

Waking up a sleeping volcano: activation of an accessory pathway after aortic valve surgery

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We present a case of a concealed atrioventricular bypass tract which stayed clinically silent for almost 80 years. After aortic valve surgery, an incessant orthodromic atrioventricular re-entry tachycardia was induced. Initiation of the re-entry with activation of a previously asymptomatic accessory pathway is explained by the development of postoperative conduction disorders.

A 79-year-old woman was referred for aortic valve replacement (AVR). Although symptomatic from her severe valve stenosis, she never experienced any palpitations or syncope. Baseline electrocardiogram (ECG) (Figure 1, upper panel) before surgery showed sinus rhythm with normal intervals. Two days after implantation of a sutureless aortic bioprosthesis (Perceval S), she presented an incessant and poorly tolerated wide-complex tachycardia with a cycle length of 410 ms. Brugada criteria for ventricular tachycardia were not met and the response to adenosine was an abrupt but transient termination of the arrhythmia followed by a re-initiation of the arrhythmia after a few sinus beats (Figure 1, left lower panel). During sinus rhythm, PR prolongation (PR of 240 ms) and a QRS morphology with a left bundle branch block (QRS of 125 ms) were noted, similar to during tachycardia (fixed aberrancy). The diagnosis of an orthodromic

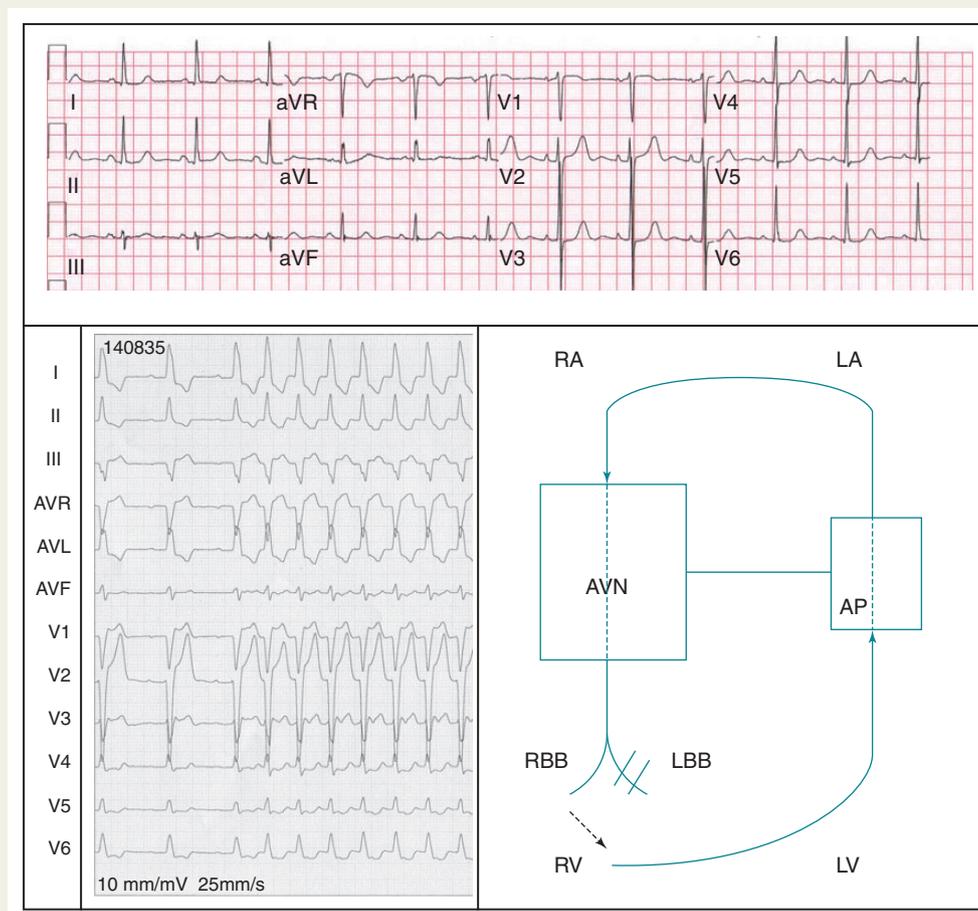


Figure 1 (Upper panel) Baseline ECG (at 25 mm/s paper speed) before surgery showing sinus rhythm with normal intervals (PR 150 ms, QRS 90 ms, and QTc 460 ms), without pre-excitation pattern. (Lower left panel) Electrocardiogram rhythm strip after surgery showing sinus beats with first degree AV and left bundle branch block followed by the initiation of an orthodromic AVRT. (Lower right panel) Illustration of an orthodromic AVRT as a direct consequence of delay in the AV node and left bundle branch (LBB) allowing more time for the AP to recover from his refractory period, therefore making retrograde conduction possible.

atrioventricular re-entry tachycardia (AVRT) with left lateral accessory pathway (AP) was made during electrophysiological study, leading to a successful ablation of the AP.

This case shows us a concealed bypass tract which stayed clinically silent for almost 80 years. The induction of an orthodromic AVRT can be explained by the development of postoperative conduction disorders, inducing a delay in the normal conduction system, sufficient to outlast the retrograde effective refractory period of the AP for that given cycle length (Figure 1, right lower panel). Conduction disorders after AVR are common with a previously described 6% rate of permanent pacemaker implantation and 8.6% of newly developed bundle branch block after conventional surgical AVR.¹ In the case of a sutureless bioprosthesis, there is a tendency for even higher rates, with a reported percentage of 16% for new-onset atrioventricular block (6, 1, and 9% for first, second, and third degree, respectively), 39.3% for left bundle branch block, and 17% for post-procedural permanent pacemaker implantation.^{2,3}

Besides surgery, we believe that any aetiology of conduction delay (ischaemia, degeneration, aortic valve disease, etc.), together with a properly timed premature impulse, can initiate re-entry by activation of a previously asymptomatic AP. Like in our octogenarian patient, this observation may unveil an AP even at an older age. The clinical presentation of an orthodromic AVRT can be variable, but may be important if induced in an acute setting (myocardial infarction, postoperative state), requiring ablation therapy of the AP.

Conflict of interest: none declared.

References

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