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IMAGING IN INTENSIVE CARE MEDICINE

Persistent left superior vena cava: should the central venous catheter be left in place?

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A central catheter was inserted without difficulty through the left internal jugular (LIJ) vein in a 69-year-old male patient. Anteroposterior chest X-ray showed the central catheter entering from the LIJ vein and descending through the left mediastinal border (Fig. 1). A transthoracic echocardiogram (TTE) showed gross dilatation of the coronary sinus (CS) (Fig. 2). A 10-ml agitated saline bolus through the central catheter demonstrated the bubbles filling first the coronary sinus and then the right atrium through it, confirming the diagnosis of persistent left superior vena cava (PLSVC) (Video 1). Chest computed tomography (CT) corroborated this diagnosis (Fig. 3).

PLSVC is an embryologic remnant of the left cardinal vein, seen in 0.1–0.3% of the general population and in 10% of patients with congenital heart disease. PLSVC usually empties in the CS, which enlarges as it enters the right atrium, and in a small percentage of the patients empties in the left atrium. This case demonstrates the typical findings on chest X-ray, echocardiography, and chest CT of a PLSVC emptying in the CS.

This case raises the question of whether a central venous catheter can be left in place if it is detected in the

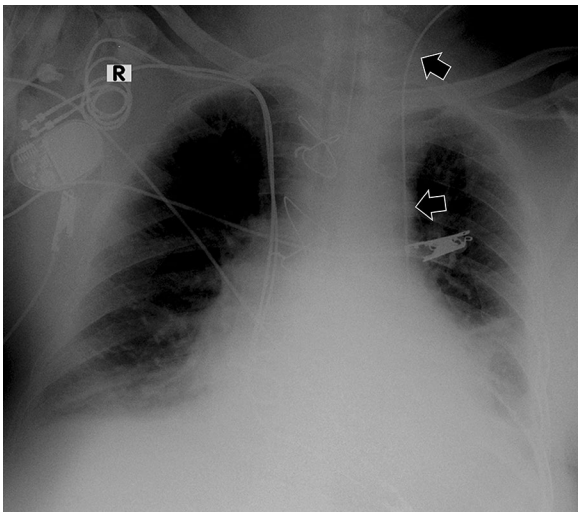

Fig. 1 Anteroposterior chest X-ray showing the central catheter entering from the left internal jugular vein and descending through the left mediastinal border (arrows). Also note the dual-chamber pacing leads on the right

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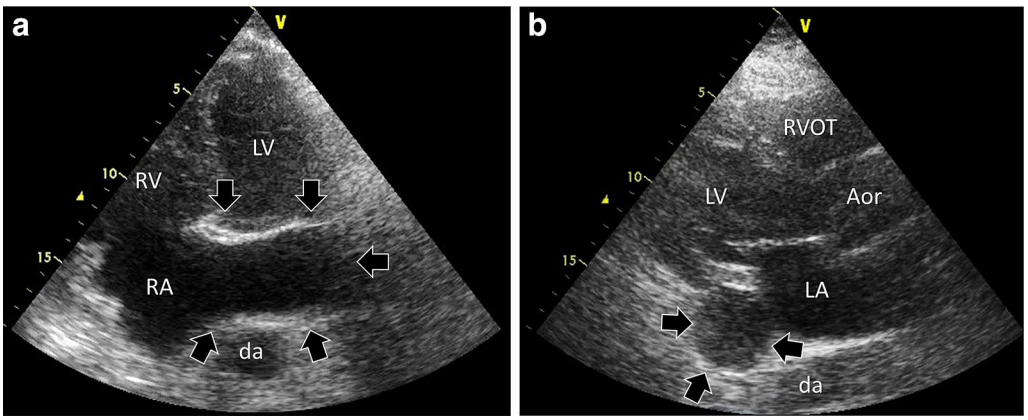

Fig. 2 **a** Grossly dilated coronary sinus observed from a modified apical four-chamber view (arrows). *RA* right atrium, *RV* right ventricle, *LV* left ventricle, *da* descending aorta. **b** Grossly dilated coronary sinus observed from a parasternal long axis view as an anechoic cavity (arrows) anterior to the descending aorta (da). *LV* left ventricle, *Aor* aortic root, *LA* left atrium, *RVOT* right ventricle outflow tract

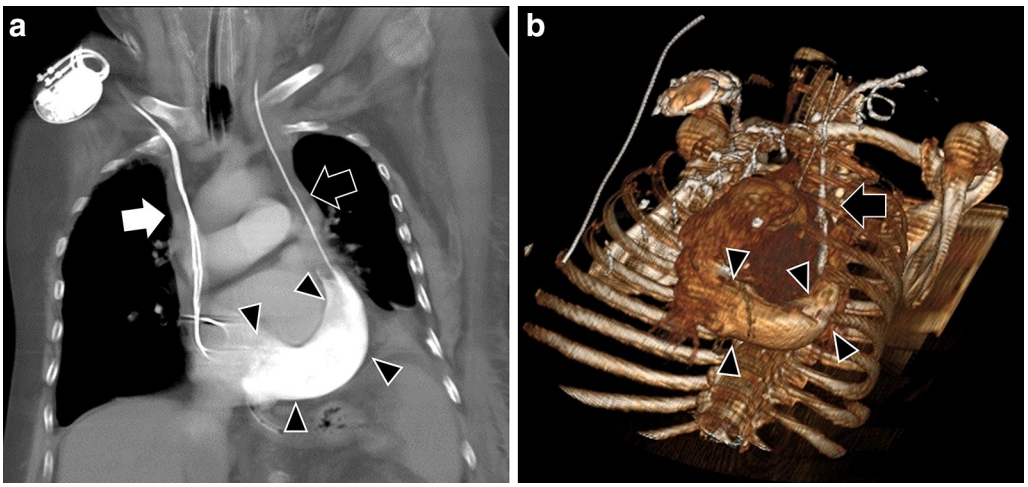

Fig. 3 **a** Chest computed tomography with intravenous contrast (**a** coronal reconstruction; **b** 3D rendering volume imaging) observing the left superior vena cava (black arrow) emptying in the dilated coronary sinus (arrowheads). The central catheter is inside the left superior vena cava, with its tip found near to the coronary sinus. Pacing leads are seen in the right superior vena cava in (**a**) (white arrow)

PLSVC. Weighing against leaving the catheter in place is that 10% of PLSVCs drain into the left atrium, which introduces a risk of systemic embolism, and the presence of a catheter in the CS, which might predispose to cardiac dysrhythmia. In this case, the ICU team left the catheter in place without complication. There is no definitive literature on this question.

Electronic supplementary material
The online version of this article (https://doi.org/10.1007/s00134-018-5362-y) contains supplementary material, which is available to authorized users.

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Compliance with ethical standards

Conflicts of interest
Authors have no conflicts of interest related to this submission.

Ethical approval
All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent
Informed consent was obtained from relatives of the patient involved in the article.

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