



CASE REPORT

INCIDENTAL DIAGNOSIS OF PERSISTENT LEFT SIDED SUPERIOR VENA CAVA DURING LEFT INTERNAL JUGULAR VEIN CANNULATION

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ABSTRACT

Central vein catheterisation of left Internal jugular vein was done under Ultrasound guidance. Post procedure chest Xray revealed abnormal position of central vein catheter tip and created confusion about its correct placement. Following confirmatory chest CT scan, it was found to be in persistent left sided superior vena cava. It's a common congenital thoracic venous anomaly. Hereby discussing case report of persistent left sided superior vena cava and its clinical implications.

Key words:

Central vein catheter, Persistent left sided superior vena cava, chest Xray, Internal jugular vein, Ultrasonography.

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INTRODUCTION

Internal jugular vein (IJV) is a commonly used vein for central vein catheterization because of its ease of cannulation and reduced rates of complications, but still catheter malposition and vascular perforation are common complications associated with it. The incidence is more with left IJV as compared to right IJV cannulation (McGee and Gould, 2003). New technologies such as real time ultrasonography have decreased the complication rates associated with conventional landmark technique and improved the safety of such procedures (Karakitsos *et al.*, 2006). Some anatomical venous variants of central vessels can cause confusion regarding placement of catheter tip, thus recognising them is of utmost importance. Hereby presenting a case of persistent left sided superior vena cava (PLSVC) that was incidentally diagnosed during left IJV cannulation due to malposition of left IJV central vein catheter (Wassim *et al.*, 2011).

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Case Report

16yrs old female patient, case of B cell Acute Lymphoid Lymphoma, was referred from hematologist for ultrasound guided IJV cannulation for receiving chemotherapy. Hematologist referred patient for ultrasound guided IJV insertion. Senior anaesthesiologist chose left side because right sided IJV was previously cannulated thrice, most recent being kept in situ for 10 days and it was found to be partially thrombosed on ultrasound scanning. Under all aseptic precautions left side IJV cannulation was done with prior local anesthetic infiltration, under USG Guidance. Following central venous catheter (CVC) insertion, blood was aspirated from all three ports. Patient was little uncooperative during procedure but did not complain of any breathlessness or discomfort. On chest auscultation, air entry into lungs was bilaterally equal. Following procedure, a post CVC insertion chest Xray posteroanterior view was done to confirm the position of tip of catheter. Chest xray (Fig.1.) showed that the tip of central line catheter was lying along left upper border of heart. It was not crossing midline to enter into right superior vena cava, which raised many diagnostic possibilities with confusion of correct placement of tip of catheter.

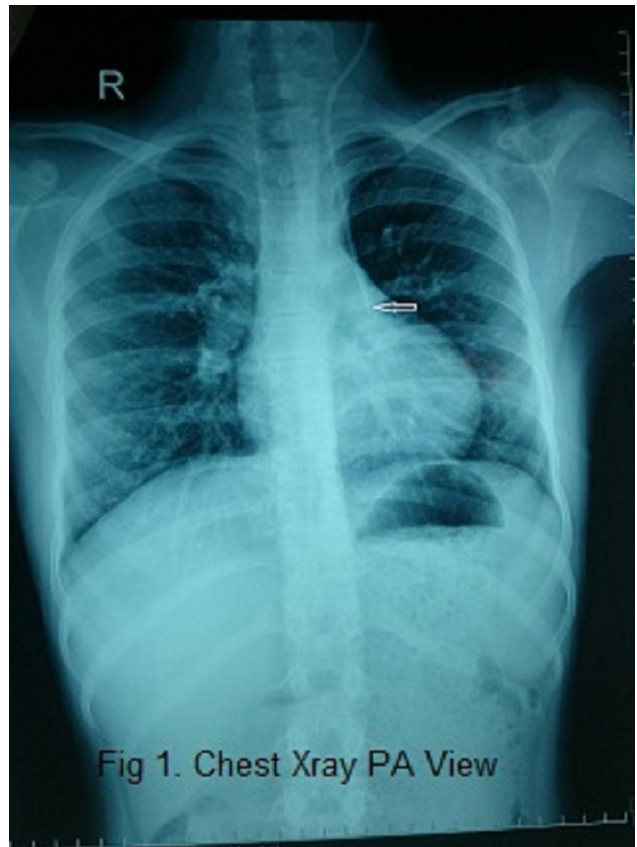


Fig 1. Chest Xray PA View

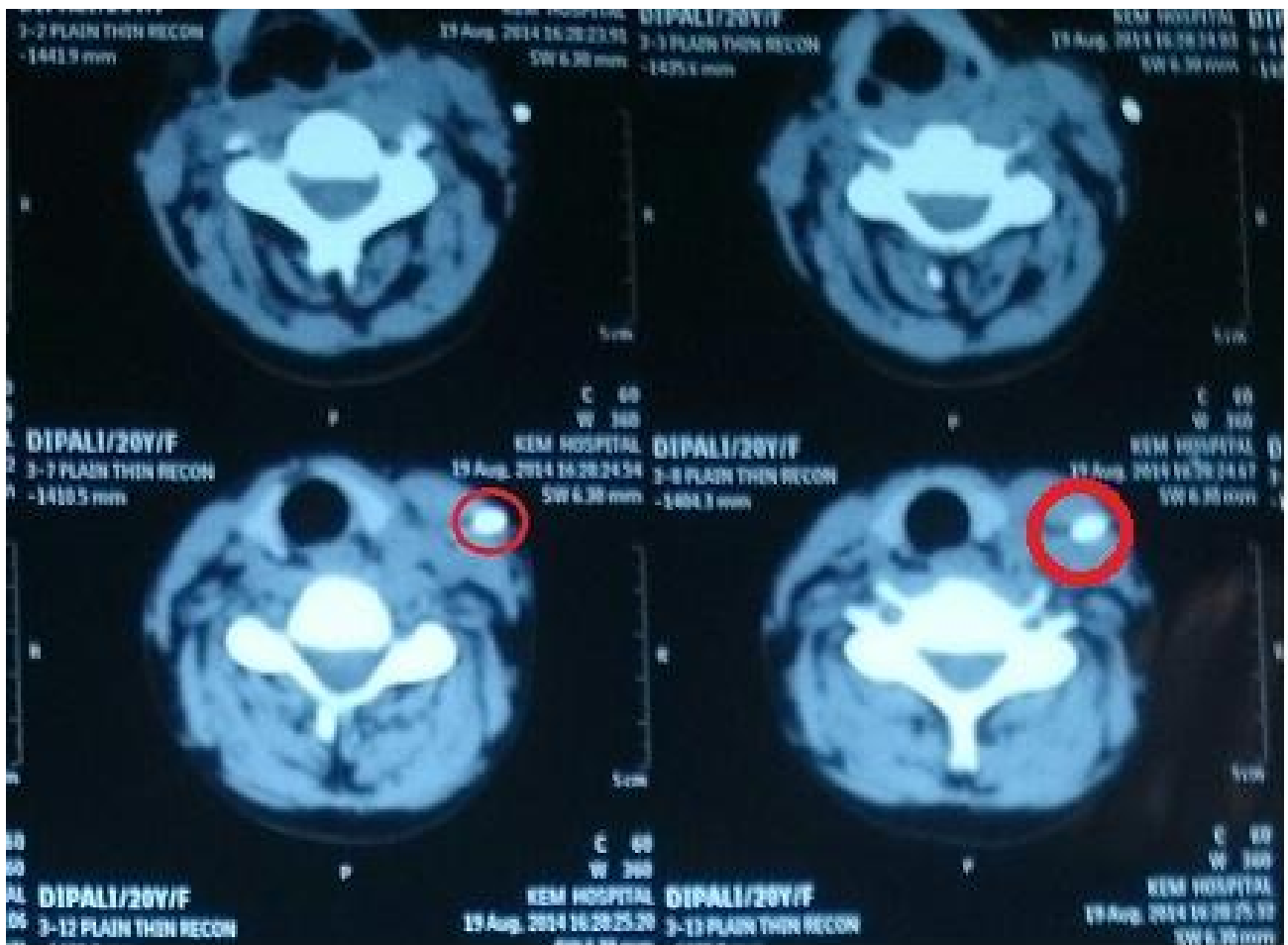


Fig. 2. Chest CT scan

Catheter tip as evident from above Xray could be in PLSVC, descending aorta, left superior intercostal vein, internal mammary vein, pericardiophrenic vein, pleura, pericardium or mediastinum (Mitchell and Clark, 1979). So patient was not given any chemotherapy or any intravenous fluids through it. For further confirmation chest CT scan (Fig. 2.) was done. It revealed presence of tip of catheter in persistent left sided superior vena cava. It was draining into coronary sinus. The rest lungs, heart and great vessels were normal. CVC was not removed and was used for administering chemotherapeutic agents.

DISCUSSION

PLSVC is the most common congenital thoracic venous system anomaly seen in 0.3 to 0.5 % of general population and 10% of patients with other associated congenital anomalies (Biffi *et al.*, 2009). It may be present with normal right IJV with which it might be communicating or draining separately into coronary sinus or left atrium (Ramos *et al.*, 2005). Embryologically the left sided anterior cardinal vein, obliterates to form a remnant structure called vein of Marshall, but when it doesn't obliterate and persists upto adult life its called as PLSVC. A new vein usually forms in its place called left brachiocephalic vein, which drains into right brachiocephalic vein. It is mostly asymptomatic but its drainage pattern might have various diagnostic and therapeutic concerns. It cannot be used for central venous pressure (CVP) monitoring. When it drains into coronary sinus and through it into right atrium it may cause some difficulty during cardio-pulmonary bypass surgeries. It's a contraindication for retrograde cardioplegia (Brinkman and Costky, 1973). Manipulation of catheter in coronary sinus can cause arrhythmia, coronary sinus thrombosis. So tip of catheter should be placed proximal to junction of PLSVC and coronary sinus. Catheter can be left in situ and used for fluid administration. But pressurized fluid administration should be avoided as it can retard coronary venous flow and decrease coronary perfusion pressure. If it drains into left atrium it may cause right to left shunt leading to cyanosis, clubbing. Usually during routine IJV cannulation, right side IJV is selected but in selective cases left IJV might have been cannulated. PLSVC not only causes diagnostic dilemma about position of tip of CVC, but also some technical difficulties during its cannulation (Schummer *et al.*, 2003). Most of the times its diagnosed as malposition of Left IJV CVC.

Left IJV has to be cannulated under ultrasonographic guidance as per recommendations from National Institute Of Clinical Excellence (NICE), which properly details the vessel position, anatomical variants and thrombus if any (NICE, 2002). Ultrasonography helps in avoiding complications related to CVC insertion. But it may sometime cannot confirm placement of tip of catheter. The additional use of fluoroscopy is required for precise insertion of the catheter to the desirable depth, in certain cases. Precise location of CVC can be determined by various diagnostic modalities. In this case plain chest CT scan was used for confirmation as its noninvasive and easily available in our hospital. Chest xray showed malposition of catheter tip along left heart border not crossing midline. The arterial placement can be excluded on the basis of pressure waveform analysis and blood gas sampling. Characteristic

central venous pressure (CVP) waveform would be absent, but might show exaggerated CVP waveform because of proximity of coronary sinus to right ventricle (Ghadiali *et al.*, 2005). Other modalities which can also be used are MRI, Transesophageal echocardiography, venous contrast study, but extensive invasive procedure like venotomy need not be done¹¹. For clinically unstable patient, venography with simultaneous chest Xray and transthoracic echocardiography with agitated saline microbubble contrast are some other confirmatory modalities.

Conclusion

As a physician, everyone should be aware of possible existence of PLSVC and its clinical implications. It will avoid the confusion regarding placement of CVC and also help in reducing complications associated with CVC insertion. Following CVC insertion, radiographical confirmation is mandatory. A post procedure chest Xray should always be done.

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