Case Report

Sternal Tuberculosis in an Infant: The Presenting Feature of Disseminated Disease

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Abstract

We report the case of a 10-month-old previously healthy girl who presented with a swelling over the anterior chest wall. Radiologic, histopathology, and microbiologic tests confirmed it as a case of sternal tuberculosis (TB). The sternal disease improved after starting anti-tubercular therapy but she developed seizures due to a paradoxical reaction, leading to unmasking of a brain tuberculoma. The child is doing well after 1 year of treatment. The case is presented in view of the relatively uncommon involvement of the sternum in musculoskeletal tuberculosis (TB).

Keywords: Infant, Sternal tuberculosis, Tuberculoma

Background

Introduction

Bone tuberculosis (TB) is usually reported in older children, adolescents, and adults and is very uncommon in infants. The sternum is also rarely involved. We report here a case of disseminated TB who first presented with sternal disease and later manifested as central nervous system (CNS) disease.

Case Report

A 10-month-old female baby presented with a gradually increasing swelling over the chest wall. This was not associated with any constitutional features such as fever, weight loss, or loss of appetite. The birth and perinatal history were unremarkable. She received Bacille Calmette–Guérin (BCG) vaccination at birth. There was no history of contact with a case of TB.

On examination, she was a playful child with a weight of 9.5 kg. She had a 2 × 2 × 1 cm reddish-brown swelling over the sternum (Fig. 1). It was soft in consistency with dilated veins over the swelling. There was no local warmth or tenderness. Systemic examination was normal with no adventitious sounds in the chest.

Investigations showed a normal hemoglobin (11.5 g/dl), elevated white cell count of 25,100/cu mm with 80% polymorphs. Ultrasound scan (USG) showed a highly vascular lesion over the sternum with cortical breach and soft-tissue extension. Magnetic resonance imaging (MRI) with contrast showed focal collapse and consolidation in the apical segment of the right lung along with focal marrow replacement and cortical disruption of the sternum, associated with a large heterogeneous enhancing soft-tissue mass which had an anterior and posterior component (Fig. 2 and 3). An USG-guided biopsy of the lesion was performed which showed fibrofatty tissue fragments and acutely inflamed

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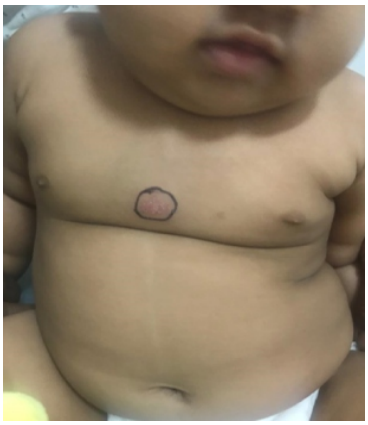

Figure 1: Clinical picture at the first presentation.

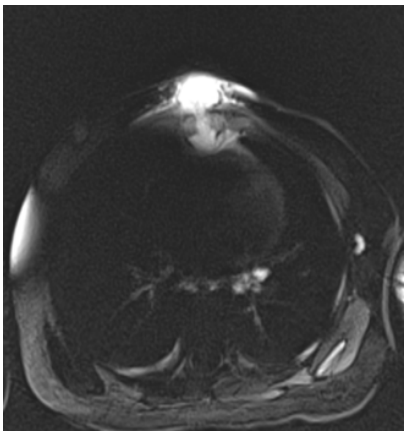

Figure 2: Magnetic resonance imaging sternum axial.

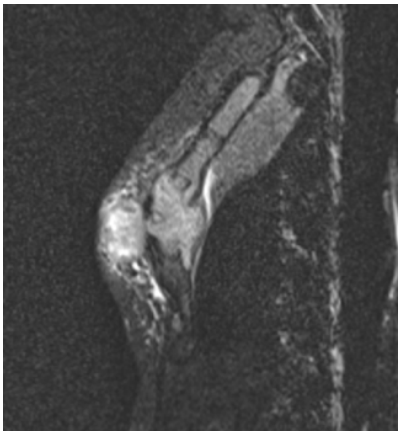

Figure 3: Magnetic resonance imaging sternum sagittal.

granulation with focal abscesses. Granulomas with Langerhans giant cells and caseous necrosis were also seen (Fig. 4). Xpert MTB/Rif was positive with no rifampicin resistance. The sample was sent for mycobacteria growth indicator tube (MGIT) culture.

A confirmed diagnosis of rifampicin-sensitive TB was made along with pulmonary TB. Treatment with standard first-line drugs including rifampicin ®, isoniazid (H), pyrazinamide (Z), and ethambutol (E) was initiated. Following the 1st month of treatment, the swelling over the sternum turned fluctuant and after the 2nd month, small granulation tissue erupted through the skin which then became ulcerative (Fig. 5). This was managed conservatively. The MGIT culture was positive and drug sensitivity testing done on the isolate showed that the isolate was sensitive to isoniazid. Treatment with isoniazid and rifampicin was continued and pyrazinamide and ethambutol withdrawn after 2 months. Four months after initiation of treatment, she developed seizures. MRI brain revealed a thick-walled, peripherally enhancing lesion in the posterior aspect of the right temporal lobe (0.4 × 0.5 cm in size) suggestive of a tuberculoma (Fig. 6). Antiepileptic therapy was instituted. At the same time, USG of sternum was repeated which showed significant reduction in size of soft-tissue lesion with resolution of the exophytic component.

The patient completed 1 year of antitubercular therapy without further complication. The sternum healed completely (Fig. 7).

Discussion

Musculoskeletal TB comprises 2–5% of all cases of TB and is usually seen in older children and adolescents [1]. Pathogenesis is by phagocytosis of the tubercular bacilli by the alveolar macrophages and subsequent bacteremia which results in deposition of the mycobacteria at different sites including bone and joints. Wallgren in his seminal paper in 1948 postulated that bone and joint TB occurs several years after infection [2]. However, recent publications allude to shorter incubation periods as seen in our patient [3]. This disseminated infection occurred despite BCG vaccination; BCG has been reported to offer protection ranging from 65% to 95% against meningeal, miliary, and disseminated TB [4].

Musculoskeletal disease in children primarily affects the spine, hip or knee joint, and small joints of the hands and feet [1]. Involvement of the sternum occurs in <1% of all musculoskeletal TB and can result from direct spread from hilar lymph nodes, hematogenous, or lymphatic dissemination from primary sites [5]. Previously reported cases of pediatric sternal TB have been in older children or adolescents who presented with a swelling or an ulcer over the sternum. The outcomes were universally good with medical therapy despite delayed diagnosis [6, 7, 8, 9, 10]. Some of these children had other sites

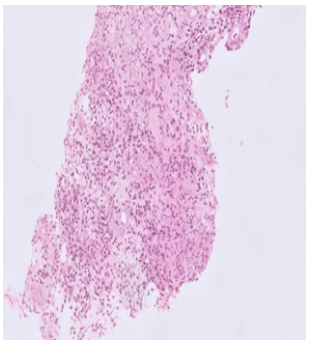

Figure 4: Histopathology slide – granuloma.

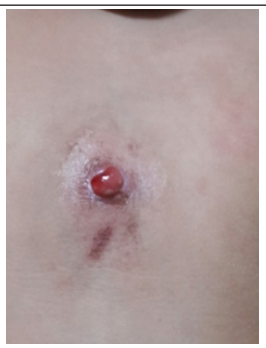

Figure 5: Clinical picture after 2 months.

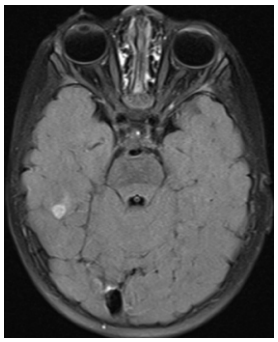

Figure 6: Magnetic resonance imaging brain – tuberculoma.

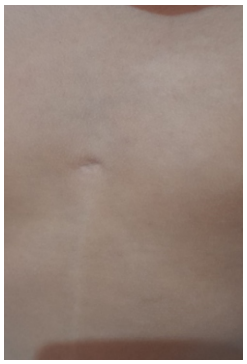

Figure 7: Healed sternal scar.

of involvement as seen in our case. Sternal TB in infancy is a rare entity with one other report from Lithuania describing sternal involvement due to BCG in a 9-month-old without immunodeficiency [11].

It is likely that the seizures occurred due to unmasking of a preexisting CNS lesion after starting antitubercular therapy. Paradoxical reactions occur due to death of the mycobacteria following initiation of anti-TB therapy akin to the immune reconstitution syndrome seen in HIV-infected individuals [12, 13]. These reactions manifest as increase in disease at the original site or appearance of lesions at new sites. Paradoxical reactions should be differentiated from an alternative diagnosis, drug resistance, and treatment failure due to non-adherence. Since in our patient, the isolate was rifampicin susceptible to begin with, compliance was good, the primary site was improving, paradoxical reaction appeared to be more likely than other possibilities. We could not demonstrate radiological resolution of the CNS lesion as repeat imaging would have necessitated general anesthesia.

Conclusion

TB should be considered as a differential diagnosis for a sternal swelling. Bacterial infections, malignancy, and lymphoma are other possibilities. The correct diagnostic pathway should include radiology (USG and MRI) followed by biopsy or fine-needle aspiration cytology. Microbiologic confirmation by cartridge-based nucleic acid amplification test (CBNAAT) and TB culture is strongly recommended. CBNAAT plays a key role in early diagnosis and also provides information regarding rifampicin sensitivity [14]. The patient should be systematically evaluated for disease at other sites. Medical management is the mainstay of treatment for TB osteomyelitis. As per Indian guidelines, the standard regime is 2HRZE and 10HRE [15]. Surgical drainage should be considered only if the abscess does not respond to medical management and aspiration [16].

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the Journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil; **Source of support:** None

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