CASE REPORT

Primary tubercular osteomyelitis of the sternum

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Introduction

Primary mycobacterial infection of the sternum, leading to osteomyelitis, is an extremely rare condition. Tuberculosis of bones and joints accounts for 1—3% of patients with the disease. Isolated tuberculosis of the sternum constitutes less than 1% of cases of tubercular osteomyelitis. Only a few cases of primary sternal tuberculosis have been reported in the literature. We report a case of tuberculous osteomyelitis of the sternum, the diagnostic evaluation of which failed to reveal any other source of primary infection.

Case report

A 42-year-old man presented with a 2-month history of pain and swelling of the anterior chest wall and manubrium sterni. He also had a history of weight loss, loss of appetite, night sweats, malaise, and fatigue. There was no history of trauma or any discharge from the swelling. He did not report any history of fever or cough. He was on glibenclamide (glyburide) 5 mg orally for recently detected type 2 diabetes mellitus. He denied a history of any major illness, injuries, or tuberculosis in the past.

Physical examination revealed a 10 x 15 cm, non-tender, firm and non-erythematous swelling that was palpable over the manubrium sterni (Figure 1). Systemic examination did not reveal any other abnormalities.

The initial laboratory investigations showed a normal hemogram, erythrocyte sedimentation rate of 80 mm/h, and...
random plasma glucose 220 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 soft tissue mass in the anterior mediastinum, which had eroded the cortex of the manubrium, extending subcutaneously over the anterior aspect of the manubrium sterni (Figure 2). The lungs and pleura were normal and there was no hilar lymphadenopathy. Ultrasonography of the abdomen was reported normal.

Fine needle aspiration cytology (FNAC) from the swelling revealed numerous epithelioid cell granulomas with mononuclear infiltrate and scattered giant cells (Figure 3). Acid-fast staining of the aspirate showed plenty of tuberculous bacilli. HIV serology was negative.

The patient was started on anti-tubercular treatment (ATT) with isoniazid, rifampin, ethambutol, and pyrazinamide after sending the aspirate from the sternal swelling for mycobacterial culture. Control of diabetes mellitus was achieved with insulin. Growth of Mycobacterium tuberculosis was noted in cultures by the fifth week. The isolates were susceptible to all the first-line anti-tuberculous drugs. After 2 months of treatment, the sternal swelling had reduced considerably in size, and his constitutional symptoms had disappeared. He was then switched over to the continuation phase of ATT with two drugs (isoniazid and rifampin) for the remaining 4 months, achieving a complete clinical recovery.

Figure 2  Computed tomography (CT) scan of the chest showing a soft tissue mass in the anterior mediastinum, which had eroded the cortex of the manubrium, extending subcutaneously over the anterior aspect of the manubrium sterni.

Discussion

Osteomyelitis of the sternum usually occurs as a complication of sternotomy, chest trauma, mediastinitis, or subclavian intravenous line insertion. The most common infecting organism in both primary and secondary sternal osteomyelitis is Staphylococcus aureus.

Tuberculosis of the sternum is rather uncommon, and when it occurs, usually results either as an extension from hilar lymph nodes or as part of hematogenous or lymphatic dissemination of the disease from other sites. Sternal tuberculosis has also been reported after BCG vaccination in the pediatric age group. Osteomyelitis secondary to the BCG vaccination is usually seen in the epiphysis of the long bones. Primary tubercular osteomyelitis of the sternum is a very rare manifestation of tuberculosis.

Most cases of tuberculous osteomyelitis have been reported in young males recently immigrated from tuberculous endemic areas. 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,\textsuperscript{10} whereas patients with pyogenic sternal infections will have a fulminant clinical course with severe systemic upset.

FNAC or trephine biopsy with histological and microbiological examination of sternal tissue for caseating granulomas and acid-fast bacilli are the methods of choice for a definite diagnosis. CT scans can be used to determine anatomical localization, osseous destruction, and soft tissue abnormalities.\textsuperscript{11} Magnetic resonance imaging (MRI) for detecting early marrow and soft tissue involvement in tuberculous sternal osteomyelitis has also been described.\textsuperscript{11} Complications of tuberculous sternal osteomyelitis include secondary infection, fistula formation, spontaneous fractures of the sternum, erosion of the large blood vessels, compression of the trachea, and rupture of tuberculous abscess into the mediastinum, pleural cavity, or subcutaneous tissues.

Aspiration and anti-tuberculous chemotherapy are the treatments of choice in sternal tuberculosis. In a recent series, 12 out of 14 patients with tuberculosis of the sternum who were initially treated with multi-drug anti-tubercular therapy, did not require any surgical interventions.\textsuperscript{12} A close follow-up is essential to detect complications that may necessitate surgery in these patients. Surgical treatment is advised when there is need for removal of a large sequestrum, when the diagnosis is doubtful, and in non-responding cases.

Early drainage and complete debridement of necrotic material from the lesions along with multi-drug anti-tubercular therapy hastens recovery. Rotational tissue flaps can be employed to cover the chest wall defect due to the extensive loss of soft tissue and bone integrity after debridement.\textsuperscript{13} Vacuum-assisted closure therapy has also been successfully employed in patients with tuberculous osteomyelitis of the sternum.\textsuperscript{14}

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\textbf{References}