

Missing ventricular paced events at hourly plus 30-s intervals

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An Advisa[®] pacemaker was implanted after replacement of an aortic valve. During postoperative electrocardiographic monitoring, single ventricular paced events were missing at hourly plus 30-s intervals. This rare phenomenon, observed with dual-chamber pacemaker manufactured by Medtronic, should not prompt explant of the device.

Introduction

Permanent pacemakers are implanted in up to one-third of patients who have undergone surgical aortic valve replacement.¹ The professional practice guidelines issued by the European Society of Cardiology recommend permanent pacing when high-degree atrioventricular (AV) block persists beyond 7 postoperative days.² The proper function of the pacemaker is usually confirmed by electrocardiographic monitoring before discharge of the patient from the hospital.

Case presentation

A 31-year-old Caucasian man presented with a stenotic, bicuspid aortic valve and ascending aortic aneurysm. He developed complete AV block immediately after undergoing a Bentall procedure and received an Advisa[®] dual-chamber pacemaker (Medtronic Inc., Minneapolis, MN, USA) on Day 13 after the operation. The device was programmed in DDD mode, with permanent ventricular pacing (VP). Shortly after the implant, electrocardiographic telemetry revealed the absence of single VP events, which, upon close scrutiny, were missing at intervals of 1 h and 30 s (Figure 1). Interrogation of the pacemaker confirmed the DDD mode programming, with atrial sensed–VP sequences, though no missing VP events were stored in memory, simulating managed VP during verification of AV conduction. The event was consistently asymptomatic. When attempting to analyse the endocavitary electrogram (EGM), the programming wand cancelled the event.

The missing VP is caused by a residual electrical disturbance on the ventricular sense amplifier, while the EGM amplifier is turned on or off by the scheduled recording of a reference EGM. When it happens after an atrial sensed event, in the absence of blanking in the ventricular chamber, it is erroneously sensed as a ventricular event, therefore inhibiting VP. The reference EGM is a firmware, which can be neither programmed nor cancelled, and is scheduled to happen at hourly intervals, to which 30 s are added to record and store the EGM and schedule the next event. The patient remained under routine monitoring, without consideration to explant the device.

Conclusion

This phenomenon, which has been observed with various Medtronic dual-chamber pacemakers (the Advisa[®] model in particular), might be manageable by decreasing the ventricular sensitivity. It seems to be a rare observation, which should not prompt a device explant.

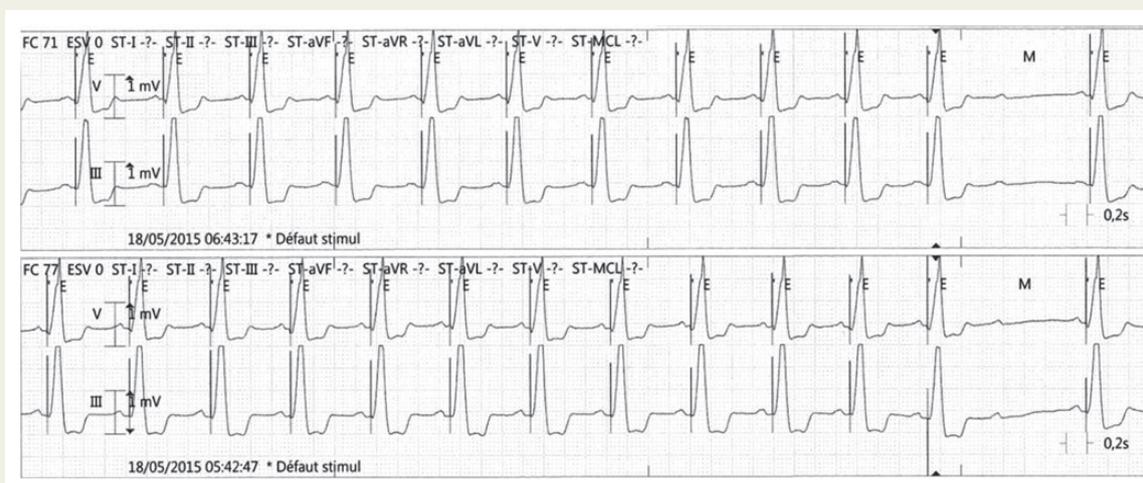


Figure 1 Ventricular pacing events are missing (M) at hourly plus 30-s intervals.

References

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