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 are 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 center. We also examined the predictors of arrhythmia recurrence post ablation.

Methods and Results: Consecutive patients with CHD undergoing SVT ablation from 2007 – 2016 were included. SVTs included AT (IART, micro-reentrant and focal), AVNRT and AVRT. Medical records were reviewed and patients were contacted for follow-up. 196 ablation procedures in 172 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) – Fallot's/Ebstein/Other and Group C (CHD of great complexity) – Fontan/Mustard/Total Cavopulmonary Connection. 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% were men. 30% of cases were in Group C. 45% of procedures were carried out under general anaesthetic with mean procedure and fluoroscopy times of 3.5 and 0.8 hours respectively. Acute ablation success was 94%, with failure to terminate arrhythmia in three, unsuccessful transbaffle puncture in one and post-procedure complications in seven patients (retroperitoneal haematoma, pseudo-aneurysm, tamponade x 2, CHBx3). Over a mean follow-up of 2 years, 72% patients remained arrhythmia free. The mean arrhythmia recurrence time was 12 months. Two deaths were noted. Difference in arrhythmia-free survival between the groups was not statistically significant (A, B, C; 61.7, 72.2, 72.5%; p 0.3, 0.2, 0.9). 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 the 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.