Catheter ablation of focal atrial tachycardia in pediatric patients: A ten year single centre experience using modern mapping systems

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Introduction: Experience of catheter ablation of focal atrial tachycardia (FAT) in pediatric patients is still limited and data have mainly been gathered prior to the introduction of modern 3D mapping and navigation systems into clinical routine. In these studies, conventional catheter ablation of FAT was associated with relatively low success rates and long fluoroscopy times in comparison to ablation of accessory pathways and atrioventricular nodal reentrant tachycardia.

Patients and methods: We retrospectively reviewed 17 consecutive pediatric patients and young adults with a median age of 15 [4-30] years and a mean body weight of 47.5 [16-73] kg who underwent electrophysiological study (EPS) for FAT. Indications included recurrent supraventricular tachycardia (n=9), permanent tachycardia (n=4), tachycardia-induced cardiomyopathy (n=3), and side effects of antiarrhythmic medication (n=1). For EPS the Navx® system (n=7), the non-contact mapping system (n=6) or the LocaLisa® system (n=4) were used, respectively. Cryoablation was performed in selected patients with foci close to the AV node, in all other patients radiofrequency (RF) was the primary energy source for catheter ablation.

Results: In 16 patients a total of number of 19 atrial foci (13 right-sided and 6 left-sided) could be targeted during EPS. In the remaining patient FAT was not present/inducible. Using modern mapping systems acute success was achieved in 14/16 patients (87.5%) with a median number of 10 [1-31] ablation lesions. Ablation was unsuccessful due to an epicardial location of a right atrial focus in one patient and due to the proximity of a focus to the HIS bundle in the remaining patient with cryoablation resulting in transient second-degree AV block. Mean procedure time was 210.4±78.1 min, mean fluoroscopy time was 12.6±4.9 min.

Conclusions: Compared to standard mapping, 3D non-fluoroscopic approach for pediatric FAT resulted in improved success rates and significantly reduced fluoroscopy times. 3D mapping and RF ablation provided improved clinical quality of care, therefore, this approach should be considered early in the course of treatment of this tachyarrhythmia.