78 **EMPIRIC VERSUS ENTRAINED CAVOTRICUSPID ISTHMUS LINE ABLATION IN CONGENITAL HEART DISEASE: A SINGLE CENTRE EXPERIENCE**

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Introduction Catheter ablation for supraventricular tachycardia (SVT) in patients with congenital heart disease (CHD) is an important therapeutic option. Complex atrial substrate in this cohort makes atrial flutter (AFL) a common occurrence. However, induction of sustained tachycardia at the time of ablation is not always possible. We hypothesised that performing an empiric Cavotricuspid Isthmus CTI line ablation in case of non-inducibility of arrhythmia will lead to good outcomes. Long-term outcomes of empiric versus entrained CTI ablation in CHD patients with right-sided supraventricular arrhythmias were examined.

Methods and results 51 right-sided atrial flutter ablations in 49 patients from 2007–2015 were included. Data was analysed retrospectively. Medical records were reviewed and patients were contacted for follow-up. All patients with left sided arrhythmias were excluded. The mean age of the whole cohort was 43 years and 50% of the patients were men. Underlying aetiology included ASD (33.3%), VSD (19.6%), Fallot's tetralogy (15.6%), Ebstein's anomaly (3.9%), Fontan surgery (10%) and Mustard repair (17.6%). There was no significant difference in the right atrial sizes between the two groups. AFL was entrained in 34 patients whereas it was non-inducible/non-sustained in 17 patients. The latter had an empiric CTI line ablation. Of those in the entrained group, 3% had other atrial arrhythmias induced in addition to typical AFL. 51% of procedures were performed without a general anaesthetic. There were no procedural complications. There was no significant difference in the mean procedure and fluoroscopy times between the two groups (Empiric vs Entrain CTI; 176.5 vs 163.8 and 41.5 vs 30.5 min). After a mean follow-up of 21 months, arrhythmia-free survival was 71% versus 85% (p-value 0.21) in the empiric and entrained CTI ablation groups.

Conclusion Long-term outcomes after empiric and entrained CTI line ablation for AFL in patients with CHD are comparable. This is a safe and effective treatment option. In the case of non-inducibility of atrial flutter, an empiric CTI line ablation should be performed in this cohort.

79 **LONG-TERM OUTCOMES OF SUPRAVENTRICULAR TACHYCARDIA ABLATION IN CONGENITAL HEART DISEASE: SINGLE CENTRE UK EXPERIENCE**

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Introduction Catheter ablation for supraventricular tachycardia (SVT) in patients with congenital heart disease (CHD) is an important therapeutic option, which is safe and effective. Ablation outcomes vary significantly with increasing complexity of cases and data is limited. We reviewed the safety and long-term efficacy of SVT ablation in CHD patients and examined the differences in outcomes of simple and complex

cases in a leading UK centre. We also examined the predictors of arrhythmia recurrence post ablation.

Methods and Results Consecutive patients undergoing SVT ablation from 2007–2015 from an independent prospective CHD registry were included. SVTs included AFL (typical/incisional/atypical), AVNRT and AVRT. Medical records were reviewed and patients were contacted for follow-up. 131 ablation procedures in 110 patients were included. Patients were divided into three groups based on complexity of cases. Group A (Simple CHD) – ASD/VSD/Valve disease, Group B (CHD of moderate complexity) – Fallots/Ebstein/Other and Group C (CHD of great complexity) – Fontan/Mustard/Total Cavopulmonary Connexion. Manual mapping and ablation was carried out in all cases using 3D electroanatomic mapping systems. The mean age of the cohort was 42 years and 52% of the patients were men. 41% of cases were in Group C. Nearly half the procedures were carried out under general anaesthetic (49%) with mean procedure and fluoroscopy times of 4 and 1 hours respectively. Acute ablation success was 95%, with failure to terminate arrhythmia in three, unsuccessful transbaffle puncture in one and post-procedure complications in three patients (retroperitoneal haematoma, tamponade, CHB). Over a mean follow-up of 2 years, 78% patients remained arrhythmia free. The mean arrhythmia recurrence time was 14 months. Two deaths were noted. Arrhythmia-free survival between the groups was not statistically significant (A, B, C; 76.5, 76.6, 72.2%; p 0.9, 0.6, 0.6). There was a trend towards longer procedure times with increasing case complexity however this did not reach significance. Presence of AF (entire cohort) and LA diameter (Group C) correlated with arrhythmia recurrence (p=0.06, 0.05).

Conclusion SVT ablation in context of CHD is safe and effective irrespective of the complexity of underlying anomaly. However, late recurrence is not uncommon. Presence of AF and atrial size is likely to predict outcome. There is scope to improve long-term single procedure efficacy (especially in complex cases) by using new technologies.

80 **RETROGRADE AORTIC ACCESS OF THE PULMONARY VENOUS ATRIUM PROVIDES EQUIVALENT OUTCOMES TO RIGHT ATRIAL OR TRANSEPTAL ACCESS OF THE LEFT ATRIUM IN PATIENTS WITH CONGENITAL HEART DISEASE**

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Introduction Patients with congenital heart disease may suffer atrial arrhythmia where the target chamber can either be reached easily from a direct or transeptal approach, or may have a relatively excluded atrium where a retrograde aortic approach to the pulmonary venous atrium is required. We hypothesised that ablation outcomes in both groups will be similar.

Methods Retrospective analyses of patients with congenital heart disease (CHD) undergoing ablation of atrial arrhythmia at Barts Heart Centre over one year. Patients were divided into three groups based on access to the chamber of interest; Group 1) right atrial arrhythmia accessed directly; Group 2) left atrial arrhythmia accessed through the interatrial septum (transeptal puncture or via patent ASD); Group 3) arrhythmia

in an excluded atrium accessed via retrograde aortic approach. Follow-up was at 3 and 6 months with ambulatory electrocardiographic monitoring for arrhythmia recurrence.

Results 49 patients with CHD undergoing atrial arrhythmia ablation were included. Group 1, 2 and 3 comprised of 33, 10 and 6 patients respectively. Vast majority had atrial septal defect/repair (35%) and repaired tetralogy of Fallot (17%). Of the patients in whom retrograde access was performed, three had a Fontan circulation, two had a transposition with Senning/Mustard Repair, and one had a surgically repaired ASD with a calcified septum not amenable to transseptal puncture. The most common procedure for group 1 was cavo-tricuspid isthmus ablation (63%), group 2 – AF ablation (62%), and group 3 atrial tachycardia ablation (50%) ($p < 0.001$ between groups). Between groups 1, 2 and 3 there was no difference in procedure time (171 ± 116 , 204 ± 94 and 245 ± 35 min, $p = 0.23$), or fluoroscopy time (6 ± 11 , 10 ± 7 and 14 ± 22 min, $p = 0.40$). There was no difference in freedom from atrial arrhythmia between groups 1, 2 and 3 (70%, 50% and 67%, $p = 0.52$), at mean follow-up of 6 ± 3 months. There was no difference in complications between group 1 (5%), group 2 (17%) and group 3 (17%, $p = 0.38$). The one complication in the retrograde access group was a femoral arterial pseudoaneurysm.

Conclusion Patients with congenital heart disease and an excluded atrium requiring ablation via retrograde aortic access can benefit from comparable outcomes to CHD patients who undergo ablation via a conventional right or left atrial approach. The retrograde aortic approach can be performed with equivalent procedure time, fluoroscopy time, and risk of complications compared with standard right or left atrial access.

81

SUITABILITY OF CARDIAC RESYNCHRONISATION THERAPY IN PATIENTS WITH UNIVENTRICULAR AND SYSTEMIC RIGHT VENTRICULAR HEARTS

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Introduction Cardiac resynchronisation therapy (CRT) is a well-recognised treatment in patients with systolic heart failure complicated by ventricular dyssynchrony. However, there is limited evidence to support its use in patients with congenital heart disease and particularly those with univentricular hearts or systemic right ventricles (RV). In 2014, the PACES/HRS published a consensus statement recommending CRT in these populations. The indications in patients with univentricular hearts include ventricular EF of 35%, with QRS duration 150 ms in a LBBB or RBBB morphology (spontaneous or paced), ventricular dilatation and NYHA II-IV symptoms. In contrast, in patients with systemic RV, CRT is recommended if ejection fraction is $< 35\%$ with RV dilatation, NYHA II-IV, RBBB, QRS duration > 150 ms in non-paced and NYHA I-IV and $> 40\%$ V-pacing in paced.

Methods We performed a retrospective analysis for EF, QRS duration and NYHA status, from 203 patients with a Fontan circulation (univentricular) and 55 patients with congenitally corrected Transposition of the Great Arteries (ccTGA, systemic RV) under specialist Adult Congenital Heart disease (ACHD) follow-up to assess the suitability for CRT according to the guidelines.

Results Table 1 shows data collected from both groups of patients. Univentricular functional data from the Fontan population was available for 194 patients. Only 5% had EF $\geq 35\%$. QRS duration was available for 190 patients and was 150ms in 3% and 47% of patients were NYHA II-IV. Ejection fraction data was available for 54 ccTGA patients and was 35% in 11%. QRS duration was 150ms in 26% and 31% were NYHA II-IV.

In total, only two patients with Fontan circulation and only one from the ccTGA population qualified for CRT according to the current recommendations. One patient had CRT implanted in 2010 and is well to follow-up in NYHA II.

Discussion We have assessed the suitability of CRT recommendations in a large pool of univentricular and systemic RV patients. We have identified very few candidates for CRT within this cohort.

Unfortunately, there is little evidence to support CRT in ACHD setting. Furthermore, procedural and technical difficulties, potential complications including infection and associated morbidity and mortality, ventricular morphology, co-existent cardiac pathologies, the aetiology of ventricular dyssynchrony and cardiomyopathic disease *per se* also require specific consideration before CRT is recommended. Decision to implant CRT in univentricular ACHD patients is more complex than guidelines suggest and requires discussion in a combined ACHD electrophysiology multidisciplinary meeting involving the patient at all levels.

Abstract 81 Table 1 Demographics, NYHA status, ejection fraction and QRS duration of univentricular and systemic right ventricular heart patients

	Univentricular	Systemic Right Ventricle
Demographics	n=203	n=55
Mean age	22.2	43.6
Female gender (%)	99 (48.7)	29 (52.7)
NYHA status		
Class I (%)	108 (53.2)	38 (69.1)
Class II (%)	62 (30.5)	8 (14.5)
Class III (%)	27 (13.3)	8 (14.5)
Class IV (%)	6 (3.0)	1 (1.9)
Ejection fraction		
$\geq 55\%$ (%)	111 (57.5)	18 (33.3)
36%–54% (%)	73 (37.7)	30 (55.6)
$< 35\%$ (%)	10 (4.8)	6 (11.1)
QRS duration		
≥ 120 ms (%)	163 (85.7)	25 (50.0)
121–149 ms (%)	22 (11.5)	12 (24.0)
< 150 ms (%)	5 (2.8)	13 (26.0)