Case Report

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Infantile Tuberculous Osteomyelitis of Proximal Tibia-Rare Occurrence: Case Report and Review of Literature

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Abstract

Skeletal tuberculosis (TB) is uncommon compared to pulmonary tuberculosis, representing 1-3% of all cases. Of these, the spine and hips are more involved. Solitary bone tuberculosis is a rare condition in infancy, has non-specific findings and can be misdiagnosed easily.

In our case report, we present tuberculosis osteomyelitis of the proximal tibia in a boy aged nine months who visited our outpatient department with painless swelling in the right leg. Diagnosis was done with radiographs, magnetic resonance imaging (MRI), open biopsy and TB-Polymerase Chain Reaction (PCR). The lesion was managed with debridement and curettage and 9 months of antitubercular chemotherapy.

Bone tuberculosis must be considered in the differential diagnosis of lytic lesions of the proximal tibial metaphysis in infancy.

Keywords: Skeletal tuberculosis, Solitary bone tuberculosis, Tuberculous osteomyelitis, Proximal tibia metaphysis

Introduction

Solitary bone tuberculosis is seen infrequently in children [1]. It commonly affects the metaphysis of the long bones in the lower extremities. The diagnosis is difficult because the clinical and radiologic findings are non-specific [2]. Solitary lesions may mimic pyogenic or fungal osteomyelitis, simple and aneurysmal bone cysts, and fibrous cortical defect/non ossifying fibroma [3]. In the literature, we were unable to identify any reports on children younger than 11 months with solitary bone tuberculosis [4]. Here, we present a case of tuberculosis of the proximal tibial metaphysis in an infant.

Case Report

A 9-month-old male patient presented with history of swelling right proximal leg which was noticed 15 days previously. The child was previously healthy with a normal birth and developmental history. All vaccinations, including BCG, were up to date.

The local examination revealed an obvious 1cm x 1cm swelling over the medial aspect of his right proximal tibia with normal overlying skin and no focal temperature change. The mass was firm, non-tender and non-pulsatile on palpation and without an associated knee effusion. The child had a full painless passive range of motion of his right knee, hip and ankle joints.

The laboratory findings were as follows: white blood cells (WBC): 15.1×109/L

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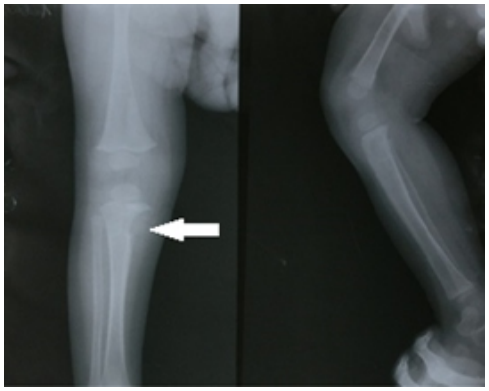

Figure 1: X-ray right knee showing lytic lesion of proximal tibial metaphysis

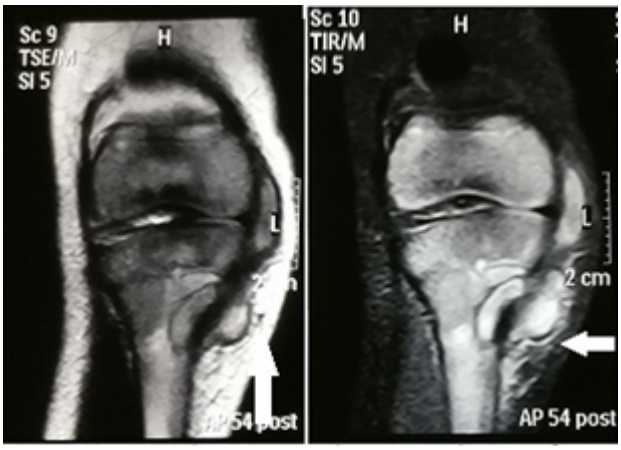

Figure 2: T2W & STIR coronal sections showing foci with cortical break and scalloping no physical involvement.

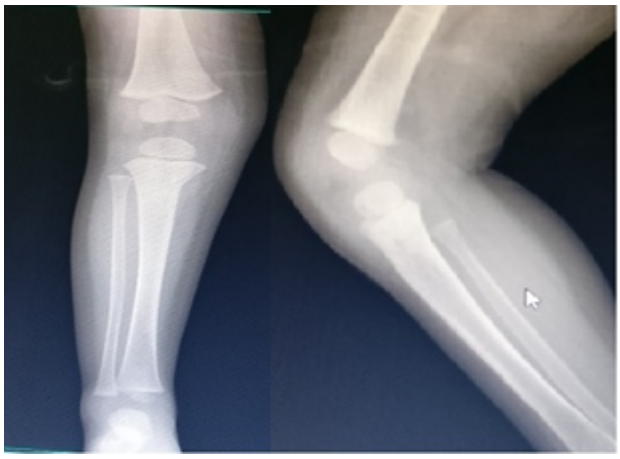

Figure 3: Steps 4 months post op with complete healing of bone defect

with normal differential count, erythrocyte sedimentation rate: 15 mm/h, C-reactive protein: 8.6 mg/L.

X-ray of the right knee showed a lytic lesion measuring 0.5 cm x 1 cm on the medial aspect of the proximal tibial metaphysis as well as moderate soft tissue swelling over medial aspect of the right knee (Figure 1). Chest X-ray was normal.

High resolution sonography of right knee showed upper third tibial metaphyseal cortical defect with soft tissue component and further evaluation by MRI was suggested.

Plain MRI revealed an exophytic soft tissue focus measuring 1.8 x 1.6 cm in the meta-diaphyseal area with cortical break and scalloping. Soft tissue involvement was seen. No effusion or articular involvement was noted (Figure 2).

Suspecting subacute osteomyelitis, an open biopsy was performed for definitive diagnosis. Intraoperatively, an organized collection of soft tissues and bony fragments were seen over the anteromedial aspect of the right proximal tibia without growth plate involvement. Specimens were sent for bacteriological studies and histopathological examination. Surgery was completed with thorough debridement and curettage of the area.

Histopathological examination confirmed necrotizing granulomatous inflammation with Langerhans giant cells suggesting tuberculous osteomyelitis. No acid-fast bacilli were seen with microscopy and culture results were negative. TB PCR of specimen confirmed the diagnosis.

Post operatively, an above-knee slab was applied for 3 weeks and Quadruple tuberculosis treatment (isoniazid, rifampin, ethambutol and pyrazinamide) was started as per weight in daily fixed-drug combination basis. Mantoux screening of close contacts was positive for the maid in the child's home.

ATT (Anti-TB treatment) was continued for a period of 9 months (2 months Intensive phase HRZE & 7 months Continuation phase HRE) as daily fixed-drug combination. Ophthalmology consultation every 2 weeks ruled out the possibility of retro bulbar neuritis. Liver function was evaluated every month.

Child was followed up for 1 year with complete bony healing on X-rays (Figure 3).

Discussion

Infection caused by Mycobacterium tuberculosis may affect all organs and tissues [5]. Skeletal tuberculosis accounts for around 10 to 20 per cent of all extra pulmonary TB cases and only between 1 and 3 per cent of all TB cases [6]. Concurrent pulmonary TB is present in less than 50 per cent of skeletal tuberculosis cases in children [7]. The axial skeleton is most commonly involved in adults, while peripheral skeletal involvement is more common among children [8]. The commonly affected sites in TB osteomyelitis are, in order of frequency, the spine, femur, tibia and fibula [9].

Skeletal system involvement in children is generally observed in multiple localizations and develops secondary to lung tuberculosis in association with immune deficiency. Solitary bone involvement is seen rarely in children. Therefore, lung radiography and family screening are recommended in patients with bone and joint involvement [1, 10]. Immune deficiency was not found in our patient.

TB bacilli reach the proximal tibia by haematogenic spread resulting in a metaphyseal focus. In children younger than one-and-a-half years further spread to the epiphysis occurs through

the patent transphyseal vessels from this metaphyseal focus [8]. In most cases, the diagnosis of tuberculous osteomyelitis is delayed by up to 6 months. It usually presents as swelling only or swelling and stiffness or pain [11].

Radiological signs include, but are not limited to: changes in the joint space, subchondral erosions, lytic bone lesions and articular osteopenia [12]. Markers of acute infection or inflammation including ESR and CRP are elevated but are non-specific [13]. A definite diagnosis must be made by biopsy and culture. Granulomatous inflammation found in histologic examination supports the diagnosis [6]. For faster diagnosis, polymerase chain reaction (PCR), which is a nucleic acid reproduction method, may be used, but one should be careful about false-negative results [6]. In our case the diagnosis was made from biopsy and TB-PCR.

Treatment can consist of either TB chemotherapy alone or surgical debridement and TB chemotherapy, but many authors believe TB chemotherapy alone for 9 to 12 months to be sufficient [14].

Conclusion

As is evident from the aforementioned literature, infantile tuberculous osteomyelitis of the proximal tibia is encountered very rarely. Hiddema et al [15] reported the youngest case of TB osteomyelitis proximal tibia till date. It was a case of 22-month-old infant with TB of the proximal tibia involving the growth plate, where extensive surgical curettage of the growth plate was initially done resulting in no long-term growth abnormality.

This article serves as a reminder that in order to make an early diagnosis of TB osteomyelitis in children, a high index of suspicion is needed. Furthermore, the absence of pulmonary TB does not exclude the diagnosis of infantile tuberculous osteomyelitis.

Long-term anti-TB chemotherapy following initial debridement yields good results with only a few reports of growth-related complications. As it is a rare condition, further reports with longer term follow-up are warranted. This will enable us to better understand long-term growth disturbances in children with TB osteomyelitis.

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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