

Isolated tuberculous abscess of the chest wall simulates pyogenic abscess/chondrosarcoma - a case report

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ABSTRACT

Introduction. Chest wall tuberculosis is an uncommon manifestation, accounting for 1-2% of musculoskeletal and extrapulmonary tuberculosis cases. The pathophysiology involves hematogenous spread, direct extension from chest wall lymphadenitis, or spread from pulmonary or pleural diseases. Diagnosis is challenging, especially in immunocompromised individuals where TB can mimic various illnesses.

Case presentation. A 50-year-old female presented with a painful swelling on the right lower lateral chest over the 9th rib. Clinical examination revealed a warm, painful, enlarging chest swelling with defined borders. Imaging studies (Radiograph, Ultrasonography, CT, and MRI) demonstrated a hypodense collection with suspicious soft tissue density, bony erosion, and involvement of adjacent structures.

Conclusion. Primary TB of the chest wall is uncommon, often resembling tumors or pyogenic abscesses. Chest wall TB may affect various structures, and imaging plays a crucial role in diagnosis. Multidetector CT offers superior spatial resolution, aiding in assessing anatomical origin and response to therapy. The recommended treatment includes a six-month ATT regimen, with surgical interventions if necessary.

Keywords: tuberculous abscess, extrapulmonary, musculoskeletal, chondrosarcoma

INTRODUCTION

Around 1-2 percent of cases of musculoskeletal and extrapulmonary tuberculosis (TB) occur at the uncommon site of the chest wall [1,2,3]. The pathophysiology of a chest wall abscess can be attributed to three different mechanisms: hematogenous spread of a tuberculous center, direct spread from chest wall lymphadenitis, or direct spread from pulmonary or pleural illness [4]. In immune-compromised individuals, tuberculosis (TB) can mimic a number of different illnesses, especially in circumstances where up to 30% of cases exclusively involve the extrapulmonary site.[5] Chest wall TB is uncommon and could mimic many conditions; hence, diagnosis could be challenging. Chest wall granuloma or abscesses are also seen in infants with BCG vaccination [6]. Abscesses can develop from pericardial or

diaphragmatic TB that extends into the chest wall. [7,8] Infections like actinomycosis or invasive aspergillosis can extend into the chest wall and form abscesses [9]. Chest wall tuberculosis can be mimicked by neoplastic causes such as metastasis or primary chondrosarcoma [10]. This study aimed to assess the Radiograph, Magnetic resonance imaging (MRI), and Computed tomography (CT) appearances of isolated chest wall tuberculosis.

CASE PRESENTATION

A 50 y/o female complained of painful swelling at right lower lateral chest over the 9th rib area. The swelling in the chest got larger over time. Absence of hemoptysis, expectoration, weight loss, cough, or fever in the past, absence of TB history. Family his-

tory is not important. The patient appeared healthy and was afebrile during the clinical examination. Vitals (pulse and BP) are normal. Respiratory system examination is normal. Local investigation shows a significant 6 × 6 cm swelling over the right anterolateral chest over the 9th area of the rib, with fairly defined borders. The enlargement in the chest is variable, warm, painful, and loose from underlying structures. Blood investigations (liver, haemogram, and renal functions) are within reference ranges. HIV serology is non-reactive.

Imaging features: Chest radiography shows focal soft tissue opacity at right lower costal margin/lateral chest wall over the 9th rib area with likely bony erosion.

Chest ultrasonography shows a hypoechoic fluid lesion with dense echoes at right lower lateral chest wall.

CT of chest in the lung window exhibits no signs of a parenchymal lesion in the lung.

CT chest in mediastinal window shows extra-thoracic, focal uni-loculated hypodense collection at right lower lateral chest wall lateral shaft of 9th rib of size ~ 55 × 42 × 65 mm (AP × TR × CC), Volume ~75cc, eccentric suspicious focal soft tissue size density ~18 × 24 × 33 mm (AP × TR × CC), peripheral smooth margin of collection causing destruction of lateral shaft of 9th rib associated with sub-cutaneous minimal edema (Figure 1a, b, c, d).

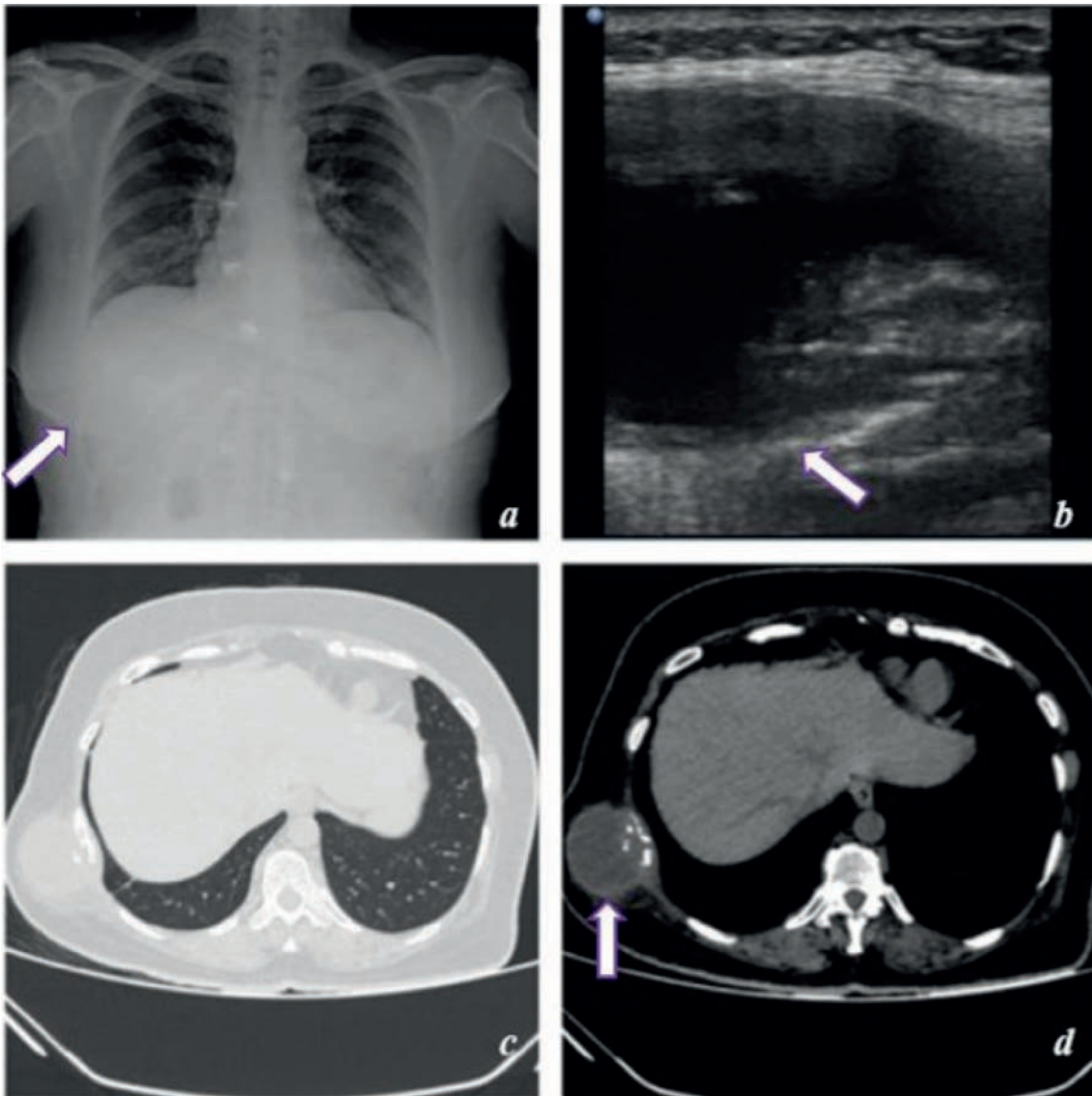


FIGURE 1. Chest radiography shows focal soft tissue opacity at right lower costal margin / lateral chest wall over the 9th rib area with likely bony erosion. Chest ultrasonography shows a hypoechoic fluid lesion with dense echoes at right lower lateral chest wall.

CT of chest in the lung window exhibits no signs of a parenchymal lesion in the lung.

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Chest MRI shows extra-thoracic, T1 - focal hypointense and T2 - focal hyperintense uni-loculated collection at right lower lateral chest wall in lateral shaft of right 9th rib (SPAIR - hyperintense, DWI - no reduced diffusivity, ADC - $1.9 \times 10^{-3} \text{ mm}^2/\text{s}$, GRE - no blooming, C+ T1 - non-enhancing), eccentric heterogenous suspicious soft tissue component (? calcification) of size $\sim 18 \times 24 \times 33 \text{ mm}$ with irregular margins (SPAIR - heterogenous hypo-hyperintense, DWI - reduced diffusivity, ADC - $0.6 \times 10^{-3} \text{ mm}^2/\text{s}$, GRE - few blooming areas (? calcifications), C+ T1 - mild heterogenous enhancing), peripheral mild enhancing hypointense smooth thin margin of the collection. Collection extending medially involving extra-pleural fat, serratus anterior muscle and causing bony erosion of lateral shaft of right 9th rib, laterally abutting right latissimus dorsi muscle associated with sub-cutaneous minimal edema (Figure 2a, b, c, d, e, f).

On the basis of imaging & clinical results: The possibility of Infectious etiology (Isolated TB abscess of chest wall) is studied. Differential diagnoses are less likely (Pyogenic abscess) / Primary malignant etiology (Chondrosarcoma).

Fine needle aspiration of chest wall collection shows pus (dark brown). Ziehl Neelsen's staining of pus demonstrated acid-fast bacilli. The cytology of pus is negative for malignancy (Figure 3a, b, c).

The 50-year-old female treated with anti-tuberculous therapy (ATT).

DISCUSSION

Primary TB of the chest wall is uncommon, and as the lesions grossly resemble tumors (chondrosarcomas) or pyogenic abscesses and do not respond to standard treatment approaches, identification is usually difficult [11-13].

Chest wall TB abscess may affect the vertebrae, rib shafts, costochondral junctions, and sternum. [14-16]. The parasternal area, the costovertebral junction, and the vertebrae are less commonly affected. Drouillard EJ & Tatelman M explained isolated chest wall TB frequency in the rib shaft (61%), the costochondral junction (13%), and the costovertebral joint (35%) [17]. Chung et al. stated a CT scan is a valuable tool for investigating a retro mammary tuberculous abscess [18]. According to Lee G. et al., 69 percent of tuberculosis cases had rib damage [19].

Tuberculous infection outcomes from direct & hematogenous spread from a tuberculous focus of the lung. Wiebe ER reported an isolated chest wall TB occurs either by hematogenous spread or direct spread by a caseous lymph node [20]. Burke, HE reported tubercular bacilli spread from local/diffuse pleuritis to regional lymph nodes like para-sternal or intercostal lymph nodes and cause chest wall tuberculosis [21].

Ultrasonography (USG) guided fine needle aspiration or biopsy of chest wall swelling is required

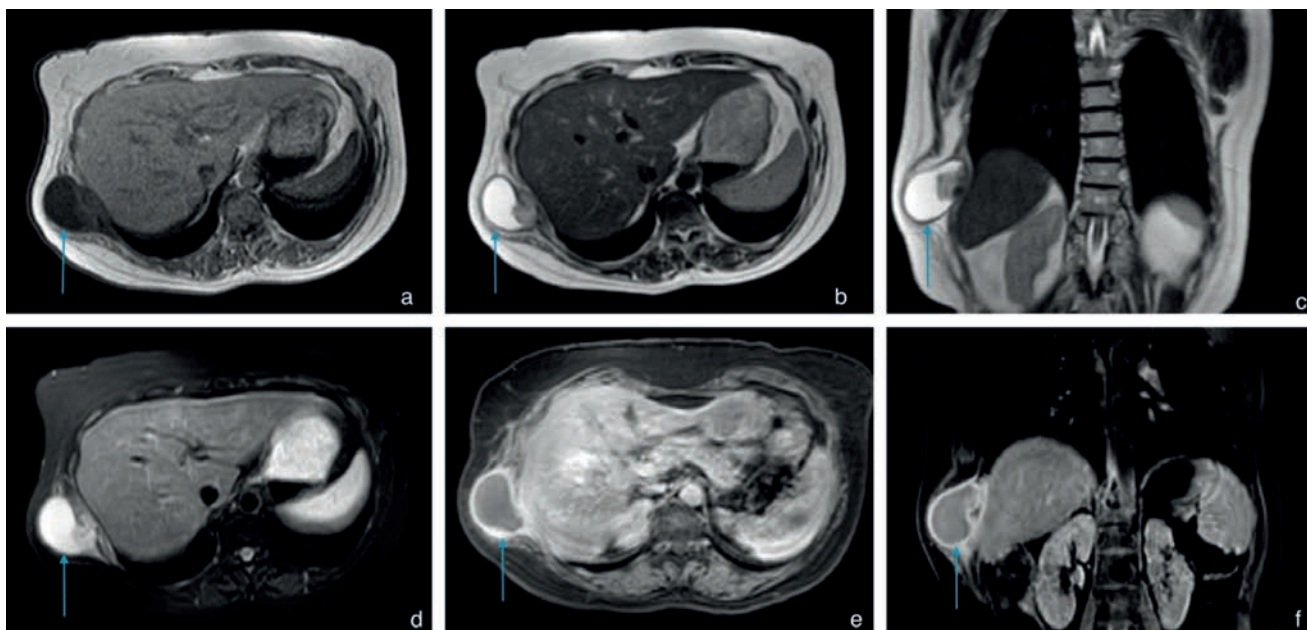


FIGURE 2. Chest MRI shows extra-thoracic, T1 - focal hypointense and T2 - focal hyperintense uni-loculated collection at right lower lateral chest wall in lateral shaft of right 9th rib (SPAIR - hyperintense, DWI - no reduced diffusivity, ADC - $1.9 \times 10^{-3} \text{ mm}^2/\text{s}$, GRE - no blooming, C+ T1 - non-enhancing), eccentric heterogenous suspicious soft tissue component (? calcification) of size $\sim 18 \times 24 \times 33 \text{ mm}$ with irregular margins (SPAIR - heterogenous hypo-hyperintense, DWI - reduced diffusivity, ADC - $0.6 \times 10^{-3} \text{ mm}^2/\text{s}$, GRE - few blooming areas (? calcifications), C+ T1 - mild heterogenous enhancing, peripheral mild enhancing hypointense smooth thin margin of the collection. Collection extending medially involving extra-pleural fat, serratus anterior muscle and causing bony erosion of lateral shaft of right 9th rib, laterally abutting right latissimus dorsi muscle associated with sub-cutaneous minimal edema

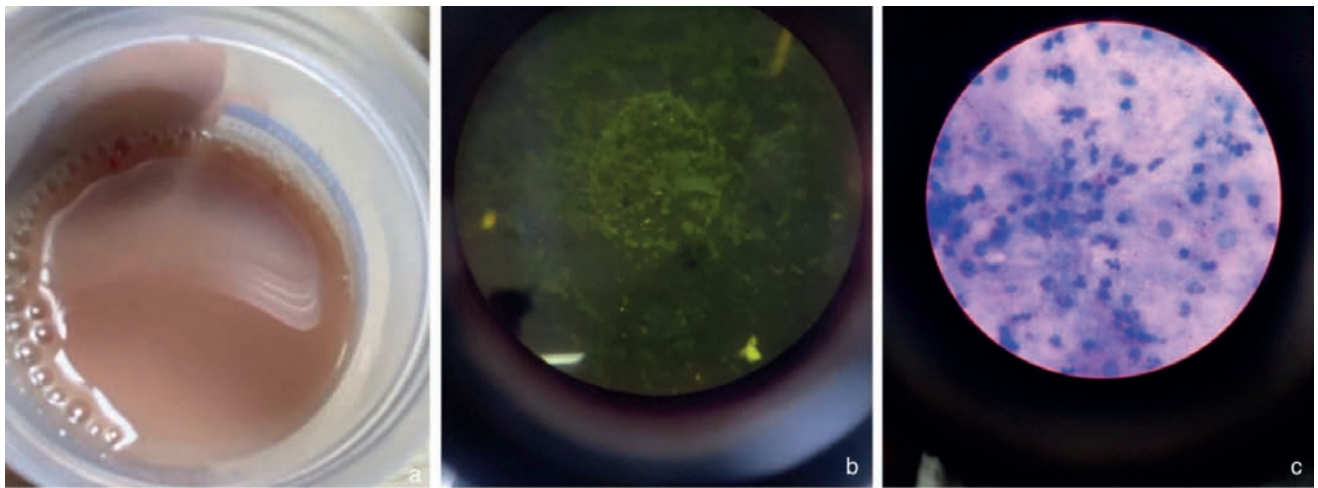


FIGURE 3. Fine needle aspiration of chest wall collection shows pus (dark brown). Ziehl Neelsen's staining of pus demonstrated Acid-fast bacilli. The cytology of pus is negative for malignancy

for a definite diagnosis of TB and to exclude other diagnoses, such as tumors and infections [22]. Radiological imaging is essential in assessing chest wall tuberculosis in determining anatomic origin, response to therapy, and recurrence [23]. Multidetector Computed Tomography (MDCT) enables larger tissue volume imaging in a short time of acquisition. Because of its superior spatial resolution, which allows it to show both soft-tissue and bone structures while assessing chest wall abnormalities, CT lessens respiratory motion. Diagnosis of osteomyelitis is possible only by bone biopsy. CT reveals mineralization and bony erosion having a higher sensitivity & specificity than MRI or USG. Plain radiographs and CT findings of rib tuberculosis are bony erosions with adjacent abscess formation [24]. MRI of rib tuberculosis shows bone marrow changes as a T1WI-hypointense signal on and T2WI and fat-suppressed sequences - hyperintense signals and post-gadolinium peripheral thick rim enhancement abscess as part of soft tissue involvement [25]. According to Kim HY et al., soft tissue masses with calcification & rim improvement and bone or costal cartilage degeneration may or may not be present in chest wall tuberculosis, with or without signs of underlying lung & pleural disease [26]. Fluoro-deoxyglucose (FDG) - Positron Emission Tomography-CT (PET-CT) and PET-MRI help diagnose chest wall tuberculosis [27].

A six-month ATT regimen is recommended by the RNTCP (Revised National Tuberculosis Control Programme). In spite of this, based on clinical recovery, treatment may be continued for a further nine to twelve months. Wide debridement, rib excision, and abscess drainage are recommended if medical therapy is insufficient. The World Health Organization advises a conventional 6-month antitubercular treatment with surgical or non-surgical treatment based on clinical presentation and bacillary load. This therapy could be extended up to 9 or 12 months based on recovery of clinical [28].

Chest wall lesions can be diagnosed differently in a number of ways, including granulomatous disorders like sarcoidosis, malignancies like chondrosarcoma, lymphomas, and metastasis, and chronic infections including fungal and parasite infections.

In our instance, cytology came back negative and the fluid that was evacuated had a sterile culture. The positive Ziehl Neelson stain for TB made our diagnosis even easier. As of right now, there is no agreement on the diagnosis of EPTB (there are several methods to choose from, such as biopsy, mycobacterial culture & stain, examination of body fluid, immunological test, and nucleic acid amplification test). The best results have been found when using a combination of biopsy, PCR, and culture.

CONCLUSION

Isolated chest wall tuberculosis is a rare involvement. Interpreting musculoskeletal tuberculous remains challenging and needs a high suspicion index. The clinical symptoms combination, positive tuberculin skin test, microbiological and histological samples, and positive imaging results strongly proposed the tuberculosis diagnosis.

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