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Ventricular fusion beat on echocardiography

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Clinical Image



Figure 1: Short-axis echocardiographic images of the left ventricle show good contractility without dyssynchrony regardless of paced wide QRS complex on monitor (Panel A). Panel B shows longer PQ intervals and narrower QRS durations than in Panel A.

Description

A 66-year-old man with a permanent pacemaker, Medtronic Adapta DR ADDRL1 (Medtronic Inc., Minneapolis, Minnesota, USA), underwent regular echocardiographic examination. The atrial lead was placed in the right atrial appendage and the ventricular lead was placed in the apex of the right ventricle; a routine pacemaker check, performed two months earlier, showed a ventricular pacing percentage of 15.8% in DDDR mode, with adequate battery life. An echocardiogram revealed no left ventricular dyssynchrony although his electrocardiographic monitor showed wide QRS associated with a pacemaker rhythm (Panel A; Movie I in the supplementary Appendix). Interestingly, QRS duration spontaneously shortened during the examination, with an increase in PR interval (Panel B; Movie II in the supplementary Appendix).

Given that right ventricular apical pacing causes wide QRS complex and left ventricular dyssynchrony, the patient is likely to have had ventricular fusion beats (i.e., a pacemaker spike on an intrinsic beat) due to an inappropriate atrioventricular delay setting, which was automatically optimized by the pacemaker with a function called Search AV+ (Medtronic Inc., Minneapolis, Minnesota, USA). In brief, the Search AV+ feature is automatically activated and measures AV conduction to promote intrinsic ventricular activation or prevent ventricular activation. If AV conduction is found before the extendable AV interval, the operational sensed and paced AV intervals are extended, whereas the AV intervals revert to the programmed values and Search AV+ suspends operation in lack of intrinsic AV conduction within the range of the extendable AV interval [1,2].

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