

# Extraction of left ventricular pacing lead inserted via the left subclavian artery

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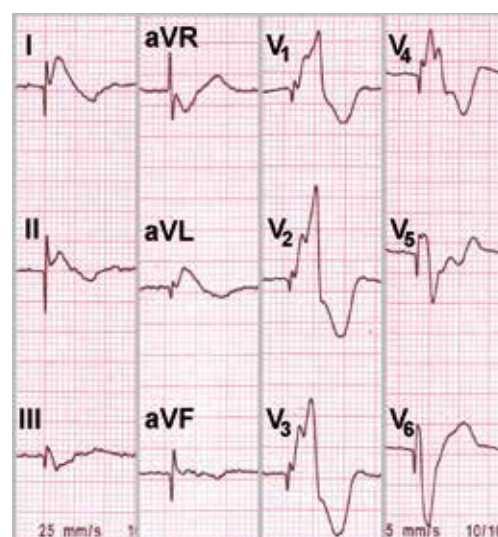
A 90-year-old woman was admitted to the hospital for lead removal. Six weeks before admission, she had been implanted a ventricular pacing system owing to symptomatic, second-degree atrioventricular block. The ventricular lead was implanted by the vessel puncture. A severe condition of the patient during the procedure with recurring asystoles and blood pressure drops was most probably the reason why the puncture of the left subclavian artery and implantation of the lead into the left ventricle was not diagnosed. During postoperative period, normal stimulation parameters were recorded and right bundle branch block, typical of the left ventricular pacing (FIGURE 1A), was seen on electrocardiogram. On chest X-ray, the image of the lead passing along the left subclavian artery, arch-like up over the pleural cupula and along the left edge of the vertebral column, was not carefully evaluated (FIGURE 1B).

The diagnostic procedures were performed after the patient was readmitted to the hospital 2 weeks later owing to pacing failure, even with the maximum amplitude and range of impulses (8 V/1.5 ms). Transthoracic echocardiography and computed tomography revealed the lead passing through the arteries and aortic valve to the left ventricular apex (FIGURE 1CD). Venography of the left-side venous confluence showed the left subclavian vein passing below the artery with the lead inside (FIGURE 1E).

Once the condition was identified, low-molecular-weight heparin was administered and the patient, because of her advanced age, was scheduled for transvascular lead extraction. Two days prior to the procedure, the dual chamber pacing system on the right chest side was implanted. The procedure was performed under general anesthesia, with transesophageal echocardiography showing no thrombi on the lead. The osteotomy

of the left clavicle was necessary. The subclavian artery puncture site was protected by the suture. The lead was extracted by simple traction. With no complications in the perioperative period, the patient was discharged in good condition 3 days later.

The malpositioned lead implanted in the left ventricle is a rarely diagnosed complication of permanent pacing.<sup>1</sup> It is vital to diagnose this complication to introduce anticoagulant therapy and thus prevent ischemic cerebral stroke. Common diagnostic methods such as electrocardiogram, X-ray imaging, and transthoracic echocardiography are sufficient to diagnose lead position. So far, only sporadic cases of lead implantation to the left ventricle by the direct puncture of the subclavian artery or aorta have been described.<sup>2-5</sup> In some of these cases, the lead was left in the left ventricle, which required chronic anticoagulant therapy.<sup>2</sup> In

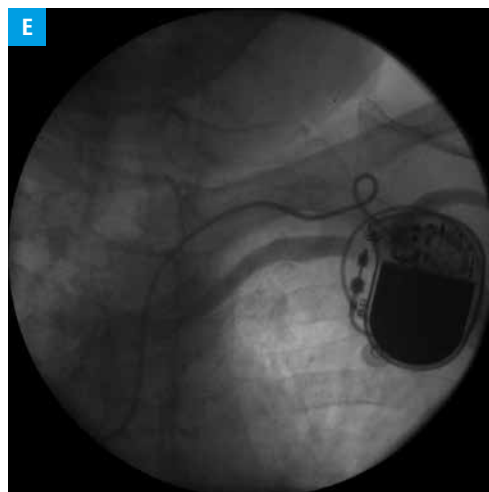
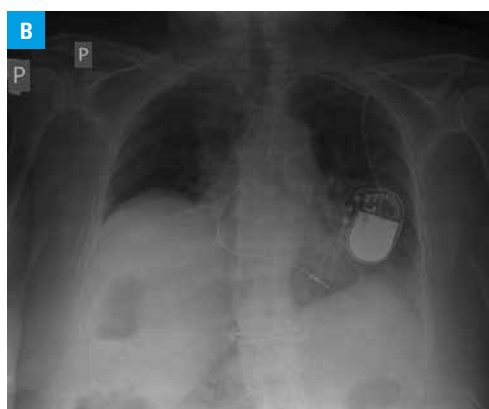


**FIGURE 1** A – electrocardiographic recording; pace, 25 mm/s; feature, 10 mm/mV

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**FIGURE 1** **B** – thoracic X-ray imaging; posterior-anterior projection;  
**C** – transthoracic echocardiography; parasternal projection; longitudinal axis;  
**D** – computed tomography; reconstruction;  
**E** – left subclavian vein venography



the other cases, the leads were extracted surgically using a cardiopulmonary bypass or by transvascular extractions by simple traction or balloon catheter to stop the hemorrhage.<sup>3-5</sup> In the present case, the need for lead extraction was evident because of the pacing failure. The advanced age of the patient limited the spectrum of the available therapeutic approaches.

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