

## Tuberculous osteomyelitis of proximal fibula: An unusual presentation of tuberculosis

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### ABSTRACT

Tubercular involvement of the proximal fibula is rare. We present a case of tuberculosis of proximal fibula in an immunocompetent 22-year-old female. She was diagnosed clinically as a case of cellulitis. Radiological investigations, including magnetic resonance imaging revealed a destructive lesion in her right proximal fibula. Finally, by fine-needle aspiration cytology and GeneXpert polymerase chain reaction, a diagnosis of tuberculous osteomyelitis of proximal fibula was established. She was managed non-operatively with multidrug antitubercular chemotherapy. A high index of suspicion is required to make a diagnosis of musculoskeletal tuberculosis of such a rare site in the early stages.

**Key words:** Antitubercular therapy, GeneXpert, Proximal fibula, Tuberculous osteomyelitis

**T**uberculosis continues to be a global health concern in this modern era. Musculoskeletal tuberculosis constitutes 1–3% of all tuberculosis cases, of which 2–3% presents as osteomyelitis [1]. Tuberculosis affection of the end of long bone usually occurs concurrently with the involvement of the adjacent joint.

Here, we report a rare and unusual case of tuberculosis affection of the proximal end of the fibula without the involvement of the knee joint. There are only two reports of proximal fibula tuberculosis in the English literature [2,3]. The rarity of the condition may lead to a delay in diagnosis with a consequent spread of the infection and grave consequences.

### CASE REPORT

A 22-year-old female presented to the clinic with complaints of insidious onset and gradually progressive pain in the lateral aspect of the right knee and upper part of the leg for the last six months; it was associated with swelling which appeared with the pain. The patient reported weight loss of around 5 kg in the past 2 months with associated loss of appetite and low-grade fever. No history of trauma or any history of systemic illness was reported.

While examining the patient, she was afebrile, the pulse rate was 86/minute, and the blood pressure was 110/80 mmHg measured from the left arm in the supine position. The respiratory

rate was 18/min, pedal edema and inguinal lymphadenopathy were noted on the right side. On local examination, there was diffuse swelling of the lateral aspect of the right proximal leg with ill-defined margins. The overlying skin was tense without any scar, sinus, or venous prominence. The swelling was tender, but the local temperature was not raised. A provisional diagnosis of improperly treated cellulitis was made. No evidence of any immune-compromised state was found.

Erythrocyte sedimentation rate (ESR) was 42 mm/h (normal range: 0–20 mm/h) and serum C-reactive protein (CRP) level was 16 mg/L (normal range: 0–6 mg/L). HIV test was negative.

A radiograph of the right leg showed lytic destruction of the fibular head with intramedullary extension and cortical breach (Fig. 1). The chest radiograph was unremarkable. Magnetic resonance imaging (MRI) of the right knee with leg revealed a T2 hyperintense expansile mass in the proximal fibula with cortical discontinuity and soft-tissue extension of the mass both anteriorly and posteriorly (Fig. 2a and b). The diffuse-weighted imaging and apparent diffusion coefficient showed diffusion restriction in soft tissue collection (Fig. 3a and b). A radiological diagnosis of an aggressive tumor or osteomyelitis of the proximal fibula was made. Ultrasound-guided fine-needle aspiration cytology (FNAC) was performed from the lesion, which showed acute inflammatory exudate and necrosis with occasional acid-fast bacilli (AFB) on Ziehl-Neelsen stain, consistent with tuberculosis (Fig. 4a and b). The specimen was also sent for GeneXpert

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polymerase chain reaction (PCR), which came to be positive for *Mycobacterium tuberculosis* sensitive to rifampicin.

As the diagnosis of tuberculosis was established, a baseline liver function test and a renal function test were done, which were within normal limits. Then the initiation phase of the antitubercular therapy (ATT), including daily dosage of rifampicin 450 mg, isoniazid 300 mg, pyrazinamide 1500 mg (in two divided doses), and ethambutol 1000 mg, was started and given for 3 months.

At three months follow-up, symptoms, particularly the pain, got resolved. The swelling was also significantly reduced in size. The ESR and CRP levels were decreased with values 35 mm/h and 5.2 mg/L, respectively. In the continuation phase, a three-drug

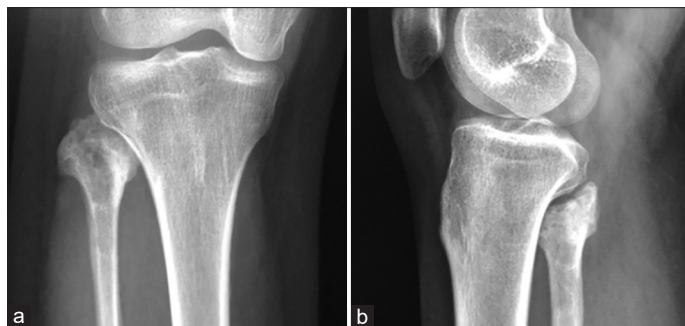


Figure 1: (a and b) Anterior-posterior view and lateral view radiograph of the right leg showing a lytic lesion within the fibular head with extension into the meta-diaphyseal area with cortical breach

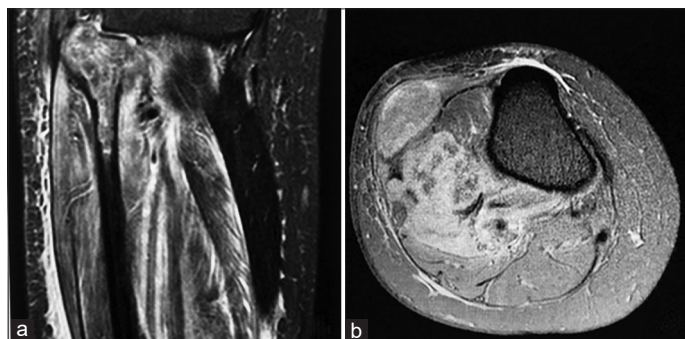


Figure 2: T2-weighted fat saturated magnetic resonance imaging: (a) Coronal section showing heterogeneously hyperintense lesion involving the fibular head and proximal shaft with cortical thinning with soft tissue edema involving the surrounding muscles. (b) Axial section showing hyperintense collection seen to extend through the muscular plane into the subcutaneous tissue anteriorly

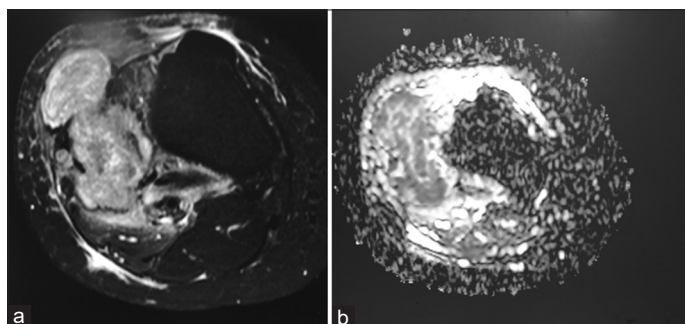


Figure 3: (a) Diffuse-weighted imaging and (b) apparent diffusion coefficient showing diffusion restriction in soft tissue collection

regimen including rifampicin 450 mg/day, isoniazid 300 mg/day, and ethambutol 1000 mg, was given for another nine months. On a 12-month follow-up, an MRI was done to look for the response to ATT, in which the lesion was reduced in size, the soft tissue edema was reduced, and the soft tissue mass was resolved (Fig. 5a and b). The ATT was discontinued after 12 months of treatment.

DISCUSSION

There is an inadequate decline in the incidence of tuberculosis despite the success of multidrug chemotherapy and a huge amount of global efforts. Early diagnosis and prompt treatment of every tuberculosis patient are essential to achieve the health target of “ending the TB epidemic” by 2030, which is a part of the sustainable development goals.

Musculoskeletal tuberculosis is usually misdiagnosed initially and the treatment is delayed, mostly due to the rarity of the condition, insidious onset, non-specific symptoms, and absence of concomitant pulmonary disease in most cases [4]. Delay in diagnosis and management can lead to the spread of infection and consequent complications.

On the literature review, we have come across only two case reports of tubercular involvement of the proximal end of the fibula [2,3]. In the first case, the patient was a 71-year-old female of Asian origin who presented with a mass lesion of the proximal fibula. Ziehl–Neelsen staining of the specimen collected by computed tomography (CT)-guided needle biopsy did not reveal

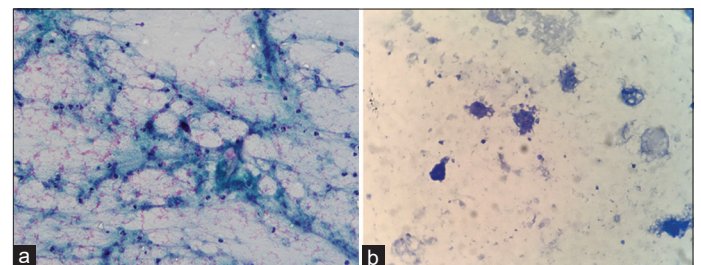


Figure 4: (a) The aspirate smear showing necroinflammatory exudate composed of degenerated polymorphs and histiocytes (Papanicolaou stain, ×200). (b) Occasional acid-fast bacilli are noted (Ziehl–Neelsen stain, ×1000)

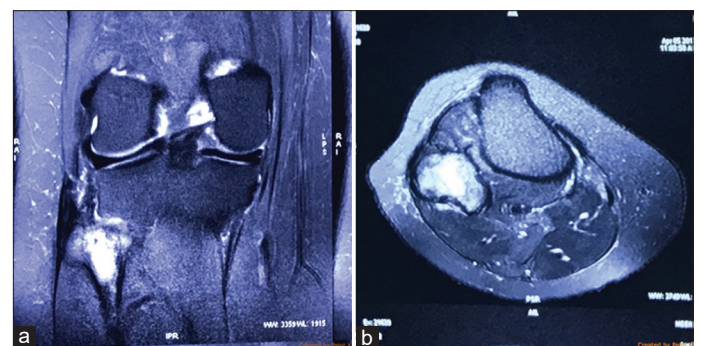


Figure 5: T2-weighted fat-saturated magnetic resonance imaging done after 12 months of antitubercular therapy: (a) Coronal section and (b) axial section showing fibular head hyperintensity seen to persist, however, there is a significant reduction in the soft-tissue edema and collection

any AFB, however, AFB culture was positive. She was treated with a 6-month course of multidrug ATT [2]. The second case was a 28-year-old male presenting with knee pain and swelling around the fibular head. An excisional biopsy was performed and a histopathological report confirmed it as tuberculous osteomyelitis. ATT was given for 15 months [3]. It is worth noting that in both these previous reports, the initial presentation was a pseudotumor of the fibular head, whereas in our case, it was a cellulitis-like picture.

MRI is the investigation of choice for imaging musculoskeletal tuberculosis [5]. Marrow hyperintensity in the T2-weighted sequence and hypointensity in the T1-weighted sequence suggest early tuberculosis [5]. The extent of the disease and any soft tissue collection can also be precisely defined. The activity of the lesion, response to chemotherapy, and duration of chemotherapy can also be guided by MRI [5]. In endemic areas, a diagnosis of tuberculosis can be made based on clinical judgment and radiological picture [1]. However, in cases where the clinical and radiological findings do not correlate with each other, further investigations are required to confirm the diagnosis.

Positive AFB culture is a confirmatory test for tuberculosis. The sensitivity of *M. tuberculosis* to various anti-tubercular drugs can also be identified. However, as the tubercular osteomyelitis is paucibacillary, the sensitivity of this test is very low, and also, the time required to get a report is 8–12 weeks [6]. Recently, GeneXpert PCR has proved to be very useful in the early diagnosis of tuberculosis [7]. It is a rapid test with high sensitivity and specificity. It also detects rifampicin resistance. However, it requires tissue specimen and it cannot distinguish between living or dead mycobacteria [8]. FNAC is a fair choice to have a tissue diagnosis of tuberculosis whenever possible. It is a simple and safe outdoor procedure and, when done precisely, avoids the need for a core needle biopsy or an open biopsy [9]. When performed under CT or ultrasound guidance, the sensitivity is also increased. The presence of granuloma and AFB is characteristic

of tuberculosis. However, only 24–68% of specimens are positive for AFB, and granuloma is also not always seen [9].

## CONCLUSION

Tuberculous osteomyelitis of the proximal end of the fibula is a very rare and unusual presentation and requires a high index of suspicion to detect it at an early stage.

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