

Prophylactic Catheter Ablation of the Arrhythmogenic Substrates for Total Cavo-Pulmonary Connection Candidates

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Background: The substrates of supraventricular tachycardia (SVT) are often associated with candidates for total cavo-pulmonary connection (TCPC) procedure. Since SVT can be a serious complication and is mostly difficult to be cured by catheter ablation (CA) because of access limitation to the heart after TCPC. Therefore, pre-operative electrophysiological evaluation seems important to prospect the risk of SVT. The purpose of this study is to delineate the incidence of arrhythmogenic substrates in TCPC candidates and evaluate the result of prophylactic CA before TCPC.

Patients: From January 2010 to December 2015, we performed electrophysiological study (EPS) upon 29 consecutive patients (isomerism in 22, Ebstein anomaly in 3, ccTGA 2, dTGA 1 and tricuspid atresia in 1) before TCPC. Median age was 3 years and median weight was 15 kg.

Results: In 26 patients (89%) except 3 with Ebstein anomaly, distinct His bundle electrograms were recorded at the unusual sites. Coronary sinus did not exist in 25 patients. The type of SVT was arioventricular (AV) reentrant tachycardia (AVRT) with accessory pathway in 2 patients, AVRT involving twin AV nodes in 14, uncommon AV nodal reentrant tachycardia (AVNRT) in 2, common atrial flutter (AFL) in 5 and incisional atrial reentrant tachycardia in 5 and ventricular tachycardia in 1. We achieved successful CA in 27 patients (93%). We could not complete the isthmus block line for AFL in two failed cases after replacement of artificial common AV valve and valvoplasty of tricuspid valve. In 14 patients with AVRT involving twin AV nodes, we performed CA of unilateral AVN which showed recessive anterograde conduction. Iatrogenic ventricular dyssynchrony after CA was never observed in all 14 cases of our series. We could eliminate uncommon AVNRT by modification of one posterior AV node in two patients. One clinically significant complication of a stuck artificial common AV valve occurred after successful CA for AFL. The mean follow-up period was 3 years. In all patients after CA no recurrence of SVT was observed. Twenty eight patients underwent TCPC procedure successfully and safely.

Conclusion: Prophylactic CA of arrhythmogenic substrates in TCPC candidates may be an effective therapeutic option.