

CASE REPORT

Accidental Retention and Ultrasound-Guided Retrieval of a Fractured IV Cannula During Diagnostic Pleural Tap: A Case Report

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ABSTRACT

Background: Thoracentesis is a commonly performed diagnostic and therapeutic procedure. Although generally safe, rare complications such as retained foreign bodies may occur.

Case Presentation: We describe a case involving a 40-year-old female who presented with fever and progressive dyspnea. Imaging revealed a right-sided pleural effusion. During diagnostic pleural tap using a 16G intravenous (IV) cannula, the catheter fractured, with the proximal two-thirds retained in the chest wall. Immediate point-of-care ultrasound (POCUS) and high-resolution computed tomography (HRCT) localized the fragment. The retained segment was successfully retrieved surgically under ultrasound guidance, and the patient recovered uneventfully.

Conclusion: This report highlights the importance of vigilance during pleural procedures and emphasizes the role of multimodal imaging, particularly POCUS and HRCT, in the safe localization and retrieval of retained foreign bodies.

KEYWORDS

• Thoracentesis • Fractured IV Cannula • Pleural Effusion • Ultrasound-Guided Retrieval

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INTRODUCTION

Thoracentesis is a routinely performed procedure for both diagnostic and therapeutic management of pleural effusion. While common complications such as pneumothorax, bleeding, and infection are well-documented, fracture and retention of an intravenous (IV) cannula during thoracentesis are exceedingly rare. Retained foreign bodies in the chest wall can lead to diagnostic challenges and pose risks including migration, infection, or chronic pain. We present a case of fractured IV cannula retained during pleural tap, which was successfully localized and retrieved under ultrasound guidance.

CASE PRESENTATION

A 40-year-old female presented to the Emergency Department with fever for one

week and progressive shortness of breath for five days, progressing from mMRC grade II to grade IV. On examination, she was hemodynamically stable with a respiratory rate of 25 breaths per minute and SpO₂ of 97% on room air. Respiratory system examination revealed decreased breath sounds and stony dullness to percussion over the right hemithorax.

Routine blood investigations and fever profile were obtained. Point-of-care ultrasound (POCUS) and chest radiography demonstrated moderate right-sided pleural effusion with underlying collapse-consolidation. CT thorax confirmed these findings and excluded additional parenchymal pathology.



Figure 1: Fractured IV cannula



Figure 2: USG showing retained foreign body



Figure 3: IV catheter retrieved from chest wall



Figure 4: IV catheter retrieved from in chest wall

After informed consent, diagnostic pleural tap was attempted with a 16G IV cannula under local anesthesia. During the procedure, the IV cannula fractured; the distal one-third was removed while the proximal two-thirds remained in the chest wall. Inspection at the insertion site and plain chest Xray failed to reveal the fragment. Immediate POCUS revealed a linear well-defined echogenic structure in the subcutaneous/intramuscular plane of posterior chest wall (Figure 2). Subsequent CT imaging showed an approximately 18-mm tubular air-filled structure in the posterolateral chest wall, consistent with the retained cannula fragment.

Under ultrasound guidance, a 3 cm incision was made at the marked site. Blunt dissection was performed, and the retained fragment was palpated and retrieved successfully. The patient tolerated the procedure well and had an uneventful recovery.

DISCUSSION

Thoracentesis, while generally considered a safe and essential procedure for the management of pleural effusions, is not without risk. Complications—though infrequent—can range from minor to life-threatening. The most commonly reported adverse events include iatrogenic pneumothorax, hemothorax, chest wall haematoma, and re-expansion pulmonary oedema, the latter often resulting from excessive negative pleural pressure during rapid fluid removal.⁽¹⁾ Operator inexperience, anatomical challenges, and lack of ultrasound guidance are key contributors to procedural morbidity. Notably, recent literature emphasises the role of point-of-care ultrasound (POCUS) in minimising these risks by enhancing site selection and needle trajectory.^{1,3,4}

In this case, a peripheral IV cannula, conventionally intended for short-term intravenous therapy, was repurposed for thoracentesis—a pragmatic choice in an urgent setting to minimise lung trauma. However, such off-label use introduces mechanical vulnerabilities not typically encountered in IV therapy.

Fracture and retention of IV cannulas during pleural procedures are extremely rare. Contributing factors may include reinsertion of the introducer needle, excessive manipulation, or anatomical constraints.^{5,6} Early recognition of catheter fracture is critical to prevent serious

complications such as migration, infection, or chronic pain. In this instance, POCUS proved invaluable for localisation and guided retrieval, offering a minimally invasive alternative to blind surgical exploration.

Historical reports underscore the clinical significance of catheter fracture, with Turner and Sommers (1954) describing fatal migration of a fractured catheter.⁷ More recent literature, including reports by Arua *et al.* and Kumar *et al.*, has highlighted fracture risks associated with repeated needle reinsertion and anatomically constrained cannulas.^{5,6}

Although IV cannulas are not designed for thoracentesis, their off-label use may be unavoidable in resource-limited settings. Clinicians must remain vigilant, avoid needle reinsertion, and inspect catheter integrity after removal. This case reinforces the importance of procedural awareness, imaging guidance, and post-procedural inspection to mitigate rare but serious complications.

CONCLUSION

This case illustrates a rare iatrogenic complication of thoracentesis, highlights the importance of procedural vigilance during thoracentesis, and emphasises the role of POCUS in managing rare iatrogenic complications. POCUS-guided retrieval is a safe and effective strategy for removing foreign bodies from the chest wall.

Ethical Considerations

Written informed consent was obtained from the patient for publication of this case report and accompanying clinical images. Ethical approval was not required, as per institutional policy for single-patient case reports.

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