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Tuberculous Abscess of The Chest Wall: About Two Cases. Report with Review of the Literature

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Abstract: *Tuberculous abscesses of the chest wall are a rare pathological situation, occurring mainly in endemic countries. Imaging, based essentially on CT scans, enables a diagnostic approach and, above all, distinguishes it from other differential diagnoses, such as pyogenic abscess and parietal tumors. The rarity of this tuberculous localization has led us to present two cases whose diagnosis was made on imaging and confirmed by anatomopathological study, with a good evolution after treatment.*

Introduction:

Tuberculosis (TB) is a public health problem in developing countries.

One to three percent of patients with tuberculosis (TB) will develop musculoskeletal TB, of which 1% to 5% are cases of chest wall TB (1). The unique location of the thoracic wall poses a diagnostic challenge, especially in the case of actinomycetes infections, pyogenic wall infections, and chest wall malignancies.

It diagnosis is often difficult and is based on radiological findings and histopathological analysis of tissues with specific cultures for mycobacteria.

Here, we describe two cases of anterior chest wall tuberculous abscesses and review the literature regarding imaging used to diagnose this disease.

Keywords:

Tuberculosis, thoracic wall, abscess, imaging.

Case presentation 1:

A 78 years old female patient, with diabetes and blood hypertension presented with 6 months of fatigue, night sweats, fever and weight loss. She had received empiric antibiotics (amoxicillin) without improvement.

There was no history of contact with tuberculous infection or any history in his family. His Bacillus Calmette-Guérin (BCG) vaccination status was unconfirmed.

The physical examination showed a conscious patient (GCS : 15), blood pressure of 17/8, heart rate at 95, fever at 37°, with normal vital parameters on presentation.

Abdominal examination showed a hepatsplenomegaly.

There was a solitary visible swelling over the sternum that was 4*1 cms in measurement, firm in consistency, tender on palpation, without local rise of temperature, non-fluctuant, and non mobile.

There was no cervical lymphadenopathy.

Initial laboratory findings showed an anemia (Hb of 7,10 g/dl), total leucocyte count of 5840, a high level of C-reactive protein (CRP) of 72 mg/L, All other biochemical investigations (liver and renal function) were within normal limits.

There were no specific findings on simple chest radiographs, especially no bone abnormalities.

Ponction and evacuation for 15cc of purulent fluid.

A TAP CT showed (Figure 2):

Presternal abscess, with infiltration of soft tissue, without osteolytic or sclerotic bone lesion.

Nodular hepatosplenomegaly.

Necrotic splenic and coeliomesenteric lymphadenopathy.

We evoket a multifocal tuberculosis with an anterior chest wall tuberculous abscess.

The patient underwer a percutaneous drainage of abcess and deep needle biopsy.

Histopathological result was consistent with caseous necrosis. The result of an auramine stain for acid-fast bacilli were negative, but PCR was positive for Mycobacterium tuberculosis complex DNA. Thus, a diagnosis of abscess TB was made. Antituberculous therapy with isoniazid, rifampicin, ethambutol and pyrazinamide was initiated. After 2 months of treatment, patient had responded well to treatment.

Axial CT image at lesion level in mediastinal window after ponction showing considerable decrease in the collection with no peripheral enhancement

Figure 1: Chest X-ray was normal.

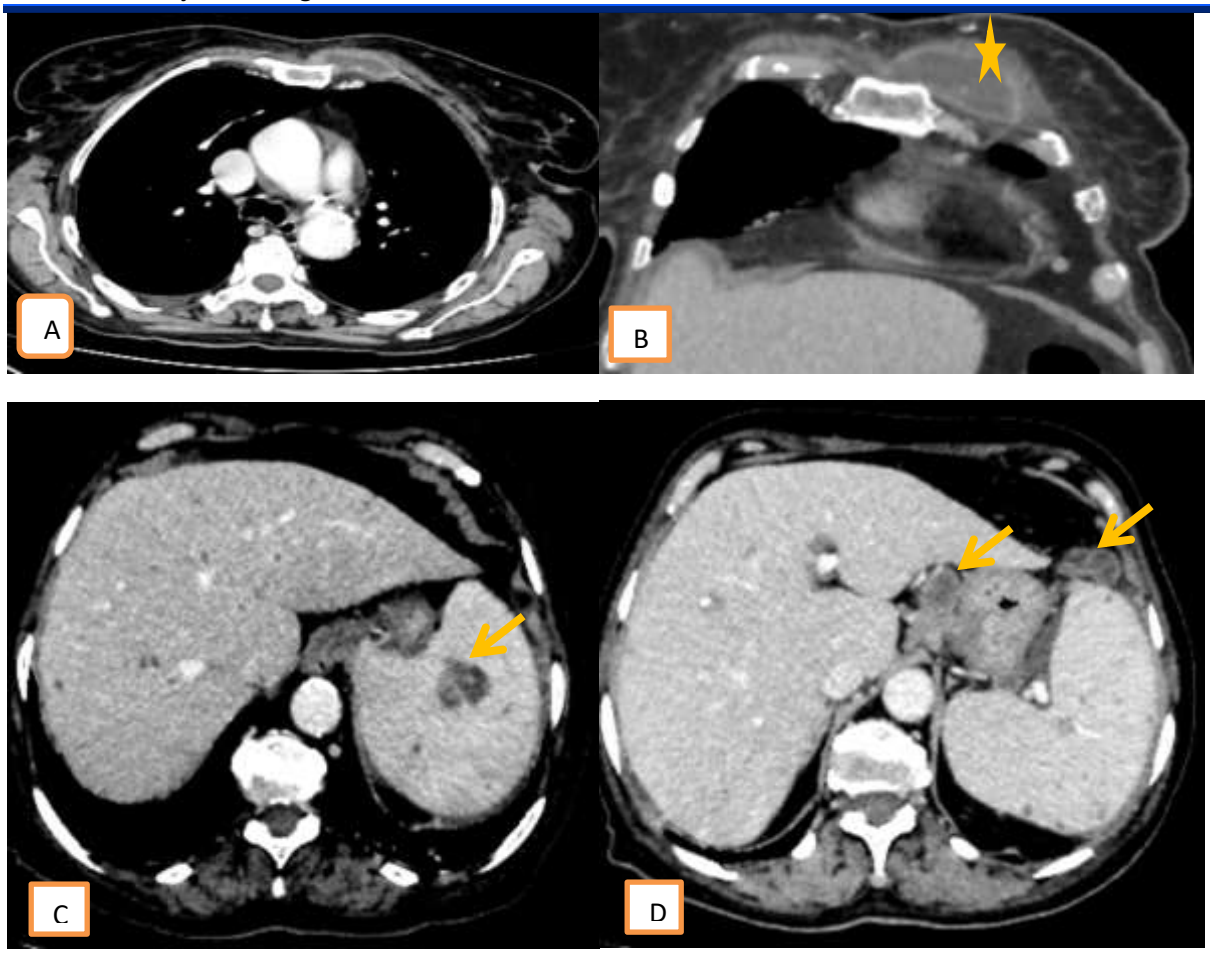


Figure 2:

A, B: Axial and frontal enhanced CT showing a well loculated hypodense collection in the left chest wall with peripheral enhancement **(star).**

C, D: Axial enhanced CT showing multiples liver and spleen nodular associated with necrotic lymphadenopathy **(arrow).**

Delayed follow-up after 12 months, the patient had responded well to treatment without recurrence.

Case presentation 2:

A 47 year old, female, with no history of tuberculosis presented with chest pain and swelling over the lower left anterior parasternal chest wall without respiratory symptoms. The patient reported history of progressive weight loss and caugh. She was BCG vaccinated and there was no history of contact with tuberculosis in the family.

On examination, the patient was apyretic, with normal pulse and blood pressure. Respiratory system examination was normal. The findings on other clinical examination were unremarkable, except for a mobile and tender soft tissue mass in the left anterior thoracic wall.

There was no involvement of the regional lymph nodes.

The white blood cell count was normal. C-reactive protein was 42 mg/l. HIV test was performed and was negative.

All other biochemical investigations (liver and renal function) were normal.

A plain radiograph of the chest was normal.

A Thoracic and abdominal CT enhanced showed (figure 4):

- A circumscribed hypodense collection in the left chest wall with peripheral enhancement over the anterior arch of left 4th rib costochondral area, eroding and extending posteriorly through the costal cartilage, into the mediastinum and pericardial space. There was no associated parenchymal or pleural lesion or effusion.
- Spleen necrotic lymphadenopathy

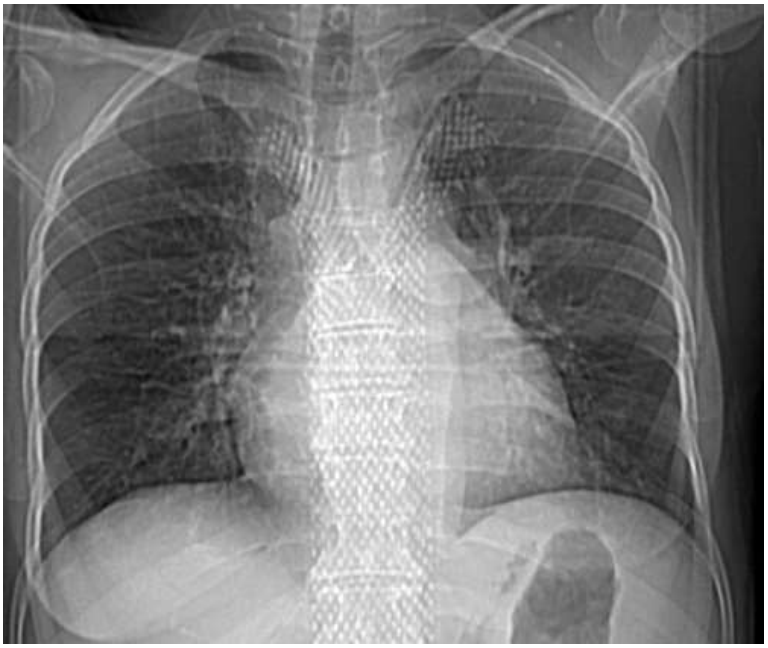
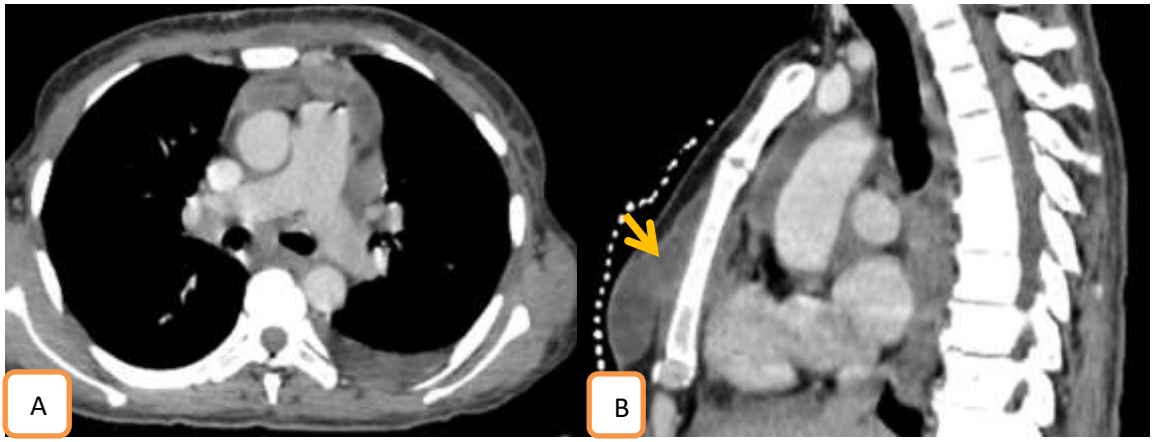


Figure 3: Normal chest radiograph without any mediastinal lymphadenopathy.



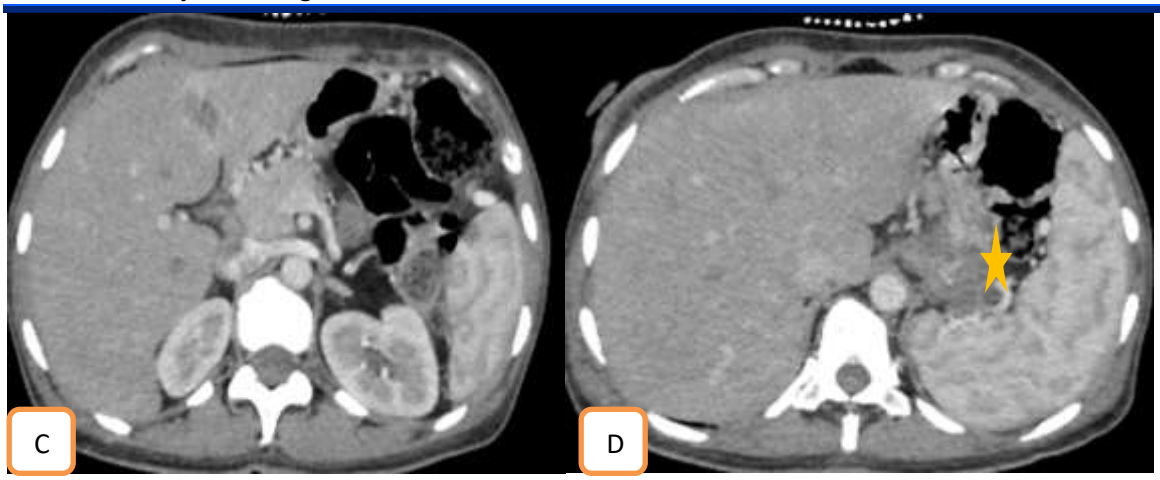


Figure 4:

A and B: Axial and sagittal enhanced chest CT showing a well circumscribed parasternal collection in the left chest wall with peripheral enhancement, extending into the mediastinum and pericardial space **(arrow).**

C and D: Enhanced abdominal CT, axial view, showing spleen necrotic lymphadenopathy **(star).**

The mass was biopsied and drained. Microscopically, epithelioid histiocytes and multinucleated giant cells, granulation tissue, and caseous necrosis were seen.

Then, the patient was put on antituberculous medical treatment for 6 months.

On follow-up after 12 months, patient had responded well to treatment and the abscess resolved completely, without recurrence.

Discussion:

TB is a significant global health issue. Africa has the greatest TB load.
It is well recognized that extra-pulmonary tuberculosis presents a diagnostic and treatment difficulty. It accounts for 15-20% of all cases of tuberculosis in HIV negative individuals and 40–50% of new infections in HIV positive patients.
Chest wall tuberculous abscesses can be simple (no abnormalities in the bones) or associated with osteitis or ostearthritis, affecting the ribs, costovertebral joints, sternum, and vertebrae.
They are most frequently found at the margins of the sternum and along the rib shafts [2]. The parasternal region, costovertebral junction, and vertebra are involved less frequently [3].

The etiology of chest wall abscesses is explained by three mechanisms: hematogenous dissemination of a dormant tuberculous focus, direct extension from pleural or pulmonary parenchymal disease, and direct extension from lymphadenitis of the chest wall [4], which is the most likely mechanism in our cases.

In contrast to a more fulminant clinical course presented by a pyogenic abscess, the clinical manifestations of tuberculous abscesses of the chest wall are typically insidious, with few or non-inflammatory tender anterior chest wall mass, and rarely with pain, swelling, and fistulae over the involved site.

X-rays of the thorax may be normal [5] or it may reveal pleural effusion, pleural thickening, parietal opacity, or bone modification (lysis, thickening).

Sonography revealed that most of the collections had poorly defined walls and were hypoechoic. Color Doppler indicated low grade peripheral vascularity, which added to the chronicity information. On the other hand, pyogenic abscesses are known to exhibit abundant vascularity, thicker, and more echogenic contents.

To establish a diagnosis and rule out other diagnoses like cancer and other infectious disorders, a first needle aspiration guided by ultrasonography of the swelling is required [6]. However, percutaneous or surgical biopsy are typically necessary to make a definitive diagnosis, as needle aspiration alone is frequently unreliable [7].

Thoracic CT is the test of choice for the exploration of tuberculous lesions of the chest wall, specifying the nature and extent of these lesions. It can also reveal the presence of bone lysis, intrathoracic lymphadenopathy or even pleuropulmonary lesions.

Scintigraphy is particularly useful for detecting mute bone sites [5,8,9].

Possible complications of chest wall tuberculous abscess include secondary infection, fistula formation, osteomyelitis of the sternum, compression or erosion of the large blood vessels, compression of the trachea and migration of TB abscess into the mediastinum, pleural cavity or subcutaneous tissues (10).

The differential diagnosis of chest wall masses includes pyogenic infections (Staphylococcus or Streptococcus), malignancy (lymphoma or metastatic lesions), Brodie's abscess and granulomatous lesions or fungal infections (Coccidioides, Histoplasma, Blastomyces or Cryptococcus) (11,12,13). Pyogenic bacteria more commonly destroy cartilage because of proteolytic enzymes, in contrast to TB which generally preserves.

The treatment of cold abscess is the subject of much controversy due to the rarity of the disease. Thus, several questions remain unanswered regarding the duration of treatment, its usefulness and the modalities of surgical treatment. The strong suspicion of tuberculous origin generally imposes a medical treatment from the beginning pending the results of the culture [14]. For some authors, a well-conducted medical treatment, lasting from 9 to 12 months, can cure alone [15,16], as we noticed in our patients. However, there are very few series with a limited number of patients and a high recurrence rate.

In most series, the combination of surgery and antituberculosis treatment is recommended, preferably to reduce the risk of recurrence [15,17]. The surgical procedure is essentially based on the obliteration of the residual cavity after flattening of the cold abscess and on the removal of all the infected tissues, including the affected ribs or cartilage segments [15,16]. This minimizes complications and postoperative recurrences.

Some authors suggest that surgical drainage of the abscess should be considered only if the needle aspiration is not enough to resolve the problem [18] they think that aspiration alone is not sufficient because there is always multiloculated sites that only surgical xide debridement can ensure good outcome and prognosis.

Conclusion:

Abscess TB of the chest wall is rare. However, in endemic area, musculoskeletal TB needs to be included in the differential diagnosis of a sternal mass with abnormal radiological findings of a cold abscess. A needle aspiration biopsy should be performed to give a definitive diagnosis.

LIST OF ABBREVIATIONS :

CT: Computerized Tomography

TB : Tuberculosis

BCG: Bacillus Calmette-Guérin

CRP: C-reactive protein

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