

PRIMARY TUBERCULOSIS OF STERNUM**Dr. Tushar Bansal*, Dr. N. C. Kajal**, Dr. Kunal Bansal***, Dr. Shagun* and Dr. Tushar Bhagat******

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ABSTRACT

Extra-pulmonary tuberculosis accounts for 15-20% of total tuberculosis (TB) cases in immuno-competent patients and skeletal system involvement is rare with presentation of sternal osteomyelitis is rarer even in endemic countries. Tuberculosis of bones and joints affects 1-3% of tuberculosis patients. Isolated tuberculosis of the sternum accounts for less than 1% tubercular osteomyelitis cases. Because of atypical presentation and lack of awareness, diagnosis is challenging and often delayed. In the differential diagnosis of a mass involving the chest wall, possibility of sternal tuberculosis should be considered especially in endemic area for early diagnosis and treatment. We report a case of swelling anterior to manubrium and proximal body of sternum that first seemed to be a chest wall tumour but was finally diagnosed as primary sternal tuberculosis.

KEYWORDS: Tuberculosis, Skeletal, Sternum.**INTRODUCTION**

Skeletal tuberculosis is the result of haematogenous dissemination of bacilli following primary infection. Tuberculosis can infect any bone in the body but still Sternum is one of the least commonly affected bone of the body. Sternal osteomyelitis accounts for even less than 2% of all cases of osteomyelitis. Cold abscesses of surrounding soft tissues followed by adjacent sinus tracts often occur and sometimes a painless cold abscess may be the only presenting clinical feature. The tuberculin skin test is positive in 95% cases and pulmonary involvement occurs in about 50% cases of sternal tuberculosis. Computed tomography (CT), magnetic resonance imaging (MRI), and CT-guided fine needle aspiration biopsy have transformed the diagnostic method resulting in more accurate results and are much less invasive procedures than plain radiography and open biopsy. In upto 90% of cases open biopsy improves the chances for bacteriologic confirmation. Polymerase chain reaction (PCR) has been proposed as a valuable method in rapid diagnosis of musculoskeletal tuberculosis. The presence of caseous granulomas on histology, however, can be used to make a presumptive diagnosis. Surgical drainage of abscesses should be used only if aspiration and chemotherapy have failed to control the infection.^[1] A high level of suspicion is needed for diagnosis and initiation of anti-tubercular treatment to prevent complications.

CASE REPORT

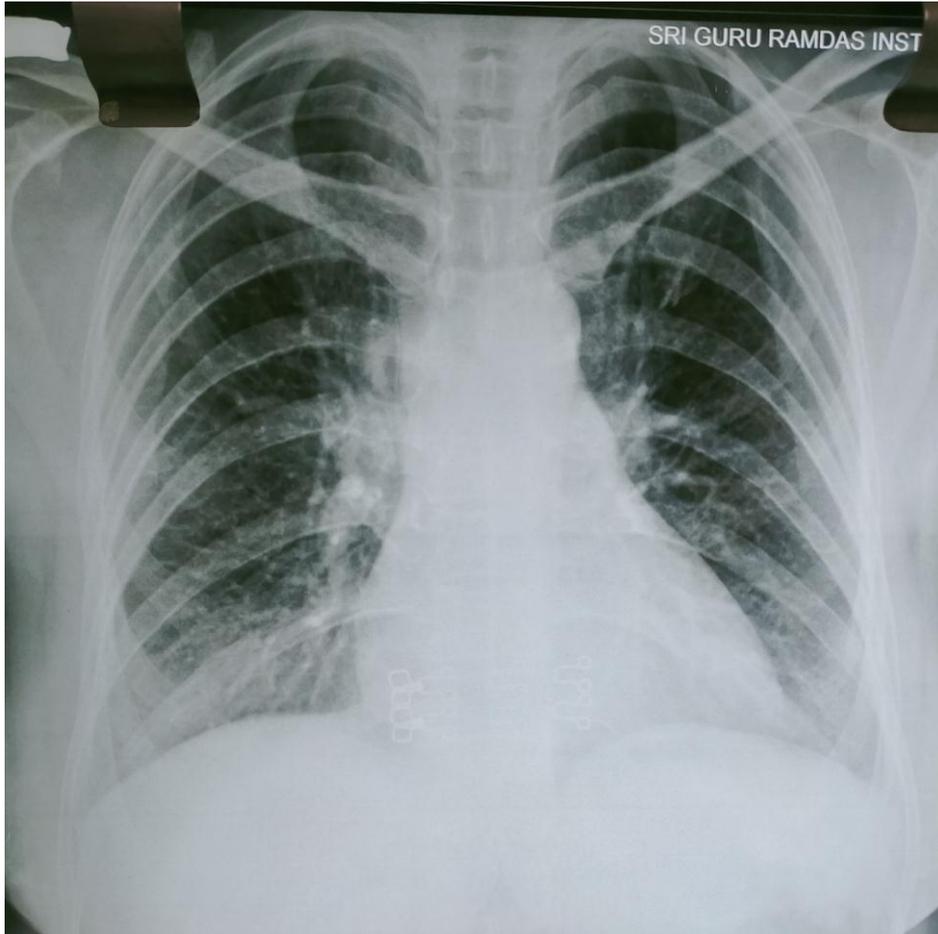
A 44-year-old female presented with a 2-month history of painless swelling of the anterior chest wall and manubrium sterni. She had no history of fever, weight loss, loss of appetite, night sweats, malaise, and fatigue. There was no history of trauma or any discharge from the swelling. Patient was non diabetic and non-hypertensive. There is previous history of pulmonary tuberculosis (sputum positive) 14 years back for which patient took antitubercular treatment and completed the course. There is history of exposure to tuberculosis patient 1 year back. Physical examination revealed a 10 - 15 cm, non-tender, soft and non-erythematous swelling that was palpable over the manubrium sterni. Systemic examination did not reveal any other abnormalities. There was no associated pulmonary tuberculosis and there was no involvement of any proximal lymph nodes and there was no involvement of any other body site. The initial laboratory investigations showed a normal haemogram, erythrocyte sedimentation rate of 80 mm/h, random plasma glucose 120 mg/dl, and strongly positive tuberculin test (20 mm induration with 5 TU of purified protein derivative (PPD)). Contrast-enhanced computed tomography (CT) of the chest demonstrated a peripherally enhancing collection measuring 6.2x4.6x4.4 cm epicentered anterior to manubrium and proximal body of sternum, deep to bilateral pectoralis major muscles causing erosion of manubrium sterni and having indistinct planes with underlying right anterior costal pleura. Ultrasonography of the abdomen was reported

normal. Ultrasonography of chest showed well defined heterogenous hypoechoic collection in the subcutaneous plane of anterior chest wall measuring approximately 5.2x4x1.8 cm in size. Fine needle aspiration cytology (FNAC) from the swelling revealed numerous epithelioid cell granulomas with mononuclear infiltrate and scattered giant cells. Acid fast staining of the aspirate showed no acid fast bacilli but in pus for CBNAAT

mycobacterium tuberculosis was detected which was sensitive for rifampicin. HIV serology was negative. The patient was started on anti-tubercular treatment (ATT) with isoniazid, rifampicin, ethambutol, and pyrazinamide. After 2 months of treatment, the sternal swelling had reduced considerably in size, and her constitutional symptoms had disappeared. She was then switched over to the continuation phase of ATT.

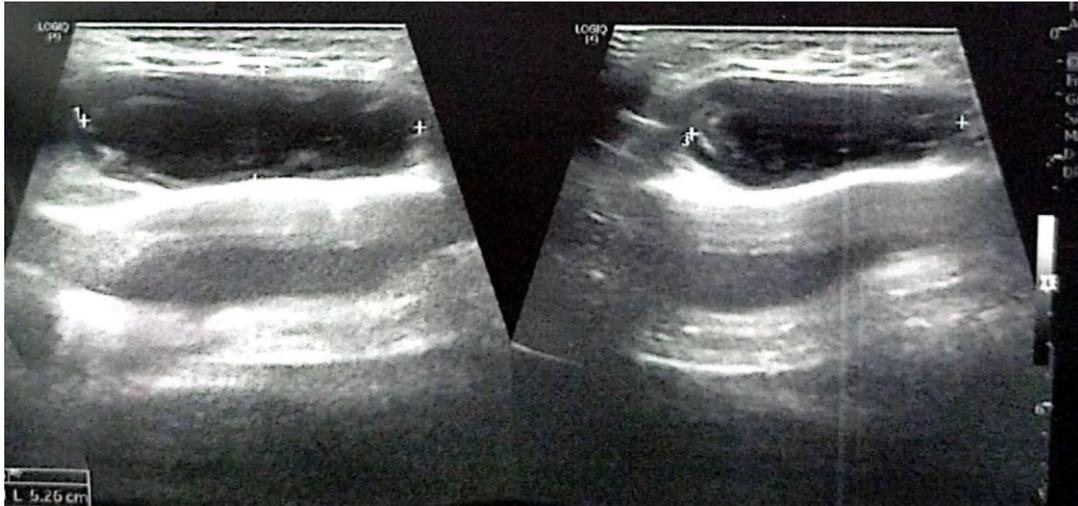


SWELLING OVER STERNUM MIMICKING ANTERIOR CHEST WALL TUMOUR



CHEST X-RAY SHOWS CALCIFIED LESIONS MOST LIKELY OLD TREATED CASE OF TUBERCULOSIS





ULTRASOUND CHEST SHOWS WELL DEFINED HYPOECHOIC COLLECTION IN THE SUBCUTANEOUS PLANE OF ANTERIOR CHEST WALL



CECT CHEST SHOWS PERIPHERALLY ENHANCING COLLECTION EPICENTERED ANTERIOR TO MANUBRIUM AND PROXIMAL BODY OF STERNUM DEEP TO BILATERAL PECTORALIS MAJOR MUSCLES CAUSING EROSION OF MANUBRIUM STERNI AND HAVING INDISTINCT PLANES WITH UNDERLYING RIGHT ANTERIOR COSTAL PLEURA

DISCUSSION

Tuberculosis (TB) can affect any organ in the body. Pulmonary tuberculosis is the most common type of tuberculosis while extra-pulmonary tuberculosis (EPTB) constitutes 15-20% of total cases. Tuberculosis can affect any bone in the body but still Sternum is one of the least commonly affected bone of the body. Sternal osteomyelitis accounts for even less than 2% of all cases of osteomyelitis and primary tubercular osteomyelitis of sternum is very rare manifestation of tuberculosis. Sternal tuberculosis is most commonly seen in middle aged adults although no age is immune for skeletal tuberculosis and it has also been reported in an infant.^[2] In the paediatric age group sternal tuberculosis has also been seen after BCG vaccination. The epiphysis of the long bones are commonly affected by osteomyelitis caused by BCG vaccination. Skeletal tuberculosis is the result of haematogenous dissemination of bacilli following primary infection or due to direct extension from hilar lymph nodes or due to lymphatic spread. Pyogenic infections, especially due to staphylococcus are the most common cause of sternal osteomyelitis. Clinical manifestations of sternal tuberculosis and pyogenic sternal infections are different. Sternal tuberculosis presents with an insidious swelling and pain over the sternum and constitutional symptoms are usually fewer, where as patients with pyogenic sternal infections will have a fulminant clinical course with severe systemic upset. India is the world's second-most populous country with more new tuberculosis than any other country each year. According to global tuberculosis report 2021 incidence of 98.7 lakh tuberculosis cases, 25.9 lakh were estimated to have occurred in India, contributing to 26% of the global burden of tuberculosis in the country. As many as 5.06 lakh extrapulmonary TB cases were diagnosed in 2021 constituting nearly 20% of cases in India.^[3] However, due to various challenges and issues, true burden in absolute number could be still higher due to under-reporting.

The computed tomography (CT) scan is more sensitive in detecting osseous destruction, soft-tissue abnormalities and anatomical localization.

The efficacy of CT scan findings in the diagnosis of chest wall tuberculosis was examined by Khalil *et al*^[4], who observed a distinctive ring enhancing hypodense soft-tissue lesion. On T1-weighted images, tubercular osteomyelitis is characterized by low signal replacement of the normal marrow fat signal and high signal intensities on T2-weighted images and enhancement on T1-weighted images.^[5]

Secondary infection, fistula formation, spontaneous fractures of the sternum, compression or erosion of the large blood vessels, compression of the trachea and migration of tuberculosis abscess into the mediastinum, pleural cavity or subcutaneous tissues are all possible complications of sternal tuberculosis osteomyelitis.^[6] The histological and microbiological examination of

sternal tissue is used to make the diagnosis. Needle aspiration is less invasive than surgical exploration, and therefore is the diagnostic method of first choice. DOTS daily regimen of 6-9 months is recommended internationally for all forms of EPTB with extended chemotherapy up to 24 months to prevent recurrence. Some cases may require repeat aspiration. Surgical resection is used only in most extreme cases, for example to remove large sequestrum, case of doubtful diagnosis, and in non-responding cases. Early drainage and complete debridement of necrotic material from the lesions along with multi-drug anti-tubercular therapy accelerates recovery. Due to the extensive loss of soft tissue and bone integrity after debridement, rotational tissue flaps can be used to cover the chest wall defect.^[7] Patients with tuberculous osteomyelitis of the sternum have also benefited from Vacuum-assisted closure therapy.

Case of sternal tuberculosis mentioned in this article had no associated pulmonary tuberculosis and there was no involvement of any proximal lymph nodes, but was having cold abscess with no sinus formation. Mantoux was strongly positive. Aspiration revealed pus with caseation but smear for AFB was negative. M tuberculosis was detected on CBNAAT which was sensitive to rifampicin. Computed tomography done demonstrated bone destruction involving sternum and vertebrae. Sternum is an uncommon site for localization in extra-pulmonary tuberculosis. A high level of suspicion is needed for diagnosis and initiation of anti-tubercular treatment to prevent complications especially if it is not associated with pulmonary tuberculosis.

CONCLUSION

Primary tuberculous osteomyelitis of the sternum is a very rare condition. Skeletal tuberculosis is the result of haematogenous dissemination of bacilli following primary infection or due to direct extension from hilar lymph nodes or due to lymphatic spread and can also occur following BCG vaccination in children. A case of primary tuberculous osteomyelitis of the sternum is reported that presented with a painless swelling over the manubrium sterni. Diagnosis was confirmed by presence of epithelioid granulomas and acid-fast bacilli and a positive M. tuberculosis on CBNAAT which was sensitive for rifampicin from the aspirate taken from the sternal swelling. In this case a thorough diagnostic work-up did not reveal any other focus of tuberculosis. The patient was successfully managed with anti-tubercular treatment.

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