



Pacemaker-mediated tachycardia

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Images in cardiology

Pacemaker-mediated tachycardia

A patient with a dual-chamber permanent pacemaker for complete heart block presented with chest discomfort and a sensation of his heart fluttering. His electrocardiogram demonstrated a broad complex tachycardia (panel A). The presence of pacing spikes preceding each broad complex beat led to a diagnosis of pacemaker-mediated tachycardia (PMT). The arrhythmia responded to his pacemaker being reprogrammed with a longer postventricular atrial refractory period (PVARP).

Pacemaker-mediated tachycardia is a malfunction of dual-chamber pacing, in this case relying on retrograde atrioventricular conduction. A ventricular impulse such as a ventricular ectopic conducts retrogradely through the atrioventricular node to the atrium: normally, the pacemaker ignores atrial signals for a set period after a ventricular signal (termed PVARP), but if the retrograde impulse arrives after this blanking period, it is inter-

preted as a legitimate p-wave. The pacemaker then sends a pacing impulse to the ventricle, which can again conduct retrogradely to the atrium, and the process repeats, creating a tachycardia circuit. The acute treatment for this arrhythmia is the external application of a magnet on the pacemaker. This forces the pacemaker to pace at a fixed rate, ignoring the impulses it receives through its leads (VOO mode), so breaking the tachycardia circuit. Prevention of recurrence involves lengthening the PVARP, so the retrograde atrial signal falls within the blanking period and is not misinterpreted as a legitimate p-wave.

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Panel A Electrocardiograms: (A) A broad complex tachycardia with pacing spikes (arrowed) preceding each broad complex beat. (B) After pacemaker reprogramming, showing dual-chamber pacing.

