel Bernstein [1], Chiu-yu Chen [1], Elizabeth Profita [1], Kari Wujcik [3], Lynsey Barkoff [3], David Rosenthal [1]
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Background / Hypothesis:
Long-term outcomes after pediatric heart transplant (pHT) are lacking owing to young programs and loss of follow-up after transition to adult care. We leveraged our program age, center volume, and linked electronic medical record (EMR) to analyze pHT outcomes over 50 years, including events occurring after adult care transfer.

Materials and Methods:
Retrospective review all pHT over 50 years at Stanford (8/19/1974-8/19/2024).
Patient characteristics and post-HT outcomes (death, retransplant, subsequent kidney transplantation) were ascertained from the pediatric and adult EMRs, public records, and personal communication with other centers.

Results:
There were 567 pHTs in 540 patients. Status as of 8/19/2024 was confirmed for 526 (97%) (Table 1). Over 1,888,341 follow-up days, 50 (9%) received a second heart transplant (HT) (27 pediatric, 23 adult), median 9 (5, 14) years; 3 (1%) received a third HT; 6 (1%) received a subsequent kidney transplant, and 212 (39%) died (172 pediatric, 40 adult). Post-HT actuarial survival improved over three successive eras (1974-1990, 1991-2006, 2007-2024),$P<0.001$).

Conclusions:
This linked analysis of pediatric and adult programs shows excellent long-term pHT outcomes with median survival nearly 20 years and improving. Nearly half of retransplants occur after transfer; subsequent kidney transplant occurs infrequently.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1008 - OUTCOMES AFTER TRANSITION FROM PEDIATRIC TO ADULT HEART TRANSPLANT CARE A PEDIATRIC ADULT CENTER LINKED ANALYSIS

Seth Hollander [1], Anubodh Varshney [2], Stephanie Hsiao [2], Helen Luikart [2], Daniel Bernstein [1], Chiu-yu Chen [1], Elizabeth Profita [1], Lynsey Barkoff [3], Kari Wujcik [3], David Rosenthal [1]
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Background / Hypothesis:
Outcomes are lacking after transfer from pediatric to adult care for pediatric heart transplant (pHT) patients, as is an understanding of the optimal age to transition. We analyzed outcomes of pHT recipients after adult care transfer in a contemporary cohort.

Materials and Methods:
Retrospective review pHT recipients transplanted at Stanford (2000-2024). Patient characteristics and post-transfer outcomes were queried from the pediatric and adult electronic medical records. A comparison of survival was conducted for those transferred before and after age 22.

Results:
Transfer dates were available for 90/98 (92%) of patients. Of these, transfer occurred at median age 21 (19, 25) years, 19 (18, 21) and 25 (23, 27) years for the younger and older groups, respectively (P < 0.001), with transfer occurring 4 (2, 9) years after transplant. (Table 1). Thirteen (14%) died at a median of 6 (1, 9) years post transfer. Older transfers (>/=22) were also older at transplant, but transplanted more recently. Post-transfer and post-transplant survival did not differ between older and younger cohorts (P=0.2 & P=0.9, respectively).

Conclusions:
This linked analysis of pediatric and adult programs reports pHT outcomes after adult care transfer. Patients who transfer later are older but closer to transplant at the time of transfer. Outcomes appear equivalent between those transferred shortly after the 18th birthday versus those transferred at older ages.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1029 - HEART FAILURE MANAGEMENT AND ACCESS TO ADVANCED CARDIAC THERAPIES FOR DUCHENNE MUSCULAR DYSTROPHY GUIDANCE FOR PROVIDERS

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Background / Hypothesis:
Patients with Duchenne Muscular Dystrophy (DMD) have historically not been offered advanced cardiac therapies for end-stage heart failure due to shortened life span and comorbidities. However, with improved respiratory care and the introduction of targeted gene therapies, median survival is now 28 years and DMD patients can be expected to benefit from both ventricular assist device (VAD) and heart transplantation (HT).

Materials and Methods:
In September 2024, a multi-disciplinary group of nearly 50 DMD experts convened in-person to draft advanced cardiac therapy protocols for DMD patients. Participants included pediatric cardiologists, pulmonologists, anesthetists, surgeons, neurologists, rehabilitation specialists, and advanced practice nurses, as well as patients and community advocates.

Results:
The resultant document provides guidance for HF assessment, prophylactic care, VAD and HT candidacy, and pre-, peri-, and post-operative care for select patients.

Conclusions:
Advanced cardiac therapies, including VAD and HT, may be offered to select patients with DMD. Guidance for advanced cardiac care for this population is now available to centers that wish to launch programs or enhance currently existing programs.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1097 - INNOVATIVE PRACTICE OF MULTIMODAL CONTRAST ENHANCED ULTRASOUND GUIDED WHOLE CYCLE MANAGEMENT IN INFANT CARDIAC FIBROMA

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Background:
Primary cardiac fibroma, a rare embryonal tumor in infants, poses significant risks of ventricular obstruction, heart failure, and arrhythmias. Conventional imaging modalities, such as transthoracic echocardiography (TTE) and cardiac magnetic resonance (CMR), face limitations in assessing tumor microcirculation and early myocardial dysfunction. This single-center study introduced a multimodal contrast-enhanced ultrasound (CEUS)-guided approach to address four key challenges in managing neonatal cardiac fibroma: preoperative classification, intraoperative navigation, postoperative residual lesion monitoring, and early detection of subclinical cardiac dysfunction.

Materials and Methods:
A prenatally diagnosed male neonate with a left ventricular (LV) mass underwent comprehensive imaging, including TTE, CMR, and dynamic CEUS with SonoVue contrast. Intraoperative transesophageal ultrasound guided subtotal tumor resection under cardiopulmonary bypass. Postoperatively, a multidimensional monitoring system integrated CEUS, hemodynamic parameters (cardiac index, LV ejection fraction [LVEF]), and biomarkers (NT-proBNP, CK-MB).

Results:
Preoperative CEUS revealed robust tumor perfusion (LVEF 55%) without outflow tract obstruction, consistent with CMR. Three-month follow-up showed reduced tumor perfusion (LVEF 48%) and mild obstruction. Intraoperative imaging confirmed extensive LV involvement, with residual lesions preserved near coronary arteries. Postoperative CEUS detected high perfusion in residual lesions, progressive cardiac dysfunction (LVEF 20%), and elevated NT-proBNP (>35,000 pg/mL), culminating in fatal cardiogenic shock on day 20.

Conclusions:
CEUS demonstrated unique value in whole-cycle management: preoperative microvascular perfusion analysis guided surgical planning, while postoperative monitoring sensitively identified residual lesions and subclinical dysfunction earlier than traditional metrics. Despite the poor outcome, CEUS offers a non-invasive, reproducible tool for pediatric cardiac tumor management. Larger multicenter studies are warranted to validate its prognostic utility.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1129 - ADVERSE EVENTS AND SURVIVAL AMONG PEDIATRIC PATIENTS UNDERGOING VAD IMPLANTATION AN ACTION REGISTRY ANALYSIS

Shahnawaz Amdani [1], Muhammad Shezad Farrukh [2], Matt O'connor [3], Lydia Wright [4], Jenna Murray [5], Lindsay May [6], Angela Lorts [7], David Rosenthal [5]
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Background:
Ventricular assist devices (VADs) are increasingly utilized in children with end-stage heart failure, including younger, critically ill patients and those with congenital heart disease (CHD). These populations face a heightened risk of adverse events (AEs) post-implantation. The last major pediatric study on VAD-associated AEs analyzed data from 2012–2014. This study provides the most comprehensive and contemporary assessment of AEs and survival in pediatric VAD recipients.

Methods:
We analyzed data from the Advanced Cardiac Therapies Improving Outcomes Network (ACTION) registry (December 2017–December 2023). Patient demographics and clinical characteristics were compared between those with and without AEs. The ACTION adjudication process employs standardized definitions, ensuring a rigorous and systematic review of all AEs. We further assessed survival outcomes based on early (≤2 weeks) versus late (>2 weeks) AEs.

Results:
Among 1,738 pediatric VAD recipients, 63.6% (n=1,105) experienced AEs. These patients were significantly younger (median age: 2.9 vs. 4.9 years, $p<0.05$) and exhibited greater pre-implant disease severity, including increased use of mechanical ventilation (59.4% vs. 45.2%), parenteral nutrition (57.1% vs. 43.8%), extracorporeal membrane oxygenation (ECMO) (28.4% vs. 19.7%), and dialysis (6.1% vs. 3.2%).

Patients with early AEs were more likely than those with late AEs to be INTERMACS 1 (35.1% vs. 29.9%), on ECMO (30.6% vs. 23.9%), and on dialysis (7.0% vs. 4.1%) pre-implant ($p<0.05$ for all). While 12-month post-VAD survival did not differ between patients with and without AEs ($p=0.971$), survival was significantly lower in those with early vs. late AEs ($p<0.001$).

Conclusions:
Two-thirds of pediatric VAD recipients experience AEs, with early AEs associated with significantly worse survival. These findings highlight the urgent need for proactive risk stratification, earlier VAD implantation, and standardized AE management strategies to improve outcomes in this high-risk population.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1153 - CLINICAL OUTCOMES AFTER COVID 19 POSITIVE DONOR HEART TRANSPLANTATION IN THE UNITED STATES PEDIATRIC POPULATION

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Background / Hypothesis:
Over the course of the COVID pandemic, the International Society for Heart and Lung Transplantation guidelines for use of COVID+ donors evolved from blanket discouragement to criteria for acceptable organ use. Since then, some adult reports have revealed no difference in short term outcomes of donor COVID+ heart transplants. However, the pediatric literature on this subject remains sparse. We investigate outcomes in the pediatric population.

Materials and Methods:
The United Network for Organ Sharing's Standard Transplant Analysis and Research database was queried for all pediatric (<18 years of age) primary heart transplant recipients. Donors were considered COVID+ if they had a positive nucleic acid amplification, antigen, or other test within seven days of transplantation. Recipients of COVID+ and COVID- hearts were compared by demographic and baseline characteristics like age, sex, days on the waitlist and at Status 1A, and average organ ischemic time. Outcome measures included mortality, treatment for rejection within one year of transplantation, and the need for extracorporeal membrane oxygenation (ECMO) post-transplantation.

Results:
Of 11,809 patients identified, 61 patients received heart transplants from COVID+ donors. Recipients of COVID+ heart spent a significantly longer time on the waitlist (207.89 vs. 107.88 days, P=0.0004) and at Status 1A (79.0 vs. 41.12 days, P<0.0001). Age at transplantation, sex, and average ischemic time were similar between groups (Table 1). Similarly, no difference in mortality was seen at 30-days (P=0.146), 3-months (P=0.471), or 1-year (P=0.757) (Table 2). There were no differences in ECMO usage at the time of transplant (P=0.2672), 24 hours- (P=0.4262), and 72 hours- (P=0.6903) post-transplantation.

Conclusions:
Despite longer times on waitlist and Status 1A, donor COVID+ heart transplant recipients have similar short-term outcomes to donor COVID- recipients. This represents the universe of donor COVID+ pediatric heart transplants in the US; caution is advised in interpreting this data due to the small sample size.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1205 - LEFT VENTRICULAR ASSIST DEVICE IMPLANTATION IN SYSTEMIC POSITION IN FONTAN PATIENT FOR PROTEIN LOOSING ENTEROPATHY

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Background:
Protein loosing enteropathy (PLE) is considered a sign of Fontan failure. The best way to treat it seems to be heart transplant. However in some cases transplantation is not feasible. The information in the literature of left ventricular assist device (LVAD) implantation for the treatment of PLE is scarce.

Materials and Methods:
We present a case of LVAD implantation for PLE in a 17-year old patient. Patient was operated for unbalanced atrioventricular canal defect with right dominance and aortic hypoplasia. Norwood procedure was performed on the 4th day of life (2007), Glenn procedure was performed at 8 months (2007), and extracardiac Fontan procedure was completed at 6 years (2013). Patient had PLE since Fontan completion. He received pulmonary vasodilators, diuretics, beta-blockers, angiotensin converting enzyme blockers and budesonide. Before LVAD implantation pulmonary artery mean pressure was 23 mmHg with no gradients in the Fontan system, patient had 3rd grade atrioventricular valve regurgitation, blood protein was 4 g/dl and albumin 2.4 g/dl. Preoperative alpha-fetoprotein was not assessed. LVAD implantation was performed in a standard fashion in October 2024.

Results:
The postoperative course was complicated by left medial cerebral artery embolic stroke (with full regression of symptoms), right kidney ischemic stroke with no renal dysfunction, relapsing hemorrhage from small intestine. Patient was discharged in December 2024. In March 2025 his blood protein level was 6 g/dl, albumin was 3.4 g/dl. Patients parents did not agree for the cardiac catheterization.

Conclusions:
LVAD implantation in a patient with PLE in failing Fontan may help to achieve protein level stabilization.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1213 - RESULTS OF THE USE OF EXTRACORPOREAL MEMBRANE OXYGENATION IN CHILDREN IN THE RUSSIAN FEDERATION.ROSECMO REGISTRY.

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Background:
In the Russian Federation, ECMO technology in children began to be used in the late 1990s. The only source of analysis is the registry of the Russian Society of Extracorporeal Membrane Oxygenation (Rus ECMO), which has been maintained since 2011.

Materials and methods:
We analyzed the results of treatment of the pediatric population using ECMO technology according to the RusECMO registry from 2011 to March 2025. The analysis included 119 children.

Results:
Distribution by age groups: newborns - 41 patients, infants - 48 patients, children over 1 year old - 30 patients. Congenital heart disease and postcardiotomy syndrome - 72 patients, pulmonary pathology - 27 patients, extracorporeal cardiopulmonary resuscitation - 7 patients, other - 13 patients.Inpatient ECMO was performed in 114 cases and transport ECMO in 5 patients.Veno-arterial ECMO was 97% and only 3% veno-venous - in children over 1 year of age.Central access was used in 64% of patients, while in 87% of cases access was performed surgically.Inotropic support before ECMO was used in 110 patients.Renal replacement therapy during ECMO was used in 62%. The median duration of ECMO was 6 [4; 10] days.The reason for weaning from ECMO: death - 33%, recovery of function - 65%, heart transplant - 2%.Outcome: death - 50%, discharge from hospital - 39%, transfer to another hospital - 11%. The main cause of death: multiple organ failure syndrome - 50 patients (85%) and bleeding - 7 (12%).

Conclusion:
The ECMO technique in children in the Russian Federation is mainly used for cardiac indications in hospitals providing care in the pediatric cardiac surgery profile.The use of ECMO is associated with a large number of adverse events: acute heart failure, renal failure and severe hemostasis disorders, all of which require high-tech and expensive treatment and diagnostics.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1238 - CARDIOMYOCYTE SPECIFIC KNOCKOUT OF SLC25A51 LEADS TO SEVERE HEART FAILURE IN MICE

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Background / Hypothesis:
Heart failure(HF), the terminal manifestation of various cardiovascular diseases, arises from intricate etiologies and pathogenic mechanisms, most of which involve mitochondrial dysfunction.Disruptions in mitochondrial morphology and dynamics can induce systemic metabolic disturbances, consequently leading to distinct subtypes of HF. Solute carrier family 25 member 20 (SLC25A51) is a newly identified mammalian mitochondrial NAD+ transporter. However, the clinicopathological and biological significance of SLC25A51 in cardiovascular diseases remains unclear.Preliminary experiments revealed significant downregulation of SLC25A51 expression in cardiac tissues of various HF mouse models.The aim of this study was to define the role of SLC25A51 in heart.

Materials and Methods:
We generated cardiomyocyte-specific SLC25A51 knockout (SLC25A51-CKO) mice using the CRISPR-Cas9 and analyzed for cardiac phenotypes.Survival and health status were monitored in cKO mice. Cardiac function was evaluated by echocardiography, myocardial fibrosis and histopathology were assessed by Masson and H&E staining. Mitochondrial morphology was examined by electron microscopy,while mitochondrial function was assessed through measurements of mtDNA, ATP levels.

Results:
In homozygous, mortality began to occur progressively at 21 days after birth. At 19 days of age, echocardiography revealed that homozygous had a significantly lower heart rate, with LVEF values ranging between 30-40%, and reduced left ventricular anterior and posterior wall thickness compared to the other two groups. Cardiac tissues showed significantly elevated levels of ANP and BNP.Gross examination demonstrated marked global cardiac enlargement. H&E and Masson staining further confirmed ventricular wall thinning, chamber dilation, and significant myocardial fibrosis. Electron microscopy revealed severe mitochondrial vacuolization in cardiomyocytes, along with evident dissolution and cristae disruption. Additionally, mtDNA and ATP content were significantly reduced in cardiac tissues. Confocal microscopy indicated markedly increased mPTP opening in mitochondria, accompanied by significantly elevated mRNA and protein expression of CYPD, a key regulator of mPTP.

Conclusions:
Our results suggest that SLC25A51 may play a critical role in the pathogenesis of heart failure.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1246 - EFFICACY AND SAFETY OF SACUBITRIL VALSARTAN IN PEDIATRIC HEART FAILURE A SINGLE CENTER EXPERIENCE

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Introduction:
Sacubitril/valsartan has emerged as a novel treatment option for pediatric heart failure (HF), yet data on its efficacy and safety across different cardiomyopathy subtypes remain limited. This study aims to evaluate the clinical and echocardiographic effects of sacubitril/valsartan in pediatric patients with right and/or left ventricular dysfunction.

Materials and Methods:
A retrospective analysis was conducted on 33 pediatric patients (aged 1 month to 18 years) with cardiomyopathy who were initiated on sacubitril/valsartan therapy between October 2020 and October 2024 at the University of Health Sciences Mehmet Akif Ersoy Thoracic and Cardiovascular Surgery Training and Research Hospital. The cohort included 15 patients with arrhythmogenic right ventricular dysplasia (ARVD), 5 with left ventricular non-compaction (LVNC), and 13 with dilated cardiomyopathy (DCM). Parameters including echocardiographic measures (TAPSE, RVEF, FAC, LVEF, LV Z-scores, FS), NT-proBNP levels, NYHA class, 6-minute walk test (6MWT), blood pressure, creatinine, and potassium were evaluated at baseline and at 1, 3, 6 months, and final follow-up.

Results:
Of the 33 patients, 63.6% were male, with a median age of 8.6 years. Baseline LVEF was >45% in 39.4% of patients, increasing to 72.7% at final follow-up. NT-proBNP levels decreased significantly from a median of 6309 pg/mL to 3919 pg/mL ($P < 0.002$). NYHA class improved or remained stable in 93.3% of patients. During a median follow-up of 17.3 months, 42.4% of patients were rehospitalized for HF, and 15% either died or underwent heart transplantation. The most common adverse effect was hypotension, seen in 18.2% of patients.

Conclusion:
Sacubitril/valsartan shows promise in improving biventricular function and clinical status in pediatric patients with cardiomyopathy. Further long-term prospective studies are warranted to confirm its safety and survival benefit in this population.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1263 - VENTRICULAR ASSIST DEVICE SUPPORT IN PEDIATRIC REFRACTORY HEART FAILURE ANALYSIS OF OUTCOMES AND MORBIDITY

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Background / Hypothesis:
Pediatric patients with heart failure unresponsive to medical therapy have limited therapeutic options. Ventricular assist device (VAD) implantation offers a potential bridge to heart transplantation or myocardial recovery. This study aimed to assess clinical outcomes, including survival and device-related morbidity, in children receiving VAD support.

Materials and Methods:
We retrospectively reviewed medical records of all patients under 18 years of age who underwent VAD implantation at Seoul National University Children's Hospital from October 2019 to February 2025. Adverse events were categorized based on standardized pediatric mechanical circulatory support criteria. Device types, clinical status at implantation, pre-implant conditions, and outcomes were analyzed.

Results:
Seventeen patients received VADs for refractory heart failure. The mean age was 9.2 years (range 4 months to 18.5 years), and the mean weight was 29.1 kg (range 5.4–61 kg). Indications included end-stage cardiomyopathy (n = 14), myocarditis (n = 1), and congenital heart disease or postcardiotomy failure (n = 2). At implantation, 35% were in critical cardiogenic shock, and 41% required mechanical ventilation. Systemic VADs were used in 76% of cases; biventricular devices in 24%. The Berlin Heart EXCOR (n = 14) and HeartMate 3 (n = 3) were the primary devices used. The mean support duration was 215 days. There was no mortality. Twelve patients were successfully bridged to transplantation, three remained on support, and two were weaned. Major complications included bleeding requiring reoperation (n = 2), stroke (n = 1), and driveline infection (none). Pump exchanges were required in three patients due to thrombus formation, upsizing, or mechanical malfunction.

Conclusions:
VAD therapy in pediatric heart failure patients results in excellent survival, with the majority successfully bridged to transplantation. Despite critical illness at baseline, complication rates remain acceptably low with current device technologies.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1264 - 25 YEARS OF EXPERIENCE IN A NATIONAL PEDIATRIC HEART TRANSPLANT PROGRAM CHALLENGES AND OUTCOMES IN A SMALL POPULATION

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Introduction:
Heart transplantation is the most advanced and effective treatment for end-stage heart failure in children. We present our experience in maintaining the only pediatric heart transplant program in Lithuania, serving a population of 2.5 million at the country's sole congenital cardiac surgery center.

Materials and Methods:
A retrospective analysis of the Lithuanian pediatric heart transplant registry was conducted, including data from all patients listed for donor heart transplantation (n = 36; median age at listing: 0.6 years; interquartile range [IQR]: 0.27–3.94 years; female-to-male ratio: 13 [36.1%] to 23 [63.9%]) from 2001 to April 2025.

Results:
Seven patients (19.4%) died while awaiting a donor heart, with a median wait time of 55 days (IQR: 25.5–144.5 days); prior death three (8.3%) of them were on mechanical circulatory support for a median of 20 days (IQR: 10–104.5 days). Twenty-two patients (61.2%) underwent heart transplantation after a median wait time of 9.55 months (IQR: 0.06–11.84 months); six (16.7%) of the transplanted patients required pre-transplant mechanical circulatory support for a median of 188 days (IQR: 69.74–312.25 days). None required support post-transplant.
Five patients (13.9%) died during the early post-transplant period (median survival: 18 days; range: 7–62 days). Three (8.3%) died in the late post-transplant period (median survival: 7.3 years; range: 1.8–11.1 years), including two from transplant-related causes. Fourteen patients (38.9%) are alive, with a median survival of 8.8 years (range: 1.2–19.7 years). Actuarial survival at 1, 5, 10, and 15 years was 77.3%, 59.1%, 27.3%, and 9.1%, respectively. Seven patients (19.4%) remain on the waiting list (median wait: 3.7 years; IQR: 2.675–6.23 years).

Conclusions:
Maintaining a pediatric heart transplant program within a small congenital cardiac surgery center appears feasible despite donor availability challenges. Most transplanted patients achieve reasonable long-term survival with favorable post-transplant outcomes.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1277 - PULMONARY ARTERY BANDING AND INTERATRIAL INTERVENTION AS AN ALTERNATIVE TREATMENT IN PEDIATRIC PATIENTS WITH DILATED CARDIOMYOPATHY

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Background / Hypothesis:
Dilated cardiomyopathy (DCM) is the most common type of cardiomyopathy in children and a leading indication for heart transplantation. Limited availability of transplantation in certain regions necessitates alternative bridging therapies. Pulmonary artery banding (PAB) and interatrial communication have emerged as promising strategies in selected patients.

Materials and Methods:
Seven patients (age range: 5–18 months) with DCM and preserved right ventricular (RV) function (LVEF ≤ 40%) underwent PAB and interatrial interventions. Preoperative assessments included echocardiography, cardiac MRI, and extensive etiological investigations. Interatrial communication was established via balloon septostomy and/or atrial stenting in patients with elevated left atrial (LA) pressure. PAB was performed after LA decompression, with intraoperative transesophageal echocardiography guiding hemodynamic optimization. Clinical and laboratory parameters were compared pre- and post-intervention.

Results:
PAB was successfully performed in all patients without complications. Mean postoperative ICU stay was 4–10 days; average intubation and inotropic support durations were 3.9 and 3.6 days, respectively. Five patients showed marked improvement in LV function, reduction in mitral regurgitation(MR) severity, and decreased BNP levels. Two patients required interatrial interventions more than once due to recurrent heart failure symptoms.

Conclusions:
PAB combined with interatrial communication is a feasible and effective bridge-to-decision therapy in selected pediatric DCM patients with preserved RV function. It offers potential for LV functional recovery, symptom relief, and reduction in medical therapy burden. Further studies with larger cohorts and long-term follow-up are warranted to validate these findings.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1284 - EVALUATING THE IMPACT OF EXTENDED WARM ISCHEMIC TIME USING EX VIVO HEART PERFUSION IN JUVENILE PORCINE MODELS OF CIRCULATORY DEATH

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Background / Hypothesis:
Ex vivo heart perfusion (EVHP) can rehabilitate and assess donor hearts procured after circulatory death (DCD) and inform whether the 30min functional warm ischemic time (WIT) threshold can be exceeded in the pediatric population, where time to arrest is longer than in adults.

Materials and Methods:
A flow-targeted pediatric EVHP protocol was applied to DCD hearts of juvenile Yorkshire pigs subjected to WIT of 30 or 45min (n = 6 each). After 2h reperfusion at 10ml/kg/min, hearts were loaded in working mode (WM) up to left atrial pressure of 10 mmHg for functional assessment by pressure-volume catheterization and epicardial echocardiography. Groups were compared using analysis of variance.

Results:
Lactate and myocardial oxygen consumption were similar between WIT groups, with higher cardiac troponin I in 45WIT. During WM, the 30WIT had greater median cardiac index (2.26 vs 1.45 mL/min/m2, p=0.01), with significant variability in the 45min group (IQR 0.96–2.29 mL/min/m2). Left ventricular ejection fraction (LVEF) was reduced from baseline for all groups, with lower LVEF in 45WIT (31.8±4.4 vs 23.0±5.6 %, p=0.02). Although the rate of change in isovolumetric pressure (dP/dT) both improved with reperfusion, higher WM minimum dP/dT (-2246±250 vs -1612±558, p=0.001) demonstrated greater diastolic dysfunction in 45WIT. The percentage of heart weight gained as an estimate of myocardial edema was not significantly higher in the 45min group (18.9±15.0 vs 22.2±16.1 %, p=0.35) but did correlate with WM cardiac index (rs= -0.62, p=0.03). Metabolomics of plasma samples showed similar differential metabolic shifts and TUNEL (Terminal Uridine Deoxynucleotidyl Transferase mediated dUTP nick end labeling) stain demonstrated equivalent prevalence of myocardial apoptosis between groups.

Conclusions:
45WIT hearts exhibit poorer cardiac function, primarily due to severe myocardial edema and associated diastolic dysfunction. However, 33% of 45WIT hearts achieved comparable cardiac function and present a borderline setting for further refinement of EVHP.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1303 - FACTORS ASSOCIATED WITH IN HOSPITAL MORTALITY AND 1 YEAR OVERALL SURVIVAL OF VENOARTERIAL EXTRACORPOREAL MEMBRANE OXYGENATION IN PEDIATRIC PATIENTS A 13 YEAR RETROSPECTIVE REVIEW

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Background:
Extracorporeal Membrane Oxygenation (ECMO) is a critical support system for pediatric patients with severe cardiac and respiratory failure, often used during or after surgery. This study aims to identify factors influencing in-hospital mortality and one-year survival in pediatric patients undergoing venoarterial extracorporeal membrane oxygenation (VA-ECMO) at Siriraj Hospital. While international studies have reported variable survival rates and key prognostic factors, data specific to Thailand remain limited. Since 2009, Siriraj Hospital has managed over 100 pediatric VA-ECMO cases; however, a comprehensive analysis of outcomes is lacking.

Methods:
This retrospective chart review study included pediatric patients aged below 18 who received VA-ECMO support at Siriraj Hospital between January 1, 2009, and December 31, 2021. Univariable and multivariable analyses were performed to identify mortality factors. Kaplan-Meier survival analysis was used to demonstrate one-year overall survival.

Results:
Ninety-one patients were included in the analysis, with an in-hospital mortality rate of 57.1%. Post-VA-ECMO albumin and HCO3 (ABG) levels were significantly associated with in-hospital mortality after multivariable analysis. The area under the curve (AUC) for post-VA-ECMO HCO3 (ABG) levels in predicting survival was 0.764 (95% CI, 0.665–0.862, $p < 0.001$). The predicted in-hospital mortality cut-off point for post-VA-ECMO HCO3 (ABG) level was ≤ 24 mEq/L. The one-year overall survival rate was 42.7%. Post-VA-ECMO serum total bilirubin and HCO3 (ABG) levels were significantly associated with one-year overall survival after multivariable analysis. A post-VA-ECMO HCO3 (ABG) level > 24 mEq/L demonstrated better one-year overall survival (63%) compared to ≤ 24 mEq/L, where the one-year survival rate was 20.9%, with a median survival time of 3.9 months (95% CI, 0.224–0.433, $p < 0.001$).

Conclusion:
Higher post-VA-ECMO HCO3 (ABG) levels were significantly associated with better in-hospital mortality and one-year overall survival. Managing and correcting severe acidosis after VA-ECMO placement is critical to improving outcomes.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1332 - EPIDEMIOLOGICAL CHARACTERISTICS AND IN HOSPITAL ADVERSE OUTCOME RISK FACTORS OF NEONATAL HEART FAILURE IN CHINA A RETROSPECTIVE STUDY BASED ON THE GBD DATABASE AND MULTICENTER CLINICAL DATA

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Background / Hypothesis:
Neonatal heart failure (NHF) is a significant cause of neonatal mortality and disease burden. However, systematic research on its epidemiological characteristics and clinical risk factors in the Chinese population remains limited. This study integrates data from the Global Burden of Disease (GBD) database and multicenter clinical data from China to analyze NHF disease burden trends and identify predictive factors for in-hospital adverse outcomes.

Materials and Methods:
We extracted data from the GBD 1990–2021 database on the prevalence, years lived with disability (YLDs), and etiological composition (as of 2021) of neonatal heart failure (NHF) in China for epidemiological analysis. Additionally, we retrospectively collected clinical data (including demographic characteristics, etiology, treatment, and outcomes) from NHF patients diagnosed between 2015 and 2023 across 24 tertiary hospitals in China. Multivariable logistic regression analysis was performed to identify risk factors for mortality in neonates with heart failure.

Results:
Between 1990 and 2021, NHF prevalence and years lived with disability (YLDs) rates declined by 47.5% overall. The highest burden was observed in neonates aged 7–27 days. Males consistently exhibited higher prevalence and YLDs than females. In 2021, congenital heart anomalies were the predominant cause of NHF (highest in males and neonates aged 7–27 days). NHF-related YLDs were primarily attributed to congenital anomalies, with secondary contributions from cardiac and renal disorders. The multivariable regression analysis of multicenter clinical data revealed that lower age, gestational age, birth weight, height were significantly associated with increased mortality risk in neonatal heart failure. Notably, the use of cardiotonic metabolic modulators (CMMs) served as a protective factor, while prolonged APTT emerged as an independent risk factor.

Conclusions:
China's NHF disease burden shows a declining trend, with congenital heart disease remaining the primary etiology.

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Category: Heart failure, Mechanical Circulatory Support and Transplant

1343 - APPLICATION OF EXTRACORPOREAL MEMBRANE OXYGENATION IN PEDIATRIC HEART FAILURE – A CLINICAL SUMMARY OF 51 CASES

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Background / Hypothesis:
To analyze the outcomes of extracorporeal membrane oxygenation (ECMO) in pediatric heart failure and summarize the clinical experience of extracorporeal life support.

Materials and Methods:
A retrospective analysis was conducted on 51 pediatric patients with heart failure who received ECMO support between December 2017 and March 2025. Clinical data included hospitalization records and surgical outcomes.

Results:

Successful weaning: 36 cases (71%).

Hospital survival: 30 cases (59%).

Median ECMO duration: 6.58 days.

Cardiac support (33 cases): 25 survivors (76%).

Extracorporeal cardiopulmonary resuscitation (ECPR, 18 cases): 5 survivors (28%).

Neonates (10 cases): 5 survivors (50%).

Children (41 cases): 25 survivors (61%).

Transport ECMO (14 cases): 7 survivors (50%).
Higher success rates: Postoperative myocardial stunning (congenital heart surgery) and fulminant myocarditis.

Lower success rates: Hematologic diseases and cardiac/respiratory arrest.

Left ventricular unloading (14 cases):

Percutaneous atrial septostomy: 4 cases.

Surgical LV decompression cannula placement: 10 cases.

A novel RA-PA ECMO configuration provided optimal RV support in a pediatric case.

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Complications (most frequent): Thrombosis (17 cases), bleeding (16 cases), infection (12 cases), hemolysis (7 cases).

Transition therapies:

Permanent pacemaker implantation: 2 cases (1 with long QT syndrome, survived ; 1 with complete [third-degree] atrioventricular block post-fulminant myocarditis, survived).

LVAD support: 1 case (survived).

Conclusions:
ECMO is highly effective for myocardial stunning post congenital heart surgery and fulminant myocarditis. Early ECMO initiation and high-quality CPR prior to ECMO improve ECPR success. Timely left ventricular decompression aids cardiac recovery. Right atrial/pulmonary artery cannulation benefits right heart dysfunction. Thrombosis and bleeding remain major challenges. For prolonged ECMO with no functional recovery, transition to pacemakers or LVAD should be considered.

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Category: Heart failure, Mechanical Circulatory Support and Transplant

1355 - CASE REPORT ON A 6 YEAR OLD CHILD WITH COMPLETE SHONE COMPLEX PRESENTING WITH LEFT SIDED HEART FAILURE

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Background / Hypothesis:
Shone complex is a rare condition that accounts for 0.6% of all cardiac abnormalities, with a male-female ratio of 1.5:1. Complete Shone is extremely rare, with a frequency of 0.02%. In the Philippines, no reported case of Complete Shone complex is documented in the Philippine Pediatric Society registry.

Materials and Methods:
A 6-year-old female was brought to the ER due to sudden onset of left chest pain, squeezing, non-radiating, associated with pallor,dyspnea, worsened by activity and temporarily relieved by rest.
On PE, she was pale, in distress, dynamic precordium, grade 3/6 systolic ejection murmur at right upper sternal border and grade 3/6 holosystolic murmur at left lower sternal border increased in intensity upon respiration.
The chest radiograph showed venous congestion. The electrocardiography showed left atrial enlargement and left ventricular hypertrophy. Echocardiography revealed a supramitral ring, parachute mitral valve, subaortic membrane, bicuspid aortic valve and coarctation of the aorta (COA). The left ventricle was dilated with concentric hypertrophy with poor ejection fraction (LVEF) of 27% by M-mode and 29% by Simpson's Biplane. Cardiac CT angiography showed single papillary muscle in the left ventricle, hypertrophy of the interventricular septal tissue extending into the left ventricular outflow tract narrowing the subaortic area and COA.
She underwent resection of supramitral ring, mitral valve commissurotomy,subaortic membrane resection, aortic arch repair. Postbypass, she had persistent hypotension hence hooked to ECMO for 24 hours.

Results:
Post-operative echocardiography showed no left-sided heart obstruction and regurgitation with improved function.
She was discharged on the 14th postoperative day. On follow-up,repeat radiograph showed clear lungs and decreased cardiac size. She reported no symptoms of heart failure. Shone complex symptoms can manifest in a variety of ways such as heart failure with no discernible pattern. Pediatric cardiac surgery is the primary form of management. Better surgical management, care, and diagnostic imaging have improved the results.

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Category: Heart failure, Mechanical Circulatory Support and Transplant

1366 - EFFECTIVE VENO VENOUS EXTRACORPOREAL MEMBRANE OXYGENATION MANAGEMENT USING A DUAL LUMEN CATHETER AFTER FENESTRATED FONTAN SURGERY A CASE REPORT

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Background / Hypothesis:
Veno-venous extracorporeal membrane oxygenation (VV-ECMO) after Fontan surgery is often ineffective due to high recirculation rates, limiting oxygen delivery. However, in fenestrated Fontan circulation, oxygenated blood entering the atrium may reduce recirculation, thereby improving VV-ECMO efficacy. The development of dual lumen catheters allows VV-ECMO via right internal jugular vein cannulation alone, enabling prone positioning and aggressive respiratory therapy. We report a case of severe hypoxemia after fenestrated Fontan surgery successfully managed with VV-ECMO using a dual lumen catheter, resulting in patient survival.

Materials and Methods:
A 4-year-old girl (10 kg, BSA 0.50m2) with pulmonary atresia and intact ventricular septum underwent extracardiac total cavopulmonary connection at 2 years of age. Postoperatively, progressive left pulmonary artery and left pulmonary vein stenosis led to elevated Fontan pressures. Despite catheter-based fenestration attempts, inadequate fenestration creation and mitral valve chordal rupture necessitated surgery. Surgical fenestration (5 mm), mitral valve repair, left superior pulmonary vein stenting, pulmonary artery septation, and a left systemic-to-pulmonary shunt (5 mm) were performed. However, hypoxemia persisted due to increased flow through the fenestration and ventilation-perfusion mismatch. On postoperative day 6, additional left lower pulmonary vein stenting and reduction of the fenestration size (from 5mm to 4 mm) were performed, but intraoperative hypoxemia necessitated VV-ECMO initiation.

Results:
Dual lumen catheter was inserted via the right internal jugular vein under fluoroscopic and echocardiographic guidance. Stable ECMO flow and improved oxygenation were achieved. Prone positioning and aggressive pulmonary rehabilitation were maintained. VV-ECMO was successfully weaned on day 5, and extubation followed on day 6. The patient was discharged on postoperative day 94.

Conclusions:
Dual lumen catheter VV-ECMO via the right internal jugular vein was effective in managing hypoxemia following fenestrated Fontan surgery. This approach enabled stable ECMO flow and allowed for aggressive physiotherapy, contributing to favorable outcomes. Further case accumulation and the development of standardized guidelines are warranted.

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Category: Heart failure, Mechanical Circulatory Support and Transplant

1370 - ANESTHETIC MANAGEMENT EXPERIENCE IN PEDIATRIC END STAGE HEART FAILURE WITH LEFT VENTRICULAR ASSIST DEVICE IMPLANTATION AN ANALYSIS OF 11 CASES

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Background / Hypothesis:
To summarize the anesthetic management strategies and outcomes of left ventricular assist device (LVAD) implantation in children with end-stage heart failure, providing evidence-based clinical experience.

Materials and Methods:
A retrospective analysis was conducted on the clinical data of 11 children (7 males, 4 females; age 6–14 years; weight 14–52 kg) who underwent LVAD implantation between February 2023 and December 2024. All had dilated cardiomyopathy, with 2 cases of congenital heart disease and 2 of progressive muscular dystrophy. Preoperative ultrasound assessed ventricular function, pulmonary artery pressure, and valve regurgitation. Anesthesia was induced slowly and maintained with intravenous and inhalational agents, with intraoperative drug adjustments based on hemodynamics. Ultrasound-guided venous and arterial puncture and pulmonary artery catheter placement were performed. During cardiopulmonary bypass, lung-protective ventilation (VT: 2 ml/kg, f: 5 breaths/min, PEEP: 5 cmH2O) was used. After bypass, inhaled nitric oxide was given to reduce pulmonary vascular resistance. Post-LVAD initiation, continuous monitoring of transesophageal echocardiography (TEE), cardiac index (CI), and pulmonary artery pressure (PAP) guided adjustments in pump speed and vasopressors to maintain circulatory stability.
Results:Intraoperative vital signs remained stable. The average operation time was 253.09 ± 37.86 minutes, with a cardiac arrest time of 77 ± 21.33 minutes. One case required ECMO for low cardiac output syndrome, and one patient died postoperatively. The survival rate at discharge was 90.9%.

Conclusions:
Pediatric end-stage heart failure surgery carries high anesthetic risk, including severe hypotension and cardiac arrest. Key considerations include: 1) comprehensive preoperative evaluation; 2) slow, staged induction with individualized anesthetic depth and high-dose opioids; 3) ultrasound-guided puncture; 4) lung protection during bypass; 5) combined milrinone, nitric oxide, and adjusted ventilation after LVAD initiation; 6) optimization of pump speed and volume with TEE and hemodynamic monitoring; 7) inotrope adjustment to maintain cardiac output and vascular resistance.

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Category: Heart failure, Mechanical Circulatory Support and Transplant

1386 - A PRELIMINARY STUDY ON THE SAFETY AND EFFICACY OF RHBNP IN IMPROVING CARDIAC FUNCTION IN CHILDREN WITH POSTOPERATIVE CARDIAC DYSFUNCTION AFTER CHD SURGERY

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Background / Hypothesis:
To investigate the safety and efficacy of recombinant human brain natriuretic peptide (rhBNP) in improving cardiac dysfunction in children with postoperative cardiac dysfunction after congenital heart disease(CHD) surgery, as well as its antagonistic effects on the catecholamine system and the RAAS system .

Materials and Methods:
Children with LVEF below 50% after CHD surgery were selected as the study subjects. The children were divided into two groups: the traditional treatment group and the rhBNP group (traditional treatment group+rhBNP).There were 50 children in each group. The following indicators were measured before and after treatment in each group. Indicator for evaluating cardiac dysfunction improvement: the increasing of LVEF. Indicators for evaluating safety: blood pressure, urine output, serum creatinine, serum NGAL, serum sodium, and serum potassium. Indicators for evaluating the antagonism of inflammatory response and the RAAS system: blood inflammatory factor indicators, catecholamines, and renin-angiotensin-aldosterone (RAAS) markers. Statistical methods: t-tests or Mann-Whitney U test were used for intergroup comparisons, with $P < 0.05$ considered statistically significant.

Results:
Compared with the traditional treatment group, there were no statistically significant differences in safety indicators in the rhBNP group. Compared with the traditional cardiac drug group, the increase in LVEF in the rhBNP group was significantly higher; the indicators of inflammatory response, catecholamines, and the RAAS system were significantly reduced.

Conclusions:
rhBNP can not only improve heart dysfunction, but also antagonise inflammatory factors, as well as the catecholamine system and RASS system.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1454 - PREDICTORS OF MYOCARDIAL RECOVERY AND DEVICE EXPLANTATION IN CHILDREN SUPPORTED WITH BERLIN HEART EXCOR

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Background / Hypothesis:
For young patients with a body surface area (BSA) under 0.6 m^2 and advanced heart failure (HF), the Berlin Heart EXCOR (BHE) is often the only available mechanical circulatory support to bridge them to heart transplant. While the majority eventually undergo transplantation, some recover sufficient cardiac function to allow BHE explantation. This study aimed to identify clinical predictors of myocardial recovery during BHE support.

Materials and Methods:
We retrospectively reviewed all consecutive patients who underwent BHE implantation at The Royal Children's Hospital between 2009 and 2024. Data were extracted from electronic medical records. A penalized Cox regression model with LASSO regularization was used to identify predictors of successful BHE explantation.

Results:
Seventy-two patients received BHE during the study period. The median age at implantation was 1.06 years (IQR: 0.44–2.92), and median BSA was 0.43 m^2 (IQR: 0.30–0.56). Overall, 47 patients (65.3%) underwent heart transplantation, 10 (13.9%) were successfully explanted after recovery, and 14 (19.4%) died during support. Among the recovered group, 60% had myocarditis and 40% had dilated cardiomyopathy. Nine of ten patients with recovery had a BSA between 0.35 and 0.53 m^2; none with BSA <0.35 m^2 recovered.
LASSO Cox regression identified myocarditis (HR = 1.76), BSA between 0.35–0.55 m^2 (HR = 3.51), bridge-to-transplant strategy (HR = 0.93), and right ventricular assist device (HR = 0.81) as factors associated with BHE explantation. Due to the low number of events, classical statistical inference was not applied.

Conclusions:
BHE is an effective support strategy for young heart failure patients, with recovery possible in select cases. Myocarditis and a body surface area between 0.35 and 0.55 m^2 at implantation were associated with myocardial recovery. These patients may benefit from tailored management and close cardiac monitoring, potentially avoiding transplantation and lifelong immunosuppression.

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Category: Heart failure, Mechanical Circulatory Support and Transplant

1479 - PROGNOSIS OF PEDIATRIC DILATED CARDIOMYOPATHY AN EVIDENCE BASED NOMOGRAM AND SCORING SYSTEM FOR PREDICTING DEATH HEART TRANSPLANTATION RISK

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Background / Hypothesis:
The aim of this study was to suggest a simple and feasible predictive model to investigate the risk factors and long-term prognosis in children with dilated cardiomyopathy (DCM).

Materials and Methods:
A total of 233 pediatric patients with DCM hospitalized between January 2019 and June 2024 were enrolled. Children were followed up regularly after discharge and divided into death/heart transplantation group and non-death/heart transplantation group. Univariate and multivariate analysis were used to explore the risk factors of death/heart transplantation in children with DCM. A nomogram model and a scoring system were developed. The performance of these models was evaluated using the H-L test, ROC analysis and internal validation.

Results:
The results demonstrated that the age of onset, cardiac functional classification III–IV, moderate-to-severe mitral regurgitation, low voltage in limb leads on the ECG, and the requirement for vasoactive drugs are independent predictors of the risk of D/HT in DCM children. A nomogram model was developed, achieving an AUC of 0.804 (95% CI: 0.734–0.874). This model exhibited a sensitivity of 80.3% and a specificity of 66.7%. A scoring system was established: 1 point for age of onset, 10 points for cardiac functional classification III–IV, 2.5 points for moderate-to-severe mitral regurgitation, 4 points for low voltage in limb leads on the ECG, and 3 points for the requirement for vasoactive drugs (or 0 points if none of these criteria were met). When the cumulative score was ≥13.25, the sensitivity and specificity increased to 68.9% and 73.9%, respectively.

Conclusions:
We developed a nomogram model and scoring system model with good calibration and discrimination, which can predict the risk of death/heart transplantation in children with DCM in a fast and accurate way.

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Category: Heart failure, Mechanical Circulatory Support and Transplant

1489 - THE ASSOCIATION OF VIT D DEFICIENCY IN PEDIATRIC PATIENTS WITH DILATED CARDIOMYOPATHY

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Nicvd, Peads Cardiology, Karachi-Pakistan [1] Nicvd, Pathology, Karachi-Pakistan [2]

Background / Hypothesis:
Heart failure is complex clinical condition in which heart is unable to generate enough cardiac output to meet the metabolic needs of the body.[1] The reported incidence of HF in children is 0.97 to 7.4 per 100,000. [2] Pediatric heart failure occurs due to multiplicity of etiologies like structural heart disease, arrhythmias, viral infections, cardiomyopathies, toxins or drugs.[3]. Vitamin D deficiency is one of the treatable cause of dilated cardiomyopathy. In adults Vitamin D deficiency has been associated with increase all cause mortality and reduced survival in patients with heart failure There is limited data in the field of pediatrics evaluating impact of vitamin D deficiency on heart failure. The aim of proposed study is to assess serum level of vitamin D in pediatric patients with dilated cardiomyopathy and to correlate its level with left ventricular dimensions, functions and with level of N terminal pro BNP.

Materials and Methods:
Study design: A cross sectional prospective study conducted from July 2024 to January 2025 at Pediatric Department NICVD.
Sample size: total 80 cases were included in this study.
Sample selection: All children between the ages of 1 month to 18 years presented with cardiac failure. Non probability consecutive purposive sampling. Sided p-value of ≤ 0.05 will be taken as the criterion for significance

Result:
Total 82 cases were included in study. cases into 2 categories, age <5 years included 62 patients (66%) and age >5 years included 32 patients (34%). vitamin D levels with the pro BNP it is found that lower levels of vitamin D is associated with high pro BNP, is statistically significant.

Conclusio :
Correlation of levels of vitamin D with the level of LV dysfunction evaluated

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Category: Heart failure, Mechanical Circulatory Support and Transplant

1571 - EXTRACORPOREAL RESUSCITATION IN A PEDIATRIC OUT OF HOSPITAL CARDIAC ARREST A FEASIBLE STRATEGY IN A DEVELOPING COUNTRY

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Background / Hypothesis:
Extracorporeal cardiopulmonary resuscitation (ECPR) has emerged as a life-saving promising intervention for refractory pediatric out-of-hospital cardiac arrest (pOHCA), with increasing reports of its use worldwide. However, its application remains under-researched, with variable outcomes based on patient selection, timing of initiation, and institutional capabilities. In low- and middle-income countries (LMICs), ECPR implementation is further challenged by limited resources and specialized training. We present a case of pediatric OHCA managed with ECPR in Mexico, contributing to the growing body of evidence on its feasibility.

Materials and Methods:
We describe the case of a previously healthy 15-year-old male who suffered a witnessed OHCA while playing soccer. CPR was initiated by Emergency Medical Services, followed by continued CPR upon emergency department arrival. Despite prolonged resuscitation efforts, the patient exhibited cardiovascular instability, including episodes of sustained ventricular tachycardia and recurrent defibrillation attempts. Given the persistence of hemodynamic compromise, the multidisciplinary team determined that ECPR was an appropriate therapeutic option. ECPR was then initiated via median sternotomy with central veno-arterial (VA) ECMO cannulation.

Results:
The patient achieved stable extracorporeal flow, and myocardial function progressively recovered, allowing for decannulation on day five. Post-ECPR diagnostic evaluation revealed an anomalous origin of the right coronary artery from the left sinus of Valsalva, and the patient subsequently underwent a successful surgical correction of this anomaly. He was discharged with no major neurological sequelae and remains under clinical follow-up. To our knowledge, this is the first documented case of pediatric OHCA successfully managed with ECPR in Mexico.

Conclusions:
This case illustrates the feasibility of ECPR in LMICs when performed in specialized centers with multidisciplinary expertise. It highlights the need for further research to optimize ECPR protocols, standardize patient selection, and improve outcomes for pediatric OHCA patients globally, especially in resource-limited settings.

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Category: Heart failure, Mechanical Circulatory Support and Transplant

1610 - SUCCESSFUL MECHANICAL THROMBECTOMY IN PEDIATRIC PATIENT WITH BERLIN LVAD AND SUSPECTED MITOCHONDRIAL MYOPATHY.

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Background :
Ventricular assist devices (VADs) are increasingly being used in pediatric heart failure patients to improve outcomes, but they carry a risk of thromboembolic complications. The Berlin LVAD has a lower stroke risk with the use of bivalirudin, however data on mechanical thrombectomy (MT) in this population remains limited. Stroke diagnosis in patients with underlying myopathy is particularly challenging due to preexisting muscle weakness, which can mask new deficits. We report a case of successful MT due to acute large-vessel occlusion (LVO) in a patient supported on a Berlin LVAD with a suspected mitochondrial disorder associated with myopathy due to TOP3A mutation.

Case:
An 8-year-old girl with dilated cardiomyopathy (DCM) developed cardiogenic shock requiring Berlin LVAD placement. Postoperatively, she exhibited diffuse muscle weakness. Genetic testing revealed a novel TOP3A variant, a mitochondrial gene associated with DCM, myopathy, and neuropathy.

During routine physical therapy on POD 36, she was noted to have acute right hemiparesis. CT angiography showed near-occlusive thrombus of the distal left internal carotid artery (ICA) with occlusive thrombus of the left M1 segment. She underwent successful MT within 90 minutes, resulting in reperfusion without ischemic or hemorrhagic complications. Her right hemiparesis fully resolved within 24 hours. Notably, she had been on therapeutic anticoagulation with bivalirudin and aspirin for several days prior and there were no visible thrombi or fibrin deposits within her LVAD. Thrombophilia workup was negative.

Conclusion:
Baseline muscle weakness from mitochondrial myopathy complicates timely stroke recognition in Berlin LVAD patients. This case highlights the importance of vigilant neurological monitoring and rapid intervention. Mechanical thrombectomy is a safe and effective treatment for acute large vessel occlusion in pediatric Berlin LVAD patients, leading to favorable neurological outcomes despite diagnostic challenges.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1624 - OUTCOME ON THE HEART TRANSPLANTATION OF A DILATED CARDIOMYOPATHY IN A CHILDREN WITH MUTATION TNNT2

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Background / Hypothesis:
Dilated cardiomyopathy is a cardiovascular disease characterized by persistent ventricular dilatation and systolic dysfunction. It has a variety of causes, including myocarditis; exposure to narcotics, alcohol, or other toxins; and metabolic or endocrine disorders. Genetic factors play a dominant role in 30%–40% of dilated cardiomyopathy cases.

Materials and Methods:
We present the case of a 15-year-old female patient, who was admitted to our Institute referred from a second-level hospital with a history of heart failure until two months-old, she has the antecedent of a brother who passed out at fourteen years old of heart failure.
She was treaded with diuretic, and had multiple internments requiring treatment with levosimendan. LVFE was estimated at 16%. During her last hospitalization secondary causes were ruled out, however the patient tested positive for TTNT2 mutation (Pathogenic variant for familial dilated cardiomyopathy).
She was presented at session and was accepted to bicaval orthotopic heart transplant.

Results:
The patient was discharged twenty days after the procedure with improved functional class, with immunosuppression and antimicrobial prophylaxis. During follow up she presented type II graft rejection, that's why she needed to readjust the immunosuppression treatment. On the next biopsy she has no graft rejection. Continued follow-up through outpatient consultations. It is noteworthy that during the analysis of the piece in pathology, marked myocardial fibroelastosis was found.

Conclusions:
Dilated cardiomyopathy is a complex entity, should be highlighted that currently, over 50 genes encoding cytoskeletal, nuclear skeleton, mitochondrial, and calcium-handling proteins are linked to hereditary dilated cardiomyopathy. Of which have been reported with a heterogeneous group of genes encoding proteins with different functions, such as sarcomere integrity and force transmission, cytoskeletal architecture, cell–cell contact, nuclear organization, transcription, and ion channel activity. However titin is the most common disease gene accounting for 20%–25% of the genetic causes.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1630 - ECHOCARDIOGRAPHIC ASSESSMENT OF VENTRICULAR PERFORMANCE DURING EXTRA CORPOREAL MEMBRANE OXYGENATION WEANING IN CHILDREN AN EXPLORATORY STUDY

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The Children, Heart Centre For Children, Sydney-Australia [1] The Children, Newborn & Paediatric Emergency Transport Services, Sydney-Australia [2]

Background:
Predictors of successful VA-ECMO decannulation in children and changes in echocardiographic indices in response to altered loading conditions are incompletely characterised. LVOT VTI>10cm and S'>6cm/sec are favourable weaning predictors in adults.

Methods:
Twenty-four children on VA-ECMO underwent echocardiography-supported ECMO weaning assessment. Data expressed as median (IQR)
Results: Twenty-four children, median age 1.9 months (IQR 0.4–21.3), weight 4.8kg (3.1-19.4), sixteen (66.67%) male included. VA-ECMO indication was myocarditis (9, 37.5%), sepsis (5, 20.8%), arrhythmia (4, 16.7%), dilated cardiomyopathy (3, 12.5%) and other (3, 12.5%). Median duration of ECMO at assessment was 5 days (3.75-7).
VA-ECMO was weaned from a median of 101mL/kg/min (77-118) to 28mL/kg/min (12-38). Comparing maximum and minimum flows, there was no change in heart rate (116BPM, 89-133 to 119BPM, 97-137) nor mean arterial pressure (57mmHg, 47-70 to 55mmHg, 45-63), but an increment in pulse (20mmHg, 16-24 to 25mmHg, 23-34) and central venous pressure (6mmHg, 5-8.3 to 8mmHg, 7-9.3).
Ejection fraction (27.7%,16.6-50.6 to 30.1%, 27.6-59.9, P=0.016), and LVOT VTI (4.1cm, 3.4-7.2 to 8.3cm, 6.1-10.8, P<0.001) increased by 28.2% and 59.7% respectively. However LVEDD, LVEDD Z-score and fractional shortening did not significantly increment (P>0.05).
Lateral mitral systolic (S' 3.7cm/sec, 3.1-4.5 to 4.4cm/sec, 3.8-5.6) and early diastolic (E' 4.4cm/sec, 3.2-6.7 to 4.6cm/sec, 4.2-8.2) indices were relatively insensitive to changes in ventricular loading, whilst early peak transmitral velocity increased (E 39.2cm/sec, 30.1-53.2 to 51.6cm/sec, 40.3-70.3).
Eighteen (75%) were decannulated from ECMO within 48hrs of weaning assessment and survived to 30-days without MCS or transplant. Of these, 12/17 (70.6%) had a minimum flow LVOT VTI of < 10cm, and 11/14 (78.6%) a lateral S' of <6cm.
Conclusions: Load-dependent and independent indices of ventricular function in children on VA-ECMO vary with ECMO flow rate. Echocardiographic indices predictive of successful ECMO weaning may differ from adult values, and should be investigated prospectively in children.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1681 - CLINICAL AND ECHOCARDIOGRAPHIC PROFILE OF PEDIATRIC CARDIOMYOPATHIES IN CHILDREN IN A TERTIARY CARE CENTRE IN INDIA

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Background / Hypothesis:
Cardiomyopathies in children are rare but serious myocardial disorders, presenting with varied symptoms and complex underlying aetiologies. Early diagnosis is challenging due to overlap with other cardiac and systemic illnesses. This study aims to delineate the clinical spectrum, echocardiographic findings, and genetic profiles of paediatric cardiomyopathies managed at a tertiary care centre.

Materials and Methods:
This retrospective observational study included 49 children under the age of 18yrs diagnosed with cardiomyopathy (excluding structural and ischemic heart disease) over a 5-year period. Data collected included clinical history and examination, echocardiographic parameters, ECG findings, laboratory markers and genetic testing results

Results:
The median age at presentation was 4.5 years (range: 2 months to 18 years); 59% were female. Common presenting complaints included fast breathing (63%), poor feeding (29%), and lethargy or syncope (14%). The predominant phenotypes were dilated cardiomyopathy (DCM, n-36, 73%), non-compaction cardiomyopathy (NCCM, n-9, 18%), HOCM (n-5, 10%), RCM (n-3, 6%) and 1 case of Arrhythmogenic right ventricle. Most common ECG finding was sinus tachycardia with LVH and low voltage complexes seen in 60%. The mean (LVIDd) was 81.9 mm +/-3.4mm, mean Ejection fraction was severely reduced at 25.3%, with over 60% of patients having EF <30%. Global longitudinal strain (GLS), showed a mean value of 9.5% & diastolic dysfunction in 39%, moderate to severe mitral regurgitation in 26%, and reduced TAPSE/MAPSE in advanced cases. Mean NT pro BNP was 14,000 (1,017 -70,000)pg/ml. Genetic mutations were identified in 24% of tested patients—common variants included TPM1, PKP2 mutations. Medical management included Diuretics, Beta blockers, ACE inhibitors with ARNI used in 20% (n-16) with advanced DCM.

Conclusions:
Paediatric cardiomyopathies exhibit diverse phenotypes with Nonspecific clinical symptoms making early diagnosis difficult, emphasizing the need for high degree of suspicion among primary paediatric care providers. Early diagnosis, risk stratification and targeted therapy can improve outcomes.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1704 - ACUTE KIDNEY INJURY IN PEDIATRIC POSTCARDIOTOMY EXTRACORPOREAL MEMBRANE OXYGENATION COMPARISON AND RISK FACTOR ANALYSIS OF PRIFLE KDIGO AND PROCK DEFINITIONS

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Background / Hypothesis:
Kidney disease: improving global outcomes (KDIGO) and pediatric-modified risk, injury, failure, loss, and end-stage (pRIFLE) classifications are commonly used in pediatric acute kidney injury (AKI). As a novel AKI definition (pediatric reference change value optimized for AKI in children), pROCK considered the high variability of serum creatinine in children. This study aims to compare the above three definitions of AKI in children who undergo ECMO after cardiac surgery, demonstrate that the pROCK criterion is more closely correlated with the prognosis of pediatric postcardiotomy ECMO, and explore the risk factors for stage-3 AKI according to the pROCK criterion.

Materials and Methods:
We analyzed a clinical cohort of 79 pediatric postcardiotomy ECMOs. AKI is defined and graded based on pRIFLE, KDIGO, and pROCK. We assessed incidence differences and diagnostic agreement across definitions. We investigated the relationship between postoperative outcomes and stage-3 AKI by each definition and analyzed the risk factors for stage-3 AKI according to the pROCK criteria.

Results:
According to pRIFLE, KDIGO, and pROCK, 25 (31.6%), 40 (50.6%), and 28 (35.4%) patients developed stage-3 AKI during postcardiotomy ECMO, respectively. The agreement between pRIFLE and KDIGO was almost perfect, while there was only a slight agreement between pROCK and them. There is a positive correlation between stage-3 AKI by pROCK and hepatic dysfunction, infection, ECMO weaning failure, in-hospital mortality, ICU length of stay, mechanical ventilation time, and hospital length of stay. The lactate at ECMO implantation, extracorporeal cardiopulmonary resuscitation (ECPR), and maximum pump speed during ECMO are independent risk factors for stage-3 AKI by pROCK criteria.

Conclusions:
Compared with pRIFLE and KDIGO, stage-3 AKI defined by pROCK was better associated with postoperative adverse outcomes. The lactate at ECMO implantation, ECPR, and maximum pump speed increased the risk of stage-3 AKI by pROCK criteria during pediatric postcardiotomy ECMO.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1770 - AN EXPLORATION OF SCAR MANAGEMENT IN PEDIATRIC HEART TRANSPLANT A QUALITY IMPROVEMENT PROJECT

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Background:
We describe a novel quality improvement project to increase clinical team knowledge on scar management, to formalize the referral process, and to identify education needs of patients and families so timely, proactive scar management education is provided.

Methods:
Members of the HTx multidisciplinary team were provided with education regarding scar healing and indications for OT referral with both pre- and post-knowledge testing using questionnaires. Families of children within a year post-HTx were asked to participate in a questionnaire to explore their experiences and understand their learning needs around scar management.

Results:
Team members (n=7) pre- and post-knowledge testing showed improved knowledge in identifying problematic scars, understanding risk factors to poor scar healing, indications and understanding the role of OT in scar management.

8 families were eligible to participate. 3/8 families were unable to participate (2=out of province; 1=nearly 1 year post HTx with stable scar). 5/8 families participated (mean age of patients 9.2 yrs ± 4.97; median 9.8 months post HTx, range 7-12 months). Responses were obtained from 5 caregivers and 2 patients (ages 10 and 16y). All caregivers and patients reported receiving “enough” scar management education, follow up and timely education. Preferences for delivery of education (multi-select available) included the following: conversation in clinic (80% caregivers, 100% patients), in-person demonstration (60% caregivers, 50% patients, handout (20% caregivers, 0% patients), video demonstration (0% caregivers, 50% patients). No participants identified a group education session as being a helpful mode of education.

Conclusions:
Frontline team member education can be impactful on clinician knowledge of scar management which may allow for more effective education provision to families. Responses from caregivers and patients suggest that a multi-modal approach may be preferred over the current uni-modal approach. The impact of the implementation of a standardized education protocol in the first year post-HTx remains to be seen.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1837 - RESEARCH ON A NOVEL SELF POWERED FONTAN CAVOPULMONARY ASSIST DEVICE

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Background / Hypothesis:
To design a novel self-powered Fontan cavopulmonary assist device and evaluate its hemodynamic performance using computational fluid dynamics (CFD) simulation, followed by optimization based on the results.

Materials and Methods:
The ventricular assist device primarily consists of three components: a power chamber, an anti-reflux elastic membrane, and a blood chamber. CFD simulations were performed using Ansys Fluent to analyze the hemodynamics of each component. Key parameters included: the influence of the power and blood chamber geometries on blood flow patterns and energy loss; the effects of the elastic membrane's diameter, thickness, and Young's modulus on strain energy, stroke volume, and energy loss; and the anti-reflux performance of the fishmouth-shaped inlet of the elastic membrane. During the simulation, the membrane's thickness, diameter, and Young's modulus were adjusted to obtain a range of stroke volume data, and the design with optimal hemodynamic performance was selected as the final configuration.

Results:
When the power and blood chambers were bowl-shaped, the wall shear stress on blood entering the chamber was minimized, generating a spiral laminar flow with the lowest fluid energy loss. Considering capacity of thoracic cavity and stroke volume requirements in children, a membrane with a diameter of 50 mm and thickness of 0.29 mm achieved a stroke volume of 18.2 mL per beat, approximating the cardiac output of preschool-aged children. Given these parameters, 88 mJ (31.5%) of input energy was consumed as strain energy, 19 mJ (6.8%) was wasted as fluid flows, and effective output work reached 172 mJ (61.7%). During systole, the elastic membrane deformed toward the blood chamber, causing the closure of fishmouth-shaped inlet, effectively preventing significant reflux.

Conclusions:
The Fontan cavopulmonary assist device basically meets the demands of stroke volume and energy distribution for pediatric patients, making a powered Fontan circulation feasible.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1867 - FIRST ON SITE EXPERIENCE WITH THE MOLECULAR MICROSCOPE DIAGNOSTIC SYSTEM (MMDX HEART) IN PAEDIATRIC HEART TRANSPLANT RECIPIENTS IN EUROPE

Karel Koubský [1], Ondřej Materna [1], Jan Janoušek [1], Petra Hrubá [2], Lenka Hošková [3], Ondřej Viklický [4]
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Background / Hypothesis:
The Molecular Microscope Diagnostic System for heart transplantation (MMDx-Heart) uses microarrays to quantify biopsy-based gene expression and utilizes machine learning to interpret the results. MMDx assesses T cell–mediated rejection, antibody-mediated rejection, parenchymal injury, and atrophy-fibrosis (Halloran et al., Transplantation, 2023). The objective was to compare MMDx to histology.

Materials and Methods:
A single-centre retrospective analysis of MMDx results (November 2022 - March 2025). The MMDx® was licensed and established into the routine clinical practice at the Institute for Clinical and Experimental Medicine in Prague, therefore the results were available in 2 days. MMDx was indicated in patients exhibiting discrepancies between clinical and histological findings, or in patients deemed to be at elevated risk of rejection.

Results:
MMDx tests were conducted on 29 EMBs from 14 patients, with a median time of 589 days (IQR 78 – 1256) after transplantation. No patients exhibited systolic graft dysfunction. Diastolic dysfunction was observed in 9 instances, and donor specific antibodies were present in eleven. The most prevalent EMB finding was no rejection in histology (cellular rejection grade up to 1R) in concordance with MMDx (N=17). Considerable disagreement was observed in cases of rejection. Histology showed significant rejection in 8 cases and MMDx in 6, with only 1 case of concordance between the two methods. Three cases of rejection by histology were classified as injury by MMDx. In cases of rejection by MMDx despite histology, the result was considered a risk factor in deciding further management.

Conclusions:
In the majority of EMBs, MMDx increased the certainty of a non-rejection diagnosis in high-risk patients. However, discrepancies between histology and MMDx were observed in cases with rejection diagnosed by either method. MMDx has the potential to enhance the diagnosis of rejection, but the current clinical relevance in paediatric heart transplant recipients remains unclear.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1875 - NEW TEAM NEW CHALLENGES TRANSITIONING AN ADOLESCENT VAD PATIENT TO ADULT CARE

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The Hospital For Sick Children, Cardiology, Toronto-Canada [1] The Hospital For Sick Children, Cardiac Critical Care, Toronto-Canada [2]

Background:
The transition from pediatric to adult care is challenging for all patients. This is further compounded by a diagnosis of heart failure (HF) and the presence of a ventricular assist device (VAD). Differences in medical management, team members, care models, and expectations are just a few of the hurdles patients/caregivers will face during their journey. This case highlights the complexities of our first successful transition of an adolescent VAD patient to an adult program.

Case Description:
Herein we describe an adolescent female with a complex medical history including cardiomyopathy and HF secondary to hydroxychloroquine exposure on a background of systemic lupus erythematosus (SLE). She received a HeartMate 3 LVAD and her postoperative course was complicated by arrhythmias, right ventricular dysfunction, and inflammation of unknown etiology requiring chronic steroids, but ultimately discharged from hospital. Six-months before turning eighteen, our team engaged in a planned transition to adult care. This process involved exploring self-care expectations, multidisciplinary coordination, and psychosocial support to prepare the patient/family for the new care environment.

Discussion:
One challenge in the transition to adult care is ensuring adolescent VAD patients develop the skills and confidence to manage their own health. The shift from a family-centered model to a more patient autonomous decision-making model can lead to gaps in adherence, increased hospitalizations, and emotional distress. In our case, we embarked on a structured transition process that provided education, self-management coaching, and multidisciplinary support, combined with regular meetings with the adult HF team. Research highlights that early, individualized transition planning improves long-term outcomes, yet standardized protocols remain limited.

Conclusions:
A well-structured transition process is essential for continuity and positive outcomes in adolescent VAD patients transitioning to adult care. This case underscores the importance of early preparation, multidisciplinary collaboration, and ongoing support to navigate differences in care models and expectations.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1909 - EX VIVO MECHANICS IN SINGLE VENTRICLE PATIENTS CORRELATES WITH CARDIAC MAGNETIC RESONSANCE IMAGING MARKERS OF VENTRICULAR PERFORMANCE AND AGE AT TRANSPLANT LISTING

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Background / Hypothesis:
Ventricular performance is key to Fontan circulation success and transplantation-free survival in single ventricle heart disease (SVHD). Cardiac magnetic resonance imaging (CMR) has enabled novel markers of systolic and diastolic function, but their correlation to ex vivo SVHD muscle mechanics is undefined. This study evaluates CMR-derived ventricular performance measures and correlates them with ex vivo muscle mechanics in SVCHD patients.

Materials and Methods:
Patients with right-dominant SVHD were selected following CMR and subsequent heart transplantation for surgical palliation failure and stratified according to age at transplant listing. Trabecular muscle from SVHD patients was harvested following recipient cardiectomy and tested within a validated, ex vivo muscle bath system to determine responsiveness to exogenous pharmacologic and electrolyte stimulation. Ex vivo mechanics were correlated to pre-transplantation CMR markers of ventricular performance along with clinical markers of heart failure.

Results:
Twelve (75%) SVHD patients had a CMR prior to transplant listing (mean 133 days ± 145 days prior to transplant) and explanted trabecular muscle mechanics. Baseline ($r=0.26$, $p<0.05$) and maximal ($r=0.28$, $p<0.05$) calcium-induced tension correlated with age at listing. Early transplant patients (2 yrs, IQR: 0.7–5.7) had lower end-diastolic volume-to-wall thickness ratios and thinner myocardial walls than late transplant patients (15.9 yrs, IQR: 14.8–16.3) ($p<0.05$). Early transplantation also correlated with higher calcium responsiveness, lower isoproterenol sensitivity, higher CMR-measured wall stress, reduced circumferential/longitudinal strain, and elevated BNP levels at transplantation.

Conclusions:
Ventricular muscle from SVHD patients requiring early transplantation is more calcium-responsive than in late transplant patients. Ex vivo muscle mechanics significantly correlated with CMR-derived systolic and diastolic performance (strain, stress, volume, wall thickness). These findings support further validation of CMR-derived ventricular performance measures to guide individualized pharmacotherapy and optimal transplant listing age. Such studies will provide a non-invasive, longitudinal approach to improve longevity and quality of life in SVHD patients

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1919 - RESULTS OF PULMONARY ARTERY BANDING IN THE MANAGEMENT OF ADVANCED HEART FAILURE IN DILATED CARDIOMYOPATHY. INITIAL EXPERIENCE FROM A PEDIATRIC CARDIOLOGY CENTER

Marcia Cristina Rodrigues Matos [1], Luis Otavio Canpanha Sant Anna [2], Vanesa Augusto Canuto Nunes [3], Renata Burini Chaccur [4], Wanda Teixeira Moreira Do Nascimento [2], Mariana Nunes Oliveira [5], Maria Rene Rocha Claure [6], José Cicero Stocco Guillen [7], Carlos Pedra [8], *Simone Rolim Pedra* [9]

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Introduction:
Dilated cardiomyopathy (DCM) is the leading cause of heart failure (HF) and indication for heart transplant (HTx) in the pediatric population. The lack of durable and appropriate ventricular assist devices for young children and the long waiting times for HTx has led to alternative therapies such as pulmonary artery banding (PAB) to improve clinical status and LV recovery.

Methods:
Retrospective analysis of 12 children with DCM and LV ejection fraction (EF) < 35%, with preserved right ventricular (RV) function and refractory to conventional medical therapy, who underwent PAB from 2021 to 2025, based on the Giessen's group protocol.
Results: Fifty percent was male, median age 7 months (mean 10.9±8). Seven patients (58.3%) were under ventilatory and Inotropic support before the procedure. Preoperative EF was 23.7±6.4%, and median NTProBNP levels were 6860 (1060-49000), decreasing to 2165 (445-17000) after 3 months. Main complications in the postoperative period were sinus tachycardia and hypotension, managed with sedation, IV beta-blockers, inotropes and vasopressors. Atrial septostomy was performed in 9 patients, 1 to 12 days after PAB. One patient required ECMO support and HTx short after the procedure. Other required re-banding after 2 months and was refered to HTx after 7 months. The others showed progressive improvement in functional class (NYHA I and II), EF and adequate weight gain. The median follow-up time was 4.5 month (1-36 months). Median length of stay was 49 days (22-416). The EF (biplane Simpson's) improved from 16±7% to 29±7% at 3 months. In 3 children, current EF is above 50%. The postoperative medical therapy included Bisoprolol, Lisinoprol and Spironolactone. No deaths occurred.

Conclusion:
PAB is a simple, cheap and safe procedure. It has shown to be a promising therapeutic strategy, improving functional class and LV EF, with potential LV functional recovery or as a bridge to heart transplantation.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1940 - PEDIATRIC DILATED CARDIOMYOPATHY PRESENTATION OUTCOME AND PREDICTORS OF MORTALITY IN A JORDANIAN POPULATION.

Laila Tutunji [1], Ala Elayyan [1], Dana Sakaji [1], Dana Alantari [1], Farah Muzher [1], Ali Halabi [2], Iyad Al-ammouri [1]
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Background / Hypothesis:
Pediatric Dilated Cardiomyopathy (PDC) constitutes a significant cause of morbidity, mortality and is the third most common cause of heart failure and the most common indication for heart transplantation in pediatrics. This study is the first to investigate the presentation, outcome and predictors of mortality of PDC in Jordan.

Materials and Methods:
A retrospective chart review was conducted on all patients diagnosed with PDC at the University of Jordan Hospital between 2009 and 2024.
Demographic and clinical parameters were collected including family history of CMP, consanguinity, affected siblings, presenting symptoms echocardiography at presentation (EF, LVEDD), medications, progression of disease and outcome.
Statistical Analysis was performed using STATA SE 18.0,
Descriptive statistics were employed. Outcome measures were death, vs alive at follow up. Univariate and multivariate regression analysis was performed exploring factors associated with mortality including family history of cardiomyopathy, consanguinity, sex, age category, ejection fraction (EF), left ventricular end diastolic dimension (LVEDD) Z scores, and the presence of mitral regurgitation (MR).

Results:
The study enrolled 58 patients, 50% were male, 19 (34.6%) were consanguineous, 19 (33.3%) had a family history of cardiomyopathy and the mortality was 50%. The median ages at presentation and mortality were 1.2 and 3 years respectively. The mean EF was 44.46% +_ 16.9 and the mean LVEDD z scores were 9.5 +_ 6.2. Multivariate logistic regression revealed familial cardiomyopathy as a strong independent predictor of mortality (OR = 53.6, 95% CI: 1.65–1735.5, p = 0.025), along with EF, (OR = 0.84, 95% CI: 0.73–0.96, p = 0.012). LVEDD Z-score, gender, and consanguinity were not significant predictors in the adjusted model.

Conclusions:
These findings underscore the importance of familial etiology and systolic function (EF) as key determinants of mortality in PDC in Jordan and highlight the importance of genetic testing and the conduct of future multicentric prospective studies.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1964 - DIAGNOSTIC AND THERAPEUTIC JOURNEY OF PEDIATRIC DILATED CARDIOMYOPATHY A CASE BASED APPROACH

Lichao Gao [1], Chunhong Xie [1]
Children's Hospital, Zhejiang University School Of Medicine, Cardiology, Hangzhou-China [1]

Background / Hypothesis:
Dilated cardiomyopathy (DCM) is a heterogeneous cardiomyopathy characterized by ventricular dilation and decreased myocardial contractility. This case report presents the diagnostic and therapeutic journey of a pediatric patient with DCM, highlighting the importance of comprehensive assessment and individualized treatment strategies in managing this complex condition.

Materials and Methods:
A boy was admitted to our Hospital on September 15, 2023. The patient had a family history of congenital heart disease in his cousin but no other significant past medical history. A thorough diagnostic workup was conducted, including laboratory tests, echocardiography, cardiac magnetic resonance imaging, and genetic testing. The patient was initially diagnosed with DCM, heart failure, NYHA class III, pulmonary hypertension, pleural effusion, and thrombocytopenia. Treatment strategies were tailored based on the patient's clinical presentation and diagnostic findings.

Results:
The patient's initial laboratory tests revealed thrombocytopenia (PLT 52×10^9/L) and elevated NT-proBNP levels (2873.5 pg/ml). Echocardiography showed global cardiac dilation with significant impairment of left ventricular systolic function and mild pulmonary hypertension. Genetic testing identified a mutation in the DSP gene, confirming the diagnosis of primary DCM. The patient was initially managed with a combination of medications, including digoxin, milrinone, dopamine, furosemide, spironolactone, enalapril, Levosimendan, and other supportive therapies. His condition improved with treatment, and he was discharged with a BNP level of 857 pg/ml. Follow-up echocardiography demonstrated reduced cardiac dilation and improved right ventricular function. The patient's treatment regimen was adjusted during follow-up visits, with the introduction of sacubitril/valsartan, metoprolol, and dapagliflozin, among other medications.

Conclusions:
This case underscores the importance of a comprehensive diagnostic approach, including genetic testing, in identifying the underlying cause of DCM in pediatric patients. Tailored treatment strategies, incorporating both pharmacological and non-pharmacological interventions, can lead to significant improvements in clinical outcomes. Continuous follow-up and monitoring are essential for optimizing treatment and managing potential complications.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1978 - PERCUTANEOUS DECOMMISSIONING OF A LEFT VENTRICULAR ASSIST DEVICE IN A PEDIATRIC PATIENT AND LITERATURE REVIEW

Hua-feng Wang [1], Chun-hong Xie [1], Ru Lin [2], Song-ling Fu [1], Yu-jia Wang [1], Li-chao Gao [1], Fang-qi Gong [1]
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Background / Hypothesis:
Heart failure remains a significant cause of mortality, with a rising incidence and high mortality rate. There are over 64 million heart failure patients globally. In pediatric patients with end-stage heart failure, Left ventricular assist devices (LVADs) have become an important treatment strategy for these patients, improving survival quality and organ perfusion while awaiting heart transplantation or as a destination therapy. However, complications such as thrombosis and bleeding are more common in children due to their immature organ function and coagulation systems. Traditional surgical removal of LVADs is highly invasive and associated with significant complications, especially in children.

Materials and Methods:
This case report describes a 6-year-old girl with chronic heart failure who underwent percutaneous decommissioning of her LVAD due to thrombosis within the outflow graft. The procedure involved placing two vascular plugs inside the outflow graft of the LVAD via a retrograde approach through the femoral artery to permanently deactivate the device.

Results:
Percutaneous LVAD decommissioning was successfully performed without complications. The patient's urine color cleared, indicating improved hemolysis, and her vital signs remained stable. There were no signs of new systemic thromboembolism. The patient eventually underwent successful heart transplantation and was discharged with normal follow-up.

Conclusions:
Percutaneous LVAD decommissioning is a safe, reliable, and less invasive alternative to surgical explantation. It avoids the risks associated with re-thoracotomy and preserves the ventricular apex for potential future re-implantation. This case highlights the feasibility and benefits of percutaneous LVAD decommissioning in pediatric patients, which may become an attractive option for managing complications related to LVADs. Further long-term follow-up and data from more patients are needed to optimize this treatment approach.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

1985 - RISK STRATIFICATION AND PEDIATRIC ECMO CARDIOGENIC SHOCK OUTCOME SCORE INSIGHTS FROM CHINA'S 7 YEAR MULTICENTER REGISTRY

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Background / Hypothesis:
ECMO support for pediatric refractory cardiogenic shock is associated with high mortality and poses significant clinical challenges. Leveraging data from the Chinese Pediatric Extracorporeal Life Support (CP-ECLS) Registry, this study established a predictive model to identify early warning factors for in-hospital mortality and assist clinical decision-making.

Materials and Methods:
This multicenter retrospective study utilized data from the CP-ECLS Registry to analyze children receiving VA-ECMO for RCS between January 2017 and December 2023. Multivariate Cox regression identified early warning factors for in-hospital mortality, while a prognostic model equation by integrating the weighted contributions of risk factors. A time-dependent risk stratification assessment tool: Pediatric ECMO Cardiogenic Shock Outcome Score PECSOS was developed to visualize the prognostic model for clinical application.

Results:
A total of 1,113 eligible children receiving ECMO between 2017-2023 were identified from the CP-ECLS registry, with 666 (59%) surviving to discharge.Through integration of Cox regression analysis and variable importance ranking to develop a model equation. A risk score cutoff of 1.74 was selected in the model equation to stratify the dataset into high-risk and low-risk groups for in-hospital mortality. Total dataset underwent stratified random sampling (6:4 ratio) yielding into training set and test set. The prognostic model developed on the training set demonstrated satisfactory performance upon external validation in the test cohort (Training set: days 3, 7, and 14 were 0.816, 0.807, and 0.800; Test set: days 3, 7, and 14 were 0.797, 0.766, and 0.759). To enhance clinical utility, we developed the PECSOS (Pediatric ECMO-Cardiogenic Shock Outcome Stratification) risk stratification schema. The high-risk cohort necessitates intensified hemodynamic monitoring and aggressive therapeutic escalation to mitigate adverse outcomes.

Conclusions:
The risk stratification model and PECSOS in this study demonstrate potential to optimize clinical decision-making for pediatric refractory cardiogenic shock (RCS) requiring ECMO support, with implications for improving prognosis and enhancing healthcare resource allocation efficiency.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2003 - ANESTHETIC MANAGEMENT EXPERIENCE IN PEDIATRIC ADVANCED HEART FAILURE WITH LEFT VENTRICULAR ASSIST DEVICE IMPLANTATION AN ANALYSIS OF 11 CASES

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Background / Hypothesis:
To summarize the anesthetic management strategies and outcomes of left ventricular assist device (LVAD) implantation in children with advanced heart failure, providing evidence-based clinical experience.

Materials and Methods:
A retrospective analysis was conducted on the clinical data of 11 children (7 males, 4 females; age 6–14 years; weight 14–52 kg) who underwent LVAD implantation between February 2023 and December 2024. All had dilated cardiomyopathy, with 2 cases of congenital heart disease and 2 of progressive muscular dystrophy. Preoperative ultrasound assessed ventricular function, pulmonary artery pressure, and valve regurgitation. Anesthesia was induced slowly and maintained with intravenous and inhalational agents, with intraoperative drug adjustments based on hemodynamics. Ultrasound-guided venous and arterial puncture and pulmonary artery catheter placement were performed. During cardiopulmonary bypass, lung-protective ventilation (VT: 2 ml/kg, f: 5 breaths/min, PEEP: 5 cmH2O) was used. After bypass, inhaled nitric oxide was given to reduce pulmonary vascular resistance. Post-LVAD initiation, continuous monitoring of transesophageal echocardiography (TEE), cardiac index (CI), and pulmonary artery pressure (PAP) guided adjustments in pump speed and vasopressors to maintain circulatory stability.

Results:
Intraoperative vital signs remained stable. The average operation time was 253.09 ± 37.86 minutes, with a cardiac arrest time of 77 ± 21.33 minutes. One case required ECMO for low cardiac output syndrome, and one patient died postoperatively. The survival rate at discharge was 90.9%.

Conclusions:
Pediatric advanced heart failure surgery carries high anesthetic risk, including severe hypotension and cardiac arrest. Key considerations include: 1) comprehensive preoperative evaluation; 2) slow, staged induction with individualized anesthetic depth and high-dose opioids; 3) ultrasound-guided puncture; 4) lung protection during bypass; 5) combined milrinone, nitric oxide, and adjusted ventilation after LVAD initiation; 6) optimization of pump speed and volume with TEE and hemodynamic monitoring; 7) inotrope adjustment to maintain cardiac output and vascular resistance.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2021 - PROTEIN LOSING ENTEROPATHY IN THE SWEDISH COHORT OF PEDIATRIC FONTAN PATIENTS

Mikaela Dolk [1], Indra Schütz [1], Erik Herou [1], Felicia Nordenstam [2], Gunnar Bergman [2], Mats Synnergren [3], Annika Rydberg [4], Petru Liuba [1], Phan-kiet Tran [1], Jan Sunnegårdh [3], Katarina Hanséus [1], Karin Tran-lundmark [1]
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Background:
The aim was to characterize patients with protein-losing enteropathy (PLE) diagnosed before the age of 18 within the nationwide Swedish cohort of patients with total cavopulmonary connection (TCPC).

Materials and methods:
Surgical registries and medical charts of all patients born after Jan 1st 1993 with a Fontan completion before Jan 1st 2021 were reviewed.

Results:
A total of 573 patients were reviewed and 28 patients (4.8%) with PLE were identified. In the PLE cohort, TCPC was performed at a median age of 2.7 years (IQR 1.9 – 3.7 years). The median time from TCPC to onset of PLE was 1.5 years (IQR 0.5 – 5.5 years). Right ventricular morphology was a significant risk factor for PLE, OR 2.3 (95% CI 1.04-5.0).
Twenty-three patients (82%) had been treated with one or more PLE targeted drug; pulmonary vasodilators (61%), subcutaneous heparin (50%) and/or long term steroids (46%).
Eleven patients (39%) underwent 18 catheter interventions (PA procedure (7), Coiling of systemic-to-pulmonary collaterals (5), Aortic arch procedure (2), Dilation of Glenn anastomosis (2), Fenestration (1), Lymphatic embolization (1)). Three pacemaker procedures were performed. Eight patients had a heart transplant (26%). Patients with an early onset of PLE (<2 years from TCPC completion) frequently had a history of pulmonary venous congestion.
Overall 5-year survival was 88% and 5-year transplant-free survival was 79%.

Conclusions:
PLE remains a severe TCPC related complication with high mortality. Patients with right ventricular morphology of the systemic ventricle had a higher risk of PLE. Previous pulmonary venous congestion was common when PLE was diagnosed early after TCPC. Catheter based interventions were frequently used to improve the hemodynamics and lymphatic interventions will likely become more common. In therapy resistant patients heart transplantation remains a realistic alternative.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2027 - COMPREHENSIVE ANALYSIS OF THE FIRST 35 YEARS OF PEDIATRIC HEART TRANSPLANTATION IN SWEDEN

Oscar Van Der Have [1], Håkan Wåhlander [2], Tove Hofbard [3], Dace Abele [4], Maria Sjöborg Alpman [5], Ilse Duus Weinreich [6], Jens Böhmer [7], Johan Nilsson [8], Jan Holgersson [4], Ann-sofie Liedberg [3], Karin Tran Lundmark [1], Michal Odermarsky [9]

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Background / Hypothesis:
The first 35 years of pediatric heart transplantation (pHTx) in Sweden were investigated to determine outcomes following listing and transplantation, investigate sub-populations of recipients, and describe the presence of donor-specific antibodies (DSA) in a contemporary cohort.

Materials and Methods:
Swedish children <18 years, listed from 1/1/1989 to 31/12/2023, were included. The cohort was split based on the era of transplantation (ERA I: 1989 – 2008, ERA II: 2009 – 2023).

Results:
A total of 254 children were listed and 185 (72.8%) reached pHTx, with no loss to follow-up. Median wait list duration was 62 days and increased over time, while mortality on the wait list decreased (30.5% in ERA I, 8.8% in ERA II). Wait list mortality was higher in children <1 year of age. Congenital heart disease was the etiology of heart failure in 36.2% of recipients, including 24.9% with univentricular physiology. The frequency of ABO-incompatible transplantations was 9.3% and 8.0% were considered to be at high immunological risk pre-pHTx, due to pre-formed HLA-antibodies with mean fluorescence intensity ≥5000. Ventricular assist device (VAD) was used in 26.9% of pHTx recipients and increased with time. Long-term survival was not significantly affected by age, heart failure etiology, the use of pre-operative VAD or elevated baseline indexed pulmonary vascular resistance. Era of transplantation was a determinant of listing, but not post-pHTx, outcome. The 30-day mortality post-pHTx was 2.2%. Survival at 1-, 10- and 30-year follow-up was 94.5%, 79.4% and 57.1%, respectively. Of the total de novo DSA burden, 45.9% were HLA-DQ-type specific. Re-transplantation was performed in 5.9% of recipients.

POSTER PRESENTATIONS

Conclusions:
A high quality of care has been achieved in Sweden, despite modest pHTx numbers, in cooperation with the Scandiatransplant organization. Wait list mortality has decreased significantly over time, despite longer duration from listing to transplantation.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2039 - ECMO BRIDGING TO LVAD IMPLANTATION A CASE REPORT

Qiang Gao [1], Xiangming Fan [1], Liyang Ying [1], Ru Lin [2], Qiang Shu [1]
The Childern's Hospital, Zhejiang University School Of Medicine, Department Of Cardiac Surgery, Hangzhou-China [1] The Childern's Hospital, Zhejiang University School Of Medicine, Heart Failure Unit, Hangzhou- [2]

Background / Hypothesis:
To summarize a case of successful ECMO bridging to left ventricular assist device (LVAD) implantation in a pediatric patient with dilated cardiomyopathy at our institution.

Materials and Methods:
In March 2025, a 13-year-and-7-month-old female patient (weight: 18 kg) diagnosed with dilated cardiomyopathy and NYHA class IV heart failure was admitted to our hospital. Due to decompensated heart failure with unstable blood pressure and persistently elevated lactate levels, neck ECMO cannulation was initiated post-admission. Bridging to LVAD implantation was performed on the 8th day of ECMO support.

Results:
The patient underwent successful LVAD implantation. Postoperative extubation was achieved on day 1, and she was transferred to the general ward for further management on day 5.

Conclusions:
LVAD implantation demonstrates favorable therapeutic efficacy for pediatric dilated cardiomyopathy with advanced heart failure. ECMO serves as a salvage preoperative support strategy, providing critical time to optimize the patient's preoperative condition.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2055 - PULMONARY ARTERY BAND FOR DILATED CARDIOMYOPATHY VIABLE OPTION IN LIMITED RESOURCE SETTINGS!

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Background / Hypothesis:

Left ventricular Dilated cardiomyopathy (LVDCM) refractory to medical management carries high mortality. Cardiac transplantation for these patients is limited by donor availability. Additionally, cost becomes a deterrent in resource limited settings. Reversible Pulmonary artery banding (rPAB) has been tried as an alternative. We present our experiance with 6 patients who underwent PAB for LVDCM.

Materials and Methods:
Six patients with LVDCM underwent reversible PA band and were followed up. The mean age and weight were 9 months and 7 kg respectively. The mean pre ePAB and post rPAB LVEF was 19.3%.

Results:
Three of these patients did not survive beyond 6 months. Four of these patients showed improvement in ventricular function. The mean post rPAB LVEF was 30.6%.

Conclusions:
cardiac transplant is rarely an option for dilated cardiomyopathy in limited resource settings and majority of these patients will be managed medically. Their survival is limited. PAB is an alternative in carefully selected patients even if the success rate is 50%.

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Category: Heart failure, Mechanical Circulatory Support and Transplant

2108 - DAPAGLIFLOZIN IN PEDIATRIC PATIENTS WITH SINGLE VENTRICLE PHYSIOLOGY AND REFRACTORY HEART FAILURE SINGLE CENTER EXPERIENCE

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Background / Hypothesis:
Children with single ventricle physiology and systemic ventricular systolic dysfunction represent a high-risk population with limited treatment options. Despite guideline-directed medical therapy, some patients continue to experience progressive heart failure. Recent data on sodium-glucose co-transporter 2 (SGLT2) inhibitors suggest benefits beyond glycemic control, including cardioprotective effects. Emerging evidence indicates that dapagliflozin may serve as a novel adjunctive therapy in pediatric patients with single ventricle physiology and advanced systolic heart failure unresponsive to standard medical management.

Materials and Methods:
We present a retrospective case series of three pediatric patients with congenital heart defects and single ventricle circulation admitted to a pediatric cardiology department for advanced heart failure. All patients demonstrated reduced systolic function of the systemic ventricle and no improvement despite maximal conventional therapy. Dapagliflozin was introduced off-label at a dose of 0.2 mg/kg body weight, administered once daily. The treatment was well tolerated, with no adverse effects observed during follow-up.

Results:
The first patient, a 7-year-old boy with hypoplastic left heart syndrome (HLHS) post-Glenn procedure, showed an increase in fractional area change (FAC) from 25% to 30% after two months. The second, a 12-year-old girl with double inlet left ventricle (DILV) post-Fontan, improved from 10% to 17%. The third, a 17-year-old girl with DILV post-Fontan, showed an increase from 39% to 42% after six months. All patients also demonstrated a noticeable improvement in physical endurance.

Conclusions:
This case series suggests that dapagliflozin may improve both systolic ventricular function and physical performance in pediatric patients with single ventricle physiology and heart failure refractory to conventional therapy. These findings support further research on the safety and efficacy of SGLT2 inhibitors in this vulnerable population.

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Category: Heart failure, Mechanical Circulatory Support and Transplant

2129 - DAPAGLIFLOZIN IN PEDIATRIC HEART FAILURE WITH REDUCED EJECTION FRACTION (DAPA PED HF) – A RANDOMIZED PILOT STUDY TO EVALUATE THE SAFETY

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Background / Hypothesis:
Heart failure in children presents significant challenges due to limited treatment options. Dapagliflozin, an SGLT2 inhibitor, has shown promise in adult heart failure patients, but its safety and efficacy in children remain underexplored.

Materials and Methods:
In this randomized controlled pilot study, pediatric patients with heart failure with reduced ejection fraction were randomized to receive Dapagliflozin in addition to conventional treatment. The outcomes were compared with those of a control group that received standard care alone.
The primary outcome is the composite of worsening heart failure, heart failure hospitalization, and cardiovascular death, and the secondary outcomes are change in NT-proBNP, safety and tolerability of Dapagliflozin, and change in functional class.

Results:
Twenty patients were enrolled, with 9 in the treatment group and 11 in the control group. The primary outcome occurred in one patient from each group (P = 0.88). Both groups showed improvements in NT-proBNP levels and functional class, with no statistically significant differences between them. Two patients in the treatment group developed transient prerenal acute kidney injury, which resolved. No cases of acute kidney injury were observed in the control group (P = 0.1). Mild hyponatremia was present in 35% of patients at enrolment and 45% during follow-up, with no significant difference between the groups (P = 0.3). All cases of hyponatremia were asymptomatic, with serum sodium levels remaining above 130 mEq/L. There were no instances of hypovolemia, shock, ketoacidosis, or urinary tract infection.

Conclusions:
Dapagliflozin was generally well-tolerated, with a safety profile similar to that observed in adults. No significant differences were observed in the primary outcome between the treatment and control groups. Both groups experienced improvements in NT-proBNP levels and functional class without statistically significant differences. Adverse events were mild, transient, and asymptomatic, with no significant difference in their occurrence between the groups.

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Category: Heart failure, Mechanical Circulatory Support and Transplant

2139 - NEONATAL CARDIAC RHABDOMYOMA CAUSING SEVERE LVOT OBSTRUCTION SUCCESSFUL MANAGEMENT WITH SIROLIMUS AND ECMO SUPPORT

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Background / Hypothesis:
Cardiac rhabdomyomas are the most common primary cardiac tumors in neonates and are often associated with tuberous sclerosis complex (TSC). Although typically benign and self-resolving, large tumors can cause life-threatening obstruction. We report a neonatal case of severe left ventricular outflow tract obstruction (LVOTO) due to cardiac rhabdomyoma successfully managed with sirolimus and extracorporeal membrane oxygenation (ECMO).

Materials and Methods:
A female neonate was delivered at 39+0 weeks (birth weight 3040g) after prenatal suspicion of cardiac mass. Postnatal echocardiography revealed multiple intracardiac tumors: left ventricle (6×3mm, LV free wall masses), right ventricle (4×3mm and 9×3mm), and right atrium (9×8mm). A large LV mass (7.1×7.0mm) caused severe LVOTO with sudden hemodynamic deterioration. ECMO was initiated for cardiovascular support. Due to tumor proximity to the aortic valve cusp, complete surgical resection was deemed high risk. Sirolimus was initiated on day 2 of life. TSC2 gene variant was later confirmed.

Results:
After sirolimus treatment, the LVOT mass size decreased to 6.6×6.8mm by day 16, enabling successful ECMO weaning. Despite stabilization, severe intraventricular hemorrhage (IVH) occurred during ECMO, resulting in subsequent obstructive hydrocephalus requiring planned VP shunting. Sirolimus therapy continues with ongoing follow-up.

Conclusions:
This case demonstrates the effectiveness of sirolimus therapy in reducing rhabdomyoma burden and resolving critical LVOTO, potentially avoiding high-risk surgery. However, complications related to ECMO such as IVH require cautious risk-benefit evaluation. Early diagnosis and interdisciplinary management are essential in such high-risk neonates with suspected TSC.

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Category: Heart failure, Mechanical Circulatory Support and Transplant

2186 - LEFT VENTRICULAR ASSIST DEVICE IMPLANTATION FOR ADVANCED HEART FAILURE IN CHILDREN A CHINESE SINGLE CENTER EXPERIENCE

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Children's Hospital, School Of Medicine, Zhejiang University, Department Of Cardiac Surgery, Hangzhou-China [1]

Background / Hypothesis:
To summarize and evaluate our center's experience with implantable left ventricular assist devices (LVADs) in treating children with end-stage heart failure, providing a reference for ventricular assist therapy in pediatric end-stage heart failure in China.

Materials and Methods:
A retrospective analysis was conducted on 13 children with end-stage heart failure who underwent LVAD implantation at the Children's Hospital of Zhejiang University School of Medicine between February 2023 and April 2025. Normally distributed continuous variables were expressed as mean ± standard deviation ($\bar{x} \pm s$), non-normally distributed variables as median, and categorical variables as percentages. Postoperative mechanical ventilation duration, hospital stay, LVAD pump speed, and follow-up outcomes were compared and analyzed.

Results:
A total of 13 pediatric LVAD implantations were performed, including 8 males and 5 females. The primary diagnosis was chronic heart failure due to dilated cardiomyopathy. Four patients had comorbid Duchenne muscular dystrophy (DMD), and 3 required ECMO support before LVAD implantation. The median age at surgery was 12.36 ± 1.08 years (range: 12 years–14 years 8 months), weight 40.37 ± 12.14 kg (range: 32–48.5 kg). Four cases underwent LVAD implantation with concomitant tricuspid annuloplasty. Average CPB time was 132.64 ± 27.61 minutes. Twelve patients showed favorable outcomes during follow-up, with significantly improved LVEF and well-functioning LVADs. One patient failed to wean from support and died on postoperative day 27.

Conclusions:
LVAD implantation for pediatric end-stage heart failure at our center demonstrated generally positive outcomes, with 8 devices functioning beyond 1 year and 2 successful bridge-to-transplant cases. Implantable ventricular assist devices serve as an effective bridge to transplant, recovery, or destination therapy in children with end-stage heart failure.

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Category: Heart failure, Mechanical Circulatory Support and Transplant

2232 - A SINGLE CENTER EXPERIENCE OF PEDIATRIC HEART TRANSPLANTATION

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Background:
In the present study, we summarize the technologies of pediatric heart transplantation, and share the experience of management perioperative and postoperative complications.

Methods:
Clinical data of children who underwent heart transplantation at Children's Hospital Zhejiang University School of Medicine from June 2023 to March 2025 was retrospectively collected. All patients were regular followed-up after discharge.

Results:
Among 9 recipients, 6 were male and 3 were female. The average age of the recipient patients was 10.1±2.9 years old (rang from 7 years old to 13 years and 8 months old), and the average weight was 24.1±8.1 kilograms (rang from 13 kg to 36.3 kg). Patient diagnoses included 6 cases of dilated cardiomyopathy, 2 cases of dilated cardiomyopathy combined with endocardial elastic fibrosis, and 1 cases of hypertrophic cardiomyopathy. There were three cases underwent mechanical ventilation, three cases received ECMO supported, and two cases received left ventricular assist before surgery. Two patients had intracardiac thrombosis. The cardiopulmonary bypass time for surgery was 216±69.78 minutes, and the aortic occlusion time was 72.12±20.43 minutes. The postoperative mechanical ventilation supported time ranged from 40 to 258 hours. ECMO support was required in 1 case, delayed chest closure in 3 cases, and secondary thoracotomy in 2 cases. Postoperative complications included: 2 cases of primary graft dysfunction, 3 cases of early postoperative arrhythmia, 1 case of late postoperative arrhythmia, 1 case of pericardial effusion, 1 case of pericardial tamponade, and 1 case of aplastic anemia. All 9 patients survived and have not experienced any acute or chronic rejection events during follow-up. There were no any adverse events in early follow-up.

Conclusions:
Pediatric patients had satisfactory clinical outcomes after heart transplantation, and provided us with valuable experience for reference. Heart transplantation is an effective means for end stage heart disease in children, with excellent survival.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2235 - UNMASKING THE SILENT VALVE INFECTIVE ENDOCARDITIS IN A CHILD WITHOUT KNOWN HEART DISEASE OR IV DRUG USE COMPLICATED BY TRANSFUSION ASSOCIATED CIRCULATORY OVERLOAD AND MULTISYSTEM ORGAN FAILURE

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Background / Hypothesis:
Infective endocarditis (IE) in children without underlying heart disease is an elusive but potentially fatal diagnosis, often masked by vague symptoms and rapid clinical deterioration. We present a case of mitral valve IE in a previously healthy child, complicated by acute heart failure, septic shock, disseminated intravascular infection, ventilator-associated pneumonia, and transfusion-associated circulatory overload (TACO).

Materials and Methods:
A 12-year-old previously well male was admitted for a two-week history of high-grade fever and progressive lower extremity weakness, initially without a clear focus. Laboratories showed anemia and leukocytosis, and blood cultures grew Staphylococcus aureus. On day 16, examination revealed multiple violaceous, non-blanching macules and nodules over the palms, fingertips, and soles, raising suspicion for IE. 2D echocardiography confirmed a 3.3 mm mitral valve echogenic focus with associated mitral regurgitation—clinching the diagnosis. Despite antibiotics, the echogenic foci progressed to 6 mm by day 21, resulting in worsening mitral regurgitation and precipitating acute heart failure.

Results:
The patient's clinical course was further complicated by progressive multisystem involvement. Respiratory distress emerged following multiple red cell transfusions—clinically consistent with TACO—requiring mechanical ventilation and inotropic support. Imaging revealed renal and splenic infarcts suggestive of hematogenous embolic spread, and laboratory evaluation indicated disseminated intravascular infection. Septic shock manifested early, with persistent hypotension likewise requiring vasoactive agents. Nosocomial infections with Pseudomonas aeruginosa on ET aspirates further complicated recovery. A multidisciplinary team guided complex decision-making, including antimicrobial escalation, transfusion strategies, fluid restriction, and ventilator weaning. Serial echocardiography ultimately revealed regression of the mitral valve vegetation and improved cardiac function. After stabilization, the patient was successfully extubated and transitioned to recovery.

Conclusions:
This case highlights the importance of a high index of suspicion for IE in children with prolonged fever—even without known heart disease. Recognition of cutaneous signs and cautious transfusion strategies are critical. Early multidisciplinary intervention can improve outcomes in complex pediatric IE.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2252 - IT TAKES A VILLAGE SINGLE CENTER EXPERIENCE FOR HEART TRANSPLANT IN DUCHENNE MUSCULAR DYSTROPHY

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Background / Hypothesis:
Duchenne muscular dystrophy (DMD) is the most common form of childhood muscular dystrophy worldwide, with prevalence estimates of 4.78/100,000 males. Heart failure(HF) is now the leading cause of mortality. Experience in heart transplantation(HTx) for DMD is limited.

Materials and Methods:
We describe our experience in evaluation and management of HTx for two boys with advanced HF from DMD. Retrospective chart review was performed.

Results:
Case 1 involved a 9 year-old ambulatory male with DMD due to deletion of exon 2 who presented with decompensated HF. Echocardiogram revealed severe biventricular dysfunction. He was initiated on milrinone and epinephrine. Attempts to transition to oral HF therapy failed as he demonstrated pulsus alternans. Patient underwent HTx which he received after 79 days on waiting list. He was extubated on first post-operative day to noninvasive ventilation. Post-transplant course was complicated by mild grade 2R rejection which was treated. Patient is currently 20 months post HTx, ambulatory and requires noninvasive BIPAP at night.

Case 2 involved an 11-year-old non-ambulatory male with deletion of exon 58. Patient had severely depressed function by age 9. Despite aggressive oral HF therapy, patient decompensated after rhinovirus infection with symptoms of HF. He was initiated on milrinone but further deteriorated requiring ventricular support with Impella device. He received HTx after 18 days on waiting list. He was extubated on first postoperative day. He is currently 7 months post HTx with improvements in respiratory function and less muscle fatigue.

Patients underwent extensive evaluation by multidisciplinary teams to optimize organ systems, assess candidacy, and plan postoperative care (table 1).

Conclusion:
HTx is a feasible option for select patients with DMD with advanced HF to improve quality of life. Multidisciplinary specialized care to evaluate and optimize DMD-related morbidity are crucial for successful outcome.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2304 - ARRHYTHMIAS ARE COMMON IN PEDIATRIC VAD PATIENTS AND ARE ASSOCIATED WITH A LONGER INDEX HOSPITALIZATION

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Children's Hospital Of Philadelphia, Pediatric Cardiology, Philadelphia-United States [1]
Cleveland Clinic Children's Hospital, Pediatric Cardiology, Cleveland-United States [2]

Background / Hypothesis:
The incidence and clinical significance of arrhythmias following ventricular assist device (VAD) implantation in pediatric patients are poorly understood. We hypothesized that arrhythmias would be common during the index VAD hospitalization and would be associated with an increased length of stay (LOS), without an impact on survival to hospital discharge.

Materials and Methods:
The Pediatric Health Information System (PHIS) database was used to identify all patients <19 years old who underwent VAD implantation between January 2016-March 2025. The primary outcome of interest was an atrial or ventricular arrhythmia during the index VAD hospitalization, identified using ICD-10 diagnosis codes. Secondary outcomes included in-hospital mortality; total, pre-procedural, and post-procedural LOS; stroke; renal dysfunction; ECMO; sepsis; and respiratory failure.

Results:
A total of 1666 patients (45% female, 55% white, 20% Hispanic, 36% infants) was identified. The primary outcome occurred in 57% of cases; these patients were more likely to be non-infants; have a complex chronic condition; and have a history of stroke, renal failure, and ECMO in logistic regressing modeling. There was no significant association with childhood opportunity index, race, gender, insurance type, or center volume. The incidence of arrhythmia during the index hospitalization was associated with an increased odds of post-implantation renal dysfunction (OR 1.75; 95% CI 1.38,2.23; p<0.001) and a decreased odds of in-hospital mortality (OR 0.80; 95% CI 0.65,1; p=0.049) in logistic regression modeling (Table). Using linear regression modeling, an arrhythmia at the index hospitalization was associated with a 9.9 day increase in pre-operative (95% CI 2.3,17; p=0.01) and 12 day increase in total hospital (95% CI 1.7,23; p=0.023) LOS.

Conclusions:
Arrhythmias occur in more than half of pediatric patients during the index VAD hospitalization and are associated with increased post-VAD renal dysfunction and LOS, and decreased in-hospital mortality. More data are needed to understand the association with decreased mortality.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2316 - CLINICAL PHENOTYPE ASSOCIATED WITH LEFT VENTRICULAR FUNCTION RECOVERY FOLLOWING SURGICAL REPAIR OF ALCAPA

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Background / Hypothesis:
ALCAPA-type coronary anomaly may present asymptomatically, with acute heart failure, or as chronic cardiomyopathy. Surgical repair is the definitive treatment. Myocardial ischemia shapes clinical presentation, and recovery of ventricular function strongly influences prognosis and quality of life. Factors associated with functional recovery remain unclear. This study evaluates whether clinical presentation at diagnosis predicts short- and long-term recovery following surgical repair.

Materials and Methods:
We conducted a retrospective study of patients who underwent surgical repair of anomalous origin of the left coronary artery from the pulmonary artery between 2004 and 2024 at a tertiary center in Colombia. Patients were classified into three groups based on clinical phenotype: asymptomatic (1), acute heart failure (2), or chronic dilated cardiomyopathy (3). Data included preoperative and intraoperative variables, including ejection fraction at diagnosis. Outcomes included ejection fraction at discharge, follow-up ejection fraction, postoperative length of stay, and operative mortality. Ventricular recovery was assessed by comparing ejection fraction at admission, discharge, and follow-up using the Kruskal–Wallis test.

Results:
Twenty-one patients were included (85.7% female; median age 0.56 years, IQR 0.4–1.1). Direct coronary reimplantation was performed in 57.1%. Patients were grouped by clinical phenotype: Group 1 (n=5), Group 2 (n=9), and Group 3 (n=7). Median ejection fraction improvement was 21.8% in group 2, 14.1% in the group 3, and unchanged in the group 1. Differences in recovery (p=0.22) and length of stay (p=0.39) were not significant. At discharge, 42.9% had ejection fraction >50%; all achieved >60% at follow-up (mean 3.8 years). No operative mortality occurred.

Conclusions:
Ventricular recovery was slightly greater in Group 2 than in Group 3, though not statistically significant. This may reflect the impact of prolonged ischemia. Despite initial differences, all patients recovered function long-term. Larger studies are needed to assess the prognostic impact of clinical phenotype on long-term outcomes.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2372 - GENETICS CLINICAL FEATURES AND LONG TERM OUTCOME OF LEFT VENTRICULAR NON COMPACTION IN CHILDREN A SINGLE CENTER STUDY

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Background / Hypothesis:
The clinical outcomes of noncompaction cardiomyopathy (NCCM) range from asymptomatic to arrhythmias, heart failure and sudden cardiac death.The aim of our study is to evaluate the left ventricular non-compaction cardiomyopathy in Children as a single center experience.

Materials and Methods:
Children diagnosed with left ventricular non-compaction cardiomyopathy from 2014 to 2025 at the department of pediatric cardiology at the Marmara University Faculty in Turkey were enrolled in this retrospective study. Patient's demographics dates, laboratory parameters, ECG, and transthoracic echocardiography, cardiac MR imaging , and follow-up period were evaluated.

Results:
Twenty-one patients (66,6% male) were evaluated in our study. The mean age at first diagnosis a was 90,5±66,9 months (min.-max.:1-192 months). The mean follow-up period was 39±10 months. Genetic testing was performed on all patients and genetic pathology was detected in 5 patients, of which TTNT', PCNT, STAT3 GOF, ACTC1 and SCN5A mutations were present. Four patients also had accompanying metabolic disease. In the echocardiographic examination,EF and FS values were found to be low(60, 28 respectively) in 6 patients.The echo images of the one of the patient are shown in Figure 1. Cardiac MR imaging was performed in 7 patients, and the diagnosis of non-compaction was confirmed. There were no patients with ICD, Pacemaker, LVAD or heart transplantation. Six patients received furosemide treatment and 11 patients received ACEI or ARB treatment.5 patients received digitalis treatment.7 patients were admitted to the clinic with heart failure and 3 of them were dead in follow-up period. Only one of the patients with heart failure had a positive genetic test result(TTNT positive).

Conclusions:
This study highlights the clinical and genetic heterogeneity of pediatric Left Ventricular Non-Compaction Cardiomyopathy.Despite some patients having identified genetic mutations,disease severity did not always correlate with genetic findings.Early diagnosis,comprehensive imaging,and individualized management are essential for improving outcomes in this complex condition.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2378 - OUTCOMES OF HEARTMATE 3 IN PEDIATRIC PATIENTS WITH END STAGE HEART FAILURE A SINGLE CENTER EXPERIENCE FROM TURKIYE

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Background / Hypothesis:
We aim to evaluate our initial experience with the HeartMate 3 (HM3) device (Abbott, USA) for palliating pediatric patients with end-stage heart failure (ESHF: L-VAD'S(HeartMate3) were implanted to children with end stage heart failure to bridge to transplantation.
Materials and Methods:We conducted a retrospective review of clinical data from pediatric patients (aged 7-18 years) who underwent HM3 implantation for ESHF at our institution between 2022 and 2025. Patient demographics and follow-up data were comprehensively analyzed.

Results:
We identified 13 patients (45% males) with a median age of 14 years (IQR 11-17), a median weight of 47 kg (IQR 28-50), a median height of 159 cm (IQR 135-165), and a median body surface area of 1.36 m2 (IQR 1.07-1.53) at the time of the intervention. All patients were diagnosed with dilated cardiomyopathy and categorized with PEDIMACS profiles ranging from one to three. The median ICU stay was 14 days (IQR 6-32), with 11 patients receiving inotropic support for a median of four postoperative days (IQR 3-8). The median follow-up period was 150 days (IQR 90-210). Early complications included two cases of pleural effusion, 1 case of cardiac tamponade, 3 cases of polyuria, and one instance of positive blood cultures. One patient, who was non-compliant with warfarin therapy, developed a thrombus in the right atrium that was resolved with a revision of anticoagulant therapy, and did not experience pump thrombosis. During follow-up, one patient died after 28 days from sepsis, one underwent heart transplantation after 10 days, and nine patients remained alive on the device. Notably, there were no reported cases of pump thrombosis, ischemia, or stroke post-implantation.

Conclusions:
The HM3 device appears to be a safe and effective palliative option for pediatric patients with ESHF.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2392 - PERIOPERATIVE MANAGEMENT OF VENTRICULAR ASSIST DEVICE IMPLANTATION IN SINGLE VENTRICLE PATIENTS 16 YEARS OF A SINGLE CENTER EXPERIENCE

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Pediatric ventricular assist device (VAD) has grown substantially over the past decade, totalling 1463 devices as of 2022.Congenital Heart Disease is the 2nd most common indication for VAD implantation, with >60% having single ventricle (SV) physiology. The Stage I and II SV VAD cohorts have significantly worse prognosis compared to Stage III (Fontan) group. The primary aim of this study is to compare perioperative management and outcomes in Stage I and II SV VADs implanted with and without CPB.

We performed a retrospective analysis of 22 Stage I and II SV-VAD implantation at Stanford Children's, 2009-2024. 10 using off-CPB technique and 12 on-CPB technique. Preop (INTERMAC stage, labs, cardiac cath hemodynamics), intraop(surgical length, bypass time, transfusion needs), and postop (time to extubation, VAD support length, survival to transplant) metrics were collected.

22 SV, pre-Fontan patients underwent SVAD implantation at Stanford Children's Hospital; 10 off CPB and 12 on CPB. The median surgical procedure time was 303.5 [214.7, 401.5] mins for the off-CPB group and 315.5 [291.5, 357.5] mins with median bypass time of 108 [87.5, 132] mins for the on-CPB group. The median total blood products transfused was 72.5 [59.7, 125.1] mL/kg for the off-CPB group and 116.1 [87.4, 189.4] mL/kg for the on-CPB group (p=0.02). Prothrombin complex concentrates were used in 0/10 patients in the off-CPB group and 8/12 patients in the on-CPB group. Mean time to extubation was 12.6 (±8.9) days and 7.8(±9.8) days and 30-day mortality was 1/10 and 3/12 for off-CPB and on-CPB groups respectively. In the off-CPB group, 5/10 patients were successfully bridged to transplant at a median of 173 [139, 199] days, compared to 6/12 patients at a median of 69 [38, 148] days in the on-CPB group.

Despite the challenges, successful outcomes for Stage I and II SV VADs are possible.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2445 - DEVELOPMENT AND VALIDATION OF AN IN HOSPITAL MORTALITY PREDICTION MODEL FOR PEDIATRIC HEART FAILURE

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Background / Hypothesis:
To develop and validate a clinical prediction model for Pediatric Heart Failure(PHF) in-hospital mortality risk using machine learning algorithms.

Materials and Methods:
(1) Based on multi-center study data, the outcome was in-hospital mortality. Potential predictors included demographic characteristics, clinical features, diagnoses, and laboratory parameters; (2) Missing data were imputed using random forest (RF). Imputed data were randomly split into training (70%) and validation (30%) sets, with balance rechecked; LASSO regression selected predictors, integrated with variables identified by clinical experts and literature review to form the final predictor set; (3) Six machine learning models were developed: LR, XGBoost, RF, SVM, CatBoost, and ANN. Performance was assessed using AUC, optimal cutoff values, accuracy, sensitivity, specificity, and F1-score. Hosmer-Lemeshow test evaluated calibration. Calibration curves and decision curve analysis (DCA) further validated clinical utility. SHAP framework provided global and local interpretability.

Results:
Among 2,903 PHF cases, 115 (4.0%) experienced in-hospital mortality. The comparison results between the original dataset and the imputed dataset, the training set and the validation set showed that the distribution of core variables was balanced (all P>0.05), indicating that the imputation did not introduce systematic bias, and the interpolated data split was reasonable. Ten predictors were selected: age, gestational age, blood pressure, respiratory symptoms, HF type, complex congenital heart disease, severe infection, NT-ProBNP, serum creatinine, and serum calcium. XGBoost demonstrated optimal performance: Training set: AUC = 0.91 (95%CI: 0.88–0.94); Validation set: AUC = 0.76 (95%CI: 0.68–0.84); Calibration curves showed excellent agreement between predicted and observed probabilities; DCA indicated significant net benefit within 3%–25% threshold probabilities, outperforming "treat-all" and "treat-none" strategies. Subgroup validation revealed superior performance in LVEF≥55% patients.

Conclusion:
The XGBoost-based PHF mortality prediction model demonstrates high accuracy, stability, and clinical translation potential, offering novel tools and perspectives for risk assessment and intervention.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2477 - WAITLIST OUTCOME OF PEDIATRIC AND CONGENITAL HEART DISEASE HEART TRANSPLANT IN THE LAGEST REFERENCE CENTER IN BRAZIL

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Background / Hypothesis:
Pediatric and congenital heart disease (CHD) transplant is challenging in a middle income country with continental dimensions. Low number of donors, large distances and progressive deterioration of patients, specially with CHD, impose high mortality at waitlist. Describing patients at higher risk of death can help to improve allocations policy, potentially reducing waitlist mortality (WM).

Materials and Methods:
Children < 18 yo and adults with CHD outcomes from the Heart Institute, Sao Paulo Brazil, listed for heart transplant (HT) between January 2020 and May 2025 were evaluated. WM included patients who died on the list and patients inactivated for clinical deterioration. Short term mortality after HT was also studied.

Results:
From 153 patients listed, 27 died on WL (18.9%), 69 were transplanted (48.3%), 38 (36.8) are still active and 9 (6,3%) were removed due to clinical improvement. 55 (80%) of transplanted patients were waiting pre-transplant in hospital with decompensated heart failure (DHF) and 7 (10.9%) died after transplant, 26 (37.6%) were CHD patients and (62.4%) had cardiomyopathy (CM). From the 27 patients who died in WL, 14 (51.8%) had CHD and 13 (48.2%) had CM, 4 (14.8%) died un-hospitalized and 23 (70.4%) were in hospital, 19 (70.4%) with DHF and 4 (14.8%) using ventricular assist devices. Median weight and age of transplanted patients were respectively 30 Kg (IQ 12 - 54) and 11 years (IQ 13 - 15) and for died at WL patients were 17Kg (IQ 8-56) and 7 years (IQ 1 - 17)

Conclusions:
Mortality in pediatric heart transplant waitlist is still high, specially in young and low weight patients and in those with congenital heart disease. Changes in allocation policy considering these high risk patients as priority may reduce mortality at heart transplant waitlist in the pediatric and congenital heart disease population.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2503 - MYOCARDITIS OR MALNUTRITION WHEN THIAMINE DEFICIENCY IMITATES MYOCARDITIS IN TWO SIMULTANEOUS CASES A DIAGNOSTIC CHALLENGE

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Background / Hypothesis:
Cardiac beriberi, a rare but reversible cause of congestive heart failure (CHF) due to thiamine deficiency, can mimic myocarditis, especially in patients with nonspecific presentations. Timely recognition is critical, as thiamine supplementation can lead to rapid recovery. We report two simultaneous cases that highlight this diagnostic challenge.

Materials and Methods:
A 13 year-old boy with autism and mental retardation, raised in an orphanage with limited dietary history, presented with progressive dyspnea and lower limb swelling following a recent febrile respiratory illness. Examination revealed signs of heart failure. An electrocardiogram demonstrated sinus tachycardia, T-wave flattening and left ventricular (LV) hypertrophy; chest radiography showed cardiomegaly and pulmonary congestion. Echocardiogram revealed moderate LV systolic dysfunction (EF 30%). Laboratory tests showed elevated troponin-T (28 ng/L) and NT-pro BNP (5,620 pg/mL), along with a positive Mycoplasma pneumoniae titer (1:40), raising suspicion for myocarditis. On the same day, a 14-year-old boy, also with developmental delay and from the same orphanage, presented with edema and cardiomegaly. His echocardiogram showed mildly reduced LV function (EF 50%) and M. pneumoniae titer was 1:80. The clustering of similar presentations in the same setting, combined with their dietary risk, prompted investigation into a shared cause. Thiamine level was low in both cases (24.73 and 27.59 µg/L respectively; reference 28-85 µg/L), confirming deficiency. Cardiovascular magnetic resonance demonstrated mild diffuse myocardial fibrosis without myocardial edema, not fulfilling 2018 Lake Louise criteria for acute myocarditis.

Results:
Both patients received intravenous thiamine and oral azithromycin alongside standard CHF therapy. Within 72 hours, symptoms markedly improved. At one-month follow-up, both showed complete recovery (EF 55%). No fold-four rise in M. pneumoniae titers was observed, excluding active infection.

Conclusions:
These cases illustrates the importance of considering nutritional deficiencies in unexplained cardiomyopathy. Cardiac beriberi can mimic myocarditis, but is reversible with timely thiamine replacement reducing the need for mechanical circulatory support.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2509 - VIRTUAL REALITY GUIDED LVAD IMPLANTATION IN PEDIATRIC PATIENT VALUABLE PRE SURGICAL TOOL

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Virtual reality (VR) is a new technology in medical field which has paved the way for many extraordinary findings for the challenging problems in surgery. However, there has been not much extensive research on developing the VR aided pre-surgical planning toolbox for left ventricular assist device (LVAD) implantation. We investigated the use of a virtual reality environment with wearable headsets and touch controllers in simulating an implant for 11year old boy which played significant role in optimal positioning of the LVAD.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2519 - CRITICAL PREDICTORS OF HEART TRANSPLANT NECESSITY IN CHILDREN WITH 2 ADVANCED DCM

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Background:
Dilated Cardiomyopathy (DCM) frequently culminates in Heart Failure (HF), positioning it as the primary instigator of cardiac transplantation among pediatric patients. Nevertheless, the issue of cardiac transplantation in children demands a comprehensive and judicious strategy.

Materials and Methods:
We retrospectively analyzed clinical data of 99 children with dilated cardiomyopathy complicated with heart failure. We compared clinical data between the heart transplant group and the non-transplant group, and used subgroup and Cox regression analysis to determine independent risk factors for heart transplantation in children with dilated cardiomyopathy complicated with heart failure.

Results:
Out of 99 children, 35 received heart transplants and 64 did not. Comparative analysis shows that there are no significant differences in age, sex, and weight between the two groups. However, compared to the non-transplant group, the transplant group had a significantly higher incidence of NYHA grade 4, abnormal heart rhythm, hepatomegaly, ascites, and orthostatic breathing (all $p<0.05$). At the same time, compared with the non-transplant group, the transplant group had a significantly higher incidence of abnormal left ventricular end diastolic diameter, aortic and pulmonary valve regurgitation rates, and left ventricular myocardial hypoplasia ($p<0.05$). Adjusted multiple regression analysis showed that NYHA score ($p=0.037$), ascites ($p<0.003$), and left ventricular dysfunction ($p=0.048$) were significantly associated with the transplant group and were independent risk factors for the transplant group.

Conclusions:
Elevated NYHA grading, ascites, and left ventricular insufficiency are independent risk factors for heart transplant treatment in children with dilated cardiomyopathy complicated with heart failure (DCM).

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2562 - TERMINAL STAGE DILATED CARDIOMYOPATHY EFFECTIVELY IMPROVED BY PULMONARY ARTERY BANDING IN A CHILD

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Background / Hypothesis:
Dilated cardiomyopathy (DCM) is the most common childhood cardiomyopathy and carries a significant mortality risk. Pulmonary artery banding (PAB) has been recently proposed as a bridge or alternative strategy for terminal-stage DCM with preserved right ventricular function when heart transplantation cannot be chosen timely, but related experience is limited.

Materials and Methods:
We present a case of PAB performed in a child with end-stage DCM, followed by a retrospective analysis of this palliative surgical approach in pediatric DCM patients.

Results:
A female child was initially diagnosed with DCM with complaint of tachycardia, tachypnea and excessive sweating especially during feeding at 4 months old. UCG revealed severe LV dilatation and LVEF of 28.6%. Then she was treated with normalized medical therapy (mainly including Captopril, Carvedilol, Furosemide, Spironolactone, Methylprednisolone and Digoxin) for half years. At 11 months old, UCG revealed LVEDD Z-score 6.3 and LVEF 26%. Immunoglobulin and milrinone was also selected. During the following 5 years, the patient was regularly admitted into hospital to adjust medications. Unfortunately, the child's cardiac function was still deteriorating. At 5 years and 5 months old, the patient was readmitted into hospital suffering from "coughing for half months" with NYHA II. UCG showed LVEDD 64.4mm, Z-score +9.7 and LVEF 26%. Levosimontane was also increased, but without improvement. CMR showed severe LV-DCM but preserved RV systolic function. After a multidisciplinary discussion, PAB was suggested according to guidelines. Postoperatively, no complications associated with PAB occurred.The child's clinical symptoms were improved to NYHA I when discharged. At the 4-month follow-up, UCG showed the LVEF improved to 30% and LVEDD decreased to 63.3mm with Z-score +8.8.

Conclusions:
This was our first successful case, suggesting that PAB was safe and effective alternative for terminal-stage DCM child when lacking of donor transplants and assist devices.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2575 - PULMONARY ARTERY BANDING AND ATRIAL SEPTOSTOMY FOR DILATED CARDIOMYOPATHY IN INFANTS AND CHILDREN

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Background / Hypothesis:
Dilated cardiomyopathy (DCM) carries a significant mortality risk. Pulmonary artery banding (PAB) has been proposed as an alternative to heart transplantation.This study aimed to delineate the functional regeneration of the dilated left ventricle after PAB and atrial septostomy.

Materials and Methods:
This prospective study was initiated in July 2021, involving paediatric patients with a significant DCM and preserved right ventricle who underwent surgical PAB. The baseline characteristics and clinical information during follow-up were collected.

Results:
Seven patients with a median age of 240 (148, 1028) days have been included thus far. No procedural or follow-up mortality was observed. The modified Ross functional class improved significantly, and the median left ventricular ejection fraction increased from 25.0 (12.0, 34.0)% before surgery to 48.0 (40.0, 65.0) % ($P < 0.05$); the median left ventricular end-diastolic diameter and corresponding Z-scores decreased. One of them underwent balloon dilation of the PAB to relieve excessively elevated right ventricular pressures.

Conclusions:
The results of the application of PAB and atrial septostomy for infants and children with DCM are promising.

POSTER PRESENTATIONS

Category: Heart failure, Mechanical Circulatory Support and Transplant

2594 - FONTAN ANATOMY OPTIMIZATION LEADING TO SUCCESSFUL MANAGEMENT OF PROTEIN LOSING ENTEROPATHY A CASE REPORT

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Background:
Protein-losing enteropathy (PLE) is a long-term complication in patients with Fontan circulation that remains a significant management challenge. Its pathophysiology involves elevated venous pressures and lymphatic congestion, often exacerbated by suboptimal Fontan pathway anatomy. Regular, comprehensive follow-up utilizing advanced imaging modalities is crutial for early detection of structural or hemodynamic abnormalities.

Materials and Methods:
A 16-year-old female with pulmonary atresia and intact ventricular septum previously undergone Blalock-Taussig shunt, Glenn, and extracardiac Fontan (without fenestration, using Gore-Tex 18mm), presented with severe hypoproteinemia, hypoalbuminemia, hypogammaglobulinemia, and lymphopenia. She had undergone unsuccessful treatment with high-protein, low-fat diet, MCT oil supplementation, and oral budesonide over several years. Imaging studies included magnetic resonance (MR) lymphography—revealing lymphatic congestion in the clavicular and mediastinal regions—and cardiac catheterization, which identified a narrowed Fontan tunnel (12mm) and left pulmonary artery stenosis with normal pulmonary pressures. Interventional procedures involved stenting of the Fontan tunnel (dilated to 22mm) and stenting of left pulmonary artery.

Results:
Following intervention, the patient experienced transient reperfusion syndrome. Over a six-month follow-up, her clinical status significantly improved with complete resolution of PLE. Laboratory parameters normalized, showing restored immunoglobulin and lymphocyte levels. Consequently, the patient was transitioned to a normal diet and budesonide therapy was discontinued. Improvement in Fontan hemodynamics was confirmed by decrease of lymphatic congestion in follow-up MR lymphography as well as decrease of liver stiffness in elastography and lower resistance in superior mesenteric artery flow.

Conclusions:
Integrating advanced lymphatic imaging with comprehensive routine follow-up assessments is essential for early detection and effective management of complications in Fontan patients. Proactive intervention aimed at optimizing Fontan pathway anatomy can prevent long term complications and serve as definitive therapy for PLE, thereby improving long-term outcomes and quality of life.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1010 - MACROPHAGE MEMBRANE MODIFIED TARGETED PHASE CHANGE NANOPARTICLES FOR MULTIMODAL IMAGING OF EXPERIMENTAL AUTOIMMUNE MYOCARDITIS

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Myocarditis is an important public health issue due to the high prevalence of sudden death in adolescents and young adults. Nevertheless, the early identification of myocarditis remains a serious problem for clinicians. There is no single non-invasive method to diagnose yocarditis in the currently available clinical guidelines and consensus. Molecular imaging is an effective approach for accurate diagnosis. Poly(lactic acid-glycolic acid) (PLGA) is considered to be the preferred carrier for molecular imaging because of its biosafety and modifiability. Macrophage membrane-modified biomimetic nanoprobes (MM-NPs) possess low immunogenicity and inflammation-directed chemotaxis capabilities and are repeatedly chosen as materials for targeted diagnosis and treatment of inflammatory diseases. In this study, experimental autoimmune myocarditis (EAM) was used as an animal model of inflammation. Previous studies have confirmed that this model is similar to pathological injury caused by acute myocarditis in humans. In multimodal imaging (US/PA/MRI), a phase-change material (PFH) and superparamagnetic iron oxide (SPIO) are used as imaging substances. Early identification of myocardial inflammatory sites was achieved by the tail vein injection of MM/NPs loaded with PFH and SPIO. This probe is expected to be a powerful tool for clinicians to diagnose myocarditis

POSTER PRESENTATIONS

Category: Multimodality Imaging

1056 - ASSOCIATION OF PULMONARY ARTERY BIFURCATION SHIFT WITH CONTRALATERAL STENOSIS AFTER POST ARTERIAL SWITCH IN THE PEDIATRIC TRANSPOSITION OF GREAT ARTERY PATIENTS

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Background / Hypothesis:
The arterial switch operation (ASO) is the gold standard surgery for treatment of the transposition of the great arteries (TGA). After an ASO, stenosis in branches of the pulmonary arteries commonly develops. We aim to explore the possible mechanisms of branch pulmonary artery (PA) stenosis using cardiac computerized tomography (CCT).

Materials and Methods:
A retrospective single-center study analyzed all pediatric patients under 18 years old diagnosed with TGA with or without ventricular septal defect (VSD). TGA patients underwent ASO and cardiac CCT between January 2004 and October 2022.

Results:
Of the thirty patients enrolled in this study, 46.67% had an isolated branch pulmonary artery stenosis, and 53.33% had no pulmonary artery stenosis post-ASO. The variables compared between these two groups were not significantly different except for the angle between the pulmonary artery bifurcation and the ascending aorta (AAO) by CCT. In “isolated RPA stenosis”, the angle had a greater leftward angulation between the pulmonary artery bifurcation and the ascending aorta than the “no stenosis” group (angle: 25 (24, 30) VS -2 (-8, 65)). In “isolated LPA stenosis” the angle had a greater rightward angulation than the “no stenosis” group (angle -22 (-32, -20) VS -2 (-8, 65), P value 0.042.

Conclusions:
Rightward or leftward angulation of the angle between the pulmonary artery bifurcation and the AAO likely contributes to the development of an isolated branch pulmonary stenosis after ASO, possibly from an over-stretching mechanism, and may change to pre-ASO surgical strategies. Advanced cardiac imaging is still needed to follow up on pediatric TGA patients after ASO surgery.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1072 - RARE MANIFESTATION OF FUNGAL ENDARTERITIS DUE TO CANDIDA TROPICALIS IN INTERRUPTED AORTIC ARCH CASE REPORT

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We present a case of a 14-year-old female patient with a history of type B interrupted aortic arch, who required multiple corrective surgeries. Upon discharge, she had a small residual interventricular shunt, left ventricular outflow tract obstruction, and moderate aortic insufficiency.

Seven months after the correction, she developed high-grade fever and pain in the right upper limb, with changes in coloration. On physical examination, a harsh grade IV/VI ejection murmur was found, along with diminished pulses in the affected limb. An echocardiogram revealed hyperechogenic, sessile images at the origin of the brachiocephalic trunk, suggesting endarteritis. Treatment with vancomycin and ceftriaxone was initiated, but a chest CT scan showed multiple hypodense lesions in the aorta and pseudoaneurysms.

Microbiological analysis confirmed infection by Candida tropicalis, leading to the initiation of voriconazole treatment. However, the disease progressed, causing septic thrombosis in the middle cerebral artery, right-sided hemiplegia, and occlusive thrombosis in the renal and iliac arteries. A femoral thrombectomy was performed, where Candida tropicalis was also isolated, prompting a change in treatment to amphotericin B.

Fungal endocarditis is rare but severe, associated with immunosuppression and prior cardiac surgeries. It is characterized by fever, septic embolisms, and high mortality. Fungal endarteritis is uncommon, with complications such as aneurysms reported in some cases. The ideal treatment combines antifungal therapy and surgery; however, in this case, due to the high surgical risk, a clinical management approach with strict follow-up was chosen.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1122 - DEVELOPMENT OF SCREENING GUIDELINE FOR FONTAN SURGERY PATIENTS TO MONITOR POSTOPERATIVE COMPLICATIONS

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Background / Hypothesis:
The Fontan Procedure Is a Palliative Surgical Procedure Used to Treat Congenital Heart Disease, Specifically Single Ventricle Physiology. Over Time, This Surgically Created Circulation Leads to Various Long-Term Complications. Additionally, Prolonged Increased Systemic Venous Pressure Can Result in Elevated Central Venous Pressure in the Liver and Abdomen, Leading to Hepatic Cirrhosis, Liver Tumors, and an Increased Risk of HCC at a Young Age. Among These Complications, PLE and HCC Are Associated with Poor Prognosis, With a Mortality Rate Exceeding 50% Within Five Years.

Materials and Methods:
A Retrospective Review of Medical Records of Patients With Single Ventricle Physiology Who Had Undergone the Fontan Procedure Was Conducted to Screen for Hepatic Cirrhosis, Liver Masses, and HCC. Patients Underwent Specialized Imaging Studies, Including Liver U/S, CTA Liver, MRI Liver, and Elastography.

Results:
Among the 37 Patients Who Underwent Screening for Liver Masses, 6 Patients Were Detected by U/S, 24 Patients Were Detected by CTA, and 7 Patients Underwent Abdominal MRI, All of Whom Were Found to Have Liver Masses. Thirty-Six Patients Underwent MRI Elastography, All Diagnosed With Liver Fibrosis. CMR Lymphangiography Was Abnormal in 100% of Cases. Among Those With Detected Masses, Liver Biopsy Was Performed for Further Evaluation, Confirming Malignant Cells in 2 Patients.

Multimodality Imaging Is Vital for Fontan Follow-Up, Extending Beyond Cardiovascular Assessment to Detect Fontan-Associated Liver Disease (FALD). Early Identification of Hepatic Nodules Through MRI, Ultrasound, and Lymphangiography Enhances Patient Outcomes by Enabling Timely Intervention and Reducing Long-Term Complications.

Conclusions:
Recognizing the Importance of Early Screening to Reduce the Risk of HCC and PLE, Our Team Initiated Discussions to Develop a Postoperative Surveillance Protocol. The Protocol Includes the Following Steps: Schedule MRI Lymphangiography at 1 Month and 6 Months Postoperation. At 1 Year Postoperation, Schedule MRI Cardiac, Lymphangiography, and Liver Along With Laboratory Test Monitoring.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1147 - ALTERED CIRCULATING GROWTH FACTORS IN FONTAN PATIENTS WITH GREATER AORTOPULMONARY COLLATERAL BURDEN

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Background / Hypothesis:
Children with single ventricle heart disease (SVHD) and Fontan circulation are at risk for developing abnormal aorto-pulmonary collateral arteries (APCs), which can cause single ventricle enlargement from left-to-right shunting. The pathway alterations underlying APC formation in SVHD remain unclear. We investigated whether circulating growth factors or extracellular matrix (ECM) proteins were associated with APC flow in Fontan patients.

Materials and Methods:
Prospective cohort study of Fontan patients undergoing cardiac MRI. Serum samples were obtained during MRI and analyzed using OLink Explore-HT. Thirty-three a priori proteins of interest (18 growth factors, 11 ECM proteins, 4 other) were investigated. Flow volumes were quantified by 2D phase contrast MRI. The primary outcome, APC flow as a percent of pulmonary blood flow (APC%Qp), was calculated as (pulmonary vein flow – pulmonary artery flow)/pulmonary vein flow. Secondary outcomes included APC flow as a percent of systemic flow (APC%Qs) and the average of APC%Qp and APC%Qs (APCavg).

Results:
Fifty-three patients were enrolled (median age 12.5y). Median APC%Qp was 19.4% (Q1-Q3=15.2-29.6%), median APC%Qs was 14.2% (Q1-Q3=9.0-22.1%), and median APCavg was 17.1% (Q1-Q3=13.7-24.1%). Higher APC%Qp was associated with lower circulating IGF-BP3, FGF21, EGF, TGFB1, FGFR2, and TIMP4 and higher IGF-BP1 ($p<0.05$, Table). After adjustment for multiple comparisons, the relationship remained significant for IGFBP3 (FDR=0.025) and FGF21 (FDR=0.025). Lower FGFR2, EGF, and IGFBP2 levels were associated with higher APC%Qs ($p<0.05$) while higher APCavg was associated with lower FGFR2, EGF, IGFBP3, TGFB1, and FGF21, although FDR was >0.05.

Conclusions:
Circulating levels of multiple growth factors are negatively associated with high APC burden relative to total pulmonary blood flow in Fontan patients. Low levels of FGF21 and IGFBP3 in particular, both known to be protective in the pulmonary vasculature, may be important in the pathophysiology of APC formation in the context of relative paucity of native pulmonary artery

POSTER PRESENTATIONS

Category: Multimodality Imaging

1149 - CONGENITAL LEFT MAIN CORONARY ARTERY ATRESIA AND ANOMALOUS RIGHT CORONARY ARTERY IN A PEDIATRIC PATIENT PRESENTING WITH VENTRICULAR FIBRILLATION ARREST

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Background:
Congenital left main coronary artery atresia (LMCAA) with an anomalous right coronary artery (RCA) is a remarkably rare anomaly with high risk of myocardial ischemia and cardiac arrest. This case highlights the critical role of comprehensive multimodal imaging in diagnosing and managing LMCAA in a patient presenting with Congenital left main coronary artery atresia

Materials and Methods:
A 12-year-old male experienced cardiac arrest during exercise, managed with cardiopulmonary resuscitation and automated external defibrillation (AED).

Results:
Initial hospital electrocardiogram post-arrest showed sinus rhythm with prominent giant T-waves in V2. Transthoracic echocardiography revealed an anomalous RCA from the left aortic sinus, the LMCA origin was unclear. CT angiography confirmed the anomalous RCA with an intramural course between the aorta and pulmonary artery, and suspected LMCAA with a hypoplastic left anterior descending (LAD) artery reconstituted by collaterals. The AED recording was obtained, demonstrating successful cardioversion of VF. Transesophageal echocardiography confirmed a possible blind-ended LMCA ostia. Cardiac catheterization showed a dominant RCA with extensive collaterals perfusing the left coronary system and late filling of the LMCA, confirming atresia. Operative findings included a small LAD, ostial atresia of the LMCA, and anomalous RCA origin. Surgical revascularization was performed; left internal mammary artery (LIMA) grafting to the LAD and unroofing of the anomalous RCA. Post-operative cardiac MRI showed no myocardial fibrosis. Repeat CT angiography confirmed antegrade flow in the RCA and LIMA graft. Repeat cardiac catheterization at three months confirmed patent graft and improved left coronary size. Serial echocardiography, including exercise echocardiography, showed no regional wall motion abnormalities and consistently patent grafts.

Conclusions:
Congenital coronary artery abnormalities are an unusual but important cause of out of hospital VF arrest in children. Multimodal imaging is essential for accurate diagnosis and surgical planning. LMCAA with an anomalous RCA is a rare but life-threatening condition requiring early diagnosis and intervention.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1171 - MULTI INSTITUTIONAL PRACTICE VARIATIONS IN THE USE OF CMR AND CCT FOR PULMONARY VALVE REPLACEMENT PLANNING A SURVEY BASED STUDY

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Background:
There are consensus documents that provide recommendations on the use of cardiovascular magnetic resonance (CMR) and cardiovascular computed tomography (CCT) in pulmonary valve replacement (PVR) planning in congenital heart disease. However, there is no published data on clinical practice patterns across institutions.

Methods:
A 30-point REDCap survey was distributed to collect data on imaging volumes, protocols, right ventricular outflow tract (RVOT) measurements, and reporting times with one response per institution. The survey was distributed to all Society for Cardiovascular Magnetic Resonance and Society of Cardiovascular Computed Tomography members.

Results:
Forty-three institutions (84% US and 16% international) with varying center volumes responded (Table 1). Ninety-five percent of centers utilize CMR first, with 71% adding CCT for self-expanding valves and 24% adding CCT for all. For CCT, 88% of centers perform retrospective gating, with 44% routinely reporting ventricular volumes and function. Measurements reported by the centers include RVOT/main pulmonary artery (MPA) (72%), distal MPA (67%), RVOT length (65%) and branch pulmonary arteries (95%) dimensions. RVOT measurement techniques were reported as centerline method (27%) (vs. angulated MPRs), and perimeter-derived dimensions (24%) (vs. orthogonal MPR diameters). For CMR, magnetic resonance angiography (MRA) was performed using 3D-SSFP in 62% of centers (Table 2). Only 30% of centers reported performing dedicated RVOT short-axis cine sequences and just 16% reported utilizing 4D flow or 3D models. Acquisition and reporting times median (range) were 60 (25-120) minutes for CCT and 120 (45-360) minutes for CMR. Only 35% of centers reported the availability of a dedicated post-processing technologist. Overall, 84% were in favor of adopting a standardized imaging protocol and/or reporting template for PVR planning.

Conclusion:
This survey highlights wide variations in imaging practices for PVR planning with most respondents supporting standardization, which may improve resource utilization, quality, and minimize radiation burden in this specific patient population.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1331 - MARFAN SYNDROME APPROACHED WITH MULTIMODAL IMAGING AND 4D FLOW.

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Background / Hypothesis:
Marfan syndrome is a syndromic aortopathy which promotes aortic aneurysms and dissections. The underlying monogenic disorder is caused by mutations in the fibrillin-1 gene encoding the extracellular matrix protein fibrillin-1. This is responsible for reduced elasticity of the connective tissue. This structurally altered connective tissue in the aorta makes the wall more susceptible to dilatation and dissection, it also can afect de mitral valve.

It is necesary to be regularly monitored and appropriately treated to prevent and delay aortic dissection. According to the international guidelines, cardiovascular magnetic resonance and echocardiography are the modalities of choice for regular monitoring of the aorta.

Materials and Methods:
We present the case of a 16-year-old female patient, who was admitted to our Institute referred from a second-level hospital with a history of Marfan Syndrome, with Severe mitral regurgitation due to anterior and posterior leaflet prolapse. Moderate tricuspid regurgitation, dilation of the aortic root (sinus of Valsalva, 55 mm). Aneurysmal dilatation of the abdominal aorta.

She was presented at a session with transthoracic echocardiogram and magnetic resonance imaging with 4D flow, was accepted to Bentall-Bono surgery with 26mm polyethylene terephthalate tube and 23mm mechanical aortic valve, mitral valve replacement with 33mm mechanical prosthesis, tricuspid valve commissuroplasty.

Results:
The patient was discharged seventeen days after the procedure with improved functional class, with oral anticoagulation, achieving goals and continued follow-up through outpatient consultations.

Conclusions:
There is a wide variety of CMR sequences including black blood images, and contrast-enhanced CMR angiography, hampering standardization and reproducibility in the follow-up between different institutions.

The use of 4D flow CMR have demonstrated the usefulness of this technique for the assessment of abnormal 3D flow patterns and wall shear stress.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1356 - THE RELATIONSHIP BETWEEN MYOCARDIAL STRAIN ANALYSIS USING CARDIAC MAGNETIC RESONANCE AND RIGHT VENTRICULAR ENLARGEMENT IN PEDIATRIC PATIENTS WITH REPAIRED TETRALOGY OF FALLOT

Watcharachai Kangvanskol [1], Paweena Chungsomprasong [2], Yontakan Sanwong [3], Supaporn Nakyen [3], Karnkawin Patharateeranart [4], Prakul Chanthong [2], Supaluck Kanjanauthai [2], Thita Pacharapakornpong [2], Ploy Thammasate [2], Kritvikrom Durongpisitkul [2], Jarupim Soongswang [2]
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Background / Hypothesis: Not only adult patients with post-repair Tetralogy of fallot (rTOF) experience the consequence of pulmonary regurgitation (PR) resulting in right ventricular enlargement (RVE) and dysfunction, but alterations also occur in children. Evaluating myocardial function using feature tracking on cardiac magnetic resonance (CMR) offers a more thorough assessment in individuals with rTOF.

Materials and Methods: This retrospective study included 36 pediatric rTOF patients who underwent CMR between 2017 and 2023. Myocardial strain was measured using CMR-derived feature tracking.

Results: The median age at the time of surgery was 3 years (1-12 years), while the median age at CMR was 14.1 years (8-18 years). There were 11 patients who had severe RVE defined by RV end diastolic volume index (EDVi) > 160 ml/m2 and 15 patients had mild to moderate RVE defined by RVEDVi 120-160 ml/m2. Strong correlations were found between RV ejection fraction (EF) and RV global radial strain (GRS) ($r = 0.794$, $P < 0.001$), and between RVEF and RV global circumferential strain (GCS) ($r = -0.816$, $P < 0.001$). RVEDVi showed a moderate correlation with RVGRS ($r = -0.432$, $P = 0.009$) and RVGCS ($r = 0.433$, $P = 0.008$) and RV end systolic volume index (ESVi) was moderately correlated with RVGRS ($r = -0.516$, $P = 0.001$) and RVGCS ($r = 0.521$, $P = 0.001$). Patients with severe RVE had significantly lower RV myocardial strain, including both RVGRS ($P = 0.04$) and RVGCS ($P = 0.04$), compared to those with mild to moderate RVE.

Conclusions: Myocardial strain analysis, particularly using CMR imaging, is a valuable tool for assessing cardiac function in rTOF patients. It helps detect subtle changes in myocardial performance in the pediatric population, even in those not exposed to long-term PR.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1359 - ANTEGRADE FLOW IN ANOMALOUS LEFT CORONARY ARTERY FROM PULMONARY ARTERY CLINICAL IMPLICATIONS

Yasser Sedky [1], Hatem Hosny [2], Mohamed Donya [3], Sherin Abd Elsalam [1], Magdi Yacoub [4]
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Background / Hypothesis:
Anomalous origin of the left main coronary artery from the pulmonary artery (ALCAPA) is a rare congenital anomaly that usually presents in childhood. It results in left ventricular (LV) ischemia with resulting LV dysfunction. This ischemia results from retrograde flow into the pulmonary artery which can act as a coronary steal. We here report antegrade flow detected in ALCAPA caused by severe pulmonary hypertension. Anatomic correction of ALCAPA is the preferred surgical option and should be performed as early as possible

Materials and Methods:
A 1.5-year-old male child presented with four months history of shortness of breath and dyspnea on exertion.
Two-dimensional color flow Doppler echocardiography revealed the presence of an abnormal mitral valve. The leaflets were thickened and dysplastic. The mitral annulus was significantly dilated. There was a central cooptation gap and severe MR. The LV was dilated with an ejection fraction of 56% and left atrial (LA) enlargement. The systolic pulmonary artery pressure was estimated to be 65 mmHg. The origin of the left main coronary artery (LMCA) seemed to arise from the pulmonary artery (PA), however there was antegrade flow in the coronaries. Multi-slice computed tomography (MSCT) angiography and selective coronary angiography confirmed the origin of LMCA from pulmonary artery

Results:
Anatomic correction of ALCAPA was performed by coronary transfer to the aorta and mitral valve repair. The postoperative course was uneventful. Repeat MSCT showed LMCA arising from the aorta

Conclusions:
The optimal management of ALCAPA repair aims at direct anatomic implantation of the left coronary ostium in the left sinus of Valsalva at infancy It is hoped that the unusual features of ALCAPA presented here will help in the management of similar patients in the future.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1364 - ISOLATED ANOMALOUS LEFT CICUMFLEX ARTERY FROM PULMONARY ARTERY CLINICAL IMPLICATIONS

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Background / Hypothesis:
Anomalous origin of the left main coronary artery from the pulmonary artery (ALCAPA) is a rare congenital anomaly that usually presents in childhood, also known as Bland-White-Garland syndrome, occurring in approximately 1 in 300,000 children or 0.5% of children with congenital heart disease. Ninety percent of the patients with ALCAPA die within the first year of life without surgical intervention. the condition causes varying degrees of left ventricular (LV) ischemia with resulting LV dysfunction. The ischemia results from several factors including the retrograde flow in the anomalous vessel into the pulmonary artery (PA) which can act as a coronary steal. The anomalous LCX coronary artery from the pulmonary artery (ALXCAPA) can be considered an extremely rare variant of the ALCAPA, with the first adult case documented in 1992 and only 47 cases reported worldwide by 2021.

Materials and Methods:
Three months old child presented with profound cardiogenic shock with hypotension and tachycardia and cardiomegaly on chest x ray, echocardiography showed dilated cardiomyopathy and origin of left coronary from PA, MSCT confirmed diagnosis and documented the presence of isolated left circumflex from PA

Results:
The child was put on high cardiac support with severe acidosis and elevated lactate and cardiac enzymes with trial of transfer to higher cardiac center for anatomic repair but unfortunately developed refractory VT and passed away

Conclusions:
we report this anomaly due to its rarity. It is hoped that the unusual features of ALCAPA presented here will help in the management of similar patients in the future.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1439 - SPONTANEOUS REGRESSION OF PULMONARY ARTERIOVENOUS MALFORMATION AFTER MODIFIED FONTAN SURGERY NEW EVIDENCE FROM MULTIMODAL MEDICAL IMAGING

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Background:
This case report describes a multi-time-point follow-up of a single-ventricle patient who experienced interstage pulmonary arteriosvenous malformation (PAVM) and recovered after Qiao's modified Fontan procedure.

Methods:
An 18-year-old female patient has undergone bidirectional Glenn procedure at age 2 and subsequently received a Fontan completion surgery (12-mm diameter conduit) at age 9. Multiple follow-ups from neonate to 18 years-old. Computational fluid dynamics has been used to assess post-Fontan hemodynamics. Postoperatively, she was treated briefly with potassium citrate granules and spironolactone, and maintained continuous home oxygen therapy for six months. No additional surgeries or relevant medications were recorded afterward.

Results:
Clinical data have been gathered at age 2, 9 (Fontan procedure), 10, 11, 14, and 18. No pulmonary hypertension is observed with average pulmonary arterial pressure equal to 7, 7, 8,15 mmHg before Fontan surgery and at age 10, 11, 18. Multimodal imaging (catheterization, cardiovascular magnetic resonance [CMR], and echocardiography) confirmed the progression and the resolution of PAVM along the way.

PAVM was observed pre-Fontan (resting oxygen saturation (SpO_2) = 83%). Minimal PAVM persisted at age 10 and 14 follow-ups (SpO_2 = 90%, 94%) and resolved at age 18 (SpO_2 = 98%). CMR 4D flow showed normal ventricular function, doppler demonstrated laminar hepatic venous flow (peak velocity = 70 cm/s), showing an optimal hemodynamic profile at the extracardiac conduit-inferior vena cava anastomosis. CFD shows relatively balanced hepatic flow distributed to both lung, showing that the hepatic-factor-enriched blood flow established by the Fontan procedure likely promoted spontaneous regression of PAVM.

Conclusions:
This case highlights the significance of comprehensive anatomical, flow, and functional assessments in managing adult congenital heart disease and offers critical insights into post-Fontan vascular remodeling mechanisms. Imaging showed delayed PAVM regression up to nine years post-surgery, suggesting caution in early intervention for select patients.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1453 - IMPACT OF CLINICAL AND SURGICAL FACTORS ON POSTOPERATIVE VENTRICULAR FUNCTION IN UNIVENTRICULAR PALLIATION A CARDIAC MAGNETIC RESONANCE STUDY

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Background / Hypothesis:
Single ventricle palliation is a surgical strategy for complex congenital heart defects. Cardiac magnetic resonance is the preferred method for assessing ventricular function. Some of these parameters have become predictive factors of clinical outcomes. The objective of this study was to evaluate the relationship between clinical and surgical variables and ventricular function parameters measured by cardiac magnetic resonance in the postoperative follow-up of single ventricle patients.

Materials and Methods:
A correlation study was conducted to analyze the relationship between clinical and surgical variables and ventricular function parameters. The study included patients who underwent single ventricle palliation surgery in the second and third stages. Ventricular function parameters were assessed using our institutional cardiac magnetic resonance protocol for single ventricle physiology. We included the following ventricular function parameters: ventricular volumes in endiastole and endsystole, ejection fraction, global function index and myocardial strain. Statistical analysis was performed using Pearson correlation.

Results:
A total of 20 patients, aged 1 to 18 years, were studied. Diagnosis of double outlet right ventricle was made in 50% and 80% underwent Fontan surgery. A positive correlation was observed between cardiopulmonary bypass time and the global function index (55%, p = 0.049). Additionally, a positive correlation was found between NT-ProBNP levels and indexed end-diastolic volume and indexed end-systolic volume of the single ventricle (54.1%, p = 0.037) and (64%, p = 0.032) respectively. No other ventricular function parameters showed statistical significance.

Conclusions:
Significant correlations were observed between cardiopulmonary bypass time and the single ventricle global function index, as well as between NT-ProBNP levels and indexed end-diastolic and end-systolic volumes. Single ventricle volumes and the global function index have been associated with clinical outcomes by a large single ventricle cohort. Our findings underscore the role that clinical variables might have as predictors of clinical outcomes in these patients.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1468 - PULMONARY PERFUSION PATTERNS AND RIGHT VENTRICULAR FUNCTION IN PULMONARY ARTERIAL HYPERTENSION ASSOCIATED WITH CONGENITAL HEART DISEASE INSIGHTS FROM DUAL ENERGY CT IMAGING

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Background / Hypothesis:
Pulmonary arterial hypertension associated with congenital heart disease (PAH-CHD) is a severe complication of long-standing congenital heart defects. This study aimed to investigate pulmonary perfusion patterns and right ventricular (RV) function in PAH-CHD patients using Dual-Energy CT (DECT) imaging and echocardiography, exploring the relationship between perfusion patterns and clinical parameters

Materials and Methods:
Twenty-five patients with simple congenital heart defects (VSD 64%, ASD 32%, PDA 4%) underwent DECT scans, echocardiography, and six-minute walk tests (6MWT). DECT perfusion patterns were categorized as normal (NL), diffuse heterogeneously decreased (DH), or peripheral wedging (PW). Echocardiographic parameters included Tricuspid Annular Plane Systolic Excursion (TAPSE) and Global Longitudinal Strain (GLS). Correlations between perfusion patterns, echocardiographic findings, and clinical parameters were analyzed

Results:
DECT revealed three main perfusion patterns: DH (48%), NL (32%), and PW (20%). Patients with DH patterns demonstrated worse RV function, with lower TAPSE (mean 20.5 mm) and GLS (-15.6%) compared to those with NL patterns (TAPSE 23.1 mm, GLS -17.2%). DH pattern patients also showed reduced exercise capacity with lower 6MWT distances (365 meters) compared to NL pattern patients (440 meters). Hemoglobin levels were highest in DH pattern patients, suggesting a compensatory response to chronic hypoxia, though this did not translate to improved functional outcomes

Conclusions:
DECT, combined with echocardiography, provides a comprehensive, non-invasive assessment of disease progression and RV function in PAH-CHD patients. The study demonstrates significant correlations between perfusion patterns and clinical parameters, suggesting DECT's potential as a "one-stop shop" for diagnosis, risk stratification, and monitoring of PAH-CHD. However, limitations including small sample size and radiation exposure concerns warrant further research, particularly longitudinal studies to track perfusion patterns over time and correlate them with clinical outcomes and treatment efficacy

POSTER PRESENTATIONS

Category: Multimodality Imaging

1470 - IMAGING BASED MORPHOLOGICAL FEATURES OF CONGENITAL CORONARY ARTERY FISTULA IN PEDIATRIC PATIENTS

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Background / Hypothesis:
Congenital coronary artery fistula (CCAF) is a rare cardiac anomaly in children, characterized by an abnormal communication between a coronary artery and a cardiac chamber or major vessel. If untreated, it may lead to myocardial ischemia, heart failure, or aneurysm rupture. Early detection and precise morphological assessment are critical. This study aims to describe the anatomical features of pediatric CCAF and assess the diagnostic performance of non-invasive imaging versus invasive coronary angiography.

Materials and Methods:
A retrospective and prospective case series was conducted on 53 pediatric CCAF patients treated at Children's Hospital 1, Ho Chi Minh City, from June 2008 to June 2022. All patients underwent transthoracic echocardiography (TTE); 34 had coronary computed tomography angiography (CCTA), and 50 underwent invasive coronary angiography (ICA). Morphological features including origin, drainage site, number of fistulas, coronary dilation, and aneurysms were evaluated. Diagnostic accuracy of TTE and CCTA was compared with ICA and surgical findings.

Results:
Median age was 23.4 months. Most fistulas originated from the right coronary artery (58.5%) and drained into the right ventricle (58%) or right atrium (24%). Multiple fistulous openings (≥2) were found in 24.5%. Median coronary diameter at the origin was 8.6 mm (Z-score 18.1); 58.5% had dilation ≥8 mm. Coronary aneurysms were present in 83%, mainly near the distal fistula. TTE identified the fistulous artery and drainage site with 100% and 90.9% accuracy, respectively. CCTA had 100% accuracy for major arteries and aneurysms, and >90% for minor branches and drainage sites. All patients were successfully treated; mortality was 1.8%.

Conclusions:
CCAF in children typically originates from the right coronary artery and drains into right heart chambers. These lesions are complex, characterized by giant coronary artery dilation and predominantly distal-type morphology, with multiple orifices, tortuous tracts, and frequent aneurysms. TTE and CCTA are reliable for diagnosis and management planning.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1471 - MULTIMODALITY IMAGING OF TOTAL ANOMALOUS PULMONARY VENOUS RETURN USING ECHOCARDIOGRAPHY BLOOD SPECKLE IMAGING AND CARDIAC COMPUTED TOMOGRAPHY ANGIOGRAPHY

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Background / Hypothesis:
Echocardiography is the primary diagnostic tool for congenital heart disease, particularly for assessing intracardiac structural lesions. However, it can be challenging to accurately evaluate extracardiac anatomical features, such as pulmonary veins. The use of multimodality imaging techniques can assist in the assessment of Total Anomalous Pulmonary Venous Return (TAPVR) and aid in identifying potential drainage restrictions and obstructions.

Materials and Methods:
This study involved a case series of 10 TAPVR patients with various anatomical forms who underwent different imaging modalities, including echocardiography, blood speckle imaging (BSI), and cardiac computed tomography angiography (CTA).

Results:
The analysis revealed different anatomical forms: 40% had the Supracardiac type, 20% had the Intracardiac type, 30% had the Infracardiac type, and 10% had the Mixed Type. Additionally, specific subtypes, such as the Intracardiac SVC-RA junction and Supracardiac SVC-Innominate junction, were characterized. Cardiac CTA demonstrated its value in the preoperative assessment of these anomalies, especially for the infracardiac type and cases with obstruction. Blood speckle imaging proved to be a simple and safe adjunct for acute postoperative echocardiogram surveillance.

Conclusions:
Through the use of multimodality imaging, early recognition of various subtypes of anatomical forms of TAPVR was enhanced compared to their initial echocardiographic diagnoses. This accurate identification of venous connection areas, potential obstructions, and postoperative assessment of constrictions significantly contributed to surgical planning and effective TAPVR patient management.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1476 - VASCULR RING WHEN MULTI MODALITY IMAGING UMASK THE REALITY.

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Cairo University, Mouwasat Hospital Dammam, Pediatric Cardiology, Cairo-Egypt [1] Ain Shams University, Pediatrics, Cairo-Egypt [2]

Background / Hypothesis:
Vascular rings occur due to disturbance in the normal sequence of maturation and involution of paired arches to form either left or right aortic arch, it is an unusual congenital condition in which the abnormal configuration of the arch, arch vessels, or both surrounds the trachea and esophagus, forming a complete or incomplete ring encircling them.
A right-sided aortic arch is rare, it is suspected to occur in about 0.1% (range 0.05-0.2%) of the population. The majority of the patients are asymptomatic, and it is discovered incidentally. However, it causes symptoms when associated with other vascular anomalies (vascular ring) due to compression of the esophagus and/or trachea

Materials and Methods:
One and half years old child presented with diagnosis of cow milk protein allergy and asthma symptoms in the form of wheezing, recurrent chest infection, reflux, dysphagia, with poor response to conventional asthma therapy. The patient was on aminoacidic base formula for the past six months with no improvement.

On presentation patient was found to be underweight, x ray showed increased broncho vascular markings and abnormal position of aortic arch.
Due to poor response and recurrent hospitalization, echocardiography was requested and confirmed the presence of right sided aortic arch with mirror image branches and pulmonary hypertension mean while due to the reflux symptoms barium swallow was done and showed external compression on the oophagous, the possibility of external air way compression was suspected and MSCT was done and confirmed the presence of complete vascular ring
Results:

The patient was referred to surgery, underwent surgical correction in the form of division of rudimentary arch and stayed in the ICU for two days and was discharged safely

Conclusion:
In conclusion, familiarity with aortic arch variants and periaortic vessel abnormalities is essential to establish a correct classification and diagnosis to guide proper management of these conditions.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1557 - BEYOND THE PROTOCOL CMR IN PEDIATRIC CARDIOLOGY ANSWERING SPECIFICS OVERCOMING CONSTRAINTS MAXIMIZING RESOURCES

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Background / Hypothesis:
Cardiac MRI can be tailored to answer specific clinical questions in complex CHDs. Targeted creative application of known imaging sequences can be utilized to resolve clinical conundrums in conjunction with or even beyond cardiac catheterization. CMR in pediatrics need not be limited to traditional applications of function and fibrosis and even simple sequences can be modified by pediatric cardiologists to overcome the need of resource-heavy modalities like 4D flow and 3D printing.

Materials and Methods:
Individual patients with complex CHD and specific clinical management questions were taken up for CMR, for example, with the intention of using routine phase contrast flow estimation to determine operability in transposition physiology with unilateral hypertensive and contralateral PA stenosis, utilizing the basic bolus tracking sequence designed to time angiograms as a surrogate of 4D streaming studies in Fontan patients with suspected PAVMs and unexplained desaturation, applying heavily weighted T2 sequences usually employed in MRCP sequences to predict lymphatic complications in pre-Fontan single ventricle patients (CHOP protocol), using phase contrast flow based aortic distensibility assessment as a marker of wall-elasticity in aortopathies, employing stress CMR based serial surveillance in Kawasaki disease to decide the timing/need for invasive testing and/or coronary intervention.

Results:
CMR was valuably utilized in deciding operability, planning type of surgery, and prognostication facilitating many difficult treatment decisions in our clinical practice.

Conclusions:
Targeted CMR and re-inventing standard sequences can be effectively integrated into clinical pediatric cardiology practice surmounting resource constraints.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1578 - BRACHIOCEPHALIC TRUNK ANOMALY AS A DIFFERENTIAL DIAGNOSIS OF PATENT DUCTUS ARTERIOSUS IN A PATIENT WITH DOWN SYNDROME

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Background:
Patent ductus arteriosus (PDA) is a common condition in pediatric patients, especially in those with genetic syndromes such as Down syndrome. Careful evaluation of vascular anatomy in these cases is essential, as anomalies can complicate clinical management and interfere with treatment.

Case report:
A 2-year-old male diagnosed with Down syndrome, atrial septal defect (ASD) and patent ductus arteriosus (PDA), was referred for percutaneous closure of the PDA. Initial angiography revealed the presence of a right aortic arch with the right subclavian artery and right carotid artery originating from it; closed ductus arteriosus and left brachiocephalic trunk connected to the main pulmonary artery and filled by cerebral circulation. The procedure was suspended and the patient was referred for angiotomography, which confirmed the anatomical variation of the brachiocephalic trunk, associated with an extensive network of collaterals in the left hemithorax and cervical region, as well as a difference in the caliber of the internal carotid arteries with volumetric predominance of the right, due to probable flow asymmetry. No other arteriovenous malformations were observed in the cerebral, thoracic and cervical circulation. Surgery correction was successfully performed with no bypass.

Conclusion:
Literature suggests that the presence of chromosomal anomalies, including Down syndrome, may predispose to multiple cardiac malformations, such as PDA and aortic arch anomalies. Therefore it is important to consider a comprehensive cardiac evaluation in these patients, often requiring the use of multiple imaging methods in order to identify and manage these conditions effectively

POSTER PRESENTATIONS

Category: Multimodality Imaging

1692 - TOTAL ANOMALOUS PULMONARY VENOUS CONNECTION WITHOUT ASD. A CASE REPORT OF CHILD WITH 3 YEARS OLD.

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Background:
Total anomalous pulmonary venous connection (TAPVC); systemic output can be maintained only if there is a right-to-left shunt, which is almost always at the atrial level. Exceptional cases have been described in which the atrial septum was intact; In these patients, the right-to-left shunt occurred either at the ventricular, or ductal level.
The CTA can make an exhaustive evaluation of patients with TAPVC. Given the inherent complexity involved in understanding the three-dimensional relationships, multiplanar imaging techniques allow evaluate the anatomic relationships whit three-dimensional reconstructions.

Clinical Case:
Child 3 years old, SPO2 70%, and supracardiac TAPVC without ASD, mimicking hypoplastic left heart syndrome (left micro atrium, small left ventricle and ascending aortic hypoplasia) with a large ductus-dependent systemic circulation, and retrograde blood supply in the transverse arch, ascending aortic, coronary artery, left ventricle and left atrium. With dilated single coronary artery. The persistence of the ductus arteriosus allowed maintaining a sufficient coronary flow to allow the patient to live.

Discussion:
The TAPVC without ASD and VSD can mimicking hypoplastic left heart syndrome; we think in these cases, the retrograde blood supply by the ductus is a characteristic feature of hypoplastic left heart syndrome. In our case, multiplanar imaging tomography allowed us to evaluate with greater precision what echocardiography was limited to define, such as the characteristics of the interatrial septum, size of the left cavities, coronary pattern and adequate characterization of pulmonary venous drainage. So, the main question is, what type of treatment can be offered in these patients who have a left atrium too small to connect the pulmonary veins and the mitral annulus is almost atresic?
Unfortunately, in our case the patient was captured late at the age of 3 years when the pulmonary pressures were already increased and the left cavities were not adequately developed.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1722 - TRANSCATHETER PULMONARY VALVE IMPLANTATION FOR ADULT CONGENITAL HEART DEFECTS SELECTING CANDIDATES USING CT.

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Background / Hypothesis:
Transcatheter pulmonary valve replacement (TPVR) is crucial to treat dysfunction of the right ventricular outflow tract (RVOT) in patients who undergone surgery for congenital heart defects.
TPVI is now rutinely performed in previously placed conduits or patched RVOT. Candidate selection is limited by available sizes of the valves.

The aim of the study was to quantify the method of planning transcatheter pulmonary valve implantation (TPVI) in patients who have undergone surgery for congenital heart defects(CHD) by measuring in both ECG and non-ECG gated CTA sizes of pulmonary artery(PA).

Materials and Methods:
27 patients with CHD as Tetralogy of Fallot and Double outlet Right Ventricle(DORV), operated in infancy, were included into study and divided into two groups: study group, in which direct intravascular balloon sizing of PA was performed, and control group in which TPVI was rejected for excessive artery size without performing angiography.
CTA of all cases were retrospectively analyzed and 4 sizing zones were measured: RVOT, supravalvular zone, middle-segment of and bifurcation zone of PA. After that calculations to find appropriate patient-specific sizing methods by comparing parameters with an actual balloon size were made (MedCalc Software Ltd, Ostend, Belgium; https://www.medcalc.org;2022).

Results:
While both maximal valvular ($r=0.85$, $p<0.001$) and maximal bifurcational ($r=0.71$, $p<0.03$) diameters of the pulmonary artery correlated with pre-stenting size, only the valvular zone was considered an independent residual in regression analysis ($F=20,9$, $P=0,0002$).
After implementing a regression equation to calculate balloon size of PA on the control group, all the estimated sizes exceeded TPVR limitation point.

Conclusions:
Our study showed that regardless of the gating type of cardiac CT preprocedural CHD TPVI landing zone sizing in diastolic phase should be based on measuring supravalvular zone of pulmonary artery, taking into consideration the type of previous surgery ($F=20,9$, $P=0,0002$), especially as an exclusion criteria.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1727 - TRACHEAL LUMEN IN VASCULAR RINGS CT PREDICTORS FOR SURGICAL MANAGEMENT.

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Introduction
Vascular rings are congenital abnormalities of the aortic arch-derived vascular and ligamentous structures, which encircle the trachea and oesophagus to varying degrees. While complete vascular rings may cause significant symptoms due to extrinsic mass effect upon the airway and esophagus,incomplete rings, not fully forming a vascular circle may be less symptomatic or have unclear clinical presentation and go undetected.

Materials and methods
A group of 35 patients with vascular rings diagnosed by CT-angiography in the National applied center for pediatric surgery from 2022 to 2024 was retrospectively analyzed. Patients were divided into two groups: 1st group underwent surgery due to significant symptoms, and 2nd group in which patients weren't operated on. Mean age counted 1,8 ± 2,5, in the 1st group and 8,97 ± 5,73 in the 2nd.

Results
There was no significant difference between the types of aortic arch with respect to age, p=,413.
A Mann-Whitney U-Test showed that the difference between operated and non-operated groups was statistically significant, U = 61, n1 = 17, n2 = 18 p = ,002.
A logistic regression analysis to examine the influence of age and residual tracheal lumen on the surgical management showed that the model as a whole was significant (Chi2(2) = 29,89, p <.001, n = 35). ROC-curve for such prediction is shown AUC 0.954

Conclusion
The analysis showed that smaller tracheal lumen in pediatric patients with vascular rings is associated with double aortic arch (p=<.001) and smaller age of clinical manifestation (U = 61, n1 = 17, n2 = 18 p = ,002), consequently leading to surgery.
Logistic regression model, concerning tracheal lumen and age of manifestation to predict surgery showed AUC 0,954 (p <.001,), which showed CT-based measurement of a tracheal lumen as a valuable predictor for vascular rings surgical management.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1738 - AORTIC ATRESIA WITH VENTRICULAR SEPTAL DEFECT AND NORMAL SIZED LEFT VENTRICLE MIMICKING TRUNCUS ARTERIOSUS A CASE REPORT

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Background / Hypothesis:
Aortic atresia is typically associated with a hypoplastic left ventricle and mitral valve; however, it may also present with a large ventricular septal defect and a normal-sized left ventricle. This case report highlights a rare instance of aortic atresia resembling persistent truncus arteriosus anatomy, which deteriorated following ductus arteriosus closure.

Materials and Methods:
Clinical data, echocardiography and computed tomography (CT) images were reviewed.

Results:
A term infant with antenatal suspected type 1 truncus arteriosus was transferred to our tertiary centre soon after birth. The initial transthoracic echocardiogram revealed balanced ventricles, a perimembranous ventricular septal defect with right-to-left shunting, an overriding dominant arterial trunk predominantly connected to the right ventricle but unusual arrangement of the brachiocephalic vessels. A CT angiogram showed a distal focal narrowing of the dominant arterial trunk just proximal to the branching of the brachiocephalic vessels. The infant's condition rapidly deteriorated, necessitating intravenous prostaglandin, inotropes infusion and emergency surgery. An episode of cardiac arrest during transfer to the operating table limited the surgery to palliation. Extensive ductal tissue involvement of the presumed distal arterial trunk was observed intraoperatively. Post-surgery, the infant required extracorporeal membrane oxygenation support and developed coagulopathy, renal failure, extensive intracranial hemorrhage, and seizures. The family opted for withdrawal of support on day 7 of life in view of grave prognosis.

Retrospective review of the echocardiogram and CT angiogram suggested aortic atresia and diminutive ascending aorta, which were not initially recognized. The hypoplastic aortic arch and brachiocephalic branches were retrograde supplied by the ductus arteriosus leading to the impression of unusual appearance of brachiocephalic vessels. There was coarctation of aorta corresponding to the focal narrowing of the presumed dominant arterial trunk.

Conclusions:
Aortic atresia with ventricular septal defect mimicking persistent truncus arteriosus rapidly deteriorated after ductus arteriosus closure. Timely differentiation is vital for prompt intervention to prevent adverse outcomes.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1819 - BERRY SYNDROME MANAGEMENT IN A TERTIARY HOSPITAL IN THE PHILIPPINES

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Background / Hypothesis:
Berry syndrome is a rare congenital cardiac condition of aortopulmonary septal defect with aortic origin of the right pulmonary artery, interruption or coarctation of the aortic isthmus, patent ductus arteriosus, and intact ventricular septum. Critical in diagnosis is identifying the presence of each component of the anatomy. Similarly, early surgical intervention is recommended to avoid pulmonary hypertension and to improve perfusion to the lower parts of the body.
Materials and Methods:
Case Report

Results:
This is a case of a two-month old female, received at our institution at the the first month of life, whose diagnosis of Berry Syndrome was initially made by 2D echo. To further elucidate the anatomy, a cardiac CT scan was done confirming the diagnosis. Guided by multi-modality imaging and after treatment of infection, the patient underwent single-stage repair consisting of arch repair, aortopulmonary window patch closure, baffling of the right pulmonary to the main pulmonary artery, and patent ductus arteriosus ligation.

Conclusions:
Berry Syndrome was diagnosed through 2D echocardiography, which revealed key congenital cardiac abnormalities. The diagnosis was confirmed by a cardiac CT scan, providing detailed anatomical visualization crucial for surgical planning. These imaging studies guided the successful surgical correction of the defect in a patient treated at a tertiary hospital in a low-resource setting, highlighting the importance of advanced diagnostics even in limited-resource environments.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1821 - ANOMALOUS ORIGIN OF THE RIGHT CORONARY ARTERY WITH MALIGNANT INTERATRIAL COURSE AS A RARE CAUSE OF PEDIATRIC CHEST PAIN A CASE REPORT

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University Of The Philippines - Philippine General Hospital, Department Of Pediatric, Division Of Pediatric Cardiology, Manila-Philippines [1]

Background / Hypothesis:

Chest pain among pediatric population is rarely cardiac in nature, accounting for less than 5% of chest pain yet it is the 2nd leading cause of referral to pediatric cardiologist. This case report highlights the investigation done in an adolescent in-patient referred to pediatric cardiology due to chest pain mimicking the characteristic of myocardial infarction. The general objective of this case report is to highlight approach in managing pediatric chest pain. Specific objectives includes discussion of anomalous right coronary artery, its diagnostics and management.

Materials and Methods:
Case report

Results:
This is an middle adolescent male presenting with severe chest pain mimicking myocardial infarction during times of hypertension and during hemodialysis. All work up done including chest x-ray, ECG, holter monitoring and cardiac biomarkers were all unremarkable. 2d-echocardiogram revealed an anomalous right coronary artery with malignant interatrial course. Coronary CT scan confirmed our findings.

Conclusions:
Despite cardiac causes of chest being rare in pediatric population, meticulous evaluation of all the cardiac structures especially the coronaries via 2d-echocardiogram is very important in the initial evaluation of all pediatric chest pain. Coronary evaluation can be supported by other advanced imaging modality such as global longitudinal strain and coronary CT scan to better delineate anatomy and function.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1863 - EXTRATHORACIC COURSE IN TOTAL ANOMALOUS PULMONARY VENOUS CONNECTION A UNIQUE CASE OF DRAINAGE TO THE LEFT SUBCLAVIAN VEIN

Alvaro Riojas Favero [1], Kenneth Gustav Abimalec Magaña [1], Roberto Desiderio Camacho Barrera [1], Theo Yasser Contreras Alvarado [1], Omar Alonso Rodriguez [2], Martin Adrian Ramos Manriquez [1], Martín Alfonso Saldaña Becerra [2], Omar Victorica Guzmán [2]
Imss Umae 34, Pediatric Cardiology, Monterrey-Mexico [1] Imss Umae 34, Pediatric Cardiac Surgery, Monterrey-Mexico [2]

Background / Hypothesis:
Total anomalous pulmonary venous connection (TAPVC) with drainage to the left subclavian vein via an extrathoracic route is an extremely rare anatomical variant, rarely reported in literature. Early recognition is critical, especially when associated with obstructive physiology, as it can lead to severe pulmonary hypertension and hemodynamic instability. We report a unique case of TAPVC with an intrathoracic-to-extrathoracic collector coursing through the posterior thorax and draining into the left subclavian vein, diagnosed through multimodal imaging and managed surgically with excellent outcomes.

Materials and Methods:
A 4-day-old female neonate presented with central cyanosis and respiratory distress. Echocardiography revealed supracardiac TAPVC and a large non-restrictive atrial septal defect. Angio-CT demonstrated a retrocardiac “C-shaped” collector, with a posterior-to-anterior course and drainage into the left subclavian vein via paravertebral and axillosubclavian collaterals.

Cardiac catheterization confirmed suprasystemic pulmonary hypertension (mean PA 36 mmHg, wedge 12 mmHg, RA 5 mmHg; gradient 7 mmHg) and provided key anatomic insights. Selective angiography visualized the extrathoracic segment of the collector running lateral to the rib cage, connecting to the left subclavian vein. Levo-phase imaging delineated the complete pulmonary venous return, with right veins joining the inferior part of the “C” and left veins the superior portion, converging into a retroesophageal and obstructed segment.

Results:
Surgical correction involved direct anastomosis of the collector to the left atrium and distal ligation. Postoperative echocardiography confirmed unobstructed venous return. Angio-CT confirmed complete anatomic correction. The patient was discharged with stable hemodynamics and normal oxygenation.

Conclusions:
This case illustrates a previously unreported extrathoracic drainage pathway of TAPVC to the left subclavian vein. Multimodality imaging was essential for precise anatomical delineation, guiding urgent surgical intervention. Early recognition and a tailored surgical approach led to excellent short-term outcomes, underscoring the importance of imaging-driven diagnosis in

POSTER PRESENTATIONS

Category: Multimodality Imaging

1880 - MULTIMODAL DIAGNOSIS AND POSTMORTEM CONFIRMATION OF CRISS CROSS HEART WITH DOUBLE DISCORDANCE AND PULMONARY ATRESIA A CLINICAL PATHOLOGICAL CASE REPORT

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Background / Hypothesis:
Criss-cross heart with atrioventricular and ventriculoarterial discordance is a rare and complex congenital anomaly. When associated with pulmonary atresia and ductus-dependent pulmonary circulation, early diagnosis and appropriate management are challenging. We present a case diagnosed through multimodal imaging—transthoracic echocardiography and diagnostic catheterization with interventional palliation—and confirmed by autopsy, highlighting its anatomical complexity and diagnostic value.

Materials and Methods:
A neonate presented with central cyanosis and severe hypoxemia within hours of birth. Transthoracic echocardiography revealed situs solitus, atrioventricular and ventriculoarterial discordance, criss-cross ventricular inflow pattern, large nonrestrictive ventricular septal defect, atresia of the pulmonary valve, and confluent ductus-dependent pulmonary arteries arising from a tortuous ductus arteriosus and a right aortic arch.
Cardiac catheterization confirmed the complex anatomy: a trabeculated anterior ventricle (morphologic RV) giving rise to the aorta, a posterior smooth-walled ventricle (morphologic LV), two interventricular defects (perimembranous and mid-muscular), a patent foramen ovale, and a right aortic arch with a tortuous ductus arteriosus supplying confluent pulmonary arteries. Hemodynamics showed suprasystemic RV pressures (67/0/8 mmHg) and severe systemic desaturation (18%). A drug-eluting stent (Xience Sierra 3.5 × 15 mm) was successfully implanted in the ductus arteriosus, restoring pulmonary flow and improving systemic oxygen saturation to 82%.

Results:
Despite initial improvement, the patient died four days later. Autopsy confirmed all preinterventional findings: criss-cross heart with L-looped ventricles, double discordance, multiple VSDs, pulmonary atresia, and a patent ductus arteriosus with an in situ stent. No additional anomalies were found, validating the diagnostic accuracy of the multimodal imaging approach.

Conclusions:
This case illustrates the diagnostic and interventional power of multimodal imaging in complex congenital heart disease. The correlation between echocardiography, catheterization, and anatomical findings emphasizes the value of early diagnosis and confirms the feasibility of palliative catheter-based approaches even in anatomically challenging neonates.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1897 - CARDIAC MAGNETIC RESONANCE DERIVED HEMODYNAMIC RISK FACTORS FOR LIVER CIRRHOSIS INSIGHTS FROM THE FINNISH NATIONAL FONTAN COHORT

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Background / Hypothesis:
Improved survival in Fontan patients has increased awareness of long-term complications, notably Fontan-associated liver disease (FALD). FALD encompasses a spectrum ranging from hepatic congestion and fibrosis to cirrhosis and hepatocellular carcinoma. Without definitive treatments, optimizing hemodynamics is crucial for mitigating liver injury. Cardiac magnetic resonance (CMR) imaging provides valuable hemodynamic assessment and may aid in early detection and risk stratification of liver disease. This study aimed to identify hemodynamic risk factors associated with liver cirrhosis using CMR and clinical data in a nationwide pediatric Fontan cohort.

Materials and Methods:
This retrospective nationwide study included 148 pediatric patients with extracardiac total cavopulmonary connection (TCPC) undergoing standardized follow-up CMR at the New Children's Hospital between February 2019 and September 2024. Liver cirrhosis was diagnosed by MRI. Hemodynamic data were obtained from CMR; additionally, SpO_2 and peripheral venous pressure (PVP) were measured, and clinical data were retrieved from patient records.

Results:
Liver cirrhosis was identified in 11 patients (7,4%), focal nodular hyperplasia in 12 patients (8,1%), and hepatocellular carcinoma in one 8-year-old patient, with a patent ductus venosus noted as a likely predisposing factor. Key factors strongly associated with liver cirrhosis included age, a systemic right ventricle, CMR-derived McGoon ratio and narrowing of the TCPC tunnel. ROC analysis identified optimal cutoff values associated with increased risk of liver cirrhosis as follows: a CMR-derived McGoon ratio ≤1.8, narrowest tunnel area ≤2.0 cm^2, and age ≥16.5 years.

Conclusions:
Liver MRI, widely adopted in Fontan follow-up protocols, is vital as cirrhosis prevalence increases with age. We identified strong associations between liver cirrhosis and lower CMR- derived McGoon ratio, TCPC tunnel narrowing, older age, and systemic right ventricle. Optimizing Fontan circulation remains essential to mitigate FALD progression and enhance outcomes.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1903 - UTILITY OF 3D ECHO AND CT ANGIOGRAM ASSESSMENT OF THE LEFT VENTRICULAR OUTFLOW TRACT AND AORTIC ARCH FOR PLANNING REPAIR FOR INTERRUPTED AORTIC ARCH.

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Background / Hypothesis:
Interrupted aortic arch [IAA] is a complex congenital heart defect that requires neonatal surgical repair or palliation. Management for biventricular repair includes arch repair, and ventricular septal defect [VSD] closure or a Yasui-type repair. Dr. Geva et al In the 1990s, demonstrated that an aberrant subclavian artery or reduced left ventricular outflow tract [LVOT] cross-sectional area were associated with significant post-operative LVOT obstruction if primary Arch and VSD repair was performed.

Materials and Methods:
We included patients at a single center with a diagnosis of Interrupted Aortic Arch from December 2005 to December 2024. Charts were reviewed for repair and associated clinical outcomes. De-identified Echocardiograms [echoes], when available 3D echoes, and CT angiograms were evaluated for anatomical features and measurements of the LVOT, aortic valve, and great arteries. We assessed anatomical factors, and surgical procedures associated with mortality and post-operative LVOT obstruction. We compared outcomes for patients who had pre-operative planning with 3D Echo or CT angiogram v/s standard 2D echocardiography.

Results:
A total of 62 patients were identified. 43 [69%] were white, and 27 [44%] female. Most common was Type B interrupted aortic arch, followed by Type A. There was only one case of Type C interruption. There was 16% [n=10] mortality overall and 14% [n=9] incidence of post-operative LVOT obstruction. 44% of patients with LVOT obstruction died. Starting in 2012, Preoperative CT scan was performed in 24 [39%] of cases. Patients with preoperative CT scans had an 8% incidence of post-operative LVOT obstruction, and 8% overall mortality while patients without preoperative CT had 18%, and 21% respectively.

Conclusions:
In our single-center study, there was an important reduction in post-operative LVOT obstruction and mortality, with the use of CT angiogram for pre-operative planning, for IAA repair. Multi-center studies are likely required in the future.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1972 - TO STUDY LYMPHADENOPATHY IN CHILDREN WITH INFECTIVE ENDOCARDITIS ON CHEST COMPUTED TOMOGRAPHY SCANS A CASE CONTROL STUDY

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Background / Hypothesis:
Lymphadenopathy in Infective Endocarditis could be due to direct effect of the infected tricuspid valve, pulmonary parenchymal disease or remotely as a generalized response to persistent bacteremia.

The aim of the study:
1.To study the prevalence, characteristics and pattern of involvement of mediastinal lymph nodes in children with Infective Endocarditis
2. To study the correlation between clinic- radiological features and outcomes in Infective Endocarditis.

Materials and Methods:
Retrospective study of all patients < 18 years of age with definite/probable IE in whom Cardiac CT angiogram was performed. Age matched CHD patients without IE were included as controls.

Results:
We included 32 patients and 32 controls. The mean age was 7.4 years. Underlying CHD was present in 90.6%. 68.7% had right sided IE while 31.2% had left sided IE. The most common site of vegetation was pulmonary valve (28.12%) followed by tricuspid valve (21.8%). Significant lymphadenopathy was present in 62.5% (20/32). Single lymph node was enlarged in 18.75% (6/32) while 43.75% (14/32) had multiple lymph node enlargement. 28.12% (9/32) had lymph node enlargement more than 15 mm. Necrotic lymph nodes were found in 18.75% (6/32). In controls, only one patient had lymphadenopathy. Septic pulmonary embolism and pulmonary infarct were the most common complications present in 40.6% (13/32) and 37.5% (12/32) respectively. 53.12% (17/32) required surgery with no significant difference between left and right sided IE. 25% (8/32) died during the hospital stay. Hence, 62.5% (20/32) had either undergone surgery or expired. There is no significant difference in mortality between the patients with lymph node size > 15 mm versus < 15 mm. Also, there is no difference between mortality whether lymph nodes are enlarged or not.

Conclusions:
Presence of lymphadenopathy and size of lymph nodes does not correlate with the outcomes. Pulmonary artery pseudoaneurysm and septic pulmonary emboli are associated with poor outcomes.

POSTER PRESENTATIONS

Category: Multimodality Imaging

1996 - CONGENITAL LV–AORTIC TUNNEL WITH COEXISTING LV NON COMPACTION SURGICAL REPAIR AND LONG TERM OUTCOME

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Introduction:
Left ventricle–aortic tunnel is a rare congenital malformation wherein an abnormal communication between the left ventricle and the ascending aorta resulting in significant hemodynamic compromise. Foetal presentation include severe aortic regurgitation, hydrops, progressing to heart failure after birth. Left ventricular non-compaction (LVNC)—attributed to incomplete embryonic myocardial compaction—can present with heart failure and arrhythmias, further complicating patient management when these two rare conditions coexist.

In a 2011, we reported 5 neonates with LV–aortic tunnel. This abstract focuses on clinical trajectory of patient over a 15-year period.

• Presentation: Male fetus was diagnosed in utero at 10 weeks' gestation with a large LV–aortic tunnel. Postnatal examination confirmed severe respiratory distress and heart failure, necessitating mechanical ventilation and inotropic support.
• Urgent Surgical repair was performed, placing a bovine pericardial patch to close the LV–aortic tunnel.

Immediate Postoperative Course was uneventful. The patient exhibited stable hemodynamics, no significant residual shunt, and an excellent early clinical course.

Cardiac MRIS demonstrated stable LV function (ejection fraction ~48–50%) alongside persistent hypertrabeculation consistent with segmental LVNC. Mild aortic and mitral regurgitation, with a mildly dilated aortic root (36 mm).

Clinical Status: Over 15 years, the patient remained asymptomatic with no exercise limitations, although notable weight gain was observed. He continues on low-dose ACE inhibitor therapy. Routine Holter monitoring confirmed normal sinus rhythm without significant arrhythmias.

Conclusion:
Despite the rarity and complexity of LV–aortic tunnel and coexisting LV non-compaction, timely surgical correction can enable favourable long-term outcomes. This survivor from our earlier series has maintained stable cardiac function, underscoring the importance of early intervention, continuous imaging surveillance, and comprehensive multidisciplinary follow-up in these high-risk patients.

References:
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POSTER PRESENTATIONS

Category: Multimodality Imaging

2004 - DELAYED POSTNATAL DEVELOPMENT OF AORTIC COARCTATION FOLLOWING REPAIR OF PULMONARY ATRESIA WITH VENTRICULAR SEPTAL DEFECT A CASE REPORT

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Background / Hypothesis:
All newborns undergo a perinatal transition from fetal to postnatal circulation, during which the ductus arteriosus constricts, the foramen ovale gradually closes, and pulmonary vascular resistance decreases. These physiological changes significantly influence the presentation and progression of many congenital heart diseases. Coarctation of the aorta (CoA) is a representative example, often becoming clinically evident after ductal closure, although morphological features are usually detectable beforehand. However, we encountered an unusual case of an infant who developed CoA after undergoing primary repair for pulmonary atresia with ventricular septal defect.

Case report:
The patient was a full-term male neonate with a birth weight of 3.546 kg. He was prenatally diagnosed with pulmonary atresia and ventricular septal defect and underwent primary repair at 16 days of age. Preoperative echocardiography and computed tomography angiography revealed no evidence of aortic arch obstruction. However, CoA was later identified during follow-up, with the narrowing located just distal to the second branch of the aortic arch—an atypical site for classic CoA. Initially suspected to be a postoperative complication, the lesion was re-evaluated during a subsequent operation performed to relieve both the CoA and residual pulmonary artery stenoses. Based on the anatomical configuration and intraoperative findings, the coarctation was presumed to have developed following the discontinuation of prostaglandin E1, likely due to the constriction of ductal tissue within the aortic wall, rather than being a direct surgical consequence.

Conclusions:
This case illustrates a rare postnatal development of CoA and emphasizes the need to consider ductal tissue dynamics during the perinatal period when evaluating late-onset aortic arch obstruction following neonatal cardiac surgery.

POSTER PRESENTATIONS

Category: Multimodality Imaging

2012 - LATE PRESENTATION OF ALCAPA IN ADULTHOOD THE CRITICAL ROLE OF CARDIAC IMAGING IN SHAPING TREATMENT STRATEGY

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Background
Anomalous origin of the left coronary artery from the pulmonary artery (ALCAPA) is a rare congenital anomaly, typically fatal in infancy if untreated. Adult presentation is exceedingly rare and often discovered incidentally or during evaluation for unexplained cardiac symptoms. This case highlights the power of multimodal cardiac imaging in diagnosing and guiding the management of adult-onset ALCAPA.

Case Illustration
A 55-year-old woman, a cancer survivor with no significant cardiovascular risk factors aside from menopause, presented with exertional chest pain and atrial fibrillation. Echocardiography revealed anterior wall hypokinesia, biventricular dysfunction, and multivalvular regurgitation. Coronary angiography showed an anomalous right coronary artery (RCA) supplying the left anterior descending (LAD) artery through collateral circulation and a fistula LAD draining into the main pulmonary artery (MPA). The left main (LM) and circumflex (LCX) arteries were not visualized. Cardiac CT confirmed the rare diagnosis: Anomalous Left Coronary Artery from the Pulmonary Artery (ALCAPA)—with a dilated and tortuous RCA, a dilated LCA arising from the pulmonary artery, and multiple inter-coronary collateral artery. Given her well-developed collateral circulation and history of cancer, the Heart Team opted for conservative medical management with close follow-up.

Discussion
While surgical repair remains the standard of care for ALCAPA, select adult patients with well-developed collateralization and high surgical risk may benefit from individualized management. Advanced imaging—particularly CTA and CMR—enables detailed anatomical mapping, assessing myocardial viability, identifies high-risk features and candidates for conservative therapy versus surgery.

Conclusion
In late-presenting ALCAPA, cardiac imaging is not just diagnostic—it's decisional and shapes the therapeutic path. A tailored, patient-centered approach, grounded in high-resolution imaging, can safely guide management in even the most unconventional cases.

POSTER PRESENTATIONS

Category: Multimodality Imaging

2096 - DETECTION OF CORONARY ARTERY FISTULA IN CHILDREN USING CT SCAN A SINGLE CENTER EXPERIENCE FROM A TERTIARY CARDIAC CENTER

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Background / Hypothesis:
Coronary artery fistulas (CAFs) incidence is difficult to define as it can be asymptomatic and detected incidentally. Thus, its accurate imaging assessment is crucial for therapeutic planning and post-operative evaluation. In this article, we reviewed the use of Computed Tomography (CT) Scan in detecting CAFs in children, in an Indonesian single high referral cardiac center.

Materials and Methods:
We reviewed pediatric patients (aged <18 years old) who were evaluated with CT scan between 2018 and 2023 at the National Cardiovascular Centre Harapan Kita, Jakarta, Indonesia. Data analysis was conducted using SPSS version 26.

Results:
Among 2,940 pediatric patients who underwent CT scans at the National Cardiovascular Centre Harapan Kita, CAFs were identified in 11 (0.37%) patients, of whom 6 (54.5%) were male. The mean age was 67.8 ± 56.0 months, with the mean weight of 18,510 ± 11,161.4 grams. The majority of CAFs were coronary-cameral fistulas (CCFs) (8 cases, 72.7%), while the remaining 3 were coronary artery to vascular fistulas (CAVFs), all draining to the pulmonary artery. Furthermore, the right coronary artery was the most frequent site of origin (45.4%), followed by the left coronary artery (36.4%), while the left anterior descending (LAD) and left circumflex arteries contributed 9.1% each.

Conclusions:
This study highlights the rarity of coronary artery fistulas and demonstrates the essential role of CT scan in identifying and characterizing these anomalies. CT imaging allows precise delineation of the origin, course, and termination of CAFs, which could facilitate optimal clinical decision-making

POSTER PRESENTATIONS

Category: Multimodality Imaging

2126 - NEONATAL DUCTUS ARTERIOSUS THROMBOSIS A CASE REPORT

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Background:
Ductus arteriosus (DA) thrombosis is a rare congenital anomaly in neonates with uncertain true incidence. It may pose potential serious complications including thrombus migration, pulmonary embolism and pulmonary hypertension. We report a case of DA thrombosis in a neonate treated with systemic anticoagulation.

Material and Methods:
Clinical, echocardiographic and computed tomographic (CT) information of the case was retrieved.

Results:
A male term neonate was born by Caesarean section for pathological cardiotocography. Antenatal history revealed gestational diabetes, and maternal obesity. He developed congenital pneumonia presenting with respiratory distress and desaturation soon after birth, requiring intubation and antibiotic therapy. Due to persistent high oxygen requirement by day 4 of life, echocardiography was performed and revealed an echogenic mass (6.2x3.9mm) locating between pulmonary artery and aortic arch extending to proximal left pulmonary artery (LPA). Contrast-enhanced CT revealed a filling defect of 3.5x3x3mm within the PDA stump (4.6x3.7x3.3mm) extending to the proximal LPA causing moderate luminal obstruction. There was no extension to the aorta and no pulmonary embolism. Thrombophilia workup was unremarkable. Intravenous unfractionated heparin infusion was initiated. Clinical condition gradually improved allowing extubation on day 9 of life. Serial echocardiograms showed progressive reduction in thrombus size and resolution of LPA stenosis with no bleeding complication. Anticoagulation regime was switched to subcutaneous enoxaparin after 2 weeks of intravenous unfractionated heparin. Follow-up CT pulmonary angiogram at 4 months confirmed complete resolution of the thrombus to a tiny linear calcification within the ligamentum arteriosum with no involvement of branch pulmonary arteries. Enoxaparin was stopped afterwards.

Conclusion:
This case illustrates a neonatal DAA complicated by thrombus formation and LPA stenosis, demonstrating favourable outcomes with timely evaluation and anticoagulation therapy.

POSTER PRESENTATIONS

Category: Multimodality Imaging

2162 - REVEALING HIDDEN LEFT VENTRICULAR DYSFUNCTION TRANSVERSE HEMODYNAMIC FORCES CORRELATE WITH EXERCISE INTOLERANCE IN REPAIRED TETRALOGY OF FALLOT

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Background:
Repaired Tetralogy of Fallot (rTOF) patients often exhibit biventricular remodeling due to chronic pulmonary insufficiency, yet the contribution of left ventricular (LV) dysfunction to exercise intolerance remains underrecognized. Hemodynamic forces (HDF), derived from cine cardiac MRI, reflect intracavitary flow dynamics and offer novel insight into LV mechanics. We hypothesized that rTOF patients exhibit abnormal LV HDF patterns compared to healthy controls and that these changes correlate with impaired exercise capacity.

Method:
In this retrospective single-center study, cine MRI datasets from rTOF patients and controls were analyzed. Directional HDF components were computed from two-, three-, and four-chamber cine views using a standardized commercial pipeline (Medis Medical Imaging), capturing dimensionless force vectors along the long-axis (apical–basal) and transverse (lateral–septal) planes across global, systolic, and diastolic phases. In rTOF patients with cardiopulmonary exercise testing (CPET), HDF metrics were correlated with % predicted VO_2. Statistical analyses included linear regression and logistic regression (exercise intolerance defined as % predicted VO_2 < 65%), adjusted for age.

Results:
Compared to controls (n=56), rTOF patients (n=122) had increased RV volumes and reduced RV function, but similar LV size/ejection fraction (Table 1). HDF analysis revealed significantly reduced LV apical–basal forces and elevated transverse components in rTOF (Table 2). Diastolic HDFLateral–Septal and HDFLAX–SAX ratio were both significantly elevated (3.98 ± 2.25% vs. 3.33 ± 1.42%, p = 0.019; 31.80 ± 15.69% vs. 23.83 ± 10.07%, p < 0.0001). Among rTOF patients with CPET (n = 107), increased diastolic HDFLateral–Septal was associated with lower % predicted VO_2 (r = –0.32, p = 0.0009) and greater odds of exercise intolerance (OR = 1.35 per %, 95% CI: 1.12–1.68, p = 0.006).

Conclusion:
Diastolic LV HDF abnormalities, particularly elevated transverse forces, are associated with impaired exercise capacity in rTOF and may serve as early markers of physiological compromise.

POSTER PRESENTATIONS

Category: Multimodality Imaging

2165 - DIAGNOSIS OF A SIGNIFICANT PULMONARY PERFUSION DIFFERENCE IN A PATIENT FOLLOWING RIGHT VENTRICLE TO PULMONARY ARTERY (RV PA) CONDUIT PLACEMENT USING FOUR DIMENSION FLOW (4D FLOW) MRI

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History & Physical Examination:
20 year old male, known case of transposition of the great arteries with ventricular septal defect and severe valvular and subvalvular stenosis. He underwent a bilateral BT shunt in the neonatal period and then a Rastelli operation (ventricular septal defect repair/right ventricular outflow reconstruction and RV-PA conduit size 14mm) at the age of 2 years. The patient was followed up regularly in the OPD and remained clinically asymptomatic. On examination, his weight= 56kg, oxygen saturation= 98% and cardiovascular examination revealed a systolic murmur more audible in the left upper sternal border.
The patient was referred for cardiac MRI for routine assessment of right ventricular volume and RV-PA conduit.

Investigation & Findings:
Cardiac MRI showed: patent RV-PA conduit with no stenosis, mild regurgitation RGF= 11%. The right ventricle is not dilated with indexed right ventricular end-diastolic volume (RVEDVi= 93ml/m2) and good systolic function (RV-EF= 56%).
Interestingly, the LPA was found to originate at a 90 degree angle of its origin from the RPA. 4D flow showed significant flow discrepancy between the two lungs which could be assesses by both flow streaming and flow quantification. The flow in the right pulmonary artery was 31ml while it was only 15ml in the left (these contribute to 70% in the right and 30% in the left).

The patient underwent cardiac catheterization to stent the RV-PA conduit to LPA with a covered stent and then perforate the covered stent to allow equal flow to both lungs. However, the procedure failed due to the steep origin of the LPA and the patient was subsequently referred to a cardiothoracic surgeon to re-do the RV-PA conduit.

Conclusions:
4D flow is a powerful tool in the diagnosis of a significant RV-PA conduit malalignment that caused differential flow difference in a patient post RV-PA conduit.

POSTER PRESENTATIONS

Category: Multimodality Imaging

2227 - BRAIN ABCESS IN TETRALOGY OF FALLOT THE GOOD THE BAD THE UGLY

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Background / Hypothesis:
Tetralogy of Fallot is the most common cyanotic congenital heart defect, affecting up to one tenth of all congenital heart lesions, has an adverse complication of brain abscesses if left uncorrected.
Brain abscess is a very uncommon but potentially fatal infection of the brain parenchyma that can affect 5%-18.7% of the CHD population. The prognosis is worse than other types of brain abscess, with fatality rates ranging from 27.5% to 71%. This case highlights challenging clinical scenario which requires a multidisplinary and multimodality imaging approach.

Materials and Methods:
A 7-year-old girl, lost to follow with TOF and severe sub valvular Pulmonary stenosis and no thrombus, presented with convulsions, tonic cloinc, difficulty in breathing and worsening cyanosis for two days before coming to clinic.
On examination the sick looking, GCS 12/15, neck soft, Kering's sign negative with left facial nerve palsy grade 2. The muscle bulk normal, with hypertonia and hyperreflexia on right sided upper and lower limb.
An enhanced helical brain MRI scans showed multiple interaxial rings enhancing lesions in the left cerebral hemisphere. The largest ring measured 2.93x2.69 cm. The brain parenchyma surrounding showed oedema with no midline shift.

Results:
Craniotomy done under aseptic technique, pus drained 150mls, capsule removal was abandoned due to episodes of severe hypoxia. Pus for culture and sensitivity isolated Staphylococcus aureus and the patient was kept on IV Meropenem and Gentamycin, with great improvement neurologically. Serial scans showed residual brain abscess, the patient improved drastically and was sent home for follow up clinic. Unfortunately, the patient died 6 months after due to similar symptoms at home.

Conclusions:
Brain abscess is a complicated and often times fatal complication of TOF, this case highlights the role of multimodality imaging for diagnostic and prognostic factors in patients with neglected Tetralogy of Fallot.

POSTER PRESENTATIONS

Category: Multimodality Imaging

2303 - 4D FLOW CARDIAC MRI TO ASSESS PULMONARY BLOOD FLOW IN PATIENTS WITH PULMONARY ARTERIAL HYPERTENSION ASSOCIATED WITH CONGENITAL HEART DISEASE

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Background / Hypothesis:
Right heart catheterization (RHC) is the gold standard to assess hemodynamics in pulmonary arterial hypertension (PAH) associated with congenital heart diseases (CHD). Four-dimensional flow magnetic resonance (4D flow MRI) has emerged as a promising non-invasive imaging technique for comprehensive assessment of cardiovascular hemodynamics. We aimed to evaluate the accuracy of 4D Flow MRI, compared to RHC, in measuring the ratio of pulmonary to systemic flow (Qp/Qs).

Materials and Methods:
64 patients with PAH-CHD who underwent 4D flow MRI were included. There were 16 men and 48 women with a mean age of 45.3 ± 13.7 (standard deviation [SD]) years (age range: 21-77 years). Fifty patients (50/64; 78%) presented with pre-tricuspid shunt. Qp (L/min), Qs (L/min) and Qp/Qs were measured invasively using direct Fick method during right heart catheterization and compared with measurements assessed by 4D flow MRI within a 24-48-hour window.

Results:
The average mean pulmonary artery pressure was 51 ± 17 (SD) mm Hg with median pulmonary vascular resistance of 8.8 Wood units (Q1, Q3: 5.3, 11.7). A strong linear correlation was found between Qp measurements obtained with 4D flow MRI and those obtained with the Fick method ($r = 0.96$; $P < 0.001$). Bland Altman analysis indicated a mean difference of 0.15 ± 0.48 (SD) L/min between Qp estimated by 4D flow MRI and by right heart catheterization. A strong correlation was found between Qs and Qp/Qs measured by 4D flow MRI and those obtained with the direct Fick method ($r = 0.85$ and $r = 0.92$; $P < 0.001$ for both).

Conclusions:
Qp/Qs as measured by 4D-Flow MRI shows a strong correlation with measurements derived from the Fick method. Further investigation is needed to develop less complex and standardized methods for measuring essential PAH parameters, such as pulmonary arterial pressures and pulmonary vascular resistance.

POSTER PRESENTATIONS

Category: Multimodality Imaging

2306 - MIXED TOTAL ANOMALOUS PULMONARY VENOUS CONNECTION A CASE REPORT

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Background / Hypothesis:
Total Anomalous Pulmonary Venous Connection (TAPVC) is a rare congenital heart disease (1-3% of cases) in which pulmonary veins fail to drain into the left atrium. The mixed type is the least frequent variant, characterized by heterogeneous systemic drainage without a common collector. We present a case of symmetric mixed TAPVC (2+2 pattern) associated with double outlet right ventricle (DORV).

Materials and Methods:
A 3-year-and-9-month-old male patient with no significant maternal history was evaluated. Diagnosis was established by transthoracic echocardiography and confirmed through cardiac CT angiography with 3D reconstruction, allowing comprehensive assessment of pulmonary venous return and associated anomalies.

Results:
Echocardiographic findings revealed: Double outlet right ventricle (DORV)
Symmetric mixed anomalous pulmonary venous return (2+2 pattern): Left pulmonary veins → right atrium, right pulmonary veins → superior vena cava.
CT angiography confirmed the anatomical arrangement and ruled out other associated malformations.

Conclusions:
Symmetric mixed TAPVC (2+2) represents an uncommon variant posing significant diagnostic and therapeutic challenges. Echocardiography and CT angiography are essential for precise evaluation. While surgical outcomes are comparable to other TAPVC subtypes, meticulous preoperative planning is critical to prevent complications such as venous return obstruction. This case underscores the pivotal role of advanced imaging in managing complex congenital heart disease.

POSTER PRESENTATIONS

Category: Multimodality Imaging

2403 - CHARACTERISTIC FLOW OF DIFFERENT RIGHT VENTRICULAR OUTFLOW TRACT MORPHOLOGY IN REPAIRED TETRALOGY OF FALLOT PATIENTS STUDIED BY 4D FLOW CARDIAC MAGNETIC RESONANCE IMAGES

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Background / Hypothesis:
Right ventricular outflow tract (RVOT) morphology may influence postoperative pulmonary flow dynamics in patients with repaired tetralogy of Fallot (TOF). Four-dimensional flow magnetic resonance imaging (4D-flow MRI) offers advanced hemodynamic assessment that may help elucidate these differences.

Materials and Methods:
This retrospective study included 120 patients with repaired TOF who underwent cardiac MRI and 4D-flow analysis between 2017 and 2023. RVOT morphology was categorized into three groups: tubular, pyramidal, and trapezoid. 4D flow MRI Hemodynamic parameters were assessed across the RVOT, pulmonic valve, MPA, pre-bifurcation, and PA branches.

Results:
RVOT morphology was tubular in 71.7%, pyramidal in 18.3%, and trapezoid in 10%. Ten 4D-flow parameters showed statistically significant differences among the groups. Compared to pyramidal RVOT, the tubular RVOT was associated with higher peak velocity, WSS, and energy loss at the RVOT, MPA, and pulmonary valve, while the pyramidal group exhibited higher axial WSS and peak velocity in the right pulmonary artery (RPA). No significant differences were observed between the trapezoid group and the others.

Conclusions:
RVOT morphology is associated with distinct hemodynamic profiles as assessed by 4D-flow MRI. Tubular RVOTs exhibit higher flow intensity and shear stress, while pyramidal shapes demonstrate more distributed and potentially favorable flow patterns. These findings support the role of RVOT morphology in long-term hemodynamic assessment and may inform future risk stratification and individualized follow-up in repaired TOF patients.

POSTER PRESENTATIONS

Category: Multimodality Imaging

2496 - WHEN IT'S NOT A PAVM SUPERIOR SINUS VENOSUS ASD WITH OVERRIDING SVC IN A HYPOXEMIC NEONATE WITH TRISOMY 21

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Background / Hypothesis:
Persistent hypoxemia in neonates with Down syndrome warrants evaluation for both pulmonary and cardiac causes. Pulmonary arteriovenous malformation (PAVM) is an uncommon etiology, but certain congenital heart defects can mimic its presentation.A rare cardiac anomaly—superior sinus venosus atrial septal defect (SVASD) with overriding superior vena cava (SVC)—can present with early, refractory hypoxemia and be mistaken for PAVM on initial imaging.

Materials and Methods:
We reviewed the clinical course, imaging findings, and diagnostic workup of a term neonate with Down syndrome and persistent hypoxemia from birth. Investigations included bedside echocardiography with bubble study, computed tomography pulmonary angiography (CTPA), and diagnostic cardiac catheterization.

Result:
The patient developed persistent hypoxemia immediately post-delivery, requiring bi-level positive airway pressure (BiPAP) with high inspired oxygen concentrations. At 4 months, she remained oxygen-dependent and unable to wean from respiratory support. Initial echocardiography revealed an atrial septal defect (ASD) with a positive bubble study, suggesting right-to-left shunting and raising suspicion for PAVM. CTPA demonstrated simultaneous opacification of both atria and anomalous drainage of the right superior and middle pulmonary veins into the SVC. Cardiac catheterization confirmed a superior SVASD. Repeat echocardiography further identified anomalous drainage of the right upper and lower pulmonary veins into the SVC near its junction with the right atrium. After diagnosis, she was successfully weaned from BiPAP to room air, maintaining saturations above 80%, and was scheduled for complex ASD repair at Institut Jantung Negara (IJN).

Conclusion:
Multimodality imaging is essential in neonates with Down syndrome and refractory hypoxemia. Rare but surgically correctable lesions such as SVASD with overriding SVC should be considered when PAVM is suspected. Early, accurate diagnosis facilitates timely intervention and improved outcomes.

POSTER PRESENTATIONS

Category: Multimodality Imaging

2522 - FERUMOXYTOL ENHANCED 4D FLOW MRI IMPROVES INTERNAL CONSISTENCY OF FLOW MEASUREMENTS IN CHILDREN WITH CONGENITAL HEART DISEASE

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Background / Hypothesis:
Accurate flow quantification by cardiac MRI is essential for clinical decision-making in children with congenital heart disease (CHD), particularly for evaluating shunts, flow distribution, and regurgitant fractions. Conventional 2D phase-contrast MRI requires the acquisition of multiple imaging planes, which is time-consuming and operator-dependent. Ferumoxytol-enhanced 4D flow MRI enables full volumetric coverage with high spatial resolution and improved signal-to-noise ratio, offering a promising alternative for routine clinical use. We hypothesized that 4D flow MRI would demonstrate greater internal consistency than conventional 2D flow MRI in pediatric CHD.

Materials and Methods:
We retrospectively compared 50 children with CHD who underwent 4D flow MRI to 50 height- and weight-matched children imaged with 2D flow MRI. Flows in the ascending aorta (AAo), superior vena cava (SVC), and descending aorta (DAo) were measured. Internal consistency was assessed by comparing AAo flow with the sum of SVC and DAo flows using Pearson correlation, Bland-Altman analysis, and root mean square error (RMSE). Acceptable limits of agreement (LOA) were predefined as ±20%. 4D flow data were analyzed using prototype software (4DFlow, Siemens Healthineers). Acquisition times for 4D flow MRI ranged from 3 to 6 minutes.

Results:
Correlation between AAo and SVC+DAo was strong for both techniques (4D flow: r = 0.92; 2D flow: r = 0.91). 4D flow showed better agreement, with a bias of 1.4% and LOA from –14% to 17%, compared to a bias of –4.4% and LOA from –22% to 13% for 2D flow. RMSE was 0.27 L/min/m^2 for 4D flow and 0.28 L/min/m^2 for 2D flow.

Conclusions:
Ferumoxytol-enhanced 4D flow MRI demonstrates superior internal consistency compared to conventional 2D phase-contrast MRI for flow quantification in children with CHD. These findings support the use of 4D flow MRI as a more clinically reliable method for assessing cardiovascular flows, particularly in complex pediatric populations where accuracy and reproducibility are critical.

POSTER PRESENTATIONS

Category: Multimodality Imaging

2563 - TWEAKING CMR FOR PEDIATRICS – THE WHY HOW AND WHEN FOR PEDIATRIC CARDIOLOGISTS

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Background / Hypothesis:
Pediatric cardiac MRI has transcended irrevocably into the realm of clinical pediatric cardiology practice – having evolved from a niche, largely academic imaging modality into an inimitable investigation tool in complex CHDs and cardiomyopathies that yields accurate clinically relevant data and guides management. CMR has traditionally been the forte of radiologists but there are unmatched advantages if pediatric cardiologists are themselves trained to utilize this cross-sectional imaging tool tailored to maximize clinical output in individualized patients, especially with complex structural heart disease that requires treatment directed specific hemodynamic or functional questions answered from CMR. Most diagnostic imaging centers adhere to MRI technicians running standardized MR sequence and planning prototypes that, though temporally efficient and generally adequate for adult generic CMR imaging requirements, are glaringly inadequate for congenital heart disease evaluation that relies heavily on hemodynamics, anatomic determinants of flow, and functional predictions post-medical or surgical intervention.

Materials and Methods:
This discussion utilizes illustrative clinical CHD cases to highlight the importance of targeted and individualized CMR sequences while performing and analyzing pediatric CMR with emphasis on how the pediatric cardiologist's awareness of each CHD patient being studied helped tailor the CMR sequences to maximize the extractable clinical information from the CMR.

Results:
CMR derived hemodynamic, anatomic, and functional information derived by pediatric cardiologists helped direct these patients with complex CHD towards their appropriate medical or interventional therapeutic route.

Conclusions:
Pediatric CMR requires meticulous pre-emptive planning and often multiple adaptive sequence modifications to succeed as a clinically important imaging tool integral to a pediatric cardiologist's effective understanding and management of complex congenital heart disease.

POSTER PRESENTATIONS

Category: Multimodality Imaging

2570 - HOW ABERRANT CAN A BLOOD VESSEL BE

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Background.
The sub clavian arteries form through the fourth aortic arch, whil e the ventral segments of the sixth a ortic archare resp onsible for the formation of both branches of the pulmonary artery. The right dorsal arch will regress, while the left dorsal arch will give rise to the patent ductus arteriosus. The malformations result from the persistence of structures that regress signific antly or from the regression of structures that usually persist.
Present in approximately less than 1%of the p opulation, the right subclavian artery is the final branch arising from the aortic arch,distal to the origin of the left subclavian arter y. This for mation occurs as a result of abnormal regression of the right fourth aortic arch, resulting in the loss of the normal proximal portion of the right subclavian artery.

Case Report.
We present the case of a 12-year-old male patient, who was admitted to our Instituted referred from a second-level hospital with a history of history of failure to thrive, recurrent respirator y infections, and fatigue; He was diagnosed with paten ductus arteriosus and atr ial septal defect that was closed with an Amplatzer PDA device during cardiac catheterization at 2 year-old.Closure of the atrial septal defect was decided by surgical procedure with a bovine pericardial patch at 5 year-old. During the follow up they detected an atrial taquycardia and reffered to our I nstitute.
There is a right-sided shunt that may correspond to a flow of a right ductus, that is way we request an angiotomograp hy, wich revels anomalous origin of the subclavian artery from the ipsilateral pulmonary branch, that is way we request an IRM that add tha the flow of blood is from the subclavian artery to the pulmonary arter y. Both ventricles are mild ly dilated.
Systolic pulmonary artery pressure was estimated at 87 mm Hg.
During the follow up we requested a hemodynamic assessment to measure pulmonary vascular resistance,and

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1079 - ASSISTED REPRODUCTIVE TECHNOLOGIES AND THEIR EFFECT ON THE OFFSPRING'S CARDIOCIRCULATORY SYSTEM INSIGHTS FROM THE MUNICH HEARTERY STUDY

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Background / Hypothesis:
Worldwide, more than 8 million children have been conceived through assisted reproductive technologies (ART). An increased cardiovascular morbidity is presumed in ART individuals; however, recent data is ambiguous. This study aimed to assess cardiac, vascular as well as metabolic function in young ART subjects compared to spontaneously conceived peers. Moreover, cardiorespiratory fitness was investigated.

Materials and Methods:
Children, adolescents and young adults conceived through ART as well as age and gender matched controls were recruited. Left ventricular (LV) systolic and diastolic function was evaluated through M-mode echocardiography, speckle tracking echocardiography as well as tissue doppler imaging. For the assessment of vascular function, the following parameters were acquired: reactive hyperemia index, pulse wave velocity, central blood pressure, 24h blood pressure, carotid intima-media thickness. Lipid profile and HbA1c were analysed as a surrogate of metabolic function. Cardiorespiratory fitness was evaluated via a 20-meter shuttle run test and subsequent calculation of maximal oxygen uptake (VO2max).

Results:
67 ART subjects and 86 spontaneously conceived peers (age: 11.31 (8.10-18.20) vs. 11.85 (8.72-18.27) years, p=0.43) were included in the analyses. LV function did not display significant differences between both groups after the adjustment for age, birth weight percentile, and gestational age. Vascular as well as metabolic function was unaltered in ART subjects compared to controls. Interestingly, ART individuals displayed a significantly lower VO2max.

Conclusions:
In contrast to previous studies, the current study does indicate an increased cardiac, vascular as well as metabolic morbidity in ART individuals. However, a significantly lower cardiorespiratory fitness was demonstrated in the ART cohort. Therefore, the assessment of cardiorespiratory fitness could potentially help to identify ART subjects at elevated risk. For overall health benefits, ART offspring should be encouraged to regularly engage in physical activities.

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1221 - THE ROLE OF MATERNAL DIABETES AND OVERWEIGHT IN THE MORBIDITY OF CHILDREN WITH CONGENITAL HEART DEFECTS DURING FIRST THREE YEARS OF LIFE

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Background / Hypothesis:
Maternal overweight and diabetes are risk factors for congenital heart defects (CHDs) in the offspring. We studied whether the effect of these risk factors extend beyond pregnancy by analyzing the need for hospital care during the first three years of life in children with CHDs.

Materials and Methods:
This national register-based study included all children born with isolated CHD in Finland between 2006-2016. Data on patient characteristics, CHDs, maternal diabetes, and maternal pre-pregnancy body mass index (BMI) were collected from nationwide registries: the Medical Birth Register, the Register on Congenital Malformations, and the Register on Reimbursed Drug Purchases. Morbidity was defined as the number of hospitalizations, outpatient visits, and emergency clinic visits collected from Care Register for Health Care. Poisson regression analyses were used for analysis.

Results:
A total of 10 254 children (52% male) were included. Of their mothers, 15% had gestational diabetes (GDM), 2.2% type I diabetes (T1DM), 0.32% type II diabetes (T2DM), 21% were overweight (BMI 25.0–29.9 kg/m2), and 13% obese (BMI ≥30 kg/m2). Maternal overweight and obesity during pregnancy associated with a higher number of hospitalizations ($p<0.001$), emergency visits ($p<0.003$) and outpatient visits ($p<0.003$) in the offspring during all three follow-up years compared to offspring of normal weighted mothers. Maternal DMI and DMII were associated with a higher number of hospitalizations ($p<0.001$) and outpatient visits ($p<0.007$) and GDM increased the number emergency visits during the first year of life ($p=0.025$). The association of maternal DMI, DMII, and GDM with offspring hospitalizations diminished during the second and the third follow up year.

Conclusions:
In this Finnish nationwide register study, we demonstrate that the transgenerational effect of maternal overweight and diabetes on offspring health extends beyond pregnancy. These findings underscore the importance of pre-pregnancy counselling in optimizing the health of both mother and the child.

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1334 - EMBEDDING CONSUMER PERSEPCTIVES IN IMPROVED NEURODEVELOPMENTAL SCREENING OF CONGENITAL HEART DISEASE ACROSS SOUTH AUSTRALIA

Annette Sargent [1], Karina Laohachai [2], Andrew Kelly [2], Rishi Agrawal [2], Thomasina Donovan [3]
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Background / Hypothesis:
Congenital heart disease (CHD)is associated with increased risk of adverse neurodevelopmental (ND) outcomes. The CHD LIFE+ program (funded by MRFF Grant ARGCHDO035) aims to inform the development of models of care to support neurodevelopment of children with CHD across Australia. As part of this program, we conducted a study to understand the current gaps in the ND surveillance of children with CHD in South Australia. The results will support developing a model of care to screen all children with CHD in SA.

Materials and Methods:
Our cohort included children with significant CHD (requiring intervention/surgery) aged under 5 years. Local medical databases were reviewed. Extracted data included demographics, clinical parameters, and rates of ND screening. Primary caregivers of the cohort were invited to participate in an online questionnaire to assess their experience/perspective of ND care. Descriptive statistics and thematic analyses were undertaken.

Results:
Two-hundred and ninety-two children met the inclusion criteria. Fifty-three percent were male and 10% were Aboriginal or Torres Strait Islander. Of the children who had surgery, 94% were under 12 months old (44% were <1month). Around 40% were overdue for a ND check and were attempted to be recalled. By 4 years of age 40% had allied health involvement. Primary caregivers (n=96) shared their experience and perception of ND care for their child. Our preliminary findings indicated significant barriers to accessing ND checks, implications of CHD on parental-child bonding and lack of mental health support for caregivers.

Conclusions:
Our study demonstrates the high percentage of children in need of ND screening in a cohort at increased risk of adverse ND outcomes. Identified challenges and gaps in access to services, and findings from the broader national program will help develop a future model of care to support long-term neurodevelopment for children with CHD in SA.

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1335 - DIFFERENCES IN CARDIOPULMONARY EXERCISE TEST RESULTS AMONG DIFFERENT TYPES OF CONGENITAL HEART DISEASE IN LONG TERM FOLLOW UP A SINGLE CENTER EXPERIENCE

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Background / Hypothesis:
To evaluate the differences in cardiopulmonary responses to exercise among patients with different types of congenital heart disease (CHD) and to explore the relationship between these responses and exercise-related symptoms.

Materials and Methods:
his study included 36 patients aged 7 to 18 years, weighing between 20 kg and 93 kg, divided into three groups:
• Group A: 10 patients with simple biventricular correction (VSD n=8, ASD, PAPVC n=2).
• Group B: 21 patients with complex biventricular correction (CAVC n=2, PAIVS n=2, TOF n=5, TGA n=3, anomalous coronary origin n=4, valve surgery n=5).
• Group C: 5 patients post-Fontan procedure for single-ventricle physiology.

All participants underwent cardiopulmonary exercise testing using a ramp protocol on a cycle ergometer. Heart rate, blood pressure, oxygen uptake, ventilation, and other parameters were recorded. Statistical analysis was performed using one-way ANOVA.

Results:
All patients completed the cardiopulmonary exercise test safely, with no severe circulatory abnormalities. All patients had an RER value greater than 1.1, indicating maximal effort. Compared to the single-ventricle group (Group C), the biventricular groups (Groups A and B) had a significantly higher VO_2/kg max and lower VE/VCO_2 ($P<0.05$), with Group A performing better than Group B ($P<0.05$). Other parameters, including HRR, O_2/HR max, VE/VCO_2 slope, and OUES/kg, showed differences but were not statistically significant ($P>0.05$). Despite variations in cardiopulmonary responses among the groups, the distribution of exercise-related symptoms (e.g., dyspnea, leg fatigue) did not differ significantly.

Conclusions:
Patients who underwent Fontan surgery for single-ventricle physiology exhibited poorer cardiopulmonary function compared to those with biventricular correction. Furthermore, patients with complex biventricular correction had lower exercise tolerance than those with simple biventricular correction. Cardiopulmonary exercise testing holds significant clinical value in assessing postoperative CHD patients.

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1340 - EVALUATION OF MEDIUM AND LONG TERM EXERCISE TOLERANCE IN CHILDREN AND ADOLESCENTS AFTER SINGLE VENTRICULAR TCPC PROCEDURE AND ANALYSIS OF ITS RISK FACTORS

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Background / Hypothesis:
The survival rate and quality of life of single-ventricular children after TCPC have been greatly improved, but the decline in exercise tolerance is still common in this population. This paper aimed to compare the differences of mid- and long-term exercise tolerance between patients after TCPC, after double ventricular correction and the healthy population, and to explore the risk factors for decreased exercise tolerance in patients after TCPC.

Materials and Methods:
Retrospective analysis of children after TCPC who followed up and completed at least one Cardiopulmonary Exercise Testing (CPET) at the specialized outpatient clinic of CHD in Guangzhou Women and Children's Medical Center from November 2018 to January 2024. According to different types of disease divided into TCPC group, simple congenital heart group (SCHD), complex congenital heart group (CCHD) and healthy control group. Compare the differences in CPET indicators between groups. In addition, the difference in motion tolerance was compared by grouping the TCPC group according to different risk factors.

Results:
The peak VO2%pre of the TCPC group was significantly lower than that of the SCHD group and the CCHD group, only 73.51% ± 15.44%. The risk of decreased exercise tolerance at the age of single-ventricular TCPC surgery ≥ 3.8 years was 2.95 times higher than that of <3.8 years old. And the exercise tolerance tended to decline with age, which showed that the risk of decreased exercise tolerance in children after 10-year-old TCPC surgery increased by 2.33 times.

Conclusions:
The exercise ability of children and adolescents after TCPC was significantly lower than that of children with congenital heart disease and healthy children with double ventricular correction. Among them, over 3.8y when surgery was the independent risk factor for the decrease of exercise tolerance after single ventricular surgery.

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1381 - MENTAL HEALTH PROBLEMS AND RECEIVED MENTAL HEALTH SUPPORT IN CHILDREN WITH VENTRICULAR SEPTAL DEFECT IN DENMARK

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Background / Hypothesis:
Long-term co-morbidities including neuropsychological co-morbidities are common in children with complex congenital heart disease. We have previously documented that children with complex CHD and a potential psychiatric diagnosis lack sufficient support for their mental health problems. It is unknown if children with simpler CHD also have a higher risk of mental health difficulties and if they are facing the same lack of support.

Materials and Methods:
This is a questionnaire study of psychiatric difficulties and received help in children and adolescents with a diagnosis of a simple CHD (VSD), whether surgically closed or left open. Parents answered the Strength and Difficulties Questionnaire (SDQ) and a custom-made questionnaire about received help. The SDQ is divided into 4 scales (Emotional, Conduct/ Behavior, Hyperactivity-inattention, Peer problem) scored on a 3-point scale. The results are compared to the Danish normative SDQ-data.

Results:
Parents of 706 children (5-17years) participated in the study, representing 40% of the eligible Danish VSD children. Children with VSD showed elevated difficulties across all four scales, exceeding normative expectations. When stratified by sex, girls exhibited more hyperactivity-inattention, conduct, and peer difficulties, while boys exhibited more emotional difficulties compared to norms. The difficulties remained high after excluding those with genetic syndromes. Approximately half of the children with an elevated SDQ-score had received mental health help at one point. In this group, over half of the parents perceived the support as inadequate.

Conclusions:
Children with a simple VSD have higher difficulties across all SDQ-scales compared to norms. Girls exhibited more hyperactivity-inattention, conduct, and peer difficulties, while boys exhibited more emotional difficulties compared to norms. Results suggests that children with VSD and mental health difficulties lack sufficient mental health support. There is an unmet need of focus on psychiatric disorders in children with simple congenital heart defects.

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1385 - NINTH GRADE SCHOOL PERFORMANCE IN DANISH PATIENTS WITH CONGENITAL HEART DISEASE

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Background / Hypothesis:
Children born with congenital heart disease (CHD) may suffer from neurodevelopmental impairment and perform worse in elementary school. This study tested whether children with CHD achieve lower grades or fail more often in the Danish final elementary school exam compared to the background population.

Materials and Methods:
We identified all Danish children with the International Classification of Disease-10th version-defined CHD who reached the age of 16 years between 2001 and 2023 and matched each case patient to controls according to municipality and year of final exam through nationwide registries. Performance at the final exam was evaluated based on the rank of their mean exam score. The risk of failing the exam was assessed using logistic regression analysis adjusted for birth year, sex, and socioeconomic status.

Results:
10,717 CHD children and 229,738 controls participated in the final exam between 2001 and 2023. CHD children ranked lower in the mean exam score compared to non-CHD children (0.47 [95%confidence interval(CI): 0.46-0.48]; p<0.0001). With increasing CHD severity, the mean exam score for CHD children remained lower ranked, with values of 0.48 [95%CI: 0.47-0.48] for mild CHD, 0.46 [95%CI: 0.45-0.47] for moderate CHD and 0.44 [95%CI: 0.42-0.46] for severe CHD (all p's<0.0001). Furthermore, 27.5% [95%CI: 26.3-28.9] of children with CHD failed the final exam compared to 19.0% [95%CI: 18.5-19.5] in non-CHD children (chi-squared p<0.0001)(adjusted odds ratio 1.45 [95%CI: 1.37-1.53]; p<0.0001). In CHD children, prematurity, cardiac intervention, exposure to cardiopulmonary bypass, and childhood hospitalization were associated with both lower exam scores and a higher risk of failing the final exam.

Conclusions:
Performance in the final elementary school exam was impaired in children with CHD, and this impairment was worse with increasing severity of CHD. The results justify an increased awareness and support for CHD school children.

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1395 - CLINICAL PROFILE AND PREDICTORS OF ACUTE NEUROLOGIC OUTCOME AMONG CHILDREN WHO UNDERWENT REPAIR OF TETRALOGY OF FALLOT

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Background:
Clinicians handling pediatric patients with Tetralogy of Fallot (TOF) are often faced with the challenge of managing post-operative neurologic sequelae. There has been a scare of data in identifying the predictors in its development, which may help in future risk stratification of patients for their management and outcome.

Objective:
To determine the clinical profile and the factors associated with the development of Acute Neurologic Outcome among pediatric patients with Tetralogy of Fallot following TOF repair

Methodology:
This is a Prospective cohort study among pediatric TOF patients who underwent TOF repair in a tertiary hospital, from July 2023-May 2024, and were monitored for acute neurologic outcome (seizures, changes in mood and/or behavior) occurring 48hours post-operatively. Sample size was based on the likelihood of pediatric TOF patients with developmental delay to develop complications following surgical repair, missing data were neither replaced nor estimated. Clinical and demographic data were monitored. Logistic regression was used to identify predictor variables. The stepwise method was utilized to determine the final multivariate model. P value of < 0.05 was considered significant.

Results/Discussion:
Of the 106 subjects, 53% (57/106) were females with a median age of 4 years old (IQR 2-9 years old) and a median weight of 15kg (IQR 10-21kg). Of whom, 11% (12/106) developed acute neurologic outcome while admitted. This rate is lower than rates reported in literature. The following were the predictive factors: baseline oxygen saturation of < 70% (OR 0.3401, 95% CI 0.1439-0.8038, p= 0.014), right ventricular (RV) dysfunction (OR211.17, 95% CI 2.0754-21486, p= 0.023), and mechanical ventilation >4 days (OR4.1525, 95%CI 1.3486-12.786, p= 0.013). The in-hospital post-operative mortality rate was 3.7%.

Conclusion:
The significant predictors of acute neurologic outcome following TOF repair were: low oxygen saturation, pre-existing RV dysfunction and prolonged mechanical ventilation.

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1461 - PHYSICAL FITNESS IMPROVEMENT AFTER SHORT TERM EXERCISE REHABILITATION IN CHILDREN AFTER HEART DISEASE TREATMENT

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Background / Hypothesis:
International studies have demonstrated that exercise rehabilitation can effectively enhance exercise tolerance in children after heart disease treatment. This study aims to examine the effectiveness of exercise rehabilitation in improving physical fitness in children after heart disease treatment by comparing changes in physical fitness before and after a short-term exercise regimen.

Materials and Methods:
This was a a prospective self-controlled study including children aged 6 to 18 years who had undergone congenital heart disease surgery or had recovered from acute myocarditis. Participants were enrolled in a 10-day short-term exercise rehabilitation, consisting of 1 hour of physical training in each morning and afternoon (10 minutes of warm-up, 40 minutes of physical training, and 10 minutes of cool-down stretching). Before and after the exercise rehabilitation,these children accepted static pulmonary function test , cardiopulmonary exercise tests (CPET), body composition tests, and exercise psychology scale assessments. Indicators were collected and compared.

Results:
16 participants were included in the study with a median age of 9.3 years (range: 7.1 to 16.2 years). The indicators reflecting oxygen uptake capacity from CPET, including peak VO2 pre% [(77.81±8.46)% vs. (81.19±9.99)%, P=0.03], peak VO2 (P=0.01), O2 pulse (P=0.009), OUES (P=0.006), and OUES/kg (P=0.043), significantly increased after exercise rehabilitation. Body composition tests showed significant increases in intracellular water, extracellular water, protein content, fat-free mass, and lower limb muscle mass ($P<0.05$). Exercise fear scores significantly decreased (P=0.003). There were no significant differences in static pulmonary function before and after exercise rehabilitation ($P>0.05$). No cardiovascular adverse events occurred during the exercise period.

Conclusions:
Short-term exercise rehabilitation can effectively enhance exercise tolerance, increase muscle mass, and improve exercise fear in children after heart disease treatment, with good safety.

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1466 - IMPROVING NEURODEVELOPMENTAL CARE FOR CHILDREN WITH CONGENITAL HEART DISEASE IN AUSTRALIA THROUGH A SUSTAINED CLINICIAN ACADEMIC RESEARCH PARTNERSHIP

Karen Eagleson [1], Robert Justo [1], Ben Auld [1], Thomasina Donovan [2], Jenna English [2], Pakhi Sharma [2], Bridget Abell [2], Nicole White [2], Steven Mcphail [2]
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Australian Centre For Health Services Innovation And Centre For Healthcare Transformation, School Of Public Health And Social Work, Faculty Of Health, Queensland University Of Technology, Brisbane-Australia [2]

Background:
Challenges to implementing best practice neurodevelopmental follow-up recommendations for children with congenital heart disease (CHD) at high-risk for adverse outcomes have been reported across varying health service contexts internationally. The Medical Research Future Fund Cardiovascular Mission (MRFF Grant ARGCHDO035) funded a five-year (2020-2025) program of research. A partnership between six paediatric cardiac health services and two research institutions worked to deliver a range of academic and jurisdictional program-specific outputs to inform evidence-based, family-centred models of care to support the long-term neurodevelopment of children with CHD in Australia.

Methods:
Six overarching objectives underpinned the research program and drove methodology selection and output types. Scoping reviews, simulation modelling, family interviews, health service provider interviews and surveys, economic analysis, and implementation science methodology were used to address the objectives. Clinician research partners in six jurisdictions developed projects focused on local priorities and contexts, including scoping activities to better understand current practices and family perspectives.

Results:
Scoping reviews identified 1) relevant economic evaluation methods, and 2) components of neurodevelopmental follow-up care for children with CHD internationally. Analysis of national stakeholder interviews (n=47) outlined the current context and models of neurodevelopmental care for children with CHD across Australian jurisdictions. The evaluation of an established Queensland model of care determined the impact on families and providers (interviews of parents (n=37) and clinicians (n=20)); financial cost to patients (economic analysis of out-of-pocket costs), and the health system's resource use (simulation and scenario modelling). The six supported local projects provided insights into, and potential solutions to challenges for implementing long-term neurodevelopmental care across the Australian healthcare system and promoted inter-jurisdictional engagement.

Conclusions:
The program of research partnership has contributed findings aiming to inform a national approach to identify future funding, research, and service delivery priorities, including a roadmap for enhanced delivery of cardiac neurodevelopmental care.

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1553 - EVALUATING NEURODEVELOPMENTAL OUTCOMES IN INFANT ECMO SURVIVORS

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Background:
The use of extracorporeal membrane oxygenation (ECMO) in critically ill infants has significantly improved survival, but concerns remain regarding long-term neurodevelopmental outcomes. Despite the neurological risks associated with ECMO, few centres worldwide offer structured, multidisciplinary follow-up from discharge through adolescence. This study evaluates neurodevelopmental outcomes in paediatric ECMO survivors and explores whether universal or risk-stratified follow-up is warranted.

Methods:
We conducted a retrospective, single-centre study at Evelina London Children's Hospital, reviewing infants who underwent ECMO between 2018 and 2024. Clinical and demographic data at discharge from the paediatric intensive care unit (PICU) were analysed for associations with neurodevelopmental outcomes. Standardised assessments using the Bayley Scales of Infant and Toddler Development, Third Edition (Bayley-III), were conducted at age three. Older children underwent clinical reviews assessing health, communication, motor skills, behaviour, feeding, sleep, and educational needs. Parental concerns were recorded across the same domains. Follow-up ceased at age five if no issues were identified.

Results:
Of 60 ECMO survivors, 5 (8.3%) died before follow-up and 7 (11.7%) declined participation. Among the remaining cohort, 24 children (50%) completed Bayley-III assessments, while older children were reviewed clinically. Most demonstrated favourable neurodevelopmental outcomes, though discrepancies were noted between parental concerns and test results.

Conclusion:
Neurodevelopmental outcomes following ECMO are highly variable and often difficult to predict. Our findings highlight the critical need for a structured and standardised follow-up programme to support early detection and intervention for potential developmental concerns. To facilitate meaningful multicentre outcome research, uniform protocols for neuromonitoring, treatment, and follow-up are essential. We advocate for intercentre collaboration to establish unified guidelines and promote the development of a global registry with standardised data collection. Such efforts will help define best practices and inform future evidence-based guidelines for the long-term neurological care of paediatric patients requiring ECMO.

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1574 - TRANSFORMING PEDIATRIC CARDIAC CARE ENHANCING HEALTH OUTCOMES WITH CHILD LIFE SPECIALIST SUPPORT

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Background / Hypothesis:
Child life specialists (CLS) use developmentally appropriate preparation and interventions to reduce stress and anxiety during hospitalization, promote positive coping mechanisms, and foster a sense of control and trust. Research shows that CLS interventions can significantly reduce anxiety and stress in children undergoing medical procedures. This reduction in stress can positively impact neurodevelopment by promoting better coping mechanisms and emotional regulation. This study hypothesizes that CLS interventions improve neurodevelopmental and long-term health outcomes in pediatric cardiac patients. Using mixed-method data collection, it aims to evaluate the effectiveness of CLS interventions in enhancing emotional safety and psychosocial health, which are key predictors of these outcomes.

Materials and Methods:
The study utilized a mixed-methods approach, collecting quantitative and qualitative data though anonymous surveys completed by pediatric cardiac nurses. Data was gathered by surveying nurses' historical perspectives on the impact of CLS interventions, looking at anxiety levels, coping skills, and neurodevelopment impacts of pediatric cardiology patients aged 5-18 years undergoing diagnostic and interventional procedures at a leading children's hospital.

Results:
Quantitative data results show an 85% increase in children's coping and understanding when supported by a CLS, and 85% of nurses report improved long-term coping and cooperation when regularly supported by a CLS Qualitative data highlights the importance of developmentally appropriate preparation and support, leading to greater emotional safety and psychosocial health; all indicators of long term psychosocial, neurodevelopmental, and overall health outcomes.

Conclusions:
The study concludes that the inclusion of CLS in pediatric cardiology care is highly effective in promoting emotional safety and psychosocial health, which are critical predictors of psychosocial, neurodevelopmental, and long-term health outcomes. CLS interventions not only reduce anxiety and improve coping skills but enhance overall patient and family satisfaction, making them an essential component of comprehensive pediatric cardiac care.

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1583 - LIVER ANOMALIES IN PATIENTS WITH CONGENITAL HEART DISEASE

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Background / Hypothesis:
Liver anomalies are occasionally associated with congenital heart disease (CHD), either as congenital abnormalities or acquired lesions. A well-established link exists between congenital porto-systemic shunts (CPSS) and heterotaxy syndrome with anomalous systemic venous return. Additionally, chronic hemodynamic alterations in CHD—including venous congestion, low cardiac output, and chronic hypoxia—can lead to acquired liver lesions. Hypervascular nodules require evaluation for hepatocellular carcinoma and follow-up.
This study aims to assess the relevance of routine liver screening via abdominal ultrasound in patients with CHD.

Materials and Methods:
We retrospectively reviewed abdominal ultrasounds performed in patients under 18 years of age who underwent CHD repair at a tertiary care center in Switzerland between January 2023 and February 2025. Routine ultrasound was conducted either as part of a congenital anomaly evaluation or to screen for CPSS. Patients with known hepatic malignancies were excluded.

Results:
Among 530 pediatric patients who underwent cardiac surgery for CHD, 119 had an abdominal ultrasound with liver assessment. The median age was 45 months. Main CHD types were right-sided obstructive lesions (n=42, 35%), left-to-right shunts (n=32, 27%) left-sided obstructive lesions (n=19, 16%) and univentricular heart (n=5, 4%). Pulmonary hypertension was present in 18 patients (15%).
Liver abnormalities were identified in 19 of 119 patients (16%). Findings included:
- Extra-hepatic CPSS (n=1), in association with a ventricular septal defect (VSD)
- Portal vein thrombosis (n=4)
- Hepatic calcifications (n=1)
- Punctate hyperechogenicity (n=3)
- Hypervascular nodules (n=2)
- Nonspecific findings (n=8), including periportal hyperechogenicity

Hypervascular nodules were found in two patients of 15 years old with long standing systemic venous congestion.

Conclusions:
This study highlights the frequent liver involvement in CHD, with both congenital and acquired liver abnormalities detected via routine ultrasound screening. Given these findings, systematic hepatic evaluation may contribute to early detection and improved management. Further studies are needed to establish screening guidelines.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1641 - GLOBAL BURDEN REGIONAL AND AGE SPECIFIC DIFFERENCE AND TEMPORAL TRENDS OF INTELLECTUAL DEVELOPMENTAL DISABILITY ATTRIBUTABLE TO CONGENITAL HEART DISEASE 1990 2021 A SYSTEMATIC ANALYSIS FOR THE GLOBAL BURDEN OF DISEASE STUDY 2021

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Background / Hypothesis:
Progressed surgical and interventional techniques improved the life expectancy of congenital heart disease population. Non-fatal complication, such as intellectual developmental disability, has progressively raised concern. However, few epidemiological studies described the burden of intellectual developmental disability attributable to congenital heart disease from global perspectives. This study aimed to comprehensively analyze the global burden, regional and age-specific difference, and temporal trends of intellectual developmental disability attributable to congenital heart disease, providing an insightful understanding on this issue.

Materials and Methods:
This study was a secondary analysis with the impairment data of the global burden of disease study 2021. The burden of intellectual developmental disability attributable to congenital heart disease was evaluated with prevalence, disability adjusted life years, and estimated annual percentage changes across global, socioeconomic, geographic, and age-specific subgroups. Joinpoint regression models were used to describe the temporal trends.

Results:
In 2021, 1.05 million (95%UI: 0.83, 1.24) people lived with intellectual developmental disability attributable to congenital heart disease worldwide. Low-middle social-demographic index regions were mostly affected, with 0.32 million people (95%UI: 0.27, 0.38). Southern Asia experienced the highest prevalence of 0.30 million (95%UI: 0.25, 0.36) among all geographic subregions. Children under the age of five were more susceptible to intellectual developmental disability attributable to congenital heart disease. The temporal trends of intellectual developmental disability attributable to congenital heart disease varied across different social-demographic index regions and age subgroups.

Conclusions:
This is the first study comprehensively describing the global burden, regional and age-specific difference, and temporal trends of intellectual developmental disability attributable to congenital heart disease. Socioeconomic disadvantage and younger age are associated with a higher burden of intellectual developmental disability attributable to congenital heart disease. Efforts for both reducing congenital heart disease mortality and improving neurodevelopmental disability should be coordinately allocated.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1670 - EMBEDDING CONSUMER AND HEALTHCARE PROVIDER PERSPECTIVES IN CARDIAC NEURODEVELOPMENTAL RESOURCES IN QUEENSLAND AUSTRALIA

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Background:
An established cardiac developmental long-term care pathway (CHD LIFE Program) for children who have undergone cardiopulmonary bypass surgery before 12 months of age was evaluated as one component of a five-year program of research (MRFF Grant ARGCHDO035). This 2023-4 evaluation, inclusive of statewide consumer and healthcare provider perspectives, identified opportunities to enhance care pathway implementation and uptake. Several of these opportunities can be targeted through a centralised resource repository. In 2025, this study therefore aims to co-design resources in partnership with consumers and healthcare providers statewide, for future use in a CHD LIFE Program digital resource repository.

Methods:
An initial scoping survey of grey literature sources including hospital and government sites will be completed to identify resources of interest. These will be appraised and mapped to key areas identified in the program evaluation, including knowledge and awareness of the care pathway; capacity building and support for families and healthcare providers; and health system navigation. A series of structured consensus generating activities including focus groups, interviews, and priority setting activities will be conducted with consumers and healthcare providers to identify priorities for resource development and preferences for access.

Results:
The scoping survey and mapping activities will provide an index of relevant and available resources as well as identify current gaps. Consumer and healthcare provider input will further refine priority areas and optimal approaches for resource development and user access. In addition to initial prioritised resources, plans for ongoing repository development, dissemination, and evaluation will be formulated.

Conclusions:
A co-designed CHD LIFE Program digital resource repository is a direct response to program evaluation key findings. This approach aims to optimally improve long-term neurodevelopmental follow up care across Queensland by systematically embedding consumer and healthcare provider perspectives, utilising a consensus approach, to respond to local needs, models of care, and processes.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1677 - DETERMINING A PRACTICAL AND FEASIBLE PATHWAY FOR NEURODEVELOPMENT CARE FOR WESTERN AUSTRALIAN CHILDREN WITH CONGENITAL HEART DISEASE

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Background:
Children with congenital heart disease (CHD) are at greater risk of neurodevelopmental (ND) challenges. Phase 5 of the CHD LIFE+ program of research (funded by MRFF Grant ARGCHD0035) partnered with Western Australia (WA) Child and Adolescent Health Service (CAHS) to develop an evidence-based pathway to inform ND care for WA children with CHD. This study examined available services and gaps in ND care and proposes a feasible ND Care roadmap informed by families and ND specialists for WA children with CHD.

Materials and Methods:
Using mixed methods, a retrospective review of Perth Children's Hospital (PCH) Cardiology departmental data (2015-2020) examined the range of ND services currently offered to cardiology patients at PCH who underwent open-heart surgery in the first 12 months of life. Descriptive statistics quantified the number and range of ND services attended at CAHS and identified a primary caregiver (PCG) survey cohort. Descriptive statistics and content analysis were applied to PCG survey and narrative responses respectively. Thematic analysis of focus group/interview transcripts from ND specialists identified key components to inform a ND care pathway and illustrate an emergent conceptual model

Results:
The retrospective review identified 313 patients meeting inclusion criteria. Most resided in the metropolitan area (n-234). Nearly 30% (n-95) underwent open heart surgery within 31 days of life. Close to 30% of the 313 were offered some developmental follow up. A range of ND specialties were attended (n-234) while remaining (n-123) attended only their cardiologist. Challenges related to distance, timing, additional family commitments were identified in PCG survey responses. Challenges and gaps identified during stakeholder discussions informed an emergent roadmap for Cardiology ND Care.

Conclusions:
The combined analyses of departmental data, PCG and stakeholder engagement provides convincing WA based evidence to inform a robust framework to guide a comprehensive program for ND care for patients with CHD.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1691 - ENHANCING THE MODEL OF CARDIAC NEURODEVELOPMENTAL CARE ACROSS CHILDHOOD IN NEW SOUTH WALES AUSTRALIA NEUROCHD NSW

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Background / Hypothesis:
Children with congenital heart disease (CHD) have an increased risk of neurodevelopmental (ND) and mental health conditions. As part of a national project called CHDLife+, we set out to develop an enhanced ND surveillance model for the Australian State of New South Wales (population 8.5 million) based on relevant activity and analysis within the Sydney Children's Hospitals Network (SCHN) – the sole provider of advanced paediatric cardiac care in this State. Neurodevelopmental assessment evaluated infant cognitive, motor, and language development using standardised assessments. The model was informed by service-based data and aligned with the Australian National Standards of Care for Childhood-Onset Heart Disease (CoHD Standards) and relevant 2024 American Heart Association (AHA) Scientific Statement.

Materials and Methods:
We conducted a retrospective medical record audit of patients who underwent cardiac surgery with cardiopulmonary bypass by age 12 months (Jan 2022- Dec 2023), reviewing ND follow-up rates. We also surveyed clinicians providing CHD care for their views on ND services, using descriptive statistics to analyse results.

Results:
Overall, 252 infants met study eligibility criteria. Of these, 33% had ND assessment at age 3 months. At 12 months of age, 24% of the cohort were seen, and 12% were receiving National Disability Insurance Scheme (NDIS) funded early intervention. Core components of ND care identified via clinician survey (N=32, 39% response rate) included: structured follow-up, integrated care, clear referral pathways, family focus, collaboration, research-driven improvements, and equity. The proposed model emphasises integrated, multidisciplinary care, clear referral processes, and family-centred support to enhance long-term neurodevelopmental outcomes for children with congenital heart disease throughout their lifespan.

Conclusions:
We have an evidence-based, purpose specific model for improving local ND surveillance and intervention in our State. Strengthening service integration within SCHN and other agencies in NSW will be essential to ensuring equitable, long-term access to ND care for children with CHD.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1730 - ASSESSMENT OF CARDIORESPIRATORY FITNESS IN CHIDREN WHO HAVE UNDERGONE PRIMARY ARTERIAL SWITCH OPERATION IN LONG TERM" A PILOT STUDY

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Background / Hypothesis:
Primary arterial switch operation (ASO) in children older than 6 weeks with regressed ventricle have shown a good midterm results.It was concluded in a previous midterm study that, Primary ASO can be safely performed in children with regressed ventricle, irrespective of age with encouraging results1. Here we have assessed the long term cardiopulmonary fitness in children who have undergone primary arterial switch operation, for d-TGA with regressed ventricle and d-TGA with preserved ventricle between the year 2006-2014 and compare it with that of the control group children.

Materials and Methods:
Data of Children who underwent ASO between the year 2006-2014 by Dr.A.K Bisoi were collected and divided in to 2 groups of those who had regressed LV at the time of surgery and those who had preserved LV total 18 children could be called for CPET and the results compared with that of the 20 age,weight,BMI matched control group children.

Results:
In the present study no statistical dfifference was found in VO2 Max (ml/kg/min) of post ASO children(34.23) and normal group children(36.84)

Conclusions:
The technique of surgery performed along with the surgical expertise do play a role in long term exercise.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1733 - THE EFFECT OF PERIOPERATIVE SODIUM CHANGE ON WHITE MATTER MICROSTRUCTURAL DEVELOPMENT AND BRAIN INJURY IN NEONATAL CRITICAL CONGENITAL HEART DISEASE

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Background / Hypothesis:
Neonates with critical congenital heart disease (CCHD) show altered postoperative microstructural white matter (WM) development, and a high incidence of brain injury. The mechanisms underlying perioperative brain changes are unclear. In adults, rapid sodium level changes can lead to osmotic demyelination syndrome. This study examined associations between perioperative sodium level change, perioperative dysnatremia, and postoperative WM microstructure and brain injury in neonatal CCHD.

Materials and Methods:
Serum sodium levels were frequently measured from 72h before to 72h after cardiopulmonary bypass surgery in 83 neonates with CCHD (exclusion criteria: surgery at >6.0 weeks postnatal age, (suspected) syndromic disorder, gestational age at birth <36.0 weeks). Sodium levels were considered hyponatremic below 135 mmol/L and hypernatremic above 145 mmol/L. Maximum intraoperative sodium change was calculated by subtracting the minimum from the maximum intraoperative observed sodium level. Postoperative T1, T2, susceptibility and diffusion weighted magnetic resonance imaging were obtained. White matter injury (WMI), arterial ischemic stroke (AIS), and cerebral sinovenous thrombosis (CSVT) were scored. Postoperative mean diffusivity (MD) was calculated and voxel-wise analyses conducted using tract-based spatial statistics.

Results:
Ninety-nine percent of neonates showed perioperative dysnatremias (Table 1). The median maximum intraoperative sodium change was 7.0 mmol/L (IQR=5.0-10.0), corresponding to a 1.3 mmol/L/h increase. Fisher's exact test revealed new postoperative AIS was significantly more common in neonates with postoperative hypernatremia (12.3% AIS with hypernatremia, 3.5% without, p=0.019, OR=10.3, 95%CI=1.3-496). There were no other significant associations between dysnatremia or sodium change and brain injury or voxel-wise MD.

POSTER PRESENTATIONS

Conclusions:
A high proportion of neonates with CCHD exhibit perioperative dysnatremias and a rapid sodium increase. Postoperative hypernatremia was associated with new postoperative AIS. Hypernatremia can be a marker and mediator of brain injury, emphasizing the need for fluid and electrolyte management. Further research is required to disentangle the potential relationship between postoperative AIS and hypernatremia in neonatal CCHD.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1742 - IMPROVING LIFE EXPECTANCY AND QUALITY OF LIFE FOR CHILDREN BORN WITH DOWN SYNDROME DEVELOPING BEST PRACTICE GUIDELINES IN RESPONSE TO CHANGING PATTERNS IN DIAGNOSIS TREATMENT AND SURVIVAL.

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Background / Hypothesis:
The incidence of Down Syndrome (DS) in Northern Ireland (NI) is higher than worldwide (1.2-2.6/1000 live births). Healthcare advances have improved life expectancy of individuals with DS resulting in a larger population with multiple comorbidities. However, longitudinal studies examining long-term outcomes are lacking, particularly regarding congenital heart disease(CHD). This project aims to: 1)Evaluate long term survival, medical comorbidities and education/employment outcomes of persons with DS, 2)Develop best practice guidelines for care of children with DS.

Materials and Methods:
Royal Belfast Hospital for Sick Children Database contains everyone born in NI with DS from 1990-2023. Information includes cardiac diagnosis, intervention, screening and outcomes. The database was expanded using NI Electronic Care Record (NIECR) to include other medical comorbidities, timing of comorbidity screening, survival status, hospital/neonatal admissions and BMI. Medical comorbidities include pulmonary hypertension, sleep apnoea, hypo/hyperthyroidism, coeliac disease, autism, hearing/visual impairment and dementia.
An online questionnaire was distributed to parents/carers of those with DS to assess family life, education/employment, hobbies, exercise and quality of life. A 'GENEActiv' device will measure activity levels. Combining database and questionnaire data will determine outcomes.

Results:
The database contains 1441 patients aged from 1 to 35 years. Incidence of DS in NI and average maternal age have increased over this time. 94.3% of patients are still alive. The commonest form of CHD is VSD, affecting 21% of patients. 43% of patients with CHD required intervention between 2014-2016, compared with 25.5% from 1990-1995. AVSD repair was the commonest intervention. ECHO screening was performed within 6 weeks of age in 95% in 2023, improved from 81% between 2005-2015.

Conclusions:
This large database is a unique resource to research quality of life of those with Down Syndrome and influence changes required in key aspects of medical/psychosocial care. Comorbidities greatly impact morbidity/mortality therefore guidelines need to include strategies for their prevention, surveillance and management.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1746 - EXPLORING THE EFFECTS OF PSYCHOSOCIAL INTERVENTIONS ON MENTAL STATUS IN PEDIATRIC CONGENITAL HEART DEFECTS IN A TERTIARY CARE HOSPITAL IN PAKISTAN

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Background / Hypothesis:
Congenital heart defects (CHD) are structural heart malformations present at birth, often requiring early surgical interventions during critical developmental stages. Children with CHD are at risk for neurodevelopmental challenges, exacerbated by hospitalization and parental stress. This study evaluates the impact of psychosocial interventions during hospitalization on the mental status of pediatric CHD patients.

Materials and Methods:
A quality improvement study was conducted in a tertiary care hospital in Karachi, Pakistan, from 2017 to 2019. The intervention utilized a Mental Status Examination Scale (MSE-S) to measure changes in mental status before and after psychosocial interventions. Purposive sampling included children aged 1 month to 6 years with CHD undergoing hospitalization. Descriptive analysis and paired samples T test were used.

Results:
Significant improvements were observed in MSE-S scores across most CHD classifications. MSE-S scores in Single Ventricle group, increased from 37.46 (SD = 9.32) to 42.92 (SD = 12.6) ($p = 0.018$), while for Transposition of Great Arteries, scores rose from 35.77 (SD = 7.75) to 40.46 (SD = 8.61) ($p < 0.001$). The other 2-Ventricle group showed the largest improvement, from 32.43 (SD = 10.2) to 38.70 (SD = 9.21) ($p < 0.001$). Improvements were consistent in motor skills, speech, mood, and cognition subscales.

Conclusions:
Psychosocial interventions during hospitalization significantly improve mental status of CHD children. These findings underscore the importance of developmental care and parental involvement in improving the mental and emotional well-being of pediatric patients. Further research with larger and diverse samples is warranted to generalize findings and explore long-term benefits.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1800 - EFFECTS OF EXERCISE TRAINING IN PATIENTS WITH FONTAN CIRCULATION A SYSTEMATIC REVIEW AND META ANALYSIS

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Background / Hypothesis:
As long-term survival after the Fontan operation has improved, exercise capacity has become a crucial determinant of prognosis. Various exercise rehabilitation programs involving different populations and protocols have been developed to improve these outcomes. This systematic review and meta-analysis compared the effects of exercise rehabilitation in patients with Fontan circulation according to age group and exercise method.

Materials and Methods:
We searched the PubMed, Embase, and Cochrane Library databases for articles on exercise rehabilitation programs for patients who had undergone the Fontan procedure up to November 2023. After selection and eligibility assessment, 20 studies (five randomized controlled trials [RCTs], two randomized trials, and 13 cohort studies) were included in the meta-analysis of peak oxygen consumption (VO2) and minute ventilation equivalents for CO2 production (VE/VCO2 slope).

Results:
Peak VO2 was significantly better in groups with exercise training than in the control groups in five RCTs (standardized mean difference [SMD], 0.48; p=0.0017); it showed a notable increase in 20 studies before and after exercise training (SMD, 0.44; p=0.001). VE/VCO2 showed no significant changes in the RCTs (SMD, 0.22; p=0.68) or before and after exercise training (SMD, –0.11; p=0.25). Subgroup analyses revealed significant improvements in peak VO2 for aerobic exercise (SMD, 0.32; p=0.0136) and in groups that included children (SMD, 0.49; p=0.0013 in "children and adults" and SMD, 0.49; p 0.047 in "children" group).

Conclusions:
Exercise training is effective for improving exercise capacity in patients after the Fontan procedure, particularly when initiated at a young age and implemented as an aerobic exercise.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1851 - OBSERVATIONS FROM A NEW FONTAN LONG TERM FOLLOW UP CINIC

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Background / Hypothesis:
Fontan patients are at risk for developing diseases of other body systems due to their Fontan circulation. It is these progressive problems that affect their quality of life and how long they survive. We report our initial experience with a new Fontan Long-Term Follow-up Clinic aimed at standardizing assessment and care from age 8-18 years.

Materials and Methods:
Retrospective review of all outpatients seen in Fontan Long-Term Follow-up Clinic from Jan 2020 - Dec 2024. Descriptive summary of patient demographics and Fontan-related co-morbidities.

Results:
142 unique patients (42% female) attended clinic. Mean age at Fontan was 3.6+/-1.7y with 86% extracardiac fenestrated of whom 53% underwent fenestration closure at a median of 1.2y (0.3-8.8y) post-Fontan. Cardiac observations revealed moderate to severe AVVR (21%), reduced heart function (18%), cyanosis (32%), and pacemaker (12%). Overall non-cardiac observations included any degree of Fontan-associated liver disease (FALD) by imaging (60%), protein-losing enteropathy (PLE,14%), plastic bronchitis (3%), reduced renal function (6%), and proteinuria (13%). Identified learning challenges were reported in 45% with formal learning disability diagnoses in 25%. Growth assessment revealed failure to thrive (13%), obesity (6%), and short stature (10%). Further liver assessment revealed fibrosis in 60% (42% mild, 5% moderate, 3% severe), cirrhosis (5%), splenomegaly (24%), varices (7%), focal nodular hyperplasia (FNH, 22%), elevated transaminases (82%), and elevated bilirubin (44%). Bone health assessment revealed osteopenia (11%) and low vitamin D (38%). Lymphatic intervention was undertaken in 8%.

Conclusions:
This snapshot of a cohort of Fontan patients reveals a number of notable cardiac and non-cardiac co-morbidities, especially FALD and learning challenges, that should be systematically screened for and addressed. By providing comprehensive care we aim to identify and treat Fontan-associated problems early in hopes of improving long-term care, quality of life, and overall patient and family outcomes.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1854 - NEURODEVELOPMENTAL OUTCOMES IN INFANTS WITH LEFT HEART OBSTRUCTIONS AND TRANSPOSITION OF THE GREAT ARTERIES

Cosimo Marco Campanale [1], Patrizio Moras [1], Luciano Pasquini [2], Serena Ventrella [1], Marco Masci [1], Silvia Bucci [1], Alessandra Toscano [1]
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Background
Children with congenital heart disease (CHD) are at risk of neurodevelopmental disorders, decreased functional status and quality of life outcomes. Data about hypoplastic left heart syndrome (HLHS) and transposition of the great arteries (TGA) children have been already published but few data are available about children with non-HLHS left heart obstructions such as aortic coarctation (CoAo) simple or associated to other lesions. We studied neurodevelopmental outcomes in CoAo and TGA patients compared with controls

Materials and Methods:
Children with CoAo (simple, complex and shone syndrome) (n=39), children with TGA (n=54) and healthy controls (n = 24) aged 12 months who were admitted to the Neonatal Medical and Surgical Department of the Bambino Gesù Children's Hospital were included. To avoid bias in the interpretation of results, only children with isolated congenital heart disease without associated genetic syndromes were considered

Results:
Children with TGA presented significantly lower mean scores on the cognitive (M=98.89 ±7.99; p <.001), language (M= 95.92 ± 7.05; p <.001) and motor scales (M= 86.34 ± 10.26; p <.001) compare to children with CoAo (Cognitive M= 103.97 ± 7.96; language M=100.18 ± 7.12; Motor M=94.21 ± 6.91) and healthy controls (Cognitive M= 107.04 ± 7.34; language M=105.18 ± 6.44; Motor M=97.65 ± 8.93). However all group had mean scores within the normal range. Children with CoAo did not differ in their development from healthy children. Within the group of children with CoAo, no significant differences were found according to disease severity (simple CoAo; complex CoAo; Shone syndrome). Two children with TGA showed developmental delay (Cognitive<85); 17 children with TGA and 3 children with CoAo showed delay in the area of motor skills.

Conclusions
at 1 year infants with CoAo have neurodevelopmental scores comparable to controls while TGA patients are a significantly lower level, although within normal ranges. Follow-up is needed

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1864 - CHARACTERISTICS AND OUTCOMES OF DEXTRO TRANSPOSITION OF GREAT VESSELS AT CHRIS HANI BARAGWANATH HOSPITAL IN SOUTH AFRICA OVER A 10 YEAR PERIOD

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Background / Hypothesis:
Transposition of great vessels accounts for 5-7% of total congenital heart disease and 20% of all cyanotic congenital heart disease. Early presentation and surgical intervention improve survival outcomes.

Materials and Methods:
Describing characteristics and outcomes of dextro-transposition of great vessels over 10-year period.
A retrospective and descriptive study done at Chris Hani Baragwanath Hospital from January 2012 to December 2022. It evaluated demographics, age at presentation, surgery undertaken and outcomes including mortality.

Results:
A total of 49 patients were identified and the majority were males (71.4%). Most patients originated from the Gauteng Province (69.4%) followed by the North-West Province (24.5%). The Median age at presentation was 12 days (IQR 0-87 days). Most patients had an associated ventricular septal defect
(59%). Patent foramen ovale or Atrial septal defects were present in 41% of cases and 45% had Patent Ductus Arteriosus. An emergency septostomy was done in 17 cases (35%). A total of 24 (49%) patients had either staged or corrective surgery. Arterial switch surgery was done in 18 cases (75% of all surgeries) with a median age of 19 days (IQR: 1.5 - 38 days). The Mustard procedure was performed in 2 patients (aged 5months and 12.5 months) and a Rastelli operation was done in 1 patient at 14months. Staged surgery was undertaken in 3 patients in the form of a BT shunt or
Pulmonary Artery Banding. Mortality was recorded in 22 cases (44.9%).

Conclusions:
Most patients presented during neonatal period and two-thirds had associated intracardiac shunts. Less than half of patients underwent corrective surgery, and the mortality rate was high compared to more resource replete countries.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1889 - INVESTIGATING GENDER DIFFERENCES IN EXERCISE CAPACITY AND QUALITY OF LIFE USING RESULTS FROM QUALIREHAB SOPHROCARE AND TRANSITION TRIALS

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Introduction:
Results from three randomized clinical trials (QUALIREHAB, TRANSITION, and SOPRHOCARE) were recently published on the efficacy of a regimented program on exercise capacity and quality of life (QOL) outcomes in patients with congenital heart disease (CHD). Leveraging this data, we aimed to investigate gender differences in outcomes of these three patient populations.

Methods:
A post-hoc analysis on patients with CHD enrolled in one of the three clinical trials was conducted. The QUALREHAB trial consisted of 70 randomized patients (54% females), with a mean age 17.11(±3.52) years, the SOPHROCARE trial consisted of 99 randomized patients (58% females) with a mean age of 16.90(±3.50) years, and the TRANSITION trial consisted of 94 randomized patients (44%) females with a mean age of 18.88(±3.72) years. Gender differences were assessed across exercise capacity outcomes and QOL measures using intention-to-treat (ITT) analysis and the per-protocol analysis within each randomized clinical trial. Differences were also assessed within gender in the randomized and controlled groups. Absolute differences (AD) between groups were reported. All comparisons were adjusted for age and baseline values.

Results:
Gender differences were identified in the ITT analysis for QUALIREHAB in physical and emotional QOL domains (AD=-9.68,p=0.0.3 and -9.95,p=0.01, respectively) and in the per-protocol analysis for QUALIREHAB in theoretical VO2max (AD =-8.49,p=0.05). Smaller gender differences were observed in the ITT analysis for the SOPHROCARE trial in VAT and VO2max domains (AD=– 2.19,p=0.027 and -2.78,p=0.048, respectively) and in per-protocol analysis for SOPHROCARE in VAT (AD=-3.29,p=0.002). There were no gender differences observed in the ITT or per-protocol analyses for the TRANSITION trial, however differences existed between the females in randomized and controlled cohorts in both ITT and per-protocol analyses.

Conclusion:
Female patients with CHD may have lower exercise capacity and lower QOL scores following certain interventions designed to improve these outcomes.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1894 - CHANGE IN HEALTH RELATED QUALITY OF LIFE IN CHD FROM CHILDHOOD TO ADULTHOOD OVER A DECADE THE MULTICENTER QUALIDECADE COHORT STUDY

Marion Audie [1], Sophie Guillaumont [2], Alyssa Venna [3], *Pascal Amedro* [1]
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Introduction:
Medical advances in the management of congenital heart disease (CHD) have shifted the focus from mortality to life-long morbidity, with a stronger attention on patient-reported outcomes. Health-related quality of life (HRQoL) has been increasingly used as primary outcomes in cross-sectional or randomized controlled trials in CHD, however few cohort studies have measured the change in HRQoL over significant periods of time. This study aimed to prospectively measure HRQoL in CHD from childhood to adulthood over a decade and identify the predictors of HRQoL in this population.

Methods:
A multicenter cohort of 282 children with CHD was prospectively followed from 2012 to 2022 in three European tertiary care centers. The baseline HRQoL and clinical data were previously reported (https://doi.org/10.1007/s00246-015-1201-x). Ten years after patient enrollment, HRQoL and clinical data were collected again. Change in HRQoL using the PedsQL™ 4.0 generic instrument during the 10-year follow-up and predictors of HRQoL at 10-year follow-up were assessed, with adjustment on sex and age, and using multivariate analysis.

Results:
From the baseline population of 282 children with CHD (mean age 12.3±3.0 years, sex ratio=1.9), 121 patients (mean age=21.3±2.7 years, sex ratio=1.4) participated in the cohort study (mean=9.9±1.5 year follow-up). Overall, HRQoL scores remain stable over a decade, with a mean 78.1±15.9 total score in young adults (mean change of 0.9±16, P=0.55). However, HRQoL scores were 10-points lower in female patients than in males (73.3±16.2 vs. 83.6±14.7,P<0.001) and increased in men during the follow-up (+3.5±13.1, P=0.03 and +5.0±11.7,P<0.001, in total and physical scores, respectively). Apart from gender, baseline predictors of poorer HRQoL at 10-year follow-up in multivariate analysis were physical deconditioning (low ventilatory anaerobic threshold), repeated cardiac catheter interventions, angiotensin-converting enzyme inhibitors, and anticoagulants.

Conclusion:
Overall HRQoL in CHD remained stable from childhood to early adulthood over a decade of follow-up. However, HRQoL significantly decreased with time in female patients.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1915 - BEYOND PULMONARY VEIN STENOSIS QUALITY OF LIFE AND EMOTIONAL BURDEN OF PATIENTS AND FAMILIES

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Background:
Pulmonary vein stenosis (PVS) is a chronic disease with significant symptom burden, need for ongoing interventions and it may impact quality of life (QoL) and cause emotional burden to patients and families. We aimed to determine the impact of PVS on QoL and emotional burden for patients and families.

Methods:
Families of patients with PVS were invited to participate from April 2024 to February 2025. The Parent Experience of Child Ilness Scale (PECI) was completed by a parent proxy. For patients under two years, the PedsQL Infant Scale was completed, and for older children, the PedsQL Cardiac Module was used. For children 8 years or older, the Cardiac Module Self-Report Scale was completed. The PECI was analyzed in three subscales that measured emotional distress (Guilt and Worry (G), Unresolved Sorrow and Anger (U), Long-term Uncertainty (U)) and one that measured Emotional Resources. In the first three, if any item was graded as "always" it was considered positive for distress. PedQL score was computed for each dimension according to the age-specific scale as well as a combined score.

Results:
Fifteen parents completed the PECI during the study period, and 12 completed the corresponding PedQL Scale (12 parent-reports and one patient-report), of which 80% were female with a mean age of 34 months (range 7 months to 12 years of age). On PECI, 67% were found to have distress in G, 47% in U and 47% in U. A mean score of 3.39 (SD 0.54) was found in emotional resources, a value within range according to the reported literature. In PedsQL, the overall mean scores are presented in Table 1.

Conclusions:
Parents of children with PVS appear to have significant emotional distress, although with adequate emotional resources. Additionally, there is a decrease in QoL, especially regarding physical symptoms, treatment anxiety, emotional and cognitive

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1929 - ESTABLISHING DEVELOPMENTAL GROWTH CHARTS FOR THE BAYLEY 4 FOR YOUNG CHILDREN WITH CHD A REPORT FROM THE CARDIAC NEURODEVELOPMENTAL OUTCOME COLLABORATIVE

Anjali Sadhwani [1], Valerie Rofeberg [2], Andrew Van Bergen [3], Sarah Morton [4], Samantha Butler [1], Laura Wood [5], Jennifer Butcher [6], Elizabeth Willen [7], Garrett Reichle [8], Wypij David [2]
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Background / Hypothesis:
The Bayley Scales of Infant and Toddler Development, Fourth Edition (Bayley-4), is the gold standard for assessing the neurodevelopment of infants and toddlers. However, it was normed on the general population, potentially limiting its ability to accurately reflect the unique developmental trajectories of children with CHD. This study aims to establish CHD-specific developmental growth charts using the Bayley-4, stratified by presence or absence of a genetic condition and cardiac condition.

Materials and Methods:
Bayley assessments of children aged 6–42 months, administered between May 2019 and July 2024 were obtained from the Cardiac Neurodevelopmental Outcome Collaborative (CNOC) registry. CHD-specific developmental growth charts were constructed for the five Bayley-4 domains using Growth Scale Values (GSVs), which are derived from raw scores using the Rasch model and provide a quantifiable measure of change over time. Quantile regression was used to estimate 25th, median, and 75th percentile GSVs. Growth charts were developed for the overall CHD cohort, by cardiac condition, and by genetic condition status, and compared to the Bayley-4 normative sample.

Results:
Data from 3,047 Bayley assessments conducted across 31 CNOC institutions were included. Approximately 57% of the participants were male, 15% preterm, and 13% had a genetic condition. Children with CHD had mean Cognitive GSVs near the 25th percentile of the normative sample, while those with both CHD and a genetic condition fell below the 5th percentile of the normative sample. Children with two-ventricle anatomy demonstrated higher gross motor performance (at the 25th percentile) than those with single-ventricle anatomy (at the 10th percentile).

Conclusions:
Children with CHD have lower cognitive, language, and motor skills compared to Bayley-4 norms, with variations based on the presence of a genetic disorder and cardiac condition. CHD-specific developmental growth charts serve as a useful clinical tool for monitoring and supporting the developmental profile and progress of children with CHD

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1980 - PROTECTIVE VALUE OF AGE AND BODY MASS INDEX IN REDUCING MALIGNANT VASOVAGAL SYNCOPAL EPISODES IN CHILDREN

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Background / Hypothesis:
Malignant vasovagal syncope (VVS) manifests itself as recurrent episodes accompanied by a cardiac arrest lasting for more than 3 s during a syncope episode. The purpose of this research is to explore the relationship between demographic characteristics and malignant VVS in children.

Materials and Methods:
We retrospectively analyzed the clinical data of 3734 children who were first diagnosed with VVS due to unexplained syncope and presyncope, of which 122 children were eligible for malignant VVS. Demographic data, times of syncopal episodes in history, heart rate (HR) and blood pressure (BP) at baseline and at the time of induced syncopal episodes during head-up tilt test (HUTT), and HUTT modes were analyzed in relation to malignant VVS.

Results:
(1) Comparison of differences between groups: age, body mass index (BMI), HR during syncopal episodes, and diastolic BP were lower in the malignant VVS group compared with the non-malignant VVS group ($P<0.01$). (2) Univariate analysis: age, BMI, HR, systolic BP, and diastolic BP at the time of HUTT-induced syncopal episodes were potentially protective against malignant VVS. (3) Multifactorial analysis: age and BMI have independent protective effects on malignant VVS. (4) Nonlinear analysis: age and BMI was nonlinearly associated with predicting the occurrence of malignant VVS. (5) Receiver operator characteristic curve analysis: age and BMI have predictive value for malignant VVS.

Conclusions:
Age and BMI are independent protective factors and have some predictive values for malignant VVS in children.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

1982 - THE IMPACT OF SCHOOL PERIODS AND LONG HOLIDAY PERIODS ON THE OCCURRENCE OF NEURALLY MEDIATED SYNCOPE IN CHILDREN

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Background / Hypothesis:
The clinical syncope symptoms of neurally mediated syncope (NMS) present biological rhythm phenomena. The purpose of this research is to explore the impact of school periods and long holiday periods on the occurrence of NMS in children.

Materials and Methods:
A retrospective analysis was conducted on 262 children with NMS. The children were aged 4-17 years, 119 males. 244 cases were diagnosed as vasovagal syncope, and 18 cases as postural orthostatic tachycardia syndrome. The data on the age, sex, syncope triggers, hemodynamic types, family history of syncope of children with syncope during long holiday periods group (n=68) and school periods group (n=194) were compared.

Results:
(1) Incidence of syncope: The incidence of syncope during school periods (74.05%) was higher than that during long holiday periods (25.95%). (2) Comparison of sex and triggers: The constituent ratio of females with syncope during school periods was higher than that of males ($P<0.05$). Among the triggers, the proportion of sudden postural change during long holiday periods was higher than that during school periods (26.47% vs. 21.13%, $P<0.05$). (3) Univariate analysis: Situational syncope was a potential protective factor when syncope occurred during school periods (OR 0.23, 95%CI 0.07-0.76, $P<0.05$), and being female was a potential risk factor (OR 1.92, 95%CI 1.10-3.35, $P<0.05$). (4) Comparison of multiple models: In the risk of syncope occurring during school periods, situational syncope reduced the risk by 79% compared with no trigger, and being female increased the risk by 78% compared with being male.

Conclusions:
The occurrence of NMS-related syncope events in children is associated with school periods and long holiday periods. During school periods, being female is a risk factor for syncope, while situational syncope is a protective factor.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

2038 - PULMONARY ARTERIOVENOUS FISTULA FORMATION AFTER TOTAL CAVOPULMONARY CONNECTION

Tai Fuchigami [1], Yusuke Iwata [1], Makoto Nakamura [1], Ken Ogura [1], Ryotaro Nagao [1], Naoki Kuwabara [2], Tetsuya Yamamoto [2], Atsushi Terazawa [2], Hideto Tanaka [2], Takashi Kuwahara [2]
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Objective:
In total cavo-pulmonary connection (TCPC), it is important to lead a blood flow from the inferior vena cava (IVC) to bilateral pulmonary arteries appropriately. Because the IVC blood containing hepatic factor may reduce pulmonary arteriovenous fistula formation.

Methods:
Fifty consecutive patients who underwent the extracardiac TCPC between 2003 and 2018 received postoperative pulmonary perfusion scintigraphy (RI) and right heart cardiac catheterization (RHC) concomitantly. RI was performed by intravenous technetium administration through the lower limbs, and we evaluate unilateral RI ratio (URI, range 0.00 to 1.00) of each lung to total both lungs. Contrast echocardiogram (CE, range 0 to 3+) was performed at each right and left pulmonary artery in RHC.

Results:
Of 50 cases (100 lungs), CE improved in 12 cases (18 lungs in total), while CE worsened in 9 cases (9 lungs) in follow-up (median 10.5 years). There was significant difference between the median URI of the 9 lungs with worsened CE (0.28 ; 0.03-0.48) and that of the 91 lungs with original negative or improved CE (0.54 ; 0.10-0.97) (p=0.00052). RI might anticipate late desaturation.

Conclusion:
The lung receiving fewer pulmonary blood flow from IVC may have pulmonary arteriovenous fistula formation in the future. RI might be useful technique for this problem.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

2155 - ASSESSING HEALTH RELATED QUALITY OF LIFE IN THE CONGENITAL HEART DISEASE PROJECT TO UNDERSTAND LIFELONG SURVIVOR EXPERIENCE (CHD PULSE)

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Background / Hypothesis:
With improved survival for congenital heart disease (CHD), attention has shifted toward understanding long-term quality of life (QOL) in adulthood. The study's aim was to evaluate differences in health-related quality of life (HRQOL) domains among disease complexity groups.

Materials and Methods:
From September 2021 to April 2023, the Congenital Heart Disease Project to Understand Lifelong Survivor Experience (CHD PULSE) sampled adult patients with a history of at least one intervention for CHD from participating U.S. centers in the Pediatric Cardiac Care Consortium registry. Participants were classified by the Canadian Cardiovascular Society Guidelines CHD severity categories (mild, moderate, severe 2-ventricle [2V], and single ventricle [SV]). Patient-reported outcomes were collected using PROMIS instruments and converted to EUROQOL EQ-5D scores (5 Dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression). Differences among groups were analyzed using general linear modeling and chi-square test.

Results:
Among 3,133 respondents (mean age 33.8 years; 56.5% female) from 11 centers, 849 had mild, 1,243 moderate, 468 severe 2V, and 248 SV CHD. SV patients reported the lowest EQ-5D scores (0.72 vs. 0.75 for the other CHD severity groups, $p<0.001$) and the worst PROMIS scores for depression (49.9 vs. 47.6–48.4, $p=0.002$), social functioning (57.0 vs. 58.0–58.8, $p=0.009$), and physical functioning (50.5 vs. 53.1–53.3, $p<0.001$). No significant differences were observed in anxiety or overall mental health among the severity groups. SV patients had the highest concern about future health (70.2% vs 42.7-54.1%, $p<0.001$) and heart health (68.8% vs. 35.8-54.8%, $p<0.001$).

Conclusions:
Adults with SV CHD experience significantly lower HRQOL, especially among physical, emotional, and social domains. Future analysis will examine how specific mediators and patient characteristics impact the association between disease complexity and HRQOL using Structural Equation Modeling to allow us to identify areas where practitioners and policymakers can intervene to maintain and improve HRQOL for CHD patients.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

2160 - ELEVATED PULMONARY ARTERIAL PRESSURE AT FONTAN IS ASSOCIATED WITH LOWER LONG TERM QUALITY OF LIFE

Caroline Shi [1], Yanxu Yang [1], Jessica Knight [2], Bradley Marino [3], Matthew Oster [4], *Lazaros Kochilas* [4], Chd-pulse Investigation Group [5]
Emory University, Pediatrics, Atlanta-United States [1] University Of Georgia, Epidemiology And Biostatistics, Athens-United States [2] Cleveland Clinic Children's, Department Of Heart, Vascular, & Thoracic, Division Of Cardiology And Cardiovascular Medicine, Cleveland-United States [3] Amb Children's Healthcare Of Atlanta, Cardiac Center, Atlanta-United States [4] Masonic Children's Hospital, Children's Mercy Hospital, Children's Hospital At Washington University, Children's Medical Center Of Dallas, Medical University Of South Carolina, Children, Children's Hospital Of Georgia, Children's Hospital University Of Louisville-United States [5]

Background / Hypothesis:
Higher mean pulmonary arterial pressure (mPAP) at pre-Fontan catheterization has been associated with reduced transplant-free survival. We examined whether elevated mPAP also predicts poorer long-term quality of life (QOL) in adult Fontan survivors.

Materials and Methods:
The Congenital Heart Disease Project to Understand Lifelong Survivor Experience (CHD-PULSE) surveyed adults from 11 centers within the Pediatric Cardiac Care Consortium, a US-based registry of congenital heart procedures from 1982–2011. Conducted between 2021–2023, the survey incorporated validated QOL measures, including PROMIS domains. mPAP at Fontan was analyzed both continuously and by tertiles: low (6–10 mmHg), middle (11–12 mmHg), and high (13–21 mmHg). Analyses included multivariable logistic regression adjusting for sex, Fontan year, and systemic ventricular type.

Results:
Among 248 survey respondents with single ventricle, 60 underwent lateral tunnel or extracardiac Fontan and had available mPAP at Fontan (median 11.0 mmHg; IQR 9.0, 13.0). Median follow-up post-Fontan was 20.3 years (IQR 18.4, 23.4) and median age at survey was 24.0 years (IQR 22.3, 27.1). Poor/fair general health was more common in the high mPAP group (29.4%) compared to middle (10%) and low (0%) (p=0.030). High mPAP tertile was associated with lower global physical (47.8±6.8) and mental health (43.4±7.6) T-scores compared to middle (51.8±8.0, 45.0±7.7) and low tertiles (53.9±7.4, 51.1±9.6) (both p=0.027). Per 1-SD increase in mPAP (~3 mmHg), adjusted odds of poor physical health (T-score <50) increased (aOR 1.80; 95% CI: 1.00–3.23), as did odds of receiving disability benefits (aOR 2.66; 95% CI: 1.27–5.57) and not having or planning for biological children (aOR 2.21; 95% CI: 1.11–4.37).

Conclusions:
Higher mPAP at Fontan is associated with worse long-term physical health, increased disability, and decreased likelihood of planning for biological children. mPAP may represent an actionable target to optimize not just survival, but quality of life in the Fontan population.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

2207 - BODY COMPOSITION IN PATIENTS WITH CONGENITAL HEART DISEASE A BIO IMPEDANCE BASED STUDY

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Background / Hypothesis:
Body composition in patients with congenital heart disease (CHD) may differ not only according to current clinical status but also by underlying cardiac physiology. This study aimed to evaluate body composition characteristics in CHD patients after open-heart surgery using bioelectrical impedance analysis (BIA).

Materials and Methods:
Between June 2020 and July 2024, a total of 333 patients who underwent open-heart surgery for CHD underwent postoperative BIA. Patients were categorized into four groups: single ventricle (n=38), one and a half ventricle (n=5), complex biventricular (n=157), and simple biventricular (n=133). The complex biventricular group was further subdivided into complex single correction (n=19) and complex multiple correction (n=138).

Results:
The mean age was 21.8 ± 12.0 years. The single ventricle group showed the lowest mean ejection fraction (50.6 ± 9.4%), while the simple biventricular group showed the highest (65.4 ± 6.8%) ($p < 0.001$). Leg muscle mass was significantly lower in the single ventricle group compared to the simple biventricular group (right leg: $p = 0.0009$, left leg: $p = 0.017$). Although not statistically significant, the prevalence of sarcopenia was highest in the single ventricle group (55.3%) compared to the complex (36.9%) and simple biventricular (42.0%) groups. Adolescents in both single and simple biventricular groups demonstrated high sarcopenia prevalence, underscoring the need for early intervention.

Conclusions:
CHD patients with single ventricle physiology exhibited reduced ejection fraction and higher sarcopenia prevalence. Sarcopenia was more frequent before adulthood, highlighting the importance of early detection and management. As sarcopenia may impair exercise capacity through extracardiac mechanisms, timely intervention during adolescence may improve long-term functional outcomes.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

2230 - APPROACHES AND PITFALLS IN UTILIZING HIGH FRAME RATE DOPPLER ULTRASOUND FOR NEONATAL CEREBRAL MICROCIRCULATION IN CRITICAL CONGENITAL HEART DISASE.

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Background / Hypothesis
Neonates with critical congenital heart disease (CCHD) are at risk for brain injury due to perioperative disturbances in cerebral hemodynamics. Compared to conventional neuromonitoring techniques, high frame rate (HFR) Doppler ultrasound offers increased spatiotemporal resolution and parametric microcirculation maps. This study aimed to assess and improve the feasibility of pre- and postinterventional cerebral HFR Doppler and to preliminary assess regional differences in periventricular cerebral microcirculation.

Materials and Methods:
Neonates with cCHD undergoing a cardiac intervention within 6 weeks of life at the University Medical Center Utrecht were included. Customized transfontanellar HFR Doppler was performed in the coronal and parasagittal planes before and after cardiac intervention, using a high-frequency linear probe (L20-5) at 650 Hz. Power Doppler images and quantitative resistivity index (RI) maps were obtained using a semi-automated Matlab-based program. Quality assessment criteria and processing guidelines were developed. Pearson correlation coefficient was calculated between arterial RI in the left and right hemisphere on coronal imaging, and between pairs of left and right parasagittal images.

Results:
33 patients were included, with transposition of the great arteries (n=13), left-sided obstructive lesions (n=7), right-sided obstructive lesions (n=4), single ventricle disease (n=4) and other cardiac diagnoses (n=5). 103 of 218 examinations were usable for analysis: 52 coronal, 23 parasagittal left and 28 parasagittal right. Processing guidelines increased usable images by 24%. Exclusion reasons were inadequate heart-beat detection (n=37), insufficient overall quality (n=43), insufficient valid pixels for RI quantification (n =24) and coronal asymmetry (n=11). RI in the left and right hemisphere showed a significant but modest positive correlation on coronal imaging ($r=0.54$, $p<0.001$), but not between parasagittal images ($r=0.24$, $p=0.3$).

Conclusions:
Although HFR Doppler shows promise for quantification of cerebral microcirculation in neonates with cCHD, it requires further technical improvements before routine implementation. Standardization of imaging processing increased usability of cerebral HFR Doppler.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

2407 - GROWING UP IN THE CICU FROM CULTURE SHIFT TO DEVELOPMENTAL CARE PRACTICE

Jade Boucher [1]
Bcch, Picu, Vancouver-Canada [1]

Background / Hypothesis:
Following the implementation of the ICU Liberation Bundle and the training of Comfort Champions, our PICU culture shifted organically: patients were more awake, mobile, and comfortable, and families became more present and engaged. Bedside nurses, newly sensitized to the risks of prolonged ICU stays - especially for infants under one year - expressed a growing need for clearer developmental expectations and actionable strategies at the bedside. In response, we hypothesized that implementing individualized developmental care plans and developmental care rounds would provide structure, deepen interdisciplinary collaboration, and promote improved long-term outcomes.

Materials and Methods:
We are in the process of designing an individualized developmental care plan for children under the age of 1 in the CICU. The tool includes eight domains: four areas of bedside practice (Feeding and Oral Comfort Strategies, Nurturing Care, Environment Optimization, and Family Engagement), and four reflecting the child's current developmental focus (Social and Emotional, Cognitive, Motor, and Language Skills). Developmental care rounds will be piloted biweekly with nurses, allied health, and family involvement. Education and training materials are currently in development, with full implementation planned for Fall 2025. To support this vision, we recently expanded physiotherapy, occupational therapy, and speech-language pathology coverage within the unit.

Results:
While early in the pilot phase, strong engagement from bedside nurses and allied health professionals reflects readiness for culture change. The previous success of ICU Liberation and Comfort Champion programs has laid fertile ground for this initiative, with growing momentum toward more developmentally attuned care.

Conclusions:
Developmental care plans and rounds represent the natural next step in our unit's evolution. Through intentional structure and interdisciplinary collaboration, we aim to support children not only in surviving CICU stays, but in thriving beyond them. Outcomes will be evaluated via follow-up clinic data, rehabilitation needs, and family satisfaction.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

2408 - ICU LIBERATION IN ACTION EMPOWERING BEDSIDE STAFF AND FAMILIES TO ENHANCE COMFORT AND PREVENT DELIRIUM IN THE PEDIATRIC ICU

Jade Boucher [1]
Bcch, Picu, Vancouver-Canada [1]

Background / Hypothesis:
Prolonged critical illness and deep sedation in pediatric patients are associated with long-term physical, emotional, and cognitive consequences. Building on the ICU Liberation Bundle, our PICU implemented a series of integrated initiatives designed to empower bedside staff and families to actively promote comfort, prevent delirium, and support recovery. We hypothesized that sustained, visible tools and interdisciplinary collaboration would support culture change and increase engagement in nonpharmacological strategies.

Materials and Methods:
A delirium prevention and comfort strategies poster was co-developed with bedside staff and families, highlighting practical, nonpharmacological approaches. It is now posted in every patient room and reviewed as part of the welcome checklist when families are oriented to the unit. Simultaneously, a multidisciplinary group of Comfort Champions - including nurses, respiratory therapists, allied health professionals, and patient care aids - received dedicated education on the science behind ICU Liberation, as well as training in the use of comfort and mobilization tools (recliner chairs, supportive positioning devices, sensory materials). These champions serve as in-unit resources to guide colleagues and model best practices.

Results:
The initiative has fostered increased staff awareness and shared language around comfort and delirium prevention. Child Life specialists, physiotherapists, occupational therapists, and speech-language pathologists play key roles in early mobility, sensory support, communication, and positioning. Although formal evaluation is ongoing, staff feedback has been positive, and families report feeling more involved in their child's care.

Conclusions:
Embedding visible, family-friendly tools and supporting frontline staff with focused education and peer champions has laid the foundation for a more liberated, comfort-centered PICU. This work demonstrates the power of interdisciplinary collaboration in advancing ICU Liberation, enhancing the role of families, and normalizing developmental and comfort-focused care practices.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

2514 - 'MY LIFE WITH DOWN SYNDROME' COMPARING QUALITY OF LIFE OF INDIVIDUALS WITH DOWN SYNDROME AGED 14 35 WITH AND WITHOUT CONGENITAL HEART DISEASE

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Ulster University, School Of Medicine, Belfast-United Kingdom [1] Belfast Trust, Paediatric Cardiology Rbhsc, Belfast-United Kingdom [2]

Background / Hypothesis:
Considering quality of life (QL) is important in individuals with Down Syndrome (DS), due to their comorbid medical conditions like congenital heart disease (CHD). PedsQL 4.0, a validated health-related QL questionnaire measured from 0-100, encompassing four domains - physical, emotional, social and school, has been commonly used to analyse QL in those with DS, with higher scores indicating better QL.

Materials and Methods:
A Northern Ireland database from Royal Belfast Hospital for Sick Children on individuals with DS was expanded using electronic medical records. Parents/carers of those with DS received an online questionnaire to assess family life, education/employment, hobbies and QL. Questionnaire results were linked to medical information for those born 1990-2010 using demographics. Scores were compared for young people (14-19 years) and adults (20-35 years) and CHD versus non-CHD. A two-way ANOVA was conducted (age-band and CHD-status as fixed factors) and a MANOVA to compare scores across domains within groups, using post hoc pairwise comparisons with Tukey adjustment.

Results:
164 people were included, 80 (49%) with CHD and 84 (51%) without CHD, 51% were female and average age was 24 years, with no significant differences in gender or age across CHD and non-CHD. Total PedsQL scores ranged from 20-100 (mean 60.3, SD 19.1) in the CHD group compared to 10-100 (mean 58.5, SD 19.7) in the non-CHD group. There were no significant differences in PedsQL scores for total, physical, emotional and school (≤19 only) domains, by age group or CHD-status ($p>0.05$ for all comparisons). In the adult (20-35) group, social scores were significantly higher in adults with CHD than without ($p=0.0046$).

Conclusions:
PedsQL scores were low compared to other literature, suggesting additional factors influence QL. Future work should explore the impact of medical co-morbidities on QL and ensure people with DS receive optimum medical care throughout their life.

POSTER PRESENTATIONS

Category: Neurodevelopmental and Other Long-term Outcomes

2620 - THE NEURODEVELOPMENTAL OUTCOMES OF CHILDREN WITH CONGENITAL HEART DISEASES AT RISK OF ACQUIRED BRAIN INJURY

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Background / Hypothesis:
Children with congenital heart disease (CHD) are at heightened risk of acquired brain injury such as hypoxia and ischemia during surgery and early life, which can adversely affect their neurodevelopment. This study compares the neurodevelopmental outcomes of children with CHD who had history of cardiopulmonary resuscitation or extracorporeal membrane oxygenation (ECMO) to those with other causes of brain injury.

Materials and Methods:
Children with ABI were referred into a comprehensive rehabilitation program at the Hong Kong Children's Hospital/ Duchess of Kent Children's Hospital in Hong Kong. A retrospective cohort study was carried out by reviewing the medical records of children aged ≤ 18 years at the time of ABI onset enrolled between 1st January 2016 to 1st August 2025. Data on developmental outcomes (physical, intellectual, and psychiatric) and special educational needs (SEN) were extracted for analysis. Using logistic regression, we compared outcomes between cardiac-related and non-cardiac-related ABI, adjusting for age, gender, and follow-up time.

Results:
A total of 87 children (Mean age 11.4 years, SD 4.97 years) were referred to the ABI programme, 15 of whom were enrolled due to cardiac-related ABI. Logistic regression revealed that significantly fewer children with cardiac-related ABI had a physical impairment compared to those with non-cardiac-related ABI (13.3% vs. 54.2%, p=0.033). No significant differences were found in the prevalence of intellectual (64.3% vs. 67.7%) or neuropsychiatric impairments (80.0% vs. 76.4%) between groups. While a smaller proportion of cardiac-related ABI patients received special educational support (13.3% vs. 23.6%), this difference was not statistically significant.

Conclusions:
Children with cardiac-related ABI had fewer physical impairment than the non-cardiac-related ABI cases. However, the comparably high burden of intellectual, neuropsychiatric, and educational needs across both groups highlights the importance of early neurodevelopmental/ cognitive assessment, monitoring and multidisciplinary support for all children with ABI.

POSTER PRESENTATIONS

Category: Perfusion

1212 - TEN YEARS OF EXPERIENCE NORMOTHERMIC SELECTIVE CEREBRO MYOCARDIAL PERFUSION IN NEONATAL AORTIC ARCH RECONSTRUTION

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Background:
We have been searching for safe perfusion method for left heart obstructive lesions for quite a long time. Methods available are deep hypothermic circulatory arrest and regional cerebral perfusion, but those methods have their drawbacks and some safety concerns.

Materials and methods:
We prospectively analyzed the results of neonatal aortic arch reconstruction in our clinic since July 2015 till 2024. In this period of time we performed 95 surgeries for hypoplastic aortic arch reconstruction in newborns. All the procedures were performed in antegrade normothermic regional cerebral perfusion and coronary perfusion. We used transcranial doppler, NIRS and ECG to assess perfusion efficacy.

Results:
Median age was 11 [8.0;14.0] days, mean weight – 3297 (3161 - 3424) g. Median perfusion time was 62 [50.0;74.0] minutes, median selective perfusion (anterograde regional cerebral and coronary) time was 28 [22;34.0] minutes, median perfusion flow was 120 [112;128] ml/kg/min. The peak severity of multiple organ failure occurred 24 hours after surgery, mean score on Neomode scale was 5,3 (4,9 – 5,7). Mean Inotropic Score in 24 hours was 13.7 (10.6 – 15.8). Median uNGAL level was 20 [16;24] mmol/L in 24 hours after the procedure. Mean lactate level in 24 hours was 3.52 (3.08-3.96) mmol/L. All patients regained consciousness with no neurologic deficiency. Median ventilation time was 5.6 [3.0;6.0] days, median ICU discharge time was 6.7 [4.0;7.0] days. Hospital mortality was 2.1% (2 patients had severe concomitant pathology: Dandy-Walker malformation and vein of Galen aneurismal malformation).

Conclusion:
Anterograde normothermic regional cerebral perfusion with coronary perfusion is a safe and decent technique in neonatal aortic arch reconstruction. It allows avoiding such detrimental risk factors as circulatory arrest, hypothermia, extensive perfusion and cardioplegia.

POSTER PRESENTATIONS

Category: Perfusion

1963 - RENAL PROTECTION DURING NEONATAL ARCH SURGERY "TOTAL BODY PERFUSION".

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Gregorio Marañon University Hospital, Congenital Cardiac Unit, Madrid-Spain [1]

Background / Hypothesis:
Neonatal aortic arch surgery has evolved from profound hypothermia with circulatory arrest to regional cerebral perfusion and moderate hypothermia. A further step has been selective cerebral, myocardial and visceral perfusion.

Objective
To determine whether visceral perfusion attenuates acute postoperative kidney injury.

Materials and Methods:
A retrospective observational study was conducted between June 2018 and December 2023 of neonates operated on for arch hypoplasia with/without intracardiac defect, and complex arch surgeries as exclusion criteria. Two groups were studied, one with the usual technique with selective cerebral perfusion (CP-group) and another in which a simultaneous cerebral, myocardial and visceral perfusion technique (Total Body Perfusion, TBP-group) was developed, with the intention of comparing the incidence of acute kidney injury. We defined acute kidney injury by measuring lactate, creatinine, use of diuretics, and extrarenal clearance techniques.

Results:
We collected 49 cases of arch hypoplasia, 12 complex arch surgeries were discarded, to obtain two homogeneous study groups: 15 children in the TBP-group and 22 in the CP-group. Post-ECC lactate was lower in the TBP-group (3.04±1.19 vs 4.09±2.35, p=0.07). Creatinine at 72 hours was higher in the CP-group (0.37±0.16 vs 0.3±0.07, p=0.057). The use of diuretics at doses >0.5mcg/kg/min was lower in the TBP-group (26.7% vs 45.5%, p=0.31), as well as the use of dialysis (6.7% vs 13.6%, p=0.63). A significantly lower degree of hypothermia was found in the TBP-group (27.9±2.2 vs 24.1±2.02, p<0.001).

Conclusions:
Total Body perfusion technique, without reaching statistical significance, shows a trend towards better renal protection during aortic arch surgery in neonates, while allowing less hypothermia. A larger sample may confirm the benefit of multisite perfusion in renal protection during neonatal arch surgery.

POSTER PRESENTATIONS

Category: Perfusion

2254 - THE APPLICATION OF MINIATURIZED CARDIOPULMONARY BYPASS (CPB) UNDERGOING OPEN HEART SURGERY IN CHILDREN - A SINGLE CENTRE RETROSPECITVE COHORT STUDY

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Objective:
To evaluate the effectiveness of retrograde autologous priming (RAP) based on miniaturized cardiopulmonary bypass (CPB) circuit in children undergoing open heart surgery.

Methods:
We performed a retrospective analysis of all patients undergoing congenital heart surgery with CPB at Shenzhen Children's Hospital from 1 May 2015 to 30 April 2024. We classified patients to the theretrograde autologous priming (RAP) based on miniaturized cardiopulmonary bypass (CPB) circuit group and the conventional CPB group.We performed a prospective randomized controlled trial (RCT) of 101 patients . Patients were divided into two miniaturised CPB (MCPB) and conventional CPB (CCPB) randomly by random data form. Blood samples atfive different time points and the ultrafiltration fluid before and after CPB were collected in all patients. IL-6, IL-8, and TNF alpha were respectively tested with Abcam ELISA kit.Compare the coagulation parameters after congenital cardiac surgery with MCPB versus CCPB. A total of 496 patients (327 with MCPB, 169 with CCPB) underwent congenital cardiac surgery. Compared with CCPB children, MCPB children had a lower mean prothrombin time and international normalised ratio, but higher thrombin time. The CCPB group had greater perioperative changes inprothrombin time, international normalised ratio, fibrinogen, and antithrombin III activity (all $p < 0.01$) but lower perioperative changes in thrombin time ($p = 0.001$) than the MCPB group.

Conclusions:
The retrograde autologous priming (RAP) based on miniaturized cardiopulmonary bypass (CPB) circuit with selective ultrafiltration was safe and effective for children who underwent congenital heart surgery in a Chinese hospital. The MCPB can significantly reduce the priming volume and reduce blood product application. It was also associated with a shorter postoperative mechanical ventilation time and shorter lengths of stay in the ICU .The miniaturized CPB system could decrease the usage of UF.MCPB was associated with lower coagulation changesand less postoperative blood loss.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1018 - THERAPEUTIC EFFECTS OF TREAT AND REPAIR STRATEGY IN PEDIATRIC PATIENTS WITH PULMONARY ARTERIAL HYPERTENSION AND SIMPLE CONGENITAL HEART DEFECTS

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Background / Hypothesis:

Surgical indications for patients with pulmonary arterial hypertension (PAH) and congenital heart defects are controversial. The treat and repair strategy has demonstrated efficacy in adult populations, but there have been no studies on pediatric patients.

Materials and Methods:
This study included pediatric patients with PAH and simple congenital heart defects who underwent corrective repair between 2012 and 2021. According to the preoperative treatment strategies, the patients were divided into a regular strategy group (Group 1) and a treat-and-repair strategy group (Group 2). Postoperative recovery and follow-up results were compared between the two groups.

Results:
A total of 33 patients were included in this study. Group 1 consisted of 19 patients, whereas Group 2 consisted of 14 patients. The pulmonary vascular resistance index in Group 2 was higher than that in Group 1 (10.9 ± 4.1 vs. 8.2 ± 1.6 WU, $p = 0.031$). There were no differences in postoperative recovery between the two groups ($p > 0.05$). During follow-up, five patients were lost (three in Group 1 and two in Group 2). The median follow-up period was 59 months. One patient died in Group 1, and two patients died in Group 2. There was no significant difference in the survival curve ($p = 0.39$). At the last follow-up, another seven patients had experienced a non-low-risk condition, with a total of three non-low-risk patients in Group 1 and seven in Group 2. According to the ROC curve, a preoperative PVRi <8.2 WU×m2 can predict postoperative persistent low-risk state.

Conclusions:
In pediatric patients with PAH and simple congenital heart defects, the treat and repair strategies may provide surgery opportunities, but PVRi should be <8 WU×m2.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1036 - LATE DIAGNOSIS OF AORTOPULMONARY WINDOW A CASE REPORT

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Background / Hypothesis:
The aortopulmonary window is a rare condition, accounting for 0.1-0.2% of all congenital heart diseases. It involves an abnormality in conotruncal septation, causing a communication between the ascending aorta and the pulmonary artery, while the aortic and pulmonary valves remain separate. If diagnosed late, it can lead to severe cardiac complications, one of which is pulmonary hypertension. The treatment is surgical and should be performed as early as possible, as 40-50% of patients will die from congestive heart failure within the first year of life. The following case report aims to illustrate the natural progression of a rare and severe heart condition with a late diagnosis and unfavorable clinical outcome

Materials and Methods:
Information was obtained through a review of medical record, patient interview, and literature review. The informed consent form was signed by the family.

Results:
A 4-year-old male patient was referred to a quaternary hospital presenting dyspnea on mild exertion, progressing to dyspnea at rest over the past month. An initial echocardiogram was performed and it suggested an aortopulmonary window. To confirm the diagnosis, a cardiac computed tomography angiography was performed, revealing signs of right ventricular overload, pulmonary hypertension, and a large communication between the ascending aorta and the pulmonary trunk measuring approximately 25x25 mm, consistent with an aortopulmonary window. The patient underwent cardiac catheterization, which confirmed pulmonary hypertension (pulmonary vascular resistance index [PVRi] of 5.9 $WU \cdot m^2$ and PVRi/SVRi ratio of 0.57, with a reduction to 4 $WU \cdot m^2$ and 0.33, respectively, after a reactivity test).

Conclusions:
Although rare, the differential diagnosis of an aortopulmonary window should be considered in patients presenting with clinical signs of pulmonary hyperflow without an apparent cause. Early diagnosis and timely surgical intervention are essential to prevent severe and often irreversible complications, such as pulmonary vascular disease.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1118 - CITRUS TO CIRCULATION VITAMIN C DEFICIENCY TRIGGERED PULMONARY HYPERTENSION

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Background:
Hypovitaminosis C (scurvy) has been reported to cause pulmonary hypertension. Common presentations include acute cardiac failure and refusal to walk. We report an unusual presentation of pulmonary hypertension due to nutritional deficiencies from severe diet restriction in Singaporean children.

Case Description:
A 7-year-old, well-thrived boy with autism and a diet consisting solely of red bean buns presented with a one-month history of limping. There was diffuse right knee and calf swelling with limited knee extension. X-ray and ultrasound of his right leg showed soft tissue swelling. In view of worsening right calf swelling, magnetic resonance imaging (MRI) was performed, which showed multifocal sites of symmetrical metaphyseal abnormal marrow signal and enhancement with subperiosteal abnormal signal along bilateral tibial metaphyses, suggestive of scurvy. Subsequent blood work showed hypoalbuminemia with low folate, vitamins A and D levels.

He was noted to have a loud second heart sound, and an echocardiogram performed showed evidence of pulmonary hypertension (pulmonary pressures estimated to systemic pressure) with reduced right ventricular systolic function, dilated right atrium and ventricle with moderate tricuspid regurgitation.

He received a one-week course of intravenous vitamin C, oral folate, vitamin A and thiamine replacement and dietetics review for nutritional rehabilitation. Repeat echocardiogram one week later showed marked improvement of pulmonary hypertension and normal cardiac function.

Discussion:
On reviewing echocardiogram images of a previous patient with autism and multiple nutritional deficiencies including scurvy, we retrospectively noted impaired right ventricular relaxation with left ventricular eccentricity index of 1.07.

Low vitamin C, D and thiamine levels have been reported to be associated with pulmonary hypertension. This highlights the importance of assessing nutrition in children with special needs who are found to have pulmonary hypertension, as their restrictive diets place them at risk of nutrient deficiency leading to transient pulmonary hypertension even in the absence of growth failure.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1139 - THE ROLE OF EXERCISE STRESS ECHOCARDIOGRAM FOR THE DIAGNOSIS OF SEVERE PULMONARRY HYPERTENSION IN CHILDREN

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Background / Hypothesis:
Exercise stress echocardiography is not typically included in the routine evaluation of pulmonary hypertension (PH). We present two pediatric cases in whom exercise stress echocardiography was crucial in diagnosing severe exercise-induced PH.

Materials and Methods:
Case reports of two patients.

Results:
The first case involves a 6-year-old girl who experienced multiple episodes of exertion-induced syncope. Electrocardiography (ECG) revealed right ventricular hypertrophy (RVH), while echocardiography showed normal cardiac anatomy with mild pulmonary hypertension (estimated right ventricular systolic pressure (RVSP) of 40 mmHg). Cardiac catheterization under sedation confirmed mild pulmonary hypertension (mean pulmonary arterial pressure of 22 mmHg). However, after moderate exercise (heart rate up to 150 bpm), echocardiography revealed a D-shaped left ventricle (LV) with interventricular septal bowing toward the LV. The patient was treated with bosentan and sildenafil, resulting in improved exercise tolerance and resolution of syncope over a two-year follow-up period.

The second case involves a 15-year-old boy with a history of bronchopulmonary dysplasia, presenting with declining exercise tolerance. ECG demonstrated RVH, and echocardiography revealed normal cardiac structure with mildly elevated pulmonary pressure (RVSP 40–45 mmHg). However, post-exercise imaging showed a flattened interventricular septum bowing toward the LV during systole, confirming exercise-induced severe PH. A high-resolution pulmonary CT scan revealed emphysematous lung changes (11.5% on the right and 5% on the left), leading to a diagnosis of Class III PH. The patient was started on sildenafil, and treatment outcomes are pending. In both cases, there were no signs of heart failure, and NT-proBNP levels were within normal limits (31 pg/mL and 65 pg/mL, respectively).

Conclusions:
Severe exercise-induced PH can occur in children with mild resting pulmonary hypertension and may result in significant symptoms such as exercise intolerance and syncope. Stress echocardiography should be considered in patients with exertion-related symptoms that appear disproportionate to their baseline pulmonary hypertension severity.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1144 - TRANSCATHETER POTTS SHUNT IS SAFE AND IMPROVES SYMPTOMS FUNCTIONAL CAPACITY AND NT PRO BNP IN PATIENTS WITH SEVERE PULMONARY ARTERIAL HYPERTENSION

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Background:
To assess procedural safety and impact of transcatheter Potts-Shunt on cardiac function, neurohormonal levels as well as patients' quality of life and functional status.

Materials and Methods:
We included 13 pediatrics patients with severe pulmonary arterial hypertension (PAH) who underwent transcatheter Potts-Shunt at a large tertiary centre between 02/2024 and 02/2025.

Results:
The median age at the procedure was 15.0 (9.2, 17.7) years and 85% of patients were female. 10 patients were diagnosed with idiopathic/hereditary PAH and 3 had postoperative PAH forms. The median follow-up time after procedure was 3.7 months. Pre-intervention, the mean pulmonary artery pressures (PAP) was suprasystemic (mPAP 86.5±14.3 mmHg, aortic pressure [AOP] 81.6±12.0 mmHg), and the sPAP was 123.0±18.8 mmHg compared to sAOP 102.1±15.6 mmHg. The right ventricular ejection fraction at baseline was 32.2 ± 12.0 % and the RVEDVI was 158.5±43.5 ml/m2 measured by cardiac MRI. Pre- and post- operative comparisons for echocardiographic and in functional parameters were as follows (Median [IQR 25-75]): TAPSE 1.8 (1.5-2.1) vs. 1.7 (1.4-2.2) cm (p=0.32, %; -5% change), RV/LV basal (4CH) 1.5 (1.4-2.1) vs. 1.3 (1.2-1.6) (p=0.07; -13.3%), echocardiographic PASP estimate 120 (108-133) vs. 109 (102-118) mmHg (p<0.001; -8.7%), Tei index 0.9 (0.5-1.0) vs. 0.6 (0.5-0.8) (p<0.001; -33.3%). After the intervention, significant reduction in NTpro-BNP levels (845 (188, 1131) vs. 189 (96, 581) pg/ml) and 6-minute walk test distance (419 ± 107 vs. 446 ± 98 m) could be documented (p<0.05 for both). As a result of the intervention, 12 patients could terminated s.c. Treprostinil and all the patients improved by at least one WHO class.

Conclusion:
Our data shows, that in experienced hands transcatheter Potts shunts are safe and can be performed with 0% mortality at a specialized tertiary paediatric PAH referral centre. The procedure improved functional status, objective exercise capacity and clinical parameters related to progression of PAH.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1146 - CHARACTERIZATION OF PULMONARY HYPERTENSION IN CHILDREN LIVING AT HIGH ALTITUDE BOGOTÁ 2640 METERS ABOVE SEA LEVEL.

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Background / Hypothesis:
Globally, approximately 140 million of people live above 2.500 meters above sea level, with 35-40 million residing in the Andean region. Pulmonary hypertension (PH) at high altitude presents distinct characteristics due to the effect of hypobaric hypoxia.

Materials and Methods:
We analyzed a cohort of 85 children, the majority with severe PH, living at high altitude and undergoing long-term follow-up, with some cases extending up to 42 years. The study assessed etiology, disease severity, outcomes (including mortality) and the role of the prolonged hyperoxia test (O2Test: FIO2 >80% for up to 24 hours) in evaluating pulmonary vascular reactivity in children at high altitude.

Results:
The primary causes of PH were idiopathic pulmonary hypertension and PH following congenital heart disease correction. The mean of mean pulmonary artery pressure (mPAP) was 69.2mmHg, and the mean pulmonary resistance (PR) was 15.8 Wood units (WU). Among the 10 longest-surviving patients, the mean survival was 22.8 years, with all remaining in functional class (FC) I–II. Overall mortality was 29.4% (25 patients), with a lower mortality rate in those diagnosed before 3 years of age. The O_2Test was negative in 79.2% (19/24) of deceased patients, compared to 22.9% (11/48) of survivors, showing a highly significant difference ($p = 0.000$). A positive O_2Test was predominantly observed in children diagnosed before the age of 3.

Conclusions:
Pulmonary Hypertension in children living at high altitude requires greater attention due to its prevalence, severity and the presence of pulmonary vascular hyperreactivity induced by hypobaric hipoxia. While mortality is lower in younger patients, severe pulmonary vascular disease can develop before the age of 3, including newborns. The O2Test is a valuable tool for assessing pulmonary vascular reactivity at altitude and serves as a predictor of survival, emphasizing the importance of early detection and intervention in this population.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1185 - PRIMARY PULMONARY HYPERTENSION DUE TO CAPILLARY HEMANGIOMATOSIS CASE REPORT

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Background / Hypothesis:
Pulmonary Capillary Hemangiomatosis (PCH) is a rare vascular disorder characterized by atypical capillary proliferation and diffuse interstitial infiltration. Histology shows capillary infiltration in bronchi, intralobular septa, and pulmonary vessel walls. Its true prevalence is underestimated, with most cases diagnosed postmortem. Clinically, PCH mimics idiopathic Pulmonary Hypertension (PH) with severe hypoxemia, right ventricular (RV) dysfunction, hemoptysis, and hemorrhagic pleural effusions. The main differential diagnosis is Pulmonary Veno-Occlusive Disease (PVOD), which involves alveolar capillary thrombosis and fibrosis. PCH has high morbidity and mortality, with lung transplantation as the preferred treatment.

Materials and Methods:
Data were obtained through medical record review, patient interview, and literature analysis. The family provided informed consent.

Results:
A 12-year-old female patient was admitted to the emergency department with a one-year history of progressive dyspnea. Medical history included short stature, sensorineural hearing loss, bone marrow abnormalities (thrombocytopenia and macrocytosis), recurrent respiratory infections, and weight loss. On clinical examination, she was hypoxemic with a loud P2 component. Echocardiography revealed a tricuspid valve with moderate regurgitation, a RV systolic pressure of 70 mmHg, and moderate RV systolic dysfunction. When oxygen was administered, she developed pulmonary congestion. A chest CT angiography showed ground-glass opacities, raising the hypothesis of PH due to PVOD. The patient deteriorated rapidly, developing low cardiac output, requiring vasoactive drugs and endotracheal intubation, and progressing to alveolar hemorrhage and pulseless electrical activity cardiac arrests, ultimately leading to death. The autopsy revealed primary PH due to PCH, with an increased number of capillaries in the alveolar walls and areas of pulmonary hemorrhage.

Conclusions:
Although rare, PCH should be considered in primary PH cases. Early recognition is crucial, as its management differs from other PH forms, with bilateral lung transplantation being the first-line treatment.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1236 - GROUP V PULMONARY HYPERTENSION IN A PEDIATRIC PATIENT REPORT OF A CASE

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Background / Hypothesis:
Pulmonary Hypertension is defined as mPAP >20 mmHg, pulmonary capillary wedge pressure <15 mmHg and iPVR -3 WU.m2 to identify pre-capillary PH; through cardiac catheterization. The most common pulmonary hypertension in children is associated with congenital heart disease, most of which include lung desease, PHNB (group 3) but also with left heart disease (group 2).

Materials and Methods:
A systematic review of the literature was performed. The search was conducted through the databases: Pubmed.
Data were collected anonymously from the patient's medical history, and a descriptive analysis was performed

Results:
We present a 16-year-old female patient with autoinflammatory syndrome, juvenile rheumatoid arthritis, and celiac disease, with diagnosis and follow-up 3 years ago. The last 6 months, the patient presents rigth ventricule failure, pulmonary hypertension and functional class III.
First echocardiogram shows right ventricle dysfunction and dilatation. Moderate PH, mild pericardial effusion, preserved left ventricle contractility, with paradoxical interventricle septum motion. Catheterization study reports severe hypertension.
She is currently taking tadalafil, ambrisentan, selexipag, spironolactone and underlying disease treatment. Last echocardiogram shows good RV function. Moderate but improved PH. Preserved LV contractility. 6-minute walk test: Distance 265 meters in 6 minutes; Borg 3. Improved functional class II.

Conclusions:
Treatment goals are multiple and include symptom improvement, quality of life, and survival. Objective assessments to measure treatment response include progress in exercise capacity, hemodynamic profile, and survival.
Group 5 PH consists of a complex group of associated disorders, the cause of which is usually multifactorial and secondary to increased precapillary and postcapillary pressure, as well as direct effects on the pulmonary vasculature. The true incidence is unknown; it is often associated with increased morbidity and mortality.
Studies investigating this treatment are few and involve limited numbers of patients. It is generally aimed at treating the underlying disorder. Currently, no specific treatment is approved for this group

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1248 - THE RELATIONSHIP BETWEEN CPAP AND DOBUTAMINE ON OXYGEN SATURATION IN PERSISTENT PULMONARY HYPERTENSION OF THE NEWBORN

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Background / Hypothesis:
Persistent Pulmonary Hypertension of the Newborn (PPHN) is a serious case in neonates where the symptoms are experiencing respiratory distress which appears as tachypnea or rapid breathing in newborns. This situation causes a decrease in oxygen levels in the blood. PPHN events that cause respiratory distress require invasive action in the form of a continuous positive airway pressure (CPAP) device which is able to maintain positive pressure in the neonate's airway for spontaneous breathing. Treatment of PPHN with dobutamine is an effective therapy that supports the achievement of good morbidity and mortality. Therefore, CPAP and dobutamine are interconnected in managing babies with PPHN

Materials and Methods:
Using a cross sectional design with a sampling technique, namely consecutive sampling, on 50 babies with PPHN who used a CPAP device and received dobutamine therapy. Data collection uses medical records from the hospital.

Results:
This study showed that 50 PPHN infant patients have decreased PASP level to normal, previously from mild 15 infants (30%), moderate 25 infants (50%), and severe 10 infants (20%), after being given dobutamin. There were 34 (68%) infant patient given dopamine 5 mcg and 16 (32%) infant patient given dopamine 3 mcq. There were 29 (58%) infant patient using CPAP and 21 (42%) patients without oxygen support. The p value <0.05 was obtained, so dobutamine and CPAP significantly improving oxygen saturation in PPHN infants patients.

Conclusions:
There is a beneficial effect of dobutamine and CPAP in PPHN infants treatment at NICU.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1267 - CLINICAL MANAGEMENT OF REFRACTORY PULMONARY ARTERIAL HYPERTENSION IN PEDIATRIC CRITICAL CARE

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Paediatric Pulmonary arterial hypertension (PAH) presents significant clinical challenges, particularly in pediatric intensive care unit (PICU). It is often associated with various underlying genetic conditions and developmental abnormalities, necessitating tailored management strategies. This abstract reviews clinical management of refractory PAH through case presentations, illustrating it's complexities in PICU. These cases underscore the importance of genetic and histopathological evaluations in management

Case 1:
9-month-old with a TBX4 mutation, resulting in primary congenital pulmonary hypoplasia and severe PAH was admitted with hypoxia. She required months of non-invasive ventilation and pulmonary vasodilators [bosentan and tadalafil]. Significant developmental lung abnormalities were noted, questioning the interplay between TBX4 mutation and PAH, highlighting the crucial role of genetic testing and histopathological findings in management.

Case 2:
Term neonate with alveolar-capillary dysplasia and mal-aligned pulmonary veins secondary to FOXF1 gene mutation required escalation of respiratory support to VA-ECMO, for refractory respiratory failure and PAH. Her care was redirected toward comfort measures after multiple unsuccessful ECMO wean. This case emphasizes the necessity of multidisciplinary collaboration, timely genetic diagnosis and clear prognostic communication.

Case 3:
Term neonate with severe PAH following meconium aspiration syndrome required high-frequency oscillatory ventilation, nitric oxide and sildenafil. Despite maximal medical therapy, the respiratory failure persisted with right ventricular distress, leading to discussions about invasive diagnostic options. Ultimately, the family's wishes guided redirection of care to comfort, reflecting the challenges of distinguishing between various pulmonary pathologies and the ethical considerations inherent in PICU

The cases underscore the diverse presentations and management challenges associated with pediatric PAH in PICU. They highlight the importance of integrating genetic and histopathological assessments into decision-making, importance of multidisciplinary approach, and the value of clear communication with families. As pediatric PAH continues to evolve as a field, ongoing research and awareness of individualized treatment strategies will be crucial for improving pediatric outcomes.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1294 - CORRELATION OF ECHOCARDIOGRAPHIC DERIVED WITH CARDIAC CATHETERIZATION DERIVED STROKE VOLUME INDEX (SVI) AND CARDIAC INDEX (CI) AMONG CHILDREN WITH ACYANOTIC CONGENITAL HEART DISEASE WITH LEFT TO RIGHT SHUNT WITH MODERATE TO SEVERE PULMONARY HYPERTENSION

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Background / Hypothesis:
Pulmonary Hypertension(PH) is mean pulmonary artery pressure of >20 mm Hg, and in CHD, mostly due to left-to-right shunts. Its diagnosis requires clinical suspicion based on symptoms, physical examination and series of ancillaries. The gold standard for evaluating PH is right-heart catheterization; however an invasive procedure, hence echocardiography is an important tool for screening, diagnosing, and evaluation.
Surrogates of heart function such as stroke volume index and cardiac index have been shown to be associated with prognosis of patients with PH. Cardiac index(CI) is reflective of the global function of RV and it decrease as PH worsens.
Stroke volume index(SVI) is another surrogate of cardiac function, and is more accurate in estimating RV function. The SVI decrease as PH progress, even in early stages of PH.
This study aimed to validate whether surrogates of cardiac function, such as SVI and CI, can be used to assess PH, strengthen the diagnosis of PH, non-invasively, and to help direct the necessary management for the patient.

Materials and Methods:
This was a prospective, cross-sectional study of patients ages 1-18 years old diagnosed with acyanotic CHD with left to right shunts, with moderate to severe PH. These patients were admitted for right-heart catheterization and repeat echocardiography was done to check the parameters to compute for SVI and CI.

Results:
A total of 43 subjects were included, with median age range 3-11 years old, mean 5 years old. Most had PDA, followed by VSD, and ASD.
The correlation between the 2 variables (SVI and CI) had p-value of <0.001 hence statistically significant between SVI and CI obtained from Doppler echocardiography and cardiac catheterization.

Conclusion:
It concludes that SVI and CI obtained from Doppler echocardiography correlates with SVI and CI obtained from cardiac catheterization among patients with acyanotic CHD with moderate to severe PH.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1399 - SURVIVAL TRENDS AND PROGNOSTIC FACTORS IN ADULTS WITH EISENMENGER SYNDROME A MULTICENTER RETROSPECTIVE COHORT STUDY

Tatpong Sriyapai [1], Kanokwan Thanetphonkul [1], Chodchanok Vijarnsorn [1], Setthasiri Petcharattana [2], Yuttapong Wongswadiwat [3], Rekwan Sittiwangkul [4], Kernfan Puthikitakawiwong [1], Prakul Chanthong [1], Paweena Chungsomprasong [1], Supaluck Kanjanauthai [1], Ploy Thammaset [1], Thita Pacharapakornpong [1], Jarupim Soongswang [1], Krivikrom Durongpisitkul [1]
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Background / Hypothesis:
Eisenmenger syndrome (ES) is the most severe form of pulmonary arterial hypertension associated with congenital heart disease (PAH-CHD). This study aimed to evaluate survival outcomes and mortality predictors in adult ES patients.

Materials and Methods:
A multicenter retrospective cohort study was conducted using the PAH-CHD database from three Thai cardiac centers. Adults diagnosed with ES via cardiac catheterization between 1998 and 2023 were included. Survival rates and risk factors for mortality were analyzed using multivariate Cox regression.

Results:
Of 119 adult ES patients (median age 31.5 years; 68.6% female), 40.2% had pre-tricuspid defects and 32.8% had post-tricuspid defects. At baseline, 10.9% had arrhythmia, mean oxygen saturation was 87.5±6.6%, and PVR was 20.4±12.1 WU. Pulmonary vasodilators were used in 97% of patients (n=116) post-diagnosis (91 on monotherapy, 25 on combination therapy). Over a median follow-up of 6.4 years (IQR 2.9–12.1), 19 patients (15.9%) died. The 5-, 10-, and 15-year survival rates were 94.4%, 81.5%, and 71.7%, respectively. Independent risk factors for mortality included resting oxygen saturation <80% (HR 4.8; 95% CI 1.4–16.4; p=0.01), age at diagnosis >40 years (HR 3.7; 95% CI 1.1–12.8; p=0.03), and presence of arrhythmia at baseline (HR 3.8; 95% CI 1.1–12.4; p=0.03).

Conclusions:
Despite advancements in PAH therapy, adult ES patients face significant mortality risks. Resting oxygen saturation <80%, age at diagnosis > 40 years and baseline arrhythmia are strong predictors of poor prognosis, highlighting the need for proactive management strategies.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1401 - THE ASSOCIATION OF RIGHT VENTRICULAR–PULMONARY ARTERIAL COUPLING AND PULMONARY VASCULAR RESINTANCE IN CHILDREN WITH LEFT TO RIGHT SHUNT LESION

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Background / Hypothesis:
Pulmonary Arterial Hypertension (PAH) is common in delayed presentation Congenital Heart Disease (CHD) patients with left to right shunts in Indonesia which may increase morbidity and mortality. Novel parameters of echocardiography are required to assess reversibility and to determine the optimal treatment.
The purpose of this study is to compare the Right Ventricular-Pulmonary Arterial (RV/PA) coupling, obtained from echocardiography examinations, to Pulmonary Vascular Resistance (PVR) measured during hemodynamic study on cardiac catheterization of L-R CHD patients.

Materials and Methods:
A cross-sectional study was conducted in CHD patients whom underwent catheterization at Hasan Sadikin General Hospital during 2024-2025. Echocardiography was performed within 24 hours before the catheterization to assess RV/PA coupling. RV/PA coupling was defined as TAPSE/TRPG > 0.4. PVRs were measured during hemodynamic study on cardiac catheterization. We exclude CHD with pulmonary outflow obstruction.

Results:
Twenty-one patients were included, 16 had RV/PA coupling and 5 had RV/PA uncoupling. There was a significant difference of PVR values between both groups (p-value 0.048). Correlation between TAPSE/TRPG and PVR showed a negative significant correlation ($r = -0.479$, $p = 0.028$).

Conclusions:
TAPSE/TRPG was correlated to PVR significantly in patients with PAH-CHD ($r = -0.479$, $p = 0.028$).

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1406 - PEDIATRIC EISENMENGER SYNDROME SURVIVAL OUTCOMES AND MORTALITY PREDICTORS

Kanokwan Thanetphonkun [1], Chodchanok Vijarnsorn [1], Setthasiri Petcharattana [2], Yuttapong Wongswadiwat [3], Rekwan Sittiwangkul [4], Kernfan Puthikitakawiwong [1], Prakul Chanthong [1], Paweena Chungsomprasong [1], Supaluck Kanjanauthai [1], Ploy Thammaset [1], Thita Pacharapakornpong [1], Jarupim Soongswang [1], Krivikrom Durongpisitkul [1]
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Background / Hypothesis:
Eisenmenger syndrome (ES) in children presents distinct anatomical and clinical characteristics compared to adults. Long term data of pediatric ES is scarce. This study aimed to evaluate survival trends and prognostic factors in pediatric ES patients.

Materials and Methods:
A multicenter retrospective cohort study included children (age at diagnosis < 18 years) diagnosed with ES via cardiac catheterization between 1998 and 2023. Survival rates and risk factors for mortality were analyzed using multivariate Cox regression.

Results:
In the pediatric cohort (n=49; median age at diagnosis: 5.3 years, IQR 2.5–13.6), complex lesions (n=19, 39%) and combined shunt lesions (n=16, 33%) were more prevalent compared to the adult group. Their initial oxygen saturation was 85.7±7.1%, with a mean Qp:Qs of 1.0±0.7 and indexed PVR of 20.6±11.4 WU·m^2. Among these children, 41 (84%) received pulmonary vasodilators (38 on monotherapy, 3 on combined; dual / triple therapy). During a median follow-up of 6.4 years (IQR 3.1–13.1), 8 patients (16.3%) died. The 5-, 10-, 15- and 20-year survival rates were 91.8%, 87.2%, 74.8 and 58.2%, respectively. Multivariate Cox regression identified resting oxygen saturation <80% (HR 6.9; 95% CI 1.0–46.6; p=0.04) and presence of hepatic impairment (HR 17.8; 95% CI 1.1–294.5; p=0.04) as significant predictors of mortality.

Conclusions:
Pediatric ES patients exhibit distinct lesion patterns but share similar long-term survival trends with adults. Recent oxygen saturation <80% and presence of hepatic impairment remain critical mortality predictors, emphasizing the need for early intervention and closed monitoring.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1438 - SURVIVAL OF PATIENTS WITH CONGENITAL HEART DISEASE (CHD) AND PULMONARY ARTERIAL HYPERTENSION (PAH) A RETROSPECTIVE OBSERVATIONAL STUDY

Jamie Cheung [1], Timothy Ka-chun Un [2], Matthew Cheuk-lam Lui [1], Will Yap-hang Chan [1], Kai-hang Yiu [1]
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Background / Hypothesis:
Pulmonary arterial hypertension (PAH) is one of the potential complications of congenital heart disease (CHD). New York Heart Association (NYHA) functional classification system is an easy-to-use tool to classify patients into 4 classes according to their symptoms at rest and with activity. We hypothesized that patients with PAH and CHD in a lower functional class are associated with poorer survival outcomes.

Materials and Methods:
Patients who were diagnosed to have PAH (ICD-9 code: 416.0 primary pulmonary hypertension and 37.21 right heart catheterization) in Hong Kong during the period of January 1, 2015 – December 31, 2024, were included. Data of patients were retrieved from Clinical Data Analysis and Reporting System, the territory-wide clinical database, and the electronic Clinical Management System used by medical doctors in the public healthcare sector. Kaplan-meier survival analysis was used. The primary outcome was death from any cause.

Results:
87 patients (mean age: 22.3 ± 24.2 years; 42.5% men) were included in the present analysis. The mean survival time for functional class I (n=46) was 9.3 (95% CI: 8.9-9.7) years, functional class II (n=27) was 9.2 (95% CI: 8.4-10.0) years, functional class III (n=7) was 6.5 (95% CI: 3.5-9.4) years and functional class IV (n=7) was 0.5 (95% CI: 0.1-0.9) years, respectively. Based on the Kaplan-meier survival analysis, the 5-year survival rates were 97.8%, 96.3%, 71.4% and 14.3% for functional class I, II, III, IV, respectively (log-rank p-value <0.001).

Conclusions:
Patients with PAH and CHD in lower functional class have lower survival rates.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1493 - A CASE OF MITOCHONDRIAL ENCEPHALOPATHY LACTIC ACIDOSIS AND STROKE LIKE EPISODE(MELAS) WHO DEVELOPED PULMONARY HYPERTENSION

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Background:
Mitochondrial diseases involve mitochondrial dysfunction and , affect multiple organs. Cardiomyopathy and conduction system disorders are known cardiac complications, but pulmonary hypertension (PH) is rare. Here, We report a sporadic case of mitochondrial encephalopathy, lactic acidosis, and stroke-like episodes (MELAS) with PH caused by the m.3243A>G mutation.

Case Report:
A 3-year-old girl, born full-term, showed developmental delay and growth failure without any identifiable underlying disease. At age 2 years, she was hospitalized with respiratory syncytial virus pneumonia, during which renal tubular acidosis, lactic acidosis, megaloblastic anemia, and PH were detected. Despite pneumonia resolution, echocardiography showed persistent PH. At age 3 years, cardiac catheterization revealed a mean pulmonary artery pressure of 31 mmHg, pulmonary capillary wedge pressure of 7 mmHg, pulmonary vascular resistance of 3.2 WU·m^2, and cardiac index of 6.6 L/min/m^2. Echocardiography showed normal cardiac structure without cardiomyopathy;no abnormalities were detected using electrocardiography, computed tomography, or lung perfusion scintigraphy. Idiopathic pulmonary arterial hypertension (IPAH) was diagnosed, and home oxygen therapy and , tadalafil, and macitentan treatment were initiated. Genetic testing later confirmed the presence of the m.3243A>G mutation (88.8% in blood), leading to the addition of taurine and arginine to the treatment regimen. At age 3 years and 1 month, she experienced a stroke-like episode, prompting vitamin cocktail therapy. She is currently undergoing outpatient follow-up.

Discussion
MELAS is characterized by stroke-like episodes and lactic acidosis, and 80% of cases involve the m.3243A>G mutation, which is typically maternally inherited. In this case, PH and lactic acidosis preceded stroke-like episodes. The mechanism and treatment of PH in mitochondrial diseases remain unclear, but nitric oxide production impairment and microvascular dysfunction are implicated, and arginine and vitamin therapy have proven effective. This case suggests a clinical course from that of IPAH due to high cardiac-output PH, highlighting the need for careful patient monitoring.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1572 - PULMONARY HYPERTENSION IN PATIENTS CARRYING FLNA LOSS OF FUNCTION VARIANTS

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Background / Hypothesis:
Pulmonary hypertension (PH) is an unusual complication of X-linked disease caused by loss-of-function (LOF) variants in the filamin A (FLNA) gene. Patients with FLNA LOF may also present dysmorphic facial features, aortic dilation, thrombocytopenia and periventricular nodular heterotopia (PVNH).

Materials and Methods:
We reported the clinical, functional, haemodynamic and radiological characteristics of patients with FLNA LOF variants and PH from the French PH Network.

Results:
Nine patients were identified with a female:male ratio of 8:1. PH was diagnosed at a median (range) age of 36 (0-69) years. Associated conditions included epilepsy (n=5), PVNH (n=7), valvular heart disease (n=8), congenital heart diseases (n=4), thrombocytopenia (n=4) and hyperlaxity (n=4). Right heart catheterisation confirmed moderate-to-severe pre-capillary PH with a median (range) mean pulmonary arterial pressure of 33 (22-49) mmHg and pulmonary vascular resistance of 4.7 (2.4-8.0) WU. The median (range) diffusing capacity of the lung for carbon monoxide corrected for haemoglobin was markedly decreased (48% (22-64%) of predicted values) and five patients had obstructive ventilatory disorder. High-resolution computed tomography showed heterogeneous parenchyma (n=8), emphysema (n=3), presence of a peripheral hyperclear band (n=3) and aortic ectasia (n=4). Pathological assessment available in one patient revealed significant remodelling of small pulmonary arteries, interstitial oedema and irregular alveoli shapes. During follow-up, three patients died, including two from right heart failure. No patient died from aortic rupture.

Conclusions:
Pre-capillary PH, likely due to multiple mechanisms, may complicate the course of patients with FLNA LOF variants and may be the presenting symptom leading to diagnosis. The combination of PH with parenchymal involvement and extrapulmonary symptoms (epilepsy, congenital heart diseases, valvular and aortic involvement, and thrombocytopenia) should prompt genetic screening for FLNA.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1575 - PULMONARY HYPERTENSION IN PATIENTS WITH NOONAN SYNDROME

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Background / Hypothesis:
Noonan syndrome (NS) is a RASopathy with an autosomal dominant mode of transmission. Gain of function variants in the PTPN11 gene are the most frequently encountered. Patients with NS may develop pulmonary hypertension, however, the specific characteristics of those patients have been poorly studied.

Materials and Methods:
We report clinical, functional, radiologic, and hemodynamic characteristics of patients with NS and PH from the French PH Network.

Results:
7 patients were identified, 5 pathogenic variants in PTPN11 and 1 in SHOC2. Associated conditions included facial dysmorphia (n=7), pulmonary valve stenosis (n=2), Atrial septal defects (n=6), scoliosis (n=3), cryptorchidism (n=3), scoliosis (n=3), sacrococcygeal dimple (n=1), and growth delay (n=5). The median age at PH diagnosis was 9 years old (5-21), the median PVR was 13 WU (10-15,3), the median cardiac output was 3.95 L.min-1 (3.12-4.95). One patient carrying a PTPN11 variant underwent lung transplantation, revealing typical PAH histopathology, including plexiform lesions, associated with diffuse lymphangiectasis (Fig 1). The imaging analysis showed vessel dilation and tortuosity.

Conclusions:
Patients with NS may develop precapillary PH, associated with congenital heart diseases and systemic manifestations, mainly affecting PTPN11. Histological analysis revealed typical PAH remodeling. Systematic follow-up screening for PH symptoms should be performed among those patients.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1596 - PEDIATRIC PULMONARY ARTERIAL HYPERTENSION IN POLAND INSIGHTS FROM THE BNP PL REGISTRY

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Background
Pulmonary arterial hypertension (PAH) in Polish children is managed across nine specialized centers. To collect nationwide data on pediatric cases, the BNP-PL registry was launched in 2018 under the oversight of the Pulmonary Circulation Working Group of the Polish Cardiac Society.

Methods
Between March 2018 and August 2023, 167 children (M/F = 1.01), aged 3 months to 18 years, were enrolled in the registry. PAH was diagnosed via right heart catheterization, and severity was assessed using WHO functional class (WHO-FC. Patients transitioned to adult centers upon turning 18 years old.

Results
Congenital heart disease (CHD) (43%) and idiopathic PAH (IPAH) (36%) were the most common causes, followed by hereditary PAH, portopulmonary hypertension, connective tissue disease-associated PAH, and pulmonary veno-occlusive disease. At diagnosis, 41.1% were WHO-FC II. Annual new cases declined from 24 (2018) to 17 (2023). Currently, 124 patients remain in pediatric care, while 23 transitioned to adult centers(follow-up available for 18). Of 11 patients listed for lung transplantation, three were considered for heart-lung and one for heart transplantation. Notably, four of the transplant-listed patients had undergone Pott's procedure prior to being listed. All interventional procedures, Pott's shunt (n=8), atrial flow regulator implantation (n=1), and septostomy (n=1), were performed in patients with PAH. The mortality rate was 11.4% (n=19), with heart failure causing 47% of deaths and respiratory failure 21%. A significant challenge in long-term care was the loss of 21% of patients to follow-up after transitioning to adult care.

Conclusions
CHD and IPAH remain the leading causes of pediatric PAH in Poland. However, difficulties in patient transition and a notable mortality rate underscore the urgent need for improved long-term management and follow-up strategies.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1695 - LIVER TRANSPLANTATION FOR PEDIATRIC PORTOPULMONARY HYPERTENSION

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Background / Hypothesis:
Portopulmonary hypertension (PoPH) is a serious complication that occurs in 1 to 5% of children with portal hypertension and in 11% of children with congenital portosystemic shunts. The outcomes of pediatric PoPH remain poor. In adults with PoPH who meet specific hemodynamic criteria, liver transplantation (LT) is indicated but data in children are lacking.

Materials and Methods:
We retrospectively reviewed all children who underwent LT for PoPH at our center and described their characteristics and outcomes.

Results:
Among the 223 pediatric LT performed at our center, 5 adolescents (aged 14-19 years) underwent LT for PoPH (Table 1). At diagnosis, baseline hemodynamics ranged: mean pulmonary artery pressure 30-70 mmHg, pulmonary vascular resistance 4-15 WU. Following PoPH diagnosis, all patients were treated with pulmonary vasodilators and reassessed by cardiac catheterization. Therapy was escalated in case of insufficient response. LT was considered according to adult suggested haemodynamic criteria and multidisciplinary discussions when above cut-off values, with right ventricular function markers being considered of paramount importance. There was no mortality at follow-up ranging from 9 months to 86 months. Three patients improved their pulmonary hypertension following liver transplant and two patients worsened, one rapidly although possibly influenced by poor medical adherence, and one progressively over a few years.

Conclusions:
Liver transplantation may be considered in selected cases of pediatric PoPH after optimizing hemodynamics through aggressive treatment with PAH-specific therapies. The hemodynamic criteria for LT need to be better defined, but pre-LT right ventricular function appears to be a critical factor. Post-LT outcome based on our small series is encouraging and warrant further research. While some patients may may experience worsening hemodynamics a few years after LT, delaying the need for lung transplantation might lead to better outcomes than performing a combined lung and liver transplantation upfront,especially considering the survival prospects after lung transplantation for PoPH.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1710 - BMPR2 MUTATION ADVERSELY IMPACTS THE COURSE OF PERINATAL LUNG INJURY AND POSTNATAL GROWTH IN RATS WITH INTRAUTERINE GROWTH RESTRICTION.

Mami Takeoka [1], Hirofumi Sawada [1], Yoshihide Mitani [1], Yutaka Otobe [1], Naoki Tsuboya [1], Kazunobu Ohya [1], Noriko Yodoya [1], Hiroyuki Ohashi [1], Tomoya Harada [1], Masahiro Hirayama [1]
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Background / Hypothesis:
Intrauterine growth restriction (IUGR) impairs alveolar and vascular development, increasing the risk of pulmonary hypertension (PH) in neonates. Bone morphogenetic protein receptor type 2 (BMPR2) mutations, a genetic risk factor for pulmonary arterial hypertension, are also implicated in both vascular and airway development. We therefore investigated whether Bmpr2 mutation exacerbates pulmonary hemodynamics and lung histology in IUGR rats induced by maternal nitric oxide (NO) inhibition.

Materials and Methods:
Wild-type female rats (WT) were mated with Bmpr2 mutant male rats (mutant) and given NO synthase inhibitor (L-NAME, L-NAME group) or vehicle (control group) subcutaneously on gestational day 17 using an osmotic pump. A total of 211 offspring rats were evaluated for body weight (BW), hemodynamics, lung histology and BMPR2 signaling in four groups: at postnatal day (P) 3, control/WT (n=10 [male], 10 [female]), control/mutant (n=10, 10), L-NAME/WT (n=10, 10), and L-NAME/mutant (n=10, 10), and at 7 weeks of age, control/WT (n=23,17), control/mutant (n=18, 12), L-NAME/WT (n=17, 20), and L-NAME/mutant (n=21, 25).

Results:
At P3, L-NAME group had lower BW and impaired alveolarization ($P<0.05$). Until P21, lower BW persisted in L-NAME group ($p<0.05$), and after 4 weeks of age, Bmpr2 mutant had the most pronounced effect on L-NAME-induced growth retardation only in male rats ($p<0.05$). Pulmonary vascular disease was induced in L-NAME group ($p<0.05$) with mildly elevated PH, which was similar in both WT and mutant rats. Alveolar size was larger in L-NAME/mutant than L-NAME/WT group. The expression of BMPR2 in the lung was decreased in L-NAME/WT group compared to control/WT group and was further decreased in L-NAME/mutant group.

Conclusions:
Bmpr2 mutant rats exhibit more severe growth retardation associated with alveolar maldevelopment than WT. These suggest that Bmpr2 mutant rats are more susceptible to perinatal injury and warrant further studies investigating the association between late pulmonary sequelae after perinatal injury and BMPR2 signaling.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1712 - CLINICAL EFFICACY OF BOSENTAN IN PATIENTS WITH PULMONARY ARTERIAL HYPERTENSION FOLLOWING TRANSCATHETER CLOSURE OF ATRIAL SEPTAL DEFECTS

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Background:
Persistent pulmonary arterial hypertension (PAH) following transcatheter atrial septal defect (ASD) closure lacks an established treatment approach. This study evaluated the safety and efficacy of bosentan, an endothelin receptor antagonist, in managing PAH post-ASD closure in adult patients.

Methods:
We conducted a prospective study of 19 adults with PAH after successful ASD device closure. Bosentan therapy was initiated following the procedure. Clinical, echocardiographic, and exercise parameters were assessed at baseline and at three months.

Results:
No procedure-related complications were observed. One patient (5.2%) discontinued bosentan due to elevated liver enzymes, which normalized without intervention. Eighteen patients (mean age 48.0 years; 2:1 female-to-male ratio) completed the study. The average ASD size was 28.2 mm. Baseline hemodynamics showed significant left-to-right shunting (Qp/Qs 2.95), elevated pulmonary artery pressures (systolic 45.9 mmHg, mean 29.3 mmHg), and a pulmonary vascular resistance index of 3.73 Wood units·m^2.
At 3-month follow-up, tricuspid regurgitation (TR) grade and WHO functional class (WHO FC) improved significantly ($p = 0.004$ and $p = 0.001$, respectively). Right ventricular longitudinal strain increased from −18.3% to −21.7% ($p = 0.045$), and TR pressure gradient decreased from 38.3 to 19.8 mmHg ($p < 0.001$). NT-proBNP levels did not change significantly.
Among 17 patients undergoing cardiopulmonary exercise testing, VO_2max improved significantly (26.9 to 29.7 mL/kg/min, $p = 0.047$), while VE/VCO_2 remained unchanged.

Conclusion:
Bosentan therapy post-ASD closure appears to be a safe and effective strategy for patients with residual PAH. It improves right ventricular function, functional capacity, and exercise tolerance over short-term follow-up. These findings support its use in this clinical context.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1744 - IMPACT OF 2022 ESC ERS GUIDELINES ON PEDIATRIC PULMONARY HYPERTENSION DIAGNOSIS AND MANAGEMENT

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Background / Hypothesis:
The 2022 ESC/ERS Guidelines on Pulmonary Hypertension (PH) introduced a revised hemodynamic definition of pulmonary arterial hypertension (PAH) by lowering pulmonary vascular resistance (PVR) <2 WU along with the mean pulmonary artery pressure (mPAP) <20 mmHg . In pediatric PAH, the applicability of these criteria, particularly the adult-based PVR threshold of 2 WU, remains uncertain. We explore the challenge of whether lowering the pulmonary vascular resistance index (PVRi) threshold from 3 to 2 WU·m^2 will impact clinical decision-making and alter management strategies.

Materials and Methods:
A retrospective cohort study included children who underwent cardiac catheterization for pulmonary hemodynamic assessment. Patients were categorized into three groups based on mPAP:
Group A: mPAP <20 mmHg
Group B: mPAP 20–24 mmHg
Group C: mPAP ≥25 mmHg
PVR was analyzed across groups to assess the impact of the new threshold. Correlations between pulmonary hemodynamic parameters and PVR were also evaluated.

Results:
Among 112 children (mean age: 6.08 ± 5.5 years), the majority (66.9%) were classified as Group C (mPAP ≥25 mmHg). With the mPAP threshold (<20 mmHg), only 4.4% of children were reclassified as Group B, increasing the PH-diagnosed population. However, all Group B children had normal PVR (<2 WU·m^2), suggesting minimal clinical impact despite the expanded diagnostic criteria. A strong correlation was observed between mPAP and PVR ($r=0.77$, $p<0.001$), reinforcing the role of direct pulmonary hemodynamic measurement. Additionally, reassessing the PVRi threshold from 3 to 2 WU·m^2 revealed minimal impact on patient selection and surgical decision-making which warranting further prospective cohort evaluation of its clinical implications.

Conclusions:
The revised ESC/ERS criteria lead to a slight increase in PH diagnoses in pediatric patients but do not PAH, as most children in the mPAP 20–24 mmHg range maintain normal PVR (<2 WU·m^2). Our findings support the use of PVR <2 WU·m^2 in children, aligning with new adult PAH criteria.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1757 - HEART RATE VARIABILITY AS A PROGNOSTIC MARKER IN PEDIATRIC PULMONARY ARTERIAL HYPERTENSION A PROSPECTIVE OBSERVATIONAL STUDY

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Background / Hypothesis:
Pulmonary arterial hypertension (PAH) is a progressive disease with high morbidity and mortality. Risk stratification is essential for therapy adjustments in adults, but it is challenging in pediatric patients due to variability in age, body surface area, and functional capacity. Thus, a non-invasive parameter for risk assessment in pediatric PAH is needed.
Aim: To evaluate heart rate variability (HRV) as a prognostic marker in pediatric PAH.

Materials and Methods:
This prospective observational study included pediatric patients with idiopathic PAH, stable on therapy for at least 3 months, followed for 2 years. All patients underwent clinical evaluation, echocardiography, and NT-ProBNP testing. HRV was measured using a Holter device, assessing parameters such as standard deviation of normal-to-normal intervals (SDNN), standard deviation of the mean values (SDANN), and square root of the mean square differences of successive RR intervals (RMSSD). Disease progression was monitored. Mean HRV values between progressive and non-progressive groups were compared.

Results:
Fifty patients (54% male) with a mean age of 8.6 ± 5.2 years and mean weight of 25 ± 15.8 kg were included. Of these, 20 (40%) showed disease progression, including 1 death, 3 requiring drug escalation, and 7 with worsening functional class or NT-proBNP levels. Progressive disease was associated with significantly lower HRV values: SDNN (48.2 ± 32.6 vs 86.7 ± 26.8 ms, $p = 0.001$), SDANN (38.6 ± 24.9 vs 68.2 ± 24.9 ms, $p = 0.001$), and RMSSD (17.4 ± 9.9 vs 36.4 ± 13.8 ms, $p = 0.001$). HRV thresholds (SDNN 63 ms, SDANN 49 ms, RMSSD 20.9 ms) predicted disease progression with high sensitivity and specificity.

Conclusion:
HRV could be used as a non-invasive, objective parameter to predict disease progression so that appropriate early intervention/ therapy can be initiated.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

1983 - RESOLUTION OF PULMONARY HYPERTENSION IN SEVERE BRONCHOPULMONARY DYSPLASIA WITHOUT PULMONARY VASODILATOR USE

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Background / Hypothesis:
Pulmonary hypertension (PH) associated with bronchopulmonary dysplasia (BPD-PH) is a significant comorbidity, with increased mortality risk up to four times greater than BPD alone. In 2021, we published outcomes from our 2018-2020 cohort of patients with BPD-PH, showing resolution of BPD-PH in all patients using a multidisciplinary approach to respiratory optimization with low pulmonary vasodilator use (8%) and low mortality (5%). We now report BPD-PH outcomes in a subsequent validation cohort cared for by our multidisciplinary team from 2021-2023.

Materials and Methods:
Retrospective record review of all infants with BPD-PH followed by the Seattle Children's Hospital BPD team between 2021- 2023. Patients with critical congenital heart disease were excluded. Demographics, comorbidities, treatments, closure of hemodynamically significant intracardiac shunts, and clinical outcomes including time to BPD-PH resolution and recurrence were reviewed (see Tables).

Results:
BPD-PH resolved in all 79 patients, and in 71 (90%) before discharge. Median age of PH resolution = 39 weeks post-menstrual age (PMA). The 32 (48%) with PDA closure had PH resolution after a median of 4 weeks. Only 4 patients were treated with PH medications: 2 patients on sildenafil at transfer, stopped on admission; 1 patient briefly on sildenafil, stopped due to desaturations; 1 patient was treated with bosentan but stopped due to transaminitis. There were 7 patient deaths, all non-cardiac etiologies.
BPD-PH recurred a first time in 37 (47%) patients and twice in 10 (13%). Increasing respiratory support led to resolution of PH recurrence in 25 (71%).

Conclusions:
Our multidisciplinary, systematic approach to BPD-PH management was associated with complete resolution of BPD-PH and compared to other cohorts with low mortality (8%) and low rates of sildenafil use (4%). Recurrence of PH is used as a marker of inadequate respiratory support. PDA closure is associated with initial resolution of BPD-PH and ASD closure is associated with resolution of BPD-PH recurrence.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

2014 - COMPARATIVE ANALYSIS OF PULMONARY ARTERY BANDING RESULTS IN PATIENTS WITH CHD BIVENTRICULAR HEMODYNAMICS AND PH IN DIFFERENT AGE GROUPS

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Background / Hypothesis:
To present the outcomes of pulmonary artery banding in different age groups of patients with CHD, biventricular hemodynamics and PH.

Materials and Methods:
The study included 178 patients who underwent surgery at Department of Cardiac Surgery of Bakulev National Medical Research Center for Cardiovascular Surgery from 2000 to 2022. Patients were divided into 5 groups according to age at the time of banding: under 6 months (Group 1, n=66), 6 months-1 year (Group 2,n=32), 1-3 years (Group 3, n=34), 3-5 years (Group 4,n=19) and over 5 years (Group 5,n=27). Mean age and body weight at surgery were: Group 1-4.0±0.9 months and 3.18±1.7kg, Group 2-9.2±2.2 months and 5.7±1.0 kg, Group 3-2.0±0.1 years and 8.9±1.9 kg, Group 4-4±0.7 years and 13±2.7 kg, Group 5-9.5±3.6 years and 24±10.9 kg respectively.

Results:
Pulmonary artery banding was performed according to pre-calculated parameters in 89 patients and under hemodynamic monitoring in 89 patients. Early postoperative echocardiography showed gradient across the band: Group 1 - 64.0±17.3 mmHg, Group 2 - 60.5±15.6 mmHg, Group 3 - 52.3±17.9 mmHg, Group 4 - 54.36±18.5 mmHg, Group 5 - 54.4±14.2 mmHg. Postoperative mortality was 2.8%.
During follow-up after banding, catheterization in Group 1 (60 patients, 90.8%, mean PA pressure 23.7±10.4 mmHg), Group 2 (29 patients, 90.6%, mean PA pressure 24.4±13.1 mmHg), Group 3 (18 patients, 52.9%, mean PA pressure 30.0±8.2 mmHg), Group 4 (8 patients, 42.1%, mean PA pressure 31.3±14.5 mmHg), and Group 5 (9 patients, 33.3%, mean PA pressure 35.4±10.2 mmHg) showed significant reduction in PA pressure allowing for complete repair.
The comparative analysis demonstrates that the optimal timing for pulmonary artery banding is before 1 year of age (surgical efficacy >90%). Efficacy decreases progressively with increasing age, showing significantly lower effectiveness in patients over 5 years (down to 33%).

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

2330 - GROWN UP PATIENT ON PULMONARY VASODILATOR SEARCH FOR LESS KNOWN CORRECTABLE CAUSES

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Pgi Nasik, Medicine, Nasik-India [1] Llrm Medical College, Pediatric, Meerut-India [2] Nutema Hospital, Cardiology, Meerut-India [3]

Background / Hypothesis:
Pulmonary hypertension (PH) is a pathophysiological disorder that may involve multiple clinical conditions and may be associated with a variety of cardiovascular and respiratory diseases. The complexity of managing PH requires a multidisciplinary approach, with active involvement of patients with PH in partnership with clinicians. Before labelling the case as idiopathic, it is important to use multimodality imaging, and best efforts should be made to find the correctable cause.

Materials and Methods:
Here we are presenting 4 cases diagnosed as idiopathic severe pulmonary hypertension and were on dual pulmonary vasodilator therapy, but found to have correctable or modifiable factors.

Results: Details of cases given in Table 1

Conclusion:
Patients with PH require an extensive work-up to define the cause of PH. It requires detailed history and examination,a multidisciplinary team including a PH specialist, adult and pediatric cardiologist, pulmonologist, and rheumatologist. The first approach should be to find a correctable/treatable cause to reduce morbidity and mortality and improve long-term outcomes.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

2340 - A RETROSPECTIVE COHORT STUDY TO ASSESS MID AND LONG TERM OUTCOMES IN PATIENTS WHO UNDERWENT SURGICAL TRANSCATHETER CLOSURE OF NON RESTRICTIVE SHUNT LESIONS WITH PULMONARY ARTERIAL HYPERTENSION NOT SATISFYING OPERABILITY CRITERIA

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Sri Padmavathi Children's Heart Center, Pediatric Cardiology, Tirupati-India [1] Madras Medical Mission Hospital, Pediatric Cardiology, Chennai-India [2]

Background:
Pulmonary vascular disease (PVD) is considered a limiting factor in the successful surgical closure of CHD with large systemic to pulmonary shunts, especially in resource limited settings like India . We decided to assess and analyse the outcomes in that cohort of patients who underwent closure of large shunt lesions with pulmonary hypertension (PH) who did not satisfy the standard operability criteria.

Materials and Methods:
A Retrospective Cohort Study comprising of patients with non-restrictive shunt lesions with PAH, aged > 6 months who underwent transcatheter or surgical closure of non-restrictive pre-tricuspid/ post-tricuspid shunt lesions and PH defined by mean PA pressure > 20 mm Hg and Pulmonary vascular resistance index (PVRI) > 3WUm2, and not satisfying operability criteria, i.e. baseline PVRI > 4 WUm2 and/or PVR: SVR > 0.3 were studied. Patients with operable hemodynamics; or incomplete baseline catheterization data,or with complex CHDs, or pulmonary venous hypertension due to left heart disease; or valvar heart lesions; or Pulmonary malformations/ Chronic respiratory conditions; or Chromosomal anomalies/ genetic syndromes other than Trisomy 21 were excluded.

Results:
Of 113 patients screened, 89 subjects with a median follow-up duration of 5.2 years were included in our study, out of which 56(62.9%) had persistent PAH post-intervention. Older age, NYHA class III/IV symptoms, right ventricular strain pattern, high baseline PVRI, insignificant fall in both PVRI and mean PAP on acute vasodilator testing were predictive of persistent PAH. Qp;Qs, PVR:SVR ratio were not found to correlate with persistent PH. Greater fall in mean PA pressure linearly correlated with lower PA systolic pressure at follow-up. We derived a PVRI cut-off of 5.1 WUm2 for pre-tricuspid lesions- ASD and 7.1 Wum2 for post-tricuspid lesions- VSD and PDA using ROC analysis.

Conclusions:
Shunt lesions with severe PAH need comprehensive evaluation for operability and post-operative surveillance for PAH is crucial.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

2377 - EXPERIENCE OF TRANSITION FROM SUBCUTANEOUS TREPROSTINIL TO ORAL SELEXIPAG IN PEDIATRIC PATIENTS WITH PULMONARY ARTERIAL HYPERTENSION

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Background / Hypothesis:
The use of parenteral drug administration may negatively impact the patients' quality of life, making long-term adherence challenging. Selexipag, an oral prostacyclin receptor agonist, can improve medication adherence. This study aims to evaluate the safety and efficacy of transitioning from continuous subcutaneous infusion of treprostinil to oral selexipag in pediatric PAH patients who have transitioned from a clinical high-risk status to a low-risk status

Materials and Methods:
A retrospective study was conducted, including pediatric PAH patients who were treated at our center.

Results:
Eight patients (4 females) were included, with a median age of 14.1 years. All 8 patients were diagnosed with idiopathic or heritable PAH(IPAH/HPAH), with 6 patients being carriers of PAH-related genes (BMPR2 n=4, ACVRL1 n=1, KCNA5 n=1). At their initial visit, all patients were classified as WHO-FC III-IV with a median nt-proBNP levels of 1617(600, 5693) pg/ml. Echocardiography revealed significant enlargement of the right heart, with an RV/LV diameter ratio of 1.92 (1.52, 2.41). Right ventricular systolic function was reduced, with a median TAPSE of 14 (11, 19) mm. Echocardiography estimated that pulmonary artery systolic pressure(SPAP) was significantly elevated (114±22 mmHg). The median duration of treprostinil therapy was 4 (2, 8) months. After treatment, all reached a low-risk clinical status. The drug transition involved tapering treprostinil dose while increasing the oral selexipag dose. The final dose of oral selexipag ranged from 0.8 to 1.6 mg. During follow-up after the drug transition (median follow-up time of 25 months), no patient died. However, three patients got clinically deteriorated and reused treprostinil, who were all PAH-related genes carriers (BMPR2 n=2, KCNA5 n=1). The other five patients were maintained low-risk status.

Conclusion:
For pediatric PAH patients with genetic mutations, transitioning from treprostinil to oral selexipag is risky, even if the patient has improved to a low-risk status.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

2379 - MANAGEMENT OF SEVERE PULMONARY ARTERIAL HYPERTENSION INITIATING TARGETED THERAPY PRIOR TO DIAGNOSTIC RIGHT HEART CATHETERIZATION

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Background / Hypothesis:
This study aims to proposes a novel management strategy for severe PAH patients: initiating aggressive targeted therapy first and postponing RHC until the patient reaches a low-risk state. This approach aims to improve patient stability before undergoing invasive hemodynamic assessment, thereby minimizing procedural risks.

Materials and Methods:
We retrospectively analyzed severe PAH patients who initially presented in a high-risk state. Instead of undergoing immediate RHC, these patients received intensive targeted therapy, once their clinical status improved to a low-risk state, they underwent RHC for further evaluation. Clinical parameters before and after RHC were collected.
This study included 13 patients, with a median age of 7 (4.4, 11.9) years at the time of their first visit. At the initial visit, all patients were in a clinical high-risk state and were immediately treated with aggressive targeted therapy, including treprostinil. The median time from the initiation of treatment to right heart catheterization was 52 (12, 426) days. Upon undergoing right heart catheterization, patients showed a significant decrease in nt-proBNP levels(599±166 pg/ml vs 9067±1564pg/ml,p=0.017) . Seven patients received intravenous anesthetics during the procedure, and no patient experienced a pulmonary arterial hypertension (PAH) crisis during the catheterization. The results indicated that pulmonary artery pressures and pulmonary vascular resistance were significantly elevated in these patints, with one patient testing positive for the acute vasoreativity test.

Conclusion
Our findings suggest that delaying RHC until after targeted therapy stabilization is a safe and effective strategy for managing severe PAH.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

2381 - TREPROSTINIL EFFECTIVENESS IN HIGHER RISK PEDIATRIC PATIENTS WITH IDIOPATHIC AND HERITABLE PULMONARY ARTERIAL HYPERTENSION

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Abstract:
Introduction: Little is known about the effectiveness of treprostinil in higher-risk pediatric patients with various PAH genotypes. This study was designed to investigate the prognosis of higher-risk pediatric patients with IPAH and HPAH (IPAH/HPAH) following treprostinil therapy.

Methods:
Children with IPAH/HPAH who were stratified as higher-risk and treated with treprostinil in our center were included for analysis in this study. All patients in the study received PAH-related genotyping and were separated into four groups according to the results of genetic testing: BMPR2 mutation carriers, ACVRL1 mutation carriers, other genetic mutation carriers, and patients without identified mutations. Survival was defined as no death. Event-free survival was defined as no death, Potts shunt or atrial septostomy.

Results:
Forty-nine children (median age 7.7 (IQR 4.2, 11.5) years, female 65.3%) were included in this study. 83.7% of the cohort had genetic disorders after genetic testing with a dominance of BMPR2 and ACVRL1 mutations. After a median therapy duration of 5.56 (IQR 2.66, 11.12) months, all patients were alive with significant improvements in clinical characteristics. One-, two- and three-year survival rate were 90.8% ,83.8% and 69.1% respectively with a median follow-up duration of 19.17 (IQR 9.7, 29.79) months. Multivariate cox regression analysis identified WHO-FC after therapy as a predictor for survival. There was no significant difference in survival among patients with different genetic groups whereas BMPR2 or ACVRL1 mutations had significant effect on event-free survival (P=0.031).

Conclusion:
Treprostinil can significantly improve the prognosis in children with IPAH/HPAH who are in higher-risk despite genetic backgrounds.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

2395 - UKRAINIAN PEDIATRIC CENTER FOR PULMONARY ARTERIAL HYPERTENSION ORGANIZATION OF WORK IN TIMES OF WAR.

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Background / Hypothesis:
The Ukrainian Center for Pulmonary Arterial Hypertension (UCPAH) in Children was created at the Ukrainian Children's Cardiac Center in 2015. The aim of our study was to analyze the demographic and diagnostic spectrum of children in Ukraine with pulmonary hypertension after 9 years of creation.

Materials and Methods:
The military invasion of the troops of the Russian Federation into the territory of sovereign Ukraine began on February 24, 2022. Under martial law, the organization of medical care in Ukraine required special measures to ensure the work of medical institutions.
Despite the limitations of scheduled consultations, urgent care was established in case of progression of pulmonary hypertension and development of complications. Basic laboratory and instrumental research methods were available to our patients.

Results:
During 9 years 207 patients with PAH were registrated in UCPAH. There were 112 females and 95 males. All patients were with diagnosis of idiopathic PAH (iPAH) - 44 (21,3%) patients and PAH – associated with congenital heart disease (PAH-CHD) – 163 (78.7%) patients. In group of PAH-CHD 41 (25 %) was after total repair of CHD, 72 (44.1%) – after palliative operations, 50 (30,9%) – non operative.

Conclusions:
During the period of martial law in the country, the main problems in the work of the UCPAH were: saving the staff of the clinic, ensuring patients' access to medical care, and finding resources to resume the supply of specific therapy drugs, because of problems with the state budget program.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

2460 - HIPERREACTIVITY OF PULMONARY VASCULATURE IN CHILDREN BORN AND LIVING AT HIGH ALTITUDE

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Background:
Pulmonary hypertension (PH) in children living at altitude deserves more attention. Population living at high altitude (>2,500 MASL) is 140,000,000 of people; 35 million live in Los Andes and in Bogota where this study was made, live 10.3 million of people. By the effect of Hypobaric Hypoxia, PH at High altitude has special characteristics related with frequency, severity and hyperreactivity of pulmonary vasculature (HPV), defined as exaggerated vasoconstriction in response for example to hypoxia.

Materials and Methods:
85 patients (3 months to 18 years old) with PH confirmed by catheterization were divided in four groups of age: 3 months to 3 years, 3-5 years, 5-10 and 10-18 years. In 72 patients, HPV was evaluated by the hyperoxia test (O2Test): FiO2 >80% during 24 hours. Echocardiogram was made before the Test and finishing the Test. BNP or NT ProBNP was valued also.

Results:
Majority had severe PH; the median age at diagnosis was 4 years [IQR 1.5-9, Range 0-16 years]; 45 (53%) were female, 37 (42%) were diagnosed <3 years old. The main cause was idiopathic: 54 patients (63.5%); 13 (15.3%) developed PH after surgery of CHD. 72 patients had O2Test; 42 (58.3%) had positive O2Test and 30 (41.7%) had negative O2Test. Patients with positive O2Test had better outcome than patients with negative O2Test and correlated with age at diagnosis; in younger patients, PVH was more notorious, with positive O2Test.

Discusion-Conclusion:
Currently the result of studies on PH in adults and at low altitude are extrapolated to children with PH living at altitude. This is a mistake because PH at high altitude has special characteristics by the effect of hypobaric hypoxia as HPV, more significant in children and even more as younger the child is. This confirms the importance of early detection of PH. The O2Test is important to value HPV

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

2473 - VSD PROVE INTERIM RESULTS OF SURGICAL CLOSURE OF LARGE VSD WITH SEVERE PAH IN CHILDREN OLDER THAN 2 YEARS

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Background / Hypothesis:
Children over 2 years with large ventricular septal defects (VSDs) and severe pulmonary arterial hypertension (PAH) require careful operability assessment, as delayed presentation may lead to irreversible pulmonary vascular disease. In low- and middle-income countries, late presentation is common, but outcome data are limited. The VSD-PROVE study (Prospective Observational Evaluation of outcomes in large VSDs operated after age 2) evaluates outcomes in children deemed operable after comprehensive evaluation.

Materials and Methods:
Thirty-six children with large VSD and severe PAH underwent clinical evaluation, echocardiography, and cardiac catheterization with oxygen vasoreactivity testing. Twenty-eight children (mean age 6.4±3.8 years, range 2–18) deemed operable underwent surgical VSD closure and received dual pulmonary vasodilator therapy (sildenafil and bosentan) for 1 year. Follow-up included clinical and echocardiographic monitoring and repeat catheterization at 1 year.

Results:
Resting and exertional SpO_2 were 97.6±1.9% and 94.4±4.1%, respectively. Baseline mean PA pressure and PVRI were 70.6±10.3 mmHg and 8.7±3.4 WU·m^2. With oxygen, mean PA pressure and PVRI decreased to 66.5±10.6 mmHg and 5.3±2.5 WU·m^2. All 28 patients underwent successful VSD closure with no mortality or PAH crises. One patient required a pacemaker for postoperative heart block. No postoperative heart failure was observed. At 1 year, 15 patients had repeat catheterization, 14 patients had mean PA pressure ≤30 mmHg, one had 34 mmHg, with 79% patients having pressures ≤25 mmHg. For others, 6-month echocardiography showed predicted RV systolic pressure of 39.4±5.8 mmHg.

Conclusions:
Surgical VSD closure in carefully selected children over age 2 with elevated PVRI is safe and effective. Near normalization of pulmonary pressures at 1 year in the majority is encouraging, supporting surgery in selected late presenters. Longer follow-up is needed to confirm sustained benefits.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

2530 - RARITIES IN RARE DISEASES OUR EXPERIENCE WITH PULMONARY VENO OCCLUSIVE DISEASE

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Background / Hypothesis:
Pulmonary veno- occlusive disease (PVOD) is a very rare entity of pulmonary hypertension. As it shares common features to Pulmonary arterial Hypertension (PAH) at presentation it is often underdiagnosed or misdiagnosed as PAH. Incidence especially in childhood is unknown. Its histological hallmark is preferential obliterative remodelling of the venules beside to capillary lesions and PAH - like arterial vasculopathy.
Treatment of PVOD remains challenging as PAH specific drugs may cause life-threatening pulmonary edema, explaining high mortality.
Herein we report on three children diagnosed with PVOD Illustrating the challenges of diagnosis and management of this disease.

Materials and Methods:
Patients diagnosed with PVOD were reviewed retrospectively. Detailed description of clinical features at presentation, clinical course and management are provided.

Results:
All infants were diagnosed within the first year of age and had suprasystemic PA pressures at presentation. Suspicion of diagnosis was made mainly due to the clinical course after PAH treatment was initiated and / or due to the typical features on Chest CT.
All patients were treated with a combination of vasoactive substances and high doses of diuretics. Two patients improved on this treatment and are still alive. One patient initially improved but died due to hypertensive crisis in the context of sepsis.

Conclusions:
Adherence to diagnostic workup of patients presenting with PH and careful and repeated evaluation after initiating therapy are key to early suspicion of diagnosis of PVOD.
Combination of balanced vasodilation and high doses of diuretics can improve hemodynamics and survival and thus postpone lung transplantation.

POSTER PRESENTATIONS

Category: Pulmonary Hypertension

2558 - CARDIAC FUNCTION RECOVERY FOLLOWING ADENOTONSILLECTOMY IN CHILDREN WITH ADENOTONSILLAR HYPERTROPHY

Dolunay Gürses [1], Hazal Tural [1], Ergin Sağtaş [2], Erdem Mengi [3]
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Background / Hypothesis:
Adenotonsillar hypertrophy is a common cause of upper airway obstruction in childhood. Chronic upper airway obstruction may result in cardiovascular complications secondary to persistent hypoxia. Early detection of cardiac effects and timely surgery may prevent irreversible cardiovascular damage.

Materials and Methods:
In this prospective study, 33 children with adenotonsillar hypertrophy and 17 age- and sex-matched healthy controls were evaluated. The study group was assessed preoperatively, and at 1 and 3 months postoperatively. All participants underwent electrocardiography, 24-hour Holter ECG monitoring, conventional Doppler, and tissue Doppler echocardiography. Brain natriuretic peptide (BNP) levels, echocardiographic measurements, and heart rate variability parameters were compared between groups.

Results:
Groups were similar in age, height, sex, body mass index, and arterial blood pressure ($p>0.05$). BNP levels were significantly higher in the study group ($p<0.05$). Preoperatively, QT and QTc dispersions were increased in the study group ($p<0.05$) but normalized by the third postoperative month ($p>0.05$). M-mode parameters were comparable between groups. Conventional Doppler showed similar mitral valve parameters; however, tricuspid E wave velocity and E/A ratio were lower, and A wave velocity was higher in the study group ($p<0.05$). Mean pulmonary artery pressure decreased from 25.33±6.01 mmHg preoperatively to 16.83±4.84 mmHg at 3 months postoperatively, approaching control values (15.09±4.2 mmHg). Tissue Doppler revealed lower Edt and Edt/Adt ratios and higher Adt in the study group ($p<0.05$). Heart rate variability parameters tended to be lower but did not reach statistical significance.

Conclusions:
Children with adenotonsillar hypertrophy may exhibit subclinical cardiac involvement. Adenotonsillectomy leads to gradual improvement in cardiac parameters, with normalization observed in some measures by 3 months postoperatively. Cardiac evaluation is recommended in these patients to ensure timely intervention before permanent cardiovascular damage develops.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1049 - OUTCOMES POST OZAKI PROCEDURE AMONG CHILDREN WITH AORTIC VALVE DISEASE AT JAKAYA KIKWETE CARDIAC INSTITUTE DAR ES SALAAM TANZANIA A RETROSPECTIVE DESCRIPTIVE STUDY

Zawadi Edward Kalezi [1], Alphonce Nsabi Simbila [2], Deogratias Arnold Nkya [3], Vivienne Mlawi [4], Naizihijwa Gadi Majani [1], Stella Mongella [1], Godwin Sharau [5], Felix Shonyela [5]
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Background / Hypothesis:
Aortic valve reconstruction using glutaraldehyde-treated autologous pericardium, also called Ozaki procedure, is a surgical procedure for patients with aortic valve disease. Gratifying results have been reported in adult patients, however, limited published data is available in paediatric population. This study looked at clinical characteristics and early outcomes of children who underwent Ozaki procedure at our Institute.

Materials and Methods:
This was a retrospective descriptive study conducted on children who underwent aortic valve reconstruction at Jakaya Kikwete Cardiac Institute (JKCI) from January 2019 through December 2022. Medical records of these children were reviewed to extract data on demographics, clinical characteristics, redo surgical interventions and survival

Results:
A total of 10 children underwent Ozaki procedure during the study period. Eight children had severe aortic regurgitation while 2 had severe aortic stenosis preoperatively. All children had either none or trivial aortic regurgitation immediately after surgery. None of them had redone operations throughout the follow-up period. There was no in-hospital mortality, however, one child died one-year after surgery. The mean follow-up period was 1.6 years with the longest follow-up time of 4 years.

Conclusions:
Ozaki procedure showed encouraging early results among children with aortic valve disease who underwent surgical repair by this technique. Future studies with larger sample sizes and longer follow up periods to evaluate long-term results in this population are recommended.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1051 - RHEUMATIC MITRAL VALVE SURGERY IN PATIENTS WITH SEVERE PULMONARY HYPERTENSION

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Background / Hypothesis:
Rheumatic heart disease remains a major public health issue in developing countries, significantly affecting the mitral valve (MV). In Angola, delayed diagnosis and treatment due to social, economic, and healthcare challenges often lead to severe pulmonary hypertension (SPH). This study reports our experience treating pediatric patients with SPH undergoing MV surgery.

Materials and Methods:
A retrospective analysis of 38 patients under 18 years with SPH who underwent MV surgery between February 2022 and December 2024 at a center in sub-Saharan Africa.

Results:
The mean age was 14 years (range: 8–17), with 26 patients (68.4%) female. MV regurgitation was the most common lesion (28 cases, 73.7%), followed by stenosis (8 cases, 21.1%) and mixed disease (2 cases, 5.2%). Additional valve involvement was seen in 16 patients (42.1%). The mean ejection fraction was 65% (range: 44–78%), and most patients (94.7%) were undergoing their first surgery. MV replacement was performed in 34 cases (89.5%) using biological prostheses, while 4 patients (10.5%) underwent MV repair. The mean systolic pulmonary artery pressure (sPAP) was 69 mmHg (51-110). The mean EUROSCORE II was 3.27% [0.99 – 48.05] (Low – 0 [0.00%], Mean – 12 [31.6%], Mean-High – 10 [26.3%], High – 10 [26.3%], Very High – 6 [15.8%]). Mean cardiopulmonary bypass and cross-clamp times were 93 (41 – 250) and 71 (35 – 183) minutes, respectively. Intensive care and hospital stays averaged 3 (1 – 6) and 15 (5 – 50) days. The in-hospital mortality rate was 7.9% (3 patients).

Conclusions:
MV surgery in pediatric patients with SPH is feasible and safe, demonstrating favorable outcomes despite challenges associated with advanced disease and resource limitations.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1096 - NEUROLOGIC MANIFESTATIONS ASSOCIATED WITH THE ACUTE PHASE KAWASAKI DISEASE AND ITS CLINICAL IMPLICATION NATIONWIDE COHORT STUDY IN SOUTH KOREA

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Background / Hypothesis:
Neurological involvement in Kawasaki disease (KD) is rare but can range from mild to severe, sometimes fatal. It is often associated with a poor prognosis, with its relationship with coronary artery lesions remaining poorly understood. This study aimed to investigate the neurologic manifestations during the acute phase of KD and evaluate their clinical implications, focusing on treatment resistance and coronary complications.

Materials and Methods:
This study was conducted using data from the Health Insurance Review & Assessment Service of the Republic of Korea from 2007 to 2022. KD was defined based on the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10), code of M30.3. Only data from patients under the age of 18 were enrolled.

Results:
4,320 (4.51%) exhibited neurological manifestations, totaling 4,541 cases. The most common was febrile seizure (50.67%, 2,301/4,541), followed by meningitis/aseptic meningitis, headache, seizures/convulsions, epilepsy, meningoencephalitis, irritability, brain hemorrhage, facial nerve palsy, and cerebral infarction/stroke (Table 1). While no significant differences were observed in mean age or gender distribution between KD patients with and without neurological manifestations, the prevalence of neurological manifestations was highest in patients aged >5 years (5.78%), followed by those ≤1 year (4.91%) and 1–5 years (3.94%). KD patients with neurological manifestations had higher incidence at summer season, longer hospitalization duration ($p<0.001$), and increased rates of multiple intravenous immunoglobulin (IVIG) treatments ($p<0.001$), transfers ($p<0.001$), and mortality ($p<0.001$). No significant differences were observed in the use of aspirin or warfarin, steroids or infliximab, and in coronary angiography or cardiac single-photon emission computed tomography.

Conclusions:
Neurological manifestations were observed in 4.5% of patients during the acute phase of KD. KD patients with neurological manifestations exhibited a higher incidence of unresponsiveness to the first IVIG treatment. However, there appears to be no associated increase in coronary complications.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1145 - DELIVERY TYPE AND OTHER BIRTH FACTORS ASSOCIATED WITH KAWASAKI DISEASE.

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Fujita Health University, Pediatrics, Toyoake-Japan [1] Chiba Cancer Center Research Institute, Cancer Prevention Center, Chiba-Japan [2] The University Of Tokyo, Clinical Epidemiology And Health Economics, Tokyo-Japan [3] Tokyo Medical And Dental University Graduate School Of Medicine, Health Policy And Informatics, Tokyo-Japan [4]

Background:
Kawasaki disease (KD) onset has been suggested to be associated with infections and various environmental factors. However, research on whether the delivery type plays a role in KD development is limited. This study investigated whether cesarean section (CS) or vaginal delivery (VD) is associated with KD onset using a large administrative claims database in Japan.

Method:
We conducted a case-control study using the JMDC Claims Database from January 2005 to December 2021. Data on children born via CS or VD and their mothers were collected. KD patients were identified from the source population, and controls without KD were randomly selected based on sex, age, and registration time, each matched to four controls using a risk-set sampling technique. We analyzed the association between delivery type and KD onset using multivariate conditional logistic regression, defining KD as the primary outcome based on specific criteria.

Results:
Case-control matching created 3,363 pairs of cases (n = 3,363) and controls (n = 13,363). The proportions of CS, maternal age, Charlson Comorbidity Index, presence of older siblings, and low birth weight infants were significantly different between the cases and controls. In the multivariate analysis, KD onset was associated with CS (odds ratio [OR], 1.17; 95% confidence interval [CI], 1.0–1.37), the presence of older siblings (OR, 1.11; 95% CI, 1.02–1.21), lower birth weight (1001–2500 g) (OR, 1.22; 95% CI, 1.02–1.24) and antibiotics use (OR, 1.12; 95% CI, 1.02–1.24)

Conclusion:
The risk of developing KD may be influenced by the delivery type (CS or VD), the presence of older siblings, low birth weight, and antibiotics use.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1251 - CROSS SECTIONAL ANALYSIS OF STREPTOCOCCAL SEROLOGY IN A GLOBAL COHORT OF ARF AND HEALTHY CHILDREN

Ndate Fall [1], Alison Spazian [2], Samantha Buonfiglio [3], Rachel Sarnacki [2], Andrea Beaton [3]
Cincinnati Children's Hospital, Heart Institute, Cincinnati-United States [1] Children's National, Rrcu, Washington Dc-United States [2] Cincinnati Childrens, Heart Institute, Cincinnati-United States [3]

Background / Hypothesis:
The diagnosis of acute rheumatic fever (ARF) relies on evidence of prior group A streptococcal infection, with antistreptolysin O (ASO) and antideoxyribonuclease B (ADB) titers serving as key markers in the revised Jones Criteria. This study aimed to identify optimal ASO and ADB cut-off values among children living in RHD endemic settings to distinguish healthy children from those with ARF.

Materials and Methods:
Participants were recruited from Brazil, Malawi, Pakistan, and Timor-Leste, including those with ARF, rheumatic heart disease (RHD), other infections or inflammatory diseases, and healthy controls. Antibody titers were compared across groups using the Kruskal-Wallis test. Receiver operating characteristic (ROC) analysis was performed to determine cut-off values, sensitivity, specificity, and area under the curve (AUC

Results:
A total of 523 participants were analyzed: 133 with ARF, 123 with RHD, 115 with other infections or inflammatory diseases, and 152 healthy controls. ASO and ADB titers were significantly elevated in the ARF group (median ASO = 480 ng/ml, ADB = 540 ng/ml). An ASO cut-off value of 283 ng/ml demonstrated excellent diagnostic performance, with an AUC of 0.94, sensitivity of 0.95, and specificity of 0.82. ADB titers were also diagnostic but less robust, with a cut-off value of 403 ng/ml yielding an AUC of 0.84, sensitivity of 0.88, and specificity of 0.68.

Conclusions:
The cutoffs identified here performed well across multiple diverse global populations. This study provides critical baseline data to enhance ARF diagnostic accuracy and refine diagnostic thresholds globally.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1258 - RAPID AI ASSISTED HAND HELD ECHOCARDIOGRAPHY DETECTION AND ANALYSIS OF RHEUMATIC HEART DISEASE

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Background / Hypothesis:
Early echocardiographic (echo) detection of rheumatic heart disease (RHD) enables secondary antibiotic prophylaxis, preventing further Strep A infections—the primary driver of RHD. AI-powered hand-held devices, single-view protocols, and rapid training of non-physician healthcare workers offer scalable early diagnosis in low-resource settings. Our deep learning model, using mitral regurgitation color Doppler on portable echo machines with parasternal and apical views, achieved 92% sensitivity and 79% specificity. We now present an updated single-view hand-held echo AI algorithm aligned with the 2023 World Heart Federation screening guidelines.

Materials and Methods:
Our model was trained and validated on 1,056 handheld echocardiograms (520 positive, 536 negative) and evaluated on an independent test set of 95 cases (44 positive, 51 negative). For validation, 5-fold cross-validation was used, with each fold maintaining an 80:20 train-validation split and a balanced distribution of positive and negative cases. The results were obtained using the mitral valve-parasternal long-axis color Doppler view after passing quality control.

Results:
The best average validation results were achieved after transfer learning from a prior deep learning algorithm developed from standard echo machine datasets. These results were selected based on maximum accuracy. The model achieved an average validation accuracy of 82%, with 82% sensitivity and 82% specificity. On the independent test set, it reached 78% accuracy, 82% sensitivity, and 75% specificity.

Conclusions:
Our latest AI models for diagnosis of RHD based on single view hand-held echos perform well with high accuracy and sensitivity. This technology holds promise to scale early detection of RHD and prevent progressive valvar disease, heart failure and death. Field testing in endemic regions is a critical next step to evaluate how this technology can be best implemented.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1336 - EPIDEMIOLOGICAL AND CLINICAL CHARACTERISTICS OF PEDIATRIC PATIENTS WITH TAKAYASU'S ARTERITIS

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Introducion:
Takayasu's arteritis is an idiopathic granulomatous vasculitis of the aorta and its main branches, affecting 2 patients/million per year in the pediatric population, with a female to male ratio of 4.3:1. It is the leading cause of large vessel vasculitis in the pediatric population, and is one of the main causes of renovascular hypertension.

Objective:
To describe the demographic, epidemiological, clinical characteristics, and type of aortic and cardiovascular damage in patients with Takayasu arteritis, with manifestations beginning before 18 years of age.

Materials and Methods:
Retrospective study between 1988 and 2019. Patients who met the criteria for Takayasu arteritis according to the American College of Rheumatology were selected, and whose manifestations were detected before the age of 18. The clinical records were reviewed and the selected variables were: onset of symptoms, initial clinical manifestations, date of diagnosis, diagnostic criteria, types of angiographic lesion, presence of pulmonary and coronary lesions, surgical and interventional procedures, health status at the end of the study, and cause of death when it occurred.

Results:
Of the total number of patients who began to suffer from the disease in childhood, 42 (86%) reached adulthood and the median age was 36 (18-61). There were 4 deaths: 1. Ischemic cerebellar infarction with extension to the medulla oblongata. 2. Post-surgical hypovolemic shock. 3. Ischemic stroke of the middle cerebral artery. 4. Acute myocardial infarction and septic shock after the application of biological agents.

Conclusions:
The timely identification of Takayasu's arteritis in the pediatric age group is a challenge that requires clinical art and in-depth knowledge of the clinical and classification criteria. The timely diagnosis and treatment of this vasculitis in the pediatric age group leads to a better prognosis and a longer survival.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1404 - VITAMIN D LEVELS AND ITS CORRELATION WITH THE SEVERITY OF MITRAL VALVE INSUFFICIENCY IN RHEUMATIC HEART DISEASE PEDIATRIC PATIENTS A CASE CONTROL STUDY FROM EGYPT

Sahar S. Sheta [1], *Nadeen Eltoukhy* [2], Eman Abdelazim Sharaf [3], Dalia Mohamed Fouad [3], Hany William Z. Hanna [4], Manar A. El Desouky [3]
Cairo University, Giza, Egypt, Pediatric Cardiology Cairo University, Giza, Egypt, Cairo-Egypt [1] Cleveland Clinic Foundation, Pediatrics, Cleveland-United States [2] October 6 University, Giza, Egypt, Pediatrics, Cairo-Egypt [3] Cairo University, Giza, Egypt, Clinical And Chemical Pathology, Cairo-Egypt [4]

Background / Hypothesis:
Acute rheumatic fever (ARF) is an autoimmune response to B hemolytic streptococcal pharyngitis infection. Rheumatic heart disease (RHD), the permanent injury to the cardiac valves caused by ARF, is a major cause of morbidity and mortality in developing countries all over the globe. Vitamin D level has played a crucial role in the severity of mitral valve regurgitation (MVR) because of its immunomodulatory effects. The study aims to assess the levels of vitamin D in pediatric RHD patients with mild to severe MVR, and reporting the potential correlations between vitamin D levels and valve lesion severity.

Materials and Methods:
Fifty adolescents with confirmed RHD and fifty matched healthy controls diagnosed by 2-Dimensional Transthoracic Echocardiography were recruited from the Rheumatic Heart Disease Clinic at Cairo University Specialized, (EGYPT). Serum 25(OH)D concentrations were measured using dried blood spots and anthropometric measures were recorded to evaluate nutritional status. Logistic regression analysis was done to identify an association between vitamin D deficiency and the severity of MVR in RHD.

Results:
This prospective case-control cohort study, recruited 50 pediatric patients from the Rheumatic Heart Disease Clinic at Cairo University Specialized. The patients were prescribed long-acting penicillin (LAP) for RHD management. The mean age of RHD patients was 12.6+/-2.51 years with a 2:1 female-to-male ratio (62% versus 38%; respectively). There was an inverse weak correlation between vitamin D serum levels and the degree of MVR; however, the result was not statistically significant. Vitamin D levels showed a statistically significant association in patients who were compliant to LAP. All laboratory measures, apart from calcium, showed no statistically significant differences between trivial to mild and moderate to severe MVR cases.

Conclusions:
Vitamin-D can play a significant role in predicting severity of MVR. Future studies are required to further predict other nutritional and demographic factors in pediatric patients with variably severe RHD.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1412 - THE CHANGED CLINICAL PROFILE OF THE ACUTE RHEUMATIC FEVER IN THE POST COVID 19 ERA

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University Of Manitoba, Pediatrics, Winnipeg-Canada [1] Children, Pediatric Cardiology, Winnipeg-Canada [2]

Background:
While the COVID-19 pandemic overwhelmed healthcare systems and had devastating effects on global economy, health, and everyday life, there were also positive effects on infectious diseases of public health importance. An estimated 94% decrease in ARF cases in Manitoba, Canada from the impact of COVID-19 was recently published by our group, and was attributed to public health measures, including social distancing[1]. Herein, we sought to assess changes in clinical presentation and profile of ARF/RHD post-COVID-19 pandemic.

Methods:
This was a retrospective review of all cases of ARF/RHD in children aged 0–18 years in Manitoba, Canada, from 2021 to 2023; the only pediatric rheumatology and cardiology centre for Manitoba, Northwestern Ontario, and Kivalliq region of Nunavut. Diagnosis was based on revised Jones and echocardiographic criteria; disease severity was assessed using clinical and echocardiographic means. All reported ARF cases were assessed by pediatric rheumatology and cardiology and coded into cardiology and hospital databases.

Results:
Twenty-four patients were newly diagnosed with ARF between 2021 and 2023. Their ages ranged from 18 months to 17 years, with four children under 5 years. Carditis was present in 17 patients, moderate to severe carditis observed in 12. Two patients had Sydenham chorea; none had erythema marginatum or subcutaneous nodules.

Conclusion:
We observed a decline in the incidence of ARF during the COVID-19 pandemic, followed by a resurgence of ARF post-COVID-19. In comparison to preceeding and pandemic years, this resurgence was associated with changes in clinical manifestations, such as disease severity, and younger ages. Carditis appeared to be the dominant feature. While t no obvious factors explain this, we believe our observations are linked in part to relaxation of social distancing, increasing interpersonal transmission of GAS. This emphasizes that ARF has not been eradicated and is preventable. Further research is needed to explore the mechanisms underlying these changes, specifically exploring any changes in GAS epidemiology.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1679 - HEALTHY HEARTS VICTORIA AN INTEGRATED HEART HEALTH EDUCATION AND SCREENING PROGRAM FOR INDIGENOUS STUDENTS IN VICTORIA

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Background / Hypothesis:
Establish a collaboratively designed, community-led health and education program for cardiovascular and skin health for Indigenous young people. Describe the demographic details and prevalence of Rheumatic Heart Disease(RHD) in First Nations high school students boarding in Victoria, identified through a holistic heart health program. Describe the outcomes from the pilot program to establish evidence for the feasibility and acceptability of an education program, screening clinic and capacity-building program for Indigenous communities in Victoria.

Materials and Methods:
Retrospective study of 'Healthy Hearts' screening program, collaboratively designed with community. Annual education program, cardiology, skin-health and general paediatric assessment. Aboriginal and Torres Strait Islander high school students aged 11-18 years living in either of two boarding schools between January 2020 and December 2024 received an education program, echocardiographic screening by an expert cardiologist and sonographer, general paediatric review and counselling. Prevalence of definite or borderline RHD, based on World Heart Federation criteria. Prevalence of skin-health issues. An array of issues was discussed during the General Paediatric Consultation. Qualitative and quantitative assessment of student feedback, including knowledge and cultural safety.

Results:
161 clinical assessments were conducted between 2020 and 2024. 131 children were seen, with a median age of 13 years. 18 new cases of either borderline or definite RHD were found over the period of
2020-2024, with 4 previously identified cases. Prevalence of 4.58% for definite RHD (6 participants) and 12.2% for borderline RHD (16 participants). 38% had a history of Strep-related skin disease. From student questionnaires, student safety rating of 4.2/5, self-rated improvement in knowledge about ARF and RHD in 47% of young people.

Conclusions:
Community collaboration in developing a Healthy Hearts education and RHD screening program resulted in a strong partnership and culturally safe initiative. Boarding school students have traditionally missed out on local screening programs. Ongoing screening for high-risk adolescents should be considered.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1758 - PERSISTING GROUP A STREPTOCOCCAL ANTIBODIES IN RHEUMATIC HEART DISEASE (RHD) A SYSTEMATIC REVIEW

Caitlin-joy Meyer [1], Taariq Salie [1], Kimona Rampersadh [2], Kélin Engel [1], Mark E Engel [2]
Afrostrep Research Initiative, Cape Heart Institute, University Of Cape Town, Medicine, Cape Town-South Africa [1] Afrostrep Research Initiative, Cape Heart Institute, University Of Cape Town And Cochrane South Africa, South African Medical Research Council, Medicine, Cape Town-South Africa [2]

Background / Hypothesis:
Echocardiography, the gold standard for RHD diagnosis, has limited availability in resource-limited settings. Given that studies suggest that Group A Streptococcus (GAS)-specific antibodies persist in patients with RHD, there is, therefore, value in investigating the potential predictive value of GAS antibodies as a screening tool to aid in identifying at-risk individuals needing referral. This systematic review explores the evidence, from published literature, of the ongoing association, if any, of GAS antibodies in RHD patients versus control participants.

Materials and Methods:
This systematic review employed the "CoCoPop" framework. We performed a comprehensive database search and selected articles of any design that evaluated antibody levels against GAS-specific antigens in RHD participants compared to controls. Data were extracted using standardized forms, digitized, and analysed in Stata. Risk of bias was assessed using the Newcastle-Ottawa Scale (NOS).

Results:
The search yielded 399 articles; of these, ten comprising participants with confirmed RHD met with the inclusion criteria. Studies evaluated titres for M peptides (n=4 studies), Group A Carbohydrate (n=2), SLO (n=2), and DNase B (n=2). Variability in methods, units, and incomplete data (e.g., missing p-values, SEM/SD) precluded a meta-analysis. Nonetheless, data suggest a persistence of GAS-specific antibodies in RHD cases, with notably higher titres observed in cases compared to controls.

Conclusions:
This review highlights the persistence of GAS-specific antibodies in RHD patients vs. control participants. However, most studies predated 2000, revealing a need for updated research to confirm their role in more diverse populations, provide further insight to their diagnostic utility.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1774 - RELATIONSHIP BETWEEN ACUTE RHEUMATIC FEVER AND PARASITE INFECTION IN MALAWI (THE WORM HEART STUDY)

Amy Sanyahumbi [1], Yamikani Chimalizeni [2], Treasure Mkaliainga [3], Norbert Kamchembere [3], Manley Kamija [4], Msandeni Chiume [3], Morgan Jibowu [5], Tayamika Tambala [6], Maya Murray [5], Rojelio Mejia [5], Mina Hosseinipour [7], Kristy Murray [8], Sarah Gunter [5]
Texas Children, Pediatrics - Cardiology, Houston-United States [1] Queen Elizabeth Central Hospital, Pediatrics - Cardiology, Blantyre-Malawi [2] Kamuzu Central Hospital, Pediatrics, Lilongwe-Malawi [3] University Of North Carolina - Malawi, , Lilongwe-Malawi [4] Texas Children, Pediatrics - Tropical Medicine, Houston-United States [5] Texas Children, Baylor Centre Of Excellence, Lilongwe-Malawi [6] University Of North Carolina, Infectious Disease, Lilongwe-Malawi [7] Emory University, Pediatrics, Atlanta-United States [8]

Background / Hypothesis:
Rheumatic heart disease (RHD) is the leading cause of acquired cardiac morbidity in young people worldwide. We hypothesized that immune dysregulation due to parasitic infection may be a driving factor in the development of acute rheumatic fever (ARF) after strep infection.

Materials and Methods:
We employed a case-control design, and prospectively recruited patients with ARF (ages 5-18 years) from eight health centers and one central hospital in Malawi, as well as healthy controls from nearby schools. ARF was diagnosed using Jones criteria. Blood, urine, and stool samples were collected from all participants. Urine microscopy was performed to evaluate for schistosomiasis. Extracted DNA from stool was evaluated by PCR for Schistosoma, Blastocystis, Giardia, Strongyloidiasis, and other parasites.

Results:
201 participants were enrolled, including 36 ARF cases and 165 controls. The mean age was 10.4 ± 3.2 years, with no difference between groups (p = 0.96). Males comprised 51% of cases and 43% of controls (p = 0.93). 79% of participants tested positive for at least one parasite. These included Schistosoma (cases: 14%, controls:19%; p = 0.44), Blastocystis (cases: 78%, controls: 91%; p = 0.02), Giardia (cases: 31%, controls: 57%; p = 0.002), and Strongyloidiasis (cases: 3%, controls: 0%; p = 0.18).

Overall, controls had 5.3 times the odds of having a stool pathogen compared to ARF cases (p = 0.03). After adjusting for seasonality, controls were more likely to have Giardia (OR: 2.8, 95% CI: 1.3 - 6.3) and Blastocystis (OR: 3.8 (95% CI: 1.4 – 11) compared to patients with ARF.

Conclusions:
Controls were more likely to have Giardia and Blastocystis than ARF cases. Our study may not have been powered to detect subtle associations. We are currently analyzing cytokine and immune profiles of our cases and controls which may shed further light on immune system priming for ARF.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1803 - RHEUMATIC HEART DISEASE IN SOUTH AFRICA THE IMPACT OF THREE DECADES OF DEMOCRACY

Laylah Ryklief [1], Kimona Rampersadh [1], Mark E Engel [2], Liesl J Zuhlke [3]
University Of Cape Town, Paediatrics And Child Health, Cape Town-South Africa [1] South African Medical Research Council, Sa Cochrane Centre, Cape Town-South Africa [2] South African Medical Research Council, Office Of The Vice-president,, Cape Town-South Africa [3]

Background / Hypothesis:
Post-apartheid South Africa has made steady progress leading towards the 2030 targets of Sustainable Development Goal 3, seeking to ensure healthy lives and promote well-being for all ages. Rheumatic heart disease (RHD), a sequel of group A streptococcal (GAS) infection, is a major contributor to cardiovascular mortality and morbidity in South Africa, as documented in a 2014 review. We report on national burden of disease estimates and availability of key components of South Africa's RHD control programme over the last decade according to a published protocol.

Materials and Methods:
We searched six databases (2014-2025) for South African studies on GAS infections, rheumatic fever and RHD. Screening, data extraction and critical appraisal were conducted independently by two reviewers. Analyses were performed using the 25 domains of the Core Conceptual Framework for Comprehensive RHD Control. PROSPERO registration number: CRD42023392782.

Results:
We included 181 studies. Definite RHD had a pooled prevalence of 6.18(95%CI: 3.75-10.18) per 1000 (n=9901;5 community-based studies). RHD accounted for 40% of infective endocarditis (n=766;8 studies) and 11.29% of heart failure (n=417;3 studies). Cause-specific mortality rate per 100,000 population decreased from 0.56(95%CI: 0.48-0.64) in 2014 to 0.34(95%CI: 0.33-0.34) per 100,000 reported by Stats SA in 2020. Pooled estimates for post-operative mortality for valve surgery was 2.83%(95%CI: 1.48-5.36) at 30 days (n=366;4 studies) and 10.68%(95%CI: 5.4-20.02) >60 days (n=234;3 studies). Across the 25 domains, adequate information was found for GAS diagnosis/treatment guidelines, secondary prophylaxis, and medical management. Only one domain, tertiary priority-based follow-up, was unrepresented in the literature.

Conclusions:
The prevalence of asymptomatic RHD has decreased in South Africa in the past decade. Post-surgical morbidity and mortality remain low, RHD continues to contribute to heart failure and infective endocarditis. Mortality attributed to RHD continues to fall at a population level, suggesting that post-apartheid efforts to address social determinants of health have helped reduce the disease's overall impact.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1862 - GLOBAL LONGITUDINAL STRAIN A NOVEL PREDICTOR OF POSTOPERATIVE OUTCOMES IN CHILDREN UNDERGOING RHEUMATIC VALVE SURGERY

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Sri Padmavathi Children's Heart Centre, Pediatric Cardiology, Tirupathi-India [1]

Background / Hypothesis:
Valve surgery in patients with pediatric rheumatic heart disease are challenging owing to the complexities involved in the anatomy and hemodynamics. Relying on left ventricular dimensions and ejection fraction is misleading as the ventricle continues to have a normal EF till late stages. Early intervention in these patients might reduce the long term morbidity, need of re operations and mortality. Strain imaging using speckle tracking and peak GLS have been studied in adult valve repairs and found to predict long term outcome

Materials and Methods:
Our study utilizes peak GLS measured in the preoperative period to study the immediate and short term post operative outcomes. 19 consecutive children who underwent surgery for rheumatic heart disease were studied.Pre operative clinical status,type and duration of surgery, duration of post operative stay, inotrope duration and vasoactive inotrope score were noted. Peak GLS of all these patients was recorded in the pre operative period, one month, 3 months,6months and 1year post surgery. The peak GLS value which predicts morbidity was obtained by an ROC curve.

Results:
In a study population of 19 children,3 patients underwent mitral valve replacement, where as all the other children underwent repair. A peak GLS value of <-15% was associated with longer post operative ventilation and inotrope requirement. Even all these children had a normal EF of >60% in the preop assessment, post operative LV EF was low in all the patients, making GLS a better predictor to outcomes as compared to LV EF

Conclusions:
All the children showed steady improvement in GLS after surgery, however the change is marked in children with better preop GLS >-15%. The mean GLS of this sub group of children reached normal value of >-21% at the end of one year, where as the subgroup still has lower GLS (-16%) at the end of one year.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1947 - CLINICAL PROFILE AND OUTCOMES OF CHILDREN WITH HEART FAILURE FROM RHEUMATIC HEART DISEASE ADMITTED TO A TERTIARY HOSPITAL A CROSS SECTIONAL STUDY IN A LOWER MIDDLE INCOME COUNTRY

Patricia Isabel De Leon [1], Maria Concepcion Sison [1], Edison Ty [1]
Philippine General Hospital, Division Of Pediatric Cardiology, Manila-Philippines [1]

Background / Hypothesis:
Heart failure from Rheumatic Heart Disease (RHD) remains a significant cause of morbidity and mortality among children in developing countries. Country-specific research on the determinants of morbidity and mortality in RHD, including use of interventions and resources, can inform not only individual patient therapy but also national policy in LMICs.

Materials and Methods:
A retrospective analysis was conducted on 115 pediatric patients with heart failure due to RHD receiving urgent care in a tertiary hospital between January 2019 and December 2023.

Results:
The cohort had a median age of 13 years. 58.3% were previously undiagnosed. 85.2% presented with moderate to severe heart failure. 36.5% were admitted for active rheumatic disease. Among those previously diagnosed, 33% adhered to secondary prophylaxis. The in-hospital mortality rate was 27.8%. The presence of pneumonia, renal and hepatic affectation, severe mitral stenosis, depressed ventricular function, intubation, and heightened inotropic requirement were linked to elevated mortality risk. Survivors faced a 32.3% re-hospitalization rate. Valve intervention was indicated in all patients but was performed in 11.3% for heart failure unresponsive to medical management, infective endocarditis, and systemic embolization.

Conclusions:
Children with severe heart failure from RHD are at risk for repeated hospitalizations and death. Timely access to surgical or catheter-based interventions is crucial to improve outcomes.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

1990 - CIRCULATING INFLAMMATORY FACTORS AND BIDIRECTIONAL MENDELIAN RANDOMIZATION ANALYSIS IN PATIENTS WITH KAWASAKI DISEASE

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Background / Hypothesis:
Kawasaki disease (KD), also known as mucocutaneous lymph node syndrome, is a systemic immune vasculitis with an unclear etiology. It is often complicated by coronary artery disease. This study uses bidirectional Mendelian randomization (MR) to investigate the interaction between KD and circulating inflammatory factors, providing insights into their causal relationships.

Materials and Methods:
We conducted a two-way pooled MR analysis to examine the causal links between 41 circulating infammatory regulators and the risk of KD. Genetic data related to infammation were sourced from three genome-wide association studies (GWASs) involving CRP, PCT, and cytokines, while KD data were derived from other studies. Inverse-variance weighting (IVW) was the primary MR method, with sensitivity analyses performed using MR–Egger, weighted median, weighted mode, and MR–PRESSO to ensure robustness.

Results:
Forward MR analyses showed no signifcant relationship between infammatory factors and KD outcomes. In contrast, reverse MR, with KD as the exposure factor, revealed that interleukin-2 (IL-2) and interleukin-8 (IL-8) were signifcantly associated with KD (IL-2: OR=1.0085, P=0.037; IL-8: OR=1.0099, P=0.014). Borderline signifcant associations were observed for factors such as B_NGF, EOTAXIN, HGF, and IL_12_P70 in MR–Egger and weighted median analyses.

Conclusions:
This bidirectional MR study highlights the role of circulating infammatory modulators in KD risk, offering insights into KD pathogenesis and potential therapeutic targets.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

2063 - STREPTOCOCCAL PHARYNGITIS IN CHILDREN IN SELECTED CLINICS IN GABORONE BOTSWANA

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Background / Hypothesis:
Group A β-haemolytic Streptococcus (GAS), also known as Streptococcus pyogenes, commonly causes childhood pharyngitis and can lead to severe complications like acute rheumatic fever (ARF) and rheumatic heart disease (RHD). Timely penicillin treatment is vital in preventing these issues. However, data on the prevalence of GAS pharyngitis in Botswana is limited, and there is no national surveillance for GAS infections. This study aimed to determine the prevalence of GAS pharyngitis among children aged 3 to 16 years presenting with sore throats in selected Gaborone clinics and assess the antibiotic sensitivity patterns of GAS isolates.

Materials and Methods:
A cross-sectional study was conducted among children aged 3–16 years suspected of pharyngitis at Nkoyaphiri and Mafitlhakgosi clinics in Gaborone. Participants were selected based on a modified Centor score ≥ 2. Throat swabs were processed for culture, identification, and antibiotic sensitivity testing.

Results:
The prevalence of GAS pharyngitis was 7.5% (24/322; 95% CI: 0.50–0.11%). The mean age of the participants was approximately 12 years. GAS isolates remained fully susceptible to penicillin, the treatment of choice, but concerns about macrolide resistance were observed in some strains.

Conclusions:
Although the prevalence of GAS pharyngitis among children with sore throats in Gaborone is relatively low, addressing the lack of systematic data collection and implementing a surveillance program are essential steps toward reducing the burden of streptococcal diseases and their complications in Botswana.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

2131 - HALOPERIDOL IN THE MANAGEMENT OF SYDENHAM CHOREA A CASE REPORT FROM A TERTIARY CARDIAC HOSPITAL IN INDONESIA

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Background / Hypothesis:
Sydenham chorea (SC) is a neurologic complication of acute rheumatic fever. Although its global incidence has declined, it remains a concern in regions with a high burden of rheumatic heart disease, including Indonesia. Currently there is no recognized guideline in managing the SC. This report describes haloperidol use for effective symptom relief in an Indonesian case.

Materials and Methods:
An 11-year-old girl presented to our hospital with uncontrollable movements of the hands and legs, accompanied by joint pain. She had a history of rheumatic heart disease with prior ICU admission. Physical examination revealed a 3/6 pansystolic murmur radiating to the axilla. Echocardiography showed moderate mitral regurgitation due to posterior mitral leaflet prolapse. She fulfilled 2 major (carditis, SC) and 2 minor (arthralgia, elevated ESR) Jones criteria. Brain computed tomography scan revealed a suspected hypoxic lesion in the right parietal subcortex. During hospitalization, choreiform movements worsened and were treated with haloperidol 0.5 mg twice daily and phenytoin 50 mg twice daily, alongside phenoxymethylpenicillin and methylprednisolone. Symptom improvement was noted following treatment. She was discharged following a 26-day hospital stay after improvement was seen clinically.

Results:
We primarily treated the patient with haloperidol, which has been historically used for SC. Haloperidol directly blocks dopamine receptor activity, alleviating the chorea. It is considered effective, with clinical improvement often observed within a few days of initiation, as seen in this case. Furthermore, it's readily available and cost-effective. Although severe side effects have been reported, no side effects were observed in this patient.

Conclusions:
Haloperidol can be a practical treatment option for SC, especially in resource-limited settings. However, careful monitoring is essential to detect and manage potential adverse effects.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

2174 - RELATIONSHIP BETWEEN CHANGES IN RESPIRATORY VIRUS BEFORE AND AFTER COVID 19 AND THE OCCURRENCE OF KAWASAKI DISEASE

Dong Deok Lee [1], Seong Man Cho [1], Doo Kwon Kim [1]
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Background / Hypothesis:
KD is well known as an immune disease associated with infectious diseases. COVID-19, which occurred in 2019, brought significant changes to the outbreak of infectious diseases due to social isolation and strengthening of personal hygiene. The author sought to investigate the relationship between changes in the occurrence of respiratory virus before and after the outbreak of COVID-19 and the occurrence of KD.

Materials and Methods:
Data from 13,434 patients hospitalized for KD from 2019 to 2022 were used using the open access big data system of Health Insurance Review and Assessment, and the relationship between the change in the frequency of respiratory viral disease before and after the occurrence of COVID-19 and the occurrence of KD disease was investigated using the monthly incidence of viral disease of Korea Disease Control and Prevention Agency.

Results:
The frequency of respiratory viral disease has decreased significantly compared to before the COVID-19 outbreak. Human bocavirus, RS virus, human coronavirus, and enterovirus decreased significantly and returned to the same pattern as in 2019 from the fall of 2021. The relationship between the occurrence of KD and each virus, there was no significant correlation between the occurrence of KD and respiratory virus in 2019. The total number of viral diseases decreased significantly in 2020, but it was found to be proportional to the increase and occurrence of KD in the cases of adenovirus, parainfluenza virus, RS virus, rhinovirus, human metapneumovirus, human coronavirus, and enterovirus.. The number of patients with KD increased in proportion to the occurrence of enterovirus in 2021, RS virus and human metapneumovirus in 2022.

Conclusions:
The COVID-19 epidemic has brought about changes in the prevalence pattern of viral diseases. During the COVID-19 period, there was a deep correlation between the increase in specific viruses and the occurrence of KD, but it is believed

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2188 - COMPARISON OF MULTIPLE DOSES OF CORTICOSTEROIDS IN KAWASAKI DISEASE A BAYESIAN NETWORK ANALYSIS

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Background / Hypothesis:
To compare the effectiveness and safety of three corticosteroid doses used as initial or rescue adjunctive treatment in children with Kawasaki disease (KD).

Materials and Methods:
A comprehensive literature search was conducted to identify relevant studies from electronic databases from their inception until December 30, 2024. A Bayesian Network Analysis was performed on a total of 4761 patients to evaluate the effectiveness and safety of low-dose, medium-dose, and high-dose corticosteroids.

Results:
The analysis revealed that low-dose corticosteroids + IVIG therapy was ranked as the most effective treatment for preventing treatment resistance, reducing fever, and managing initial treatment and refractory KD. High-dose corticosteroids + IVIG therapy had the highest probability of reducing the risk of coronary artery aneurysm (CAA). However, high-dose corticosteroids + IVIG therapy was associated with a higher incidence of hypertension. Medium-dose corticosteroids had the highest probability of causing bradycardia.

Conclusions:
Low-dose corticosteroids + IVIG therapy was found to be the most effective approach for reducing fever in KD patients. However, for reducing the incidence of CAA, high-dose corticosteroids + IVIG therapy was ranked best. These findings may help clinicians in choosing the most appropriate corticosteroid dose for KD patients based on their clinical characteristics.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

2374 - THE USE OF GLUCOCORTICOIDS IN IMMUNOGLOBULIN RESISTANT KAWASAKI DISEASE A COHORT STUDY

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Background / Hypothesis:
The treatment of intravenous immunoglobulin-resistant Kawasaki disease (IVIGRKD) is still controversial, and few studies investigate using glucocorticoids (GCs) alone as rescue therapy for Kawasaki Disease (KD) patients. This study aimed to investigate the efficacy of using GCs alone as rescue therapy in IVIGRKD patients and to further explore the appropriate GCs dosage.

Materials and Methods:
We enrolled 210 IVIGRKD diagnosed in our hospital and conducted a cohort analysis. Patients were divided into the IVIG group, IVIG + GCs group, and the GCs group. The GCs group was further divided into GCs A group(10-15mg/kg/d) and GCs B group(1-4mg/kg/d). Clinical outcomes and changes in coronary arteries after the treatment during a one-year period were observed. Propensity-score matching and logistic regression analyses were used to make the comparison.

Results:
1. After propensity-score matching, the therapeutic response rate in the GCs group was significantly higher than that in the IVIG group (51/56 VS. 39/56, P =0.004). And there was no significant difference between the IVIG group and IVIG +GCs group and between the GCs group and IVIG+ GCs group. We further compared various doses of GCs and didn't find a significant difference.
2. After logistic regression analysis, it was found that the therapeutic response rate in the GCs group was significantly higher than in the IVIG group (P =0.001). In the meantime, the therapeutic response rate was significantly higher in the IVIG+GCs group than in the IVIG group (P =0.01). However, there was no significant difference between the GCs and IVIG+GCs groups. Different doses of GCs (10-15 mg/kg/d and 1-4 mg/kg/d) were also not significantly correlated with the treatment efficiency.
3. There was no significant difference in preventing CALs between different groups.

Conclusions:
Single-GCs therapy is a viable option for patients who do not respond to IVIG, and a dosage of 1-4mg/kg/d of GCs is typically sufficient.

POSTER PRESENTATIONS

Category: Rheumatic Heart Disease

2472 - PEDIATRIC RHEUMATIC CARDITIS IN A SUPPOSED LOW INCIDENCE COUNTRY A DIAGNOSTIC CHALLENGE THAT STILL EXISTS

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Background / Hypothesis:
Rheumatic carditis is still prevalent in low- and middle-income countries, but its occurrence in high-income countries is rare and often unexpected. Delayed recognition can lead to irreversible valvular damage. We report our recent experience in a pediatric cardiology center in a low-incidence setting.

Materials and Methods:
From January 2022 to June 2025, all patients admitted to our pediatric cardiology unit with newly diagnosed rheumatic carditis were reviewed. Clinical presentation, ECG findings, echocardiographic data, laboratory results, treatment, and outcomes were analyzed.

Results:
Eight patients (age range 7–15 years, median 9.5; 5 females) were identified. All presented with fever, migratory polyarthritis, and cardiac murmurs. ECG abnormalities included PR prolongation in three cases and complete atrioventricular block in two (one in a 9-year-old girl with delayed diagnosis). Echocardiography showed mitral regurgitation in all patients; three also had mild aortic regurgitation. One 9-year-old patient with both mitral and aortic regurgitation presented with tachycardia, elevated C-reactive protein, and PR prolongation. All patients had elevated inflammatory markers and serological evidence of recent group A β-hemolytic streptococcal infection. Treatment with corticosteroids and strict bed rest led to clinical and biochemical improvement in all cases. Most patients were referred from non-specialized centers, where rheumatic fever had not been initially suspected.

Conclusions:
Rheumatic carditis, though rare in high-income countries, still occurs and may present with conduction abnormalities or multivalvular involvement. Pediatricians and cardiologists in low-incidence settings should remain vigilant and include rheumatic fever in the differential diagnosis of unexplained cardiac symptoms. Early detection with antibiotic and anti-inflammatory treatment remain crucial to prevent long-term valvular sequelae.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1012 - PROJECT MEND A LITTLE HEART BUILDING SUSTAINABLE PROGRAMS IN UNDERSERVED COUNTRIES

Angela Hartley [1], Sara Holst [2], Pierre Wong [3]
Mt Sinai, Or, New York-United States [1] Chla, Or, Los Angeles-United States [2] Chla, Cardiology, Los Angeles-United States [3]

Background
Medical missions have become a frequent occurrence in underserved countries, with many different models and strategies being implemented. Significant problems have been reported from host countries, such as a lack of continuity with planning and preparation, outcomes-only driven missions, low community impact, and lack of education for the local medical and nursing staff. Project Mend a Little Heart (MLH) was developed with the intention of collaborative teaching and furthers the goal of creating a sustainable pediatric cardiac program. Project MLH has successfully used an integrated teaching model to build programs in Vietnam, Ecuador, El Salvador, and Honduras.

Methods
Rotary Clubs in underserved countries are identified in collaboration with Gift of Life International (GOLI). During mission preparation, optimal case selection and education are the priorities. Communication between the MLH cardiologist, Dr Pierre Wong (PW), and the local cardiologist initiates the screening and collaborative education process. Cases are discussed, and echocardiograms and other available medical/imaging data are reviewed, resulting in a final list of between 10 and 15 children, with the goal of ten surgeries performed over five working days.

Results
Since 2004, MLH has helped build programs in Vietnam, Ecuador, El Salvador, and Honduras. These programs can now operate independently of mission groups. The first location was Hue, Vietnam. Exact data is not available for Vietnam, but the best estimate is that each center for children does approximately 1000 cases per year. El Salvador performed 250 pediatric cases in 2022.

Conclusion
Over the past 20 years, Project MLH and GOLI have performed successful medical missions in many countries, and they are currently continuing their work in Amman, Jordan. The collaborative teaching model provides a sustainable foundation that allows the host institutions to perform independently and furthers knowledge throughout the globe.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1033 - GLOBAL TRENDS AND RESEARCH HOTSPOTS IN LEFT VENTRICULAR NONCOMPACTION AND EXCESSIVE TRABECULATION A BIBLIOMETRIC ANALYSIS (2005–2024)

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Background / Hypothesis:
Left Ventricular Non-Compaction (LVNC), a rare form of cardiomyopathy, is characterized by distinct myocardial abnormalities and associated with severe complications such as heart failure, arrhythmias, and sudden cardiac death. These conditions present substantial challenges to global healthcare systems.

Materials and Methods:
This study conducted a detailed bibliometric analysis to explore the research trends and advancements in LVNC and Excessive Trabeculation (ET) using tools like the Bibliometrix R package, VOSviewer, and CiteSpace.

Results:
The analysis encompassed 1,155 publications from 2005 to 2024, revealing a steady upward trend in research output, with the highest number of publications (92) recorded in 2022. Citation data from 2018 to 2021 indicated heightened research interest during this period. The United States emerged as the most active contributor, with China, Australia, and Italy also playing significant roles, highlighting extensive global collaborations. Key institutions such as the University of London and the Chinese Academy of Medical Sciences were pivotal in advancing this field. Influential journals, particularly the International Journal of Cardiology, served as primary platforms for disseminating findings. The analysis also identified Josef Finsterer as a leading author in this area. A keyword co-occurrence analysis revealed evolving research themes, focusing on cardiac genetics, advancements in diagnostic techniques, and the broader understanding of LVNC and ET.

Conclusions:
Despite these developments, gaps remain in addressing management strategies and long-term outcomes. This study offers a comprehensive overview of the current research landscape, providing actionable insights to foster international collaboration and guide future investigations aimed at improving diagnosis, treatment, and understanding of these complex cardiomyopathies.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1035 - ANTIBIOTIC PROPHYLAXIS ADHERENCE IN PATIENTS WITH CONGENITAL HEART DISEASE IN KOREA A NATIONWIDE COHORT STUDY

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Background / Hypothesis:
Infective endocarditis (IE) is a life-threatening condition. In 2007, the American Heart Association (AHA) restricted antibiotic prophylaxis (AP) to invasive dental procedures for high-risk individuals only. This study examines adherence to these guidelines in Korea.

Materials and Methods:
Data from the National Health Insurance Service System (NHISS) (2002–2022) were analyzed to identify patients with specific congenital heart disease subtypes, including ventricular septal defect (VSD), atrial septal defect (ASD), tetralogy of Fallot (TOF), and those with prosthetic valves (PV) using Korean Classification of Diseases (KCD-9) codes. Dental treatments within 14 days were grouped as a single episode, with a new episode initiated if AP was prescribed within this period. Dental procedures were classified as invasive or noninvasive, and AP was defined as a single dose of amoxicillin prescribed within 7 days before a dental procedure. Risk periods were assigned based on CHD subtype and time since surgery. AP appropriateness was assessed using AHA guidelines, and logistic regression identified factors associated with inappropriate AP use.

Results:
Among 35,386 dental visits from 14,257 patients, 21,097 (59.6%) involved invasive procedures. Appropriate AP was used in 7,491 visits, while 27,895 (78.8%) involved inappropriate AP use. Inappropriate prescriptions were more common in younger patients (median age: 9 years; $p < 0.001$), with 76.1% of cases occurring in the 0–19 age group. The highest rates of inappropriate prescriptions of AP were noted in pediatric dentistry departments and smaller medical facilities. Over time, inappropriate AP use decreased significantly, with an odds ratio of 0.73 (95% CI:0.67–0.79) for 2018–2022 compared to 2008–2012.

Conclusions:
Adherence to AHA guidelines remains low in Korea, particularly among pediatric patients and in smaller medical facilities. Although inappropriate AP use has decreased over time, targeted education and awareness programs are essential to improve adherence and reduce unnecessary prescriptions.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1050 - INFECTIVE ENDOCARDITIS IN CHILDREN WITH HEART DISEASES AT JAKAYA KIKWETE CARDIAC INSTITUTE TANZANIA A CROSS SECTIONAL STUDY.

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Background / Hypothesis:
Infective endocarditis (IE) in children with pre-existing heart conditions is a life-threatening disease entity associated with significant morbidity and mortality. In our cardiac setting, the management outcomes of children with IE are not well documented. We therefore aimed to document the clinical profile and treatment outcomes of children with IE attended at the Jakaya Kikwete Cardiac Institute (JKCI).

Materials and Methods:
This was a hospital-based cross-sectional study with longitudinal follow-up conducted among children with IE diagnosed by Modified Duke's Criteria at the JKCI from November 2021 to November 2023. A structured questionnaire was used to collect patients' socio-demographic and clinical data.

Results:
During the study period, 1,546 children were admitted to the JKCI. A total of 30 children with IE were enrolled, of these half (n=16, 53%) were aged 10 to 18 years, with a median of 10 yrs (Inter quartile range, IQR: 6.5-12.2 yrs). Twelve children (40%) and nearly half (n=14, 47%) had fever and used antibiotic therapy respectively. Majority of participants had anaemia (n=26, 87%) and heart failure (n=21, 70%). Nine children (30%) had positive blood cultures and S. aureus was the most frequently isolated organism (n=7). Ten patients (33%) developed acute kidney injury (AKI), and eleven (37%) children died during the hospital stay.

Conclusions:
In our setting, in-hospital mortality due to IE among children with heart diseases is high. Heart failure and anaemia were the common presentations of IE. Furthermore, AKI was observed to be the leading in-hospital non-cardiac complication.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1061 - COST AND COST EFFECTIVENESS OF A 5 YEAR PROGRAM TO DETECT CRITICAL CONGENITAL HEART DISEASE AT BIRTH IN THE SUB SAHARA AFRICA COUNTRIES

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Background / Hypothesis:
Low-and Middle-Income Countries (LMIC) have scarce resources, and their health allocations should be determined by the expected Cost-Effectiveness (CE) of an intervention. Congenital heart disease advocacy demands tools destined to demonstrate such CE.

Materials and Methods:
We developed a free-access calculator to estimate the CE of a Pulse-Oximetry based 5-year program aimed at screening for Critical Congenital Heart Disease (CCHD) at birth in any country.

Our CE calculator makes several assumptions: No inflation of supplies and labor during the 5-year program; All births being institutional; All hospital-quality pulse-oximetry devices must be bought anew. It also assumes a 20% incidence of CCHD with a 100% detection rate, and a 10% surgical mortality rate. Based on published data, this calculator uses 39.9y as the average DALYs averted per surviving treated patients.

Equipped with this calculator and using 2022 data, we estimated the cost of a 5y CCHD screening program in the 48 countries of Sub-Sahara Africa (SSA) region.

Results:
The calculated incidence of congenital heart disease for the SSA region was 340,632 newborns/year for 2022, with an estimated CCHD incidence of 68,126 children.

Overall cost of a CCHD detection program would be USD $60 566 077. The median cost per patient detected would be USD$188 (IQR $43). If surgical treatment was widely available, the median cost/effectiveness per DALY averted by the program would be USD $5 (IQR $1). Making a program like this Highly Cost-Effective even for the poorest countries in SSA.

Conclusions:
Research in Cost-Effectiveness may prove fundamental in the ability to influence the decision makers in LMIC and facilitate the development of congenital heart disease detection programs.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1065 - CLINICODEMOGRAPHIC LABORATORY PROFILE TREATMENT RESPONSE AND OUTCOME OF CONGENITAL HEART DISEASE PATIENTS WITH INFECTIVE ENDOCARDITIS A 15 YEAR STUDY IN A TERTIARY PEDIATRIC GOVERNMENT HOSPITAL

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Background / Hypothesis:
Congenital heart disease (CHD) is the most common predisposing factor for infective endocarditis (IE) in children. Locally, there is paucity of data on the burden, clinicoepidemiologic spectrum, and outcomes of CHD patients with IE.

Materials and Methods:
This descriptive study reviewed the charts of 36 CHD patients with IE who fulfilled the eligibility criteria at the National Children's Hospital between January 2008 to June 2023. Accordingly, pertinent data were abstracted from the medical records.

Results:
The male to female ratio was 1:1. IE was seen in pediatric age groups and in all CHD lesion groups. The majority of our cases had uncorrected CHD lesions (80.56%) and no history of surgical intervention (91.67%). Fever was the predominant clinical presentation (36.11%); vegetation was present in 97.22% of cases; and leukocytosis was the most common laboratory finding (77.78%). The predominant associated complication was pneumonia (52.78%). The most common causative microorganisms isolated in our study population were Enterococcus, Burkholderia, and Candida. Twenty Five percent of the total patients were treated with Penicillin G + Amikacin. All patients were managed medically. In terms of clinical outcomes, about 22.22% expired, 66.67% were discharged as improved, while 11.11% opted for HAMA. The mean length of hospital stay was 39.75 days.

Conclusions:
In clinical practice, pediatricians should pay close attention to the clinicodemographic profile and dynamic changes of laboratory results, treatment response and outcomes of CHD patients with IE. These findings help identify opportunities for the detection, risk stratification, primary prevention, referral system, and treatment strategy aimed at improving clinical outcomes.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1104 - ASSESSMENT OF CONGENITAL HEART DISEASE AND GENETIC DYSMORPHOLOGY IN MARRAKECH MOROCCO

Lucas Heilbroner [1], Kristina Woodis [1], Nadia Elidrissi [2], Drissi Boumzebra [3], Christina Grant [4], Faisal Al Munajjed [5], Xinyang Liu [5], Christina Yang [6], Marius Linguraru [5], Craig Sable [7]
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Background / Hypothesis:
Pediatric cardiac pathology in resource-limited settings presents unique challenges due to limited diagnostic resources and late presentations. This study aimed to describe the spectrum of cardiac pathologies and dysmorphology observed in children aged 0–18 at Mohamed VI Hospital, a public hospital in Marrakesh, Morocco. The research was conducted as part of a collaborative effort between local pediatricians, neonatologists, and a visiting team of pediatric cardiologists and geneticists from Children's National Hospital, with the broader goal of improving early identification and risk assessment for cardiac conditions in limited-resource settings.

Materials and Methods:
Patients in the pediatric cardiology clinic or emergency department at Mohamed VI Hospital between May and July 2024 were included. Data were collected on cardiac diagnoses (based on echocardiography), demographic information, and genetic diagnoses. Dysmorphology assessments were performed through clinical evaluations by a visiting geneticist (in person and using systematic acquisition of digital photos).

Results:
A total of 326 pediatric cases were included, comprising 147 females and 178 males, with a mean age of 3.53 years (±4.70). Of these, 157 had cardiac disease including ventricular septal defect (34), atrial septal defect (23), atrioventricular septal defect (10), patent ductus arteriosus (28), tetralogy of Fallot (9), aortic stenosis (11), coarctation (1), cardiomyopathy (6), transposition of the great arteries (3), double outlet right ventricle (5), mitral valve/RHD (11), pulmonary stenosis (5), and single ventricle (11). Dysmorphic features were present in 78/157 (50%) of cases with heart disease and 32/169 (19%) of non-cardiac cases ($p < 0.0001$).

Conclusions:
This study provides a snapshot of pediatric cardiac pathology in a resource-limited setting and highlights the high prevalence of dysmorphology in this population. Resources are needed to provide ready access to genetic diagnoses in this population.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1106 - GLOBAL SURVEY OF ACCESS TO GENETIC SERVICES IN PEDIATRIC CARDIOLOGY CLINICS

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Background / Hypothesis:
Integrating genetic services into pediatric cardiology is essential, yet access to testing, counseling, and multidisciplinary care varies widely. This survey aims to identify access gaps, assess current practices, and explore cardiologists' interest in telemedicine and AI-based tools to enhance genetic integration.

Materials and Methods:
A global, cross-sectional survey will be distributed via email and QR code to cardiologists practicing in academic centers, public hospitals, and private clinics across regions with varying levels of access to medical resources. The survey will be administered via Google Forms and offered in English, Cantonese, Mandarin, Spanish, Portuguese, French, and Arabic to ensure accessibility. The sample will include cardiologists from high-, middle-, and resource-limited settings, with representation from North America, South America, Africa, Europe, Asia, and the Middle East.

The survey combines quantitative and qualitative components to assess (1) access to genetic testing and geneticists, (2) utilization of services, (3) confidence in managing genetic cardiovascular conditions, and (4) interest in AI tools. Quantitative data will be collected through Likert scales and multiple-choice items; qualitative data through open-ended questions on barriers, resource needs, and AI integration.

Responses will be stratified by geographic region, practice setting, and resource availability. Descriptive statistics, including frequencies and proportions, will summarize quantitative responses. Comparative analyses will be conducted using chi-square tests for categorical variables and Kruskal-Wallis tests for ordinal data. Thematic analysis will identify key barriers and opportunities for integrating genetic services and AI tools, providing insight into challenges and facilitators across diverse healthcare settings.

Conclusions:
Understanding genetic syndromes and their complexities is critical for improving patient outcomes, as it enables earlier diagnosis, personalized treatment, and better management of cardiovascular conditions. By identifying access gaps and evaluating interest in AI tools, this study aims to inform strategies to integrate genetic services and technology into cardiology care—especially in resource-limited settings—and reduce disparities.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1133 - BRIDGING THE GAP IN CRITICAL CONGENITAL HEART DISEASE DIAGNOSIS THE ROLE OF PULSE OXYMETRY IN TANZANIAN NEWBORNS

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Background / Hypothesis:
Early detection of Critical Congenital Heart Disease (CCHD) reduces infant mortality. Pulse oximetry (POX) is widely used in high-resource settings but remains under-researched in sub-Saharan Africa. This study evaluated the diagnostic accuracy of POX in screening Tanzanian newborns for CCHD.

Materials and Methods:
A prospective cohort study was conducted in two hospitals in Dar es Salaam, Tanzania. Pre- and post-ductal oxygen saturation (SpO2) readings were taken before discharge. A positive screen was defined as SpO2 <90%, two pre- and post-ductal readings <95%, and/or a difference >3%. Newborns with positive screens underwent echocardiography, while negative cases were followed up for six months. The study followed STARD guidelines for diagnostic accuracy reporting.

Results:
Between October 2020 and June 2023, 10,630 newborns were screened. The majority were male (54.0%) with a median birth weight of 3.0 kg. A total of 51 newborns (0.5%) tested positive, of which 18 (35.3%) had CCHD. This resulted in a CCHD prevalence of 1.41 per 1,000 live births, increasing to 3.27 per 1,000 at six months. With an 86.7% follow-up rate, POX had a sensitivity of 50.0% (95% CI: 32.1–67.9) and specificity of 99.5% (95% CI: 99.4–99.7), with a false-positive rate of 0.4%. Screening between 48 and 72 hours had the highest diagnostic performance (AUC: 0.79, 95% CI: 0.64–0.93). Low birth weight (<2.5 kg) was associated with a lower detection rate (OR: 0.403, p = 0.021).

Conclusion:
POX demonstrated high specificity but lower sensitivity, with improved accuracy when performed after 48 hours. Timing and birth weight influenced accuracy, highlighting the need for protocol adjustments.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1152 - GLOBAL CARDIAC CARE FOR INDIVIDUALS WITH DOWN SYNDROME

Dr. Raman Krishna Kumar [1], Dr. Louisa Joan Go [2], Lauren Costabile [3], Dr. Pk Brijesh [4]
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Background / Hypothesis:
1 in 1,000 children worldwide are born with Down syndrome. Congenital Heart disease affects 50% of individuals with Down syndrome and the majority requires surgical intervention before it becomes fatal.

Methods:
Panel Discussion with multiple healthcare providers/surgeons and experts who are caring for children with Down syndrome in different countries including India, the Philippines and Uganda. This session will explore a more detailed approach to education on CHD in Down syndrome, create awareness for the importance of early diagnosis of heart disease in patients with Down syndrome, and discuss the challenges, barriers and varying access to care in the global healthcare systems of low and middle income countries. We will additionally explain cultural sensitivity and our goal to end stigma, using person first language and creating a more inclusive society for individuals with Down syndrome.

Conclusions:
Through community awareness, collaboration with global healthcare systems and education, access to quality cardiac care is made possible for individuals with Down syndrome in middle to low income countries.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1179 - HEARTS IN HAND AFFORDABLE SURGICAL MODELS TO MAXIMIZE EDUCATION ON GLOBAL CARDIAC SURGERY MISSIONS

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Background:
Access to cardiac surgery for ventricular septal defect (VSD) closure is severely limited in low- and middle-income countries (LMICs), where there are 100-times fewer cardiac surgeons than developed nations. Global cardiac surgery missions attempt to address this disparity, yet their short-term nature limits the transfer of skills to local surgeons. Simulation is a proven tool for enhancing surgical training, but its high cost remains a barrier to widespread adoption. By combining an accurate, affordable silicone-molded VSD training model with an associated self-paced curriculum, we aim to provide global cardiac surgeons and trainees with opportunities to improve surgical skills outside of time-constrained surgical missions.

Materials and Methods:
An open-source computer-aided design (CAD) model of a heart was modified for pediatric sizing and addition of a VSD. It was further segmented into medial, lateral, and septal components from which 3D-printed molds were created. Individual silicone-molded components were cast from the molds and fused using a parts-and-assembly methodology. A supplemental thorax, composed of a printed base and silicone skin covering, simulated the surgical depth and environment. A previously validated, self-paced curriculum and performance checklist developed by Toronto SickKids provided a framework for the training curriculum.

Results:
The cost of consumable materials for one model was $17.32. Feedback from Houston-based cardiac surgeons and trainees confirmed the model's clinical accuracy and realistic tissue properties.

Conclusions:
A clinically accurate, affordable silicone-molded pediatric VSD training model was designed and developed, in combination with a self-paced curriculum. Next steps include pilot testing of the training model and curriculum at our first global site in Tanzania. Performance scores, times, and user questionnaires will be collected before, during, and after simulation training to assess the model's ability to improve local surgeons' skills, efficiency, and confidence, with the ultimate goal of improving accessibility and outcomes for children with VSDs in LMICs.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1216 - ANALYSIS OF THE IMPACT OF AN HUMANITARIAN MISSION

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Background :
Every year, around 15 million children, in developing countries, die or develop life-long disabilities because of congenital cardiac diseases. In this report we measure the effect of a pediatric cardiac surgery humanitarian project on the health of the individual and on the potential influence this has on the countries economy and its growing health services.

Materials and Methods:
We collected and analyzed data from the Italian NGO, Mission Bambini's database, including all congenital cardiac missions undertaken in Uzbekistan between 2011 and 2015. DALY's (Disability Adjusted Life Years) saved by the humanitarian mission were estimated and used to reflect on the impact this had on the populations economy.
Progression in the local medical teams skills emulated the advancements made in the health sector of the region.

Results:
We focus our attention in a humanitarian mission on an Asian country in patients underwent a congenital cardiac operation in the Vakhidov hospital in Tashkent Uzbekistan. We analyze a patient with tetralogy of Fallot age 6,5 year. The Aristotle's Complexity Score was 8.The cost-effectiveness analysis identified 54,32 DALY's saved for this patient by surgery. If we calculate the years of early death adverted for all the coort of 42 patients operated by our team in that period of time, were 1608 years. These numbers impact also on the cost effectiveness on the years of schooling and in the gross national income of that country. This standard can be replicated in all the missions.

Conclusions:
In developing Countries, performing congenital cardiac surgery cases can be carried out successfully with improvement in both the economy and the health system of the country by increasing the years and the quality of life of the working population and developing the expertise of the regional team.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1255 - CRITICAL INTERVENTION TRANSFORMING PAEDIATRIC CARDIAC SURGERY AND TRAINING IN CONFLICT AND RESOURCE SCARCE ENVIRONMENTS

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Background / Hypothesis:
In regions affected by armed conflict, humanitarian crises, and limited resources, paediatric cardiac surgery remains an essential but often inaccessible treatment. Children with congenital heart defects face preventable mortality due to the lack of skilled surgical providers and inadequate infrastructure. Despite the magnitude of need, efforts to expand and strengthen paediatric cardiac care and surgical training programs in these settings are critically underdeveloped.

Materials and Methods:
A systematic review was performed across leading medical databases, including PubMed, Embase, and Google Scholar, to identify global efforts in paediatric cardiac surgical training in conflict zones, disaster-stricken areas, and resource challenged environments. The analysis focused on programs aimed at improving local expertise in paediatric cardiac surgery, evaluating their impact on surgical outcomes, and identifying the barriers preventing successful implementation.

Results:
From 1,573 records screened, 21 studies met inclusion criteria, revealing glaring gaps in both access to paediatric cardiac surgical care and the availability of training for local healthcare professionals. While a few programs exist, they remain limited in scope, with many facing significant challenges due to lack of funding, trained faculty, and essential infrastructure. Most studies failed to offer quantitative data on the effectiveness of training, demonstrating a critical need for more rigorous evaluations and sustainable solutions.

Conclusions:
The limited access to paediatric cardiac surgical training in conflict zones and resource-limited environments is a global health crisis that demands immediate action. Without sustainable training programs, thousands of children will continue to die from treatable heart conditions. Urgent efforts to empower local providers and bridge the gap in cardiac care are essential. By empowering local providers and bridging the gap in cardiac care, we can create a future where every child has access to the life-saving surgery they need—regardless of where they are born.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1275 - THE GLOBAL REGIONAL AND NATIONAL BURDEN OF CONGENITAL HEART DISEASE 1990–2021 AN ANALYSIS OF THE GLOBAL BURDEN OF DISEASE STUDY 2021 AND FORECAST TO 2050

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Background / Hypothesis:
Congenital heart disease (CHD) is common, caused by embryonic heart-related structural issues. It has a high global prevalence and is a major cause of infant and child deaths. Existing Global Burden of Disease (GBD) studies on CHD lack 1990 to 2021 data and future projections. This study uses 1990 to 2021 GBD data to analyze and predict CHD burden for public health.

Materials and Methods:
The data on CHD came from The Global Burden of Disease (GBD) database. The incidence, prevalence, deaths, and Disability Adjusted Life Years (DALYs) of CHD were included in this study to assess the burden of CHD. The Age-period-cohort model was used to estimate the effect of three independent factors, age, period, and cohort, on CHD prevalence or deaths. The Bayesian age-period-cohort model was used to predict the global disease burden of CHD from 2022 to 2050 based on the disease burden data of CHD from 1990 to 2021.

Results:
Globally, the number of CHD cases has risen from 11787061 in 1990 to 15774457 in 2021. The global incidence, deaths, and DALYs of CHD all showed decreasing trends. The CHD prevalence for high-middle SDI area, middle SDI area, low-middle SDI area, and low SDI area, except for the high SDI area, showed an upward trend. Among 204 countries, in 2021, the incidence of CHD in Greenland was the lowest, and the incidence of CHD in the Republic of Austria was the highest. The prevalence, incidence, deaths, and DAYLs of CHD were predominantly distributed in the < 5-year-old group, regardless of gender. The burden of CHD showed a downward trend in 2050.

Conclusions:
Analyze and predict CHD burden with 1990 to 2021 GBD data could help public health work. These findings highlight the need for targeted interventions and resource allocation to mitigate CHD impact.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1289 - CLINICAL DETERMINANTS OF SURVIVAL AMONG ADOLESCENTS WITH UNREPAIRED CYANOTIC CONGENITAL HEART DISEASE

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Background:
Cyanotic congenital heart disease comprises 20% of all cardiac malformations with an estimated incidence of 2.5-3 per 1000 live births. There is a growing number of patients surviving through adolescence with or without intervention which may represent a unique subset of patients needing specialized care.

Objective:
To determine factors influencing survival in adolescents with unrepaired cyanotic heart disease.

Methodology:
This is a single-center case control study from 2017 to 2022 conducted in a specialized tertiary center in the Philippines. Sample size was based a 2.6% total fatality rate among infants who underwent CHD operations with a 5% level of significance and a 5% desired width of confidence interval. Clinical and demographic data were recorded. Missing values were neither replaced nor estimated. The odds ratio and corresponding 95% confidence intervals from binary logistic regression were computed to determine significant survival factors. A value of <0.05 was considered significant.

Results/Discussion:
Of the 125 subjects, 58% (72/125) were males with a median age of 16 years old. The median age at diagnosis was 1 year and 1 month with majority of patients living outside Metro Manila (73%). Most belong to the NYHA 1 Class (49%), TOF was the top diagnosis (52%) and only 26% underwent palliative procedures. The following were the predictive factors for survival: place of origin (OR 0.3802, 95% CI 0.1520 to 0.9509, p= 0.039), oxygen saturation (OR 1.1150, 95% CI 1.0608 to 1.1720, p= <0.001), right ventricular function (OR 0.9274, 95% CI 0.8791 to 0.9784, p= 0.006), and functional classification (OR 0.0643, 95% CI 0.0175 to 0.2367, p= <0.001).

Conclusion:
Early and strategic interventions focusing on optimizing oxygenation, addressing healthcare access disparities, and improving treatment approaches are crucial in enhancing survival among adolescents with cyanotic CHD.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1313 - DROWING PREVENTION IN CHILDREN CARDIOVASCULAR EFFECTS OF THE COLD SHOCK RESPONSE

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Background / Hypothesis:
Swimming and diving are popular recreational activities and essential skills to prevent death from drowning. Traditionally, impaired cardiovascular adaption and disease were thought to have a major impact on drowning. Still, most drownings occur in cold water and lately cold shock response is discussed as a major cause of drowning. Until now, the data on the physiology of drowning and cold shock response in children are scarce, while drowning remains a significant concern in this population. This study investigates the cold shock response during the immersion of healthy children in cold water, with the goal to provide reliable comparative data for future studies in children with cardiovascular disease.

Materials and Methods:
Healthy voluntary participants were recruited. Inclusion criteria were age of 8-14 years, ability to swim and overall health. Anthropometric data were measured. The aquatic protocol consisted of 2 minutes immersion in both a warm (34°C) and a cold (11°C)water pool. Skin temperature, heart rate and respiratory rate were measured and ECG was conducted continuously.

Results:
Significant differences in skin temperature, heart rate and respiratory rate were observed between warm water and cold water immersion. In warm water, heart and respiratory rates remained relatively constant, whereas in cold water, with a significant drop in skin temperature by 8°C, heart rate increased by 31% and respiratory rate increased by 58%. The peak of the cold shock response occurred at around 30 seconds. After 60 seconds,acclimatization had already begun, with heart and respiratory rates starting to normalize. No participant reported symptoms. No adverse events were seen.

Conclusions:
The current study presents the first data on the cold shock response in healthy children. Significant increase in heart rate and respiratory rate during immersion into 11°C cold water was seen,yet the cold shock response observed in healthy children was significantly less pronouced than reported in the adult population.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1314 - WHAT IS PENTALOGY OF CANTRELL

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Background / Hypothesis:
Pentalogy of Cantrell (POC) carries high mortality, with congenital cardiac defects being a major source of morbidity. While incomplete expression is well-recognized, the full spectrum remains rare.

Materials and Methods:
Case of an 8-month-old female with TOF, CoA, and complete presentation of POC. She presented during a medical mission to Guyana due to a 1-month history of cyanotic spells with brief loss of consciousness. She was cyanotic, pale and in respiratory distress with SpO2 of 80% and weight 6.2 kg (<5th percentile). Examination showed a spontaneously closed sternal cleft, paradoxical bulging of chest and systolic ejection murmur 3/6 at left sternal border. Chest CT showed sternal agenesis, cardiomegaly, diaphragmatic eventration and CoA (6.51 mm length, 3 mm width). Echocardiography revealed a 7 mm ventricular septal defect (VSD), overriding aorta, CoA and subvalvular pulmonary stenosis (mean gradient 81 mm). Patient underwent successful repair of TOF and reconstruction of CoA. At six-month follow up, she was doing well.

We performed a meta-analysis of 236 patients with POC reported in PubMed and Medline databases, from 1972 to 2023, to compare intracardiac findings, patient outcomes, and associated malformations.

Results:
Our meta-analysis found VSD (32.6%), ASD (26.7%), and TOF (12%) as the most common intracardiac findings, while CoA was present in 3% of cases. Common extracardiac abnormalities included ectopia cordis (45.8%) and ventricular diverticulum (12.7%). Prognosis varied: 22.5% survived, 39% were stillborn, and 26.3% expired postnatally. Surgical repair around 8 months of age has better prognosis, whereas most non-survivors were operated on the first day after birth.

Conclusions:
The case highlights an unusual presentation of POC as it is the first reported in literature to present with both TOF and CoA. Intracardiac findings are a major prognostic factor; thus, comparing these findings across a 250-year span allows us to better understand the evolving patterns of cardiac anomalies in this syndrome.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1358 - HEALTHCARE STRATEGIES FOR LEARNING ORGANIZATIONS EFFECTIVE APPROACHES FOR LOW AND MIDDLE INCOME COUNTRIES IN PEDIATRIC AND CONGENITAL HEART DISEASE

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Background:
Pediatric and congenital heart disease (PCHD) continues to be a major contributor to childhood mortality worldwide, with significant disparities influenced by national income and access levels. Many low-income countries (LICs) experience inconsistent outcomes due to critical shortages in infrastructure, trained specialists, and the lack of systems designed as learning organizations.

Methods:
A comparative analysis of global PCHD care models was conducted, focusing on four key pillars: service delivery, financing, workforce capacity, and technology integration. Strategies were evaluated through global health data and policy frameworks in both LICs and middle-income countries (MICs). This included an assessment of task-shifting, telemedicine, AI-assisted diagnostics, and regional private public partnerships for their effectiveness in enhancing system performance.

Results:
The analysis indicates that resource-limited settings, whether in LICs or MICs, benefit most from decentralized, resource-efficient solutions. Examples include mobile screening units, task-shifting to mid-level providers, AI-powered diagnostic tools, and early detection strategies led by non-specialists, which facilitate broader access and earlier interventions. Conversely, higher-resourced settings are better suited to expand surgical programs, strengthen tertiary care, and integrate PCHD into national health financing schemes. In both contexts, co-designed partnerships with regional and global organizations—focused on continuous learning and quality improvement—are essential for staff engagement and sustainability.

Conclusions:
This analysis highlights an opportunity to address the global PCHD implementation gap through context-appropriate innovation. While higher-resourced systems can increase surgical capacity through workforce training and systems integration, lower-resourced settings may benefit from community-based solutions supported by technology. The findings suggest a strategic roadmap for global health investment in learning health organizations to promote equitable PCHD care and improve long-term health system resilience.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1365 - OPENING OF A SURGICAL UNIT FOR THE TREATMENT OF CONGENITAL AND ACQUIRED HEART DISEASE IN CHILDREN IN MADAGASCAR

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Background:
Madagascar faces urgent health needs, especially for cardiac care, within a challenging socio-economic context. Access is restricted due to insufficient resources, inadequate facilities, and geographic barriers. Children in need of diagnosis and management of congenital and rheumatic heart diseases require expensive treatment abroad, highlighting the need for local cardiac care. La Chaine de l'Espoir brought its worldwide expertise for opening cardiac services in Madagascar.

Materials and Methods:
Renovating the cardio-pediatric department in Antananarivo was the first step in improving specialized care, with a hospitalization unit, pediatric cardiac intensive care unit (PCICU), and international-standard operating theater. Since 2024, efforts have focused on training in heart disease diagnosis, large-scale consultations, and medical missions to strengthen Madagascar's healthcare capacity, paving the way for open-heart surgery.

Results:
In total, 67 pediatricians, cardiologists, and general practitioners across Madagascar have been trained to screen pediatric heart diseases. The surgeons, anesthesiologists, perfusionists, cardiologists and technical staff also completed intensive training before the first surgery in early 2024.

In 2024, 705 Madagascan children were screened, 200 diagnosed with congenital heart disease, and 100 were identified and planned for surgery.
In May 2024, the first open-heart surgery was successfully performed by a Malagasy team, with support from 16 doctors and nurses from La Réunion, Nantes, and Bordeaux.

So far, 12 children have undergone surgery, additionally, 30 patients were operated on requiring close heart surgery by the local team, without the presence of supportive teams. The average hospital stay is 3.5 days in PCICU and 6.7 days in hospitalization, without complications.

Conclusions:
Establishing congenital heart surgery in a low-income country like Madagascar is a major challenge, requiring training, technology, and significant investments. While the first open-heart surgery is a hopeful step toward high level national healthcare access, sustainability is the main key to long-term successin Madagascar.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1403 - HEARTS OF JOY INTERNATIONAL AND GLOBAL ACCESS TO CARDIAC CARE FOR INDIVIDUALS WITH DOWN SYNDROME

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Background / Hypothesis:
1 in 1,000 children worldwide are born with Down syndrome. Congenital Heart disease affects 50% of individuals with Down syndrome and the majority requires surgical intervention before it becomes fatal.

Methods:
Hearts of Joy International is the only non profit organization in the world that provides life saving heart surgery exclusively to children with Down Syndrome. Due to poverty and lack of resources in low and middle income countries, these individuals often do not have access to quality medical care due to their disability and cultural stigmas. Hearts of Joy International is dedicated to serving these vulnerable children by providing heart surgeries and by supporting families through the entire surgery process, providing resources and education to communities, orphanages, caregivers and parents on the inherent dignity and value of the child. Hearts of Joy International serves in the Philippines, India, Uganda and the United States and works alongside community partners and healthcare teams in these countries to further access to cardiac care for children with Down syndrome. 150 little hearts have been healed around the world due to their efforts.

The discussion will be about caring for children with Down syndrome in different countries including India, the Philippines and Uganda. This session will explore a more detailed approach to education on CHD in Down syndrome, create awareness for the importance of early diagnosis of heart disease in patients with Down syndrome, and discuss the challenges, barriers and varying access to care in the global healthcare systems of low and middle income countries. It will additionally explain cultural sensitivity and our goal to end stigma, using person first language and creating a more inclusive society for individuals with Down syndrome.

Conclusions:
Through community awareness, collaboration with global healthcare systems and education, access to quality cardiac care is made possible for individuals with Down syndrome in middle to low income countries.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1425 - EPIDEMIOLOGICAL CHARACTERIZATION OF PATIENTS WITH CONGENITAL HEART DISEASES DESCENDANTS OF HAITIAN IMMIGRANTS BORN BETWEEN 2018 AND 2023 IN A REGIONAL HOSPITAL

Victor Henzi [1], Paul Bravo [2], Daniel Perez [3], *Trinidad Ruiz* [2], Carlos Fernandez [3]
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Background / Hypothesis:
Migration dynamics have led to changes in the national epidemiological profiles of some diseases. In the last decade, there has been a significant influx of immigration from Haiti to Chile, with a peak in 2018. There is little data reported in the literature regarding congenital heart disease (CHD) in Haitian patients, and their contribution to the national epidemiology is unknown. The objective of this work is to epidemiologically characterize patients with CHD descendants of Haitian immigrants born between 2018 and 2023 at the Rancagua Regional Hospital (HRR).

Materials and Methods:
A non-randomized, retrospective, observational study of all patients with CHD of Haitian descent, born between 2018 and 2023 at the HRR who were referred for cardiac surgery. Data were extracted from local clinical registries. An Excel database was created, categorized, and subsequently analyzed.

Results:
Of a total of 309 patients , 9% (28) correspond to descendants of Haitian immigrants. Of this subgroup, 58% are male. 30% had low birth weight. 15% (4) presented univentricular CHD, 27% complex biventricular CHD, and 58% simple biventricular CHD. 53% had a prenatal diagnosis of CHD. Regarding the population of not descendants of Haitian immigrants (281), 5% (14) correspond to univentricular patients. The Chi square test was performed for both subgroups of univentricular patients, obtaining 4.01 (p 0.04), the difference between both groups being statistically significant. In the subgroup of children of Haitian immigrants, 58% were not associated with genetic syndromes. Regarding sociodemographic background, 60% were rural, 48% had parental exposure to pesticides, 19.2% had parental exposure to tobacco, and 46% had maternal pathology. The most frequently used medications during pregnancy were hypoglycemic and antihypertensive drugs.

Conclusions:
The study population is highly rural and exposed to proven risk factors for CHD. The data provided could contribute to future studies on social determinants of health in CHD.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1464 - STRATEGIC PROJECT MANAGEMENT TOOLS TO ADDRESS GLOBAL PEDIATRIC CARDIAC CARE GAPS A FRAMEWORK FROM EMPOWERING HEARTS GLOBALLY

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Background:
Pediatric and congenital heart disease (PCHD) is a leading cause of preventable childhood mortality, especially in low- and middle-income countries (LMICs), where many children lack access to cardiac care. The WCPCCS 2023 Call to Action urges global efforts to expand care capacity, strengthen the workforce, and address equity gaps. Empowering Hearts Globally (EHG) aims to meet this challenge with project management tools for developing a sustainable pediatric cardiac training system.

Methods:
EHG uses a hybrid project management approach and combines the Project Canvas to define mission, stakeholders, deliverables, and resources with Theory of Change (ToC) to map pathways to long-term impact. These frameworks guided the action of committees during the 2025 strategic planning meeting. Tools like task management and outcome mapping create a long-term strategy that enhances adaptability and collaboration, and their use increases the likelihood of success.

Results (Including Planned):
An advisory committee—including physician, nursing, and administrative leaders—has formed to develop implementation frameworks focused on regional customization, local ownership, and task-sharing models. Over 80 volunteers from around the world are working in 4 committees: 1) Global Survey and Needs Assessment, 2) Curricula Development, 3) Accreditation and Credentialing, and 4) Nursing. EHG plans to launch pilot training programs with a modular curriculum supported by a cloud-based LMS and AI-enhanced educational sessions, emphasizing a combined iterative and incremental development approach. Metrics for success that align with WCPCCS Call to Action will be tracked by a project management dashboard.

Conclusions:
The use of structured project management tools, particularly the Project Canvas and Theory of Change, has given EHG a clear, adaptable roadmap. As the initiative transitions to pilot implementation, this model provides a replicable foundation for addressing workforce and equity challenges in global health programs.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1474 - PRECISION PUBLIC HEALTH POPULATION GENOMIC SCREENING FOR FAMILIAL HYPERCHOLESTEROLAEMIA IN ASIA

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Background / Hypothesis:
Population genomic screening programs are being developed worldwide to increase case detection of Tier 1 genetic conditions, including Familial Hypercholesterolaemia (FH). Low-cost genetic screening to increase detection of FH, cascade testing of family members and implementation of risk management strategies will address unmet needs across Asia and reduce preventable cardiovascular morbidity.

Materials and Methods:
Collaboration between clinical experts involved in the planning of large-scale genomic screening programs for FH facilitated the development and/or implementation of the respective programs. A questionnaire was developed to understand the core clinical and implementation principles underpinning the programs and capture the key outcomes. These initial findings and communication pathways were used to improve accessibility to expert advice and support for developing the programs.

Results:
At least five countries across Asia are currently in the development and/or implementation phases of clinical or research-based National population screening programs for FH and other Tier 1 genetic diagnoses. Genomic newborn screening, universal child-adult or asymptomatic adult-child screening, provide complementary opportunities for addressing the current major gaps in detection, with 95-98% of children and adults with FH still undiagnosed. Initial findings include prevalence rates of FH between 1:100 and 1:250 individuals in Asia.

Conclusions:
These programs demonstrate the feasibility of co-designed national population genomic screening and risk management programs across High and Low-income settings, all focused on reducing preventable cardiovascular morbidity. This lays the groundwork for advocacy in establishing scalable programs across Asia with the potential to allow access to early intervention to prevent cardiovascular disease in children and young adults across Asia. Wider discussions of strategies for implementing population screening in diverse populations to modify cardiovascular risk are needed to ensure equitable access to family-centered, cost-effective healthcare. Phenotype-genotype correlation of screen-detected FH is required to best understand the potential impact.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1494 - ZINC MICRONUTRIENT DEFICIENCY AND ITS PREVALENCE IN MALNOURISHED PEDIATRIC CHILDREN AS COMPARED TO WELL NOURISHED CHILDREN A NUTRITIONAL EMERGENCY

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Background / Hypothesis:
To compare zinc levels in malnourished paediatric populations compared to well-nourished ones, aiming to provide valuable insights into deficiency prevalence and control.

Materials and Methods:
A case-control study was conducted after IERB approval at Abbasi Shaheed Hospital, Karachi, Pakistan, involving 108 children aged 2 months to 12 years. Malnourished cases (n=54) and healthy controls underwent zinc analysis. Data were analyzed using SPSS, employing logistic regression and chi-square tests.

Results:
Zinc deficiencies were four times more common in malnourished cases than controls (OR: 3.86, 95% CI: 1.1-14.9). Deficiencies remained consistent across age groups and were not significantly influenced by gender. Logistic regression confirmed malnourished children's significant association with zinc deficiency.

Discussion:
Zinc plays vital roles in gene functioning, growth, and immune maintenance. The study uniquely compares zinc levels between malnourished and well-nourished children, revealing a significant difference. Similar global studies support these findings, emphasizing the susceptibility of malnourished children to zinc deficiency.

Conclusions:
Zinc deficiency is more prevalent in malnourished paediatric populations than well-nourished ones. The study's significance lies in its case-control design, offering valuable insights for clinicians to predict patient outcomes and develop effective intervention plans. Zinc supplementation emerges as a crucial strategy to address deficiencies during malnutrition rehabilitation, underscoring the need for national and international strategies to combat malnutrition burdens, especially in socioeconomically disadvantaged groups.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1514 - COST AND COST EFFECTIVENESS OF PEDIATRIC CARDIAC SURGERY FOR THE CHINESE POPULATION OF ASIA

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Background / Hypothesis:
Resources in public health should be allocated according to the cost-effectiveness (CE) of each health interventions. Cost-Effectiveness is derived in part form the Gross National Income per capita (GNIp/c) of the population under study.

Because the population of Chinese origin in Asia is distributed among regions with highly variable GNIp/c, we decided to study how that variability affected the cost and the CE of pediatric cardiac surgery.

Materials and Methods:
We developed a free-access calculator to estimate the CE of a 10-year pediatric cardiac surgery program in any country.

Our CE calculator makes several assumptions: No inflation of supplies and labor; a capital depreciation of 3% a year, and that all children born with congenital heart disease (CHD) are diagnosed and surgically treated.
Based on published data, this calculator uses 39.9y as the average DALYs averted per surviving treated patients.
Equipped with this calculator and using 2022 data, we estimated the cost and CE of a 10-y cardiac surgery program covering the entire Chinese population across the region

Results:
The calculated incidence of congenital heart disease among the Chinese population across the region would be, Mainland China 75 900; Hong Kong Special Administrative Region 257; Macau Special Administrative Region 52 and Taiwan 1087.

The average costs would be USD$17 584 ($7 450 - $26 741) per patient operated, with an average CE of $441 ($187 - $670) per DALY averted. Despite the GNIp/c variability across the region, pediatric cardiac surgery would be Highly Cost-Effective in every region.

Conclusions:
Cost-Effectiveness studies are fundamental tools to facilitate the information needed by decision makers in particular regions of Asia and to facilitate the development of sustainable congenital heart disease surgical programs.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1515 - THE COST AND COST EFFECTIVENESS OF PEDIATRIC CARDIAC SURGERY IN LATIN AMERICA

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Background / Hypothesis:
Latin American (LatAm) countries have limited resources. Ideally public health allocations should be determined by the expected Cost-Effectiveness (CE) of a particular intervention. Congenital heart disease (CHD) is perceived to be an expensive intervention, yet its CE has not been documented in LatAm.

Materials and Methods:
We developed a free-access calculator to estimate costs and the CE of a 10-year pediatric cardiac surgery program in any country, and used it to calculate the costs and the CE of operating every child born with CHD in every LatAm country
Our CE calculator makes several assumptions: No inflation of supplies and labor; a capital depreciation of 3% a year, and that all children born with congenital heart disease (CHD) are diagnosed and surgically treated.
Based on published data, this calculator uses 39.9y as the average DALYs averted per surviving treated patients.
Based on 2022 data, we estimated the cost and CE of a 10-y cardiac surgery program covering the entire population across the LatAm region

Results:
The calculated incidence of CHD for the entire South America region is 57 157 newborns/ year. If surgical treatment was available for each patient born with CHD, the average cost per patient would be $ 9 355 ($4 068- $21 957) and the average CE $234 ($102 –$550) per DALY averted (see table).
After comparing CE with the Gross National Income per capita in every South America country, surgical treatment for patients born with CHD would be Highly Cost- Effective even in the poorest LatAm countries.

Conclusions:
We encourage proper cost-effectiveness research in this area, since it may prove fundamental on its ability to influence South American stake holders as to whether the development of congenital heart disease surgical programs should be funded.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1516 - BRIDGING THE GAP UNDERSTANDING ACCESS TO PAEDIATRIC AND ADULT CONGENITAL CARDIOLOGY SERVICES IN REGIONAL VICTORIA AUSTRALIA

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Background / Hypothesis:
Timely access to appropriate cardiology services is critical for the diagnosis, treatment, and optimal outcomes in congenital heart disease. Families living in rural areas face significant barriers that compromise care due to geographic, financial, and systemic factors, potentially impacting patient outcomes and satisfaction.

Materials and Methods:
A mixed-methods study design was used to explore barriers to paediatric and adult congenital heart care in the rural setting of Gippsland in Victoria, Australia. Semi-structured interviews were undertaken with parents of children suspected or diagnosed with cardiac conditions, and adults diagnosed with congenital heart disease. Participants were recruited from public and private clinics, regional hospitals, and via community referrals. Healthcare providers including paediatricians and general practitioners, were also interviewed to obtain complementary clinical perspectives. Data included participant demographics, experience with diagnostic and follow-up services, travel requirements, use of telehealth, tele-imaging, and perceived gaps in care. The sample was described and compared to other cohorts and interview data were thematically analysed.

Results:
Analysis-to-date suggests that families and patients in rural Gippsland encounter delays in accessing appropriate specialist consultant and imaging services, especially for acute presentations during infancy and childhood. Other challenges include travel and accommodation, and expenses above the available universal healthcare cover. Clinicians cited a shortage of appropriately-paediatric-trained staff and inconsistent access to real-time diagnostic tele-echocardiography.
Parents also reported emotional distress, logistical strain, and difficulties in caring for their other children if referred to tertiary centers in Melbourne. Positive experiences were noted when coordinated telehealth models were available.

Conclusions:
Barriers to accessing appropriate cardiology services in rural areas are multifactorial. Findings underscore the need for targeted interventions such as expanded telemedicine services, streamlined referral pathways, and attention to equity in care delivery, especially for acute presentations. These insights can inform regional service planning and future models of care to increase the current outreach services.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1561 - SOCIOECONOMIC DETERMINANTS OF HEALTH AND QUALITY OF LIFE IN PEDIATRIC CONGENITAL HEART DISEASE A SUMMARY REVIEW OF CARDIOSTART INTERNATIONAL SURGICAL MISSIONS

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Background / Hypothesis:
Children with congenital heart disease in low- and middle-income countries (LMICs) face significant barriers to timely surgical care. While humanitarian missions help address surgical access, the broader impact of socioeconomic status (SES) on quality of life, emotional well-being, and health perception remains underexplored. We hypothesized that SES, though not directly associated with surgical mortality, influences subjective health outcomes and access to care.

Materials and Methods:
A literature review was conducted using previously published articles, abstracts, and posters referencing REDCap data from CardioStart International's surgical missions across 20 LMICs from 1997 to 2020. Studies included pediatric patients (<18 years) with SES indicators (e.g., poverty, unemployment, household crowding), quality of life metrics (emotional functioning, perception of health and care), and outcomes, such as time to surgery and mortality. Quantitative and qualitative analyses were performed using statistical correlations and thematic synthesis.

Results:
Data from over 94-176 pediatric patients showed no significant association between SES and 30-day postoperative mortality or clinical symptom severity. However, children from lower SES backgrounds were significantly more likely to perceive their health as poor ($p = 0.028$). Emotional quality of life was adversely affected by familial instability and poverty. Surgical delays exceeding 90 days were more common in households with unemployment ($p= 0.008$), crowding ($p=0.037$), or caregiver illness ($p= 0.004$). Younger children (ages 6–12) reported greater limitations in daily physical and social activities compared to adolescents. Patient satisfaction with care remained high (97.6%) despite SES or clinical severity.

Conclusions:
While short-term surgical missions can mitigate mortality risk, SES profoundly shapes patient-reported quality of life metrics and access to care. By integrating social follow-up and culturally sensitive evaluation tools into mission planning improvement in long-term recovery and equity in pediatric cardiac surgery might be achieved.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1588 - TREATMENT OF DYSAUTONOMIC SYNDROME IN CHILDREN IN THE POST PANDEMIC ERA

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Background:
Since 2002, there have been reports of dysautonomic dysfunction secondary to SARS infections, as well as infections caused by other pathogens. Over time, we realized that the after-effects of the disease persisted far beyond the aforementioned. In children, minimal information has been described after COVID19, and most of the clinical findings are nonspecific. Therefore the approach protocol and treatment should be different.

Materials and Methods:
Through an observational study, from January 2020 to December 2024, using comparative tables and graphs in Microsoft Excel, data were documented on the clinical presentation, by age and sex. Targeted questions about the time of the last viral infection prior to symptom onset, last SARSCoV-2 vaccination, number of hours of blue light exposure, hours of restorative sleep, sleep hygiene, diet, hydration, and physical activity. All patients underwent a 12lead EKG, 24hr Holter monitoring, transthoracic echo, and lab tests.
Results: A total of 224 patients aged between 4-17 years were evaluated. Inappropriate sinus tachycardia, fatigue, and anxiety predominated. A significant increase in the presentation of symptoms was observed, with a total of 13 patients in 2020, 33 in 2021, 36 in 2022, 64 in 2023, and 78 in 2024. Females predominated from 2020 to 2023. In 2024 difference was 3 patients.

Conclusions:
There are several points of discussion in an observational study due to the potential variations in the results. There was no abrupt increase in the number of patients between 2021-2022, which was the peak vaccination period in Mexico. Assessing whether this caused the abrupt increase in the total number of cases in 2023 and 2024, is difficult, but 80% did not receive vaccinations in this period. The observation of this large number of cases led to modifications in the approach and treatment, and we shouldn't assume that they behave like pre-pandemic dysautonomic patients.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1659 - TRAJECTORIES OF PULSE OXIMETRY SATURATION CHANGES IN NEONATES AT 0 4000 M ALTITUDE OVER 6 72 HOURS AFTER BIRTH

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Background / Hypothesis:
Pulse oximetry (SpO_2) is an important indicator for neonatal screening for prevalent heart disease, but the current WHO threshold (<90%) is based on low altitude data. This study hypothesised that SpO_2 would change with altitude and post-natal period in healthy neonates.

Materials and Methods:
Multicentre cross-sectional study. Healthy asymptomatic neonates were included and divided into 4 groups by altitude (0-4000 m). SpO_2 was measured at 6/12/24/48/72 hours postnatally using a standardised Masimo RAD-7 oximeter. Dynamic trajectories were constructed using the GAMLSS model (BCCG distribution) with the 2nd.5th percentile (P2.5) as the hypoxia thresholds.

Results:
7055 neonates, 0-1000 m (3765), 1000-2000 m (2031), 2000-3000 m (552) and 3000-4000 m (707) were included. The mean gestational week was 38 weeks, 3240 girls (45.9%) and 3815 boys (54.1%), and the difference in SpO2 values between genders was not statistically different. The differences in pre-catheterisation and post-catheterisation SpO2 at different time intervals were statistically significant in all altitude groups. The mode of delivery had an effect on SpO2 values. 97.42%, 97.60%, 97.39%, 97.41%, 97.48% for each time period from 0 to 1000m; 96.68%, 96.52%, 96.20%, 96.32%, 96.40%, for SpO2 from 1000 to 2000m; 94.81%, 94.39%, 94.43%, 94.39%, 94.34%, for SpO2 from 2000 to 3000m. ; and 89.92%, 89.93%, 91.11%, 91.36%, 91.68%, for 3000~4000m. The 2nd.5th percentile of 0~1000mSpO2 values was 96% for all time periods; 94% for 1000~2000m; 2000 to 3000m was 92%; 3000 to 4000mSpO2 values were 82%, 83%, 84%, 85%, and 86%, respectively.

Conclusions:
Altitude significantly affects neonatal SpO2, which is lower than the current WHO threshold (<90%) in >2000 m. SpO2 reaches its lowest level at 24 h in the 0-2000 m group, decreases slowly in the 2000-3000 m group, and shows a gradual increase in the 3000-4000 m group. An altitude-differentiated threshold is recommended for screening for congenital heart disease.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1685 - OPTIMAL STRATEGY FOR THROMBOPROPHYLAXIS IN FONTAN CIRCULATION A SYSTEMATIC REVIEW AND META ANALYSIS WITH A FOCUS ON ETHNIC DIFFERENCES

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Background / Hypothesis:
Fontan circulation alters cardiovascular hemodynamics to maintain circulation using a single ventricle, which may consequently increase the risk of thromboembolism, underscoring the need for effective thromboprophylaxis strategies. This study assessed the optimal thromboprophylaxis regimens for patients undergoing Fontan circulation, through a comprehensive meta-analysis of existing literature that focused on personalized approaches according to ethnic differences.

Materials and Methods:
A comprehensive search of the PubMed, Embase, and Cochrane Library databases was performed to identify studies that reported the thromboembolic and bleeding outcomes of patients with Fontan circulation.

Results:
Thirty reports were analyzed, including four randomized controlled trials and 16 cohort studies. Aspirin (risk ratio [RR], 0· 46; p = 0·07; 95% confidence interval (CI), 0.20–1.08), warfarin (RR, 0·40; p < 0·001; 95% CI, 0.24–0.65), and direct oral anticoagulants (DOACs) (RR, 0·22; p = 0·4; 95% CI, 0.01–7.57) all reduced the risk of thromboembolic events versus no antithrombotic therapy. Subgroup analysis in the East Asian group revealed that aspirin significantly decreased thromboembolic risk compared with no intervention (RR, 0·31; p < 0·001; 95% CI, 0.16–0.58) and appeared more effective than warfarin (RR, 0·57; p = 0·01; 95% CI, 0.37–0.88). No significant differences in bleeding risk were observed between the aspirin and warfarin groups or between the any-thromboprophylaxis and no-thromboprophylaxis groups.

Conclusions:
Thromboprophylaxis during Fontan circulation reduces thromboembolism risk versus no intervention. Although current results suggest that aspirin is more effective than warfarin in East Asian patients, definitive conclusions remain challenging to draw. Hence, further research should consider ethnic differences when developing tailored thromboprophylaxis strategies for patients with Fontan circulation.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1796 - "A CALL TO ACTION" AND A GLOBAL NURSING RESPONSE

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Background / Hypothesis:
The WCPCCS 2023 Call to Action aims to address the global burden of pediatric and congenital heart diseases (PCHD) by increasing awareness, promoting sustainable care systems, and improving access to quality healthcare. Nurses represent the largest group of health professionals in the world. They are a major stakeholder in quality patient care and can represent key advocacy priorities to reduce disparities in low- and middle-income countries (LMICs). While there are many organizations and initiatives to improve care for individuals with PCHD, there is no single, universally recognized "global nursing advisory committee" dedicated to educating, empowering, engaging, and retaining nurses globally.

Materials and Methods:
Using the "Convergent Care Theory", we developed an international nursing advocacy and education collaborative to support global education and mentorship for nurses specializing in PCHD. The collaborative was structured with a hierarchical design to enlist nurse experts and leaders in an advisory role and to recruit other global expert nurse colleagues to address relevant initiatives including nursing education, mentorship, quality, and membership/ engagement.

Results:
Approximately 18 PCHD nurse leaders from North America, Europe, South America, Africa, Oceania, and Asia were recruited to form a global nursing advisory committee under the governance structure of a new non-profit organization, Empowering Hearts Globally (EHG). Nurses' expertise encompassed education, administration/management, patient management, global advocacy, and program development. Workgroups were developed by enlisting global expert nurse colleagues which further diversified the experience and will over time address the needs of the global PCHD nursing community.

Conclusions:
A "Call to Action" campaign and advisory group was established to address nursing education and practice disparities in PCHD in LMICs. Our nursing collaborative plans to continue to grow over the following years as a vital contributor to EHG's goal of improving the lives of children with heart disease and their families through equitable access to lifelong care.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1944 - EMPOWERING PEDIATRIC CARDIOLOGY A GLOBAL CURRICULUM FOR SUSTAINABLE AND QUALITY CARE IN RESOURCE LIMITED SETTINGS

Shubhika Srivastava [1], Waiman Lai [2], Shazia Mohsin [3], Sandra Mattos [4], Babar Hasan [3], Ruth Heying [5], Renelle George [1], Jamie Penk [6], Colin Mcmahon [7]
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Congenital heart disease (CHD) remains a major global health challenge, particularly in resource-limited settings where pediatric cardiology (PC) training is inconsistent, and care is often delivered by non-specialists. To address this gap, Empowering Hearts Global (EHG) developed a standardized, scalable curriculum through expert consensus, incorporating global best practices.

EHG initiated discussions at the 2023 World Congress, followed by monthly consensus meetings, to design a structured PC training program. The hybrid model combines didactic instruction, self-learning, discussion-based platforms, and hands-on training. The Curriculum Committee analyzed established programs across Africa, South America, Asia, Europe, and North America, integrating Quality Improvement (QI) sciences at every stage. Participating centers will enroll in IQIC and QNET for continuous benchmarking and key performance indicator (KPI) tracking.

The two-year core PC curriculum focuses on echocardiography, non-invasive electrophysiology, and CHD management, with advanced training in cross-sectional imaging (CT/MRI), 3D/strain echocardiography, fetal cardiology, catheter-based interventions, and electrophysiology. Minimum requirements include 1000 echocardiograms, 100 catheterization interventions, and 300 EKGs/chest X-rays, with integrated ICU training. A structured mentorship model will cultivate master trainers in low- and middle-income countries (LMICs), supported by regional centers of excellence offering standardized fellowships.
The EHG curriculum emphasizes early adoption of advanced skills, mentorship, and QI-driven evaluation to ensure competency alignment with global standards. By integrating training, mentorship, and continuous benchmarking, this initiative aims to enhance trainee proficiency and improve pediatric cardiac care outcomes in resource-limited settings.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1952 - DEVELOPING A SUSTAINABLE PEDIATRIC AND CONGENITAL HEART PROGRAM IN UGANDA INSIGHTS FROM 14 YEARS EXPERIENCE

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Background / Hypothesis:
The paradigm in global health has shifted from 1-2 week medical mission trips to the longer term goal of sustainable program development. Our aim was to form a collaboration with the Uganda Heart Institute in Kampala Uganda, with the ultimate objective of developing a sustainable cardiac program. After the first three years, the model of collaboration transitioned from service delivery to service development, ensuring the local physicians operate as primary surgeons.

Materials and Methods:
Our comprehensive cardiac team, composed of physicians and support staff, has been traveling from the United States to the Uganda Heart Institute annually since 2011. Since 2014, our trips have been week-long visits with a focus on training, initially treating simple congenital cardiac lesions and progressing to more complex lesions over time. The objective of the partnership is to emphasize capacity building, enabling the local team to continue performing cases between visits.

Results:
The surgical volume is shown in Table 1. Early on, the service delivery model yielded a maximum yearly volume of 38 cases in 2013/2014. Since evolving to a service development model, independent cardiopulmonary bypass (CPB) cases and total case volumes performed by the local team have increased steadily and reached to >100 for CPB cases and >250 total cases for the last two consecutive years. Despite setbacks imposed by the pandemic, the local UHI team has developed sustainable experience in independently managing surgical cases of increasing complexity.

Conclusions:
International collaborations to develop a sustainable pediatric cardiac program are feasible with long-term relationships to emphasize training of local providers. Service delivery models can create dependency resulting in overall low impact. Successful program development requires long-term commitment of both local and international partners aimed at service development. Significant barriers to progress include material costs, supply chain sustainability, hospital and governmental support, and infrastructural deficiencies.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1969 - THE ROLE OF CYSTATIN C IN KAWASAKI DISEASE WITH CORONARY ARTERY ANEURYSM

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Background / Hypothesis:
This study focused on coronary artery aneurysm (CAA), a severe cardiac consequence of Kawasaki disease (KD), aiming to examine the predictive value of Cystatin C (Cys C) and other common laboratory indicators before and after intravenous immunoglobulin (IVIG) treatment on KD with CAA.

Materials and Methods:
Based on patients' coronary status, 122 KD individuals were categorized in this retrospective analysis. After comparing the clinical and laboratory information of the patients with KD, multivariate logistic regression analysis was employed to identify independent risk factors for CAA development among them. Additionally, the predictive values of these parameters in CAA development of KD were assessed by receiver operating characteristic curves.

Results:
In this study, 28 patients (23.0%, 28/122) participants had CAA, including 12 who had coronary artery regression (9.8%, 12/122). The parameters with $P < 0.10$ in the difference analysis, namely polymorphous exanthem, changes in the extremities, plateletocrit and Cys C before IVIG, prealbumin >107.2 mg/L and prognostic nutritional index >54.7 after IVIG, were included in multivariate logistic regression analysis. Finally, binary logistic regression analysis identified the pre-IVIG Cys C (odds ratio, 10.183; 95% confidence interval: 1.158-89.525) as an independent risk factor for developing CAA among KD patients. In addition, the 0.71 Cys C cut-off value sampled within five days had a 100% sensitivity and a 42.9% specificity (area under the receiver operating characteristic curve = 0.752, 95% CI 0.577-0.928, P=0.03).

Conclusions:
Higher pre-IVIG Cys C levels may be associated with increased CAA risk, but further large-scale prospective studies are needed to confirm its predictive utility. Furthermore, Cys C acquired within five days of disease onset may theoretically provide better prediction power for the CAA development in KD.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1970 - THE FACTORS ASSOCIATED WITH CORONARY ARTERY ANEURYSMS AND ITS REGRESSION IN KAWASAKI DISEASE

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Background / Hypothesis:
Kawasaki disease (KD) is an acute febrile illness in children, with coronary artery aneurysms (CAAs) being its most severe complication. The regression of CAAs and the factors associated with it are worth exploring. This study aimed to explore general demography and laboratory indicators in the prediction of CAA formation and persistent CAA in KD.

Materials and Methods:
This retrospective study collected general demographic and clinical data from the medical records. The independent risk factors of CAA and persistent CAA were determined via logistic regression. The predictive ability of risk factors was assessed by receiver operating characteristic (ROC) curves.

Results:
Totally, 217 KD patients were enrolled. They were divided into no coronary artery aneurysm group (NCAA, n=160) and CAA group (n=57). After one-year follow-up period, CAA group were regrouped into persistent CAA group (n=20) and regression group (n=36). Binary logistic analysis suggested that male gender [odds ratio (OR): 2.541, 95% confidence interval (CI): 1.052-6.137, p=0.038], increased capillary leakage index (CLI) (OR: 1.209, 95% CI: 1.009-1.450, p=0.040) and decreased creatinine clearance (Ccr) (OR: 0.984, 95% CI: 0.971-0.998, p=0.026) before intravenous immunoglobulin (IVIG) were independent risk factors for KD with CAA. Besides, younger age at diagnosis (<33.5 months, OR: 1.041, 95% CI: 1.001-1.084, p=0.047) was a protective factor for CAA regression. According to Kaplan-Meier survival analysis, older individuals at diagnosis (≥33.5 months) had a substantially higher estimated median period of CAA persistence (hazard ratio:2.746, 95% CI: 1.360-5.547, p=0.017).

Conclusions:
In KD, male gender, higher CLI, lower Ccr before IVIG treatment were risk factors for CAA formation. Furthermore, younger age at diagnosis was a protective factor for CAA regression, and an age at diagnosis younger than 33.5 months has a positive impact on the regression of CAA.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

1979 - THE CORRELATION AND PREDICTIVE VALUE OF PROGNOSTIC NUTRITION INDEX WITH VASOVAGAL SYNCOPE IN CHILDREN

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Background / Hypothesis:
The incidence of vasovagal syncope (VVS) is intricately linked to nutritional indicators, with the prognostic nutritional index (PNI) serving as a rapid assessment tool for nutritional status. This paper aims to investigate the correlation between PNI and VVS in children, as well as its predictive value.

Materials and Methods:
151 children (68 males, aged 4-18 years) diagnosed with VVS due to unexplained syncope and presyncope in our hospital from January 2022 to December 2023 were the study group, 152 healthy children (72 males, aged 7-14 years) who underwent physical examination in the same hospital during the same period of time were matched as the control group. Serum albumin (SA), serum globulin (SG), albumin/globulin (AGR) and peripheral blood lymphocyte absolute count (Lc) were measured, and PNI was calculated.

Results:
1 - PNI (51.35 vs 55.28), SA (40.90 g/L vs 43.05 g/L), AGR (1.65 vs 1.75) and Lc (2.08×109/L vs 2.49×109/L) were decreased in VVS group compared with control group ($P < 0.05$). 2- Predictive analysis of VVS by PNI: The area under receiver operator characteristic curve of PNI prediction of VVS was 0.814 indicated that PNI had moderate predictive value for VVS diagnosis. When PNI cutoff value was 55.00, the sensitivity, specificity and Youden index of predicting VVS were 90.73%, 54.61% and 0.45 respectively. 3-PNI (OR=0.65, 95%CI: 0.58-0.74, $P < 0.001$) also as an independent protective factor for VVS.

Conclusions:
PNI is correlated with VVS in children, holds predictive value for the diagnosis of pediatric VVS, and serves as an independent protective factor for VVS occurrence in children.

POSTER PRESENTATIONS

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2020 - PREDICTIVE VALUE OF PDA DIAMETER BSA RATIO FOR SHORT TERM MECHANICAL VENTILATION IN PRETERM INFANTS WITH PATENT DUCTUS ARTERIOSUS (PDA)

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[1] The First Affiliated Hospital Of Sun Yat-sen University, Neonatology Department, Guangzhou-China [2]

Background / Hypothesis:
The clinical necessity of PDA intervention remains controversial, while mechanical ventilation (MV) serves as a critical indicator for assessing intervention requirements. Our study is to identify independent risk factors and develop a predictive model for preterm infants with PDA requiring MV at 7 days of age, thereby informing clinical decision-making for PDA intervention.

Materials and Methods:
This retrospective study included preterm infants (gestational age <37 weeks) diagnosed with PDA at The First Affiliated Hospital of Sun Yat-sen University (January 2017–January 2022). Participants were stratified by MV dependency at 7 days of age. Perinatal/postnatal clinical data were analyzed to identify independent risk factors that were used to construct a predictive model by multivariate logistic regression, validated by receiver operating characteristic (ROC) analysis.

Results:
Of 298 eligible preterm infants, 210 were randomly assigned to model development and 88 to validation. In the modeling cohort, 173 infants (82.4%) achieved MV weaning by day 7, while 37 (17.6%) remained MV-dependent. Five independent risk factors were identified: lower gestational age (β=-0.491), elevated PDA/BSA (body surface area-adjusted PDA diameter, β=+0.907), larger PDA diameter, lower 10-minute Apgar score (β=-0.696), and history of red blood cell transfusion (β=+1.079) (all $P<0.05$ in univariate analysis, β values were calculated in multivariate logistic regression modeling). The predictive model demonstrated strong discriminative capacity at a cut-off value of 72% (AUC=0.954, 95% CI:0.925–0.983, $P<0.001$), with 86.5% sensitivity and 92.5% specificity. PDA/BSA alone showed significant predictive value (AUC=0.857, 95% CI:0.794–0.920, $P<0.001$), with optimal cutoff at 17.33 (sensitivity=73.0%, specificity=84.4%). Validation cohort results aligned with model predictions.

Conclusions:
Approximately one-sixth of preterm infants with PDA require prolonged MV. PDA/BSA demonstrates robust predictive utility for MV dependency at 7 days, supporting individualized management strategies for PDA in preterm neonates.

POSTER PRESENTATIONS

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2031 - ANALYSIS OF RISK FACTORS FOR PERIOPERATIVE CTRCD IN CHILDREN WITH SOLID TUMORS A SINGLE CENTER PROSPECTIVE STUDY

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Background / Hypothesis:
Surgery is the primary treatment method for most solid tumors. The risk factors for Cancer Therapy-Related Cardiac Dysfunction (CTRCD) occurring perioperatively in children with solid tumors remain unclear.

Materials and Methods:
Children with solid tumors undergoing surgical treatment at our center were prospectively enrolled. Preoperative clinical baseline data and echocardiographic baseline assessments were collected and compared with those of healthy children of the same age and gender. Anesthesia records were reviewed for surgical details, and preoperative and postoperative examinations were gathered. Using the latest IC-OS definition of CTRCD, the patients were grouped, and risk factors were analyzed through intergroup comparisons.

Results:
Compared to the control group, the patient group had a faster heart rate (102 ± 23.4 vs. 89.1 ± 19 beats/min, $P < 0.01$) and higher blood pressure (104.9 ± 13 vs. 94.6 ± 8.3 mmHg, $P < 0.01$ / 64.1 ± 14.6 vs. 58.2 ± 5.2 mmHg, $P < 0.01$). Echocardiography showed subclinical systolic and diastolic dysfunction in the patient group, with significantly reduced left ventricular global longitudinal strain (-19.8% [-16.8%, -20.8%] vs. -23.62% [-21.0%, -24.5%], $P < 0.001$). Postoperatively, the patients had a slower heart rate, while systolic and diastolic pressures were higher. QTc was prolonged.
A total of 62 patients experienced perioperative CTRCD. The risk factors for perioperative CTRCD included age, weight, height, use of alkylating agents, duration of surgery, maximum heart rate during surgery , fluid balance per weight during surgery, baseline heart rate, QT interval, and serum aspartate aminotransferase.
Conclusion:
Perioperative heart rate can serve as an important indicator in assessing the risk of CTRCD. Pediatric patients with solid tumors already exhibit subclinical cardiac function changes before surgery, with echocardiography revealing impaired systolic and diastolic functions. Compared to preoperative measurements, postoperative heart rate decreases, blood pressure increases, and QTc prolongs in children with solid tumors.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

2051 - LESSONS LEARNED FROM A QUARTER CENTURY SCREENING AND TREATING CHILDREN AND ADULTS FOR CONGENITAL HEART DEFECTS IN BOLIVIA IRAQ KENYA KOSOVO KURDISTAN MEXICO MONGOLIA NEPAL PAPUA NEW GUINEA SUDAN SYRIA TANZANIA UZBEKISTAN YEMEN AND ZAMBIA.

Kirk Milhoan [1]
For Hearts And Souls, Pediatric Cardiology, Kihei-United States [1]

Background / Hypothesis:
For Hearts and Souls (FHAS), a medical non-profit organization, has screened over 30,000 children and adults internationally for congenital heart defects since 1999. Screenings consist of history, vital sign assessment, physical exam, and echocardiogram, if indicated. Additional studies, such as CT angiography or diagnostic cardiac catheterization, are arranged if possible and necessary to determine the appropriateness of surgical or catheter-based intervention. Having discovered thousands of patients in need of cardiac intervention, we've endeavored to lessen the burden of need for international travel by assisting in the development of in-country cardiac catheter diagnosis and intervention programs, as well as surgical programs, in some of the countries we've visited.

Materials and Methods:
Prior to initiating an interventional mission, the following are evaluated and considered:
• Capabilities of the country, city, and hospital where the mission will be performed (catheterization laboratory, surgical theater, intensive care unit (ICU), anesthesia services, ancillary support to include anesthesia capabilities, intensive care unit, and ancillary support, including laboratory, radiology, pharmacy, blood bank, and biomedical technology
• Capabilities of the local staff
• Capabilities of the visiting staff
• Proposed age, weight, and cardiac diagnoses that can be safely treated in the local center (versus those that should be referred out-of-country)
• Disposables required

Results:
Screenings have resulted in 66 interventional missions: Surgical (82 with cardiopulmonary bypass and 46 without). Cardiac catheterizations (412 interventional and 274 diagnostic, nine pacemakers). Procedural survival rate of 99.4%.

Conclusions:
Success of an interventional cardiac program begins with a correct diagnosis. In addition, the level of the complexity of interventions must be set to the least experienced aspect of the visiting and local team, avoiding intervention even if the justification is, "if we do nothing, the patient will die." The goal of every mission is to have an experienced team member in every critical position on the team and have the critical materials

POSTER PRESENTATIONS

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2083 - CURRENT MORTALITY AND INFECTION RATES AFTER CONGENITAL HEART SURGERY IN LOW AND MIDDLE INCOME COUNTRIES

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Background:
The International Quality Improvement Collaborative (IQIC) for Congenital Heart Disease (CHD) in low-and-middle-income countries (LMICs) uses a registry paired with quality improvement strategies to improve outcomes. Data has been evaluated annually from 2008-2023 to assess program performance and monitor quality improvement.

Methods:
In 2023, 42 sites in 16 LMICs submitted congenital heart surgery cases to a registry. Registry data were audited and 10% of cases or at least 20 cases per site were reviewed; verified data were included in analyses. Baseline patient characteristics and outcomes were summarized. Risk categories were assigned based on the Risk Adjustment for Congenital Heart Surgery (RACHS-1) method.

Results:
Among 12,814 cases of pediatric congenital heart surgery, 55% were male, 8% were ≤30 days of age and 31% were 31 day to < 1 year of age. 4% of cases were born premature, 7% had a genetic syndrome, 3% had a major non-cardiac structural anomaly, 6% had a major non-cardiac medical illness, and 58% were below the 5th percentile of BMI-for-age, based on WHO standards. Among cases assigned to a RACHS-1 risk score, 83% had a risk score of 1-3 (15%, 48%, and 20%, respectively) and 9% had a risk score of 4-6 (8%, <0.1%, and 1%, respectively). Unadjusted mortality was 4.4% and any major infection was 7.8% (sepsis 6.3%; surgical site 2.2%). As RACHS-1 score increased, in-hospital mortality increased from 0.7% (category=1) to 23.2% (category=4-6, combined). The most common surgical procedures were VSD repair (16%), TOF repair (15%), ASD repair (7%), and Fontan procedure (2%) with corresponding in-hospital mortality rates of 2.0%, 4.9%, 0.3%, and 5.6%.

Conclusion:
IQIC is composed of sites in variable contexts and lengths of participation. Baseline patient characteristics and outcome summaries of the IQIC registry provide a useful method to evaluate pediatric cardiac program performance and improvement over time.

POSTER PRESENTATIONS

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2103 - BIOMARKERS FOR EARLY WARNING OF CARDIOVASCULAR EVENTS IN PEDIATRIC OSTEOSARCOMA PATIENTS

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Background / Hypothesis:
As the most prevalent primary malignant bone tumor in pediatric patients, osteosarcoma exhibits dysregulation of extracellular matrix proteins. The pathophysiological mechanism of its fibrosis closely resembling cardiac remodeling processes. This study focuses on the influence of osteosarcoma on cardiac function through secreted proteins.

Materials and Methods:
Through analyzing the single-cell RNA sequencing data of tumor tissues from osteosarcoma patients (GSE162454) and osteoblasts from osteopenia patients (GSE147390) available in public databases (Gene Expression Omnibus, GEO), we conducted a differential gene analysis between the osteosarcoma group and the normal control group (osteopenia group) within the osteoblast cluster after cell clustering. We identified differentially expressed genes (DEGs) that are significantly upregulated in the osteosarcoma group, as well as secreted protein genes among the DEGs using online resources such as UniProt and The Human Protein Atlas (HPA). Furthermore, hub genes were determined through protein-protein interaction (PPI) analysis utilizing STRING and Cytoscape. Finally, we evaluated the effects of these secreted proteins on myocardial fibrosis and cardiac remodeling.

Results:
Through scRNA-seq analysis, secreted proteins such as osteopontin (OPN), secreted protein acidic and rich in cysteine (SPARC), transforming growth factor beta 1 (TGF-β1), tissue inhibitor of metalloproteinases-1 (TIMP-1) and collagen type I alpha 1 chain (COL1A1) are highly expressed in the osteoblast cluster of osteosarcoma group . Among these, OPN, SPARC, TGF-β1, and TIMP-1 can be secreted into the circulatory system. Concurrently, studies have demonstrated that the expression imbalance of these secreted proteins within the extracellular matrix (ECM) of the heart may promote myocardial fibrosis, ultimately leading to cardiac remodeling and diastolic dysfunction.

Conclusions:
OPN, SPARC, TGF-β1, and TIMP-1, as secreted proteins, may represent potential pathways through which osteosarcoma impacts cardiac function. This study aims to facilitate the early assessment of cardiovascular event risks in pediatric patients diagnosed with osteosarcoma by identifying relevant blood biomarkers.

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2133 - PATTERNS OF CONGENITAL HEART DISEASES AND ACCESS TO CARE AMONG CHILDREN WITH PRESENTING AT TERTIARY LEVEL HOSPITAL IN RWANDA

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Background / Hypothesis:
Congenital heart defects (CHD) remain among the main causes of mortality and morbidity in developing countries. Antenatal diagnosis of congenital heart anomalies remains a challenge with many children dying of undiagnosed defects. In developed countries where advanced cardiac facilities are present, CHD are diagnosed prenatally or promptly after birth, resulting in timely surgical intervention. In contrast, CHD in developing countries face lack of access to cardiac services in fragile health systems that often prioritize other health conditions over pediatric cardiac care.

Materials and Methods:
This study aimed to describe the spectrum of CHD , their short-term outcomes and access to care. Its objectives included to determine current prevalence, sociodemographic characteristics and to describe access to surgical care. This is a prospective cross-sectional study from birth to 15 years of age diagnosed in- and out-patient at a tertiary level of care in Rwanda over a period of one year (December 2023-December 2024) followed by 6 months follow up (June 2025).

Results:
Sample size of 541 patients was obtained and the following data were collected prospectively: age at time of diagnosis, socio -economic status, growth patterns, clinical presentations, type of CHD, genetic abnormalities, access to care and treatment modalities. Recruited participants are being followed up for a 6 month period (ending June 2025) to determine the clinical outcomes with or without access to cardiac intervention (catheterization or surgery). Factors associated with poor outcomes are studied as well.

Conclusions:
Rwanda relies on non-governmental organizations (NGO) to provide cardiac surgery via regular surgical visits and transfers of patients abroad. Overall,good clinical outcomes have been shown with relatively low morbidity and mortality.

POSTER PRESENTATIONS

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2135 - HEALTH WORKFORCE DEVELOPMENT VIA SOUTH TO SOUTH COLLABORATION SHORT TERM OUTCOMES AND ANALYSIS OF COST EFFECTIVENESS OF RWANDA'S PAEDIATRIC CARDIAC SURGERY PROGRAM

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Background / Hypothesis:
Congenital heart disease (CHD) remains a leading cause of paediatric mortality in low- and middle-income countries (LMICs), yet access to surgical intervention is critically limited. In 2022, Rwanda transitioned to an independently run paediatric cardiac surgery program at King Faisal Hospital Rwanda (KFH), leveraging a South-to-South collaboration model between Ethiopian and Rwandan Hospitals. Early clinical outcomes and a cost-effectiveness analysis offer valuable insights for sustainable healthcare investment in LMICs.

Materials and Methods:
A retrospective review of 367 paediatric patients undergoing 433 cardiac procedures at KFH from October 2022 to April 2025 was conducted. Clinical outcomes, including 30-day mortality, major complications, and ICU resource utilisation, were evaluated. In parallel, a cost-utility analysis comparing surgical intervention to medical management for common CHD lesions was performed using a Markov model to simulate outcomes and measure quality-adjusted life years (QALYs) and incremental cost-effectiveness ratios (ICERs).

Results:
The program achieved a 30-day mortality rate of 2.5% and a major complication rate of 8.2%, aligning with global standards. Median ICU and hospital stays were 2 and 6 days, respectively. Cost-effectiveness analysis showed that surgical intervention provided 17.15 additional discounted QALYs at an incremental cost of $6738.23, resulting in an ICER of $269.52 per QALY, below the World Health Organisation's cost-effectiveness threshold of $2898.60 for Rwanda. Sensitivity analyses confirmed that surgery remained cost-effective across varying parameters.

Conclusions:
Rwanda's paediatric cardiac surgery program demonstrates that high-quality surgical outcomes can be achieved sustainably in LMICs through targeted workforce development and South-to-South partnerships. Furthermore, surgical intervention for common CHD lesions is highly cost-effective, offering decades of life expectancy gains for modest incremental costs. These findings support the case for sustained investment in regional, locally led paediatric cardiac services across sub-Saharan Africa.

POSTER PRESENTATIONS

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2163 - ENVIRONMENTAL TOXINS AND AREA DEPRIVATION ARE ASSOCIATED WITH HYPERTENSION IN U.S. ADOLESCENTS EVIDENCE FROM A NATIONAL PEDIATRIC COHORT IN THE UNITED STATES

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Background / Hypothesis:
Environmental toxins and neighborhood deprivation are emerging drivers of early cardiovascular risk. Adolescents exposed to high levels of air pollution, lead, or traffic-related toxins may be more prone to hypertension (HTN), especially when living in socioeconomically disadvantaged areas. We hypothesized that environmental toxin burden and the Area Deprivation Index (ADI) would be independently and jointly associated with adolescent HTN in the United States.

Materials and Methods:
We analyzed data from PEDSnet (2009–2019), a U.S. national pediatric clinical research network aggregating electronic health records from children's hospitals. Adolescents aged 10–17 with ≥2 valid blood pressure readings were included. HTN was defined using the 2017 AAP guidelines. Environmental toxin burden was derived from census-tract level PM2.5, lead exposure risk, and traffic proximity. ADI was categorized into low, medium, and high tertiles. Multivariable logistic regression models assessed associations between exposures and HTN, adjusting for age, sex, race/ethnicity, and BMI percentile, and mixed-effects models were used for repeated measurements of HTN within individuals across time.

Results:
Among 112,300 U.S. adolescents (mean age 14.1 ± 2.1 years; 50.7% female), the overall HTN prevalence was 8.4%. Adolescents in the highest quartile of environmental toxin exposure had 28% higher odds of HTN compared to those in the lowest quartile (adjusted OR: 1.28; 95% CI: 1.20–1.36). High ADI was also independently associated with HTN (OR: 1.35; 95% CI: 1.29–1.42). Subgroup analysis showed the combined effect of high toxin exposure and high ADI led to 52% increased odds of HTN (OR: 1.52; 95% CI: 1.41–1.63), with significant interaction ($p < 0.01$). Racial disparities were noted, with non-Hispanic Black adolescents disproportionately represented in high-exposure/high-ADI areas.

Conclusions:
Environmental toxin exposure and neighborhood deprivation are independently and jointly associated with adolescent hypertension in the United States, with implications for global strategies to address early cardiovascular disparities.

POSTER PRESENTATIONS

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2193 - ONE TRUNCUS TWO PATHS SURGICAL CANDIDACY FOR AN ADOLESCENT REFUGEE WITH UNREPAIRED TRUNCUS ARTERIOSUS AND ATYPICAL DISEASE PROGRESSION

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Background:
Without surgical intervention, prolonged survival in truncus arteriosus (TA) is extremely rare and typically fatal early in life. Patients presenting with unrepaired TA typically have significant pulmonary vascular disease limiting surgical options.

Case Presentation:
We present the case of a 17-year-old immigrant from Africa with history of unrepaired truncus arteriosus type 2. Cardiac history at presentation was significant for chronic cough, moderate exercise intolerance, and history of supraventricular tachycardia. Heart rate and blood pressure were within normal limits and oxygen saturation was in the low 90's by pulse oximetry. Cardiac examination was notable for a hyperactive precordium, grade IV/VI low-frequency holosystolic murmur and grade III/IV diastolic murmur. A transthoracic echocardiogram demonstrated a quadricuspid, dysplastic truncal valve with mild stenosis, severely dilated truncal root (5.8cm , Z-score +15.4), moderate truncal insufficiency, diastolic flow reversal in the descending aorta, and normal biventricular systolic function. A CTA confirmed the diagnosis and showed dilated branch pulmonary arteries without stenosis, and concern for compression of the left main bronchus. Cardiac catheterization performed under general anesthesia on room air demonstrated systemic PA pressure, normal cardiac index with Qp:Qs of 1.8, PVR of 6.2, and Rp:Rs of 0.49 There was some responsiveness to pulmonary vasodilator testing (100% FiO2 and 20ppm iNO) with increase in Qp:Qs to 2.6, decrease in PVR to 3.4, and Rp:Rs of 0.31. His data is currently being reviewed by congenital heart centers for surgical candidacy.

Discussion:
This is a rare case of unrepaired truncus arteriosus type 2 with congestive heart failure (NYHA class 2). It is unclear why this patient has not yet developed severe pulmonary vascular disease in the absence of any pulmonary artery stenosis. Balancing risks of surgery compared to the expected natural history of his disease if left unrepaired presents a unique clinical dilemma for which limited data exists.

POSTER PRESENTATIONS

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2261 - CURRENT STATUS OF TRAINING OF PEDIATRIC CARDIOLOGISTS IN SOUTH AMERICA AN EMPOWERING HEARTS GLOBALLY SURVEY BASED STUDY

Ricardo Pignatelli [1], Carolina Vieira De Campos [2], L. Alesandro Larrazabal [3], Babar Hasan [4], Shubhika Srivastava [5], Anthony Chang [6], Casey Culbertsen [7], Wyman Lai [6], *Colin Mcmahon* [8]
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Background / Hypothesis:
Limited data exists on the current training status of paediatric cardiologists in South America.

Materials and Methods:
A survey, validated by 5 cardiologists of Empowering Hearts Globally (EHG) committee, was circulated to practicing pediatric cardiologists at South America centres. Detailed questions probed the level of congenital services in each country, presence of a paediatric cardiology training program, duration of training, exit examination and certification.

Results:
Twenty-two respondents from 10 countries (Argentina (n=2), Bolivia (n=2), Brazil (n=2), Chile (n=2), Colombia (n=2), Ecuador (n=3), Paraguay (n=2), Peru (n=2), Uruguay (n=2), Venezuela (n=3)) completed the survey. Seven respondents stated their country offered public care, 8 provided private care and 5 provided a mix of private/public care. There was a median of 4 hospitals (range 2-30) per country providing congenital heart disease (CHD) care. Nine countries provided cardiac surgery with median patient volumes of 300 cardiopulmonary bypass cases per year (range 100->600). Nine countries reported they provide pediatric cardiology training. All trainees have access to imaging training, 8 countries reported access to cardiac catheterisation and 5 access to advanced imaging. Median duration of training is 3 years (range 2-5). 70% of trainees come from a pedatric background while 30% have mixed internal medicine/pediatric background. Six respondents reported their trainees have an exit examination, while 8 reported their country has a certification on exit without examination. Six respondents reported that their trainees travel abroad for further pediatric cardiology training. The top three suggestions for improving congenital training included a) better organized pediatric cardiology training programs b) improved certification process and c) improved training structures for other CHD specialists (surgeons, intensivists etc.).

Conclusions:
There is well-organised pediatric cardiology training in many South American countries. Efforts to standardise training, improve exit examination and certification via organisations such as the EHG, may promote greater care for CHD patients.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

2269 - USING IMPLEMENTATION SCIENCE TO UNDERSTAND CAREGIVER PERSPECTIVES ON PEDIATRIC VACCINATION AND CONGENITAL HEART DISEASE SCREENING IN A LOW MIDDLE INCOME COUNTRY

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Background / Hypothesis:
Congenital heart disease (CHD) remains a leading cause of neonatal mortality in low- and middle-income countries (LMICs), yet most children go undiagnosed due to missed opportunities at the primary care level. While global health efforts have focused on expanding immunization, limited data exist on caregiver perspectives around integrated care models that combine routine vaccination with CHD screening. This absence of caregiver-informed insight hinders the design of culturally sensitive, sustainable implementation strategies. We aimed to understand caregiver knowledge, perceptions, and barriers related to pediatric vaccination and CHD screening using implementation science.

Materials and Methods:
In collaboration with Vital Pakistan Trust and the Sindh Institute of Urology and Transplantation (SIUT), we conducted in-depth interviews with 48 caregivers of children aged 0–23 months in Songal, a high-risk, underserved urban community in Karachi. Interview guides were designed using the Consolidated Framework for Implementation Research (CFIR), allowing for systematic exploration across five domains: Intervention Characteristics, Outer Setting, Inner Setting, Characteristics of Individuals, and Implementation Process. Interviews were conducted in Urdu or Pashto, translated, transcribed, and coded in Dedoose for thematic analysis.

Results:
Key themes included:
Limited knowledge of CHD and high interest in early screening: Caregivers expressed strong support for CHD screening, especially when linked to existing immunization services, though some raised fears due to unfamiliarity and historical distrust in free healthcare programs.
Outer and Inner Setting Barriers: Socioeconomic constraints, mistrust, language gaps, and lack of accessible services hindered care. Facilitators included mobile health outreach and visible community health worker presence.
Decision-making dynamics: Male household members played a dominant role in care decisions, influencing uptake of both vaccines and CHD screening.
Implementation Process: Families recommended integrating educational messages with incentives and ensuring communication in preferred languages.

Conclusions:
Using CFIR to guide study design enabled us to systematically uncover caregiver-driven barriers and opportunities for implementing CHD screening alongside immunization in high-risk

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2283 - CARDIAC FUNCTION EVALUATION BEFORE AND AFTER TREATMENT IN HEPATOBLASTOMA

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Background:
While contemporary oncology has achieved remarkable 5-year survival rates exceeding 80% for childhood malignancies, emerging evidence reveals a concerning prevalence of premature cardiovascular morbidity among long-term survivors.
Materials and Methods:his prospective cohort study enrolled 58 newly-diagnosed hepatoblastoma patients undergoing chemotherapy followed by surgical resection at our hospital between March 2021 and March 2023. A gender- and age-matched healthy cohort served as controls. We test at baseline, during chemotherapy, before operation, and at ending of the treatment. The control group received echocardiography only. Finding changes in cardiac function by comparing different treatment stages with baseline in the study group. Evaluating the cardiac function through a comparative analysis between the study and control groups.

Results:
A comparative analysis was conducted between 20 pediatric patients with hepatoblastoma and 20 healthy children. Our findings revealed significant differences were observed in echocardiographic parameters such as GLS of the left and right ventricles (-22.4% vs -19.6%; -29.6% vs -23.8%), Tei index of both ventricles (left: 0.42 vs 0.49; right: 0.39 vs 0.51). Further echocardiographic evaluations from post-chemotherapy to pre-surgery revealed significant changes in left ventricular end-diastolic diameter compared to baseline (median 32.5mm vs 33mm), as well as in Tei index at post-surgery versus baseline (left: 0.49 vs 0.45;right: median 0.48 vs 0.47). No significant differences were observed in systolic function throughout treatment.Regarding serum troponin T levels, significant elevations were detected preoperatively compared to baseline (median 0.012 vs 0.004 pg/L, with sustained differences observed at the end of treatment (0.016 vs 0.005pg/L).

Conclusions:
Subclinical cardiac dysfunction is evident in children with hepatoblastoma compared to age-matched normal children before treatment and shows further aggravation after treatment, independent of clinically apparent cardiac insufficiency or reduced LVEF.

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2297 - ASSISTING CHD PATIENTS NEAR THE MYANMAR–THAILAND BORDER COLLABORATIVE EXPERIENCES BETWEEN NGOS AND NON NGOS

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Background / Hypothesis:
Numerous refugees reside in the Myanmar–Thailand border areas, facing significant barriers to accessing health care, leading to widespread suffering from delayed treatments for congenital heart disease (CHD). Various NGOs, equipped with resources such as financial support and manpower, have provided assistance in multiple ways. This necessitates cooperation and coordination to achieve key objectives and improve outcomes.

Materials and Methods:
PCSF helps lead the coordination efforts with NGOs and Non-NGOs operating in the area since 2023 to provide medical treatments to this group of patients with the following key functions.
1. Arrange meetings between NGOs (such as PCSF, CCFT, CDF, BCMF, IRC and Mae Tao Clinic) and Non-NGOs (such as Mae Sot Hospital, KH Hospital and KCMH).
2. Organize medical missions at Mae Sot Hospital.
3. Coordinate with other organizations to schedule surgeries, pre-op evaluations, patient transfer authorization requests with local authorities (from a border town to Bangkok), transportation and accommodation for patients, parents and translators.
4. Conduct pre-op revaluation and post-op care for at least seven days.
5. Perform pre-op/post-op evaluations by local doctor and online communication by consultant cardiologists.
6. Provide training to local doctors to conduct screening and follow-up echo.
7. Schedule patients to have a follow-up at local hospitals and PCSF medical missions.

Results:
From January 2023 to January 2025, six medical missions were conducted. A total of 413 patients were examined, with 255 listed for surgeries. Of these, 204 patients underwent surgeries, resulting in two mortalities (the mortality rate = 2/204 = 0.98%). Additionally, 16 patients received interventions with zero mortalities (the mortality rate = 0%).

Conclusions:
This ongoing project can be deemed successful in terms of medical treatments, evidenced by low mortality rates. The objectives and goals were achieved through the cooperation and coordination between NGOs and non-NGOs, reflecting the hard work and dedication of all involved.

POSTER PRESENTATIONS

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2302 - EXPRESSION AND SIGNIFICANCE OF NLRP3 INFLAMMATORY VESICLES IN A DOX INDUCED RAT MODEL OF DCM

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Background / Hypothesis:
Dilated Cardiomyopathy (DCM) is one of the most common causes of heart failure, and it has been shown that excessive inflammatory immune response plays a key role in DCM, and activation of NLRP3 inflammatory vesicles is associated with many cardiovascular risk factors. However, whether the activation of NLRP3 inflammatory vesicles and pro-inflammatory and pro-focal death contribute to DOX-induced DCM is currently unknown. The aim of this study was to investigate the role of NLRP3 in DOX-induced DCM and its underlying mechanisms.

Materials and Methods:
SD rats were randomly divided into control group, DCM model group, MCC950 intervention group, and sacubitril valsartan intervention group to observe the survival status and survival rate of the rats, detect the cardiac function of the rats, and detect the histological pathology of the heart by hematoxylin-eosin staining.Furthermore, the expression of NF-κB, BNP, and caspase-1 was detected by ELISA, and the expression of NLRP3, GSDMD, and IL-1β was detected by Western blot.

Results:
In this study, we found that the expression of NLRP3, GSDMD, IL-1β, and BNP was increased in the DOX-induced DCM model, and inhibition of NLRP3 inflammatory vesicle activation resulted in a significant decrease in the expression of NLRP3, caspase-1, IL-1β, and GSDMD, as well as a significant improvement in the survival rate, myocardial pathology, and cardiac function.The efficacy of the MCC950 group was superior to that of the sacubitril valsartan group.

Conclusions:
Activation of NLRP3 is involved in the development of DOX-induced DCM.NLRP3 activation promotes both chronic inflammation in cardiomyocytes through activation of downstream proinflammatory factors (IL-1β), NF-κB, and modulation of cardiomyocyte scorch death through the NLRP3-caspase-1-GSDMD signaling pathway, which together contribute to DOX-induced cardiac dysfunction in DCM.

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2348 - OUTCOME AND COST EFFECTIVENESS OF HUMANITARIAN INTERNATIONAL PEDIATRIC CARDIAC SURGERY TRIPS IN LOW AND MIDDLE INCOME COUNTRIES

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Background / Hypothesis:
In recent years, global efforts have been made to decrease morbidity and mortality from congenital heart disease (CHD), as it remains one of the leading causes of death in developing countries. Access to specialized pediatric cardiac care and resources remains limited in many parts of the world. Riley Hospital for Children launched the International Heart Trips (IHT) in 2007, utilizing their own multidisciplinary team members to provide underserved populations with access to free cardiac surgery and care. Given the growing humanitarian crisis in the Middle East in recent years, the team has been working with local partners in Jordan to treat children with CHD from neighboring war-torn, low-income countries, including many refugees.

Materials and Methods:
Our study aimed to evaluate the short-term outcomes of pediatric patients with CHD who received surgical interventions through the humanitarian IHT program to Jordan by the heart center team from Riley Hospital for Children. This retrospective study of pediatric patients treated between 2020 and the present, collecting demographic data and short-term outcome data.

Results:
We reviewed the charts of 101 patients. The mean age at surgical repair was 2.7 years, with an average weight of 12.4 kg. Of the patients, 49 (48%) were female. The patient nationalities were Syrian (42.5%), Palestinian (20.1%), Iraqi (11.1%), Yemeni (5.2%), and Jordanian (21.1%). Non-Jordanian patients were either living in Jordan with refugee status or were arranged to travel from their country to Jordan for surgery. The surgical mortality rate was 3% (3 patients died). The average ICU length of stay (LOS) was 3.1 days, while the hospital LOS was 5.6 days. The cost per surgical procedure was $5,000. 18 patients (17.8%) had already lost follow-up

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2352 - RESPIRATORY TRAINING IN CHILDREN IN THE LATE POSTOPERATIVE PERIOD OF FONTAN SURGERY.

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Introduction:
Fontan surgery is a surgical intervention designed for individuals with a single functional cardiac chamber, with the primary goal of improving blood flow. Children who undergo this procedure often exhibit lower physical performance compared to their healthy peers, which may be attributed to their unique clinical characteristics and compromised physical development. Therefore, this study aims to evaluate and compare various parameters, including respiratory capacity, respiratory muscle strength, diaphragm mobility, maximum and submaximal functional capacity, and quality of life in Fontan patients aged 8 to 12 years after a inspiratory muscle training.

Methods:
This cross-sectional study included 27 Fontan Treinament Group (FTG) and Fontan Control Group (FCG). Different examinations were performed: spirometry was used to analyze pulmonary volume and capacity; manovacuometry was used to determine respiratory muscle strength; chest ultrasound was used to determine diaphragm muscle characteristics; cardiopulmonary exercise was used; and the six-minute walk test (6MWT) was used to determine functional capacity, the AUQEI questionnaire was used to determine quality of life. Descriptive analysis and intergroup comparisons were performed for all the data.

Results:
The Fontan Group demonstrated significant improvements in overall quality of life, spirometry measurements (including FEV and FEV1/FVC ratios), respiratory muscle strength, the distance covered in the 6MWT, peak VO2, and VO2 pulse during cardiopulmonary exercise testing, as well as changes in diaphragm mobility and thickness.

Conclusion:
Respiratory training in children during the late postoperative period following Fontan surgery yielded positive outcomes in both physical assessments and quality of life measures. These findings emphasize the importance of targeted respiratory rehabilitation to enhance recovery and overall well-being in this patient population.

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2363 - ESTABLISHING NEONATAL PULSE OXIMETRY REFERENCE VALUES FROM SEA LEVEL TO 4500 METERS A CRITICAL STEP TOWARDS IMPROVING CRITICAL CONGENITAL HEART DISEASE SCREENING ALGORITHMS

Katia Bravo-jaimes [1], Daniel Lozano [2], William Rosales [3], Carmen Davila [4], Priscilla Tolentino [5], Paulina Ordaz [6], Leslie Martinez [7], Edgar Chavez [8], Jorge Galdos [9], Pat Johnson [10], Rickey Carter [10]

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Background / Hypothesis:
Neonatal pulse oximetry screening has been associated with lower neonatal mortality as it helps detect critical congenital heart disease and other hypoxemic conditions. However, pulse oximetry reference values for newborns born at high altitudes have not been developed.

Materials and Methods:
Pulse oximetry (SpO_2) data were collected from newborns across ten sites spanning sea level to 4,338 meters in the Andean and high-altitude regions of Latin America. Each newborn had 1-3 sets of preductal and postductal SpO_2 measurements (six readings per set), with the number of sets determined by altitude-based criteria. Only healthy newborns were included, defined as those alive at one-month follow-up without cardiac, pulmonary hospitalizations, no cyanosis episodes, or no abnormal findings via echocardiograms. For analysis, the minimum SpO_2 per newborn was used to characterize the lower limit of normal. Quantile regression with quadratic terms for elevation was used to estimate the 10th, 25th, 50th (median), 75th, and 90th percentiles of SpO_2 across elevations, applying the Barrodale and Roberts algorithm. This provided continuous, altitude-specific reference values for preductal and postductal oxygen saturation.

Results:
A total of 1,385 healthy newborns were included. Patient distribution varied by site, with the largest cohort at 3,249 m (Huancayo, n=383) and the smallest at 2,640 m (Bogotá, n=24). Smoothed percentile regression demonstrated a non-linear decline in SpO_2 with increasing elevation (Figure 1). Table 1 summarizes the estimated 10th, 50th (median), and 90th percentiles of preductal and postductal SpO_2 across elevations. SpO_2 values declined progressively with increasing altitude, with a steeper drop observed above 3,000 m. The fitted regression models provide altitude-specific reference values for SpO_2 in healthy newborns across diverse elevations.

Conclusions:
SpO_2 percentiles decline non-linearly with increasing altitude, with a sharper drop above 3,000 m. These findings provide altitude-specific reference values for assessing newborn oxygen saturation in diverse geographic

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2384 - INFANTS OF DIABETIC MOTHERS EPIDEMIOLOGY PATHOPHYSIOLOGY FETAL HEART ASSESSMENT STRUCTURAL AND FUNCTIONAL HEART CONSEQUENCES A NARRATIVE REVIEW

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Background / Hypothesis:
Infants of diabetic mothers, also known as IDMs, are neonates born to a woman who had periodic hyperglycemia during pregnancy. Consequently, IDMs are at higher risk of illness besides morbidity and mortality due to teratogenic effects on the fetal cardiovascular system, causing the most frequent congenital heart disorders.

Materials and Methods:
This narrative review addresses the research question of the relationship between maternal diabetes and cardiac manifestations in their infants. Key repositories were examined to identify pertinent scientific papers available for such analysis. The search queries, used singly and in conjunction, are “Maternal diabetes,”” Infants, “Newborns,” “Infants of Diabetic Mothers,” “IDMs,” “Cardiac manifestations,” “Epidemiology,” “Pathophysiology,” and “Congenital heart disease.” Only English-language articles have been included in this narrative review. Ethical review and approval were waived for this study because it did not directly involve human subjects (secondary research study). The study itself was a review article and did not involve human subjects, and hence patient consent was waived.

Results:
Maternal diabetes is associated with a 4–5 5-fold higher risk of fetal cardiac malformations and congenital heart defects (CHDs).
Up to 8.5% of infants of diabetic mothers are affected, compared to 0.8% in the general population.
Poor glycemic control increases the risk of cardiomyopathy and cardiac dysfunction in newborns.
Markers like cardiac troponin I are elevated in affected infants, indicating myocardial injury.
Preventing and managing diabetes in women of reproductive age is key to reducing neonatal cardiac complications.

Conclusions:
The predominance of pregestational and gestational diabetic pregnancies can affect maternal, fetal, neonatal, and future adult health. Further research should be conducted to analyze the occurrence of diabetes, its management, in addition to interventions to decrease the burden due to diabetes throughout the prenatal period, and its adverse effects.

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2393 - PEDIATRIC CARDIAC SURGERY PROGRAM DEVELOPMENT – THE DILEMMA OF ISLAND NATIONS

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Background / Hypothesis:
Small countries, looking for ways to lower their infant mortality, may resort to outsourcing the treatment of congenital heart disease (CHD) to bordering countries while others may opt to develop their own programs. The surgical costs per patient and the Cost-Effectiveness (CE) of program development may be significantly different for small countries than for those with larger incidence of CHD.
Caribbean countries/territories are a model of small societies where low incidence of CHD, cost of local program development, safety of small annual surgical volume and long-distance referrals combine to create a challenging situation.

Materials and Methods:
We calculated costs and the CE of operating every child born with CHD in the Caribbean utilizing a free-access available calculator. This calculator makes several assumptions: No inflation of supplies and labor; a capital depreciation of 3% a year, and that all children born with congenital heart disease (CHD) are diagnosed and surgically treated. Based on published data, uses 39.9y as the average DALYs averted per surviving treated patients. Values are expressed in 2022 USD$.

Results:
We calculated costs and CE for 25 Caribbean islands with a total incidence of CHD of 5,299 patients/year. Only six islands account for 95.5% of the cases, making program development cost-effective (Cuba, Dominican Republic, Haiti, Jamaica, Puerto Rico and Trinidad-Tobago). The Median surgical costs per patient was estimated at $6,080 ($5223 - $15574). The Median cost of a 10-year surgical program was USD$21,188,640 ($11,986,080-$126,051,783). The median CE was estimated at $224.5 per DALY averted ($130-$390).

Conclusions:
Patient safety and cost-effectiveness seem to come together to justify program development in small countries with at least a CHD incidence of 100 new cases/year and above. International referral seems like the safer, more cost-effective way to manage patients with CHD at an incidence below 100 cases/year.

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2422 - CRITICAL CONGENITAL HEART DISEASE SCREENING IN NEWBORNS AWARENESS AND IMPLEMENTATION AMONG HEALTHCARE PROVIDERS

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Universidad Libre, Pediatrics, Cali-Colombia [1] Universidad Del Valle, Pediatrics, Cali-Colombia [2]

Background / Hypothesis:
Critical congenital heart diseases (CCHD) are severe cardiac malformations that require early detection to reduce neonatal morbidity and mortality. Diagnosis can be challenging, as clinical signs may be subtle or confused with other conditions. Pulse oximetry screening is a validated tool with high sensitivity and specificity. In 2024, the American Academy of Pediatrics (AAP) updated its recommendations; however, in Colombia, implementation varies, and healthcare professionals' knowledge remains uncertain. Evaluating awareness and practice in Cali can support medical education and timely diagnosis

Materials and Methods:
Observational, cross-sectional, and analytical study conducted in 2025 among general practitioners, nurses, pediatric residents, pediatricians, and neonatologists in Cali, Colombia.

Results:
100 healthcare professionals participated (12 nurses, 13 general practitioners, 32 pediatric residents, 29 pediatricians, 14 neonatologists). While 80% reported performing CCHD screening, only 78% had up-to-date knowledge, and just 38% had received formal training—significant differences were observed between groups. Although 98% acknowledged its importance in asymptomatic newborns, only 70% knew the correct timing, 58% identified the appropriate anatomical site, and 56% could interpret oxygen saturation accurately. Regarding test thresholds, 62% answered correctly about inter-limb differences, 79% about retesting criteria (90–94% saturation), and 82% recognized ≤90% as an indication for echocardiography. Only 50% knew the maximum number of retests allowed. The average knowledge score was 5.3/9 (median: 6).

Conclusions:
Despite advances in CCHD screening implementation, knowledge and training gaps persist, especially among general practitioners and residents. As pulse oximetry is effective and low-cost, improving adherence to updated guidelines and reinforcing professional education is essential to enhance early detection and reduce neonatal mortality.

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2465 - INTERNATIONAL ADVANCEMENT IN FETAL CARDIOLOGY ACTIVITY REPORT FROM THE FETAL HEART SOCIETY GLOBAL AFFAIRS COMMITTEE

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Osaka City General Hospital, Division Of Pediatric Cardiology & & Electrophysiology, Osaka-Japan [1] University Of Texas, Department Of Pediatrics, Division Of Pediatric Cardiology, San Antonio, Tx-United States [2] Sakakibara Heart Institute, Division Of Pediatric Cardiology, Tokyo-Japan [3] University Of California, San Francisco, Department Of Pediatrics, Division Of Pediatric Cardiology, San Francisco, Ca-United States [4] Children's National Hospital, Division Of Cardiology, Washington, Dc-United States [5]

Background
The Global Affairs Committee (GAC) of the Fetal Heart Society (FHS), founded in 2023, promotes international collaboration in fetal cardiology. Despite advances in congenital heart disease (CHD) care, disparities remain worldwide. Many low- and middle-income countries (LMICs) lack pediatric cardiologists, surgeons, and infrastructure to diagnose CHD in-utero and provide postnatal care. The prenatal diagnosis of CHD offers value in LMICs by enabling earlier referral and improving care coordination, highlighting fetal cardiology's global role.

Materials and Methods
We reviewed literature on disparities in global pediatric cardiovascular care, focusing on workforce and infrastructure limitations and access barriers, acknowledging that such disparities often begin prenatally. We explored how collaboration amongst fetal experts and global providers could help reduce disparities in LMICs by identifying shared challenges and implementing initiatives to improve education and training in fetal cardiac care.

Results
With participants from Americas, Europe, Asia, and Africa, GAC addresses disparities in prenatal CHD care through education, research, and global partnerships. Key activities include: designing a global fetal cardiology survey; translating FHS didactic material and fetal guidelines into Spanish, Japanese and Arabic; initiating multilingual webinars with the Pan American Health Organization, the Association for European Paediatric and Congenital Cardiology, and other societies; launching AI based fetal echocardiography validation in LMIC academic centers; creating culturally tailored counseling tools; and promoting FHS membership. Additionally, GAC is collaborating with Empowering Hearts Globally to develop a fetal cardiology curriculum for both high-resource and resource-limited settings and partnering with the Mexican Society of Congenital Cardiomyopathy to study outcomes in LMICs following prenatal CHD diagnosis.

Conclusions
The FHS-GAC aims to bridge global gaps in fetal cardiology through collaboration, innovation, and expand access to high quality education to improve care. The committee hopes to facilitate more equitable global training in fetal cardiology, advancing equitable care and a better future for children with CHD worldwide.

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2495 - CASE REPORT RIGHT LUNG HYPOPLASIA VS. RIGHT PULMONARY VEIN AGNESIA YANES SANABRIA CC. MIRANDA CHÁVEZ IO. TRUJEQUE RUIZ AL. VÁZQUEZ MARTÍNEZ RM. GARCÍA MONTES JA. SUAREZ DÍAZ FA. PEDIATRIC CARDIOLOGY SERVICE OF THE IGNACIO CHÁVEZ NATIONAL INSTITUTE OF CARDIOLOGY MEXICO CITY MEXICO.

Cinthia Carolina Yanes Sanabria [1], Irma Ofelia Miranda Chávez [1], Ana Laura Trujeque Ruiz [2], Rocío Maily Vázquez Martínez [3], José Antonio Garcia Montes [4], Fernando Armando Suárez Diaz [4]

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Background / Hypothesis:
Pulmonary vein agenesis is a rare congenital anomaly in which one or more pulmonary veins fail to develop properly or are absent. This prevents oxygenated blood from returning from the lungs to the heart through normal pathways, which can lead to complications such as pulmonary hypertension and heart failure.

Materials and Methods:
We present the case of a 15-year-old female patient who was admitted to undergo further imaging and interventional studies to address heart disease.

Results:
This is a 15-year-old patient who was found to have probable right pulmonary vein agenesis, inferior vena cava venous malformation, ostium secundum interatrial communication, right lung hypoplasia, pulmonary hypertension with systolic and mean pulmonary artery pressures of 64 and 39 mmHg. LVEF 55%. TAPSE: 21 mm. DAVF: 34%. A lung CT scan revealed probable intralobar sequestration at the right anterobasal level, associated with fibroscarring changes in the ipsilateral basal lobe. She presented at a medical-surgical session and it was concluded that she is not a candidate for any cardiovascular or interventional surgical procedure. She was evaluated in conjunction with a pulmonology specialist and underwent a 6-minute walk test, covering 498 meters. Initial and final oximetry were 97% and 93%. Initial and final heart rates were 110 bpm and 83 bpm. Baseline spirometry with a mixed pattern (mild obstruction with decreased forced vital capacity). Spirometry with bronchodilator suggested a restrictive pattern.

Conclusions:
The patient is in NYHA functional class I. Her cardiovascular status is asymptomatic. She does not require any cardiovascular medications. Physical examination reveals no significant murmurs, her heart sounds are right-sided, and the pulmonic component of the second sound is elevated. Her electrocardiogram is in sinus rhythm. She will be monitored.

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2498 - MACHINE LEARNING–BASED PROGNOSTIC MODEL INSIGHTS INTO TWO YEAR PERSISTENCE OF CORONARY ARTERY ANEURYSMS IN KAWASAKI DISEASE

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Background / Hypothesis:
Coronary artery aneurysm (CAA) is a major cardiac complication of Kawasaki disease (KD), and persistent CAA is a recognized risk factor for myocardial infarction in adulthood. We aimed to develop and validate a machine learning (ML) model to predict two-year persistence of CAA in KD.

Materials and Methods:
We retrospectively reviewed clinical data from children with primary KD treated at the First Affiliated Hospital of Guangxi Medical University between 2012 and 2023. Ten ML algorithms, including logistic regression, stacking, generalized linear model with elastic net regularization, naive Bayes, random forest, quadratic discriminant analysis, support vector machine, XGBoost, decision tree, and k-nearest neighbor, were trained using 10-fold cross-validation for hyperparameter optimization. To address class imbalance, the synthetic minority over-sampling technique (SMOTE) was applied. Model interpretability was assessed with SHapley Additive exPlanations (SHAP) analysis.

Results:
Of 722 KD cases analyzed, 16.9% had CAA persisting for two years. After preprocessing and feature selection, nine predictors were retained: sex, age (months), body mass index, intravenous immunoglobulin resistance, CAA size, white blood cell count, platelet count, globulin, and prealbumin. The stacking model achieved the highest performance on the SMOTE-balanced dataset (accuracy 0.937; F1-score 0.938).

Conclusions:
An explainable stacking-based ML model accurately predicted two-year CAA persistence in KD and may support early risk stratification and individualized management in clinical practice.

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2523 - THE GLOBAL COSTS AND COSTS EFFECTIVENESS OF PEDIATRIC CARDIAC SURGERY

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Background / Hypothesis:
Public health stakeholders in Low-and Middle-Income Countries (LMIC) assume pediatric cardiac surgery (PCS) to be a very costly enterprise, prioritizing other investments in public health.
As advocates for global availability of PCS, we need tools to demonstrate the Cost-Effectiveness (CE) of the health interventions we recommend, providing guidance to the decision makers.
We calculated the costs of PCS in every country (currently available or not) and estimated PCS Cost-Effectiveness worldwide.

Materials and Methods:
We designed and made publicly available 2 calculators: A Congenital Heart Disease (CHD) incidence and a PCS Costs and CE calculators. We used 2022 demographic data and 2023 prices (US$) for costs.
Cost-effectiveness was calculated by dividing estimated costs by our published 39.9 Disability Adjusted Life Years (DALY) averted per surgical survivor. Results were compared to Gross National Income per capita at purchasing power parity (GNI p/c). Territories with CHD incidence <100 were excluded from analysis (n=56)

Results:
Included countries (n=162) had a median GNI p/c of US$16,840 (US$950 – US$126 190). The median estimated cost of PCS per patient was US$6746(US$4065 - US$35 909). The calculated Median CE was US$169 (US$102 – US$900) per DALY averted.
After the capital costs on year 1, largest operational costs for LMIC would be disposables, and for high income countries would be salaries.
With a cost-effectiveness lower than the annual GNI p/c in every single country studied, PCS would be a highly cost-effective health intervention.

Conclusions:
While prices for PCS may be out of the reach for most families without some form of government subsidy, private insurance or humanitarian assistance, the actual costs would be reasonable and highly cost-effective in every country studied.

It is up to each society willingness to pay to decide the future of their children born with CHD

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

2526 - ANALYSIS OF INFLUENCING FACTORS OF DIAGNOSTIC DIFFERENCES BETWEEN PRE AND INTRAOPERATIVE TRANSTHORACIC ECHOCARDIOGRAPHY IN PATENT DUCTUS ARTERIOSUS INTERVENTION

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Background / Hypothesis:
PDA is a common congenital heart disease in children.Interventional therapy is the preferred treatment for PDA,the key to the success is the estimation of the shape and size of the arterial duct. The routine preoperative examination method for PDA intervention is transthoracic echocardiography(TTE).The current gold standard for PDA diagnosis is cardiovascular angiography(CAG),but it is invasive, difficult to operate, and has radiation.Therefore, the accurate evaluation of PDA by TTE is becoming increasingly important.Numerous studies have shown that there are differences in the measurement of PDA size between TTE and CAG, but there are few reports on the impact of PDA type, PDA size, and other factors on the measurement differences, as well as the analysis of influencing factors.

Materials and Methods:
This study used a retrospective analysis method, and all case data were sourced from 216 children with PDA who underwent interventional treatment in the pediatric cardiovascular department of Sichuan Maternal and Child Health Hospital and Chengdu Women and Children's Hospital from January 2019 to July 2023.The size of PDAs measured by preoperative transthoracic echocardiography and intraoperative angiography were compared, and a difference of more than 0.5mm was defined as a difference.

Results:
Through univariate analysis of the differences between preoperative TTE measurements of PDA size and intraoperative CAG measurements, it was found that the reasons for the differences were related to PDA type, PDA size, normal growth and development, full-term production, abnormal myocardial enzyme spectrum, and abnormal chest X-ray.

Conclusions:
TTE cannot completely replace CAG examination. In clinical practice, for PDA patients with risk factors, preoperative TTE examination should be more cautious, selecting the appropriate location, combined with experienced ultrasound physicians and using multi position measurement or waiting for their myocardial enzyme spectrum to return to normal before performing TTE, in order to improve the accuracy of TTE diagnosis.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

2547 - THE CHARACTERISTICS AND IMPACT OF ACCESSORY RENAL ARTERY ON TARGET ORGAN DAMAGE IN CHILDREN WITH PRIMARY HYPERTENSION

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Background / Hypothesis:
To analyze the characteristics of accessory renal artery in children with primary hypertension and explore its relationship with blood pressure and target organ damage.

Materials and Methods:
A retrospective analysis was performed on the clinical data of children with primary hypertension at Children's Hospital of Soochow University from 2019 to 2025. The enrolled children were divided into two groups: the accessory renal artery group (n=72) and the control group (no accessory renal artery, n=150).

Results:
1. The office diastolic pressure in the accessory renal artery group was significantly higher than the control group, and the nighttime blood pressure dipping was higher in the accessory renal artery group compared with control group.
2. The accessory renal artery group had significantly higher standing and supine angiotensin concentrations compared to the control group. However, there were no significant differences in supine or standing renin and aldosterone concentrations between the two groups (all $P > 0.05$).
3. The accessory renal artery group exhibited higher left heart mass, left heart mass index, and a higher incidence of left ventricular hypertrophy (50.7% [36/72] vs. 34.0% [51/150]).

Conclusion:
Children with primary hypertension who have accessory renal arteries show higher angiotensin concentrations and are more likely to develop left ventricular hypertrophy.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

2569 - ENCOURAGING INVESTMENT FUNDING FOR SUSTAINABLE CARDIAC SURGERY IN SUB SAHARAN AFRICA BY DEFINING AND MEASURING SOCIAL RETURN ON INVESTMENT.

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Background:
75% of the morbidity and mortality associated with heart disease occur in low- and middle income countries (LMIC), where the disproportionately high incidence of congenital heart disease (CHD) and rheumatic valvular heart disease (RHD) have a major impact on socio-economic sustainability and development. A dire shortage of expertise required to treat these diseases significantly compounds the existing clinical burden. Non-governmental funding for self-sustaining local surgical programs offering clinical outcomes, teaching, training, research and development is needed. Inviting funding is severely curtailed by an inability to demonstrate outcomes and benefits to investors. Traditional impact reporting typically focuses on surgical outputs, whilst omitting long-term outcomes such as life years gained and economic productivity gains.

Methods:
The Young Hearts Africa Foundation in Cape Town has launched a cardiac surgical program to alleviate the burden on waiting lists of patients suffering from CHD, RHD and grown-up congenital heart disease (GUCH) at the two premier University hospitals on the African continent. The impact is measured using detailed Social Return on Investment (SROI) metrics. SROI quantifies the broader societal value of interventions by (1) monetizing outcomes, including Quality of Life Years (QALY) gained, economic productivity, healthcare cost savings and tax revenue generated, (2) comparing total benefits to costs, demonstrating ROI and (3) highlighting non-financial impacts in financial terms for investors.

Results:
The Foundation's current program has developed 6 key measurable SROI impact benefit categories designed to enable investors to monitor the positive impact their investments have. For this cardiac surgery program, SROI reveals that every ZAR 1 invested generates up to ZAR 2.46 in societal value.

Conclusion:
The implementation of this method to clarify impact will encourage investment by offering clearly defined parameters to measure ROI.

POSTER PRESENTATIONS

Category: The Call to Action: Global Health and Pediatric Heart Disease

2593 - TANZANIA AND ZAMBIA SOUTH SOUTH COLLABORATION SAVING HEARTS ACROSS BORDERS

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Background:
SubSaharan Africa has among the world's largest burden of congenital and acquired heart diseases but among the world's least available resources for cardiac surgery. The Jakaya Kikwete Cardiac Institute (JKCI) in Dar es Salaam is Tanzania's only paediatric cardiac surgery and intervention Centre, operating 300 children and performing more than 250 interventions annually. JKCI has partnered with the only cardiac hospital in Zambia, the National Heart Hospital (NHH) in Lusaka, to provide support to their cardiac programme through twice yearly missions to NHH to perform open heart surgeries.

Materials and Methods:
A team from JKCI (surgeon, cardiologist, anaesthesiologist, perfusionist, ICU specialist, ICU nurses) had two one week missions to Zambia in 2024. In these missions, a Zambian team member worked side-by-side with a similar member of the Tanzanian team for the duration of the mission. This encourages and empowers the Zambian team in their continued pursuit of a sustainable paediatric cardiac surgery programme.

Results:
During the two missions, a total of 7 and 12 children were successfully operated on respectively. The Zambian team was able to gain from the over decade experience of performing safe surgeries using cost-effective means necessary for a similar resource limited setting that the JKCI team provided.

Conclusions:
A South-South collaboration among centers with similar resource limitations offers immense opportunity to expand sustainable paediatric open heart surgery availability in subSaharan Africa.

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Category: The Call to Action: Global Health and Pediatric Heart Disease

2595 - PSYCHOLOGICAL DISTRESS AND ITS ASSOCIATED FACTORS AMONG PARENTS OF CHILDREN WITH CONGENITAL HEART DISEASE A CROSS SECTIONAL MIXED METHOD STUDY AT THE NATIONAL CARDIOTHORACIC CENTER GHANA

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Background / Hypothesis:
The aim of this study was to examine the prevalence and factors associated with psychological distress among parents of children with congenital heart disease (PCCHD) receiving treatment at the National Cardiothoracic Centre (NCTC), Accra.

Materials and Methods:
A cross-sectional mixed method study involving 248 parents of children with congenital heart disease receiving treatment at the NCTC was employed. Systematic sampling was used to select participants. The outcome variables were depression, anxiety, and somatization, assessed using the brief symptom inventory. A semi-structured interview guide was used to understand the contextual factors that contribute to parents' psychological distress. Poisson regression and inductive thematic analyses were employed for quantitative and qualitative data, respectively.

Results:
The prevalence of depression, anxiety, and somatization was 42.9% [95%CI=36.749.3], 42.4% [95%CI=36.3-48.9], and 41.2% [95%CI=35.1-47.6] respectively. Parents who were divorced [aPR (95%CI)=1.60(1.022.51)], had only basic level education [aPR (95%CI)=2.13(1.34-3.39)], were without a religious affiliation [aPR (95%CI)= 2.24(1.58-3.19)], and in the low asset quintile significantly increased the likelihood of psychological distress. Delay/ postponement of scheduled surgery, worsening state of child's condition, feeling a sense of helplessness, societal stigma, and lack of funding or health insurance for the treatment of the condition were contextual factors that contributed to increased psychological distress among parents.

Conclusions:
The prevalence of psychological distress was quite high among parents of children with congenital heart disease in Ghana and was associated with both parent and patient factors. Psychosocial care should be integrated into the clinical health services of this group of patients and their parents to improve psychological health outcomes.

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