Accessory Pathway with Decremental Conduction Properties

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ABSTRACT
Permanent junctional reciprocating tachycardia (PJRT) is an orthodromic atrioventricular tachycardia mediated by a concealed accessory pathway with slow conduction and decremental property. The accessory pathway in PJRT is most often located in the posteroseptal region, especially around the coronary sinus ostium. Here I describe a case of clinical tachycardia with a long RP interval due to slow retrograde conduction.

Key Words: supraventricular tachycardia, accessory pathway

Introduction
Narrow-QRS tachycardia with a long RP interval presents interesting diagnostic challenges. A correct diagnosis is essential for performing safe and effective catheter ablation. The differential diagnosis of narrow-QRS tachycardia with a long RP interval includes atypical atrioventricular nodal reentrant tachycardia (AVNRT), ectopic atrial tachycardia, and atrioventricular reentrant tachycardia (AVRT) with a decremental property. I present a case of permanent junctional reciprocating tachycardia (PJRT) with a long RP interval that exhibited a decremental property.

Case
A 65-year-old woman was referred to our hospital for sustained palpitations and general weakness. The electrocardiogram (ECG) showed narrow QRS tachycardia of ~120 /min, with an inverted P wave in leads II, III, aVF, and a long RP interval in all precordial leads (Figure 1). She had normal left ventricular function on echocardiography, with an ejection fraction of 62%. Twenty-four-hour Holter monitoring showed repeated induction of supraventricular tachycardia (SVT), with intervening periods of sinus rhythm lasting a few minutes. I administered IV adenosine, verapamil injection, and DC cardioversion several times in an attempt to terminate the tachycardia, but after few seconds in sinus rhythm the tachycardia was reinduced and sustained. To maintain sinus rhythm I prescribed 240 mg of verapamil or 150 mg of atenolol per os; however, the patient continued to exhibit the same drug-refractory tachycardia.

The patient was scheduled for electrophysiological study and catheter ablation. In the electrophysiology lab she showed SVT with intermittent short periods of sinus rhythm. The SVT could be easily induced by one premature ventricular contraction (PVC), and was also inducible in sinus rhythm without any AH jump (Figure 2). For the differential diagnosis, I applied a PVC during SVT. In contrast to orthodromic AVRT without a decremental property, after the PVC the AA interval was prolonged from 467 ms to 494 ms (Figure 3). To ablate the
accessory pathway, I identified the earliest activation site of A in the right postero-septal area (Figure 4, Figure 5). After 4 seconds of radiofrequency application, the SVT terminated and showed ventriculo-atrial dissociation (Figure 6). The patient remained in hospital for two days after the catheter ablation and was discharged in sinus rhythm.

Discussion

In this case, no preexcitation was observed. During the tachycardia, the earliest atrial activation was observed around the coronary sinus ostium. The critical finding for the differential diagnosis was the atrial response to a PVC during the His refractory period. Since the atrial activation was delayed by the PVC, AVNRT could be excluded.

PJRT is an orthodromic AVRT mediated by a concealed and slow-conducting accessory pathway. The clinical course of PJRT is not always benign. Many patients try multiple antiarrhythmic drugs and ultimately require catheter ablation. Radiofrequency catheter ablation is a safe and effective therapy. However, the higher recurrence rate of PJRT, compared with that of reentry with no decremental property, may be explained by the long, tortuous course of the accessory pathway. The most important complication of incessant PJRT is tachycardia-induced...
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Figure 2. (A) Electrocardiogram showing induction of supraventricular tachycardia (SVT) by a premature ventricular contraction (PVC), (B) Electrogram showing SVT induction by PVC.
Figure 3. (A) Electrocardiogram showing induction of supraventricular tachycardia (SVT) in sinus rhythm, (B) Electrogram showing SVT induction in sinus rhythm.
Figure 4. The earliest atrial activation site in supraventricular tachycardia.

Figure 5. Catheter in fluoroscopic view.
RAO, right anterior oblique projection; LAO, left anterior oblique projection.
cardiomyopathy, which has been observed in 18% of patients with PJRT. Slower conduction through the accessory pathway has a wider excitable gap. In most cases of PJRT, the accessory pathway is located in the posteroseptal region.

References

