CASE REPORT

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latrogenic intramural esophageal hematoma during EUS-B-FNA procedure



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Abstract

Background Esophageal ultrasound with bronchoscope fine needle aspiration (EUS-B-FNA) is a valuable tool for the diagnosis and staging of lung cancer, complementing endobronchial lung ultrasound (EBUS). While generally considered safe, there is a notable lack of comprehensive knowledge within the interventional pulmonology community regarding potential complications.

Case presentation We present a case involving a 66-year-old male with squamous cell lung carcinoma undergoing mediastinal staging. A systematic mediastinal assessment through EBUS confirmed the presence of enlarged lymph nodes at 4 L with limited access to puncture. Complementary EUS-B widened the visualization and access to station 4 L and after excluding nearby vessels, a single puncture was performed. Unexpectedly, an iatrogenic esophageal hematoma was promptly noted at the puncture site. The procedure was immediately interrupted, and subsequent workup confirmed the hematoma without active bleeding. Conservative management, including upper endoscopy and clip sealing, resulted in the patient's asymptomatic recovery.

Conclusion This case underscores the importance of recognizing and managing complications associated with EUS-B-FNA, emphasizing the need for heightened awareness and education in the interventional pulmonology community. Despite being infrequently discussed in medical literature, EUS-B-FNA can give rise to both immediate and delayed complications, warranting increased vigilance during its practice.

Keywords EUS-B, EBUS, Esophageal hematoma, Lung cancer

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Background

Esophageal ultrasound with bronchoscope fine needle aspiration (EUS-B-FNA) represents a complementary tool to endobronchial lung ultrasound (EBUS) in the diagnosis and staging of lung cancer, extending the access to the inferior mediastinum and upper-abdominal structures [1, 2]. When performed by proficient and well-trained interventional pulmonologists is generally considered a safe procedure with a low rate of complications [3]. These may include bleeding, infection, perforation and pneumothorax [4]. Despite its demonstrable advantages, there exists a dearth of comprehensive knowledge within the interventional pulmonology



Fig. 1 (a) - Identification of station 4 L through EUS-B. (b) - Identification of esophageal hematoma after puncture of 4 L by EUS-B-FNA



Fig. 2 (a) - Baseline CT scan where esophageal lumen is evident. (b) – CT angiography which confirms esophageal wall thickening and luminal collapse after EUS-B-FNA relating to the presence of a hematoma

community regarding these complications as evidenced by a paucity of relevant literature.

Case presentation

We describe the case of a 66-year-old male, former smoker, with a previous medical history of dyslipidaemia and diagnosed with squamous cell lung carcinoma in the left upper lobe. The patient was referred for mediastinal staging following a Positive emission tomography Computed Tomography (PET-CT) scan that revealed positive FDG uptake (up to SUV Max 4.5) in the 4 L lymph node station (potential N2 disease). A systematic mediastinal assessment through EBUS confirmed the presence of enlarged lymph nodes at 4 L with limited access to puncture. No other lymph node stations were impaired. Complementary EUS-B widened the visualization and access to station 4 L (Fig. 1A). After excluding nearby vessels using doppler effect ultrasound guidance, a single puncture was performed (SonoTip°EBUS-Pro, 22 Gauge, Medi-Globe[®]). Unexpectedly, an iatrogenic esophageal hematoma was promptly noted at the puncture site (Fig. 1B). The procedure was immediately halted to assess the situation and ensure the patient's safety. Upon careful surveillance, the hematoma remained stable with no signs of expansion or active bleeding. A contrastenhanced CT scan of the thorax revealed an increased esophageal wall diameter (when comparing to the baseline CT scan [Fig. 2B]) but ruled out active bleeding (Fig. 2A). After discussion with Gastroenterology, it was decided to proceed with an upper endoscopy which identified an 8 mm protrusion with a blood clot and a small orifice from which blood was seeping. This orifice was meticulously sealed using two clips. The patient underwent close monitoring and management included withholding oral intake, intravenous fluids and proton pump inhibitors. He then progressed for cold diet after 24 h. A

subsequent contrast-enhanced thoracic CT scan showed no significant changes or recurrent bleeding. Throughout this period, the patient remained asymptomatic, clinically stable with no evidence of hematoma expansion or active bleeding. After 48 h of monitoring, he was discharged, and no new complications were reported on his ongoing follow-up.

Discussion and conclusions

EUS-B is a valuable tool for mediastinal assessment of lymph nodes. However, like any medical procedure, it can lead to potential complications. Considerable expertise to EUS-B-FNA stems from the field of endosonography primarily practiced by gastroenterologists. This includes proficiency in performing the procedure, anatomical structures recognition and the associated technical skills [5]. In this specific setting, it is reported to have very few complications [4, 6, 7] In what concerns EUS-B, a recently prospective study including 41 EUS-B-FNA (34 EUS-B-FNA, 7 EBUS plus EUS-B-FNA) reports only one procedure-related severe complication (mediastinitis) [8]. Though the exact incidence rate of esophageal hematomas remains to be fully clarified, it is estimated to be a rare event, mainly associated with endoscopic procedures (including EUS and EUS-B). It typically results from the induced injury of the esophageal wall and/ or nearby minor vessels. In many cases, patients have a prior history of a coagulopathy or aspirin or anticoagulant use. Patients may present with symptoms such as chest pain, dysphagia or hematemesis. Diagnosis is often made through imaging, either during EUS/EUS-B or with a contrast-enhanced CT scan which exhibits thickening of the esophageal wall with luminal collapse (more frequent in large hematomas) [9–11]. Treatment is primarily conservative. Patients are initially advised to refrain from oral intake, receive intravenous fluids and proton pump inhibitors and undergo correction of any coagulopathy. Surgical intervention is rarely needed. Monitoring through CT scans or contrast swallow should guide the gradual reintroduction of oral intake. Most patients who develop an esophageal hematoma fully recover with conservative treatment. Complete resolution typically occurs within 3 to 4 weeks. Long-term complications are uncommon [12]. However, the presence of recurrent symptoms should lead to the suspicion of hematoma rupture and leakage [13]. Patient selection and operator skills are fundamental. Swift recognition, precise diagnosis and timely intervention are essential for the successfully managing of this rare complication.

It is our hope that this case may contribute to broader awareness of EUS-B-FNA complications and how to deal with them. In this case, prompt recognition led to an immediate cessation of the procedure and the implementation of essential diagnostic and therapeutic measures. Remarkably, our patient did not report any symptoms related to the hematoma, an unusual occurrence that might be related to its small size compared to those documented in the literature.

It is noteworthy that EUS-B-FNA can give rise to both immediate and delayed complications despite being less frequently discussed in medical literature (possibly due to underreporting). To reduce the risk of this complication, as in this case, we recommend using Doppler imaging for vascular anatomy assessment. Although it occurred in this case, the probability of involving a larger-caliber vessel remains markedly low. Hence, awareness to this type of complications is pivotal in educating the interventional pulmonology community to its immediate recognition and timely intervention to prevent further damage and achieve positive clinical outcomes. It is our hope that this report encourages the documentation of more significant complications associated with this technique, enabling the development of robust, evidence-based guidelines for its application and for minimizing associated risks.

Abbreviations

EUS-B-FNA	Esophageal ultrasound with bronchoscope fine needle
	aspiration
EBUS	Endobronchial lung ultrasound
CT	Computed tomography
PET	Positive emission tomography

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Not applicable.

Author contributions

JOR primarily drafted the manuscript. PM was a major contributor in writing and reviewing the manuscript. LVR was a major contributor in writing and reviewing the manuscript. MdS was a major contributor in writing and reviewing the manuscript. LB was a major contributor in writing and reviewing the manuscript. All authors read and approved the final manuscript.

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Data availability

All data generated or analysed during this study are included in this published article.

Declarations

Ethics approval and consent to participate

Written informed consent was obtained from the patient. Ethics approval is not applicable to case reports.

Consent for publication

A written and verbal informed consent was obtained from the patient for publication of this case report and accompanying images.

Competing interests

The authors declare that they have no competing interests.

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