



Letter to the editor

Persistent left superior vena cava: Implications for Anaesthesiologists

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Abstract

A chest radiograph is a commonly accepted method for confirming the position of a central venous catheter and to rule out immediate complications related to central venous access. Congenital variation in the venous anatomy is an uncommon reason for central venous catheter malposition and may be incidentally detected on imaging after central venous catheter placement. The condition described in this letter is called persistent left superior vena cava. The catheter in this condition is seen on the left side of the cardiac shadow on a chest radiograph and non-cardiovascular anesthesiologists working in rural areas may not be well aware of it.

Keywords: Central line; Central venous catheter malposition; Persistent left superior vena cava

Dear Sir,

A chest radiograph is a commonly accepted method for confirming the position of a central venous catheter (CVC) and to rule out immediate complications related to central venous access. Congenital variation in the venous anatomy is an uncommon reason for central venous catheter malposition and may be incidentally detected on imaging after CVC placement.

A young female with chronic kidney disease who was on haemodialysis was scheduled for live related renal transplant surgery. Central venous access was planned during the surgery as part of an institutional protocol for managing perioperative volume status. As this patient had previous repeated right internal jugular vein and right subclavian vein cannulation for dialysis access and scarring noted on the right side of neck, central venous access was obtained via the left subclavian vein intraoperatively by landmark technique. Her intraoperative course was uneventful.

Postoperative chest X-ray obtained to ascertain the position of the central venous catheter revealed the catheter to be passing towards the left side of the cardiac shadow (Figure 1). Blood could be freely aspirated through all the lumen of the central venous catheter. A transthoracic echocardiographic examination done revealed persistent left superior vena cava.

Persistent left superior vena cava (PLSVC) is the most common anomaly of the central venous system. Though the exact incidence is difficult to determine, it has been reported as seen in 0.3% of the general population and 11% of patients with congenital heart disease.^{1,2} Embryologically, PLSVC results due to failure of regression of the left superior cardinal vein caudal to the brachiocephalic vein.³ It is more often detected incidentally either following central venous access chest radiograph or during imaging studies done for other reasons.³ Clinical clues that may suggest the presence of a PLSVC are, a left-sided course of a central venous

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catheter, a longer than expected pulmonary artery catheter insertion length to obtain the characteristic waveforms or difficulty during threading a catheter. The presence of PLSVC can be confirmed by venogram, contrast echocardiography (bubble study), computerised tomography or magnetic resonance imaging of the chest.³ In the present case

the preoperative echocardiogram had failed to report the presence of a markedly dilated coronary sinus which is suggestive of persistent left superior vena cava. The central venous catheter malposition prompted a careful repeat echocardiogram leading to the detection of the dilated coronary sinus and the presence of a left superior vena cava.

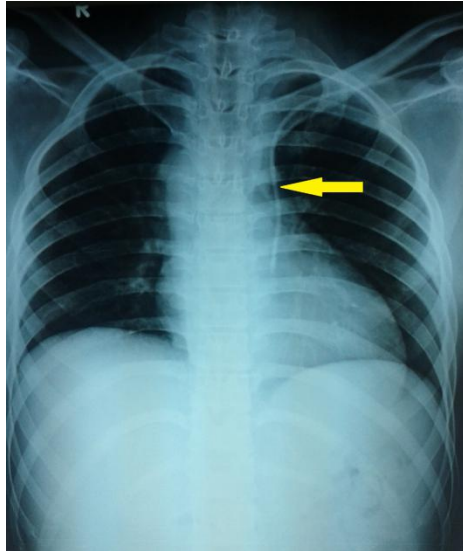


Figure 1. Post-procedure chest X-ray showing the central venous catheter passing along the left side of the cardiac shadow

Anaesthesiologists and intensivists need to be aware of this rare anatomical variation as it can lead to the dilemma about the correct position of a central venous catheter, systemic air or thromboembolism if PLSVC is draining into the left atrium, arrhythmias due to dilatation of coronary sinus opening, and inadequate myocardial perfusion with use of

retrograde cardioplegia during cardiac surgery. Good working knowledge of the anatomy of central vessels is essential for the safe practice of anaesthesia and intensive care, however not every clinician will be aware of this rare anatomical variation which can create difficulties during central venous cannulation.

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