Apparent delay in tachycardia detection due to ventricular pacing: what is the mechanism?

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A dual-chamber implantable cardioverter-defibrillator (Secura DR, Medtronic) was programmed to AAIR-DDDR 60–130 b.p.m.; a monitor zone for slow ventricular tachycardia (VT) = CL 410 – 370 ms for 20 intervals [marked on electrogram (EGM) as ventricular sense (VS)]; VT zone = CL 370 – 310 ms for 16 intervals treated with 4 attempts ATP and 4 shocks [tachycardia sense (TS)] and ventricular fibrillation (VF) zone CL ≤ 310 ms for 18/24 intervals treated with ATP while charging and 6 shocks [fibrillation sense (FS)]. A remote follow-up showed an episode of slow VT (CL 400 ms) which apparently was delayed by ventricular pacing. What is the mechanism?

Ventricular tachycardia (400 ms) started after a premature ventricular beat (FS—VF). Every second ventricular beat fell within the crosstalk detection window starting safety ventricular pacing. Later, two ventricular complexes fell in the ventricular blanking after atrial pacing. This led to two ventricular paced beats without capture and to two native beats recognized as FS. This event ended ventricular safety pacing. Finally, tachycardia detection occurred (VM). The ventricular sensed events causing safety pacing in the beginning of the episodes are counted as VT cycles. The safety paces are not. Thus, ventricular safety pacing did not cause a delay in detection. Ventricular tachycardia detection was apparently delayed because the tachycardia was fluctuating around the detection limit.

The full-length version of this report can be viewed at: http://www.escardio.org/communities/EHRA/publications/ep-case-reports/Documents/Apparent-delay-in-tachycardia.pdf.

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