

*Case Report*

## **Sternal Swellings in Children - How often are they Tubercular?**

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### **ABSTRACT**

**Background:** We are reporting two cases which presented with a sub-acute swelling over the sternum. Imaging showed lytic lesion and biopsy proved tuberculosis. AFB Culture and Gene Expert test showed Mycobacterium tuberculosis sensitive to primary line of anti-tuberculosis drugs.

**Outcome:** Both the patients responded well to AKT with one child requiring second line drugs.

#### **Message**

Even though skeletal tuberculosis is rare in children, and sternal involvement even more so, it is important to consider this diagnosis and send appropriate bacteriological and immunological studies to prove the diagnosis as well as gain a head start on starting the appropriate AKT.

**Key Words:** Sternal osteomyelitis, tubercular osteomyelitis, children

### **INTRODUCTION**

Skeletal tuberculosis is uncommon, accounting for less than 7% cases. <sup>[1]</sup> Sternal tuberculosis accounts for less than 1% of cases of musculoskeletal tuberculosis. <sup>[2]</sup> Tubercular involvement of the sternum is rare even in countries where tuberculosis is highly prevalent. <sup>[2]</sup> Youngest known case reported was in a 9 month old child in a Japanese study. <sup>[3]</sup> Here we report two cases of sternal tuberculosis; the first was a eleven month old child and the second a 9 year old girl. Sternal tuberculosis as an extension of primary tuberculosis in the lungs and mediastinum is documented well, but is rare as a primary presentation without a focus elsewhere. Both the cases in this report did not have a documented primary tuberculosis

infection and did not have family history of tuberculosis.

### **CASE REPORT**

#### **Case 1**

An eleven months old female child presented with history of swelling over sternum since 2 months. There was no history of fever and the child was gaining weight normally. BCG vaccination had been given and there was no history of contact of tuberculosis in family.

On examination, the child was afebrile, and there were no significant findings, except for a swelling seen over the sternum, which was localized with the overlying skin being inflamed. There was no

discharge or sinus present, and the swelling was fixed and immobile. (Fig 1)

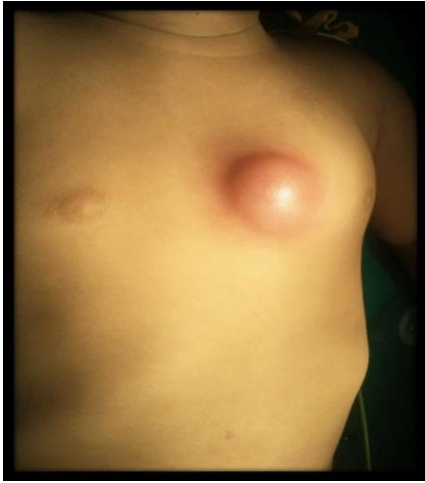


Fig. 1

Mantoux test was negative. X-ray chest was normal. CT scan chest revealed an osteolytic lesion in the sternum extending into the subcutaneous plane with soft necrotic tissue within it. No mediastinal or lung involvement was seen. (Fig 2)

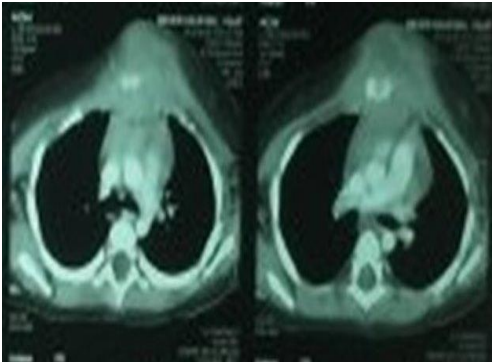


Fig. 2

The child underwent incisional biopsy and the soft necrotic tissue was curetted out. There was involvement of both anterior and posterior bony tables of sternum. The tissue was sent for AFB culture which was positive for *M. tuberculosis* and the child was started on anti-tuberculosis treatment (resistant to isoniazide so RZE was started – this case was seen about a decade back and therapy

was as per protocol at that time). The wound did not heal after a month, so second line drugs which were sensitive (streptomycin + Ofloxacin) were added and the wound healed in two months. The child has remained asymptomatic since then.

### Case 2

A nine year old female child presented with history of sternal swelling since 1 month, with intermittent fever and pain in the chest wall. BCG vaccination was given at birth, and there was no family history of tuberculosis.

Mantoux test was negative. LDH was elevated to twice the upper limit of normal. MRI scan of chest was done to rule out small cell tumor of the sternum (as LDH levels were high, malignancy was suspected), which revealed lytic lesion in the sternum with subcutaneous extension without involvement of the lungs or mediastinum. Mediastinal lymph nodes were enlarged. (Fig 3)

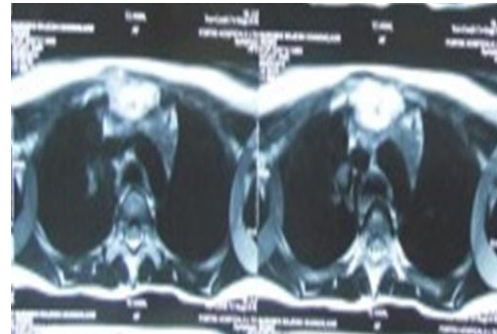


Fig. 3

She then underwent incisional biopsy which revealed soft necrotic tissue, which was curetted out and sent for HP which showed granulomatous inflammation suggestive of tubercular infection (Fig 4) and Gene X pert test which revealed *M. Tuberculosis* complex sensitive to rifampicin. AFB Culture reports showed sensitivity to primary line of AKT.

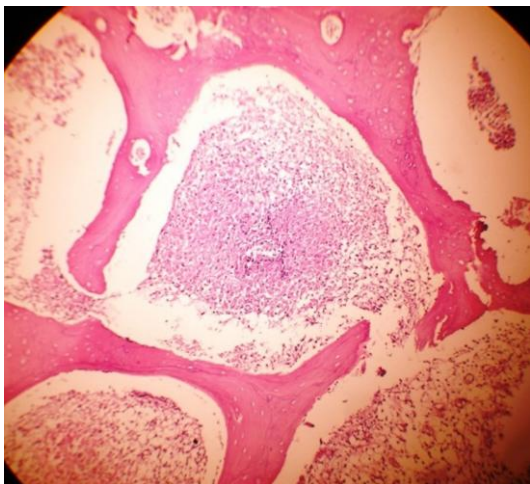


Fig. 4

Post-surgery the child was put on 4 drug primary AKT and recovered well. Following surgery she developed a sinus with pink granulation and this healed over the next two months. (Fig 5)



Fig. 5

## DISCUSSION

Sternal tuberculosis is an uncommon condition, accounting for less than 1 % of musculoskeletal tuberculosis. [1] It is uncommon even in countries with a high prevalence of tuberculosis. [1] It could develop as a late complication of primary tubercular infection elsewhere in the body spreading either through direct extension from the mediastinal lymph nodes or through hematological or lymphatic spread

from the primary focus of infection. [4] Sternal tuberculosis without primary focus of infection is very rare as seen in both our patients.

The diagnosis is usually delayed because of subtle clinical features. [1] The child may have bony pain or fever and weight loss. Plain X-ray chest may show sclerosis with periosteal reaction in the underlying bone that is usually picked up only on lateral views. Earliest changes can only be picked up in MRI which may show marrow edema. Involvement of lungs and mediastinal lymph nodes is better picked up on CT scan rather than MRI. The choice between MRI and CT for evaluation depends on whether one suspects associated pathology in the lungs or mediastinum or whether the lesion is restricted only to the bone. The gold standard for diagnosis of tuberculosis is culture from the aspirate and biopsy. [2]

The differential diagnosis of a sternal swelling with fever and weight loss, includes osteomyelitis secondary to tubercular infection and mumps or malignancies like acute or chronic leukemia, Hodgkin disease and multiple myeloma.

Complications of sternal tuberculosis include spontaneous fractures of sternum and spread to sternoclavicular joints and mediastinum. [5] Uncomplicated tuberculous bone lesions may resolve with medical therapy but intervention is required at least to establish the diagnosis. Treatment options include AKT and surgical debridement. [6] Surgical excision with primary closure is recommended for patients who fail to improve after 3 to 4 weeks of anti-tuberculosis therapy or under conditions such as unstable or deformed bone structure, with a high risk of sinus formation. [7] Surgical debridement has less incidence of sinus formation as the infected sequestrum is removed. [8]

## CONCLUSION

Skeletal tuberculosis is rare in children, sternal involvement even rarer. One must keep this condition in mind and send biopsy of the swelling and histopathology with Gene X-pert and TB culture for diagnosis followed by anti-tuberculosis treatment to prove the diagnosis and have a fallback sensitivity report in case, the organisms prove to be resistant. Successful treatment requires long term follow up.

### Abbreviations Used

AFB: Acid Fast Bacilli  
AKT: Anti Koch's Therapy  
CT: Computerized tomography  
HP: Histopathology  
LDH: Lactic acid dehydrogenase  
BCG: Bacillus Calmette-Guerin

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