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Novel Insights from Clinical Practice

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Aspiration of Pericardial Effusion Performed with EUS-B-FNA in Suspected Lung Cancer

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Established Facts

- Ultrasound-guided needle aspiration via the esophagus using the endobronchial endoscope (EUS-B-FNA) in the hands of the respiratory physician is a relatively new technique for establishing lung cancer diagnosis, but with expanding utility.
- The pulmonologist has limited experience in the technique, especially for disease staging.

Novel Insights

- EUS-B-FNA may be useful for the aspiration of malignant pericardial effusion (M1a-disease) and may therefore save time in the diagnostic workup, improve staging, and prevent transthoracic pericardiocentesis.

Keywords
Pericardiocentesis · EUS-B-FNA · Lung cancer · Endoscopy

Abstract
Ultrasound-guided needle aspiration via the esophagus using the endobronchial endoscope (EUS-B-FNA) is increasingly being performed by the pulmonologist for the diagnosis of lung cancer, but we have little experience and data available in the literature especially with respect to staging of the disease. We present 2 cases of EUS-B-guided aspiration of malignant pericardial effusion performed in the same setting as bronchoscopy and endobronchial ultrasound. No complications were observed. We conclude that EUS-B-FNA may be safe and efficacious in the evaluation of pericardial effusion during lung cancer workup. Thus, EUS-B-FNA may save time in the diagnostic workup, improve cancer staging, and prevent transthoracic pericardiocentesis.

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Introduction

Ultrasound-guided fine-needle aspiration via the esophagus using the endobronchial endoscope (EUS-B-FNA) is increasingly being performed by the pulmonologist as an integrated procedure in the workup of suspected thoracic malignancies [1, 2]. Several structures both inside and outside the thoracic region, such as retroperitoneal lymph nodes, liver, ascites fluid, left adrenal gland, and pleural thickening, have been reported to be accessible by EUS-B-FNA [3–6]. In this report, we present 2 cases of aspiration of pericardial fluid with EUS-B-FNA in patients with suspected malignant pericardial effusion. This has never been presented before.

Case Report

Case 1

A 57-year old male with a history of cigarette smoking was admitted since computer tomography (CT) was suspicious of a left-sided centrally located lung cancer with enlarged mediastinal lymph nodes and a pericardial effusion (Fig. 1). Bronchoscopy, endobronchial ultrasound (EBUS), and EUS-B were performed in that order under conscious sedation. The normal routine of moving from M1a to N3-N2-N1-tumor order was applied in the procedure. Systematic bronchoscopy was normal, and at EBUS, enlarged lymph node stations 7 and 10 L were biopsied. In order to perform a staging procedure as accurately as possible, the pericardial effusion was aspirated with EUS-B-FNA. A new 22G needle was introduced into the fluid through the esophageal wall and 50 mL of hemorrhagic fluid was aspired. No suspicious lesions in the liver or left adrenal gland were seen. The patient was monitored

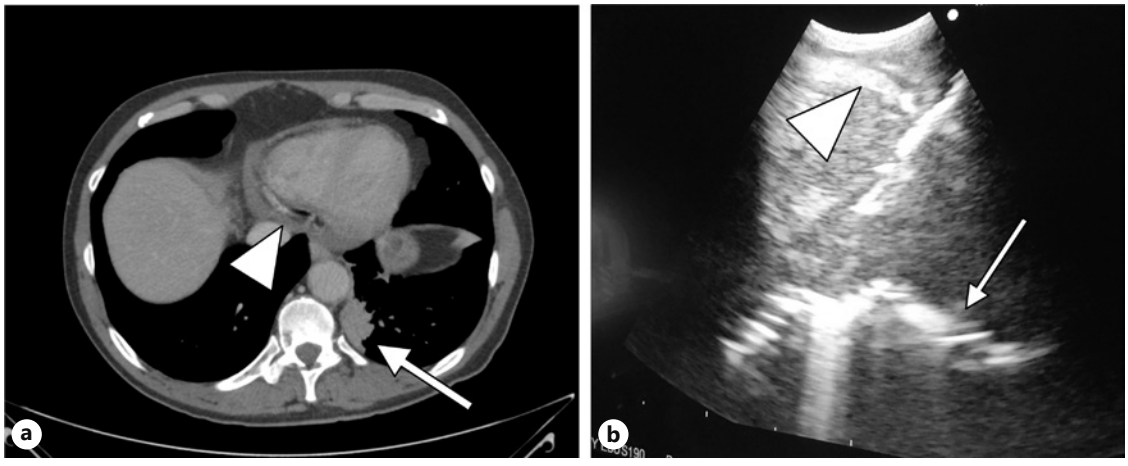

Fig. 1. a CT scan with pericardial effusion. The arrow shows suspicious lesion in the left lower lobe. The arrowhead shows fluid in the posterior pericardium. **b** EUS-B picture of the needle in the pericardial effusion. The arrowhead shows the pericardium, and the arrow shows the myocardium.

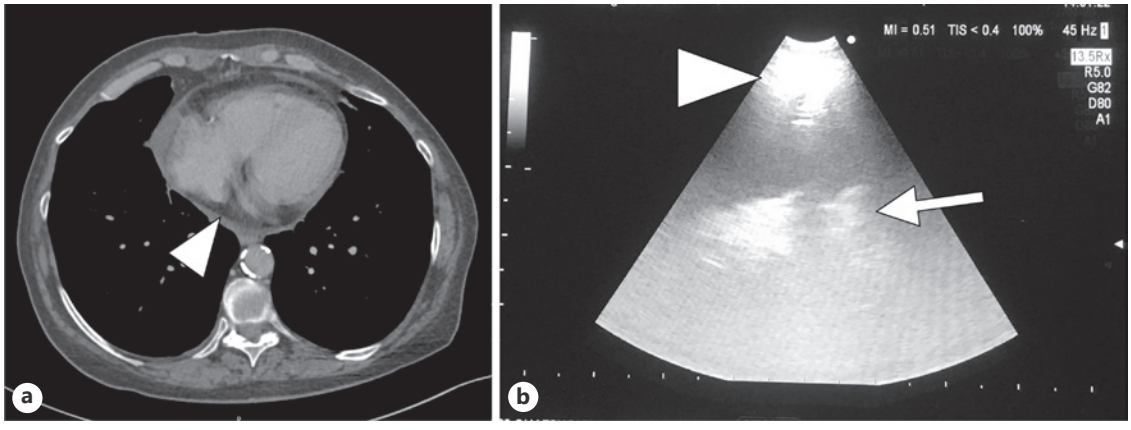

Fig. 2. a CT scan with pericardial effusion. The arrowhead shows fluid in the posterior pericardium. **b** EUS-B picture of the needle in the pericardial effusion. The arrowhead shows the pericardium, and the arrow shows the myocardium.

with a 3-lead electrocardiogram, oxygen saturation, and blood pressure during and after the procedure for 1 h. No complications were observed. The pericardial fluid contained metastatic adenocarcinoma cells of pulmonary origin. Similar cells were found in lymph node stations 7 and 10 L. The final diagnosis was non-small-cell lung cancer stage IV with biopsy proven M1a disease (pericardial fluid).

Case 2

A 63-year-old female with a history of cigarette smoking was admitted because of a CT scan with a suspicious lesion in the right upper lobe with growth in the mediastinum, affection of the vena cava, and suspected pericardial effusion. Bronchoscopy, EBUS, and EUS-B were performed in that order under conscious sedation. Systematic bronchoscopy showed a tumor in the right main bronchus <2 cm from the carina. At EBUS, enlarged lymph node station 7 was biopsied, and at EUS-B, 40 mL of translucent pericardial effusion was aspirated using a new 22G needle (Fig. 2). The patient was observed with 3-lead electrocardiogram monitoring, oxygen saturation, and blood pressure during and after the procedure for 1 h. The biopsies from the central lung tumor contained tumor cells from small-cell lung cancer, and the pericardial fluid contained similar cells. The pericardial sampling upstaged the patient to M1a, thus the final diagnosis was small-cell lung cancer stage IV with biopsy-proven M1a disease (pericardial fluid).

Discussion

Diagnostic aspiration of pericardial effusions is traditionally guided by transthoracic ultrasound. Though the potential complications can be serious, the procedure is considered to be safe, and an overall complication rate of 4.7% has been reported with minor complications without need of intervention making up 3.5% and major complications 1.2% [7]. Currently, no guidelines exist on administering prophylactic antibiotics during or after pericardiocentesis, EUS or EUS-B, except for EUS-FNA from cystic lesions [1]. No antibiotics were given in the case series.

Diagnostic pericardial effusion aspiration with the EBUS-guided transbronchial needle aspiration (EBUS-TBNA) has been reported in a case series of ten patients [8].

In 1 case, a malignant pericardial mass and effusion was aspired and diagnosed by EUS-FNA [9], and in 1 case, therapeutic centesis was performed with EUS-FNA [10]. No pericardial infections were observed in these cases. We conclude that pericardial effusion can be aspirated safely with EUS-B-FNA and may provide proof for pericardial malignancy and thus M1a disease in lung cancer.

Since the combination of EBUS-TBNA and EUS-B-FNA in combination is recommended for the diagnosis and staging of lung cancer [1], we recommend performing EUS-B guided aspiration of pericardial effusion in the same setting if indicated. This may save time and spare the patient from a superfluous percutaneous aspiration.

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Statement of Ethics

Written informed consent was obtained from the patients.

Disclosure Statement

The authors have no conflicts of interest to declare.

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Author Contributions

All authors contributed to the manuscript writing and approved the submission of the final manuscript. I.S.C., P.F.C., and U.B. stood for drafting. All authors undertook critical revision. Correspondence should be addressed to J.K.P. All authors read and approved the final manuscript.

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