Right Ventricular Lead Perforation Presenting as Left Chest Wall Muscle Stimulation

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A 83-year-old man with a history of coronary artery disease and 3-vessel coronary artery bypass grafting underwent implantation of a pacemaker (Medtronic EnPulse E2DR01) at an outside facility because he experienced recurrent syncope and an abnormal response to tilt table testing. Active fixation leads were implanted in the right atrium (Medtronic 5076-52) and right ventricle (Medtronic 5076-58). At the time of implantation, all lead parameters were within normal limits, and the right ventricular lead was positioned in the apex. Twelve days after the implantation, the patient developed intermittent left chest muscle twitching. He presented to an outside hospital’s emergency department, where chest radiographs revealed that the right ventricular lead was outside the cardiac silhouette (Figure 1). A trans-thoracic echocardiogram excluded a pericardial effusion. He was subsequently transferred to our institution, where interrogation revealed visible evidence of left pectoralis major muscle contraction when pacing the right ventricle at 2.5 V and 0.5 ms. Left chest muscle twitching resolved with reprogramming to AAI mode at a rate of 50 bpm.

Chest CT showed the right ventricle electrode tip position to be in the anterior chest wall and confirmed the absence of a pericardial effusion (Figure 2). The patient was taken to the operating room. The right femoral vein and artery were exposed to provide rapid access in the event that cardiopulmonary bypass would be required. Continuous transesophageal echocardiography was used to monitor the pericardial space. The ventricular lead was disconnected from the pacemaker generator. Under fluoroscopic guidance, the surgeon retracted the screw into the lead. Gentle, steady traction resulted in lead extraction in its entirety without complications or the development of pericardial fluid. A new ventricular lead was not implanted at the time. The patient was discharged home and was doing well at his 1-month follow-up examination.

This case illustrates the potential for delayed pacemaker lead perforation after an uneventful implantation of an active fixation lead.1 Pacing electrode stimulation of the chest wall musculature and absence of a pericardial effusion are unusual features of this presentation.

References

Figure 1. Chest radiographs in the posterior-anterior (A) and lateral views (B). A dual-lead transvenous pacemaker is evident. The right ventricular (RV) lead (arrow) appears to penetrate the RV free wall and terminate in the left lung. There is no pneumothorax. Median sternotomy wires and mediastinal clips are noted consistent with previous coronary artery bypass grafting.
Figure 2. CT scan of the chest without intravenous contrast. Axial images display the pacemaker lead (black arrow) extending through the right ventricular (RV) free wall and epicardial fat pad (A) before penetrating the pericardium and terminating in the left anterior chest wall (B). There is no evidence of pericardial or pleural effusion.
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Circulation. 2005;111:e451-e452
doi: 10.1161/CIRCULATIONAHA.104.494732
Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the
World Wide Web at:
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