

## Our encounter with left superior vena cava

Sir,

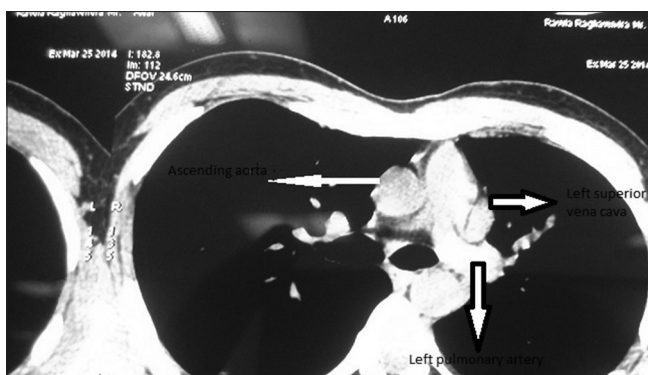
A Left Sided Superior Vena Cava (LSVC) is usually an incidental finding, which is revealed during insertion of central venous lines in asymptomatic patients. However if detected, the patient should be investigated for the presence of congenital cardiac ailments. We had a 28 years male who had a left sided loculated pleural effusion, who was posted for a left sided open decortication under general anaesthesia. For monitoring central venous pressure and in anticipation of use of vasoactive drugs, we placed a 7-French triple lumen catheter in the left subclavian vein by supraclavicular approach under ultrasound guidance. Post-operatively

we obtained a chest radiograph to confirm the position of the central venous catheter [Figure 1]. His resting heart rate was 64/min, and oxygen saturation on room air was 99%.

Suspecting a persistent LSVC (PLSVC), we advised a two-dimensional (2D) echocardiogram to find any associated congenital cardiac anomaly. The echo revealed normal sized chambers, no septal defects with good biventricular function. Retrospectively, we reviewed the computed tomography scan that was done at another hospital. It revealed a LSVC with an absent of SVC on the right [Figure 2].

Persistent left superior vena cava is the most common thoracic venous anomaly encountered. The most common presentation is presence of both LSVC and right SVC.<sup>[1]</sup> However, isolated LSVC is usually associated with atrial septal defect, bicuspid aortic valve, coarctation of the aorta, coronary sinus ostial atresia and cor triatriatum.<sup>[2]</sup> The prevalence of PLSVC in the general population is 0.3–0.5%, and about 12% in patients with congenital heart diseases.<sup>[3]</sup> Presence of PLSVC is the result of failure of regression of left anterior cardinal vein in the embryological state, which normally forms the ligament of Marshall.<sup>[4]</sup> LSVC is not clinically important if it is not associated with other cardiac anomalies. It is revealed during central venous catheter placement, thoracic surgery, and imaging for a cardiothoracic condition or as a finding on autopsy. A PLSVC usually drains in the coronary sinus. Hence, a dilated coronary sinus on 2D echocardiography should alert the cardiologist to look for a LSVC as well, even though there are other causes.<sup>[5]</sup>

A cardiac magnetic resonance imaging is helpful in detecting venous anomalies and the course of abnormal veins. Radiologically, a widened aortic shadow,



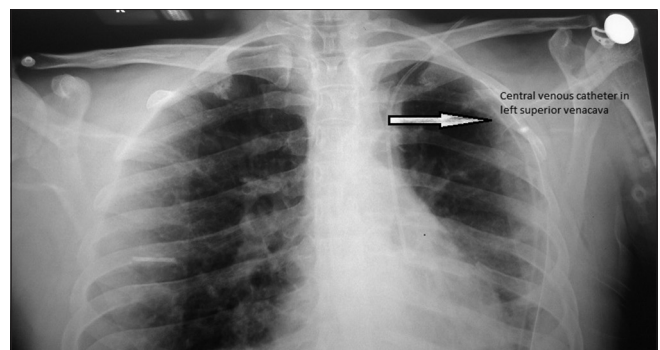
**Figure 1:** Post-operative chest radiograph

paramediastinal bulge or a low density line along the upper left margin of the heart on a postero-anterior view could be due to an LSVC but this requires an extremely high index of suspicion.<sup>[6]</sup>

The most common presentation of a LSVC is presence of both right and left SVC in the same patient. In the presence of a right SVC along with LSVC, the abnormality can be missed unless the catheter inadvertently enters the LSVC, during catheter placement instead of right. If the right SVC is absent, the condition is called Isolated PLSVC.<sup>[7]</sup>

During coronary artery bypass grafting (CABG), the surgical field will be filled with blood in the presence of LSVC and hence, the SVC needs to be ligated or separately cannulated. A PLSVC can lead to steal of solution during retrograde cardioplegia, due to which it is considered a relative contraindication for retrograde cardioplegia. While passing a Swan-Ganz catheter for a cardiac surgery, if the patient develops serious arrhythmia (at times ventricular fibrillation), a suspicion of LSVC should rise. Hence, it is important to know about LSVC during workup for a CABG.

The LSVC can create a problem while performing a permanent pacemaker implantation or during an implantable cardioverter placement via left subclavian approach. Serious arrhythmias, coronary sinus thrombosis and cardiac arrest have been reported due to inadvertent LSVC cannulation, especially after Swan-Ganz, chemoport or peripherally inserted central venous catheters for chemotherapy, haemodialysis catheters, and pacemaker placement. Hence, in the interest of the patient, the line should be removed and the other site or vein should be used.<sup>[8]</sup> However, single chamber pacemakers have been successfully, placed under fluoroscopy.<sup>[9]</sup>



**Figure 2:** Computed tomography chest showing isolated left superior vena cava

Therefore, the knowledge of PLSVC is important for anaesthesiologists and intensivists so that they do not get confused with the radiological picture after central venous cannulation and can evaluate the patient further. Agitated saline injection via left antecubital vein (Bubble study) and performing transthoracic echo is a safe, harmless and inexpensive test that can help in the detection of LSV in suspected patients.<sup>[10]</sup>

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