

## Case Report

# Tuberculous Arthritis of The Ankle Mimicking Synovitis in Child

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## ABSTRACT

**Background:** Extrapulmonary Tuberculosis is approximately 10% of all tuberculosis (TB) cases, and the musculoskeletal system's involvement was only 2-4. The incidence of ankle TB was found to be less than 2% of all musculoskeletal TB. The rare occurrence, uncommon site, non-specific symptoms, lack of awareness frequently causes diagnosis difficulties.

**Case Report:** A 2,5-year-old child came to the hospital with the main complaints of swelling and pain on the left ankle since one year ago. She was diagnosed with the ankle's synovitis from the previous hospital and was given analgesics and a warm compress on the left ankle. However, the swelling of her left ankle increased during the last seven months, causing limitation of the left ankle movement, then she was admitted to the hospital for further examination.

**Discussion:** Radiologic examination revealed peripheral osseous erosions, reduced bone mineral content, and soft tissue swelling. A Mantoux test was positive with 15 mm induration and 25 mm erythema. Anti-tuberculous drugs (ATD) therapy was given with isoniazid 50 mg, rifampicin 75 mg, pyrazinamide 150 mg, and ethambutol 230 mg for two months, as an intensive phase therapy following rifampicin 75 mg and isoniazid 50 mg for ten months.

**Conclusion:** Tuberculous arthritis of the ankle poses a diagnostic-difficulties, it should be considered especially in the endemic area. It is often misdiagnosed with other musculoskeletal conditions, which can delay the initiation of appropriate treatment. TB must be confirmed by histological pathology. A combination of ATD and surgery can lead to clinical improvement.

Keywords: Tuberculous ankle; Child; Synovitis; Human and Medicine

## INTRODUCTION

Tuberculosis (TB) is a worldwide infectious disease which represents the ninth leading cause of death worldwide.<sup>1,2</sup> Pulmonary TB is the most common form of presentment, but extrapulmonary TB, involving the skeletal system, serous membranes, the genitourinary tract, lymph nodes, bowel, and meninges, can significantly contribute to morbidity and mortality. Diagnosing skeletal TB, especially the tuberculous ankle, remains challenging

because of the non-specific clinical symptoms and its rarity of the cases.<sup>2</sup>

Latent TB occurred in one-third of the world population. In 2018, latent TB cases were approximated to be 1.7 billion cases worldwide, and as high as 10.5 million cases were approximated to be at high risk for active TB.<sup>2</sup> In Indonesia, approximately 840,000 (32 per 100,000) people were infected with TB, and 107,000 died. Indonesia had 840,000 cases, China had 880,000 cases, and India 2,700,000

cases, ranking third, second, and first, respectively, in TB incidence worldwide.<sup>1</sup> In particular, skeletal tuberculosis accounts for 3% of all TB cases and 10–20% of extrapulmonary TB cases. The most commonly affected sites are spine (50%), pelvis (12%), ribs (7%), hip and femur (10%), upper limbs (7%), shoulder and ankle are affected in only 2% of the cases of musculoskeletal tuberculosis.<sup>3,4</sup>

The rare incidence of tuberculous arthritis of the ankle usually causes diagnosis challenges, especially in children. Low clinical suspicion may delay the initiation of treatment resulting in deformities and functional deficits.<sup>4</sup> We describe a patient who presented with non-specific symptoms in the left ankle, with no TB risk factors, and has similar symptoms with other musculoskeletal conditions. Casual diagnosis and proper treatment could help avoid the worse outcome.

## CASE REPORT

A 2.5-year-old girl came with the main complaints of swelling and pain on the left ankle since December 2018. She was diagnosed with synovitis of the ankle from the previous hospital and was given analgesics and a warm compress only on the left ankle. However, the swelling of her left ankle was gradually getting worse over the past seven months, causing progressive limitation of the left ankle movement, no other symptoms were reported. She was admitted to the hospital for further examinations.

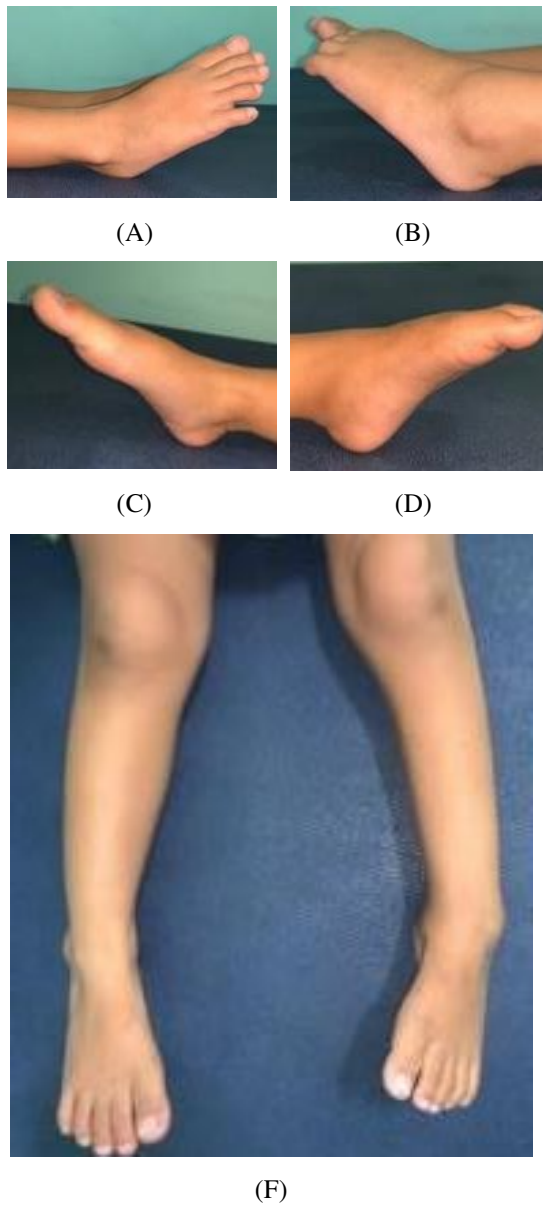
Physical examination (Figure 1) revealed a tender and swollen left ankle, without erythema or warmth. Foot and ankle movements were difficult to be examined due to the pain. Laboratory findings revealed an increased white blood cell (13.75 mg/dl) and a slight increase in Erythrocyte Sedimentation Rate (25 mm/h). Rheumatoid factor and autoantibodies tests were negative. Other hematological parameters (albumin, serum electrolytes, liver enzymes, serum bilirubin), complete blood count, and coagulation tests were within normal limits.

Mantoux test was positive with 15 mm induration and 25 mm erythema. A chest x-ray showed no signs of tuberculosis infection such as consolidations or opacities. Anti-tuberculous drugs (ATD) therapy was given with isoniazid 50 mg, rifampicin 75 mg, pyrazinamide 150 mg, and ethambutol 230 mg for two months, as an intensive phase therapy following rifampicin 75 mg, and isoniazid 50 mg for ten months.

The foot x-ray (Figure 2) showed soft tissue swelling, which presented ankle osteoarthritis and peripheral osseous erosions.

The chest x-ray (Figure 3) showed no signs of tuberculosis infection, such as consolidations or opacities.





**Figure 1.** Clinical manifestation of the patient (A) Right ankle lateral view (B) Left ankle lateral view (C) Right ankle medial view (D) Left ankle medial view (E) Anterior view of the lower leg.



**Figure 2.** AP / lateral right and left ankle X-ray.

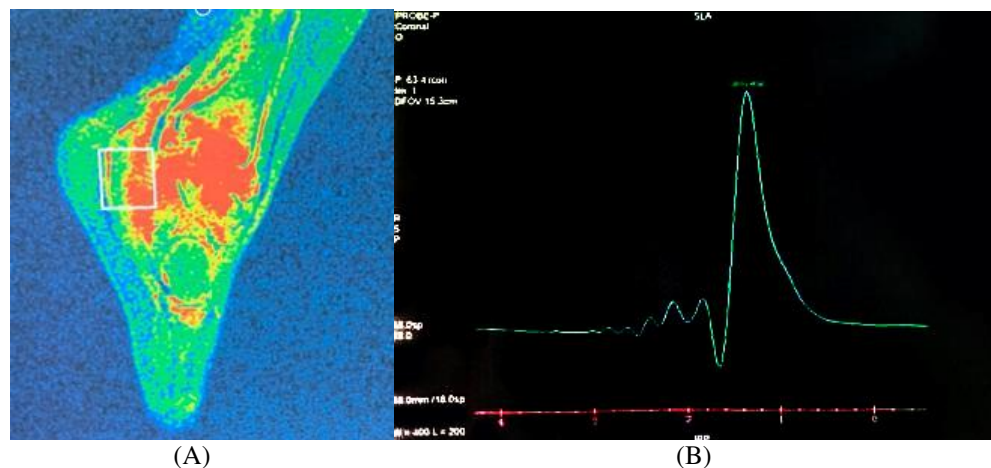


**Figure 3.** Anteroposterior chest X-ray.



**Figure 4.** MRI evaluation of tubercular arthritis of the left ankle.

We also performed Magnetic Resonance Imaging (MRI) of the left ankle. The MRI (Figure 4) showed the destruction of the left ankle joint, especially the left talus bone dome. Swollen extensive bone marrow on the epiphyseal of distal tibia and fibula, talus bone, and calcaneus bone. Erosion of the superior part of left calcaneus bone, dislocation of the left talus calcaneal joint to anteromedial, and the narrowing of the left talus tibia joint to medial. Magnetic Resonance Spectroscopy (Figure 5) showed that the increase of lipid lactate Intra lesion is associated with necrotic cells.

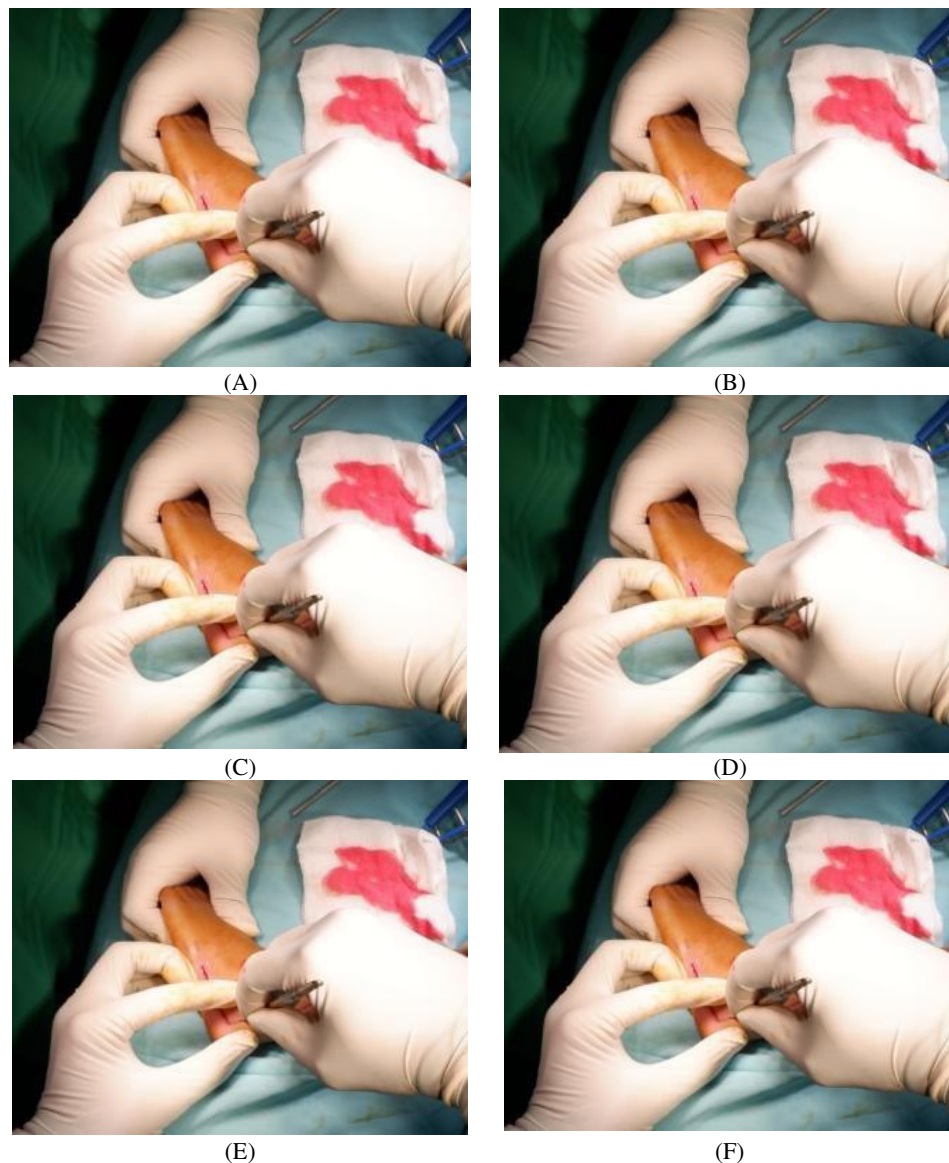


**Figure 5.** Magnetic Resonance Spectroscopy of the left ankle, (A) The increase of lipid lactate caused by tuberculous arthritis of the ankle is indicated by the square box, (B) Magnetic Resonance Spectroscopy showed the increased of lipid lactate.

Debridement and sequestrectomy of the left ankle were performed. Specimens were submitted for histopathologic analysis, including Gram and acid-fast staining. After that, we performed bone grafting with synthetic

bone graft and closure without drainage shown in Figure 6. After surgery, the ankle was immobilized with gips, and the patient was planned for post-op rehabilitation programs.



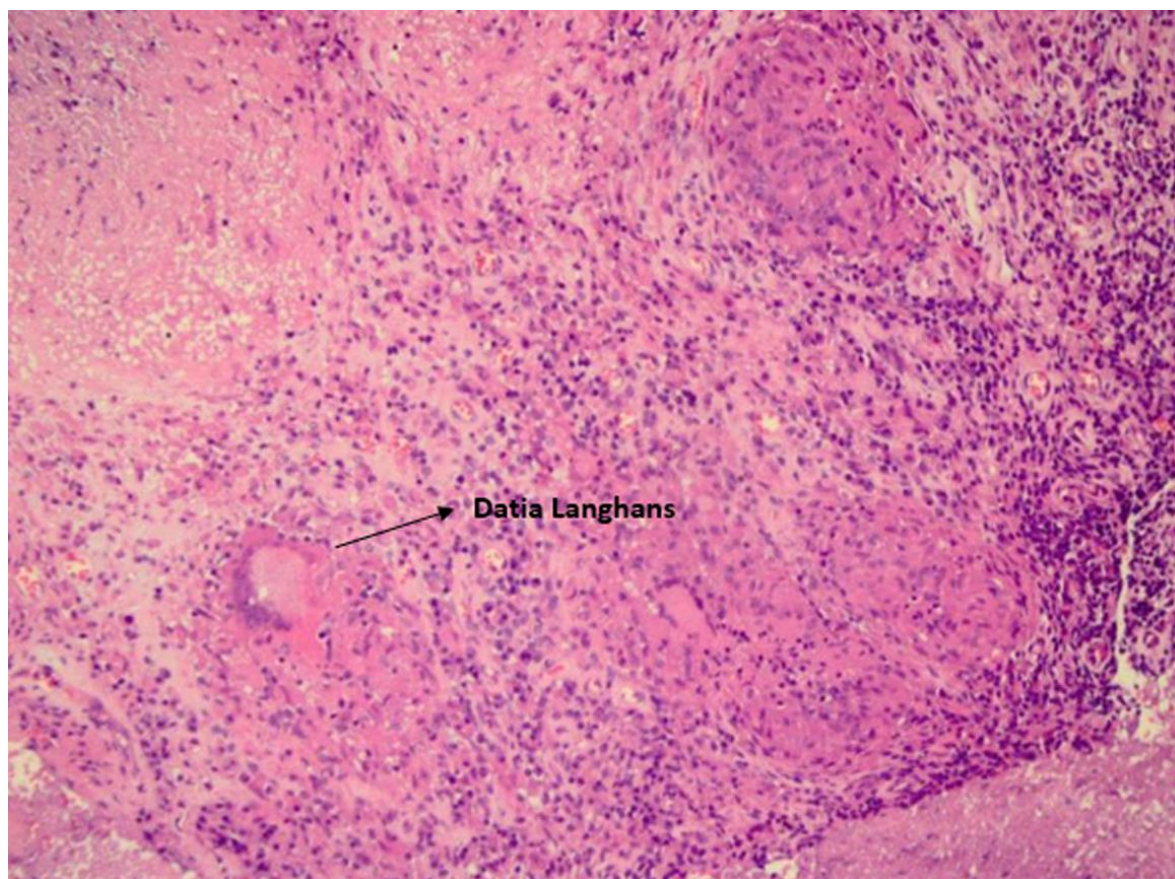


**Figure 6.** Intraoperative procedures, (A) Incision with lateral approach, (B) Sequestrectomy & debridement, (C) Tissue sampling, (D) Bone grafting to fill the gap, (E) Wound closure preparation, (F) The specimens.

Histopathology examination presented a chronic granulomatous inflammatory process with multinucleated giant cells (Datis Langhans) (Figure 7) surrounding necrosis areas, similar to tuberculous osteomyelitis. Even though acid-fast staining results were negative, the most common etiology for necrotizing granulomas is mycobacteria.

## DISCUSSION

Tuberculosis remains a major global health problem, especially in developing countries. Our patient was presented with TB of the ankle, which is very rare (<2% of skeletal TB), and the clinical presentation may similar to other musculoskeletal conditions. Due to its atypical symptoms and its rarity of the cases, TB of the ankle is often neglected and misdiagnosed, especially in primary health care.<sup>5</sup>



**Figure 7.** Hematoxylin and eosin staining of the left ankle sample.

The clinical history, imaging modality, and histological examination are essential to diagnose TB of the ankle. TB's classic systemic symptoms, such as night sweats, weight loss, and fever, are often absent.<sup>4,5</sup>

The compliance of ATD should be monitored every day because she has no parents who can ensure her to consume ATD regularly. This patient has a higher risk of becoming un-compliant with the ATD, leading her to multi drugs resistance.

Early diagnosis and treatment can give significance result to the prognosis. Mantoux test is the most common diagnostic tool for tuberculosis infection, especially in children, but its efficacy is still debatable. Plain radiographs of the ankle remain first-line

imaging modality. In cases of suspected TB infection, general imaging should always include a chest X-ray to eliminate suspicion of pulmonary TB. Phemister's triad (peripheral osseous erosions, juxta-articular osteoporosis, and joint space narrowing) in tuberculosis may mimic rheumatoid arthritis, but when the implication of monoarticular and erosions are hard to be defined, the diagnosis of TB must be considered. By the time ankle shows a destructive bony appearance, the TB disease process is already severe and capable of contiguous or hematological spread to other sites.<sup>6</sup>

MRI can be useful to diagnose soft tissue infections. It could present the spreading of the disease. It is extremely sensitive, even in the early phase of bone infection. MRI can show

bone marrow inflammation, which is indicated as the general bone pathology and is useful for identifying the pre-destructive phase of bone implication at the ankle's tuberculosis. Early diagnosis during the pre-destructive phase is essential so that the treatment of ATD can be given earlier.<sup>7,8</sup>

The child's conservative treatment is started with ATD, isoniazid, rifampicin, pyrazinamide, and ethambutol for two months for initial treatment, following rifampicin and isoniazid for ten months for continuous phase. Surgery will be considered if conservative therapy did not provide significant results. The purposes of surgical intervention are diagnostic and debridement therapy. Debridement of bone lesions can provide better therapeutic results because M. Tuberculosis is sequestered in necrotic tissues that ATD could not reach. In some cases, arthrodesis is performed to achieve stability and relief of pain. But in this case, performing arthrodesis is not advantageous because of the greater joints remodeling ability in children.<sup>9</sup>

Surgery aims to eliminate sequestered bone, neovascularization of tissue, and debridement of bone. The monitoring of treatment can be followed up by performed a plain X-ray of the ankle and blood tests every three months.

## CONCLUSIONS

Diagnosing tuberculous arthritis of the ankle, especially in children, is difficult because of its atypical symptoms, rare incidence, uncommon site, and lack of awareness. Tuberculous

arthritis of the ankle should be considered, especially in an endemic area like Indonesia. It is usually misdiagnosed with other musculoskeletal conditions that can delay treatment initiation, resulting in devastating deformities and functional deficits. Histology examination could confirm the diagnosis of TB. A combination of ATD therapy and surgery can lead to clinical improvement.

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