Double fire tachycardia

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A 69-year-old lady without any relevant medical history presented with recurrent palpitations. A 12-lead ECG was recorded and is shown in Figure 1. The differential diagnosis of the narrow-complex tachycardia with a P:R ratio of 1:2 was (1) atrial bigeminy with a low voltage P-wave masked by the preceding T-wave, (2) junctional bigeminy, (3) atrioventricular nodal re-entrant tachycardia (AVNRT) with 2:1 retrograde block and (4) non-re-entrant atrioventricular nodal tachycardia (otherwise known as 'double fire' tachycardia). An electrophysiological study was performed with the intracardiac recordings shown in Figure 2. Atrial bigeminy was ruled out by the right atrial catheter, and junctional bigeminy was unlikely due to the sustained nature of the tachycardia, the fixed coupling interval as well as absence of any retrograde P-waves. AVNRT with a 2:1 retrograde block was ruled out by the morphology and activation sequence of the P-wave (indicating a cranio-caudal sequence). A diagnosis of non-re-entrant atrioventricular nodal tachycardia with dual conduction via a fast and a very slow pathway was thus retained.

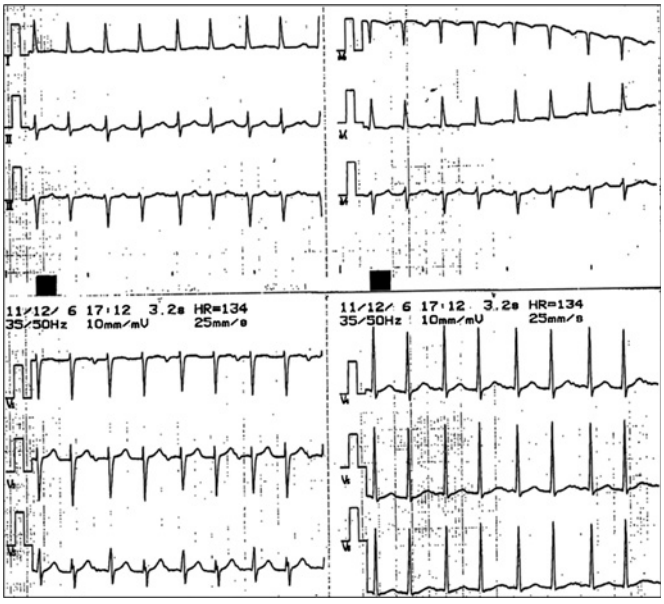

Figure 1 ECG showing a supra-ventricular tachycardia of 134 bpm with slightly alternating RR intervals and sinus P-waves (easily visible in lead V1) with a P:R ratio of 1:2.

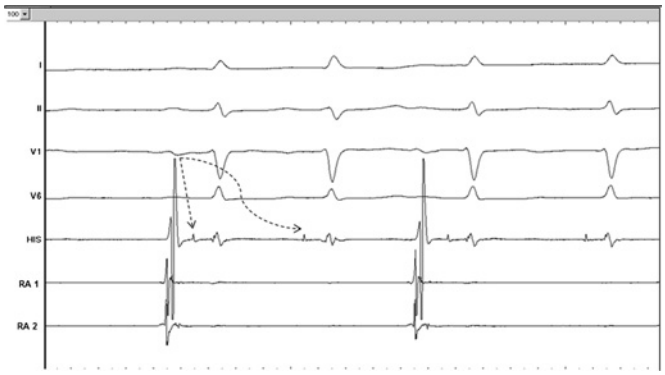

Figure 2 Intracardiac recording with a bipolar His catheter (the His potential is indicated at the tip of the arrows) and a quadripolar right atrial (RA) catheter. Atrioventricular conduction occurs both via a fast pathway (straight arrow) and via a very slow pathway (curved arrow), resulting in 'double fire' of each P-wave.

Radiofrequency modification of the slow pathway (as for AVNRT) resulted in interruption of the tachycardia within 10 s. The tachycardia was thereafter not inducible.

Double fire tachycardia is a rare but under-recognised entity, with a total of 49 cases published to date.[1 2] It should be properly identified as it may lead to tachycardiomyopathy, and may be easily cured by radiofrequency catheter ablation.

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Contributors HB and MZ conducted the electrophysiological study and wrote the manuscript. JH referred the patient, provided the electrocardiogram and reviewed the manuscript. All authors take full responsibility for the content of the manuscript.

Ethics approval This is not a study. The patient gave her consent for publication (even though the report does not identify her).

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