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Aspiration of pericardial effusion performed with EUS-B-FNA in suspected lung cancer.

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Short Title: Diagnostic pericardiocentesis via EUS-B-FNA

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Keywords: Pericardiocentesis, EUS-B-FNA, lung cancer, endoscopy.

Established Facts
- EUS-B-FNA in the hands of the respiratory physician is a relatively new technique with expanding utility in lung cancer diagnosis and staging.
- EUS-B-FNA is a viable option for diagnosing malignant pericardial effusion.

Novel Insights
- EUS-B-FNA may be useful for aspiration of malignant pericardial effusion (M1a-disease) and may therefore save time in the diagnostic workup, improve staging and prevent transthoracic pericardiocentesis.
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 two cases of EUS-B guided aspiration of malignant pericardial effusion performed in the same setting as bronchoscopy and EBUS. 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 both save time in the diagnostic workup, improve cancer staging and prevent transthoracic pericardiocentesis.

Background
Ultrasound-guided 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 work up 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 (3,4,5,6). In this report, we present two cases of aspiration of pericardial fluid with EUS-B-FNA in patients with suspected malignant pericardial effusion. This has never been presented before.

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 (Figure 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 10L 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 haemorrhagic fluid was aspirated. No
suspicious lesions in liver or left adrenal gland were seen. The patient was monitored with a 6-
3-lead ECG, oxygen saturation and blood pressure during and after the procedure for one
hour. No complications were observed. The pericardial fluid contained metastatic
adenocarcinoma cells of pulmonary origin. Similar cells were found in lymph node station 7
and 10L. The final diagnosis was non-small cell lung cancer stage IV with biopsy proven M1a
disease (pericardial fluid).

Case 2
A 63-year-old woman 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
vena cava and suspected pericardial effusion. In the following order: bronchoscopy, EBUS and
EUS-B were performed under conscious sedation systematic bronchoscopy showed tumour in
the right main bronchus less than 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 22 G needle (Figure 2). The patient was observed with 3-lead ECG monitoring, oxygen
saturation and blood pressure during and after the procedure for one hour. The biopsies from
the central lung tumour contained tumour 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 trans-thoracic
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 made 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 endobronchial ultrasound guided needle
aspiration (EBUS-TBNA) has been reported in a case series of ten patients (8).
In one case, a malignant pericardial mass and effusion was aspirated and diagnosed by endoscopic ultrasound guided fine needle aspiration (EUS-FNA) (9), and in one 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.

Educational learning point: 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. IC, PC and UB stood for drafting. All authors undertook critical revision. Correspondence should be addressed to JKP. All authors read and approved the final manuscript.
Figure legends:

Figure 1
A: CT-scan with pericardial effusion. Arrow shows suspicious lesion in the left lower lobe. Arrowhead shows fluid in the posterior pericardium.
B: EUS-B picture of needle in the pericardial effusion. Arrowhead shows pericardium, arrow shows myocardium.

Figure 2
A: CT-scan with pericardial effusion. Arrowhead shows fluid in the posterior pericardium.
B: EUS-B picture of needle in the pericardial effusion. Arrowhead shows pericardium, arrow shows myocardium.
References


