

EP CASE REPORT

Leadless pacemaker used as long-term temporary therapy in Lyme carditis with high-grade atrioventricular block

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Case presentation

A 22-year-old man presented with dyspnoea and dizziness with additional history of a tick bite and a fever of 104°F for 2 weeks followed by an annular erythematous rash. A Holter monitor revealed symptomatic third degree atrioventricular (AV) block and multiple pauses up to 2.5 s. Upon admission, alternating bundle branch block with complete heart block was noted on electrocardiogram (Figure 1A), followed by asystole. Urgent temporary pacing was provided and intravenous ceftriaxone was initiated for clinical suspicion of Lyme carditis. IgM antibodies against *Borrelia burgdorferi* were positive. An echocardiogram revealed an ejection fraction of 40–45% with septal and inferior hypokinesia due to myocarditis.

Persistent high-grade AV block despite 3 days of appropriate antibiotic therapy prompted us to consider the placement of a permanent pacemaker (PM). Given the anticipated natural history of recovery of conduction as well as the absence of a need for atrial pacing, we decided to implant a single chamber PM. The patient's young age, the risk of infection and extraction associated with transvenous pacing, prompted us to implant a single chamber leadless pacemaker (NanoStim™, St. Jude Medical, St Paul, MN, USA) (Figure 1B). At follow-up 1 year later, there was no evidence of infra-Hisian block or a need for pacing. The PM exhibited adequate sensing and capture thresholds at routine device interrogations throughout follow-up. Echocardiogram demonstrated a recovery of the ejection fraction to 62%. The leadless pacemaker was extracted without complication.

Discussion

In an observational study of 45 patients with Lyme carditis complicated by complete heart block, 4% of patients needed a permanent PM, while 40% requiring temporary transvenous pacing. All other cases of heart block improved, demonstrating the transient feature of AV block in Lyme carditis. Median time to improvement to first degree block or normal sinus rhythm was 6 days (range 1–42 days).¹ As Lyme carditis is usually transient, we expected the recovery of the conduction system and anticipated the need for extraction of the pacemaker.

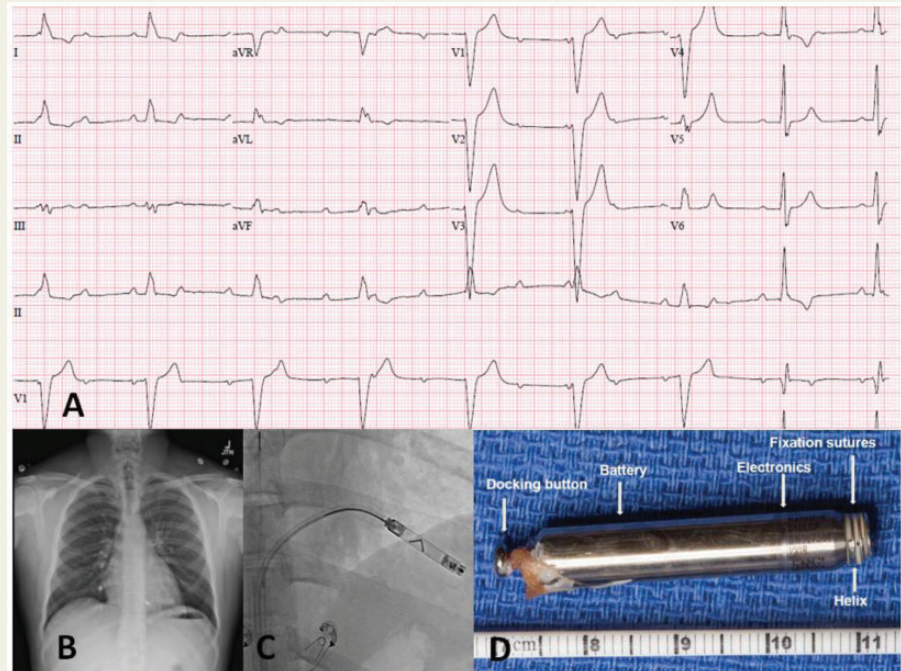


Figure 1 (A) Electrocardiogram complete heart block with wide left bundle branch escape rhythm. (B) Chest X-ray post-pacemaker implantation. (C) Fluoro image at extraction. (D) Extracted NanoStim pacemaker.

Further, in light of the young age, cosmetic concerns, and the need for only ventricular pacing, we elected to implant a single chamber leadless PM after discussing with the patient.

The extraction procedure with a leadless PM may be simpler than that with a transvenous pacemaker due to the lack of scar formation along the entire length of a transvenous lead. Retrieval is possible through the docking feature on the back of the device of both Nanostim™ (St. Jude Medical) (Figure 1C and D) and Micra™ (Medtronic). The significant risk of tear in the vascular structures as in the transvenous PM is significantly reduced.

Given the safety profile of the leadless PM,² it may be potentially be used as a longer-term temporary pacemaker in conditions for which the duration of pacing is too long to permit transvenous temporary pacing.

Conflict of interest: none declared.

References

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2. Reddy VY, Exner DV, Cantillon DJ, Doshi R, Bunch TJ, Tomassoni GF et al. Percutaneous implantation of an entirely intracardiac leadless pacemaker. *N Engl J Med* 2015;**373**:1125–35.