Empyema necessitans, a complication of tuberculosis
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Section: Chest imaging
Area of Interest: Lung
Procedure: Diagnostic procedure
Imaging Technique: CT
Imaging Technique: Ultrasound
Special Focus: Infection Abscess Case Type: Clinical Cases
Authors: Ressurreição J, Soares JT, Madaleno P, Portugal P
Patient: 78 years, male

Clinical History:

77-year-old male Caucasian patient was admitted with left-sided chest mass, first noticed 15 days before admission. At physical examination a non-tender tumefaction on the mid-axillary line of left chest wall was perceived. There was no fever, chills or cough. The patient had a clinical history of pulmonary tuberculosis 50 years before.

Imaging Findings:

Chest radiography demonstrated a loculated left pleural effusion with associated soft-tissue opacity in the left chest wall (Fig. 1). An abdominal ultrasound (US) was performed in order to better characterize the radiographic findings, showing a subcutaneous fluid collection with fine internal debris, measuring 5 x 3 x 7 cm, that communicated with the pleural cavity through a well-defined tract (Fig. 2 a, b). Imaging findings were further investigated with contrast-enhanced computed tomography (CT) imaging. CT revealed a loculated left pleural effusion with thickened, contrast-enhanced and partially calcified pleural surfaces that communicated with an organized, subcutaneous chest-wall fluid collection (Figures 3a-i).

Both the subcutaneous collection and the pleural effusion were drained and the fluid samples from both cavities were analyzed: they were positive for acid fast bacilli and cultures confirmed the presence of Mycobacterium tuberculosis.

Anti-bacillary treatment was initiated and the patient was discharged totally asymptomatic. Consultation with the thoracic surgeon was scheduled.

Discussion:

Empyema necessitans (or empyema necessitatis) is a complication of pulmonary infection, most frequently secondary to Mycobacterium tuberculosis infection reactivation, although it can also occur with actinomycosis and pyogenic bacterial infection [1, 2]. It represents extension of pus from the pleural cavity to the chest wall (most frequently), but also to the bronchi, oesophagus, breasts or retroperitoneum [3, 4]. The patients generally present with an enlarging, occasionally painful, erythematous chest wall mass, most frequently affecting the second through sixth intercostals spaces [5]. Associated respiratory symptoms such as cough or dyspnoea and pleuritic-type chest pain also occur.

While chest radiography can suggest the diagnosis, demonstrating a loculated pleural effusion in a patient with past
history of pulmonary tuberculosis presenting with an anterior chest wall mass, the definitive imaging findings are usually seen with CT. Contrast-enhanced CT clearly demonstrates the existence of a communication between the empyema (i.e.: a loculated pleural effusion with thickened and enhancing pleural surfaces) and a well-deliniated chest wall fluid collection with thickened and enhancing walls, representing an abscess [6].

US and CT can also aid in the therapeutic process, guiding the thoracostomy necessary to drain the pleural cavity. Generally there is a good response to tube-thoracostomy and parenteral antibiotic therapy but, in some cases, there is necessity to perform a thoracotomy and pleural decortication to definitely solve the problem [4].

Tuberculous empyema necessitans has a good clinical outcome when managed accurately and promptly, with an associated mortality rate less than 5% [7]. Accurate diagnosis based on imaging evaluation and adequate antibiotic therapy are crucial for management of this disease.

**Differential Diagnosis List:** Empyema necessitans as manifestation of tuberculosis, Actynomycosis, Mesothelioma

**Final Diagnosis:** Empyema necessitans as manifestation of tuberculosis

**References:**


Description: Chest radiograph (PA) demonstrates loculated left pleural effusion. Origin: Ressurreição, J, Department of Radiology, Centro Hospitalar de Vila Nova de Gaia, Vila Nova de Gaia, Portugal
Description: Ultrasound image demonstrates a large subcutaneous collection with fine internal debris.

Origin: Ressurreição, J, Department of Radiology, Centro Hospitalar de Vila Nova de Gaia, Vila Nova de Gaia, Portugal
Description: Ultrasound image reveals communication between large subcutaneous collection and pleural effusion. Origin: Ressurreição, J, Department of Radiology, Centro Hospitalar de Vila Nova de Gaia, Vila Nova de Gaia, Portugal
Description: Contrast-enhanced chest CT axial image reveals a loculated pleural effusion with thick, enhancing and focally calcified pleural surfaces, suggestive of an empyema. Origin: Ressurreição, J, Department of Radiology, Centro Hospitalar de Vila Nova de Gaia, Vila Nova de Gaia, Portugal
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Description: Contrast-enhanced CT axial image reveals communication between the empyema and a lateral chest wall inflammatory fluid collection consistent with presence of "empyema necessitans".

Origin: Ressurreição, J, Department of Radiology, Centro Hospitalar de Vila Nova de Gaia, Vila Nova de Gaia, Portugal
Description: Contrast-enhanced CT axial image reveals communication between the empyema and a lateral chest wall inflammatory fluid collection consistent with presence of "empyema necessitans".

Origin: Ressurreição, J, Department of Radiology, Centro Hospitalar de Vila Nova de Gaia, Vila Nova de Gaia, Portugal
Description: Contrast-enhanced CT axial image reveals communication between the empyema and a lateral chest wall inflammatory fluid collection consistent with presence of "empyema necessitans".

Origin: Ressurreição, J, Department of Radiology, Centro Hospitalar de Vila Nova de Gaia, Vila Nova de Gaia, Portugal
Description: Contrast-enhanced CT axial image reveals communication between the empyema and a lateral chest wall inflammatory fluid collection consistent with presence of "empyema necessitans".

Origin: Ressurreição, J, Department of Radiology, Centro Hospitalar de Vila Nova de Gaia, Vila Nova de Gaia, Portugal
Description: Contrast-enhanced CT coronal reconstruction image reveals intimate contact between the empyema and a lateral chest wall inflammatory fluid collection. Origin: Ressurreição, J, Department of Radiology, Centro Hospitalar de Vila Nova de Gaia, Vila Nova de Gaia, Portugal