

The Sound of the Parasite

Diagnosing Mediastinal Cysts with Endoscopic Ultrasound Techniques

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The management of patients with intrathoracic cystic structures is a challenge to pulmonologists. In adults, these symptomless structures are often discovered coincidentally on radiographs. However, an exact diagnosis is needed in view of the differential diagnoses including malignant mediastinal tumours. The main tool for imaging these structures is the CT scan, although MRI is sometimes advocated. However, these techniques do not always provide the clinician with an unequivocal diagnosis. Hence, patients are often referred to a surgeon for resection.

Oesophageal endoscopic ultrasound (EUS) with a curved linear ultrasound probe is a fairly new diagnostic technique in pulmonary medicine for the investigation of the middle and posterior mediastinum. This outpatient technique allows 'real time' fine needle aspirations and is increasingly used for the diagnosis and staging of lung cancer. It significantly decreases the number of mediastinoscopies and is thus cost effective [1, 2]. We show that EUS is a valuable technique for the investigation of mediastinal cystic structures, influencing clinical decisions.

A 38-year-old Turk presented with mild thoracic pain. Three years ago, he underwent surgery for a mediastinal cyst. The diagnosis of echinococcosis was made on the resected specimen and positive serum antigens. On physical examination, no abnormalities were detected. A laboratory analysis including liver function tests and C reactive protein was normal. A contrast CT scan showed a mediastinal mass compatible with a para-atrial cyst (fig. 1A) that could be approached closely with a curved linear oesophageal ultrasound probe. EUS showed a 50-mm cystic lesion reaching from the subcarinal to the retrocardial region (fig. 1B). The cyst could be deformed with the ultrasound probe and a distal reinforcement of the echo-signal was observed. The cyst wall was hyperechogenic, irregular and showed the presence of different membranes. A heterogeneous content with membranes and daughter cysts (arrows in fig. 1B) were pathognomonic for echinococcosis. Fine needle aspiration was not performed. The CT scan excluded

hepatic or cerebral involvement. Because the patient had a thoracotomy before, and thus anticipating difficult surgery, we treated him with albendazole. This resulted in a radiographic reduction in the size of the cyst after 2 and 4 months, and a stabilization after 6 months whereafter the patient was referred for resection. The intact cyst was sent for pathological examination (fig. 1C). It was filled with a clear fluid and its inner wall was covered with a white folded membrane. Microscopy showed that the outer part of the cyst wall or pericyst (fig. 1D) consisted of a dense eosinophilic infiltrate covering an acellular fibrinous exudate. This pericyst represents the inflammatory reaction of the host. The inner part of the cyst wall (fig. 1E) consisted of an exocyst (parasite-derived laminated membrane) and an endocyst (germinal layer), the latter barely detectable. The cyst lumen contained numerous scolices.

This is the first time a mediastinal echinococcosis was diagnosed by EUS, an elegant tool to investigate endothoracic cystic structures [3] which are hypoechogenic lesions that can be deformed by the ultrasound probe. The distal reinforcement of the ultrasound signal beyond the cyst is the hallmark of its fluid content. In this case, the laminated hyperechogenic cyst wall and the presence of daughter cysts were the pathognomonic characteristics, not observed on the CT scan. Echinococcosis is caused by tapeworm infections (*Echinococcus granulosus*) and results in cyst formation mainly in the liver (70% of the cases) but also in the thorax, bone, spleen and brain. For the liver, there are a few cases indicating the high diagnostic value of abdominal ultrasonography [4]. Because of the risk of infection and parasite spreading, puncture of mediastinal cystic structures is not recommended [3, 5]. Patients with mediastinal cystic masses are often referred for surgery [6]. However, in case of parasitic disease, this includes the danger of parasitic spread in the thorax. Our findings with EUS prompted us to treat the patient first with albendazole in order to facilitate the surgical procedure.

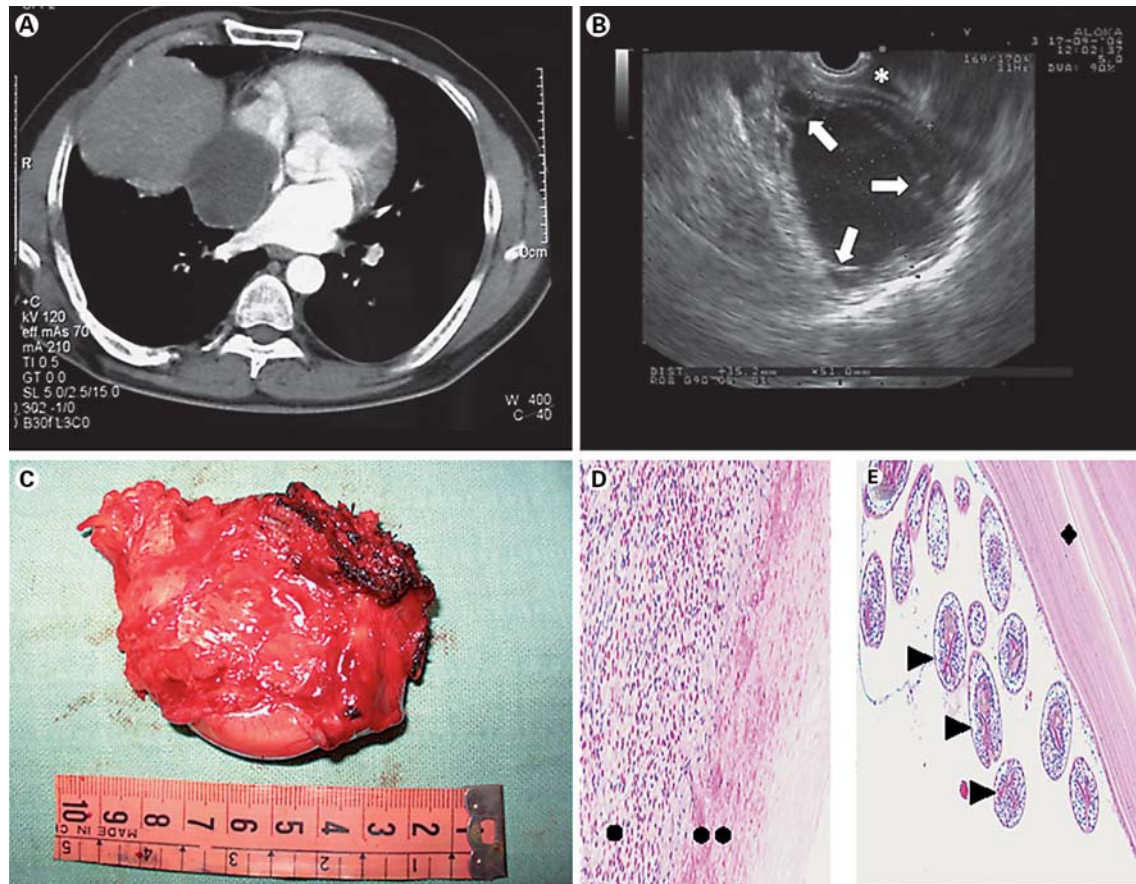


Fig. 1. **A** CT scan of the chest showing the sharply marginated spherical paramediastinal mass, compatible with a right-sided para-atrial cystic lesion. The diameter measured 55 mm. The wall was thin, regular and took up the contrast (80 Hounsfield units) while the centre of the cystic structure had a density of only 8 Hounsfield units, compatible with a liquid content. **B** Oesophageal endoscopic ultrasound with a curved linear probe shows details of this cystic structure that are pathognomonic for mediastinal echinococcosis. The arrows indicate the multiple daughter cysts. The cyst wall is multilayered while the retrocystic reinforcement of the ultrasound signal is clearly visible. The asterisk (*) indicates the position of the left atrium. **C** Resection specimen.

A well-circumscribed, intact cystic lesion measuring 76 mm in diameter was resected. Upon opening of the cyst, a clear fluid was evacuated. The inner wall of the cyst was covered by a smooth, irregular, folded, whitish membrane which easily loosened from the wall. The global thickness of the wall measured 7 mm. **D** Histopathology of the pericyst. The outer wall of the cyst represents the host's reaction and consists of a dense eosinophilic infiltrate (●), covering a pink, acellular fibrinous exudate (●●). HE. ×400. **E** Histopathology of the parasite-derived exocyst and endocyst. A laminated membrane (◆) is lined by a barely detectable germinal layer and on this picture, 14 intraluminal scolices (▶) are shown. HE. ×640.

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