

Coiling of central venous catheter in the left subclavian vein, a rare complication

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Abstract

Invasive monitoring is the need of the hour in today's scenario in intensive care units and perioperatively in hemodynamically unstable patients. Despite careful placement using proper landmarks and USG guided methods central venous cannulation (CVC) is associated sometimes with unforeseen complications. We report a rare complication of coiling of CVC in the left subclavian vein.

Keywords: Coiling, complication, central venous catheter malposition, subclavian vein

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Introduction

Central venous catheter (CVC) placement is a routine practice in intensive care units (ICU) and in the perioperative period for monitoring fluid status or assessing circulating blood volume, cardiac status, and vasomotor tone in critically ill patients and during major surgeries.^[1] Despite careful placement using proper landmarks and technique, it might be associated with complications like catheter malposition, haematoma formation at insertion site, pneumothorax, inadvertent arterial puncture and nerve injury. We report a rare complication of coiling of CVC in left subclavian vein.

Case Report

A 73 year old female, a post sternotomy for retrosternal goitre resection was admitted with sternal dehiscence (having sero-sanguineous discharge from chest wire site) and respiratory distress on the third post operative day. On the day of surgery, a right subclavian CVP (because of neck surgery and possibility of

tracheostomy) was placed and tracheostomy performed because of surgical concern. The patient received ventilator support, hemodynamic monitoring, empiric broad spectrum antibiotics, colostomy bag at wound site care for two hourly suction and general ICU care. On the sixth day of ICU admission pus at CVC insertion site was noticed, and was decided to change the catheter as per protocol. To change the site, left subclavian vein was cannulated with a 7.5F triple lumen CVP catheter (Edward) using standard Seldinger technique with ultrasound guidance (USG) (Sonosite, USA) under all aseptic precautions. We used the lateral approach with the needle inserted longitudinal to the transducer. The guide wire was confirmed well in position in the vein. The guide wire movement was free at insertion and during its removal after the placement of the CVP catheter. All channels of the CVC were aspirated for blood and fixed at 12 cm. On attaching the transducer to the monitor the CVP waveform appeared dampened, and despite all described standards measures it could not be improved [Figure 1a]. A chest radiograph performed after insertion to confirm the position of catheter revealed that it was coiled in a C-shaped pattern either in the same vein or possibly in one of the large venous tributaries of the left subclavian vein [Figure 1b]. The left subclavian CVC was removed and a new left internal jugular (IJV) catheter was placed by Seldinger technique using USG guidance. The guide wire was confirmed well in

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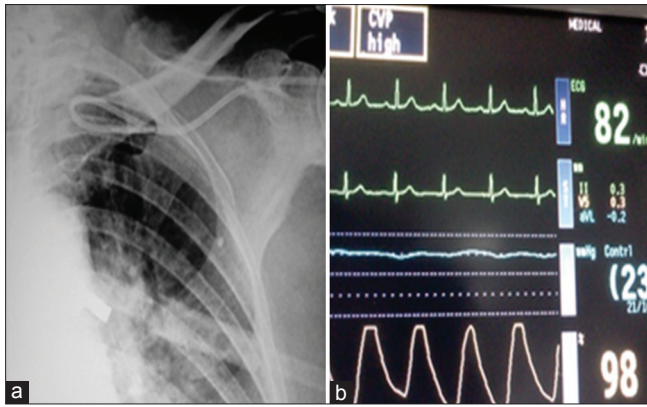


Figure 1: (a) Monitor showing dampened/absent CVP waveform with abnormal value. (b) Chest X-ray PA view with C-coiled CVP catheter *in situ*

position in the vein- it could be traced much beyond the subclavian vein. A repeat chest radiograph confirmed the correct placement with normal CVP tracing.

Discussion

The correct placement of the CVC is important to obtain accurate tracings pressure waveforms and pressure measurements. A fallacious CVP value or suboptimal waveform configuration can be suggestive of a malpositioned catheter tip.^[2] Occasionally, however, despite meticulous technique, the tip of the catheter may not terminate at the desired level.^[3]

Malposition of the catheter tip may occur at the time of insertion or later as a result of its spontaneous migration due to anatomic positioning or pressure changes within the thoracic cavity.^[4] The approach to and the type of vein cannulated can affect the probability of catheter malposition. The incidences of catheter malposition are higher for the internal jugular as compared to the subclavian catheter. The reported incidence of primary misplacement is 4.12% for the left internal jugular access, but was lower for the right internal jugular at 1.1%. The incidence is lower for the and the right and left supraclavicular approach is (1.01%) and (0.89%) respectively). The incidence of catheter malposition depends on the site of insertion and the type of material used, but not on the experience of the physician who inserted the catheter.^[5] According to another study the total incidence of radiographic catheter tip malposition, defined as extrathoracic or ventricular positioning, was 3.3%. Cannulation by the right subclavian vein was associated with the highest risk of malposition (9.1%) compared with 1.4% by the right internal jugular vein. No case of malposition was associated with vascular perforation, local venous thrombosis or cerebral symptoms.^[6] The ability to aspirate blood freely from the catheter lumen after the placement of the catheter does not necessarily

confirm a proper placement of the catheter tip.^[7] As the incidence of catheter malposition is very low some says opine that routine chest X-ray after placement of CVC may not be justifiable.^[8] So the important message is that when the CVP waveform is not obtained despite checking for blockage of the tubing, zeroing of the system and excluding transducer and cable malfunction, misplacement of central venous catheter tip should be suspected as in our case.

Real-time, ultrasound-guided central venous cannulation is a simple technique that needs practice. It results in an overall lower technical failure rate on the first attempt, faster access, and a reduction in mechanical complications as compared to the traditional landmark techniques. Ultrasound-assisted location of the vein has been reported to have no effect on the rate of complications or failure of subclavian vein (SCV) cannulation and catheterization. Similar results were reported recently in a large study on SCV.^[8] USG only helps in safe and visible venous puncture but not in detecting malposition of the tip of the CVP catheter.^[9] We conclude that interpretation of waveforms and pressure measurements may be affected in the case of catheter malposition. The use of chest radiographs to establish the correct placement of central lines is to be routinely practiced. Venography and fluoroscopy can be used to assess real time the position of the tip of catheter if available.

References

- Ghatak T, Azim A, Baronia AK, Muzaffar SN. Malposition of central venous catheter in a small tributary of left brachiocephalic vein. *J Emerg Trauma Shock* 2011;4:523-5.
- Agrawal P, Gupta B, D'souza N. Coiled central venous catheter in superior vena cava. *Indian J Anaesth* 2010;54:351-2.
- Asudani D, Wretzel S, Patel R, Stayman A. The Clinical Picture: A judgment call. *Cleveland Clin J Med* 2008;75:690-5.
- Rasuli P, Hammond DI, Peterkin IR. Spontaneous intrajugular migration of long term central venous access catheters. *Radiology* 1992;182:822-4.
- Muhm M, Sunder-Plassmann G, Apsner R, Pernerstorfer T, Rajek A, Lassnigg A, *et al.* Malposition of central venous catheters. Incidence, management and preventive practices. *Wien Klin Wochenschr* 1997;109:400-5.
- Pikwer A, Baath L, Davidson B, Perstoff I, Akeson J. The incidence and risk of central venous catheter malpositioning: A prospective cohort study in 1619 patients. *Anaesth Intensive Care* 2008;36:30-7.
- Matthias Hohlieder, Heinrich M.Schubert, Matthias Biebl. Successful aspiration of blood does not exclude malposition of a large-bore central venous catheter. *Can J Anaesth* 2004;51:89-90.
- Fragou M, Gravvanis A, Dimitriou V, Papalois A, Kouraklis G, Karabinis A, *et al.* Real-time ultrasound-guided subclavian vein cannulation versus the landmark method in critical care patients: A prospective randomized study. *Crit Care Med* 2011;39:1-6.
- Amshel CE, Palesty JA, Dudrick SJ. Are chest X-rays mandatory following central venous recatheterizations over wire? *Am Surg.* 1998;64:499-502.

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