DOI: https://doi.org/10.3329/cardio.v14i1.55378

Case Report

Appearance can be Deceptive- A Case Report on Central Venous Line Complication

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Keywords:
Central venous catheterization.

Abstract:

Central venous (CV) lines are widely used for anything from rapid fluid resuscitation, to drug administration, to parenteral nutrition, and even for administering hemodialysis. Central lines come in different sizes, types, and sites of administration. Sometimes their use can be associated with complications as well. Our patient is an 85 years old hypertensive, diabetic female presenting with post COVID fibrosis with aspiration pneumonia with septic shock. After admissions in ICU, CV line was inserted through right sub-clavian venous route for administration of essential medications including inotropes. However, forceful backflow of blood was noticed after insertion of CV line raising the suspicion of arterial insertion. It was later confirmed by CXR, ABG and duplex arterial study. Taking appropriate precautions, we were able to remove the CV line safely without any complications. Sometimes minor and easy things like CV like insertion can become life threatening. But with proper knowledge and planning we can overcome any complications.

(Cardiovasc j 2021; 14(1): 73-75)

Introduction:

Central venous catheterization (CV line) is an invasive medical procedure widely used in pediatric and adult patients not only to measure central venous pressure but also to secure a stable route for continuous drug administration. Over five million central venous catheters are placed yearly in intensive care units (ICUs) in the USA.[1–3] Insertion of a central venous catheter in a human was first reported in 1929. A technique that facilitates catheter placement into lumens and body cavities was subsequently introduced by Sven-Ivar Seldinger in 1953.[4] Insertion of a central venous catheter using the Seldinger technique revolutionized medicine by allowing safe and reliable venous access.[5] CV line can be inserted through several routes. Subclavian route is preferred for long-term venous access in non-bedridden patients (eg, ambulatory patients needing parenteral nutrition, antibiotics and chemotherapy). The most common complications include central line-associated bloodstream infections (CLABSIs), arterial puncture, hematoma, and cardiac arrhythmias.[6] However, the complications resulting from vascular puncture (soft-tissue bleeding, hematoma, hemothorax, and pneumothorax) can be more serious than at other central venous catheter (CVC) sites because the venipuncture site is shielded by the overlying clavicle and thus cannot be monitored or compressed. Sometimes very rare complications may arise in every invasive procedure. We should take proper measure to handle the complications.

Case History:

An 85 years old hypertensive, diabetic lady presented to our hospital with shortness of breath and altered level of consciousness. She was admitted in our hospital one month back with severe COVID pneumonia requiring HDU support and high flow oxygen. She was discharged from the hospital after 14 days with 94-96% oxygen

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saturation with 2 litters oxygen support. She remained relatively well at home for 10 days, but then developed progressively increasing severe shortness of breath and deteriorating consciousness along with hypotension.

This time after admission she was diagnosed as post COVID fibrosis with aspiration pneumonia. complicated with septic shock. For proper treatment a CV line was inserted through right subclavian route. After insertion forceful backflow of blood was noticed, raising suspicion of arterial insertion. It was evaluated by CXR and ABG (Fig:1,2). Chest X-ray showed usual position of CV line. But arterial blood was confirmed by ABG report. For further confirmation duplex arterial study was done, which revealed linear bright echogenic structure within the lumen of right subclavian artery with fuzzy mixed echogenic material around it indicating some thrombus around the catheter. However, flow in right upper limb arteries and veins were found normal.

This also confirmed that the catheter which was apparently in proper position, as shown by the chest X-ray was actually inside RIMA (right internal mammary artery) simulating usual expected position in right atrium through superior vena cava. We planned for removal of the catheter. The CV line was slightly pulled back from RIMA. However, as the catheter was in the arterial lumen so direct total removal of the catheter might lead to the blood leakage from a non-accessible arterial site. So, we had to think of a safe way for removal of the catheter.

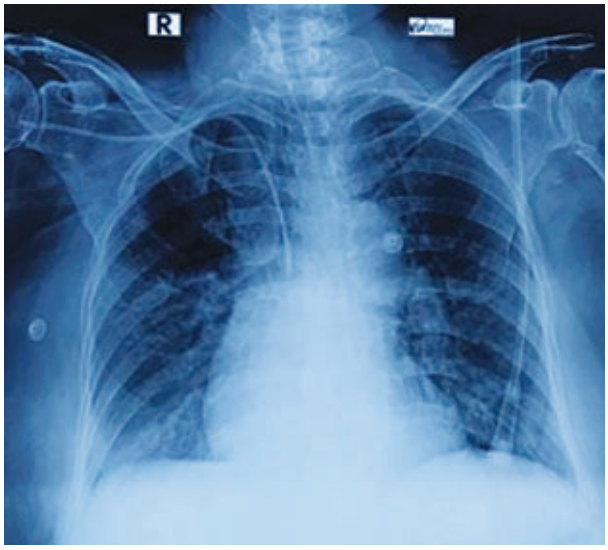

Fig.-1: *X-ray chest P/A view shows CV line in normal position.*

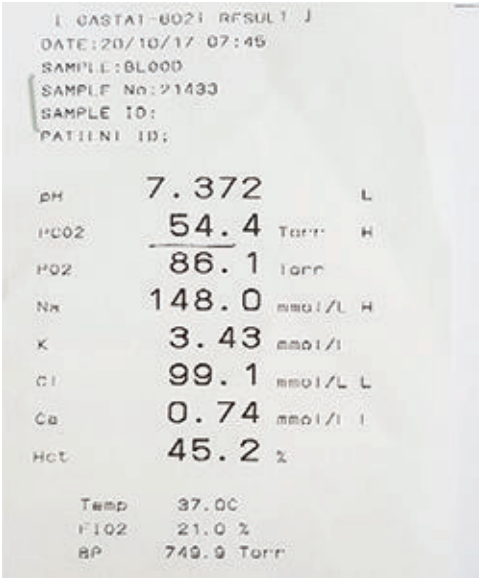

Fig.-2: *CV line blood result showed high PO2.*

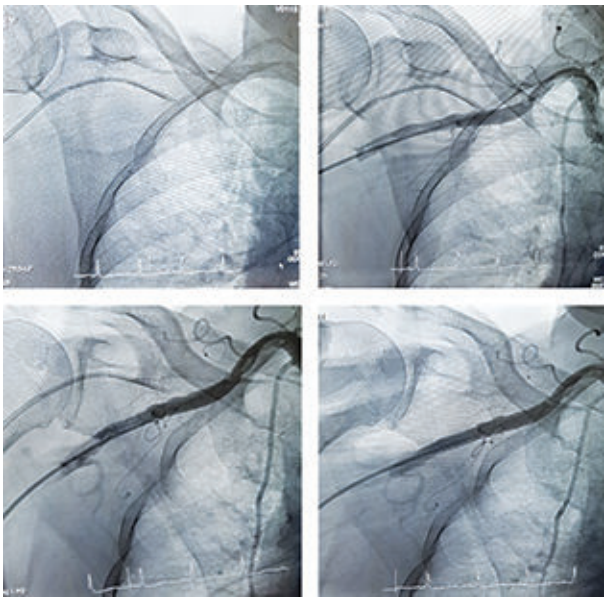

Fig.-3: *a) Position of CV line under fluoroscopy; b) After injection of dye in proximal subclavian artery, tip of CV line was close to but not inside the subclavian artery; c) After slight pull back, it was shown that tip was separated from subclavian artery; d) After removal of CV line there was no leakage from subclavian artery.*

Procedure:

According to the plan, appropriate sized balloon and covered stent was kept at hand for subclavian artery, in case of post CV line removal blood leakage. Patient was transferred to cath lab. With all aseptic precaution, puncture was done at right brachial artery (at the level of right elbow).

A short guide wire was inserted followed by a 6 Fr vascular access sheath. Then right Judkins catheter was advanced over the guide wire. It was advanced up to the proximal part of the subclavian artery. Views were taken after contrast injection. It showed that the CV line was just at contact with subclavian artery and not inside. We slowly pull back the CV line. When the CV line was away from the subclavian artery again dye was injected; which showed that there was no leakage of contrast. So we were able to safely remove the CV line without any complication.

Conclusion:

Many cardiovascular procedures are blind procedures. So, complications can arise and sometimes it can be life threatening. But with proper knowledge and planning we may overcome any complications.

Conflict of Interest: The authors declare that there is no conflict of interests regarding the publication of this paper.

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