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Case Report

CASE REPORT

An isolated case of first metatarsal tuberculosis

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Abstract

An apparently healthy adolescent presented to us with multiple discharging sinuses from his right foot for the past 1 year. All serological parameters were within normal limits. X-ray picture revealed an expansile osteolytic lesion of first metatarsal. Tissue biopsy and PCR confirmed it be of tubercular etiology. The incidence of isolated occurrence of metatarsal tuberculosis is very rare and the diagnostic dilemma it brings about is briefly discussed in the following report.

INTRODUCTION

Globally, the incidence of missed cases of tuberculosis (TB) is on the rise and factors responsible for it are multifaceted. One of the major factors is the ability of TB to emulate a wide variety of common clinical conditions with similar presentations. An otherwise healthy young individual with no contact history of TB and no medical co-morbidities presented with TB of an unusual location. This led to delay in diagnosis and management. Skeletal TB constitutes only 3–5% of all forms of TB cases. Spine being the predominant region, it not uncommon to miss osteoarticular TB occurring in unusual location.

CASE REPORT

A 19-year-old boy presented to our foot and ankle clinic with pain and wound over right foot for past 1 year. There was 'watery' discharge coming from the wound on and off which started spontaneously and subsided by taking antibiotics. There was no history of trauma or any constitutional symptoms. On examination, there were five active discharging sinuses over dorsum of right foot all clustered around first and second ray (Fig. 1). All serological parameters were within normal limits (Table 1) and chest X-ray was also apparently normal. X-ray of foot revealed an expansile osteolytic lesion of the first metatarsal shaft with cortical thinning (Fig. 2). MRI of foot revealed a lytic lesion measuring 26 × 22 mm involving the head, proximal shaft and base of first metatarsal and a sequestrum within the bone (Fig. 3). With preliminary diagnosis of chronic osteomyelitis (pyogenic/tubercular/fungal/parasitic), open biopsy and wound debridement was planned. A formal dorsal approach to the first metatarsal was employed. The medullary cavity was found to be filled with caseous material with thinning of the overlying cortex (Fig. 4). The cavity was thoroughly curetted, sinus tracts were excised and the samples were sent for histopathological and microbiological work-up (Table 1). Under the microscope, extensive areas of caseous necrosis surrounded by lymphocytes and epitheloid cells were observed, which is typical of tubercular pathology (Fig. 5). He was started on an anti-tubercular regime comprising of four drugs (Isoniazid, Rifampicin, Pyrazinamide and Ethambutol) daily for 2 months followed by two drugs (Isoniazid and Rifampicin) daily for 10 months. Patient was given a below knee slab support and advised non-weight-bearing walking for 6 weeks, followed by partial weight bearing with walking boot for another 6 weeks. Patient is currently in the 10-month follow-up of 12 months planned treatment with healed sinuses and no fresh complaints.

DISCUSSION

TB is known to affect bones and joints in up to 1–3%, of which majority is the involvement of spine and major joints like hip and knee. About 10% of osteoarticular TB is known to affect the foot bones with calcaneum being the commonest followed by

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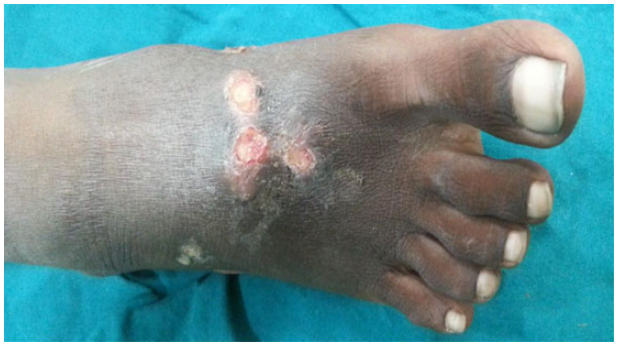

Figure 1: Picture showing multiple discharging sinuses over dorsum of right foot.

Table 1: Serological parameters, histopathological and microbiological work-up of the case

Investigations	Reports (reference values)
Hb	9.1 (13–17 g/dl)
TLC	10.4×10^3/µl ($4–11 \times 10^3$)
DLC	Lymphocytes—32% Neutrophils—57%
ESR	19 (0–20 mm/h)
CRP	7.1 (0–6 mg/l)
Glucose (random)	81 (60–140 mg/dl)
Total protein	7.30 (6–8 g/dl)
Serum albumin	3.90 (3.5–5 g/dl)
ALP	92 (50–390 U/l)
HIV 1&2 (ELISA)	Negative
AFB (wound swab)	No AFB seen
Mycobacterial culture	Negative (8 weeks)
Fungal culture	Negative (8 days)
PCR (nested)	Positive
Tissue biopsy	Necrotizing granuloma seen

Hb, hemoglobin; TLC, total leucocyte count; DLC, differential leucocyte count; ESR, erythrocyte sedimentation rate; CRP, C-reactive protein; ALP, alkaline phosphatase; ELISA, enzyme-linked immunosorbent assay; AFB, Acid-Fast Bacilli; PCR, polymerase chain reaction.

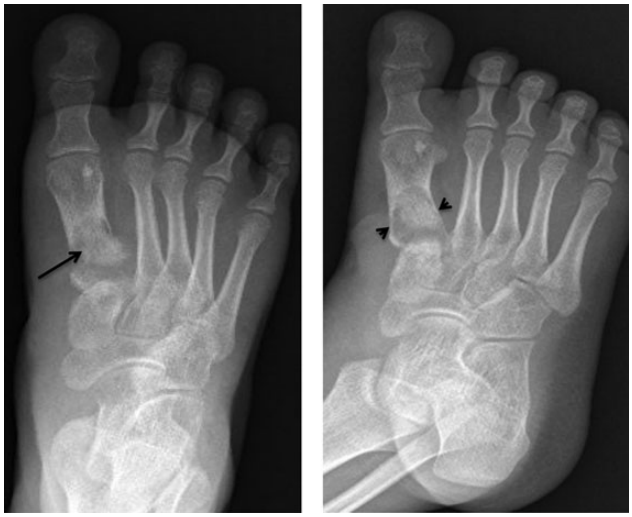

Figure 2: Plain X-rays (antero-posterior and oblique views) of right foot showing an expansile osteolytic lesion (arrow pointing) with thinning of overlying cortex (arrow heads) of the first metatarsal.

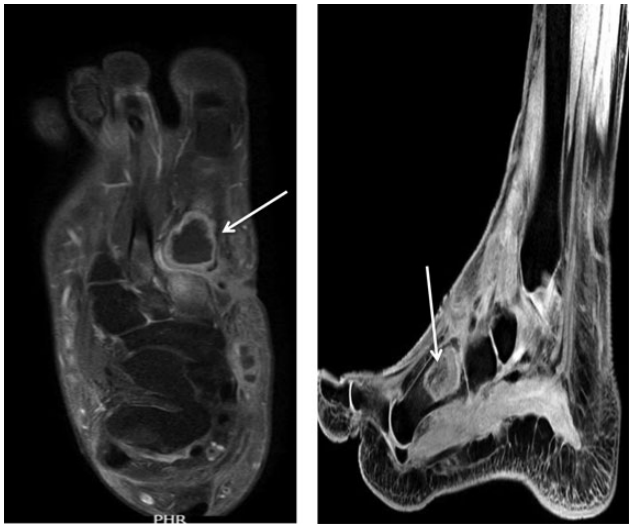

Figure 3: MRI scans: axial and sagittal views. T_2-weighted images (white arrows pointing the site of lesion).

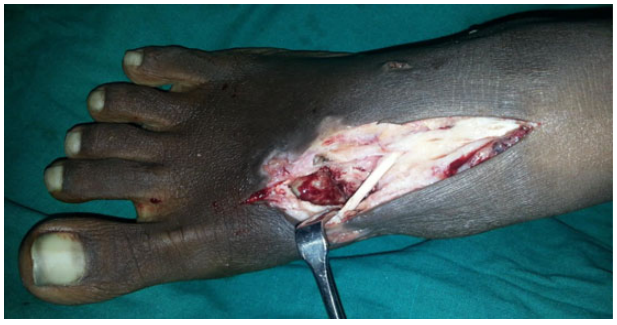

Figure 4: Intraoperative picture showing the cavity of first metatarsal.

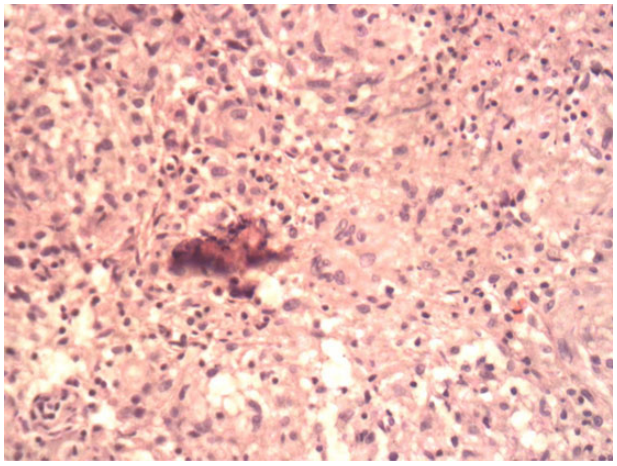

Figure 5: Tissue biopsy showing classical necrotizing granuloma. H&E staining (40× power).

metatarsals and phalanges [1]. The literature review suggests an incidence of <0.5% for metatarsal osteomyelitis [2], among which first and fifth are frequently involved [3]. In 2012, it was noted that

there have been about 35 cases of TB metatarsals documented in the English literature [3] and recently another case of TB arthritis of the second toe metatarsophalangeal joint has been described [4].

Clinical manifestations of TB metatarsals include chronic foot pain, swelling, difficulty in walking and in long-standing cases, discharging sinuses/wound and pathological fractures. Constitutional symptoms such as weight loss, loss of appetite and fever are seldom seen [5]. Another common etiology attributed for multiple discharging sinuses from the foot is Madura mycosis, a chronic fungal infection of skin, subcutaneous tissue and bone. Incidentally, TB and Madura mycosis, both are endemic in tropic and subtropic regions [6]. Serological parameters in TB metatarsals, like total leucocyte count, ESR and CRP, and joint fluid aspiration are all inconclusive most of the times [7]. *Mycobacterium* organism is rarely isolated from the samples taken from wound discharge. Chest X-ray will also be apparently normal in majority of times, although like all other forms of extrapulmonary TB, TB metatarsals are also secondary to lymphohematogenous dissemination from lungs to bones [5].

Radiologically, five types of bone lesions for osteoarticular TB of foot bones are described: cystic, rheumatoid, kissing, subperiosteal and spina ventosa [1]. Among these, TB metatarsal can present with cystic or spina ventosa like picture. However, these presentations are not exclusive of TB and are usually confused with miscellaneous infections or tumorous conditions such as chronic pyogenic osteomyelitis, enchondromata, syphilitic dactilitis, fibrous defect, sarcoidosis, brucellosis, Brodie's abscess, fungal osteomyelitis (Madura foot) and ganglion [3, 8]. On the contrary, it is not uncommon to initiate an 'empirical' antitubercular regimen for these conditions, especially in tubercular endemic belts.

With a picture mimicking numerous diverse disorders, the diagnosis and subsequent management is invariably delayed unless there is a high index of suspicion. A preliminary radiological screening with CT/MRI/PET scans is sometimes helpful to differentiate infections and tumors; however, the earliest confirmation to a diagnosis is usually made by open biopsy and PCR analysis of tissue samples. Besides biopsy, surgery is also indicated for debridement and curettage of the lesion, especially in long-standing cases harboring sequestrum.

After thorough wound toilet, it is preferable to support the limb with a posterior splint and advice non-weight-bearing walking for at least 6 weeks to prevent inadvertent pathological fractures. Medical management by multidrug regimen remains the mainstay of treatment. It comprises of four drugs (Isoniazid, Rifampicin, Pyrazinamide, and Ethambutol) daily for 2 months in the intensive phase followed by two drugs (Isoniazid and Rifampicin) daily for 10–18 months depending up on response to treatment. With the advent of multi-drug resistant forms (MDR-TB), it is desirable to routinely work up for the sensitivity of the organisms by sequencing the rifampicin resistance-determining region of the rpoB gene (positive predictive value >95%) and start the regimen accordingly. Compared with conventional culture-based methods, the rapid detection of rifampin-resistance using molecular methods can enable earlier initiation of effective therapy, reduce periods of infectiousness of MDR-TB cases and improve patient outcomes; all of which may have a large impact on efforts to control MDR-TB [9]. Unfortunately, this is not routinely undertaken in developing countries (resource-limited settings) and MDR-TB is usually suspected in the event of failure to improve or worsening of symptoms despite on treatment. Likewise, the index case was also not tested for the drug sensitivity, however, has responded well to the regular regimen. Unlike pulmonary TB, in osteoarticular TB, most of the treating physicians prefer to keep the continuation/maintenance phase (Isoniazid and Rifampicin) for 10–18 months; however, the protocol or the duration of treatment remains at best ambiguous. Generally, combined clinical and radiological improvements are taken into account regarding deciding the termination of the regimen. Clinical signs of improvement include a weight gain, decrease in pain and swelling, and healing up of sinuses. Radiological signs of healing, however, usually lag behind clinical improvement by several weeks. Prognosis is generally good unless adjacent joints are involved.

CONFLICT OF INTEREST STATEMENT

None declared.

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