
Ultrasound as a guide to reposition a misdirected central venous catheter

Sir,

Central venous cannulation is a routine procedure done for a variety of indications. It is associated with several complications, misdirection of catheter being one of them. Catheter misdirection has an incidence of 1% to >60%.^[1] Misdirected catheters are usually withdrawn and repositioned over a guidewire.

We report a case of misdirection of a central venous catheter inserted into the right internal jugular vein (IJV) into the right subclavian vein and its subsequent management.

A 45-year-old male patient with a diagnosis of acute myeloid leukemia was referred to our department for central venous catheterization for chemotherapy. A 7 French, triple-lumen catheter was placed in the right IJV under ultrasound guidance and fixed at 13 cm at the skin. A postprocedure chest radiograph showed the catheter to be misdirected into the ipsilateral subclavian vein [Figure 1].

To reposition, an ultrasound probe was placed in the right infraclavicular region and the subclavian vein was identified along the long axis. 5 mL of saline was rapidly injected into the distal port of the catheter, and microbubbles due to turbulence (swirl sign) were noted within the subclavian

vein [Figure 2]. A guidewire was inserted into the central venous catheter and was subsequently identified entering the subclavian vein. The catheter and guidewire were then withdrawn. The ultrasound probe was then placed over the right IJV along the long axis and the guidewire further withdrawn until the J tip was visualized within the vein. The probe was again placed in the infraclavicular region as before. The guidewire was gently reinserted up to 20 cm mark at the skin. As the guidewire was not identified entering the right subclavian vein, the catheter was inserted over the guidewire. Rapid saline flush did not result in swirl sign in the subclavian vein.

A postprocedure chest radiograph revealed the catheter tip corresponding to the lower half of the superior vena cava (SVC) [Figure 3].

The correct positioning of the catheter tip in the SVC is necessary for central venous pressure monitoring and for the longevity of the catheter. Misdirection of central venous catheter is commonly reported with subclavian vein cannulation but only rarely with right IJV cannulation.^[2] This is likely because of the right IJV entering the SVC in a straight course. The Anesthesiologists Task Force recommends the routine use of ultrasound in cannulation of the IJV and a

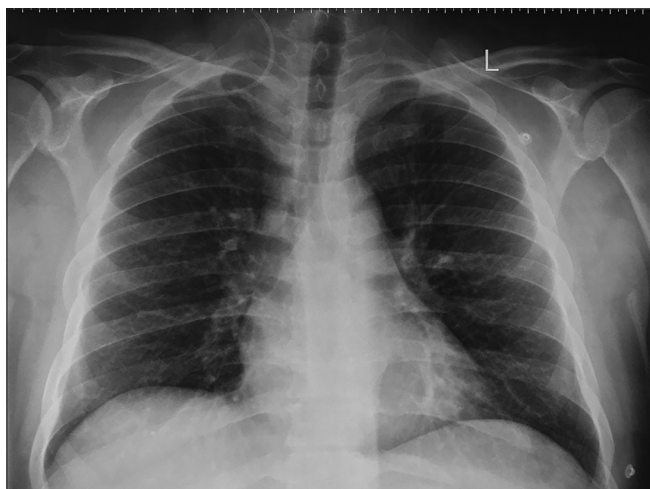


Figure 1: Chest radio-graph showing a right jugular central venous catheter misdirected into ipsilateral subclavian vein

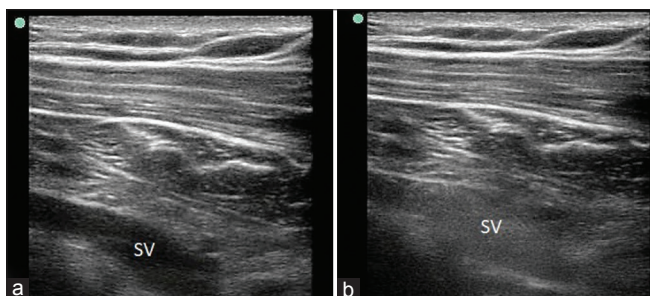


Figure 2: (a) Subclavian vein seen in long axis with ultrasound probe placed infra-clavicularly. (b) Microbubbles due to turbulence (swirl sign) noted within the subclavian vein following a rapid saline flush

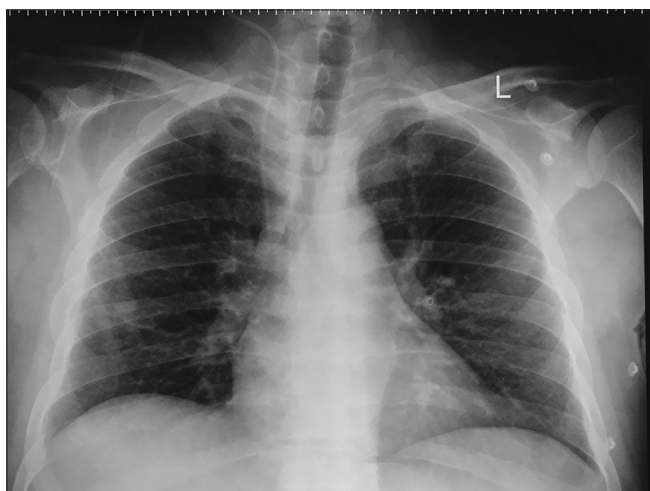


Figure 3: Chest radio-graph following repositioning showing the correct position of the central venous catheter

postprocedure chest radiograph to confirm the tip position.^[3] Transthoracic echocardiography to detect microbubbles has been used to estimate tip position.^[4] Ultrasound has also been

used for early identification of misdirected catheter from IJV to ipsilateral subclavian vein.^[5]

The above case shows that ultrasound can also be used to guide the repositioning of a misdirected central venous catheter. Detecting a misdirected catheter using ultrasound immediately after insertion can prompt repositioning in the same sitting. This may prevent a second procedure following the chest radiograph, to reposition a misdirected catheter.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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