

CASE REPORT

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Dislodgment of VDD Lead Connected to DR Pacer and Managed by Mode Switch

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Abstract: An 80-year-old patient having a dual chamber DR pacer connected to a VDD lead presented with chronic lead dislodgment with the atrial ring displaced into the right ventricle. There was no ventricular capture at maximal ventricular output, and given the clinical settings, the condition was managed with a conservative approach, the mode was switched to AAI ensuring a minimal adequate ventricular pacing backup in a non dependent patient.

Keywords: VDD, dislodgment, pacing, elderly

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Introduction

VDD leads are usually connected to a VDD device, only in exceptional circumstances they are connected to a dual chamber device (DR); in this latter case, the device can be switched to AAI mode. Leads dislodgment are among the most common complications of cardiac pacing, they usually occur hours or days after device implantation. Lead repositioning is difficult or impossible when it is a chronic lead dislodgment; accordingly, management decision in these cases should take into account the clinical settings and ventricular pacing backup for patient safety.

Clinical Presentation

An 80-year-old male patient had a dual chamber pacemaker (PM) (Talos DR biotronic) connected to a VDD lead and programmed in VDD mode, it was implanted three years previously for paroxysmal second degree atrioventricular block. The patient record showed that the implantation procedure was simple, a VDD device was not available during the operative period and it was decided to connect a VDD lead to a DR device programmed in VDD mode. 24-hour-post-operative pacing parameters were satisfactory, the patient was discharged on the second post-operative day.

The patient has not been seen for a PM check since the implantation date (non-compliant patient), he presented lately for gastrointestinal disorder for which he was hospitalized, there was no history of syncope or other relevant cardiac symptoms. EKG showed a spontaneous rhythm at 70 bpm, narrow QRS, a long PR interval with intermittent Wenckebach phenomenon, chest X rays (Fig. 1) showed a relative cardiomegaly and a dislodged lead with displacement of the atrial ring into the right ventricle and the tip of the lead making a small loop at the apex of the right ventricle. Lateral x-ray projection was not available (bedridden patient), and cardiac echogram confirmed the position of the lead in the right ventricle. PM check showed unmeasurable ventricular pacing threshold with no capture at maximum output and a “P” wave (in reality = “R” wave) at 8 mv, R wave (from tip electrode) at 18.9 mv and impedance at 1120 ohms. The patient was reluctant to have any interventional procedure in order to relocate (or change) the lead; Consequently, pacing mode was switched to AAI resulting in VVI-like pacing mode (Fig. 2) with intermittent loss of capture at nominal

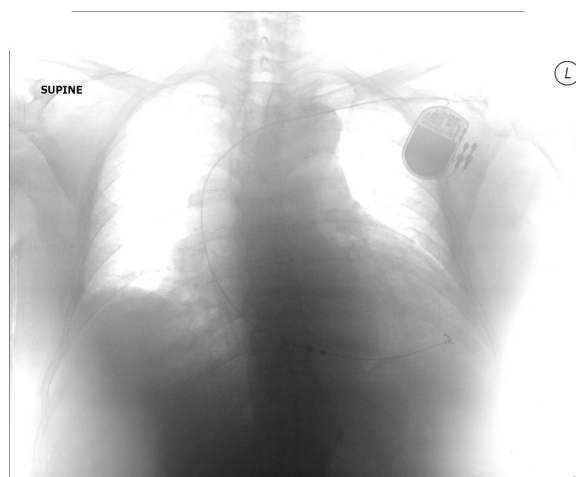


Figure 1. Bedside antero-posterior Chest X rays showing atrial ring in the right ventricle.

setting (3.6V/0.4 ms), the threshold was at 2.0/0.4 ms and accordingly the atrial output was programmed at 4.5V/0.4 ms (Fig. 3).

Discussion

This case shows an example of a dislodged VDD lead connected to a DR PM with the atrial ring being displaced into the right ventricle, and a non measurable ventricular threshold. Given the clinical settings, the condition was managed by programming an AAI mode. In this case, having a DR device connected to a VDD lead allowed to switch to AAI pacing mode ensuring a minimal ventricular pacing backup; Nevertheless, even if this “coincidence” (DR device + VDD lead + lead dislodgment + management with AAI mode) was “beneficial”, this kind of dislodgment is rare and it is not a reason to make it a regular practice to connect a VDD lead to a DR PM.

The first point to raise is the importance of regular device follow-up,¹ this issue is of utmost importance and every effort should be made to ensure that patients—especially those with dependent PM—have a regular PM check. A typical follow-up visit should include a targeted cardiovascular evaluation, assessment of the underlying rhythm, thresholds, and appropriate reprogramming to optimize device function and longevity. This patient was fortunate in being non-dependent and having an adequate ventricular rate despite the atrioventricular dissociation; the time of dislodgment is undefined given that the patient had no follow up since the implantation, but

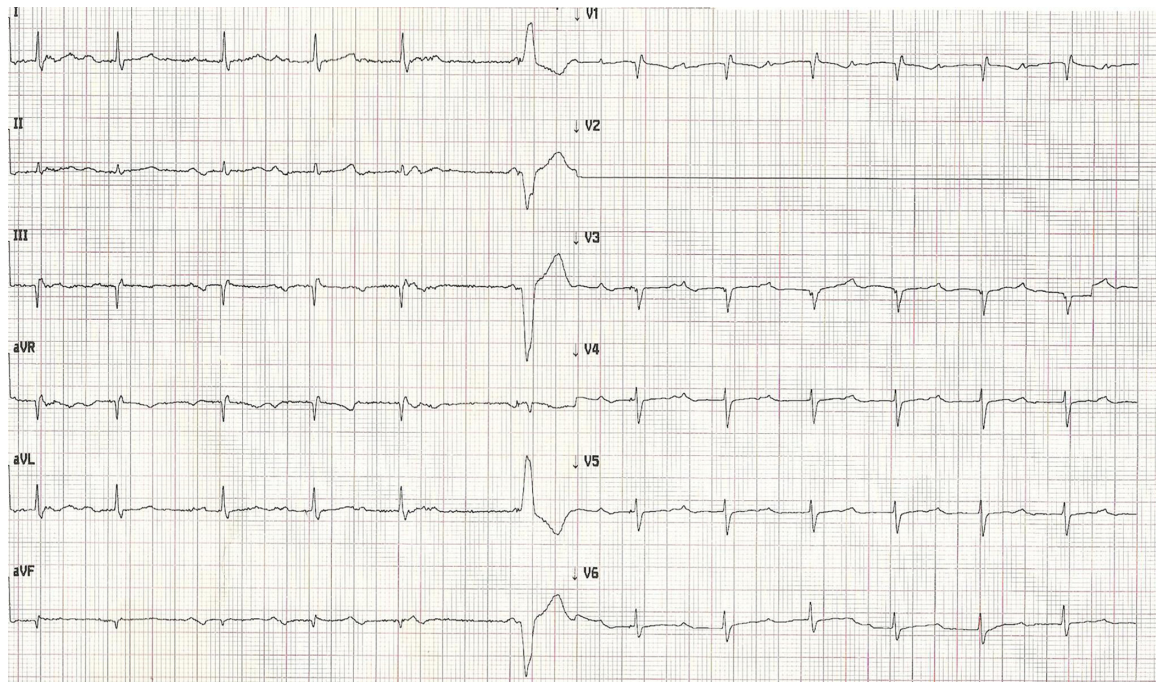


Figure 2. VVI-like pacing (paced 6th QRS complex) with AAI mode at nominal setting (3.6V/0.4 ms), the first QRS complex in precordial leads was not captured.

Patient: XXXXXXXXXXXXXXXX Implant: TALOS DR S/N: ██████████	
ICS 3000 SW 1001.A/1	
Mode	AAI
Basic/Night rate...	60/60 ppm
Rate hysteresis...	OFF ppm
ATRIUM	
Pulse amplitude	4.5 V
Pulse width	0.40 ms
Sensitivity	1.0 mV
Refractory period	425 ms
Min. PVARP	----- ms
ARP extension	----- ms
Far-field blanking	----- ms
Pacing polarity	BIPL
Sensing polarity	BIPL
Lead impedance	----- 1120 Ω
Polar. pace	----- BIPL
Measured values are related to permanent pacemaker program.	
R meas. (sensing) VVi	
Basic rate...	30 ppm
Sensitivity	2.5 mV
Polar. sense	BIPL
Results:	
Mean rate	115 bpm
Min. ampl.	18.9 mV

Figure 3. Interrogation data and programmed parameters.

we hypothesize that it happened in the days following the implantation procedure.

The second point to raise is the importance of factors associated with perioperative morbidity:² six variables were found to be independent predictors of events after first PM implantation: lower body mass index, heart failure, indication, subclavian vein access, active fixation of atrial lead, and dual chamber PM. In a study³ conducted to assess complications of PM implantations in the elderly, lead dislodgment was found among the most common complications; nevertheless and according to the same authors, older age, was not found—by itself—associated with a significant increase in complication rates.

Given the increased life expectancy, pacing in the elderly is an increasingly frequent procedure; Shen et al⁴ found that pacing in the elderly improved quality of life, with a complication rate comparable to younger patients when no significant cardiac comorbidities are present. Nevertheless and according to the same author, PM implantation in the very elderly is accompanied with higher risks of worsening of cardiac, neurologic, or orthopedic disabilities and this was related to the general clinical settings rather than to PM implantation by itself.



Conclusion

Chronic lead dislodgment is not always easy to relocate because of fibrosis and adherence, also the clinical setting (non dependent patient, age > 75 years old) and patient reluctance to any interventional procedure leading to conservative management; In this case, a DR pacemaker connected to VDD lead gave the opportunity the switch to AAI mode and so to ensure a minimal backup pacing in this setting.

Author Contributions

Conceived and designed the experiments: AK. Analysed the data: AK. Wrote the first draft of the manuscript: AK, NN. Contributed to the writing of the manuscript: AK, NN. Agree with manuscript results and conclusions: AK, NN. Jointly developed the structure and arguments for the paper: AK, NN. Made critical revisions and approved final version: AK, NN. All authors reviewed and approved of the final manuscript.

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Competing Interests

Author(s) disclose no potential conflicts of interest.

Disclosures and Ethics

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contributorship, conflicts of interest, privacy and confidentiality and (where applicable) protection of human and animal research subjects. The authors have read and confirmed their agreement with the ICMJE authorship and conflict of interest criteria. The authors have also confirmed that this article is unique and not under consideration or published in any other publication, and that they have permission from rights holders to reproduce any copyrighted material. Any disclosures are made in this section. The external blind peer reviewers report no conflicts of interest.

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