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CASE REPORT

Diagnostic Dilemma of Chest Wall Tuberculosis Masquerading Breast Lump and Sarcoma

Nik Aminah Nik Abdul Kadir[1], Farnaza Ariffin[1], Norliana Dalila Mohamad Ali[2], Mardiana Abdul Aziz[3]

1 Department of Primary Care Medicine, Faculty of Medicine, Universiti Teknologi MARA, Selangor, Malaysia
2 Department of Radiology, Faculty of Medicine, Universiti Teknologi MARA, Selangor, Malaysia
3 Department of Pathology, Faculty of Medicine, Universiti Teknologi MARA, Selangor, Malaysia

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Corresponding author:
Assoc. Prof. Dr Farnaza Ariffin,
Department of Primary Care Medicine,
Faculty of Medicine,
Universiti Teknologi MARA,
Selayang Campus, Jalan Prima
Selayang 7, 68100 Batu Caves,
Selangor, Malaysia
Tel: 016-7761654
Fax: 03-61268888
Email: farnaza@uitm.edu.my

ABSTRACT

Chest wall tuberculosis (TB) is rare and can often masquerade as a tumour. Diagnostic confirmation is made by bacteriological findings of acid-fast bacilli and culture of Mycobacterium tuberculosis or histopathological findings. This is a 37-year-old immunocompetent lady who presented with a 3-month history of gradually increasing right breast lump with suspicious characteristics during clinical examinations. Ultrasound of the breast showed normal breast tissue with a well-defined hypoechoic lesion within the anterior inferior pectoralis muscle. CT scan of the thorax revealed a right anterior chest wall lesion with multiple lung nodules and consolidations. Thus, there was a high suspicion of chest wall tumour and an initial diagnosis of soft tissue sarcoma was made. Biopsy of the lesion showed necrotising granulomatous inflammation but no acid-fast bacilli. A revised diagnosis of chest wall tuberculosis was made. She attended follow-up complaining of shortness of breath and pleuritic chest pain with signs of right pleural effusion. Her symptoms improved after the initiation of anti-TB treatment. This case demonstrated the challenge in making an early diagnosis of chest wall TB and commencement of anti-TB treatment.

KEYWORDS: Tuberculosis, chest tuberculosis, musculoskeletal tuberculosis, chest wall tumour

INTRODUCTION

Globally, the incidence of extrapulmonary tuberculosis (TB) accounts for 16 percent of the 7.1 million TB cases that were notified in 2019 [1]. It has been estimated that one-tenth involve the musculoskeletal system [2] and chest wall TB only accounts for one to five percent of all musculoskeletal TB cases [3]. There are two variants of chest wall TB in soft tissues which are in the forms of abscess and tuberculoma [3]. Chest wall TB may present as a painless cystic mass similar to a cold abscess or sometimes, as a firm, mobile mass [4]. It typically presents in individuals with underlying risk factors including immunosuppression, undernutrition, diabetes, smoking, and alcohol consumption [1]. The systemic symptoms such as constitutional symptoms of fever, weight loss, and night sweats were present in 22% of the patient [4]. The symptoms and signs of musculoskeletal TB are not specific, resulting in diagnostic difficulties. A definitive diagnosis must be made based on bacteriological and histological confirmation. This case report highlights the challenge of early and prompt diagnosis of chest wall tuberculosis because it resembled a chest wall tumour or breast tumour. It also highlights the risk of complications in an immunocompetent adult if the diagnosis is delayed.

CASE PRESENTATION

A 37-year-old female, who was previously well, presented to a primary care clinic with 3-month history of a right breast lump. Initially it was painless, but it became painful 2 weeks prior to presentation. There were no constitutional symptoms such as fever, loss of weight, loss of appetite, night sweats, or respiratory

symptoms such as chronic cough. She has no family history of breast cancer. She has no known previous history of exposure to TB. There was no history of trauma.

On examination, she was obese with a body mass index of 33.1 kg/m^2 and afebrile. Clinical examinations revealed a firm 4 x 5 cm lump in the lower inner quadrant of the right breast. It was non-tender and, firm in consistency with regular border and was fixed to the underlying muscle. The nipple and skin were normal. There was no palpable axillary lymph node and supraclavicular lymph nodes. All other systems examination was normal.

At this first presentation, a clinical diagnosis of breast cancer was made, and she was referred to the surgical outpatient clinic immediately. An urgent ultrasound of the breast was arranged one week later. The ultrasound findings revealed that the right breast lesion felt on palpation was instead, a chest wall lesion within the right anterior inferior pectoralis muscle and not within the breast tissue. Given this finding, a contrasted computed tomography (CT) of the thorax was performed to characterize the lesion. The CT thorax was performed two weeks after the initial presentation. The CT showed an enhancing hypodense right anterior chest wall lesion anterior to 3rd and 4th costal cartilages. It measures 2.6cm (AP diameter) x 3.6cm (width) x 5.9cm (craniocaudal height) (Figure 1a and 1b). The lesion from CT findings has a mean Hounsfield Unit (HU) of 30 which could represent soft tissue or an infected fluid collection. Thus, the possibility of malignancy such as soft tissue sarcoma must be ruled out. Lung changes were also seen on CT scan with tree-in-bud changes in both upper lobes, scattered lungs nodules up to 0.8cm in diameter, and consolidation in the right lower lobe (Figure 2a, 2b, 2c, and 2d).

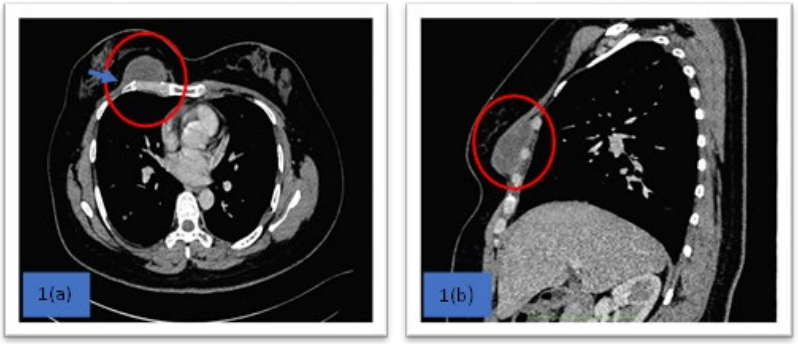

Figure 1 (a) Axial contrasted CT thorax showing a well-encapsulated hypodense right anterior chest lesion (red circle) splaying the pectoralis muscles (blue arrow). (b) The lesion was seen on a sagittal CT cut showing no underlying rib erosion

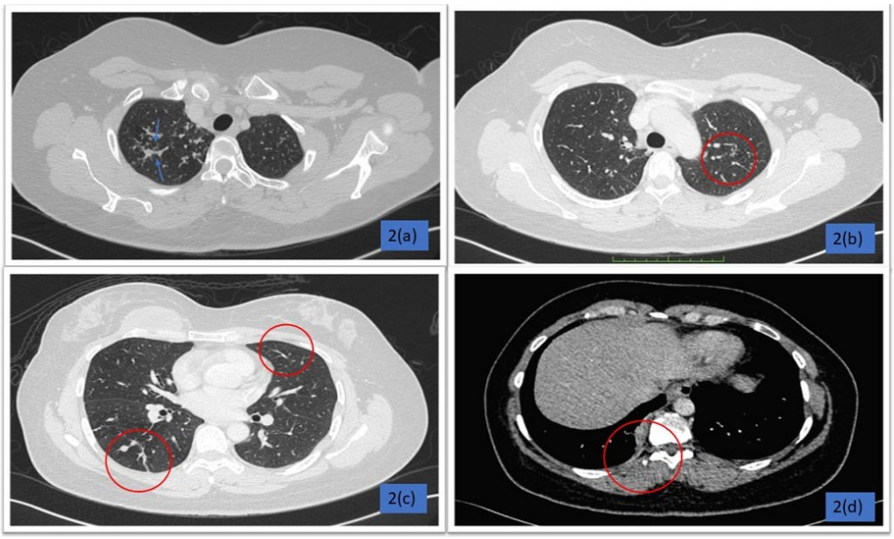

Figure 2 (a): Axial contrasted CT thorax on lung window showing tree-in-bud changes in both upper lobes predominantly on the right side with superimposed nodules (blue arrow); **(b):** CT thorax at a different level showing more tree-in-bud changes in the left upper lobe (red circle); **(c):** CT thorax at a different level showing more nodules with adjacent fibrotic strands in the right lower lobe (red circle); **(d):** CT thorax at a lower level showing consolidation at posterior segment of the right lower lobe.

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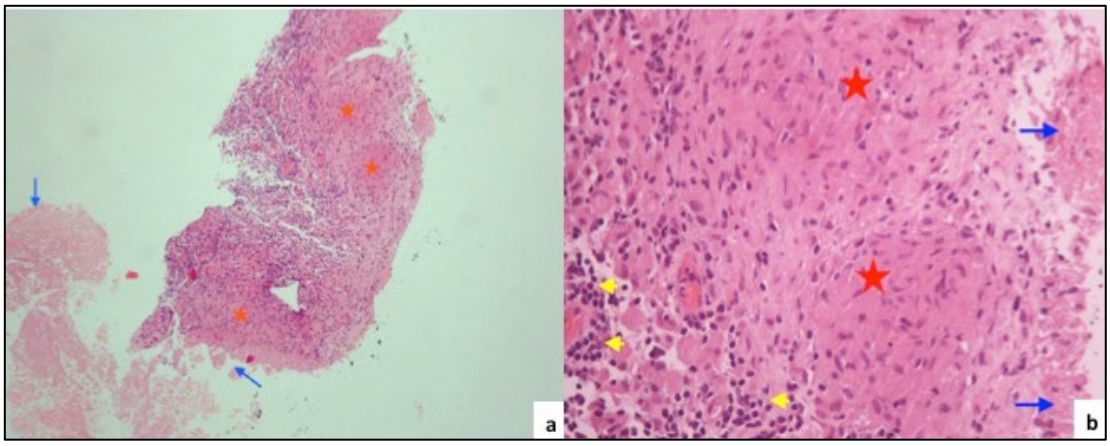
Following the CT findings, an ultrasound-guided biopsy of the chest wall mass was performed. The biopsy revealed fibrofatty tissue with granulomatous inflammation, characterised by aggregates of epithelioid histiocytes, focally associated with necrosis. Granular necrotic debris was also seen in the background (Figure 3). No acid fast-bacilli (AFB) or fungal bodies were identified on histochemical stains. The findings were suggestive of tuberculosis. There was no evidence of malignancy. No foreign body material was visualised.



Figures 3 (a): Photomicrograph of the chest wall biopsy, showing multiple granulomata (*) associated with necrosis (blue arrow), H&E 10x. **(b)** The epithelioid histiocytes are characterised by their elongated nuclei, abundant eosinophilic cytoplasm, and indistinct cell margins (*). Granular necrotic debris (blue arrows) and rim of lymphocytes are also seen at the periphery (yellow arrowheads), H&E 40x

She presented before the follow-up appointment with a history of pleuritic chest pain and shortness of breath on exertion for 5 days. There was no fever, night sweats, loss of weight, and loss of appetite. Clinical respiratory examination revealed reduced breath sound at the right lower zone up to mid zone with dullness on percussion. The chest radiograph showed right-sided pleural effusion (Figure 4). Her basic blood tests showed normal haematological and biochemical profiles except for an elevated ESR of 106 mm/hour. Her sputum for AFB was negative. Her serology test for HIV was negative.

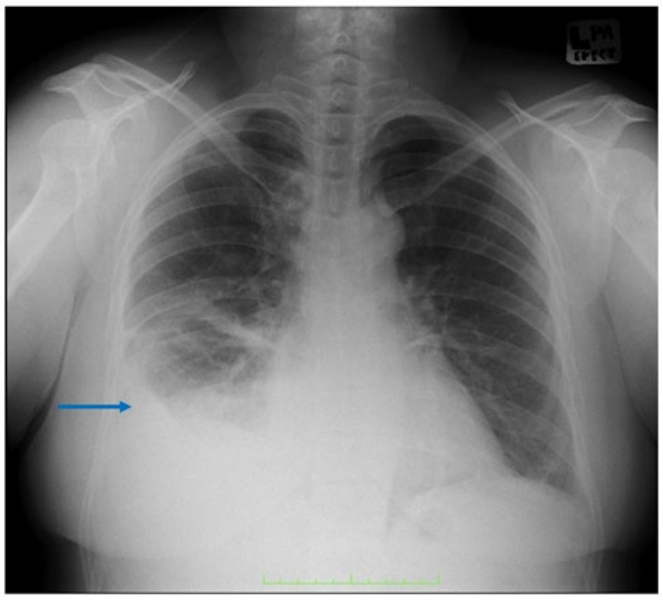


Figure 4 Frontal chest radiograph showed right pleural effusion evidenced by opacity in the right lower zone obscuring the right hemidiaphragm and costophrenic angle (blue arrow)

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The diagnostic dilemma was whether to manage this case as a chest wall tumour or tuberculosis. However, there was enough evidence to diagnose her with pulmonary and chest wall tuberculosis with the presence of right-sided pleural effusion supported by the histopathology findings. She was started on anti TB drugs which are Akurit 4 (ethambutol, isoniazid, rifampicin, and pyrazinamide). She had a shared care approach with the primary care team managing her direct observed therapy short-course (DOTS) and co-managed by the respiratory team. During treatment follow up she responded well to the anti-TB medication and had full remission of symptoms. The breast lesion resolved, and with mild residual right-sided pleural effusion.

DISCUSSION

Chest wall TB is a diagnostic challenge in clinical practice as the presentation may be insidious or atypical. The diagnosis may be delayed as TB may not be the initial consideration in the differential diagnosis. In this case, apart from TB, additional differential diagnoses to be considered included various benign and malignant neoplasms such as chondroma, lipoma, and soft tissue sarcoma. The mean HU unit of the lesion on CT did not allow discrimination between a soft tissue neoplasm or fluid collection; the latter being seen in infective causes. Furthermore, CT showed a well-encapsulated hypodense right anterior chest lesion which makes soft tissue sarcoma is highly suspected. Approximately 80 % of new cases of sarcoma originate from soft tissue and the rest originate from bone [5]. The most common presenting complaint about a soft tissue sarcoma is a gradually enlarging painless mass, although some patients may complain of pain. Constitutional symptoms such as fever and weight loss are uncommon [6]. As the clinical presentations are often non-specific, a definitive diagnosis of malignancy may not be reached without histopathologic examination, which is the gold standard for the diagnosis of soft tissue sarcomas.

In this case, the histopathological examinations revealed granulomatous inflammation with necrosis. Granulomatous inflammation may be seen in both infective and non-infective conditions. Examples of the former include infections due to fungi, tuberculous and non-tuberculous mycobacteria, as well as Brucella spp. Non-infective conditions producing granulomatous inflammation include sarcoidosis, traumatic fat necrosis, and foreign-body giant cell reactions [2]. Despite the absence of demonstrable AFB, the presence of necrotizing granuloma in combination with the clinical and radiologic findings had led to a presumptive diagnosis of chest wall TB in this patient. Her favourable response to anti-TB treatment further reaffirmed the diagnosis.

Our patient had unique presentations in which she presented with a breast lump without respiratory symptoms, even though there were lung changes seen on CT, characterised by tree-in-bud changes in both upper lobes and scattered lung nodules. The tree-in-bud refers to a pattern seen on thin-section lung CT of multiple areas of centrilobular nodules with a linear branching pattern most pronounces in the lung periphery. It represents dilated and impacted centrilobular bronchioles by mucous or pus. Initially, it was used to describe the endobronchial spread of Mycobacterium tuberculosis, the tree-in-bud pattern has now been associated with many other entities including other infections (bacterial, fungal, viral, or parasitic), congenital disorders, idiopathic disorders, aspiration or inhalation of foreign substances, immunologic disorders, connective tissue disorders and peripheral pulmonary vascular disease [7].

The epidemiology of extrapulmonary TB was demonstrated in a study done in China [8]. The authors observed that out of 19,279 hospitalized TB patients, 33.4% had extrapulmonary TB while 66.6% had pulmonary TB. The most frequent forms of extrapulmonary TB observed were skeletal TB (41.1%) and pleural TB (26%). The pathogenesis of chest wall tuberculosis has been suggested in three mechanisms which are a direct extension of the underlying pleural or pulmonary parenchymal disease, hematogenous dissemination correlated with the activation of a latent tuberculous focus, and direct extension of tuberculous mediastinal lymphadenitis in the chest wall [3]. For this case, it was plausible that the tuberculous bacilli reached the musculoskeletal site via this route; by initially invading the pleural space, creating a local or widespread pleuritis, and then travelled the parasternal or the posterior intercostal lymph nodes. These nodes become subsequently ruptured, resulting in necrotic and

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caseous material burrowing in the anterior chest wall to form the musculoskeletal tuberculosis lesion.

World Health Organization recommends a standard 6-month duration of anti-TB treatment for chest wall TB. However, tailored to clinical presentation, bacillary load, and response to anti-tubercular therapy, the treatment can be extended up to 9-12 months [9]. Surgical intervention was only necessary if needle aspiration is inconclusive findings, presence of draining sinuses, as debridement procedure to promote early healing for markedly damaged or sequestrated bones or joint, in extensive mediastinal disease or worsening diseases, or when the disease does not respond to an effective course of anti-TB treatment. In this case, she received 9 months of anti- TB with full remission of symptoms.

CONCLUSION

The case highlights the rare presentations of chest wall TB mimicking a neoplasm, and the importance of correlating between the clinical, radiological, and histopathological findings to arrive at the correct diagnosis and allow appropriate management to be instituted.

Conflict of Interest

Authors declare none.

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Authors' contribution

All authors wrote and reviewed the manuscript before submission.

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