An aberrantly positioned central venous catheter: A presage of an underlying anatomical anomaly

Sir,

The left subclavian vein was cannulated uneventfully using bony landmark technique in a 52-year-old male for hyperalimentation and administration of inotropes and intravascular fluids in Intensive Care Unit (ICU). He was a postoperative case of cancer of the sigmoid colon and had undergone a hemicolectomy. He was admitted in view of massive intraoperative blood loss leading to hemodynamic instability and long duration of surgery. His stay was further complicated by development of septic shock. Postinsertion chest radiograph revealed the position of the catheter in the left para mediastinal location [Figure 1]. This raised suspicion of a left-sided superior vena cava (SVC). Cross-sectional imaging with computed tomography (CT), magnetic resonance, or a saline contrast echocardiography was the options available to confirm the diagnosis. A bedside CT (contrast-enhanced) of the thorax is not available in our ICU and decision to shift the patient to radiology was deferred in view of hemodynamic instability of the patient and requirement of high dose of inotropes. Bedside transthoracic echocardiography was performed which showed a structurally normal heart with a dilated coronary sinus. The tip of the central venous catheter, however, could not be observed with confidence. Agitated saline was infused via the central venous catheter and this was followed by opacification of the coronary sinus and the right atrium. Persistent left-sided SVC (PLSVC) draining to right atrium via coronary sinus was confirmed. Malpositioning into tributaries of left brachiocephalic vein (left internal thoracic vein, left superior intercostal vein) and left pericardiophrenic vein was unlikely as the pressure tracing was consistent with central venous placement (a,c, x, v, y waves could be identified). Placement in left subclavian artery and descending thoracic aorta was ruled out as pressures ranged from 5-8cm of H20 and results of blood gas analysis were consistent with venous placement.

The incidence of PLSVC is 0.3–0.5% in healthy individuals and 1.3–4.5% in patients with coexisting cardiac defects.[1,2] About 82% of PLSVC coexist with a right SVC and so this anomaly is often missed when central venous catheters are inserted on the right side. Venous drainage of PLSVC is into right atrium in majority of cases but could be in the left atrium also [Table 1].

Left-sided jugular venous distention and an abnormal and exaggerated jugular venous waveform on left-sided catheterizations due to direct transmission of left atrial

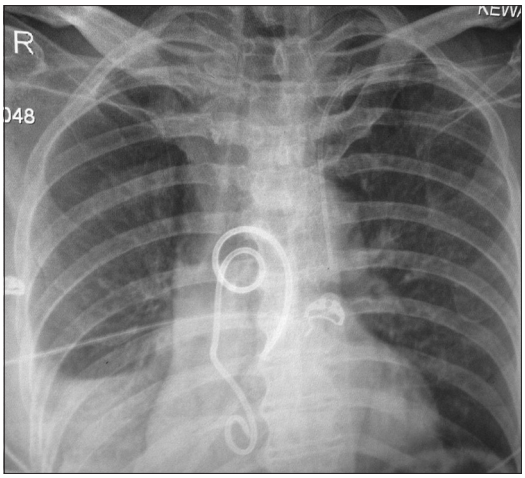

Figure 1: Chest X-ray suggestive of persistent left-sided superior vena cava; widening of the aortic shadow, a paramedian bulge along the left heart border. An electrocardiography lead and a surgical drain can also be visualized

Table 1: Venous drainage of persistent left-sided superior vena cava

PLSVC draining into the right atrium (via the coronary sinus)	PLSVC draining into the left atrium
Majority of cases (90%)	Less common (10%)
Clinically insignificant	Causes right to left shunt
Incidental finding	Associated with other cardiac anomalies such as situs inversus, tetralogy of fallot

PLSVC: Persistent left-sided superior vena cava

pressures raise suspicion of this anomaly. Anesthetist and intensivist need to be aware of this anomaly as it may cause the following complications:[3-5]

a. Difficulty in insertion of left-sided pulmonary artery catheters or pacing wire
b. Systemic embolization of air or thrombus in patients with PLSVC draining into the left atria
c. Right-to-left shunting and unexplained cyanosis and clubbing in the patient (PLSVC draining into left atria)
d. Arrythmias, cardiac arrest, and coronary sinus thrombosis
e. Causes distention of the right heart during cardiac surgeries if not ligated or separately cannulated. It is a contraindication to retrograde cardioplegia.

Left para mediastinal location of central venous catheter led to diagnostic dilemma in our patient, but a methodological assessment of all the differential diagnosis using simple bedside tests enabled us to make a diagnosis of PLSVC draining into right atria. It is the most common congenital venous anomaly in the chest and it is thus important for the clinicians to be aware of this.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Quick Response Code:

Website: www.ijccm.org

DOI: 10.4103/0972-5229.182208

How to cite this article: Saini V, Gupta A, Samra T. An aberrantly positioned central venous catheter: A presage of an underlying anatomical anomaly. Indian J Crit Care Med 2016;20:310-1.