Antidromic Atrioventricular Reciprocating Tachycardia Using a Concealed Retrograde Conducting Left Lateral Accessory Pathway

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KEYWORDS

• Catheter ablation • Accessory pathways • Wolf Parkinson White

KEY POINTS

- Atrioventricular reciprocating tachycardia is a common cause of undifferentiated supraventricular tachycardia.
- In patients with manifest or concealed accessory pathways, it is imperative to assess for the presence of other accessory pathways.
- In rare cases, multiple accessory pathways can act as the anterograde and retrograde limbs of the tachycardia.

CLINICAL PRESENTATION

A 35-year-old man with a history of palpitations and preexcitation underwent prior electrophysiologic study and ablation. He had a reported ablation of a pathway in the coronary sinus as well as a left-sided para-Hisian pathway that was not successfully ablated. Since then the patient has had recurrent documented supraventricular tachycardia with symptoms of dizziness and palpitations that have been refractory to beta-blockers and flecainide. He was referred for a repeat electrophysiologic study and possible ablation.

ELECTROPHYSIOLOGY STUDY

Venous access was obtained in the left and right femoral veins; under fluoroscopic guidance, catheters were placed in the right atrium, His bundle region, right ventricle, and coronary sinus. Baseline electrocardiogram showed evident preexcitation with a left bundle morphology and left indeterminate axis (Fig. 1). Baseline intracardiac electrograms showed a negative His-Ventricular (HV) interval (Figs. 2 and 3). The Halo catheter (Biosense-Webster, Diamond Bar, CA) was placed with Halo 1-2 close to the coronary sinus, Halo 7-8 in the right lateral free wall, and Halo 11-12 in the high right atrium. Ventricular pacing demonstrated earliest activation in the lateral coronary sinus and right free wall (Fig. 4). Programmed ventricular and atrial extrastimulation easily induced tachycardia with manifest preexcitation and with earliest atrial activation in the distal coronary sinus. Ventricular overdrive pacing of the tachycardia demonstrated a V-A-V-A response

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Fig. 1. Resting 12-lead electrocardiogram showing manifest preexcitation.

consistent with atrioventricular reciprocating tachycardia (AVRT) (**Fig. 5**).

QUESTION

What is the diagnosis and mechanism of the arrhythmia?

DISCUSSION

The electrograms illustrate an AVRT using a right free wall pathway as the anterograde limb and a left lateral free wall pathway as the retrograde limb. The evidence for this lies in the presence of manifest preexcitation without a His electrogram in tachycardia as well as retrograde activation via a left lateral pathway. The V-A-V response to overdrive pacing excludes an atrial tachycardia originating from the left atrium.[1]1 A paced atrial premature beat during tachycardia demonstrates anterograde conduction through the AV node and His bundle. Anterograde AV nodal conduction during tachycardia is likely not present because of the retrograde invasion of the His bundle during tachycardia with a long refractory period due to conduction slowing in the His-Purkinje system.

CLINICAL COURSE

Electroanatomic mapping of the right free wall pathway was performed by assessing for earliest retrograde atrial and anterograde ventricular signals. Earliest atrial activation was performed with ventricular pacing. Earliest ventricular activation was performed with atrial pacing and during