

## Chronic heel pain: It could be tuberculosis.

Muhamad Effendi F, Ibrahim MI, Rozali KN, Miswan MF

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### Authors:

#### Ferdhany Muhamad Effendi

(Corresponding author)

MS(Orth)

Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh Campus, Jalan Hospital, 47000 Sungai Buloh, Selangor, Malaysia  
E-mail: ferdhany@yahoo.com

#### Mohd Ikraam Ibrahim

MS(Orth)

Universiti Teknologi MARA, Selangor, Malaysia

#### Khairul Nizam Rozali

MS(Orth)

Universiti Teknologi MARA, Selangor, Malaysia

#### Mohd Fairudz Miswan

MS(Orth)

Universiti Teknologi MARA, Selangor, Malaysia

### Abstract

**Introduction:** Heel pain is a common presentation at a primary care setting. The majority of these cases are benign and self limiting in nature. Common differential diagnoses include plantar fasciitis and peroneal muscle sprains. However, certain conditions—if undetected early—may cause significant morbidity to the patient. A high index of suspicion and early referral for further investigations are needed to prevent long-term morbidities.

**Methods:** A clinical review of a patient with chronic left heel pain was performed. Blood parameters and imaging investigations indicated chronic infection of the calcaneum. Histopathological examination was highly suggestive of tuberculosis.

**Result:** The patient responded well to antituberculous therapy. She was pain free and showed no signs of recurrence at final follow-up.

**Conclusion:** Here, we report a case of chronic heel pain, which was later diagnosed as tuberculosis of the calcaneum and successfully treated with antituberculous therapy.

### Introduction

Foot pain is highly prevalent in primary care, with up to 63% of the population reporting stiffness or pain in their feet.<sup>1</sup> Of these, heel pain constitutes 14% of the reason for consultation. The majority of these cases are benign and self limiting in nature. There is a wide range of differential diagnoses, most of which are mechanical in nature and their recognition is guided by the anatomic location of pain.<sup>2</sup> Common differential diagnoses for heel pain include plantar fasciitis, Achilles tendinopathy, Haglund's deformity and peroneal tendinopathies. tuberculosis of the foot and ankle is rare, especially in an immunocompetent individual.<sup>3</sup> The tendency to treat heel pain as a benign condition and the rarity of calcaneal tuberculosis may result in diagnostic and therapeutic delay. Furthermore, tuberculosis is known to mimic other conditions, both clinically and radiographically.<sup>4</sup> Even with blood investigations and advanced imaging technique, it could be a challenging task to arrive at the diagnosis because of the non-specific findings of these investigations. Therefore, general practitioners being the frontliners in medical care should be aware that a patient presenting with unresolving chronic heel pain must be further investigated and referred to an orthopaedic surgeon for further evaluation.

### Case report

We report about a 24-year-old lady with no past medical history who presented with left heel pain for 5 months duration. It was a dull, aching pain which progressively worsened over a 5-month period and subsequently started to disturb her function about 2 weeks prior to the presentation. There was no obvious history of trauma, but she admitted that the pain started when she became active in badminton. The pain was triggered by activities such as long-distance walking and prolonged standing. Upon initial visits to a general practitioner, she was diagnosed with peroneal tendinitis and was told to reduce her sporting activities and prescribed oral analgesics. The heel pain was only partially relieved with the oral analgesics and progressively became unrelenting and caused disturbance of her daily activities. She denied having fever, night sweats or constitutional symptoms such as unexplained weight loss and appetite loss. She did not have any contact with persons with known tuberculosis or chronic cough. She was afebrile at the presentation and her vital signs were stable. Examination of her left foot and ankle revealed tenderness over the lateral aspect of the ankle joint extending distally towards the heel. The tenderness became more marked with inversion of the subtalar

joint with limited range of motion. There were no sinuses or swelling observed. Blood counts revealed a raised erythrocyte sedimentation rate (ESR) of 47 mm/h and C-reactive protein of 18 mg/L, but the white blood cell count was normal. Axial and lateral view radiographs of the calcaneum showed a radiolucent area in the marrow of the left calcaneum with no periosteal reaction (**Figures 1 and 2**). Magnetic resonance imaging (MRI) demonstrated hyperintense lesions on T2-weighted images within the calcaneum with surrounding marrow oedema, suggestive of osteomyelitis (**Figure 3**). MRI also revealed a normal peroneal tendon.



**Figure 1.** Axial view of the calcaneum: radiolucent area (yellow arrow) adjacent to the lateral wall

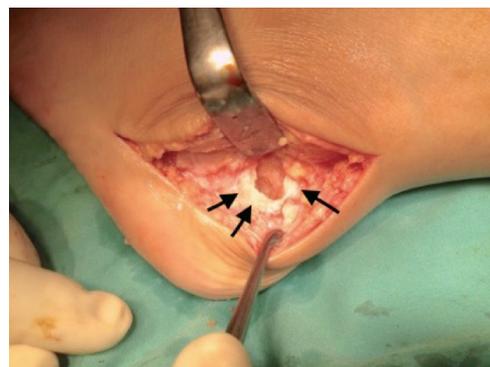


**Figure 2.** Lateral view of the calcaneum: radiolucency (yellow arrow) within the marrow with no periosteal reaction



**Figure 3.** Hyperintense areas within the calcaneum (red arrows) indicating cysts with surrounding marrow oedema, suggestive of osteomyelitis

A working diagnosis of pyogenic osteomyelitis of the left calcaneum was made based on the clinical findings of tenderness over the lateral aspect of the calcaneum, laboratory results of increased level of ESR and C-reactive protein (CRP) and typical MRI findings. Surgical drainage was performed. At the operation, it was noted that there were intraosseous caseous material with multiple cystic areas in the left calcaneum, which was consistent with pyogenic osteomyelitis (**Figure 4**).



**Figure 4.** Intraoperative picture. Caseous necrosis, a 'cheese-like' appearance of the tissue (small black arrows) surrounding a cyst in the lateral part of the calcaneum. This is consistent with osteomyelitis

Histopathological examination of the material evacuated from the calcaneum revealed granulomatous inflammatory material with areas of necrosis. Acid-fast bacilli smear of calcaneal bone tissue was negative. She was started on antituberculous (anti-TB) treatment based on the overall clinical, biochemical and

histopathological findings. She showed good clinical response after completing a 2-months regime of ethambutol, isoniazid, rifampicin and pyrazinamide, followed by 7 months of isoniazid and rifampicin. Final follow-up at 18 months revealed she was pain free and able to perform her routine daily activities.

### Discussion

Tuberculous osteomyelitis involving the foot is very rare. It represents <1% of extrapulmonary tuberculosis,<sup>3</sup> with the calcaneum being the most frequently tarsal bone involved. Tuberculosis of the calcaneum has the ability to mimic other diseases such as Charcot's arthropathy, psoriatic arthritis, Haglund's deformity and Achilles tendinopathy because of its rarity and insidious clinical course.<sup>5,6</sup> This frequently resulted in diagnostic delays,<sup>7</sup> which may lead to subtalar joint collapse and secondary degenerative changes.<sup>6</sup> Although our patient presented with skeletal tuberculosis symptoms such as unexplained chronic heel pain, bony tenderness and limited range of motion,<sup>6</sup> these symptoms were non-specific. Furthermore, based on the location of pain, which was on the lateral aspect, it mimicked a diagnosis of peroneal tendinitis.<sup>8</sup> Other symptoms that should have increased the suspicion of skeletal tuberculosis include constitutional symptoms such as fever, night sweats, unexplained weight loss and anorexia.<sup>6</sup> Our patient did not manifest any of the symptoms and did not have any contact with persons affected by tuberculosis. Therefore, in this particular case, we found that it was difficult to differentiate calcaneal tuberculosis and peroneal tendinitis based on the history and physical examination. Thus, anecdotally we recommend imaging for cases with unresolved chronic heel pain. Radiographic findings in tuberculous osteomyelitis are non-specific, thus making it difficult to be differentiated from pyogenic osteomyelitis. The most common findings include osteopenia, subchondral sclerosis and soft tissue swelling.<sup>9</sup> In their series of 44 patients, Mittal et al<sup>10</sup> identified five types of lesions in tuberculosis of the foot based on its radiological pattern; cystic, rheumatoid, subperiosteal, kissing and spina ventosa. The 'cystic' type, as seen in our patient, is characterised by well-defined lucent lesion with no sequestrum (dead, sclerotic bone). 'Rheumatoid'-type lesion is similar to the changes seen in the coalesced carpals of patients with rheumatoid arthritis. 'Subperiosteal' type is scalloping or indentation of cortical bones.

'Subperiosteal' lesion involved in both articular surfaces in a joint results in the 'kissing'-type lesion. In children, tuberculous infection results in spindle-shaped expansion with layers of periosteal new bone denotes the 'spina ventosa'-type lesion. Identification of the radiological types may help in predicting prognosis of the infection. Patients with the cystic type do well with appropriate treatment, as is the case in our patient, whereas the rheumatoid type had the poorest outcome. Subtle changes in our patient's radiographs were missed initially; thus, MRI was performed to provide a more detailed imaging of the calcaneum to narrow the spectrum of differential diagnoses. Magnetic resonance (MR) images have been shown to be non-specific in the cases with infection.<sup>11</sup> In our patient, MR findings favoured a diagnosis of pyogenic osteomyelitis with increased marrow density, in contrast to tuberculosis, which typically presents with smooth margined lesion with normal marrow intensity. Diagnosis of pyogenic osteomyelitis of the calcaneum was made based on the clinical findings of tenderness over lateral aspect of the calcaneum, laboratory results of increased level of ESR and CRP and MR findings. To our surprise, the result of histopathological examination of bone tissue obtained during the surgical curettage of the calcaneum revealed granulomatous inflammation with areas of necrosis, which was highly suggestive of tuberculosis.<sup>4</sup> Subsequently, her diagnosis was revised to calcaneal tuberculosis, based on the endemicity of the disease in our setting, clinical presentation and histological findings. She was started on a 2-months regime of ethambutol, isoniazid, rifampicin and pyrazinamide, followed by 7 months of isoniazid and rifampicin. Anti-TB is the mainstay of treatment for tuberculosis involving the foot, with a suggested minimum treatment duration of 9 months.<sup>10</sup> It is important for the treating doctor to be aware that radiological features lag behind the healing progress; thus, the follow-up imaging is only recommended after 6 to 7 months after initiation of anti-TB.<sup>4</sup> Surgical interventions have role in treating those who fail to respond to the anti-TB and to obtain a confirmatory tissue biopsy. Salvage surgical procedures, such as ankle and subtalar joint fusion, are also indicated in patients with painful deformities of the hind foot.<sup>4</sup> In conclusion, unexplained 'benign' heel pain not responding to conservative measures could be a presenting symptom of calcaneal tuberculous osteomyelitis and warrants further investigation to avoid a delay in diagnosis.

**How does this paper make a difference in general practice?**

- It creates awareness regarding an uncommon cause of heel pain, which is a common presentation in primary setting.
- Value-added knowledge regarding diagnostic features and the treatment of calcaneal tuberculosis.

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