Electrophysiological Studies in Patients of Complex Congenital Heart Disease with Twin Atrioventricular Nodes before Total-Cavo Pulmonary Connection

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Backgrounds: Histologic studies confirm the coexistence of two distinct atrioventricular nodes (AVNs) in a number of patients with complex congenital heart disease who require total-cavo pulmonary connection (TCPC).

Methods: We performed electrophysiological studies (EPS) in 5 patients with twin AVNs before TCPC procedure. Five patients (3 male) with an age of 24 ± 19 months did had congenital heart disease, asplenia syndrome with common atrioventricular valve: 3, atrioventricular discordance: 1, atrioventricular concordance: 1.

Results: All five cases had the existence of two discrete nonpreexcited QRS morphologies, each with an associated His-bundle electrogram, antegrade and retrograde conduction with decremental property. In one case with asplenia syndrome, ventriculo-atrial conduction did not exist and tachycardia was not induced. In four cases, supraventricular tachycardia was induced, atrioventricular reciprocating tachycardia (AVRT) involving twin AVNs: 3, atrioventricular nodal reentrant tachycardia (AVNRT): 1 within a posterior AVN. In three cases with AVRT, we could ablate the one anterior AVN and 2 posterior AVNs during EPS. In a case with AVNRT within the posterior AVN, we could ablate selectively retrograde conduction of slow pathway. All four cases have been recurrence free after ablation.

Conclusion: TCPC limits access to the heart making preoperative EPS essential for complete arrhythmia evaluation.

Keywords: twin atrioventricular nodes, congenital heart disease, total-cavo pulmonary connection