

CASE REPORT

Multifocal Tubercular Osteomyelitis of Metatarsal and Ulna: A Case Report

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ABSTRACT

Introduction: Skeletal tuberculosis is relatively uncommon compared with the pulmonary form of tuberculosis. Bones and joints are affected in 1–3% of all cases, the spine and hip are most commonly involved. Localization in the foot is very rare. Management of tubercular osteomyelitis of metatarsals includes medical/surgical or both depends on the severity and location of the disease.

Case description: A 25-year-old female patient presented with complaints of pain, swelling over the medial aspect of the right foot for 6 months. She had a history of left proximal ulna tubercular osteomyelitis 6 years ago, for which curettage was done and she took AKT for 6 months. X-ray foot showed a cavitary lytic lesion in the proximal part of the first metatarsal bone. It was managed with debridement, curettage, and saucerization of the metatarsal bone and CAT2 AKT. At present 1-year follow-up, the patient is comfortable with no pain, difficulty in weight-bearing, and no recurrence. X-ray foot revealed complete filling of the defect in the metatarsal with remineralization with no recurrence and fracture.

Conclusion: Although metatarsal and olecranon tubercular osteomyelitis involvement is rare, early diagnosis and management help in getting a better outcome. Early surgical intervention and anti-tubercular treatment help in preventing further progression to adjacent joint/bone/soft tissue. Along with long-term AKT, high protein and nutritious diet help in maintaining good immunity and helps in preventing recurrence.

Keywords: Anti-tubercular treatment, Curettage, Metatarsal and ulna, Tubercular osteomyelitis.

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INTRODUCTION

Skeletal tuberculosis is relatively uncommon compared to the pulmonary form of tuberculosis. Bones and joints are affected in 1–3% of all cases,^{1,2} the spine and hip are most commonly involved. Localization in the foot is very rare. About 10% of osteoarticular tuberculosis is known to affect the foot bones with calcaneum being the commonest followed by metatarsals and phalanges.² The literature review suggests an incidence of <0.5% for metatarsal osteomyelitis, among which first and fifth are frequently involved. Osteoarticular tuberculosis usually affects weight-bearing joints, with 15% being polyarticular but non-weight bearing joints affected by tuberculosis, such as the elbow, are not frequently reported in the medical literature. The tubercular infections of metacarpals/metatarsals and phalanges are known as dactylitis. The main mode of spread is bacilleemia via blood, lymph nodes, and seeding to different locations. The multifocal tuberculosis is seen in individuals with weak innate or acquired immunity owing to diabetes and other comorbid conditions, immune therapy, substance abuse, or HIV. The occurrence of multifocal tuberculosis in an immune-competent patient is very rare. Management of tubercular osteomyelitis of metatarsals include medical/surgical or both depends on the severity and location of the disease. The treatment aims to get the painless weight-bearing foot with biological control of the disease. We present a case of a young patient with tuberculosis osteomyelitis of metatarsal and ulna and their management.

CASE DESCRIPTION

A 25-year-old female patient came to OPD with complaints of pain, swelling over the medial aspect of the right foot for 6 months. The patient was apparently alright 6 months ago when she started having pain over the medial aspect of the right foot and she took analgesic treatment for the same but pain increased

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over the period of time and also swelling gradually increased over the period of 6 months patient noticed pus discharge from the same area since 15 days. The patient had a history of pulmonary tuberculosis nine years back for which she took 6 months of AKT and she also had a history of left proximal ulna tubercular osteomyelitis 6 years ago, for which curettage was done and she took AKT for 6 months (Fig. 1).

On examination, deep tenderness was present along with active discharge from the medial aspect of the foot. Wound measuring 1.5 × 1.5 cm size was present over the medial aspect of the foot with purulent discharge (Fig. 2). Blood investigations were normal with raised ESR and CRP.

X-ray foot AP, lateral and oblique views showed a cavitary lytic lesion in the proximal part of the first metatarsal bone (Fig. 3) with thinning and break in the inferomedial aspect of the metatarsal cortex. MRI foot showed bone marrow edema in the first metatarsal along with cortex destruction and soft tissue edema with sinus over the inferomedial part suggestive of osteomyelitis (Fig. 4). As the patient had active discharge, sinus, and bony destruction, we planned for surgical management.

Surgery was performed under spinal anesthesia with all aseptic precautions in the supine position and limb in external rotation. The incision was taken over the area of the wound, dead, and necrotic soft tissue and bone were removed with sinus excision. Debridement, curettage, and saucerization of metatarsal bone left a defect of about 2 × 1 cm in the inferomedial aspect (Fig. 5). Local debridement was done bony curettage until the small petechial bleed comes, wash given and the wound was closed. Intraoperative samples were sent for culture sensitivity and histopathological examination and Genexpert for tuberculosis. The postoperative X-ray showed the complete removal of dead bone with a defect in the metatarsal (Fig. 6).

Histopathological examination confirmed the diagnosis of tuberculosis and Genexpert which showed multidrug-resistant tuberculosis. The patient was started on CAT2 AKT (second line anti-tubercular treatment as per weight Tab. bedaquiline, Tab. cycloserine, Tab. linezolid, Tab. clofazimine, Tab. levofloxacin, and Tab. pyridoxine).

In 20 days, wound was healed completely (Fig. 7), weight-bearing was started after 3 months. At present 1-year follow-up, the patient is comfortable with no pain and difficulty in weight-bearing with no recurrence. X-ray foot revealed complete filling of the

defect in the metatarsal with remineralization with no recurrence and fracture (Fig. 8).

DISCUSSION

The most commonly affected sites of tuberculous osteomyelitis are the spine, hip joint. Less frequently affected is the hand and foot.³⁻⁵ Skeletal tuberculosis of the foot is very uncommon and usually affects the calcaneus, talus, first metatarsal bone, navicular bone, and medial and intermediate cuneiform bones.^{1,2,6} The diagnosis depends on proper medical history, clinical and radiological examination, laboratory tests (blood count, ESR, CRP), microbiological and histological examination (grams stain, AFB stain). The clinical manifestation consists of pain, swelling, stiffness and muscle atrophy. Chronic discharging sinus or chronic skin ulcer may be present.⁷ The radiological investigations like CT scan and MRI help to identify nearby structures involved and the joint involvement if any. Also, the dead bone within the infective foci can be identified.

The current line of management for MDR TB is 2nd line oral AKT as per weight basis: Tab. BDQ 400 mg Od × 2 weeks f/b. 200 mg thrice weekly × 22 weeks, Tab cycloserine od, Tab linezolid od, Tab clofazimine od, Tab levoflox or moxiflox od, Tab pyridoxine 100 mg od. If drugs show resistance then we can replace those drugs with other 2nd line AKT drugs-inj kanamycin, amikacin, PAS, ethionamide.

The radiological pattern is usually osteoporosis, bone expansion with reactive sclerosis, periosteal reaction, reduced joint space, soft-tissue swelling, and the progressive destruction of the joint, with a typical aspect of the cystic expansion of the



Figs 1A to C: Lytic lesion (tubercular osteomyelitis) in olecranon and healed wound of the same



Figs 3A and B: Preoperative X-ray showing lytic lesion in the first metatarsal



Figs 2A and B: Preoperative clinical picture shows swelling, wound, and pus discharge

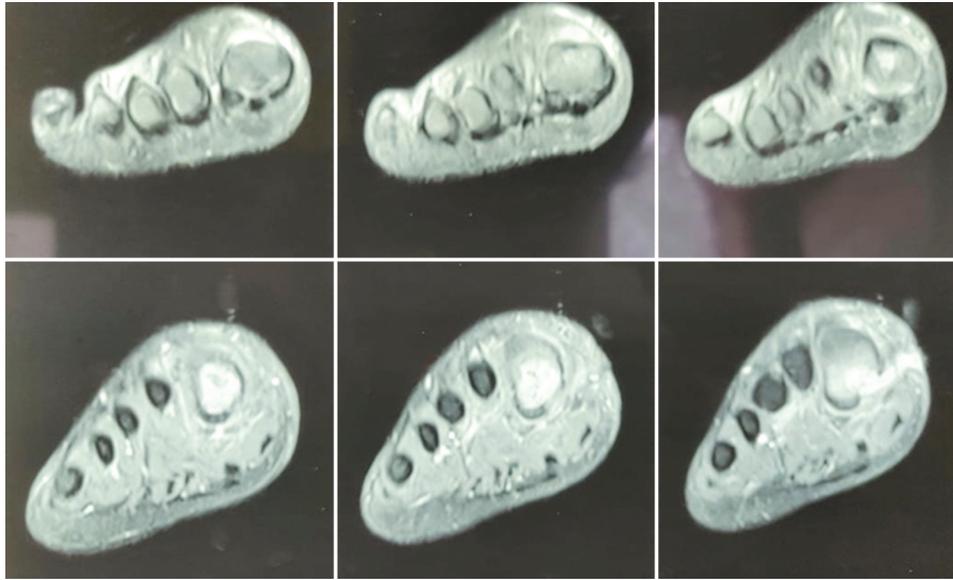
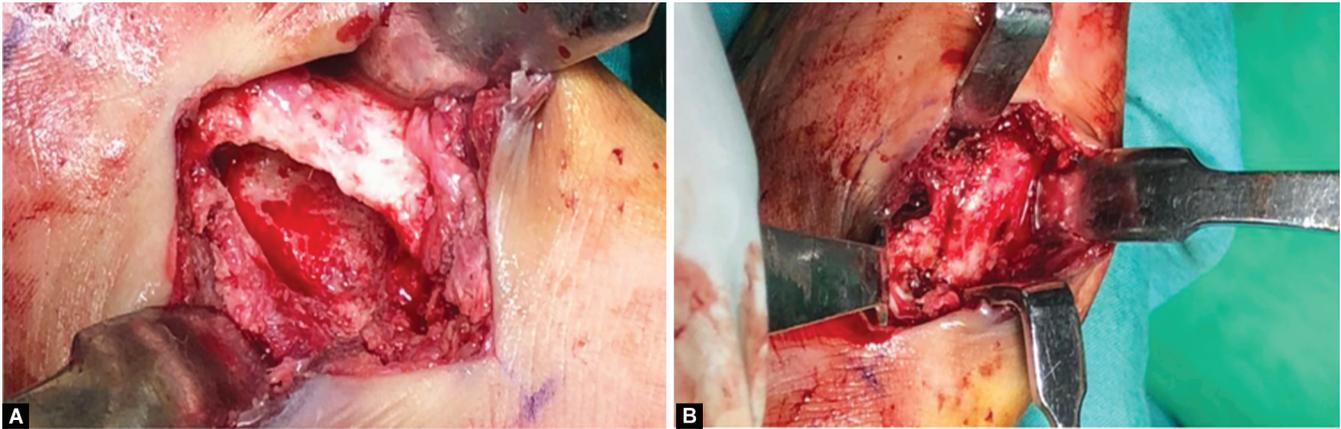


Fig. 4: MRI foot showing bone marrow edema and soft-tissue involvement



Figs 5A and B: Intraoperative picture showing the cavity in the metatarsal after curettage and debridement



Fig. 6: Immediate postoperative X-ray

short tubular bones named spina ventosa.^{1-3,8-10} MRI helps in identifying the soft-tissue and marrow involvement before plain radiography. A long-term course of anti-tubercular drugs is the main treatment. Debridement and curettage with resection of destroyed or sequestrated metatarsal bone may be indicated in non-healing lesions. In the present case, the large involvement of soft tissue suggested a need for debridement and curettage, followed by an anti-tubercular treatment. Good functional results have been achieved with conservative treatment in cases affecting the metatarsal and phalanges, and rehabilitation has been successful even when joint destruction was present. Resection of the destroyed metatarsal bone is rarely necessary.

The disease was considered to be healed when (a) local or systemic symptoms disappeared (including the healing of sinuses), (b) there was no elevation or change in serial erythrocyte sedimentation rates, and (c) there was radiologic evidence of remineralization, obliteration of cavities, decrease in osteoporosis, and restoration of trabeculae.¹¹ The above-mentioned findings were also observed in our case (Table 1).



Figs 7A and B: Postoperative wound status and healed scar



Fig. 8: Follow-up X-ray at 1-year shows mineralization of the defect

Table 1: The review of literature of the foot and ankle TB

<i>Author</i>	<i>Year</i>	<i>Diagnosis</i>	<i>Management</i>
1. Vijay et al. ¹²	2015	42-year-old female patient with multifocal tuberculosis of the bilateral metatarsal	AKT
2. Julia et al. ¹³	2009	20-year-old male with 3rd, 4th, and 5th metatarsal tuberculosis	AKT
3. Yuen et al. ⁷	2001	22-year-old male with 5th metatarsal tuberculosis	AKT
4. Varun et al. ¹⁴	2015	30-year-old male patient with 4th metatarsal tuberculosis	Surgical debridement and AKT
5. Hu ¹⁵	2015	19-year-old male with multifocal tuberculosis of hand and feet	AKT
6. Ganda ¹⁶	2015	25-year-old male with 5th metatarsal TB	AKT
7. Dhillon et al.	1993	22 cases of foot TB	All were managed with AKT except one patient which required surgical intervention.
8. Mittal et al.	1999	44 patients with tuberculosis of the foot	All were managed with medical management
9. Dhillon et al.	2002	74 cases of foot TB	All patients were managed conservatively except triple arthrodesis in three patients, talonavicular arthrodesis in one patient, curettage in three patients, and sinus tract excision in two patients
10. Sahil et al.	2016	1st metatarsal TB	Curettage, sinus tract excision, and AKT
11. Berrady et al.	2014	53-year-old male with 2nd ray foot TB	AKT

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Author	Year	Diagnosis	Management
12. Kadu et al.	2016	Navicular TB	AKT
13. Magnussen et al.	2013	2nd and 3rd tarsometatarsal TB	AKT
14. Nayak et al.	2014	20 cases of ankle and foot TB	AKT
15. Azirar et al.	2018	Multifocal ganglionic and navicular TB	AKT
16. Apoorva et al.	2018	5th metatarsal TB	Metatarsal amputation
17. Modi et al.	2015	19-year-old male with first metatarsal TB	AKT
18. Oriundo et al.	2015	Midfoot TB	AKT
19. Muratori et al.	2007	29-year-old male with 2nd metatarsal TB	AKT
20. Prakash et al.	2014	8-year-old boy with first metatarsal TB	AKT

CONCLUSION

Although metatarsal and olecranon tubercular osteomyelitis involvement is rare, early diagnosis and management help in getting a better outcome. Early surgical intervention and anti-tubercular treatment help in preventing further progression to adjacent joint/bone/soft tissue. Along with long-term AKT, high protein and nutritious diet help in maintaining good immunity and helps in preventing recurrence.

CLINICAL MESSAGE

Early suspicion and detection of tubercular disease is necessary to treat the disease more properly and to avoid further complications of the same. Tubercular ulcers and wounds are specifically notorious when it comes to healing. One must always suspect tuberculosis in cases of non-healing ulcers. Adequate and early anti-TB drugs/regimes should be initiated along with special attention to the patient's general health and regular tubercular medications.

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