AV nodal reentry is the most frequent mechanism of paroxysmal supraventricular tachycardia (PSVT) in man. In most patients with AV nodal reentrant PSVT, electrophysiologic studies demonstrate discontinuous AV nodal conduction curves suggestive of dual AV nodal pathways. Measurable slow and fast pathway properties determine the occurrence of single or repetitive reentry.

In rare cases, dual AV nodal pathways and AV nodal reentry can be diagnosed on the electrocardiogram by demonstrating the presence of two distinct PR intervals. The short PR interval represents antegrade fast pathway conduction and the long PR interval antegrade slow pathway conduction. Induction of PSVT occurs when antegrade slow pathway conduction is sufficiently delayed to allow recovery of the fast pathway for retrograde conduction with a resultant atrial echo beat. Repetitive antegrade slow pathway conduction allows for the occurrence of sustained PSVT.

In the present report, we describe a patient with two PR intervals (dual AV nodal pathways) and PSVT, who also exhibits type 1 AV nodal block (Wenckebach) and periods of pseudo sinus exit block.

**Case Report**

The patient is a 73-year-old man who had Holter monitoring because of palpitations. Figure 1, panel A, demonstrates sinus rhythm at a rate of 78/min. There are two distinct PR intervals suggestive of dual AV nodal pathways. The short PR interval (0.20 sec) represents the fast pathway conduction and the long PR interval (0.44 sec) reflects slow pathway conduction. In panel B during sinus rhythm, conduction occurs through the fast pathway (PR 0.20 sec). PSVT is induced with a premature atrial beat conducting through the slow pathway with a PR interval of 0.54 sec. The rate of PSVT is 100/min. During the 24-hour recording there were 14 such episodes of PSVT, lasting from 7 to 25 beats, with a ventricular rate of 100 to 120 beats/min.

In panel C, the sinus rhythm is 75/min (there is slight variation in PP intervals), the PR interval increases from 0.20 to 0.52 sec, and the fifth P wave is blocked. The first P conducts through the fast pathway; the second, third and fourth P waves are blocked in the fast pathway and conduct through the slow pathway. The fifth P wave is blocked in both pathways (atypical Wenckebach period). In Figure 1, panel D, the sinus rate is 63/min (PP interval of 0.96 sec). Following the third P wave an apparent sinus pause ensues (PP interval of 1.8 sec) suggesting the presence of sinus exit block. The first two PR intervals are 0.52 sec and the beat preceding the pause shows a PR of 0.54 sec.

**Discussion**

In a previous study it was shown that atrial extrastimulus testing in patients with dual AV nodal pathways can predict repetitive reentry which is dependent on the properties of the slow and fast pathways. Patients who demonstrate the presence of AV nodal Wenckebach periods at long paced cycle lengths are not likely to have AV nodal reentrant PSVT because of impaired slow pathway antegrade conduction which would allow the occurrence of only single atrial echoes. In this patient, we observed single echoes, episodes of PSVT at a rate of 100 to 120/min and also spontaneous AV nodal Wenckebach periods at an atrial rate of 75/min. A possible explanation for this finding is that the site of block producing the AV nodal Wenckebach period is proximal to the area of reentry.

An additional interesting observation is the presence of the apparent long sinus pause (Fig 1, panel C). Each of these pauses is preceded by a slight prolongation of PR interval (0.54 sec). This PR interval reflects the critical slow pathway delay that is necessary for reentry. Indeed, with close inspection, a hidden echo beat can be observed in the terminal portion of the QRS. Thus, spontaneous delay in slow pathway conduction results in reentry with occurrence of a single echo.

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*From the Section of Cardiology, Department of Medicine, Rush-Presbyterian-St. Luke’s Medical Center, Chicago.
†Fellow.
‡Professor of Medicine.
Reprint requests: Dr. Denes, Rush Presbyterian St. Luke’s, 1753 West Congress Parkway, Chicago 60612
Figure 1. Selected rhythm strips from the Holter recordings. Modified lead V1 at paper speed of 25 mm/sec is shown. Panel A: two PR intervals during sinus rhythm; Panel B: induction of AV nodal reentrant PSVT; Panel C: atypical AV nodal Wenckebach; Panel D: pseudo sinus exit block.

beat that fails to reset the sinus node and gives the appearance of sinus exit block.

REFERENCES