Atrial arrhythmias in patients with adult congenital heart disease

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Introduction: Catheter ablation is performed to treat atrial tachyarrhythmias in adult congenital heart disease (ACHD). However, the rate of recurrence is reported to be up to 50%. We aim to describe the electrophysiological findings, procedure details, and recurrence at 6 months after catheter ablation in patients with ACHD.

Methods: Patients with ACHD who underwent catheter ablation for atrial arrhythmias at the National Heart Centre Singapore between January 2017 and December 2018 were studied. Pre-specified clinical and procedural data of interest and time from ablation to recurrence were obtained by chart and procedure report review. Patients with atrial arrhythmias after Maze procedures were excluded.

Result: 16 patients with ACHD and atrial arrhythmias underwent catheter ablation; their ACHD diagnoses were atrial septal defect (ASD) (37.5%, n=6), atrioventricular septal defect (18.8%, n=3), ventricular septal defect (12.5%, n=2), tetralogy of Fallot (12.5%, n=2), pulmonary stenosis (12.5%, n=2) and complex congenital heart disease with transposition of great vessels, ventricular septal defect and pulmonary stenosis (6.25%, n=1) were studied. Female was 81%. Mean age was 59 +/-13 years. All patients had previous surgical correction of defects except one patient with ASD. Mean left ventricular ejection fraction was 54 +/-9%. A total of 24 arrhythmias were inducible. The EP diagnoses were cavotricuspid isthmus (CTI) dependent flutter (42%), intra-atrial reentry flutter around atriotomy scar (38%), RA free wall flutter (8%), atrial tachycardia (8%) and peri mitral flutter (4%). 50% of patients had two arrhythmia mechanisms. Mean procedure time was 176 +/-79min. Mean radiofrequency ablation time was 1185 +/-761 seconds. Mean Fluoroscopy time was 19 +/-16min. No sustained atrial tachyarrhythmias were induced after ablation. Acute procedural success rate was 87.5% without any complication. Patients were followed over a median of 368 days (Interquartile range - 127 days to 438 days). At 6 months follow-up, recurrence occurred in 5 patients (31%) with two arrhythmia mechanisms. Of these 5 patients with recurrence, 3 patients underwent a repeat ablation with 100% success.

Conclusion: Catheter ablation of atrial arrhythmias in patients with ACHD is effective and safe. More than one arrhythmia mechanism has a higher risk of recurrence.