High-Density Mapping of Atrial Tachyarrhythmia in Congenital Heart Diseases - Single Tertiary Centre Experience in Hong Kong

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Introduction: High-density electroanatomical mapping is increasingly employed in complex arrhythmia ablation. However, the use of this technology in Chinese population for congenital heart disease (CHD) is not well reported.

Methods: Retrospective review of consecutive transcatheter ablation of atrial tachyarrhythmia using high-density mapping for CHD patients (at least moderate complexity) in the only tertiary congenital heart centre in the territory from Jan 2017 to Jan 2019 was conducted. Orion mapping catheter in Rhythmia system (Boston Scientific) was used to create activation and voltage maps. Parameters including mechanism of arrhythmia, acute success, and follow-up data were recorded.

Result: Eight patients were identified (median age 35.5 years, IQR 31.2-42.1 years) who underwent transcatheter ablation of atrial arrhythmia (focal atrial tachycardia-1; intra-atrial reentry tachycardia (IART)-3; both-4). More than one reentry circuits of IART were identified in 5 patients, in which 3 patients had three or more IART mechanism. A median of two maps were acquired per person and it took in median 32.4 minutes (IQR 15.6–50.6) with median number of 15,952 (IQR 13,395–18,530) mapping points per map. Cavo-annulus isthmus dependent mechanism was the predominant reentry mechanism. At least one of the arrhythmia was ablated in all the patients. In 2 patients (25%), there was residual atrial arrhythmia which was not ablated. There was recurrence of atrial arrhythmia in 3 patients (37.5%). Additional targeted substrate ablation was performed in 6 patients with multiple IART circuits. Near-miss anatomical pouches were identified in 3 patients.

Conclusion: High acute success rate of atrial arrhythmia ablation can be achieved using high-density anatomical mapping in CHD. Substrate ablation was required with multiple IART circuits identified.