

Atrioventricular Reciprocating Tachycardia Mediated by Twin Atrioventricular Nodes



Antonio Frontera, MD, Darren Hooks, MD, PhD, Bernard Kreitmann, MD, PhD, Jean-Benoit Thambo, MD, PhD, Michel Haïssaguerre, MD, Nicolas Derval, MD

A 21-year-old man with univentricular and uniauricular heart came for a third attempt at ablation of recurrent supraventricular tachycardia. He had undergone a previous cardiac surgery of a Blalock-Taussig shunt, and bidirectional Glenn, and the electrophysiological study revealed an atrioventricular (AV) node very posterior and low in the atria, close to the inferior vena cava junction. Further mapping allowed us to identify a second sharp electrogram of His bundle, timed late in the QRS complex, located anteriorly to the annulus (Figure 1). Atrial pacing dissociated this signal from both atrial and ventricular activity, indicating a distinct tissue type. Ventricular pacing documented a retrograde atrial activation decremental exclusively via the “anterior” pathway, supporting the presence of a second AV node. Supraventricular tachycardia was easily induced with atrial burst pacing, having cycle length of 450 ms with 1:1 AV relationship and ventriculo-atrial time of 190 ms. Ventricular premature beats synchronous to the “posterior” His failed to reset the tachycardia and entrainment performed from the ventricular apex had a post-pacing interval of 140 ms. These 2 data supported a mechanism other than

atrioventricular re-entrant tachycardia (AVRT). However, entrainment of the circuit was perfect when pacing at high output from the anterior and posterior AV connections (Figure 2), and poor when pacing at low output from the same sites (Figure 3). This can only be explained by an AVRT circuit using twin AV nodes, with capture of the His bundles at high output, and capture of only ventricular tissue at low output.

High- and low-output entrainment pacing at both His-bundles demonstrated to be instructive in establishing mechanism of the tachycardia. Failure of His-synchronous ventricular premature beats to reset tachycardia may be explained by the decremental properties of the retrograde limb, and the long ventricular post-pacing interval may be consistent with previously described slings of specialized conduction tissue traversing the ventricle.

REPRINT REQUESTS AND CORRESPONDENCE: Dr. Antonio Frontera, Hôpital Cardiologique Haut Lévêque, CHU Bordeaux, Bordeaux 33600, France. E-mail: a.frontera@gmail.com.

KEY WORDS AVRT, congenital, twin AV nodes

From the Hôpital Cardiologique Haut Lévêque, CHU Bordeaux, Bordeaux, France. Dr. Frontera received a grant from the European Heart Rhythm Association outside this work. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

Manuscript received September 8, 2015; revised manuscript received October 8, 2015, accepted October 15, 2015.



