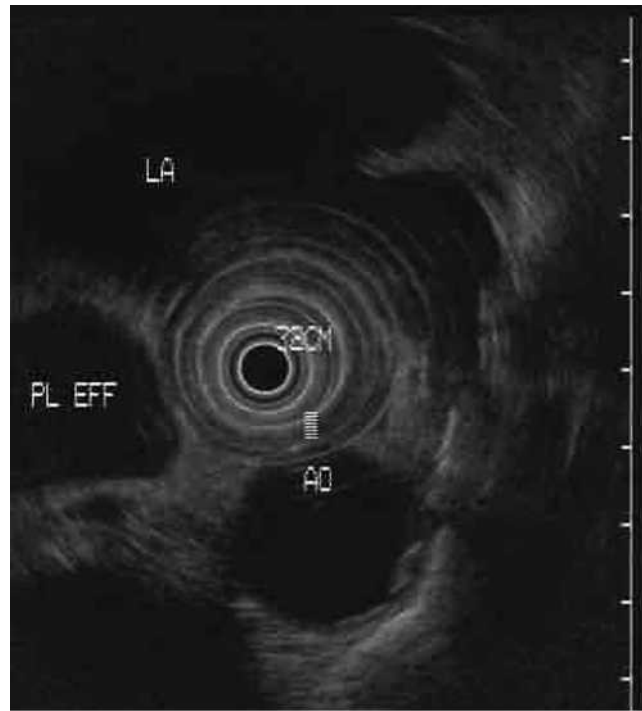


## Endoscopic ultrasound-guided transesophageal thoracentesis

In a retrospective, single-center study, we identified nine consecutive patients (six male; median age 66 years; range 55–79 years) who, between January 2003 and April 2007, underwent attempted endoscopic ultrasound (EUS)-guided thoracentesis into the right (n=7) or left (n=2) pleural space. In all patients a diagnosis of cancer was made either prior to (n=6) or by (n=3) EUS. Thoracentesis was not the primary indication for EUS in any patient. Right-sided thoracentesis was performed when possible due to the dependent position of the pleural fluid relative to the right esophageal wall in the left lateral decubitus position. Prior to aspiration, no additional maneuvers (i.e. patient breath hold) were performed. Thoracentesis was successful in all patients, and a median of 12 mL (range 2.5–36 mL) was aspirated without complications. Pleural fluid cytology was positive for malignancy in two patients (22%): adenocarcinoma of unknown primary (n=1) and metastatic ovarian adenocarcinoma (n=1). In both cases, EUS-guided thoracentesis provided the initial diagnosis of a malignant effusion (• Fig. 1–4). Pleural fluid cytology in each of the remaining seven was benign. Following EUS, all patients were given one dose of an intravenous antibiotic (ampicillin/sulbactam or ciprofloxacin), and a prescription for an additional 3–5 days of oral antibiotic treatment (amoxicillin/clavulanic acid or ciprofloxacin). Follow-up chest radiographic imaging (median 3 months; range 1–18 months) in the seven with benign cytology showed complete or near complete resolution of all effusions.

Traditional thoracentesis using a percutaneous posterior approach without image guidance may be associated with pneumothoraces in approximately 10% of patients [1]. With sonographic guidance, the rate of pneumothorax following diagnostic percutaneous thoracentesis remains 2.5%–5.5% [2,3]. There are limited data on the utility of EUS-guided thoracentesis [4,5]. Our series shows that EUS-guided thoracentesis is technically feasible and safe, and may provide the initial diagnosis of a malignant pleural effusion



**Fig. 1** Radial endoscopic ultrasound image (7.5 MHz) of a right pleural effusion (PL EFF). LA, left atrium; AO, aorta.



**Fig. 2** Linear endoscopic ultrasound image (6 MHz) of the same patient showing the pleural effusion (PL EFF) between the esophageal wall and the right lung. The pleura is demonstrated as the hyperechoic line between the pleural fluid and the lung.

in a subset of patients with previously known or suspected cancer (• Video 1).

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### Video 1

A 66-year-old female with a history of ovarian cancer and a new left pleural effusion underwent endoscopic ultrasound-guided thoracentesis for drainage of symptomatic retroperitoneal cyst causing early satiety. Cytology from both the pleural fluid and cyst cavity demonstrated metastatic adenocarcinoma.



**Fig. 3** Endoscopic ultrasound-guided fine needle aspiration of the pleural effusion. The tip of the needle is seen within the pleural cavity.

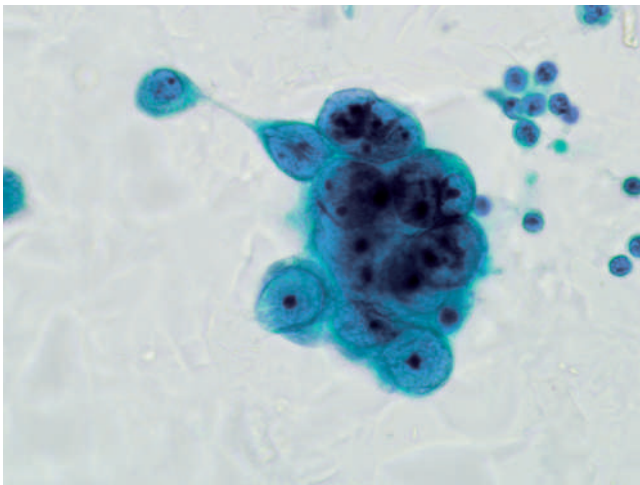
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**Fig. 4** Cohesive group of pleomorphic cells with large, eccentric nuclei and centrally located nucleoli consistent with adenocarcinoma (Papanicolaou stain; × 100).

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