

Case Report

Local Alveolar Hemorrhage Post Dialysis Catheter Insertion: A Case Report

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Abstract

Introduction: The Internal Jugular Vein catheter (IJV) is essential in the care of hemodialysis patients. This case presents an unusual complication of localized alveolar hemorrhage following left IJV catheterization.

Case presentation: 66 years old, lady, with multiple comorbidities presented with hemoptysis and dyspnea after insertion of left internal jugular vein catheter, found to have local alveolar hemorrhage and pneumothorax. Patient started on supportive management, improving and discharged home after 2 days.

Conclusion: Local alveolar hemorrhage, very rare but lethal complication can occur following IJV catheterization. Experienced physicians, ultrasound usage and avoidance of force during insertion can prevent this life-threatening complication.

Keywords: Alveolar hemorrhage; Central venous catheter; Internal jugular vein; Hemodialysis; Lebanon.

Introduction

The Internal Jugular Vein Catheter (IJC) plays a crucial role in the management of patients with kidney failure who necessitate Hemodialysis (HD). Internal Jugular Vein (IJV) catheterization is commonly used to obtain HD access in patients with renal failure, and it is associated with a high rate of successful catheter placement. Significant complications such as carotid artery puncture, vessel erosion, pneumothorax, airway obstruction, thrombosis, and infection can occur during this procedure. Multiple catheter placements may be required for HD patients. This, combined with their comorbid conditions, raises the likelihood of such complications [1,2]. We present a case of an HD patient who developed an unusual complication of localized alveolar hemorrhage after left IJV catheterization.

Case presentation

Case of 66 years old, female patient, smoker, known to have hypertension, old stroke without sequelae, Chronic Obstructive Pulmonary Disease (COPD), end stage renal disease recently started on hemodialysis via intermittent right internal jugular catheter, waiting right arm arteriovenous fistula presented with non-functional right catheter, admitted for replacement of the dialysis catheter. A left internal jugular dialysis catheter was inserted after multiple attempts. After 1 hour, patient started to have minimal hemoptysis, chest discomfort and dyspnea at rest with increase oxygen requirement. A Computer Tomography (CT) scan of chest was conducted, showing left minimal pneumothorax, left neck subcutaneous emphysema, and left upper lobe infiltrates suggestive of alveolar hemorrhage (Figure 1).

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A CT with intravenous contrast was performed, after 24 hours, didn't revealed any source of bleeding. A non-rebreather face mask was applied to patient delivering 15 l/min O₂, ethamsylate (Dicynone) 500 mg every 8 hours was started, intravenous broad spectrum antibiotics with steroids were given and patient was transferred to Intensive Care Unit (ICU) for close monitoring. After 2 days, patient improved and was transferred to floor without any oxygen requirement. Thereafter she was discharged home.

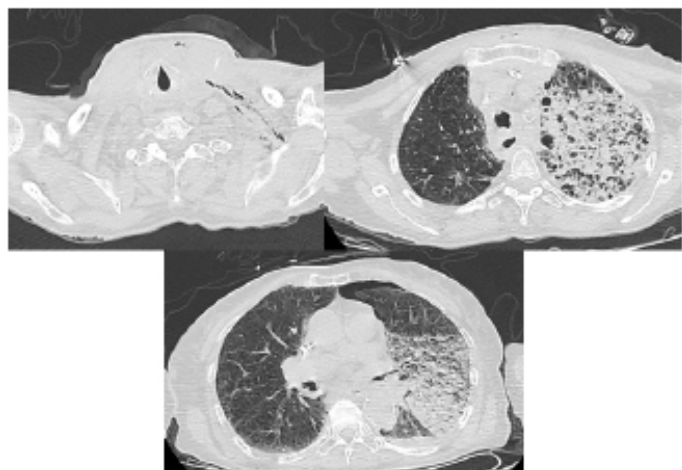


Figure 1: (A) CT chest scan showing A. left neck subcutaneous emphysema, (B) Left upper lobe infiltrates, (C) Left minimal pneumothorax.

Discussion

Each year, approximately five million Central Venous Catheters (CVCs) are implanted in the United States. Infectious complications are reported in 5% to 26% of CVC patients, thrombotic complications in 2% to 26%, and mechanical complications in 5% to 19%. The most common mechanical complications during CVC insertion are pneumothorax, hematoma, arterial puncture, and line misplacement. They are more common with less experience or after three attempts. Air embolism, arterial laceration, arrhythmia, hydrothorax, and superior vena cava perforation have all been reported as potentially fatal complications [3].

Hemoptysis is a rare complication of IJV puncture in the setting of central venous catheterization, with only a few cases reported in the literature to the best of our knowledge. It was difficult to determine the precise mechanism of lung injury in this case [4].

Friedman et al. [5] described massive hemoptysis during IJV cannulation, which was associated with airway obstruction and a cervical hematoma, but did not specify the underlying mechanism. A needle-created fistulous tract between the IJV, carotid artery, and trachea is one possible mechanism. Wiseheart et al. [6] also reported a massive hemorrhage following IJV catheterization, which eventually led to death. This was caused by a secondary hemothorax caused by tears in the mediastinal and apical pleura following an ascending cervical artery puncture.

Localized alveolar hemorrhage can occur as a result of excessive bronchial circulation bleeding, which can swiftly inundate the alveoli [3]. One possible explanation is that the guide wire becomes trapped against the vessel wall during insertion, and subsequent insertion of the dilator or catheter causes the wire

to bend and push against the vessel wall [7]. This can result in a laceration injury. A direct visualization of the guide wire using ultrasound or fluoroscopy can help to prevent atria or venous injury.

In this case, the placement of a left internal jugular vein line coincided with hemoptysis and the development of a left upper lobe infiltrate. Although significant bleeding was not visible on angiogram, we hypothesize that one or more perforations of the bronchial artery caused the alveolar hemorrhage in the left upper lobe.

Pneumothoraxes occur in about 1% of cases and are most frequently seen with subclavian vein central lines. Any injury to the parietal pleura during insertion will result in pneumomediastinum or pneumothorax formation. A greater number of attempted insertions and a larger catheter size increase the risk of pneumothorax [8].

Tsotsolis et al. [9] concluded that ultrasound guidance catheterization reduces the number of catheter placement failures, the time required for IJV insertion, and mechanical complications.

Conclusion

The sudden occurrence of severe hemoptysis and pneumothorax during the insertion of an IJV catheter emphasizes the potentially life-threatening complications in this case report. Additional precautions, such as the use of ultrasound and fluoroscopy guidance catheterization, should be taken to avoid complications. Catheter should be inserted by experienced hands, with no force applied while passing the guidewire, dilators, and catheter itself.

Declarations

Consent for publication: Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review upon request by the Editor-in-Chief of this journal.

Ethics approval and consent to participate: Ethical approval was not applicable.

Conflict of interest: The authors declare that they have no conflict of interest.

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Authors' contributions: Shereen Mollaei (SM) contributed to the diagnosis and management of the case. Zeinab El Mawla (ZM) contributed to the conceptualization and planning of the case report. ZM provided the preparation of manuscript. Both authors read and approved the final manuscript.

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