A large mediastinal teratoma presenting with acute abdomen
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Clinical History:
The patient presented with acute onset right-sided pleuritic chest pain with mild shortness of breath and abdominal pain. On examination the patient had decreased breath sounds on the right side and signs of peritoneal irritation. He is smoker and his medical history is clear. There has not been any loss of appetite or weight.

Imaging Findings:
Initially a workup of coronary syndrome was applied without significant results. Subsequently owing to the patient's history an initial chest radiograph was obtained showing loss of silhouette sign that gave impression of a possible radiopaque mass on the right side. For investigating a possible extra-cardiac pathology a computed tomography (CT) scan of the chest was obtained. CT scan showed a large well-differentiated process measuring 14 x 11 x 11 cm in the right hemithorax along the mediastinum with compression and displacement of the heart to the left side. The process is inhomogeneous and contains liquid, fatty and solid areas including small calcification (Fig. 2). The patient's abdominal pain and the present CT appearance raise suspicion of Morgagni hernia with complications, and a diagnostic laparoscopy was applied revealing no abdominal pathology. Eventually the mass was removed by lateral thoracotomy. Discovery of tallow and discreet exudate in pleura during surgery led to suspicion of teratoma rupture as a likely cause of acute chest pain.

Discussion:
BACKGROUND
About 15% of primary mediastinal masses originate from germinal tissue. Mature teratomas are slow-growing benign congenital tumours that should be kept in mind when evaluating an anterior mediastinal mass [1, 2].

CLINICAL PERSPECTIVE
Mature mediastinal teratomas are usually diagnosed in adolescence or early adulthood at the average age of 27 [3]. They grow slowly and are asymptomatic in most cases, until the tumour compresses nearby structures. Individuals may present with chest pain, dyspnea, cough, back or shoulder pain as well as atrial fibrillation or symptoms of pulmonary stenosis [3, 4, 5].

IMAGING PERSPECTIVE

The routine chest radiograph is valuable to diagnose mature teratomas. These tumours may appear as either well-circumscribed or more lobulated depending if they are cystic or solid [2]. A large mediastinal teratoma adjacent to diaphragm can resemble Morgagni hernia at first sight, but a defect in the diaphragmatic wall must be shown with an accurate imaging modality [6]. Calcifications, bone or teeth-like structures or soft tissue may be seen in CT imaging [1, 2]. Magnetic resonance imaging (MRI) can be beneficial in case of unclear diagnosis or need for more details about the relations of the mass to other mediastinal structures [1, 5]. Some mediastinal teratomas close to the heart may also be detected by a cardiologist via echocardiography [5]. A bronchoscopic examination may be performed for obtaining a tissue sample. If the teratoma is ruptured or invades the bronchial tree, hair-like material may be visualised in this examination [7].

OUTCOME

CT is accepted to be the radiographic modality of choice to evaluate a mature mediastinal teratoma. It can visualise the three-dimensional anatomy of the tumour and its relation to the adjacent mediastinal organs. In this way it will also provide valuable information during the planning process of surgical resection [1, 2]. The recommended treatment for mature teratomas is a complete surgical resection for both diagnosis and prevention of complications in the future [1, 7].

TEACHING POINTS

Mature teratomas are rarely seen, yet should be taken into account as a differential diagnosis when evaluating a mediastinal mass.

Although the routine chest radiograph is an important diagnostic tool, it may show nonspecific findings as in our case.

When a mediastinal mass is initially evaluated by a clinician, its inhomogeneous appearance can be confused with a Morgagni hernia. In this point determination of existence or absence of an intact diaphragm by CT scan may be helpful to confirm the diagnosis.

Written informed patient consent for publication has been obtained.

Differential Diagnosis List: Mature teratoma with assumed origin from thymus, Thymoma, Lymphoma, Neurogenic tumour, Carcinoma, Parathyroid adenoma, Lymphangioma, Aortic aneurysm, Intrathoracic goitre, Morgagni hernia (for our case)

Final Diagnosis: Mature teratoma with assumed origin from thymus

References:


Mediastinal teratoma with pulmonary involvement presenting as massive hemoptysis in 2 patients (2010) Mediastinal teratoma with pulmonary involvement presenting as massive hemoptysis in 2 patients. Respir Care 1094-6 (PMID: 20667158)
Description: There is a filling appearance at the right heart, which can also raise suspicion of enlarged heart. Loss of silhouette sign gives the impression of a possible radiopaque mass on the right side of the heart. Origin: Gül G, Department of radiology, Hvidovre Hospital, Copenhagen, Denmark
Description: A chest plain film was also obtained on suspicion of pneumothorax because of the patient's age and symptoms. However, no pneumothorax was seen. Origin: Gül G, Department of radiology, Hvidovre Hospital, Copenhagen, Denmark.
Description: The process is inhomogeneous and contains large amounts of liquid fatty areas and solid areas including small calcifications. Origin: Gül G, Department of radiology, Hvidovre Hospital, Copenhagen, Denmark.
**Description:** Computed tomography (CT) of the chest showed a large well-differentiated process with compression and displacement of the heart to the left side. **Origin:** Gül G, Department of radiology, Hvidovre Hospital, Copenhagen, Denmark.
Description: A large well-differentiated process measuring 14x11x11 cm in the right hemithorax along the mediastinum with compression and displacement of the heart to the left side. Origin: Gül G, Department of radiology, Hvidovre Hospital, Copenhagen, Denmark.
Description: There was also discreet pleural effusion and a little lower lob compression atelectasis posteriorly on the right side. Origin: Gül G, Department of radiology, Hvidovre Hospital, Copenhagen, Denmark.