



Isolated first metatarsal Tuberculous osteomyelitis in a pediatric patient: A Case Report

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Abstract:

Skeletal Tuberculosis (TB) commonly affects the spine and large joints like the hip and knee. Only a few cases of isolated metatarsal involvement have been reported. However, because skeletal TB can mimic a wide range of acute and chronic conditions, it needs a high index of suspicion to prevent further joint involvement and damage. We report a case of a two-year-old female patient complaining of mild to moderate right foot pain on palpating or wearing socks. Then after minor trauma, she started to have swelling in the right upper dorsum of the right foot with red discoloration and pain upon touch. X-ray and MRI of the right foot showed osteomyelitis of the first metatarsal in the right foot. However, the clinical presentation did not match the radiological finding. Thus, an open biopsy was requested, and a diagnosis of TB Osteomyelitis was made based on the low-detected Mycobacterium tuberculosis Complex. The patient started on Anti-TB regimen for one year. The patient responded to Anti-Tuberculosis drugs well, and pain and swelling have completely disappeared.

Keywords: Bone TB, tuberculosis, metatarsal, case report.

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Supplementary information The online version of this article (<https://doi.org/xx.xxx/xxx.xx>) contains supplementary material, which is available to authorized users.

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Introduction

Tuberculosis (TB) is the most serious public health problem in many countries. Although TB commonly affects the lungs, it can also spread to other body parts. This is known as extrapulmonary TB (1). Skeletal TB is prevalent in the pediatric age group, with about 5-6% of extrapulmonary TB (2). Moreover, the Spine and large joints like the hip and knee are commonly affected by TB. However, only a few cases of isolated metatarsal involvement have been reported (3).

Skeletal TB and Ankle and foot TB (AFTB) can mimic other diseases such as pathological fractures, non-unions, dislocations, arthritis, ankylosis, instability, limb deformity, osteomyelitis, and a wide range of acute and chronic conditions. Therefore, The diagnosis of AFTB needs a high index of suspection; otherwise will be delayed or missed (2).

Even though most TB cases involving the foot and ankle are managed with TB chemotherapy, there are some indications for surgery. Surgical intervention can also prevent joint destruction or the spread of disease to adjacent joints if executed appropriately (4). We report a case of a two-year-old girl with right first metatarsal bone TB Osteomyelitis. We propose that physicians should be aware and have a high index of suspection for skeletal TB, particularly in exceptional localization.

Case presentation

We are reporting a case of a two-year-old female who is medically free. She came to the Emergence Department complaining of right foot pain. Three months back, she started to have right first meta-tarsal mild to moderate pain on palpating or wearing socks, no change in the range of movement, no limping, and no other joints involved.

Afterward, one month after the first pain episode, she had a minor trauma (the phone falling on her foot) resulting in swelling in the right upper dorsals of the right foot, with red discoloration and pain upon touch. After five days, she sought medical attention as the swelling, and the pain did not improve. Therefore, she did a foot x-ray; she was reassured and advised to wait one month. After one-month patient's symptoms did not improve. As a result, she sought medical attention again, and she did another foot x-ray which showed osteomyelitis of the first metatarsal in the right foot (Figure 1).

After one month patient had another foot trauma that resulted in swelling in the medial aspect of the right foot, tender and red, with no limitation of motion. Consequently, the patient did an MRI that showed metatarsal osteomyelitis and distal shaft intra-osseous abscess (Figure 2). The patient had no history of other bone or joint pain, no history of rash, no history of upper respiratory tract infection, and no history of visual problems. There was no history of constitutional symptoms, and the patient had no previous admission or surgical history. The mother had vaginal tract bacteria and was treated with a one-year course of Ethambutol, Azithromycin, and Rifampicin.

On examination, she is vitally stable (Table 1). She can move but could not be adequately assessed due to pain. All serological parameters were within normal limits except for low detected MTB complex (Table 1). After consultation, A biopsy was recommended by the pediatric radiology consultant because the clinical picture did not match the radiological findings. In an open biopsy of the Right foot, Pus-like material came out from the bone sinus at the first metatarsal bone. Samples were sent for cultures and histopathology. Histopathology showed Remodeling cortical bone with periosteal inflammation, marrow edema, fibrosis, and chronic inflammatory cell infiltrate, which are compatible with chronic osteomyelitis.

TB Osteomyelitis was diagnosed based on MTB Complex and the mother's medical history. The plan was to start Anti-TB medication (Isoniazid 10mg/kg/day, Ethambutol 15mg/kg/day, pyrazinamide 15mg/kg/day, and Rifampicin 10mg/kg/day + Pyridoxine (Vit B6) 1mg/kg/day) for 12 months. Furthermore, the baseline liver function test, TB workup, and chest x-ray showed no abnormality. After 12 months of follow-up, the pain completely disappeared.

Table (1): Serological parameters and microbiological work-up of the case.

Investigations	values
Vital signs	BP:104/56, HR:94, RR: 22, O ₂ sat 99% on RA, Temp:36
WBC	8.29
Hb	13.1
Hct	39.3

<i>MCV</i>	71.1
<i>MCH</i>	23.7
<i>MCHC</i>	33.3
<i>PLT</i>	309
<i>PT</i>	12.4
<i>APTT</i>	43.3
<i>INR</i>	1.10
<i>CRP</i>	< 2.98
<i>Souduim</i>	138
<i>potassium</i>	4.3
<i>chloride</i>	106
<i>Urea</i>	3.8
<i>Creatinine</i>	23
<i>calcium</i>	2.50
<i>Phosphate</i>	1.92
<i>Total Protein</i>	66
<i>Albumin</i>	48
<i>ALP</i>	259
<i>MTB complex:</i>	Low detected
<i>AFB stain</i>	Negative
<i>AFB Culture</i>	No organism.
<i>Bacterial swab culture:</i>	No organism.
<i>Fungal swab culture:</i>	No fungal infection.

WBC, White blood cells; Hb, hemoglobin; Hct, hematocrit; MCV, mean corpuscular volume; MCHC, mean corpuscular hemoglobin concentration; PLT, Platelet count; PT, Prothrombin time; APTT, Activated Partial Thromboplastin Clotting Time; INR, international normalized ratio; CRP, C-reactive protein; ALP, alkaline phosphatase; MTBC, Mycobacterium tuberculosis Complex; AFB, Acid-Fast Bacilli.

Discussion

The evidence showed that TB affects bones and joints in up to 3% of patients, mostly involving the spine and major joints such as the hip and knee. Approximately 10% of osteoarticular TB (OAT) occurs in the foot bones, with calcaneum the most commonly affected, followed by metatarsals and phalanges (3,5). Metatarsal osteomyelitis has an incidence of 0.5%, and adults usually experience this type of lesion (6,7). Several authors suggest that trauma can contribute to OAT development by reactivating dormant Koch's bacillus. However, others believe trauma is the cause of consultation (8).

Skeletal TB diagnosis can easily be missed due to nonspecific clinical features and the absence of systemic manifestations such as fever, night sweats, and weight loss (9). However, in case of long-standing pain, swelling, restriction of movements, and sometimes the formation of abscesses and discharging sinus in the foot, AFTB must be rolled out (10). Furthermore, to confirm the diagnosis, bacteriological and histological analyses must be conducted after the surgical biopsy (11).

Our two-year-old patient presented with chronic foot pain since three months that got swallowed and red after minor trauma without the restriction of movement and normal serological parameters except low detected MTB complex. In comparison, there are several reports of post-traumatic tuberculosis cases induced by falling, slipping, or falling off heavy objects but no reported cases of minor trauma. Additionally, there is an extended presentation period from two

months to one year and a half. Moreover, there is a wide variation in presentation between the cases. Most of the described cases lack constitutional symptoms, swelling, and chronic foot pain not relieved by analgics. In addition, slight elevation of inflammatory markers (ESR and CRP) (12).

Long-term anti-tubercular therapy is primarily used for treating bone TB: isoniazid, rifampicin, pyrazinamide, and streptomycin for two months; then isoniazid and rifampicin for ten to fourteen months; immobilization is also used to eradicate Mycobacterium tuberculosis, but radiological lesions improve slowly until complete osseous reconstruction, leaving painful sequelae and deformities (13). In advanced cases of bone destruction, surgical intervention is indicated. Surgery performed after recovery is primarily to relieve pain, correct deformities, or reconstruct joints (4).

Conclusion

Tubercular osteomyelitis is a rare condition and is usually described in adults. Thus, it can be easily missed. However, this case shows a variety of unusual findings as it isolated metatarsal tuberculosis in skeletally immature child. The challenging part in such a case is that Tubercular lesions can mimic other common diseases. Therefore, no site or age group can be considered safe until a high suspicion is kept. Moreover, an early biopsy in such lesions avoids undue delay in diagnosis.

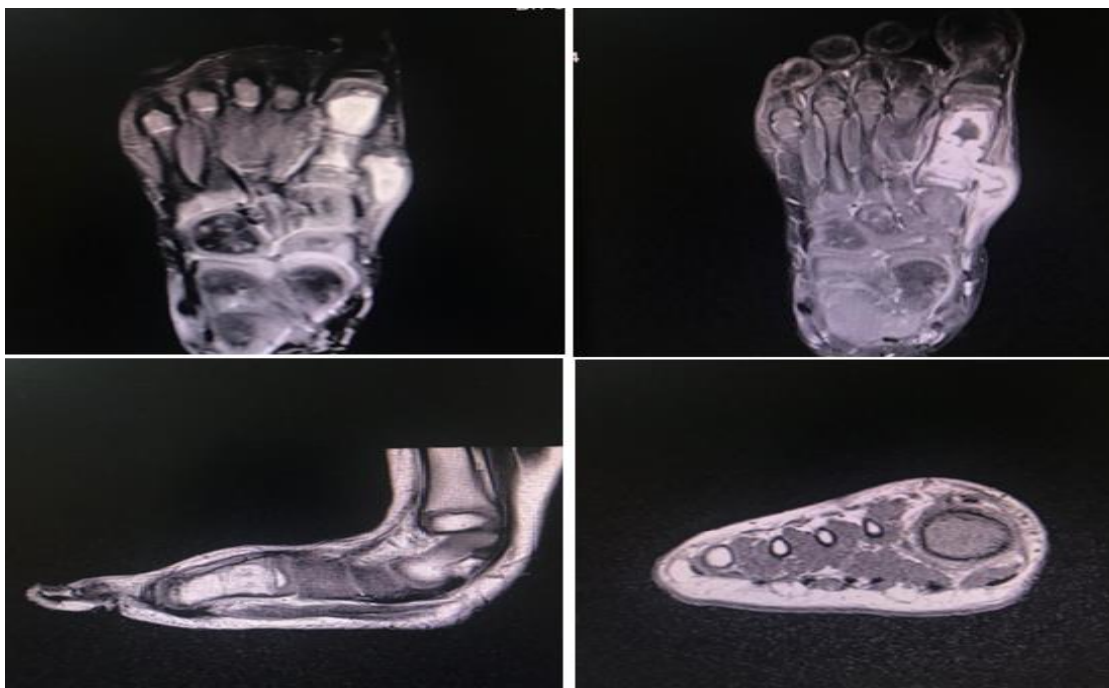
Figure 1.

Plain X-Ray (Antero– posterior and oblique view) of right foot Showing diffuse sclerosis and medullary expansion of the first metatarsal bone with persistent focal cortical break at the proximal medial aspect.



Figure 2.

MRI (Axial – sagittal - coronal) of right foot Showing osteomyelitis in first metatarsal joint and distal shaft intra-osseous abscess.



Disclosures

Human subjects: Consent was obtained or waived by the participant in this study.

Conflicts of interest: In compliance with the ICMJE uniform disclosure form, all authors declare the following:

Payment/services info: All authors have declared that no financial support was received from any organization for the submitted work.

Financial relationships: All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work.

Other relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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