Radiofrequency catheter ablation of Para-Hisian Accessory Pathways in children: Strategy for mapping and ablation

Lin Liu
Shaoying Zeng
Zhenheng Ou
Cong Liu
Zhilin Li
Boning Li
Shushui Wang
Zhiwei Zhang

Introduction: Radiofrequency catheter ablation (RFCA) of para-hisian accessory pathways (APs) in children can be challenging due to their anatomic proximity to the normal conduction tissue. Recent studies have suggested that para-hisian APs can be successfully ablated by different approaches, including the right anterior septum (RAS), the non-coronary cusp (NCC), and the left anterior septum (LAS). The study aims to evaluate the efficacy and safety of para-hisian APs in children.

Methods: A retrospective review was performed with 34 pediatric patients (18 males and 16 females; mean age 7.8±3.5 years and average body weight 27.8kg) with para-hisian APs in two centers from 2015 to 2017. 18 patients had manifest APs. All the children underwent RFCA for the treatment of PSVT except one for treatment of non-arrhythmic pre-excitation-induced cardiomyopathy. During mapping at the para-hisian region in RAS, we used a pacing technique to differentiate the near-field from far-field His activation. On the basis of response to para-hisian pacing, we performed different ablation approaches which targeted at either the RAS or the NCC or LAS.

Result: Acute ablation success was achieved in 29 cases (85%, 29/34). Ablation was abandoned for the suspicion of atrioventricular conduction in 3 patients because of near-field response during para-hisian pacing. Para-hisian APs were successfully ablated in the RAS in 22 cases (76%), in the LAS in 1 case (3%), and in the NCC in 6 cases (20%). No atrioventricular block occurred during the procedures except one with RBBB. After a mean follow-up of 21.5±5.5 months, SVT recurrence was observed in 5 of 22 patients (23%) ablated in the RAS group, 0 of the 6 patients in NCC group (P<0.05). 3 patients underwent 2 procedures, and 2 patients underwent 3 procedures, and the total successful rate was 91% (31/34).

Conclusion: Most para-Hisian APs in children can be safely and effectively ablated in RAS. If mapping in RAS shows characters of near-field during para-hisian pacing, ablation in the NCC is preferred because it has a lower complication rate, and good long-term outcome.