



Tuberculosis of the Talonavicular Joint: A Case Report

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ABSTRACT

Extrapulmonary, extraspinal tuberculosis is underreported despite being a common presentation of tuberculosis in the Philippines. The ankle and the smaller joints of the foot are infrequent locations of tuberculosis. A 41-year-old female presented with a six-year history of left midfoot swelling, pain, and limited ankle dorsiflexion following trauma. She underwent several wound debridements, with inconclusive biopsy findings. Radiographs showed cortical irregularities with sclerotic changes of the talus and navicular bones, and MRI revealed synovitis with associated bony erosive changes and marrow edema. Debridement, sequestrectomy, and application of antibiotic-laden cement were done. Histopathology revealed caseating necrosis, confirming the diagnosis of tuberculosis. She underwent eight months of antituberculosis therapy. Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) remained normal postoperatively. After two months, the patient underwent removal of antibiotic cement and talonavicular arthrodesis with iliac bone grafting. Follow-up radiographs showed incorporation of the graft with no implant loosening. Patient eventually recovered full weight bearing of the left foot with minimal pain. Diagnosis was difficult due to the insidious onset and non-specific symptoms, delaying treatment and allowing progression of the disease. Antituberculosis therapy (ATT) is the mainstay of treatment of bone tuberculosis, and should be initiated upon diagnosis. Surgical intervention depends on the extent of bony destruction and joint instability.

Keywords. extrapulmonary tuberculosis, talonavicular joint

INTRODUCTION

Tuberculosis (TB) is a chronic infectious disease caused by the bacteria *Mycobacterium tuberculosis*, affecting approximately ten million people worldwide annually. As of 2016, the Philippines remains among the top 20 countries with the highest TB burden, with an estimated 760,000 people affected of its population of 107 million.^{1,2}

Pulmonary TB is the most common presentation, with extrapulmonary TB seen in only 1–15% of cases.^{1,3,4} Of the extrapulmonary cases, tuberculous spondylitis is the most common form, accounting for approximately 50% of cases, while extraspinal musculoskeletal TB is among the least common manifestations of TB.⁵ TB of the foot and ankle is uncommon in literature, with only 8% to 10% of the patients having osteoarticular tuberculosis, representing approximately only 0.1% to 0.3% of all patients with extrapulmonary disease.⁶ In the foot and ankle, the ankle joint and the calcaneus are the most frequently affected, representing 25% and 22% of the cases, respectively. The talonavicular joint is rarely involved, although cases may also be underreported.⁷ We now present a case of an adult female with a rare presentation of tuberculosis of the talonavicular joint.

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CASE

A 41-year-old female office worker presented with a history of chronic pain and swelling of the left foot. Six years before the consultation, a heavy object fell on her left midfoot, resulting in pain and swelling but no open wounds. She consulted a doctor and was managed conservatively. After a few months, due to persistent symptoms, she consulted at the local hospital, where an MRI revealed a mass on the dorsomedial aspect of the left foot. The patient underwent excision biopsy of the mass. The specimen was submitted for culture and histopathological examination, which turned out negative for infection or neoplasm. After the procedure, poor healing of the post-biopsy site was noted, requiring constant dressing and wound care. She eventually noted cheesy, semi-solid discharge from the wound. The patient consulted with an infectious disease specialist, where she was started on anti-Koch's medications for six months: two months of intensive phase with isoniazid (H), rifampicin (R), pyrazinamide (Z), and ethambutol (E), then four months of continuation phase with HR. Despite treatment and wound care, there was persistent pain and non-healing of the wound.

Patient eventually sought a second opinion, eight months after the index surgery. A repeat wound debridement and biopsy were performed. The specimen was submitted for culture and histopathology, which, according to the patient, were negative for infection or neoplasm. The patient was treated with unrecalled antibiotics for one month. During the interim, the post-op site healed with on-and-off pain and swelling on the midfoot, which were tolerable.

The patient noted increasing severity of pain in the left midfoot on ambulation and range of motion for a year, which prompted an initial consult at our institution. The patient did not present with fever, weight loss, chronic cough, or constitutional signs.

On physical examination, there was swelling on the dorsum of the left midfoot with a hyperpigmented, healed post-biopsy scar on the medial malleolar aspect (Figure 1). There was no

noted erythema, warmth, or open wound. Plantarflexion was full, but dorsiflexion was limited due to pain.

Plain radiographs revealed cortical irregularities with sclerotic changes of the talus and navicular bones, along with arthritis of the talonavicular joint (Figure 2). T2-weighted MRI revealed a lobulated fluid signal abnormality with intermediate signal intensity in the talonavicular joint, indicative of synovitis with associated bony erosive changes and reactive marrow edema of the talar head and navicular (Figure 3).

The patient underwent debridement, sequestrectomy, and application of antibiotic bone cement of the talonavicular joint. No cheese-like material was seen intraoperatively. Friable fragments of the talus and navicular bones were submitted for Gram stain and culture studies, KOH, AFB smear, and MTB PCR (GeneXpert), which yielded negative results. Histopathology revealed chronic granulomatous inflammation with caseation necrosis. The patient started another antituberculosis treatment regimen comprising two months HRZE, followed by two months HRE, then four months HR.

During the interim, the patient was compliant with non-weight-bearing with no untoward wound complications. Patient was readmitted after two months for removal of antibiotic spacer and talonavicular arthrodesis via lag screw fixation with iliac bone grafting for the definitive treatment (Figure 4). Intraoperatively, we saw no gross purulence but noted cheesy material upon curetting the lateral navicular. Specimens, including talonavicular joint curettings and navicular bone chips, were obtained intraoperatively and submitted for Gram stain and culture studies and MTB-PCR. This time, MTB-PCR revealed positive results while Gram stain and culture studies yielded no growth. The patient was maintained on a short leg posterior mold and allowed gentle ROM for four weeks. At six weeks post-operatively, radiographs noted no signs of implant loosening or peri-implant lucencies. Weight bearing was progressed with a walking boot and assistive device. Full weight bearing without a boot was allowed four months post-operatively, with follow-up radiographs showing graft incorporation (Figure 5).

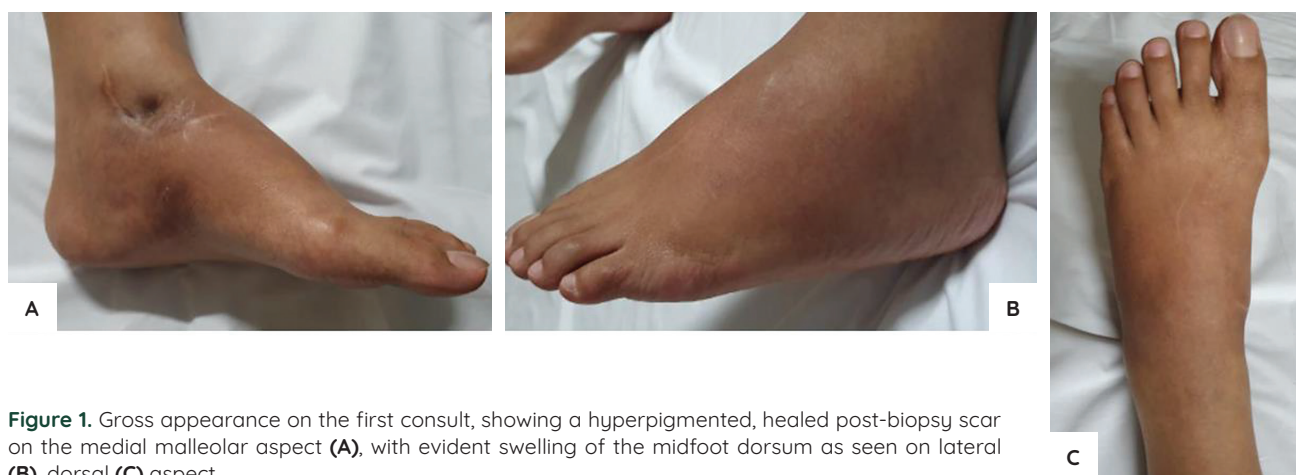


Figure 1. Gross appearance on the first consult, showing a hyperpigmented, healed post-biopsy scar on the medial malleolar aspect (A), with evident swelling of the midfoot dorsum as seen on lateral (B), dorsal (C) aspect.



Figure 2. Preoperative radiographs [lateral view (A), anteroposterior view (B), oblique view (C)] of the left foot 'showing cortical irregularities with sclerotic changes (white arrows) of the talus and navicular bones with apparent narrowing of the talonavicular joint.



Figure 3. Magnetic resonance imaging of the left foot. T2-weighted sagittal image (A) demonstrating diffuse joint effusion (white arrow) and marrow edema (red dots); T1-weighted sagittal image (B) demonstrating cortical destruction (yellow arrow); T2-weighted axial (C) and coronal (D) images further demonstrating the talar head and navicular abnormalities.

DISCUSSION

Extrapulmonary, extraspinal tuberculosis is an uncommon presentation of tuberculosis, with an even more uncommon presentation in the foot, with a reported incidence of 3% among bone tuberculosis cases.⁸ The tarsal joints and calcaneus are the two most common lesion sites, but navicular and cuneiform tuberculosis are extremely rare.⁹ The insidious course and non-specific presentation make diagnosis and detection difficult, often at a more advanced stage.¹⁰

Upon review of the literature, the authors were able to identify only a total of three cases of isolated osseous tuberculosis involving the talonavicular joint (Table 1). Of these, the majority were females, while the ages ranged from as young as nine to as old as 43 years.

Diagnosis of osteoarticular tuberculosis of the foot and ankle is relatively difficult compared with other presentations of extrapulmonary tuberculosis, such as in the spine and hips. The delay in diagnosis is often due to difficulties in isolating the organism and differentiating the disease from other diseases that TB can mimic, such as osteoarthritis, pyogenic osteomyelitis, fungal osteomyelitis, or bone tumor.^{11,12} In our literature review, all cases presented with chronic pain of at least four months, with associated swelling and limited range of motion due to pain. Clinical presentations of talonavicular TB were similarly insidious and non-specific.

Hematologic tests such as erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) are non-specific but commonly used to monitor response to treatment. In a study of extrapulmonary TB, 15.5% and 26.8% presented with

normal CRP and ESR levels, respectively.¹³ In other studies, two of three cases show a slight elevation of ESR and CRP. Our patient presented with normal values.

Preoperative imaging, such as radiographs, demonstrated signs of osteopenia, erosive changes of the bone and joint, and soft tissue swelling. These findings are consistent with chronic or ongoing bone infection; however, these findings are not specific to tuberculosis. MRI can reveal marrow edema, joint effusion, and bone or cartilage destruction on T1 and T2 weighted images, as seen in our case, which are suggestive of inflammation, but are not specific to tuberculosis.⁹

Our diagnosis was made based on the histopathologic report from samples taken during debridement. In the literature

review, all cases confirmed the diagnosis of tuberculosis through histopathologic findings consistent with tuberculosis and yielded positive cultures of *Mycobacterium tuberculosis*. Histopathology and demonstration of Acid-Fast Bacilli (AFB) either by Ziehl-Nielsen staining or culture is the gold standard in diagnosing musculoskeletal tuberculosis.¹⁴ MTB-PCR assays, like the Xpert MTB/RIF and Xpert Ultra, show faster yield with high specificity (95–100%) comparable with culture and AFB staining, but variable sensitivity (75–85%).¹⁵ Diagnosis confirmed via culture or MTB-PCR should be established before initiating anti-tuberculous therapy.¹⁶

Antituberculous therapy (ATT) remains the mainstay of treatment of bone tuberculosis, and should be initiated upon diagnosis.^{8,9,11} Literature presents varying regimens and

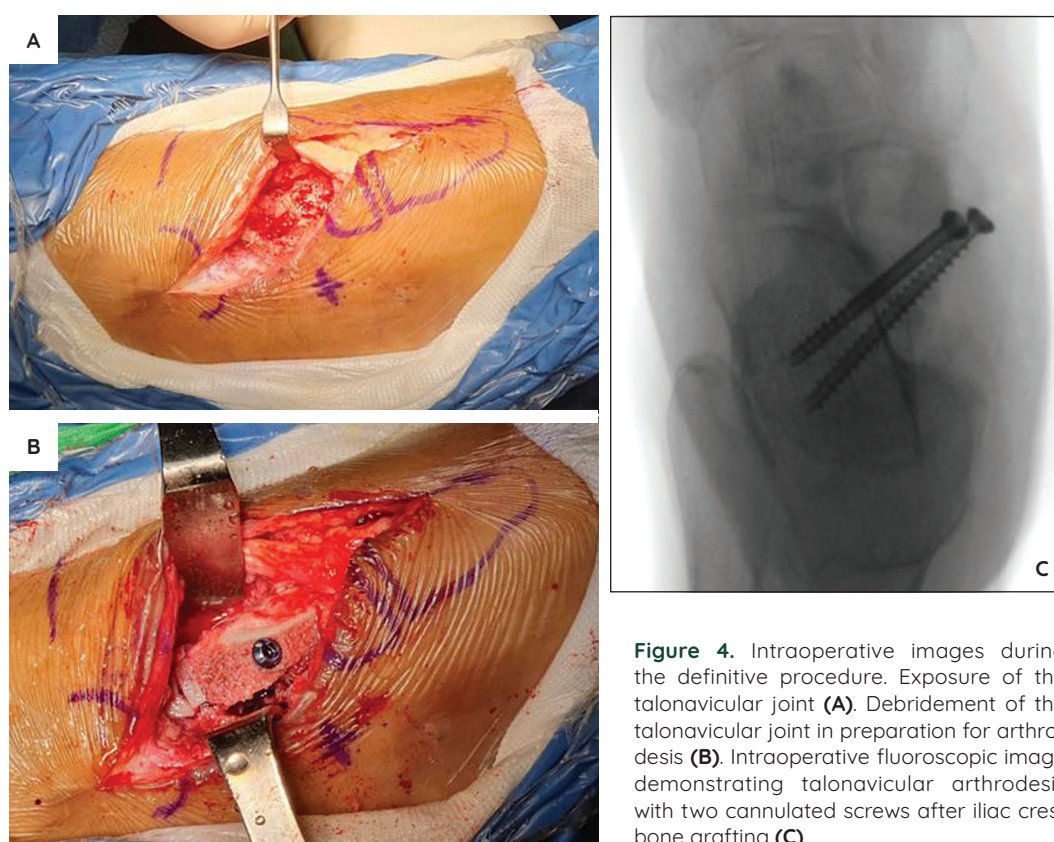


Figure 4. Intraoperative images during the definitive procedure. Exposure of the talonavicular joint (A). Debridement of the talonavicular joint in preparation for arthrodesis (B). Intraoperative fluoroscopic image demonstrating talonavicular arthrodesis with two cannulated screws after iliac crest bone grafting (C).

Table 1. Summary of literature of talonavicular joint tuberculosis

Author / Year Published	Demo-graphic	Presentation	Duration of symptoms	Tests	Radiographs	Final Diagnosis	Surgery	ATT
<i>Present Study</i>	41F	Pain, swelling	6 years	Normal ESR and CRP	Cortical irregularities with sclerotic changes	Positive biopsy and MTB-PCR	Sequestrectomy, antibiotic bone cement, bone grafting	HRZE 2 months, HRE 2 months, HR 4 months
<i>Faizan 2017</i>	9M	Swelling, pain, limited ROM	6 months	Elevated ESR, CRP	Diffuse osteopenia, marginal erosion, soft tissue prominence	Needle biopsy; positive culture	None	HRZE 4 months, HR 1 year
<i>Kapetanakis¹² 2018</i>	43F	Swelling and pain, limited ROM	4 months	-	Osteitis and arthritis	Positive culture, bone biopsy	None	HRZE 2 months, HR 4 months
<i>Brew 2010</i>	41F	Pain, swelling, tenderness, limited ROM	7 months	Elevated ESR	Periarticular osteopenia, narrow TN joint	Open biopsy, positive culture	None	RE 12 months

TN, talonavicular joint; ATT, antituberculous therapy; H, isoniazid; R, rifampicin; Z, pyrazinamide; E, ethambutol; S, streptomycin

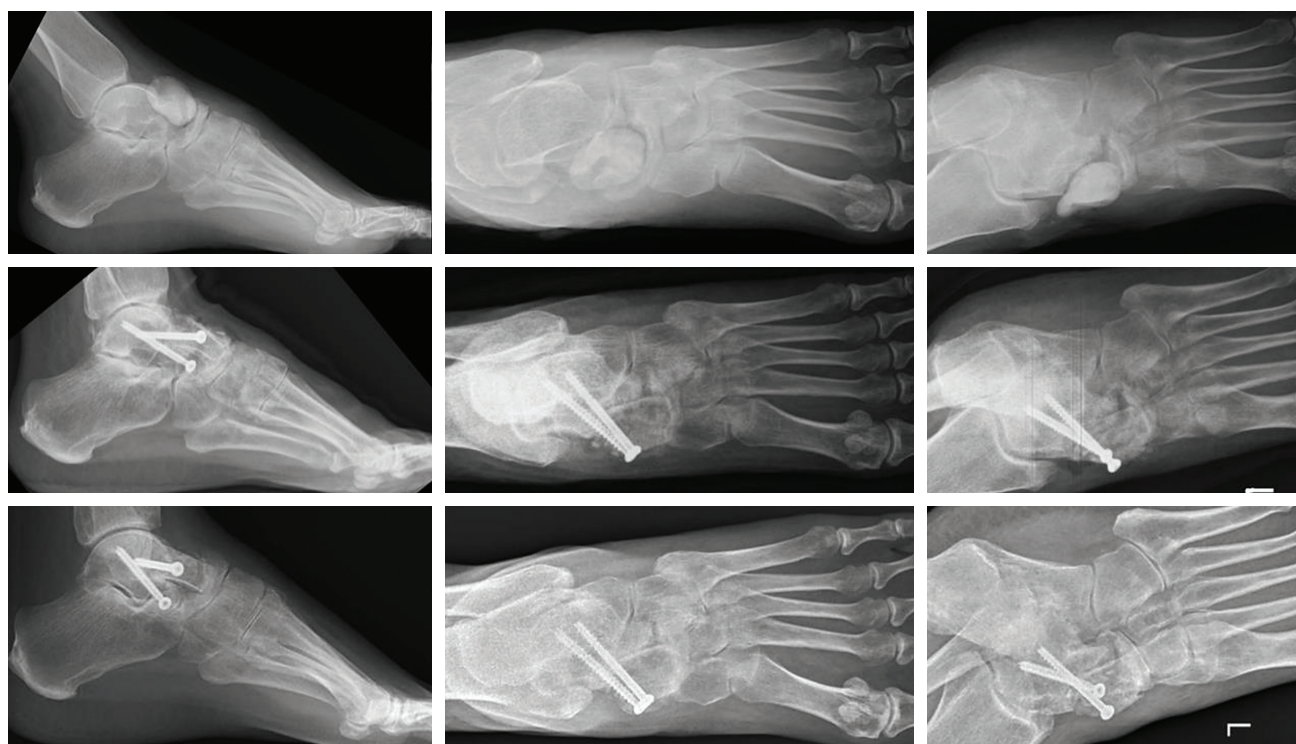


Figure 5. Comparative radiographs of the affected foot in lateral (*left*), anteroposterior (*center*), and oblique (*right*) views. **Top row:** Radiographs after the index surgery demonstrating persistent talonavicular joint destruction. **Middle row:** Immediate post-operative radiographs following definitive talonavicular arthrodesis with screw fixation. **Bottom row:** Radiographs at 4-month follow-up demonstrating maintained alignment, stable hardware, and progressive osseous fusion across the arthrodesis site.

durations of anti-TB medications, with three of six studies employing an initial high intensity phase with isoniazid (H), rifampicin (R), ethambutol (E), and pyrazinamide (Z) for two to four months, and a maintenance phase with isoniazid and rifampicin for six to 18 months. Related literature recommended extended treatment with ATT for bone and musculoskeletal TB.¹⁷ In the Philippine setting, the disease treatment regimen for newly diagnosed extrapulmonary TB involving bones and joints consists of two months HRZE and ten months of HR.¹⁶

The decision for surgery depends on the severity of clinical and radiographic presentation. Resection and curettage of sequestered bone can be done for non-healing lesions.¹¹ Local infection control and immediate mechanical stability can be achieved by placing a temporary antibiotic-laden cement spacer.¹⁸ Surgery could take the form of a biopsy when the diagnosis is uncertain, debridement for severe cases or poor response to therapy, or resection with or without arthrodesis for deformity or arthritis.¹⁹ The decision to do arthrodesis is dependent upon the extent of bony destruction and instability.¹⁸

CONCLUSION

Tuberculosis of the talonavicular joint is a rare presentation of a prevalent infectious disease in the Philippines. The difficulty in diagnosis is attributed to its insidious onset and non-specific presentation, which can result in treatment delay

and disease progression. Although uncommon, tuberculosis should always be a differential in cases of chronic ankle and foot pain.

ETHICAL CONSIDERATIONS

Patient consent was obtained before manuscript submission.

STATEMENT OF AUTHORSHIP

All authors certified fulfillment of ICMJE authorship criteria.

CREDIT AUTHOR STATEMENT

DMC: Conceptualization, Methodology, Software, Validation, Formal Analysis, Investigation, Resources, Data Curation, Writing – original draft preparation, Writing – review and editing, Visualization, Project administration, Funding acquisition; **LEA:** Conceptualization, Methodology, Formal analysis, Writing – review and editing, Visualization, **HMC:** Conceptualization, Methodology, Writing – review and editing, Visualization, Supervision, Project administration; **JRP:** Writing – review and editing, Visualization, Supervision.

DATA AVAILABILITY STATEMENT

No datasets were generated or analyzed for this research.

AUTHOR DISCLOSURE

The authors declared no conflict of interest.

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