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 parahisian accessory pathways (APs) in children can be challenging due to their anatomic proximity to the normal conduction tissue. Recent studies have suggested that parahisian APs can be successfully ablated by different approaches, including the right anterior septum (RAS), the noncoronary cusp (NCC), and the left anterior septum (LAS). The study aims to evaluate the efficacy and safety of parahisian 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 27.8 kg) with parahisian 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.