Paradoxical atrial undersensing due to inappropriate atrial noise reversion of atrial fibrillation in dual-chamber pacemakers.

Abstract:

Paradoxical atrial undersensing. BACKGROUND: Paradoxical atrial undersensing at high atrial sensing levels was described as false atrial noise reversion of dual-chamber pacemakers during atrial fibrillation in a sheep model. It is unknown whether this phenomenon occurs in humans. METHODS: In total, 71 patients with implanted dual-chamber pacemakers and atrial fibrillation were tested for the occurrence of paradoxical atrial undersensing. After determination of the sensing threshold of atrial fibrillation (30 seconds of continuous mode switch), the atrial sensing level was stepwise increased. If, after correct mode switch behavior at insensitive levels, loss of mode switch occurred at higher sensing levels and if the pacing mode was consistent with atrial noise reversion, paradoxical atrial undersensing was assumed. RESULTS: Paradoxical atrial undersensing could be provoked in 9 of 71 (13%) patients at a median sensing level of 0.4 (range 0.15-2.0) mV. Six different pacemaker models of five different manufacturers were affected. The occurrence of paradoxical atrial undersensing was significantly associated with the sensing threshold of atrial fibrillation (2.7+/-1.5 mV for patients with paradoxical undersensing compared to 1.6+/-1.3 mV for those without, P=0.02). Decreasing the atrial sensing level avoided paradoxical undersensing in 8 of 9 patients while maintaining an adequate safety
margin for the detection of atrial fibrillation. CONCLUSION: Paradoxical atrial undersensing is inherent to all current dual-chamber pacemakers. The incidence is about 13% when using very high atrial sensing levels. Inappropriate atrial noise reversion can be resolved in most of the cases by decreasing atrial sensing levels and knowledge of this phenomenon is important to avoid unwarranted atrial lead revisions.