



P. P. Velankar, M.D.

TRANSARTERIAL DIRECT LEFT VENTRICULAR PACING

Pradnya P. Velankar, M.D.; Sama Alchalabi, M.D.; Sayf Khaleel Bala, M.D.; Su Min Chang, M.D.

Methodist DeBakey Heart & Vascular Center, Houston Methodist Hospital, Houston, Texas

Case Report Introduction

A 77-year-old male with sick sinus syndrome status post pacemaker placement was admitted for arterial embolectomy of the left foot after an embolic event. Chest X-ray revealed an abnormal course of the pacemaker suggestive of a lead in the left ventricle (LV) (Figure 1a). The lead appeared to have entered through the left subclavian artery into the aorta, crossed the aortic valve, and lodged into the LV (video clip 1). An electrocardiogram (ECG) showed right bundle branch block (RBBB) pattern of the paced beat (Figure 1b). It was thought that emboli originated from this lead and caused lower extremity ischemia. Transesophageal echocardiography was negative for thrombi and confirmed the course of the pacer wire in the aorta and LV (video clip 2). The patient underwent successful lead extraction. Subsequently, a new

pacemaker was placed in the right ventricle (Figure 1c) with a different QRS morphology (Figure 1d).

Discussion

Malposition of a ventricular lead into the LV is an uncommon event, and its actual incidence is unknown. It may be underestimated because of underreporting. Inadvertent LV pacing can result from unintentional placement of the ventricular lead into the LV through a patent foramen ovale or after perforating the interatrial septum, especially at the fossa ovalis.¹ Moreover, unintentional placement of the ventricular lead into the distal coronary sinus or other cardiac veins has also been reported and may present with an ECG pattern of RBBB in paced mode.² Misplacement of the lead via the subclavian artery through the aortic valve into the LV may also result in LV pacing

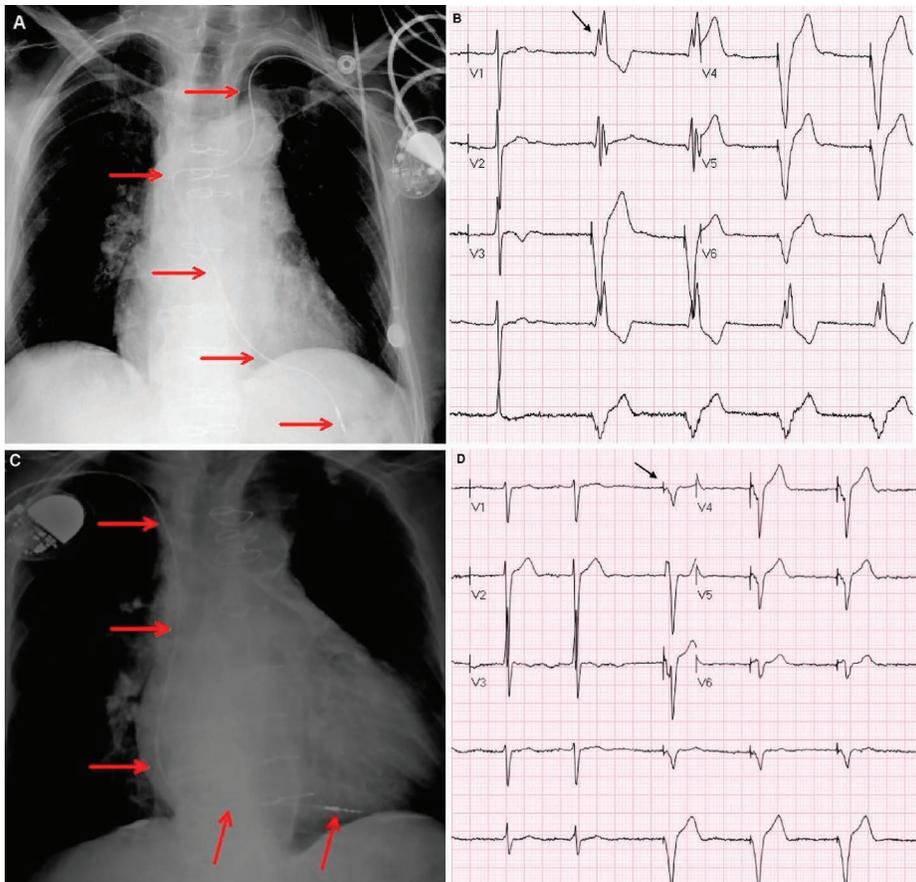


Figure 1. (A) Chest X-ray shows an abnormal course of the pacemaker, suggesting a lead in the left ventricle; (B) an electrocardiogram reveals right bundle branch block pattern of the paced beat; (C) a new pacemaker placed in the right ventricle; and (D) new pacemaker with a different QRS morphology.

and a subsequent RBBB pattern on an ECG in paced mode as in our case.³ The diagnosis of malpositioned pacing leads can easily be missed during routine pacemaker interrogation due to the use of modified or a limited number of surface leads. A 12-lead ECG in ventricular pacing mode that shows a RBBB pattern should raise suspicion about ventricular lead misplacement. Moreover, echocardiography or other imaging modalities like a chest X-ray will confirm the exact position of the wire. The therapeutic options for a misplaced lead in the LV are limited. If misplacement is diagnosed early after implantation, lead removal or adjustment is usually feasible. Adequate lifelong anticoagulation with warfarin is the therapeutic option of choice if the lead has been misplaced for a while. Lead extraction should be reserved for special circumstances, such as failure of anticoagulation or during other concomitant cardiac surgery.⁴

Conflict of Interest Disclosure: The authors have completed and submitted the *Methodist DeBakey Cardiovascular Journal* Conflict of Interest Statement and none were reported.

Funding/Support: The authors have no funding disclosures.

Keywords: malpositioned pacing leads, ventricular lead misplacement, right bundle branch block (RBBB) pattern

References

1. Schiavone WA, Castle LW, Salcedo E, Graor R. Amaurosis fugax in a patient with a left ventricular endocardial pacemaker. *Pacing Clin Electrophysiol.* 1984 Mar;7(2):288-92.
2. Meyer JA, Millar K. Malplacement of pacemaker catheters in the coronary sinus. Recognition and clinical significance. *J Thorac Cardiovasc Surg.* 1969 Apr;57(4):511-8.
3. Mazzetti H, Dussaut A, Tentori C, Dussaut E, Lazzari JO. Transarterial permanent pacing of the left ventricle. *Pacing Clin Electrophysiol.* 1990 May;13(5):588-92.
4. Van Gelder BM, Bracke FA, Oto A, Yildirim A, Haas PC, Seger JJ, et al. Diagnosis and management of inadvertently placed pacing and ICD leads in the left ventricle: a multicenter experience and review of the literature. *Pacing Clin Electrophysiol.* 2000 May;23(5):877-83.