

Aberrant Course of Pacemaker Leads: When Left is Left

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A 58-year-old man with a medical history of sick sinus syndrome, atrial fibrillation, and dual-chamber pacemaker placement was referred for evaluation of dyspnea on exertion. A transthoracic echocardiogram showed preserved left ventricular systolic function (ejection fraction, 0.55–0.59) and a dilated coronary sinus (Fig. 1). Because we suspected a left persistent superior vena cava (LPSVC), we injected agitated saline contrast medium through the patient's left arm. This revealed opacification of the coronary sinus preceding opacification of the right atrium (Fig. 2), which strongly suggested LPSVC.¹ We reviewed the patient's previous imaging studies. A chest radiograph revealed an aberrant course of both leads of a left-sided pacemaker (Fig. 3). Computed tomograms of the chest, which had been obtained to rule out pulmonary embolism, confirmed the diagnosis of LPSVC (Fig. 4).

Comment

Left persistent superior vena cava occurs in approximately 0.5% of the general population and in as many as 10% of patients with known congenital heart defects.² It

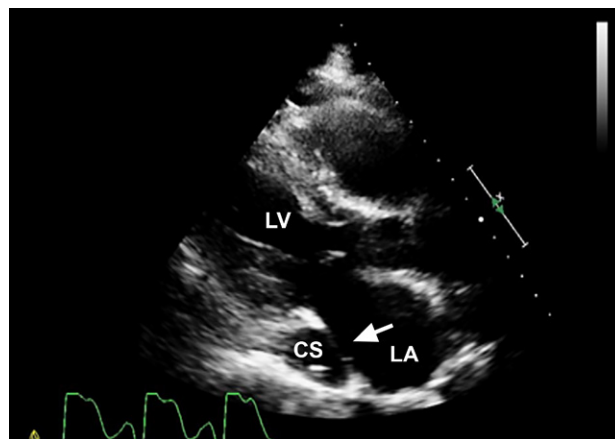


Fig. 1 Transthoracic echocardiogram shows a dilated coronary sinus (CS) and the pacemaker leads (arrow).

LA = left atrium; LV = left ventricle

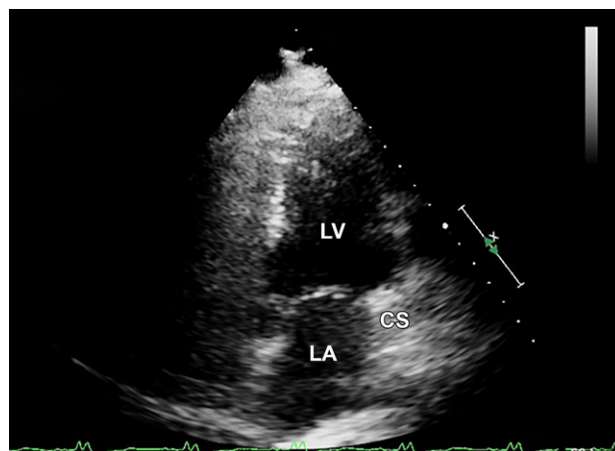


Fig. 2 Transthoracic echocardiogram after agitated-saline injection shows opacification of the coronary sinus (CS) preceding opacification of the right atrium.

LA = left atrium; LV = left ventricle

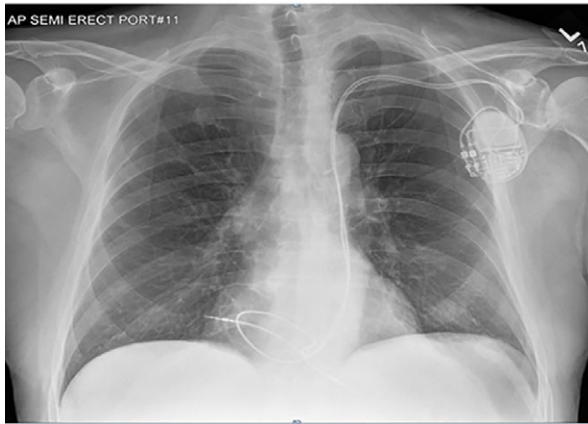


Fig. 3 Chest radiograph shows an unusual course of the dual-chamber pacemaker leads.

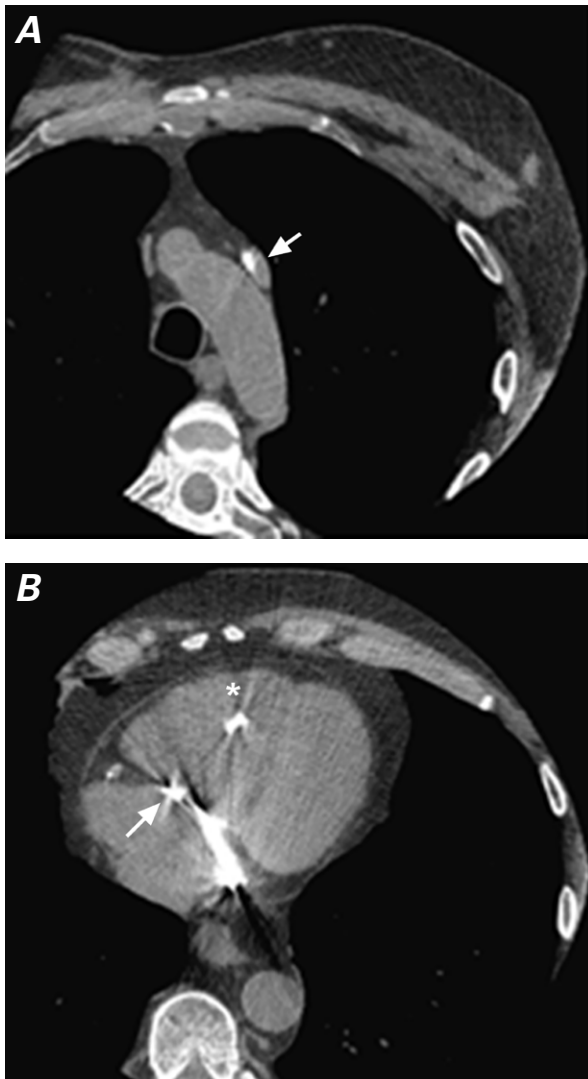


Fig. 4 Chest computed tomograms with contrast show the pacemaker leads entering the venous system through the left subclavian vein and passing into **A**) the left persistent superior vena cava (arrow), **B**) the dilated coronary sinus (arrow), and the right ventricle (asterisk).

results from failure of regression of the left anterior cardinal vein in the developing embryo.³ Isolated LPSVC, in the absence of right-sided SVC, occurs in 10% to 20% of patients.⁴ An LPSVC drains into the right atrium through the coronary sinus, resulting in a dilated coronary sinus on an echocardiogram.¹ The diagnosis is further confirmed by means of computed tomographic imaging of the chest with contrast medium or venography.⁵ This anomaly does not usually cause symptoms or hemodynamic consequences and is often diagnosed incidentally.⁴ However, it causes challenges during pacemaker placement from a left subclavian vein approach because the lead to the right ventricle has a tortuous course.⁴

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