

Case Report

Tuberculosis Mimicking-Musculoskeletal Tumor of The Hand: An Uncommon Case of Extrapulmonary Tuberculosis

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ABSTRACT

Background: Musculoskeletal extrapulmonary tuberculosis is accounting for only 10-15% of all cases. Current attention has been focused on hand tuberculosis due to its increasing prevalence. This study describes an unusual case of extrapulmonary tuberculosis that manifested as a soft tissue tumor of the hand.

Case Report: A 17-year-old male presented with a painful swollen part of the 3rd finger of the left hand. The mass was irregular and suppurative, with discoloration and foul smell. Laboratory results showed anemia and increased erythrocyte sedimentation rate. The computed tomography scan showed an isodense soft tissue (size 2.19 cm x 1.59 cm x 4.21cm) across the distal to the proximal part of 3rd phalanx bone to the metacarpal region with a decrease of phalanx bone density with no sign of bone destruction or any periosteal reaction. The histopathology study revealed a chronic granulomatous structure surrounded by epithelioid cells, Langhans cells, and caseating necrosis. The acid-fast staining confirmed the presence of bacilliform bacteria.

Discussion: Extrapulmonary tuberculosis typically results from secondary hematogenous dissemination and reactivation of the main foci. There are no specific tests to diagnose musculoskeletal tuberculosis preoperatively, leading to delayed diagnosis. Histopathological examination and culture are needed to confirm the diagnosis.

Conclusions: Slow progression and multiple differential diagnoses frequently result in a delayed diagnosis, which leads to complications. Initial radical excision and anti-tuberculosis multidrug therapy provide excellent functional outcomes and recurrence prevention.

Keywords: Tuberculosis; Musculoskeletal Tumor; Extrapulmonary Tuberculosis; Human and Medicine

INTRODUCTION

Tuberculosis (TB) is a leading cause of morbidity and mortality on a global scale. Certain regions, including Asia, the Middle East, and Africa, are endemic to tuberculosis. Tuberculosis is particularly prevalent in crowded, unsanitary, and malnourished areas.¹ The two clinical manifestations of tuberculosis are pulmonary TB and extrapulmonary TB. In 2019, the Indonesian Minister of Health determined that of 563,987 confirmed tuberculous cases, about 59,525

(11%) cases were extrapulmonary tuberculosis.² Musculoskeletal extrapulmonary tuberculosis is a rare symptom, accounting for approximately 10-15% of patients.³ The spine, hip, and knee are the most frequent musculoskeletal sites. Then, hand involvement in patients with the musculoskeletal site is infrequent.⁴

The cause of extrapulmonary tuberculosis is caused by the bacterium *Mycobacterium tuberculosis*, which infects lung tissue and spreads to other organs outside the lungs, such as the pleura, lymph nodes, abdomen (organs in the



abdomen), genitourinary tract (organs and urinary tract), skin, meninges, joints, and bones.^{3,5} Tuberculosis has clinical symptoms such as coughing for more than two weeks, a cough with phlegm, a Cough mixed with blood, Pain in the chest, and shortness of breath. Other symptoms may occur, such as Malaise (weakness, lethargy, feeling unwell), Weight loss, Decreased appetite, Body shivering, fever, and Body sweats at night without strenuous activity.⁶ Hand's symptoms and signs include pain, swelling, joint effusion, stiffness, digital enlargements, carpal tunnel syndrome, and persistent sinus discharge.^{7,8} To detect tuberculosis, each patient must undergo a bacteriological test (sputum, body fluids, and other tissues) by direct microscopic examination, rapid molecular TB test, or culture.^{5,9,10}

The literature on musculoskeletal TB was still limited and mostly published as case reports. Moreover, atypical presentation may present, such as soft tissue enlargement at an unusual site. This atypical presentation makes it difficult to diagnose earlier.¹¹ To confirm the diagnosis, a biopsy should be performed. A granulomatous inflammatory response against a mycobacterial species results in the formation of caseous necrosis. It comprises mononuclear cells (lymphocytes), giant cells, and epithelioid hystiocytes. Erlich-Ziehl-Neelsen (EZN) stain is the gold standard for histopathological diagnosis of Mycobacterium TB bacilli. Other diagnostic tools, such as the polymerase chain reaction (PCR) and DNA amplification, may be considered.¹²

Current attention has been focused on hand musculoskeletal tuberculosis because of its rising prevalence. This paper discusses an uncommon extrapulmonary tuberculosis manifesting as a hand soft tissue tumor growing for four months.

CASE REPORT

A 17-year-old male came to the emergency department with an overgrowth tumor between the 3rd and 4th fingers of the left hand. The tumor had been growing as a solid mass in the middle part of the 3rd finger four months before admission, which enlarged gradually and involved the proximal part of the left hand. The tumor grew darker, more painful, and excreted a yellowish smell discharge. He had no history of tuberculosis infection or close contact with TB cases. History of prolonged fever, chronic productive cough, and weight loss were absent. On physical examination, the tumor was 5x3x2 cm in dimension and grew extensively toward the 3rd metacarpal bone. It was suppuratively ulcerated and produced an unpleasant smell. It was immobile and not well demarcated. The smaller tumor was also found in the right hand on the 3rd finger (Figure 1).

Laboratory results showed anemia (Hemoglobin level 10.5 gr/dL) and increased erythrocyte sedimentation rate (26 mm/hour), usually associated with chronic infection. He underwent several radiological examinations and tumor biopsy. The computed tomography scan (CT-scan) with contrast of left hand and arm revealed a soft



Figure 1. Clinical Presentation of The Hand Musculoskeletal Tumor.



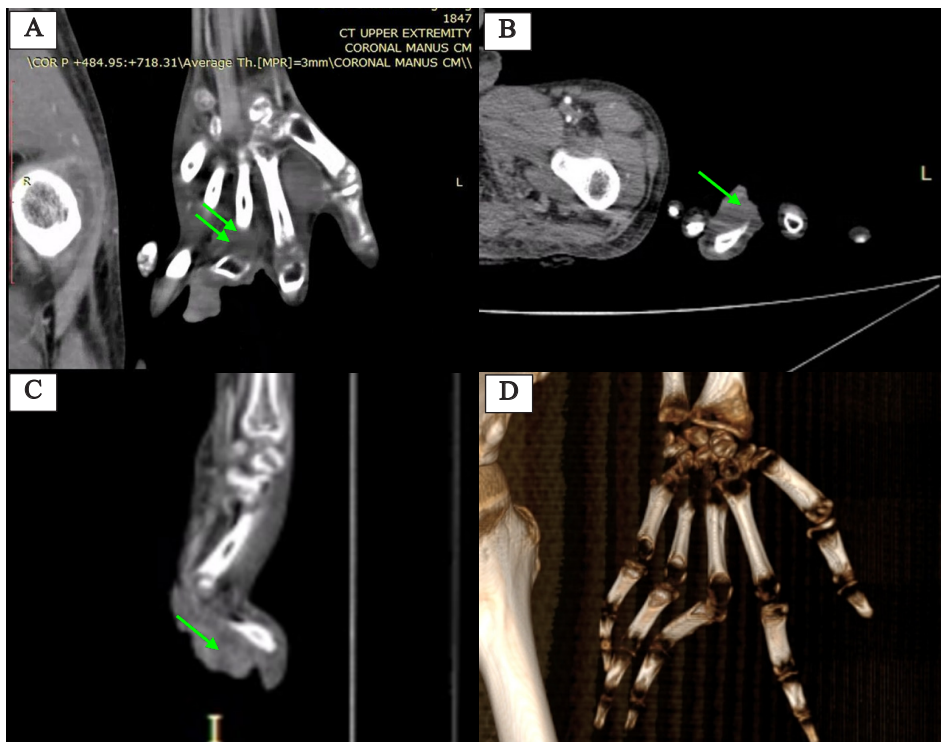


Figure 2. (A, B, and C) A CT scan shows a soft tissue mass in the proximal left third metacarpal without bone destruction. (green arrow). (B) 3D reconstruction showed no bone destruction.

tissue mass (size 2.19 cm x 1.59 cm x 4.21cm) from proximal to distal part of 3rd phalanx to metacarpal bone, with decreased density of phalanges bones. There was no sign of bone destruction or any periosteal reaction but clear evidence of muscle contracture in the distal phalanx bone (Figure 2).

An x-ray of the chest reveals active pulmonary tuberculosis with secondary infection and right pleural effusion (Figure 3). The

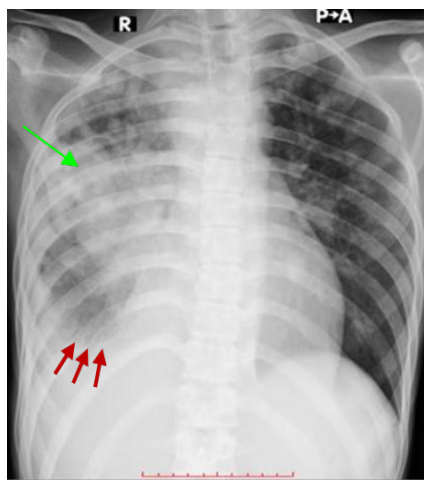


Figure 3. Chest x-ray showed active pulmonary tuberculosis with secondary infection (green arrow) and pleural effusion (red arrow).

CT scan of the thorax with contrast revealed consolidation in the medial and lateral segment of the anteromedial part of the left inferior lobe; infiltrative multiple nodules across the superior and medial right lobe and apicoposterior seg-

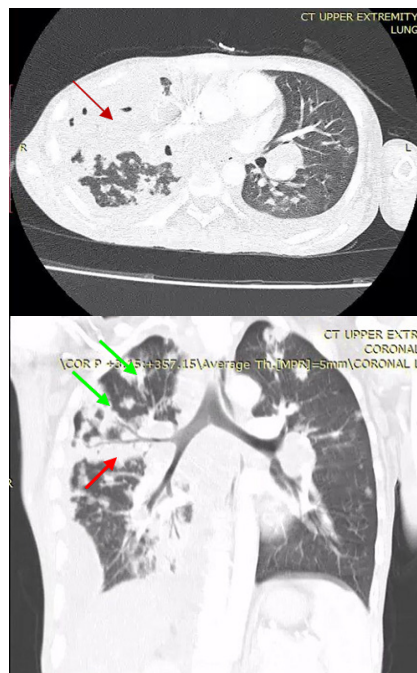


Figure 4. (A) A chest CT scan shows consolidation of the anteromedial segment of the left inferior lobe and (B) the medial and lateral segments of the middle lobe of the right lung with multiple nodules (green arrow) and infiltrates (red arrow).



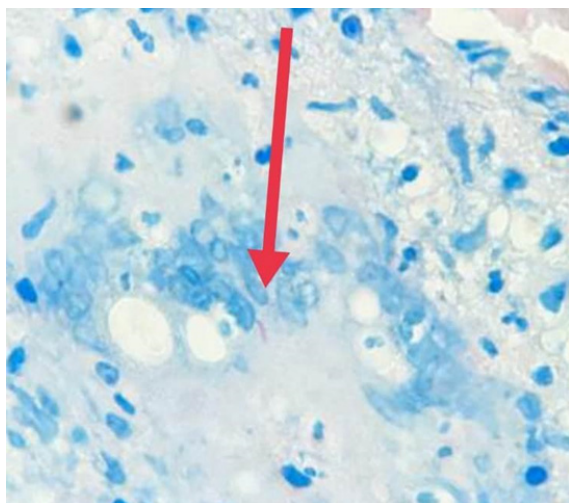


Figure 5. Histopathological Examination of The Hand Tumor.

ment of the superior left lobe; subpleural nodule in apicoposterior segment of superior left lobe; and right pleural effusion.

The abdominal ultrasonography revealed the formation of a cyst (diameter 8 cm) in the liver. The axilla node ultrasonography found the lymph node enlargement of bilateral axillar, superior paratracheal (2R), inferior paratracheal (4L), subaortic (5), and interlobaris (11L) (Figure 4).

The biopsy was immediately performed, and the histopathology study revealed a chronic granulomatous structure surrounded by epithelioid cells, datia langhans cells, and caseating necrosis (Figure 5). The acid-fast staining examination also confirmed bacilli growth from the tissue specimen. In December 2021, he started the fixed-dose combination of anti-tuberculosis drugs.

DISCUSSION

TB is a very common infectious disease in Indonesia, with 443,235 patients in 2021.¹³ Indonesia is in third place with the most TB cases, after India and China.¹⁴ More than 80 percent of all TB cases are pulmonary TB. However, several manifestations of extrapulmonary TB have been reported, including musculoskeletal TB. The area of hand and foot may be affected by only 2% of cases.^{15,16}

The spread usually develops from direct inoculation, hematogenous, or reactivated pulmonary TB.¹⁷ The infected cells in musculoskeletal tissue and mononuclear cells merge into epithelioid cells, called tubercles.¹⁸ The diagnosis of musculoskeletal TB may need thorough investigation because it may present in atypical presentation (tumor-mimicking) and location.¹⁹ Signs and symptoms of tuberculosis may vary from prolonged low-grade fever, weight loss, anorexia, and night sweats.²⁰ Musculoskeletal TB of the hand region shows specific symptoms and signs such as painful and stiff joints, swelling joints with effusion, digital enlargement, and carpal tunnel syndrome.¹⁸ In our case, the patient presented with suppuration, discoloration, and a painful mass on the 3rd finger of the left hand. Initially, the patient was suspected of having a malignancy. The delayed diagnosis of hand tuberculosis due to a lack of specific preoperative tests frequently leads to poor outcomes.²¹ But in this case, a chest X-ray was performed, and the results showed active pulmonary tuberculosis with secondary infection and right pleural effusion. The extent of TB lesions can be evaluated with CT or Magnetic Resonance Imaging (MRI) scans. Although not specific, these tests may be useful to evaluate differential diagnosis.²² In our case, a CT scan of the arm revealed a soft tissue mass in the proximal-distal of the left third metacarpal phalanges bone with decreased density. The recognition of the bacilli on histology staining or tissue culture may confirm the diagnosis of *Mycobacterium* TB bacteria. Ideally, both studies should be done after the tissue biopsy.²¹

Treatment options consist of medical, surgical, or combined therapy. Most cases combine surgical drainage and debridement. It may also involve antibiotics administration to reduce the incidence of recurrence.²³ Surgical intervention will remove all the infected material and the involved tissues. The local tissue blood circulation will improve after surgery.



This condition is important for faster tissue healing.²⁰ Biopsy is crucial in determining the organism's sensitivity in areas where drug resistance is common.²⁴ In this case, the anti-tuberculosis drug regimen of rifampicin, isoniazid, pyrazinamide, and ethambutol was given since pulmonary TB was diagnosed in a chest X-ray examination. The patient was scheduled for a third finger amputation surgery but was lost to follow-up while undergoing pulmonary TB treatment at his home.

CONCLUSION

Musculoskeletal TB may present with atypical presentation and varying signs and symptoms. This condition makes it difficult to recognize the disease earlier. It results in multiple differential diagnoses and delayed diagnosis due to its slow progression, which leads to delayed treatment and, ultimately, frequent complications. Early treatment with initial radical excision and anti-tuberculosis multidrug therapy provides excellent functional outcomes and recurrence prevention. However, the literature on musculoskeletal TB was mostly case reports and few original articles, which may provide a reliable reference source. Diagnosis of musculoskeletal TB should be considered in cases with unusual presentation, especially in TB-endemic regions such as Indonesia. Future prospective studies were needed to investigate other musculoskeletal manifestations of TB.

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REFERENCES

1. Sotgiu G, Sulis G, Matteelli A. Tuberculosis—a World Health Organization perspective. *Microbiol Spectr* 2017;5(1):1–18.
2. Kementerian Kesehatan Republik Indonesia. Situasi TB di Indonesia [video file]. 2021 April 4 [cited 2022 Dec 26]. Available from: <https://tbindonesia.or.id/pustaka-tbc/dashboard-tb/>.
3. Sharma SK and Mohan A. Extrapulmonary tuberculosis. *Indian J Med Res* 2004;120(4):316–53.
4. Al-Qattan MM, Al-Namla A, Al-Thunayan A, Al-Omawi M. Tuberculosis of the hand. *J Hand Surg Am* 2011;36(8):1413–21.
5. Lee JY. Diagnosis and treatment of extrapulmonary tuberculosis. *Tuberc Respir Dis (Seoul)* 2015;78(2):47–55.
6. Lange C and Mori T. Advances in the diagnosis of tuberculosis. *Respirology* 2010;15(2):220–40.
7. García-Arias M, Pérez-Esteban S, Castañeda S. Septic arthritis and tuberculosis arthritis. *J Arthritis* 2012;1(1):1–10.
8. Bush DC and Schneider LH. Tuberculosis of the hand and wrist. *J Hand Surg Am* 1984;9(3):391–8.
9. Nyendak MR, Lewinsohn DA, Lewinsohn DM. New diagnostic methods for tuberculosis. *Curr Opin Infect Dis* 2009;22:174–82.
10. Mehta PK, Raj A, Singh N, Khuller GK. Diagnosis of extrapulmonary tuberculosis by PCR. *FEMS Immunol Med Microbiol* 2012;66(1):20–36.
11. Wagh Y, Reddy R, Gundavda M, Agarwal M, Agashe VM, Bajwa S. Tuberculosis (T.B.) masquerading as tumor. An 8-year study on 25 cases of long bone tuberculosis presenting as tumors. *Sicot J* 2020;6:14.
12. Davidson PT and Horowitz I. Skeletal tuberculosis. A review with patient presentations and discussion. *Am J Med* 1970;48(1):77–84.
13. Noviyani A, Nopsopon T, Pongpirul K. Variation of tuberculosis prevalence across diagnostic approaches and geographical areas of Indonesia. *PLoS One* 2021;16(10):e0258809.
14. World Health Organization. Global tuberculosis report 2020. 2020 [Cited 2022 Dec 26]. Available from: <https://www.who.int/publications/i/item/9789240013131>.
15. Leonard MK and Blumberg HM. Musculoskeletal tuberculosis. *Microbiol Spectr* 2017;5(2).
16. Al Laham S, Aljasseem G, Asnaf A, Omari RY, Alyazji Z, Sada R. A rare presentation of hand



- TB extending to the space of parona. *Plast Reconstr Surg* 2022;10(3):e4156.
17. Gopaldaswamy R, Dusthacker VNA, Kannayan S, Subbian S. Extrapulmonary Tuberculosis—An update on the diagnosis, treatment and drug resistance. *J Respir* 2021;1(2):141-64.
 18. Sbai MA, Benzarti S, Chalbi E, Msek H, Khorbi A. Pseudotumoral form of soft tissue tuberculosis of the hand: six cases. *Pan Afr Med J* 2016;25:178.
 19. Zaman K. Tuberculosis: a global health problem. *J Health Popul Nutr* 2010; 28(2):111-3.
 20. Wu KC, Tang HM, Yeh KT, Ding DC. Extrapulmonary tuberculosis in the wrist presenting as a ganglion cyst-like mass: A case report. *Tzu Chi Med J* 2012; 24(2): 77-9.
 21. Matta Ramos RF, Cancian L, Calcagnotto F, Zeni R, Varela G, Burgues T, et al. Synovial tuberculosis of the hand: An ancient disease in an unusual localisation. *Indian J Plast Surg* 2017;50(2):130-7.
 22. Xiang Y, Huang C, He Y, Zhang Q. Cancer or tuberculosis: a comprehensive review of the clinical and imaging features in diagnosis of the confusing mass. *Front Oncol* 2021;11:644150.
 23. Yushan M, Yalikun A, Hamiti Y. Clinical features and treatment outcome of wrist tuberculosis in adult- a retrospective study of 84 consecutive cases with minimum of 2 years follow up. *BMC Musculoskelet Disord* 2022;23(1):618.
 24. Mahdi E, Alabdan L, Amer S, Alashqar MB, Almustanyir SA. Case report of tuberculosis in the inger. *Cureus* 2021;13(3):e14071.

