

Case Report



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Isolated Calcaneal Tuberculosis: A Case Report

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Abstract

Introduction: Calcaneal Tuberculosis (TB) is a rare disease that can be easily misdiagnosed due to its nonspecific features and low clinical suspicion.

Case Report: This report described an 85-year-old woman who presented to the Emergency Department with foot pain and swelling following a fall. Initial investigations revealed a calcaneal fracture requiring surgery, but the patient declined the intervention. She was discharged with a splint and re-presented after one year with persistent pain, swelling, and a draining skin wound over her right ankle. Further investigations confirmed the diagnosis of calcaneal TB. The patient responded well to a four-drug regimen (Isoniazid, Rifampin, Ethambutol, and Pyrazinamide) for three months, followed by a two-drug regimen (Isoniazid and Rifampin) for 15 months.

Conclusion: This case highlights the importance of considering tuberculosis in patients with bone lesions, even without typical symptoms. Delayed treatment may lead to complications such as abscesses and fistulae, potentially causing disability.

Keywords: Tuberculosis, Calcaneus, Bone Tuberculosis, Osteoarticular

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Introduction

Despite remarkable medical achievements, tuberculosis (TB) remains a major concern in most developing countries. According to the World Health Organization (WHO), approximately 10 million people were affected by TB annually in 2018 (1). Although pulmonary infection is TB's primary manifestation, extrapulmonary involvement may occur with diverse clinical presentations. The most common extrapulmonary sites include lymph nodes, abdomen, bones, and joints (2). Mycobacterium tuberculosis is the predominant cause of bone and joint TB (3). Nontuberculous mycobacteria rarely cause bone infections, primarily affecting immunocompromised patients such as HIV (3).

Bone and joint TB prevalence ranges from 1% to 3% across endemic regions (4), with approximately 10% involving the foot (5). Calcaneal TB is exceptionally rare; consequently, most surgeons omit it from differential diagnoses. Early diagnosis and treatment are critical to prevent permanent disability, as delayed intervention may cause irreparable sequelae (6). To highlight this significance, we report a complex case of calcaneal TB initially misdiagnosed as a calcaneal fracture.

Case Report

An 85-year-old woman presented with right heel pain and swelling after a 2-meter fall from a walnut tree. She was unable to bear weight. Physical examination revealed foot tenderness, swelling, ecchymosis, limited/painful ankle range of motion, and intact dorsalis pedis/posterior tibialis pulses. No paresthesia or open wounds were noted. Radiographs demonstrated a calcaneal fracture with increased Gissane's angle and decreased Böhler's angle (Figures 1A and 1B), without contralateral involvement. Despite surgical indications, she declined the intervention. A splint was applied for 10 days followed by casting, with adjunct broad-spectrum antibiotics.

One year later, she re-presented with severe medial heel pain/swelling. The examination revealed a medial heel wound with seropurulent discharge, edema, erythema, and tenderness (Figure 2), without localized warmth. CT showed calcaneal deformity, fragmentation, subchondral lytic changes, talar fracture line, and talocalcaneal subluxation (Figure 3A and 3B). At 4-month follow-up, she had recurrent pain/swelling with one medial and two lateral draining sinuses (Figure 4). She denied fever, weight loss, night sweats, or TB exposure. No lymphadenopathy was detected.



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Figure 1. (A, B). Calcaneal fracture (Joint-depression type) in 85 years-old female



Figure 2. Medial side heel wound



Figure 3. (A, B). CT-scan one year after fracture



Figure 4. Two sinuses at lateral side of ankle

In further investigations, three-phase bone scintigraphy revealed increased right ankle tracer uptake (blood flow phase), suggesting infection/inflammation (Figure 5A and 5B). Lab results are as follow: WBC = $8400/\text{mm}^3$ (normal), ESR = 31 mm/hr (elevated), and CRP = 5 mg/L (normal). Given chronic sinuses and rural residence (TB risk), PPD testing showed 26 mm induration. MTB DNA (*Mycobacterium tuberculosis* DNA) real-time PCR (Polymerase chain reaction) confirmed TB (Figure 6).

Immediately, Antitubercular therapy (isoniazid, rifampin, ethambutol, pyrazinamide) was initiated for 3 months, then, isoniazid/rifampin for 15 months. At 10-month assessment, symptom resolution was noted.

After 2 years, she ambulated pain-free with healed sinuses (Figures 7A and 7B).

Discussion

Osteoarticular tuberculosis represents the third most common extrapulmonary TB manifestation (7), predominantly affecting the spine and hip. Ankle and foot involvement is exceptionally rare (7,8). The presentations are fever, sweating, fatigue, and weight loss (9). Typical systemic symptoms include fever, night sweats, fatigue, and weight loss (9), while local manifestations comprise pain, swelling, tenderness, edema, erythema, and occasionally fistulae (9,10). Diagnosis remains challenging due to similarities with infections or malignancies. Given its rarity, clinicians often overlook bone TB in differential diagnoses, despite the critical need for early intervention. Untreated calcaneal TB may cause disability, sinus tracts, or abscesses. Although TB typically spreads via airborne droplets, soil transmission was probable in this case. Velayati et al. confirmed *Mycobacterium tuberculosis* viability in Iranian soil samples (11). Common laboratory findings include elevated ESR, variable CRP/WBC levels, and nonspecific results (12). Less than 50% of infected patient show radiographic evidence of pulmonary TB (13). Imaging may reveal osteopenia, soft-tissue swelling, sclerotic lesions, periosteal reactions, joint-space narrowing, or bone cysts (14-17). Sometimes, findings can resemble other infections and cancers. These nonspecific features frequently delay diagnosis (18). MRI (Magnetic Resonance Imaging) and CT-Scan better evaluate osseous/soft-tissue changes. Histopathological examination of bone/synovial



Figure 5. (A, B). Isotope scan, suggesting inflammatory/infection process

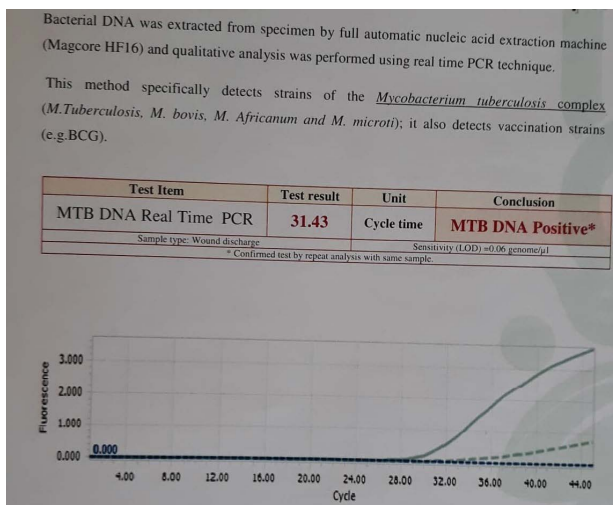


Figure 6. Fluorescence Qualitative Real Time PCR Report

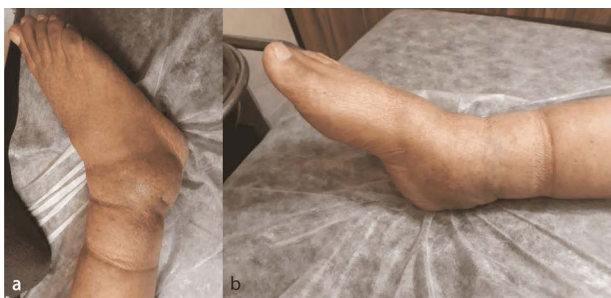


Figure 7 (A, B). No swelling and sinus tract after two years follow-up

biopsies-positive in 80% of cases- remains the diagnostic gold standard (19). PCR offers lower sensitivity but high specificity (20,21). Yadav et al. reported a 21-year-old male with calcaneal TB diagnosed by biopsy showing granulomas, caseous necrosis, and Langhans giant cells after radiography (6). First-line antitubercular therapy involves isoniazid (10 mg/kg/day), rifampin (10 mg/kg/day), pyrazinamide (15 mg/kg/day), and ethambutol (15 mg/kg/day) for ≥ 12 months with joint immobilization (20,22).

Wadhawan et al. described isolated calcaneal TB in an immunocompetent adult treated with chemotherapy and immobilization, resulting in healed disease but calcaneal collapse and valgus deformity (23). Jadawala et al. emphasize early diagnosis and medical therapy as primary

management, reserving surgery for failed conservative treatment or extensive soft-tissue/joint involvement with sinuses (24).

Conclusion

This case underscores the importance of considering tuberculosis in patients presenting with typical manifestations such as pain, swelling, inability to bear weight, or even fractures. Clinicians should maintain a high index of suspicion for TB infection when no definitive alternative diagnosis is established, particularly in endemic regions.

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Authors' contributions

Conceptualization: Mohammad Sajjad Mirhoseini and Leila Sadati, Rana Abjar.

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Competing Interests

The authors declare that they have no conflict of interest.

Data Availability Statement

Data are available by corresponding author on a reasonable request.

Ethical Approval

According to the ethical guidelines, case reports that describe individual patient observations without any experimental intervention do not require an ethics approval code. However, written informed consent for publication was obtained from the patient. There is no information (names, initials, hospital identification numbers, or photographs) in the submitted manuscript that can be used to

identify the patient.

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