

A Rare Presentation of Osteoarticular Tuberculosis in a Child with Chronic Foot Swelling: A Case Report

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ABSTRACT

Background: Osteoarticular tuberculosis is a rare form of extrapulmonary tuberculosis in children and often presents with nonspecific clinical manifestations that may mimic malignancy or chronic infection. Its insidious onset and often normal initial imaging frequently lead to delayed diagnosis.

Objective: To report a rare case of pediatric osteoarticular tuberculosis involving the left dorsal foot that initially mimicked malignancy and highlight the importance of clinical suspicion and histopathological confirmation.

Case: A 6-year-old boy presented with progressive swelling of the left dorsal foot since the age of four following minor trauma, accompanied by a chronic wound with purulent discharge despite symptomatic treatment and two prior surgical debridements. The patient had a history of close contact with a parents with tuberculosis and had previously completed Tuberculosis preventive therapy. Physical examination showed a 2 × 2 cm ulcer with yellowish discharge and granulation tissue. Laboratory tests and chest radiography were unremarkable. Computed tomography revealed a destructive heterogeneous lesion suspicious for malignancy. However, histopathological examination revealed granulomatous inflammation with caseous necrosis and multinucleated giant cells, consistent with osteoarticular tuberculosis. The patient was treated with a 12-month anti-tuberculosis regimen (2HRZE/10HR) with close follow-up.

Discussion: Osteoarticular tuberculosis accounts for 5–6% of pediatric extrapulmonary TB, with foot and ankle involvement being extremely rare and may resemble chronic infection or malignancy radiologically. Histopathological examination remains essential for definitive diagnosis.

Conclusion: Pediatric osteoarticular tuberculosis should be considered in children presenting with chronic monoarticular swelling, particularly in the presence of tuberculosis contact history. Early recognition and comprehensive evaluation are crucial to avoid delayed treatment and long-term complications.

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KEYWORDS: Tuberculosis, Osteoarticular, Child , Extrapulmonary Tuberculosis

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INTRODUCTION

Tuberculosis (TB) remains a major global health problem, particularly in low- and middle-income countries. According to the World Health Organization 2024 report, approximately 1.2–1.3 million children and adolescents (<15 years) were affected by TB during 2022–2023, with 12% of cases occurring in children. It is estimated that more than 200,000 pediatric deaths occur annually, predominantly in those under

5 years of age.¹ Indonesia is among the countries with the second highest TB burden worldwide, with an estimated over 1 million TB cases annually and approximately 135,000 cases occurring in children aged 0–14 years in 2024.²

Tuberculosis is an infectious disease caused by *Mycobacterium tuberculosis*, which primarily affects the lungs but can also involve various extrapulmonary sites; this condition is referred to as extrapulmonary tuberculosis

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(EPTB). Data from the Global TB Report 2020 indicate that extrapulmonary TB accounts for approximately 16% of all reported TB cases worldwide, with proportions of around 8% in the Western Pacific region and 24% in the Eastern Mediterranean region.³

In children, extrapulmonary TB most commonly manifests as lymphadenopathy, central nervous system involvement, pleural TB, miliary TB, and skeletal or osteoarticular tuberculosis (OATB).⁴ The incidence of osteoarticular TB in children is reported to be approximately 5–6% of all extrapulmonary TB cases in the pediatric population. The pathogenesis of osteoarticular TB involves reactivation of dormant bacilli in bone following mycobacteremia during primary infection. These bacilli typically remain dormant in the spine and large joints due to their rich vascular supply. Osteoarticular TB may also occur secondary to direct inoculation of mycobacteria following exposure such as traumatic injury or surgical procedures (e.g., arthroplasty). Additionally, infection can occur via hematogenous dissemination, particularly when host immunity is compromised.⁵

Musculoskeletal TB in children is important to recognize, as it shares clinical, radiological, and hematological features with various infectious and non-infectious conditions. Osteoarticular TB progresses insidiously and often presents with minimal symptoms, such as chronic swelling, mild pain, or the formation of non-healing sinuses. Consequently, it is frequently misdiagnosed as a

soft tissue tumor or chronic pyogenic infection. Studies indicate that more than 50% of osteoarticular TB cases experience a diagnostic delay exceeding 6 months, largely due to its nonspecific clinical presentation. Early diagnosis of TB in children is essential, as the disease has the potential to cause joint destruction, leading to severe sequelae and loss of joint function.⁶ Definitive diagnosis generally requires a combination of imaging studies and histopathological examination demonstrating necrotizing granulomas, given the low sensitivity of *Mycobacterium tuberculosis* culture from bone tissue.

This case report highlights the importance of considering osteoarticular TB in children presenting with chronic extremity swelling, particularly in the presence of a household TB contact, as well as the need for multidisciplinary collaboration to establish a timely and accurate diagnosis.

CASE ILLUSTRATION

A 6-year-old boy presented with a history of chronic swelling of the left ankle since the age of 4 years. The complaint began after a fall, during which his left foot struck a swing, resulting in swelling and a wound over the dorsum of the left foot. Initially, the patient was still able to ambulate; however, the swelling progressively worsened. The patient was taken to a midwife and received oral syrup medication and topical ointment, with no clinical improvement.

Over the following year, the swelling increased in size and was accompanied by mild pain and high-grade fever, leading to hospitalization at Kasih Ibu Kedonganan Hospital. A plain radiograph of the left foot was performed and reported as normal. The patient subsequently underwent wound debridement twice; however, there was no improvement, and the left foot remained swollen with minimal exudate discharge. The patient was then referred to Bali Mandara General Hospital for further evaluation and management.

The patient had no prior history of similar illness, weight loss, prolonged fever, or chronic cough; however, there was a history of night sweats. There was no similar complaint among family members, but the patient had a history of household contact with tuberculosis. His father had a history of pulmonary tuberculosis prior to marriage, and his mother had bacteriologically confirmed tuberculosis when the patient was 2 years old. The patient had received tuberculosis prophylactic therapy at the age of 2 years.

The patient was born at term via spontaneous vaginal delivery assisted by a midwife in Java, with incomplete immunization history. Growth and development were reported as normal, with good appetite.

The patient lived with seven other family members, and no other household members had received tuberculosis prophylaxis. From birth until the age of 3 years, the patient lived in Java with his parents and extended family. He had been residing in Bali for the past 3 years in a rented house. During the time when his mother was diagnosed with tuberculosis, only the patient underwent screening, while other family members were not screened. There were no similar complaints reported in the patient's current neighborhood.

On physical examination at Bali Mandara General Hospital, the patient was compos mentis (GCS E4V5M6). Vital signs were as follows: blood pressure 99/60 mmHg, pulse rate 80 beats per minute, respiratory rate 20 breaths per minute, temperature 36.9°C, and oxygen saturation (SpO₂) 99%. Body weight was 18.6 kg and height 117 cm. Nutritional status based on the CDC 2000 growth chart was within normal limits. General examination revealed normal findings of the head and neck, non-anemic conjunctiva, no scleral icterus, and no palpable lymphadenopathy. Thoracic and cardiovascular examinations were unremarkable. Abdominal examination showed no hepatosplenomegaly. Examination of the extremities revealed swelling over the dorsum pedis, with an approximately 2 × 2 cm ulcer producing thick yellowish discharge. Mild erythema and granulation tissue were noted surrounding the wound. There was no visible bone deformity or regional lymphadenopathy.



Figure 1. Lesion on the dorsum of the left foot (*dorsum pedis sinistra*) following debridement.

Further investigations included contrast-enhanced CT scan of the left foot, chest radiograph, and laboratory examinations including complete blood count, renal function, liver function, coagulation profile, and HIV screening. Histopathological examination of tissue obtained from the left foot lesion was also performed.

Laboratory results were within normal limits. Chest radiograph showed normal lung fields and cardiac silhouette, normal bronchovascular markings, no infiltrates or nodules, and normal bilateral hila.

Tabel 1. Laboratory findings

White blood cell	10.11 uL	5.00 – 14.5 uL
Red blood cell	5.13 uL	3.70 – 5.70 uL
Hemoglobin	12.3 g/dL	10.8 – 15.6 g/dL
Hematocrit	39.4%	31 – 43 %
MCV	76.8 fL	72 – 88 fL
MCH	24 pg	26 – 38 pg
MCHC	31.2 g/dL	32 – 36 g/dL
AST	23 U/L	0-35 U/L
ALT	9 U/L	0-45 U/L
Urea	14 mg/dL	< 50
Creatinine	0.27 mg/dL	0.6 – 1.2
Random blood glucose	88 mg/dL	70-140 mg/dL
Bleeding time (BT)	1'30''	1'00'' – 3'00''
Clotting time (CT)	11'30''	5'00'' – 15'00''
Anti-HIV	Non-reactive	Non-reactive

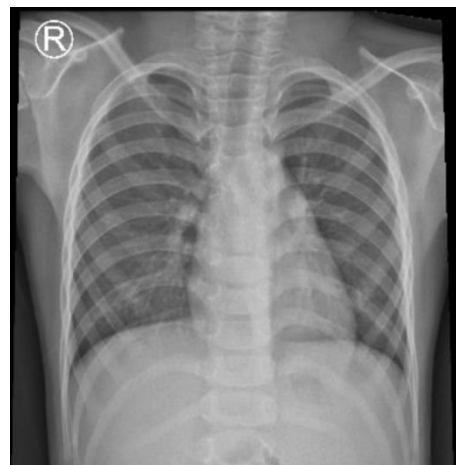


Figure 2. Chest radiograph

Contrast-enhanced CT scan of the left foot (axial, coronal, and sagittal reformatted images with 3D reconstruction) demonstrated a large, heterogeneous, enhancing solid lesion involving the cutaneous to deep soft tissue of the midfoot. The lesion appeared to destruct the lateral base, extending from the mid to medial cuneiform bones and the anterior talus. It also encased the dorsalis pedis artery. These findings were suggestive of a malignant soft tissue mass. Additionally, a hypodense area extending to the cutaneous aspect of the medial dorsum pedis was noted, raising suspicion of secondary infection.

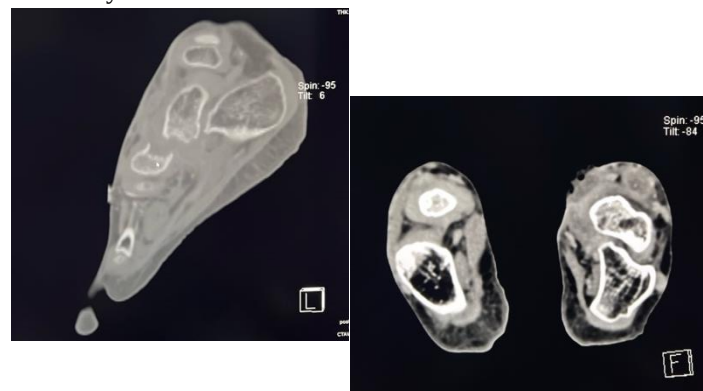


Figure 3. Contrast-enhanced CT scan of the left foot (*pedis sinistra*)

Histopathological examination of tissue from the left foot lesion revealed dense aggregates of epithelioid histiocytes forming granulomas, surrounded by lymphocytes, plasma cells, and macrophages. Central necrosis was observed, along with the presence of multinucleated giant cells. No neoplastic cells were identified. The histomorphological findings were consistent with chronic granulomatous inflammation, compatible with osteoarticular tuberculosis.

Based on the clinical, radiological, and histopathological findings, the patient was diagnosed with osteoarticular tuberculosis.

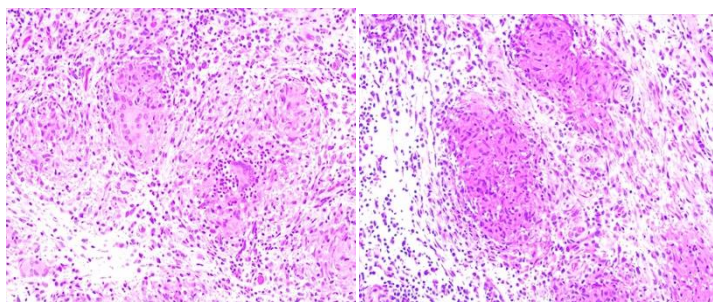


Figure 4. Histopathological findings.

Following diagnosis, the patient was initiated on anti-tuberculosis therapy (ATT) with a regimen of 2RHZE followed by 10RH for a total duration of 12 months, along with vitamin B supplementation (1 tablet daily). The patient's family was educated regarding medication adherence, and the mother was designated as the treatment supervisor to ensure compliance. The patient was scheduled for monthly follow-up to monitor adherence and potential adverse effects of anti-tuberculosis therapy.



Figure 5. Lesion on the dorsum of the left foot (*dorsum pedis sinistra*) after 2 months of anti-tuberculosis therapy (ATT)

DISCUSSION

Osteoarticular tuberculosis (OATB) in children accounts for approximately 5–6% of all extrapulmonary tuberculosis cases in the pediatric population. The spine is the most commonly affected site, a condition known as Pott's disease. Tuberculosis involving the foot and ankle is extremely rare, representing only about 0.13% of extrapulmonary TB cases, and its clinical presentation may mimic various other musculoskeletal infections. Atypical manifestations and the rarity of cases often result in delayed or incorrect diagnosis, particularly in primary healthcare settings.^{7,8}

This case illustrates osteomyelitic tuberculosis of the ankle in a child, a relatively uncommon form of extrapulmonary TB that carries a risk of long-term morbidity if diagnosis is delayed. The interval between initial symptom onset and diagnosis of foot and ankle TB varies widely across studies; reports have described delays exceeding one year, consistent

with this case, where symptoms persisted for more than a year. Clinical manifestations of osteoarticular TB vary depending on the site involved. The disease is typically monofocal and initially presents with pain, swelling of the affected area, limited range of motion, sinus tract formation with discharge (as seen in tuberculous osteomyelitis), and occasionally tuberculous ulcers. The disease course is often subacute to chronic and progressive. Regional lymphadenopathy (inguinal or axillary) may also be present. These findings are consistent with the current case, in which the patient presented with progressive chronic swelling of the dorsum pedis accompanied by ulceration and purulent discharge.^{7,9}

Several studies have shown that classic systemic symptoms of tuberculosis such as fever, weight loss, chronic cough, and night sweats are frequently absent, even in active ankle TB. This is consistent with the present case, where the patient reported only night sweats without other typical TB symptoms.^{5,7}

Risk factors play an important role in the development of osteoarticular TB in children. A history of close household contact with individuals with active tuberculosis significantly increases the risk of transmission, particularly in children under 5 years of age due to their immature cell-mediated immunity. In this case, the patient had a history of exposure to tuberculosis through his mother at the age of 2 years and had received prophylactic therapy. However, literature indicates that children who have received TB prophylaxis may still develop active disease, especially with ongoing exposure.³

Nutritional status is another important risk factor. Malnourished children have impaired immune function, particularly in T-lymphocyte-mediated immunity, which plays a critical role in controlling mycobacterial infections.¹¹ Recent studies have demonstrated that malnutrition increases the risk of progression from latent to active TB, including extrapulmonary forms such as osteoarticular tuberculosis, and may lead to more severe clinical manifestations and slower therapeutic response. A history of trauma may also act as a precipitating factor, potentially facilitating local macrophage aggregation carrying bacilli from the primary infection site.^{5,12}

Osteoarticular TB often presents with nonspecific features and may mimic other conditions, leading to frequent misdiagnosis as chronic pyogenic infection or musculoskeletal tumors. Initial diagnosis can be supported by clinical findings, imaging studies, and microbiological or histopathological evaluation through aspiration or biopsy. Bone biopsy has been reported to have high sensitivity (94–100%) for diagnosing osteoarticular TB. Chest radiography is typically performed as part of the initial TB evaluation; however, a normal chest radiograph does not exclude osteoarticular TB, as approximately half of such cases occur without concurrent pulmonary involvement. In this case, CT imaging revealed destruction of the cuneiform bones and

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talus, initially suggestive of a malignant soft tissue mass, along with hypodense areas extending to the cutaneous aspect of the medial dorsum pedis, raising suspicion of secondary infection. These findings are consistent with typical imaging features of osteoarticular TB, including irregular osteolytic lesions, sclerosis, periosteal reaction, and bone erosion. CT imaging has higher sensitivity and specificity (67% and 50%, respectively) than conventional radiography, as it can detect early sequestrum and involucrum formation, as well as abscesses and the extent of bone destruction.^{7,13}

When osteoarticular TB is suspected, histopathological examination of biopsy specimens is essential to avoid contamination and establish a definitive diagnosis. Typical findings include granuloma formation, caseous necrosis, epithelioid tubercles, lymphocytes, and Langhans-type multinucleated giant cells. In this case, necrotizing granulomas with epithelioid cells and multinucleated giant cells were identified from FNAB samples, confirming tuberculosis infection. The concordance of clinical, radiological, and histopathological findings established the diagnosis of osteoarticular tuberculosis in this patient.^{6,7}

The mainstay of treatment for pediatric bone TB is prolonged anti-tuberculosis therapy. The World Health Organization 2022 guidelines recommend an initial 2-month intensive phase with isoniazid, rifampicin, pyrazinamide, and ethambutol (HRZE), followed by a 10-month continuation phase with isoniazid and rifampicin (HR), for a total duration of 12 months (2HRZE/10HR).¹⁴ The extended duration is recommended because osteoarticular TB is considered a deep-seated infection with high bacillary load, limited drug penetration, and a high risk of structural sequelae.¹⁵

In addition to pharmacological treatment, supportive management is important, including immobilization, physiotherapy, and selective surgical intervention for abscess drainage or debridement. Surgical intervention may be indicated in cases unresponsive to medical therapy, advanced disease with abscess formation, or significant soft tissue necrosis with osteochondral destruction and deformity. The most common indication for surgery remains diagnostic biopsy, as performed in this case. Long-term outcomes of osteoarticular TB may include reduced mobility, limb length discrepancy, persistent pain, and bone deformity due to epiphyseal plate involvement affecting bone remodeling. However, the cure rate can reach up to 90% if treatment is initiated early, adherence is maintained, and adequate nutritional and immune status are preserved.^{9,16}

CONCLUSIONS

This case highlights the importance of maintaining a high index of suspicion for osteoarticular tuberculosis in children presenting with chronic extremity swelling, particularly in the presence of a history of household TB contact. Nonspecific clinical manifestations often lead to delayed diagnosis; therefore, a multidisciplinary approach involving comprehensive history-taking, imaging, and histopathological examination is essential.

The identification of necrotizing granulomas on FNAB was pivotal in establishing the diagnosis in this patient. Early detection and prompt initiation of therapy are crucial to prevent long-term morbidity. This case underscores that extrapulmonary TB remains a diagnostic challenge in the pediatric population and should be considered in cases of chronic swelling unresponsive to conventional treatment.

CONFLICT OF INTEREST

All the authors declare that there are no conflicts of interest.

ETHICS APPROVAL

Informed consent has been acquired from the guardian (father). The patient's guardian provided written informed consent to be published as a case report.

REFERENCES

- I. Chen Z, Wang T, Du J, Sun L, Wang G, Ni R, An Y, Fan X, Li Y, Guo R, Mao L, Jing W, Shi K, Cheng J, Wang Q, Nie W, Liu H, Liang J, Gong W. Decoding the WHO Global Tuberculosis Report 2024: a critical analysis of global and Chinese key data. *Zoonoses*. 2025;5:1. Available from: doi:10.15212/ZOONOSES-2024-0061.
- II. Kementerian Kesehatan Republik Indonesia. Indonesia's Movement to End TB [Internet]. 11 Apr 2025 [cited 2025 Nov 23]. Available from: https://kemkes.go.id/eng/indonesias-movement-to-end-tb?utm_source=chatgpt.com
- III. World Health Organization. *Global tuberculosis report 2023*. Geneva: World Health Organization; 2023.
- IV. Cruz AT, Starke JR. Clinical manifestations of tuberculosis in children. *Paediatr Respir Rev*. 2007;8(2):107-117. Available from: doi:10.1016/j.prrv.2007.04.008.
- V. Pigrau-Serrallach C, Rodríguez-Pardo D. Bone and joint tuberculosis. *Int J Infect Dis*. 2013;17(3):e171–e177. Available from: doi:10.1016/j.ijid.2012.09.012.
- VI. Nemuri S, Agashe M. Musculoskeletal tuberculosis in children. *Int J Paediatr Orthop*. 2023;9(3):28-34. Available from: doi:10.13107/ijpo.2023.v09.i03.160.
- VII. Wicks L, Faroug R, Richler-Potts D, Bowden A, Issac R, Mangwani J. Diagnosis and treatment of tuberculosis of the foot and ankle: a literature review. *The Foot*. 2018;37:105-112. Available from: doi:10.1016/j.foot.2018.07.005.
- VIII. Agarwal A. Paediatric osteoarticular tuberculosis: a review. *J Clin Orthop Trauma*. 2020;11(Suppl 1):S1-S6. Available from: doi:10.1016/j.jcot.2020.01.005.

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- IX. Navarrete FE, Gómez-Alessandri J, Tintó M, Sánchez-González M, Vicent V. Ankle tuberculosis: a case in childhood. *Rev Esp Cir Ortop Traumatol*. 2017;61(5):319-323.
- X. Dubois MM, Brooks MB, Malik AM, Siddiqui S, Ahmed JF, Jaswal M, *et al*. Age-specific clinical presentation and risk factors for extrapulmonary tuberculosis disease in children. *Pediatr Infect Dis J*. 2022;41(8):620–625. Available from: doi:10.1097/INF.0000000000003534.
- XI. Cahyadi A, *et al*. Association of nutritional status with severity of pediatric tuberculosis. *BMC Infect Dis*. 2021;21:1203.
- XII. Herdea A, *et al*. Reevaluating pediatric osteomyelitis with osteoarticular tuberculosis: diagnostic delays and treatment outcomes. *Children (Basel)*. 2024;11(11):1279.
- XIII. Ortiz GJ, Delgado J, Ramírez T, Galeano MA, Barnafi N, Pillaca O, Corral G. Osteoarticular tuberculosis: imaging findings in pediatric patients. *Pediatr Radiol*. 2024. Available from: doi:10.1007/s00247-024-06092-3.
- XIV. World Health Organization. *WHO consolidated guidelines on tuberculosis. Module 5: management of tuberculosis in children and adolescents. Web Annex 5: Overview of consolidated WHO recommendations*. Geneva: WHO; 2022.
- XV. World Health Organization. *Guidance for national tuberculosis programmes on the management of tuberculosis in children*. 2nd ed. Geneva: World Health Organization; 2014.
- XVI. Igbokwe V, Ruby LC, Sultanli A, Bélard S. Post-tuberculosis sequelae in children and adolescents: a systematic review. *Lancet Infect Dis*. 2023;23:e138–e150.