



Case report

Chest pain in a young immunocompetent male: A rare case scenario

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ABSTRACT

Musculoskeletal tuberculosis is the commonest form of extrapulmonary tuberculosis however Rib lesion is uncommon and occurs in zero to five percent of bone and joint tuberculosis. In our case report both chest X ray and CT were useful in demonstrating the skeletal lesion and also in the assessment of response to treatment, as follow up chest X ray and CT scan at 4 months and after 12 months of anti tubercular drugs showed remarkable new bone formation and clearing of pleura parenchymal lesions.

1. Introduction

Though musculoskeletal system is the most common form of extra pulmonary tuberculosis Rib tuberculosis is rare probably due to its insidious onset [1–4] There were 400 cases of rib tuberculosis recorded in the world literature before the introduction of anti tuberculous chemotherapy [5] however paleopathological literature [6,7] provides more cases probably because On a skeletal material we can research more closer and directly the ribs and their possible small lesions. We present a case of rib tuberculosis with pleura parenchymal involvement and emphasize the role of chest X ray and Computerized tomography (CT) in demonstrating the skeletal lesion and in the assessment of response to treatment.

2. Case report

2.1. History

A 17-year-old Indian boy presented with 3 month history of left sided chest pain which was increased by inspiration. The pain was stabbing in nature over the left infrascapular and infra axillary region with no radiation to elsewhere. There was no cough, hemoptysis, dyspnea, or fever. There was no past history of tuberculosis or childhood malignancies.

2.1.1. Physical examination

Was essentially normal except for tenderness to palpation over the left infrascapular region and minimal left infrascapular crepitations on auscultation.

2.2. Diagnostic studies

- 1) His ECG was normal.
- 2) Chest X-ray film showed a small peripheral dense opacity at LT lower zone with convexity facing towards the hilum (white arrow), and erosion of the inferior margin of eighth rib posteriorly (black arrow) with pathological fracture (Fig. 1a).
- 3) Sputum smear results for malignant cells, acid-fast bacilli (AFB) and fungal elements were negative.
- 4) Computerized tomography (CT) of the thorax showed diffuse pleuroparenchymal thickening along the apical, mediastinal and posterolateral aspect of LT hemithorax with a soft tissue mass over the internal surface of the posterior aspect of the LT eighth rib which was eroded. (yellow arrow) (Fig. 1a).
- 5) Ultrasound showed heteroechoic pleuroparenchymal thickening measuring 2.6×3 cms along with few calcifications and vascularity in LT posterior chest wall. USG guided Percutaneous aspiration of the chest wall mass yielded 5 ml of pus filled material.
- 6) The sample material revealed AFB(Acid fast bacilli) on Ziehl-Nielsen (Z-N) stain and histopathology showed well defined epitheloid granulomas with extensive areas of caseous necrosis.
- 7) The white blood cell count was within normal limits. All biochemical examinations as well as erythrocyte sedimentation rate were within normal ranges. HIV, HCV and HBS Ag tests were negative.

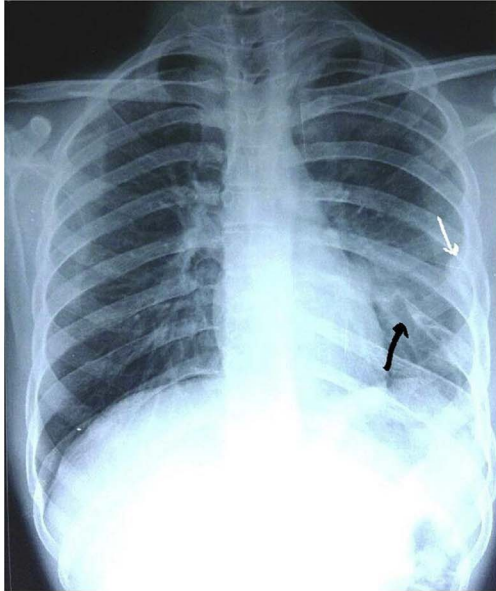
2.3. Diagnosis

A diagnosis of tubercular osteomyelitis of the Rib probably secondary to extension from pleuroparenchymal foci was made. However it couldn't be established whether the initial lesion was in the rib with extension to pleura and adjoining parenchyma or vice versa but because

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CHEST XRAY AT INITIAL PRESENTATION



CT CHEST AT INITIAL PRESENTATION



Fig. 1a. Chest X ray and CT scan at initial presentation.

the incidence of pulmonary tuberculosis is more we presumed it to be a pleuroparenchymal tuberculosis with secondary extension to Rib.

2.4. Treatment

The patient was started on Anti tuberculous treatment (ATT) with category one DOTS, i.e., an initiation phase with four drugs 2HREZ (H= ISONIAZID, R = RIFAMPICIN, E = ETAMBUTOL, Z = PYRAZINAMIDE) thrice weekly which he tolerated well. 2 months later patient visited to our hospital and told improvements of the symptom, he was kept on the continuation phase of anti tubercular therapy that is on two drugs isoniazid and rifampicin and advised for frequent follow ups. On his follow up visit after around two months of continuation phase, chest X ray and computed tomography of chest (Fig. 1b) were taken which showed remarkable healing of the bone with new callus formation and there was no pleura parenchymal thickening.

As it is a case of pleura parenchymal along with skeletal involvement, pt was advised to continue continuation phase for a period of 10 months making the total duration of therapy to 12 months. His last chest X ray (Fig. 1c) was taken at the end of 12 months of ATT which has shown remarkable improvement compared to previous ones. Presently the patient is in the follow up period after his ATT treatment as risk of relapse is more during the first two years after completion of ATT.

3. Discussion

Tuberculosis can involve any bone in the body. Skeletal tuberculosis accounts for 1 to 5% of all tuberculosis infections, and of these, approximately one half are in the vertebral column. Rib lesion is uncommon and occurs in zero to 5% of bone and joint tuberculosis [1]. Although pleura pulmonary tuberculosis is very common, there are few reports on its association with local rib destruction [1]. This low

FOLLOW UP CHEST XRAY AFTER 4 MONTHS OF ATT SHOWING RESOLUTION OF PLEUROPARENCHYMAL FOCI WITH ONGOING NEW BONE FORMATION



FOLLOW UP CT CHEST SHOWING THE RESOLUTION OF LESION AFTER 4 MONTHS OF ATT



Fig. 1b. Chest X ray and CT scan after 4 months of ATT.

CHEST XRAY AT THE END OF 12 MONTHS OF TREATMENT SHOWING COMPLETE NEW BONE FORMATION

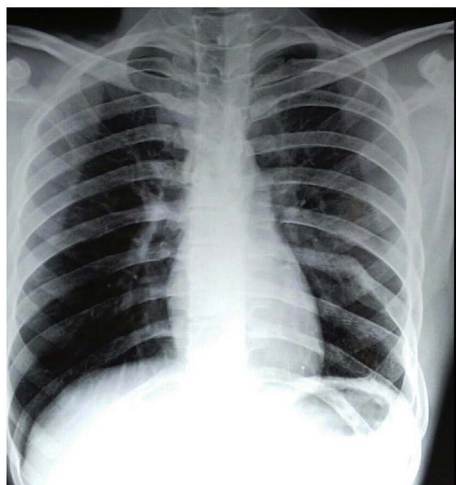


Fig. 1c. Chest X ray after 12 months of ATT.

percentage of tuberculous rib lesions information comes from the medical literature [1,2,5]. In paleopathological literature [6,7] the described rib lesions are much more frequent than we see in the medical papers. This difference could be due to the limitations of the CT and other recent medical investigations. On a skeletal material we can research more closer and directly the ribs and their possible small lesions.

The rarity of rib tuberculosis may also be attributed to its insidious onset, which often occurs up to 18 months after infection, and to the lack of other organ involvement; less than 50% of patients have active pulmonary disease [2].

Pathogenetically, rib tuberculosis is believed to occur in one of the three ways:

1. Secondary to hematogenous spread from the lungs or activation of a distant latent focus [1,3].
2. Contiguous with tuberculosis of the intercostal lymph nodes leading to cold abscess and
3. Direct extension to the rib from the underlying lung [1,3].

In various series on osteoarticular tuberculosis, parenchymal lung lesion adjacent to the affected rib was not present or not specifically mentioned [1] however the contiguity of the rib and pleuropulmonary lesion in our patient strongly suggests direct extension of disease from the lung focus to the bone.

In a series in which the skeletal remains of patients with chronic pulmonary tuberculosis were reviewed, periostitis of the rib adjacent to a pulmonary lesion was found in 8% of cases [3]. A subsequent series found that rib lesions were more common in individuals who died of tuberculosis (61%) than in those who died of other causes (15%) [4]. This finding suggests that tuberculosis at a peripheral lung focus may disseminate directly through the pleura to the visceral surface of the rib or that an empyema may itself initiate periostitis of the rib [4].

The lack of clinical report of rib involvement in pleuropulmonary tuberculosis in various studies [1,2] may be partly due to insensitivity of the chest roentgenogram in picking up early skeletal disease. Computerized tomography is valuable in investigation whenever skeletal involvement is suspected. However in our patient both chest X ray and CT was useful in demonstrating the skeletal lesion and delineating the extent of disease. They may also be useful in the assessment of response

to treatment as follow up chest X ray and CT scan 4 months and at the 12 month after initiating anti tubercular drugs showed remarkable new bone formation and clearing of pleura parenchymal lesions. The dominant clinical feature in most of the reported cases of rib tuberculosis was subcutaneous swelling in the chest wall [1]. however our patient did not have any superficial mass, nor was there any fever suggestive of infection. With the presence of rib destruction, the condition simulated malignancy. TB is considered the second commonest cause of rib destruction after metastasis from the breast or lung, but it is important to consider the differential diagnosis of a chest wall mass, including myeloma, lymphoma, eosinophilic granuloma, disseminated fungal or mycobacterial infection and sarcoma [5].

The role of surgery in treatment of skeletal tuberculosis is controversial. The course in our patient suggests that the bone lesion could heal with antituberculosis drug therapy alone. According to Reyes [8] empyema necessitans caused by *M. tuberculosis* has a cure rate of 99% when treated with isoniazid and rifampicin for 9–12 months. Mathlouthi states that surgery is rarely indicated and anti-TB therapy is all that is necessary once the diagnosis is confirmed by histology [9]. However, Chang could only confirm TB in all of their 12 cases, following rib resection [10]. Faure et al. [11] could not diagnose TB prior to surgery in many of their cases either. As well as this, Yao, in a large series of 712 cases, spanning 11 years, advocates surgical treatment for parietal chest wall TB [12]. Surgical excision with primary closure is recommended for patients who fail to improve after 3–4 weeks of ATT or under conditions, such as unstable or deformed bone structure, bearing a high risk of sinus formation [13]. Agrawal is of the opinion that treatment for bone TB requires a minimum of 12 months of anti tubercular treatment and this is further reinforced in other Indian studies [13,14].

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