

A 30 Year Old Man with Fever and Indolent Soft Tissue Masses

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Abstract: Problem statement: Multifocal Skeletal Tuberculosis (MSTB) is a rare presentation of skeletal tuberculosis. The indolent nature of this condition often leads to delayed or missed diagnosis, sometimes with devastating consequences for the patient. In order to provide meaningful clinical information and to highlight pitfalls in diagnosis of MFST, we present a case of MSTB. A review of this condition is included for broader coverage. **Approach:** A 30 year old immune-competent male patient with a 1 year history of indolent soft tissue masses on the chest wall overlying the sternum and the ribs. CAT scan of the chest showed multiple lytic bony lesions involving the ribs, sternum and vertebrae that mimicked metastatic cancer. Fine needle aspiration of the lesion revealed AFB and granulomas. Culture of the aspirated material grew mycobacterium tuberculosis and a diagnosis of MSTB was made. **Results:** A diagnosis of MSTB was made and anti-tuberculous therapy was initiated. **Conclusion:** This case indicated that multi-focal skeletal tuberculosis may develop in immune-competent patients without overt pulmonary involvement. From our experience along with previously reported data, MSTB should be suspected in patients from endemic areas who present with multiple skeletal bony lesions. Appropriate management and therapy are essentials for cure and to prevent complications.

Key words: Osteomyelitis, skeletal tuberculosis, mycobacterium tuberculosis, pulmonary, chemotherapy

INTRODUCTION

Case report: A 30 year old Filipino man was referred to our outpatient clinic because of two visible masses in the chest wall. The patient had been well until a year ago when he started to have some discomfort in the right side of his posterior chest wall. He felt a small soft swelling in this area and his discomfort was related to twisting movements and sleeping on his right side. This did not interfere with his daily activities and the patient did not seek medical advice.

Over the course of the next 6 months, he started to have low grade fevers, occasional night sweats, occasional dry cough and a 4-5 kg weight loss, despite no change in his appetite. He used over-the-counter Acetaminophen and Naproxen to control his fever and pain.

Within the same period he noticed that the swelling in his right posterior chest wall was gradually increasing in size and at this point was about 6 cm in diameter. Five months prior to his

presentation he noticed the appearance of another swelling overlying his sternum (Fig. 1). It was soft with mild discomfort in the beginning but grew at a more rapid rate and was becoming increasingly more painful.

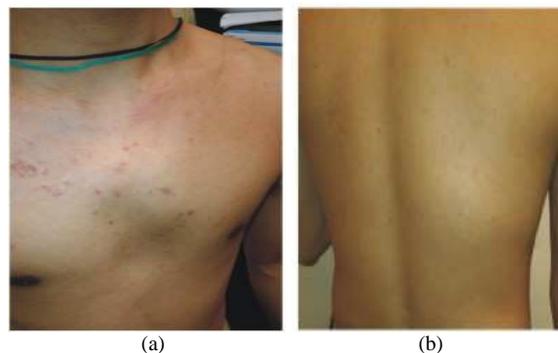


Fig. 1: Two masses overlying the sternum and the posterior chest wall

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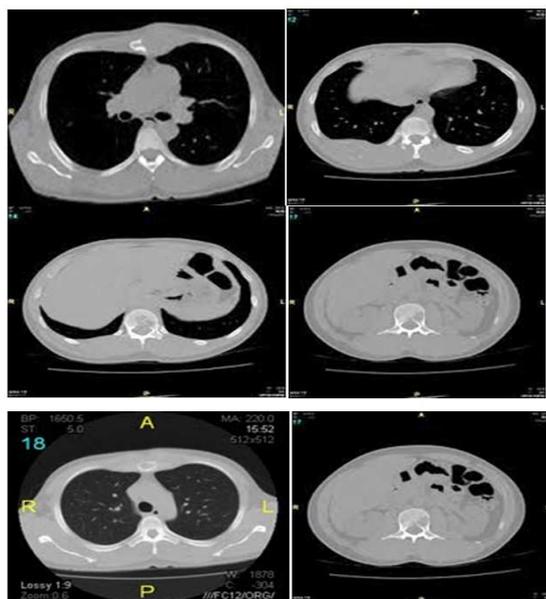


Fig. 2: Radiology imaging studies

Three and ½ months prior to presentation, he started to have significant chest pain that had increased over the course of three days that required him to go to the Emergency Room (ER), physical examination in the ER was noticeable for tenderness overlying the mid-sternal area and costal cartilages and a poorly circumscribed protuberance overlying on his right lower back, CXR was unremarkable at the time. Patient had EKG and cardiac enzymes as he presented with chest pain and they were within normal limit. No other labs were done.

The patient immigrated to the US from the Philippines 17 years ago. He went back to the Philippines to go to nursing school and stayed there for 4 years, returned to the United States 3 years ago. Upon his return to the United States he has been working as a cake decorator in a bakery. He had BCG vaccination during his childhood; he doesn't recall having PPD at all. Patient is not sexually active and has never had any sexual contact before.

On the day of his scheduled visit in our clinic, his pulse was 79 beat per minute; blood pressure 140/78 mm Hg, temperature 98.3 F, respiratory rate 18. His physical examination was notable for the presence of a 6×8 cm. protruding subcutaneous mass arising from the sternum. The skin overlying the mass was intact. There was slight tenderness in the costal cartilages and around the mass. There was another bulge in the right side of the posterior chest wall measuring 6×10 cm. with overlying intact skin. There were no other masses anywhere else in his body. There was no cervical, axillary, occipital, submandibular, or inguinal lymphadenopathy. The rest of the physical examination was unremarkable.

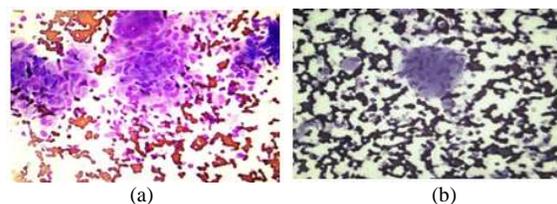


Fig. 3: Fine needle aspiration biopsy revealed multiple granulomas, seen here in Diff Quick Stain

Laboratory examination results: ESR was 100 mm h⁻¹, Hb 11.6G DL⁻¹, WBC 9200 mm⁻³, platelets 377,000/MM3, CRP was 44.5MG/L. The outcome of biochemical tests and liver function tests were normal; HIV1 antibody screening test was nonreactive.

CT scan of the chest showed (Fig. 2): An expansile soft tissue mass along the left anterior chest wall associated with destruction of the left side of the sternum and; another expansile soft tissue mass associated with destruction of the right posterior ninth and tenth ribs. The soft tissue mass surrounding the posterior right ninth rib measured approximately 7.0×3.8 cm. Multiple additional lytic lesions were present within the spine and ribs. There was a right posterior paraspinal soft tissue mass associated with destruction of the T10 vertebral body and pedicle.

Multiple lytic lesions and expansile lesions along the left anterior chest and right posterior ribs with associated bone destruction. Findings are consistent with metastatic disease. Left lung pulmonary nodules measuring up to 9 mm subpleural left upper lobe.

Shortly after the patient had the CT scan, he had a fine needle aspiration biopsy of the lesion overlying the sternum, which showed multiple granulomas mostly non-caseating with a rare caseating granuloma (Fig. 3a and b). Auramine/rhodamine stain of the smear showed at least five mycobacteria. AFB culture of the aspirated material grew *Mycobacterium tuberculosis* (Fig. 4). Antibiotic testing showed susceptibility to Isoniazide, Rifampin, Ethambutol and Pyrazinamide. The patient was informed of his diagnosis and a preliminary management plan was arranged. The health department was called and we referred the patient there for initiation of therapy.

Skeletal tuberculosis is ancient infection; analysis of 483 pre-Columbian skeletons from Chile showed lesions consistent with bony tuberculosis in 2% of the skeletons (Arriaza *et al.*, 1995). Bone and soft tissue samples from 85 ancient Egyptian mummies were analyzed for the presence of ancient *Mycobacterium tuberculosis* complex DNA; all the specimens showed either an *M. tuberculosis* or an *M. africanum* pattern (Zink *et al.*, 2003).

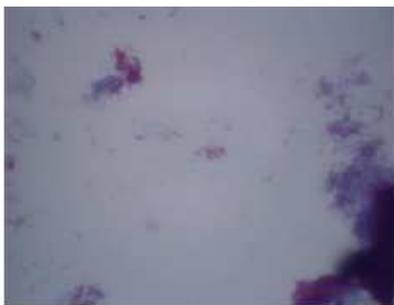


Fig. 4: Culture of the sternal aspiration biopsy material grew Mycobacterium Tuberculosis, smear of which shown here are acid fast rods

Skeletal tuberculosis accounts for about 10-20% of cases of extra-pulmonary tuberculosis and it accounts for 1-2% of all cases of tuberculosis. The spine is involved in 50% of cases of skeletal tuberculosis (Morris *et al.*, 2002), lumbar and thoracic regions are more often involved, whereas the incidence of cervical involvement is 2-3% (Weaver and Lifeso, 1984). Multifocal lesions are reported in 10-15% of cases in developing countries (Lachenauer *et al.*, 1991; Kumar and Saxena, 1988). Tuberculous osteomyelitis can affect any bone, including the ribs, skull, phalanx, sternum, pelvis and long bones. Other causes of osteomyelitis of the rib are rare and tuberculosis is the most common infectious cause of single or multiple osteomyelitic rib lesions (Muradali *et al.*, 1993).

The sternum is one of the least common bones of the body to get infected. Sternal osteomyelitis accounts for less than 2% of cases of osteomyelitis (Tuli and Sinha, 1969), Tubercular involvement of sternum is a rare entity and may occur in isolation or in association with multifocal skeletal tuberculosis. Reports of the disease are very sparse and limited to a handful of cases all from countries where tuberculosis is endemic. In many of these cases, a previous trauma or thoracotomy preceded the development of tuberculosis. The ribs are involved in between 0 and 5% of osteoarticular tuberculosis cases and it is the most commonly involved site in extrapulmonary tuberculosis in heroin-addicted patients (Muradali *et al.*, 1993).

In multi-focal skeletal tuberculosis, the disease usually has an insidious course. As in our patient, swelling and pain are the usual presenting symptoms (McLellan *et al.*, 2000), systemic manifestations are usually mild and patients may present with vague multiple somatic symptoms, resulting in misdiagnosis or delayed diagnosis. Most reported cases have been in immunocompetent patients (Marudanayagam and Gnanadoss, 2006). A high index of suspicion is needed

so that early diagnosis and institution of anti-tubercular treatment can prevent complications.

In skeletal tuberculosis, no radiological evidence of pulmonary tuberculosis can be identified in about 50% of cases (Andresen *et al.*, 2006). Therefore, the presence of osteolytic lesions without the evidence of pulmonary involvement does not exclude the diagnosis of osteoarticular tuberculosis.

The radiologic appearance of multifocal skeletal tuberculosis can mimic metastatic tumors (Rieder *et al.*, 1990). The most common radiological finding in skeletal tuberculosis is osteolytic lesions, patients may also present with pathological fractures and the bones show marked osteopenia and varying amounts of sclerosis and periostitis (Lee *et al.*, 1993; Shalini *et al.*, 2005; Roy *et al.*, 2006).

The radiologic features of multi-focal skeletal tuberculosis are non specific. Almost all cases can mimic metastatic tumors. Other conditions that could have similar radiological appearance include pyogenic osteomyelitis, histiocytosis X and fungal infections (Swellam and El-Aal, 2005; Handa *et al.*, 2010).

A suspicion of multi-focal skeletal tuberculosis, especially in patients from endemic areas, should be raised on clinical and radiological basis; a definitive diagnosis can be made by fine needle aspiration biopsy which is simple and safe procedure and obviates the need for an open biopsy

Current recommendations are to treat skeletal tuberculosis with a 6-9 month regimen that includes INH and RMP, with PZA and EMB for the first 2 months, this regime is at least as effective as 18 month treatment regime that includes the same four anti-tuberculous medications. This result was observed in a multi-center study in Korea, India and Hong Kong and included more than 500 patients (Mandell, 2009). Cultures and drug sensitivity should be performed as (3-19%) of the tuberculous bacilli are either resistant to isoniazid, para-aminosalicylic acid, or streptomycin (Moghaddam *et al.*, 2009).

Although anti-tuberculous therapy is the cornerstone for the management of skeletal tuberculosis, surgical intervention must be addressed on an individual bases (Muradali *et al.*, 1993). Surgery may be necessary in patients who do not respond to therapy, those with cord compression with neurologic deficits, or spine instability.

CONCLUSION

MSTB is a rare presentation of skeletal tuberculosis. The indolent nature of this condition often leads to delayed or missed diagnosis.

Immunocompetent patients from endemic areas could be affected. Most cases reported were without overt pulmonary involvement. The multiple lytic bony involvements could mimic metastatic cancer. Strong clinical suspicion and fine needle aspiration biopsy are vital for early diagnosis and therapy.

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