

## Case Report

# Tuberculosis of Calcaneus – A Case Report and Review of Literature

Arjun Poudel<sup>1</sup>, Pranodan Poudel<sup>1</sup>, Birendra Bahadur Chand<sup>1</sup>, Bibek Banskota<sup>1</sup>, Ashok Kumar Banskota<sup>1</sup>

<sup>1</sup>B&B Hospital, Gwarko, Lalitpur

### ABSTRACT

Osteoarticular tuberculosis (TB) constitutes 1-3 % of cases of which about 10% affect the foot and ankle. In foot TB, the calcaneus is the most commonly affected bone. TB calcaneum is a rare entity and a high index of clinical suspicion along with imaging studies helps in diagnosis. Thorough debridement of the lesion along with chemotherapy for adequate duration helps in the complete resolution of infection with good functional results.

**Keywords:** Calcaneum, Foot, Tuberculosis

### INTRODUCTION

Osteoarticular TB constitutes 2-3% of cases and about 10% of cases affect the foot and ankle in the musculoskeletal system.<sup>1, 2</sup> Calcaneum tuberculosis is rare in young adults.<sup>3</sup> Most of the studies report that calcaneus is the most commonly affected bone.<sup>4,5</sup> According to some authors the most commonly affected tarsal bone is the talus followed by calcaneus.<sup>6</sup> Foot and ankle tuberculosis is rare and mimics other diseases due to which it poses difficulty in early diagnosis and treatment. Early diagnosis and treatment are important for better clinical outcomes. Here, we report a case of isolated TB of left calcaneus treated with debridement, curettage, and anti-tubercular medication and immobilization of the ankle joint with protected weight-bearing leading to a good functional outcome.

### CASE REPORT

A 19-year female presented with pain and swelling of her left ankle and heel following a twisting of the same ankle four months ago. She had difficulty in walking for two months. She had a history of weight loss, loss of appetite for three weeks, and an episode of high-grade fever on admission. She didn't have any contact with a person with known tuberculosis or chronic cough. She also denied a history of pulmonary tuberculosis in the past. She had visited a foot and ankle specialist where a core needle biopsy was done with an inconclusive histopathological report. On clinical examination, there was swelling on the left heel and ankle which was tender with serous discharge from the lateral aspect of the ankle. The plain x-ray of the left foot in oblique view showed an area of lytic lesion in calcaneus

(Fig. 1). The magnetic resonance imaging (MRI) of the right ankle showed hypointense and hyperintense lesion on T1 and T2-weighted images, respectively (Fig. 2). Laboratory investigation showed positive C-reactive protein (51.1mg/L), raised erythrocyte sedimentation rate (106 mm in first hour) with lymphocytosis. The plain radiograph of the chest was normal.



Fig.1: Plain X-ray showing lytic lesion

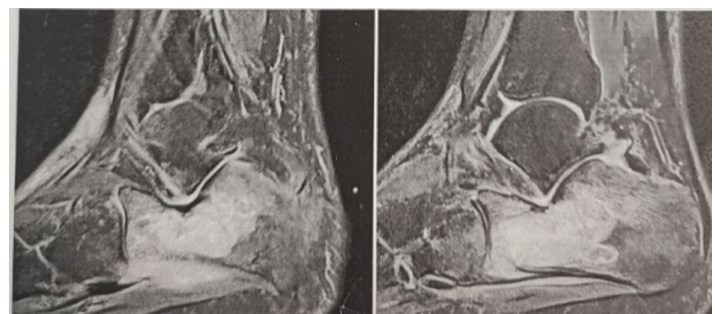


Fig.2: T1 and T2 weighted MRI of right ankle showing hypointense and hyperintense lesions

### Correspondance:

Dr. Arjun Poudel  
Fellow – Hip, Pelvis, and Acetabulum Surgery,  
Tel: +9779851172052, Email: arjunpoudel57575@gmail.com

After informed consent, open biopsy and curettage were done under spinal anesthesia through the Ollier approach

of the ankle (Fig. 3). Pus along with the caseous material (Fig. 4) were sent for histopathological examination, pus culture, and sensitivity, Ziehl-Neelsen (ZN) stain and gram stain.



Fig. 3: Biopsy through Ollier's Approach to Ankle



Fig.4: Pus along with the caseous material

Histopathological examination shows caseating granulomatous inflammation, with multiple confluent epithelioid granuloma with Langhan's giant cells, associated with heavy lymphocytic infiltrate (Fig. 5). Ziehl-Neelsen (ZN) stain, gram stain, and culture were found to be negative. Gene expert was not done in our case. Anti-tubercular treatment (ATT) was initiated which included isoniazid, rifampicin, pyrazinamide, and ethambutol for the first three months followed by isoniazid, rifampicin, and ethambutol for nine months. Non-weight bearing was advised, and the foot was protected in a below-knee slab for four weeks. Partial weight-bearing was allowed at four weeks and progressed to full weight-bearing at 12 weeks. X-ray, ESR, and CRP were performed every three months till treatment completion.

Her symptoms have resolved and ESR and CPR have settled down.

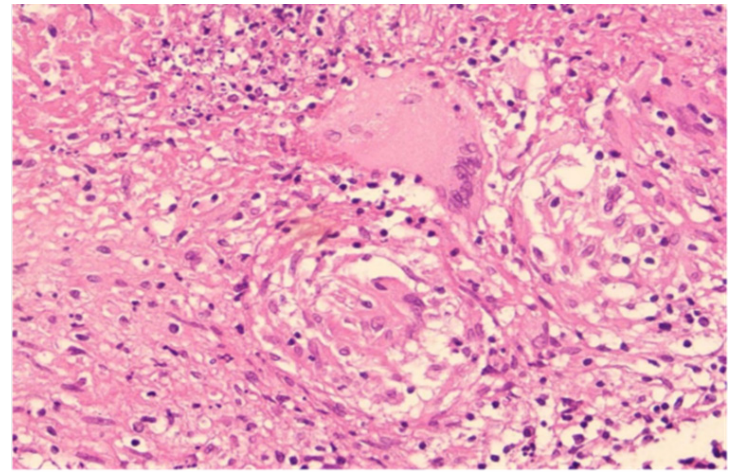


Fig. 5: Histopathological report showing central caseous necrosis with Langhan's giant cell and epithelioid cells

## DISCUSSION

The classical symptoms of evening rise in temperature, weight loss, and loss of appetite are rarely seen in tuberculosis of the foot and ankle.<sup>7</sup> The diagnosis and treatment of calcaneal tuberculosis are often delayed due to uncommon site involvement, lack of awareness, less dramatic signs, and symptoms of calcaneal osteomyelitis than osteomyelitis of long bones, and ability to mimic other disorders clinically and on radiograph.<sup>8</sup> Delay in diagnosis and treatment may lead to functional disability.<sup>9</sup> Thus a high index of clinical suspicion is required in those with chronic symptoms not responding to routine treatment. Tuberculosis of bone mimics clinical conditions like chronic osteomyelitis, Madura mycosis, actinomycosis, multiple myeloma, or secondary malignant deposits. The National Institute of Clinical Excellence (NICE) recommends that all patients with non-respiratory TB should have a chest X-ray to exclude or confirm co-existing respiratory TB.<sup>10</sup> plain X-ray of ankle and foot in early stage may only show osteoporosis whereas, in late-stage cancellous bone involvement may present with cystic lesion with or without sequestrum.<sup>8</sup> By the time the x-ray shows cystic changes, the disease process is already advanced with a high possibility of hematological spread to distant sites.<sup>11</sup> Plain radiographs have low sensitivity and specificity and cross-sectional imaging in the form of MRI or CT is more reliable.<sup>11</sup> MRI is good at looking at soft tissue architecture and collections. CT scan is useful to delineate the bony anatomy and delineate cortical breaks or collapse of the articular surface. It is useful to plan reconstructive procedures. Since the radiologic features lag behind the actual healing process, cross-sectional imaging should be repeated only after 6-7 months of ATT to reduce the rate of false positives for disease progression.<sup>8</sup> Fine needle aspiration cytology (FNAC) can diagnose TB osteomyelitis based on caseating granulomas of epithelioid histiocytes and multinucleate giant cells. The success rate of FNAC reported by Khanna et al is 100%, while Kakkar et al. reported a success rate of 73 percent.<sup>12</sup> But in our case, the core needle biopsy done at other centers had inconclusive reports, so we did the open biopsy and curettage of the lesion with sufficient material for histopathological examination.



ESR and CRP are not specific to the diagnosis of TB. Paucibacillary lesion of the osteoarticular TB makes it difficult to demonstrate the AFB on culture or identify ZN-staining from the lesions. Molecular diagnostic tests such as nucleic acid amplification tests (NAAT) have also been shown to be a reliable alternative diagnostic tool compared to the isolation of tubercular bacilli.<sup>13</sup> The main treatment of foot and ankle TB is anti-tubercular chemotherapy which should be started as early as possible. WHO recommends a 12-month course of ATT for osteoarticular TB patients, i.e., two months with rifampicin, isoniazid, pyrazinamide, and ethambutol followed by a 10-month course of rifampicin, isoniazid, and ethambutol.<sup>14</sup> Surgery for foot and ankle TB is indicated for obtaining tissue diagnosis, debridement of abscesses despite medical treatment, and cases resistant to chemotherapy.<sup>11</sup>

## CONCLUSION

TB calcaneus is rare so a high index of clinical suspicion with positive imaging findings, histopathological examination, and staining for acid-fast bacilli could help us in diagnosis. Early diagnosis is crucial to prevent disease progression to the adjacent bones and joints. Conservative management with adequate anti-TB chemotherapy along with immobilization helped in the complete resolution of the infection with good functional results. Surgery is indicated for obtaining tissue diagnosis, debridement of abscess, cases resistant to chemotherapy, deformity correction, or joint reconstruction.

## CONFLICT OF INTEREST

None

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