Turk J Phys Med Rehab 2025;71(1):127-130
DOI: 10.5606/tftrd.2024.14395
Available online at www.turkishjournalpmr.com

Case Report

Tuberculosis tenosynovitis: A rare cause of tenosynovitis in the hand and wrist

Mehmet Serhat Topaloğlu, Murat Yıldırım

Department of Physical Medicine and Rehabilitation, Recep Tayyip Erdogan University Faculty of Medicine, Rize, Türkiye

ABSTRACT

Tuberculosis is an infectious disease caused by the bacterium *Mycobacterium tuberculosis*. While it is commonly associated with lung involvement, it can affect other parts of the body. Approximately 10% of extrapulmonary tuberculosis cases involve bone and joint manifestations. Apart from the spine, the most commonly affected joints are the knee, hip, and ankle joints. Joint involvement can present as a slowly progressive and chronic monoarthritis. In this study, we presented a 63-year-old male patient who was diagnosed with primary tuberculosis tenosynovitis, a rare condition that can be easily confused with many clinical conditions, despite the absence of any infectious focus. In conclusion, *Mycobacterium tuberculosis* can involve joints, acting as an exceptional mimicker. Therefore, this pathogen should always be considered in the differential diagnosis and management of patients with arthritis.

Keywords: Primer, tenosynovitis, tuberculosis.

Tuberculosis is an infectious disease caused by the bacterium *Mycobacterium tuberculosis (M. tuberculosis)*. While it is commonly associated with lung involvement, it can affect other parts of the body. Extrapulmonary tuberculosis is more frequently encountered in individuals with immunodeficiency. Approximately 10% of extrapulmonary tuberculosis cases involve bone and joint manifestations. Spinal involvement is the most common form of skeletal tuberculosis, accounting for about 50% of cases. Apart from the spine, the joints most commonly affected are the knee, hip, and ankle. Joint involvement can present as a slowly progressive and chronic monoarthritis. Less commonly, the ribs and the sacroiliac and sternoclavicular joints can also be affected.[1-3] This case report aimed to emphasize the challenges in diagnosing and managing primary tuberculosis tenosynovitis by highlighting the necessity of clinical suspicion, thorough evaluation, and consideration of atypical presentations, which becomes crucial in the absence of typical risk factors.

CASE REPORT

A 63-year-old male patient presented with a one-month history of swelling and pain in the right hand and wrist flexor. On physical examination, mild swelling and tenderness were noted in the right hand and wrist, and the Finkelstein test was positive. There were no signs of redness or increased warmth in the affected area. The patient denied experiencing night sweats, cough, or fever. A thorough medical history inquiry did not reveal any specific rheumatological findings. The patient had a medical history of chronic obstructive pulmonary disease and experienced two episodes of spontaneous pneumothorax. A radiographic examination of the right hand and wrist revealed no pathological findings. Laboratory tests showed an erythrocyte sedimentation rate of 34 mm/h and a C-reactive protein level of 9.0 mg/L, with normal results for biochemistry, complete blood count, and urine analysis. Subsequently, a musculoskeletal ultrasound was performed, revealing synovial

Corresponding author: Mehmet Serhat Topaloğlu, MD. Recep Tayyip Erdoğan Üniversitesi Tıp Fakültesi, Fiziksel Tıp ve Rehabilitasyon Anabilim Dalı, 53020 Rize, Türkiye
E-mail: drmsshb@gmail.com

Received: December 05, 2023 **Accepted:** February 26, 2024 **Published online:** July 26, 2024

Cite this article as: Topaloğlu MS, Yıldırım M. Tuberculosis tenosynovitis: A rare cause of tenosynovitis in the hand and wrist. Turk J Phys Med Rehab 2025;71(1):127-130. doi: 10.5606/tftrd.2024.14395.

hypertrophy and effusion with Doppler positivity among the flexor tendons of the second, third, and fourth fingers, along with the flexor pollicis longus tendon. Based on these findings, the patient was initially diagnosed with flexor tenosynovitis and was prescribed a treatment regimen involving six sessions of 10-min cold applications, along with topical and oral nonsteroidal anti-inflammatory drugs. In the follow-up visit 10 days later, the patient's complaints persisted, and there was a slight increase in swelling. Additional control laboratory tests were requested, revealing an erythrocyte sedimentation rate of 18 mm/h and a C-reactive protein level of 26.2 mg/L, with normal results for biochemistry, complete blood count, and urine analysis. Tests for rheumatoid factor, anti-cyclic citrullinated peptide, and autoantibody profiles were all negative. Tests for Brucella, hepatitis B, hepatitis C, and human immunodeficiency virus were also negative. Magnetic resonance imaging was scheduled, which revealed marked synovial hypertrophy among the flexor tendon groups (Figure 1). Using

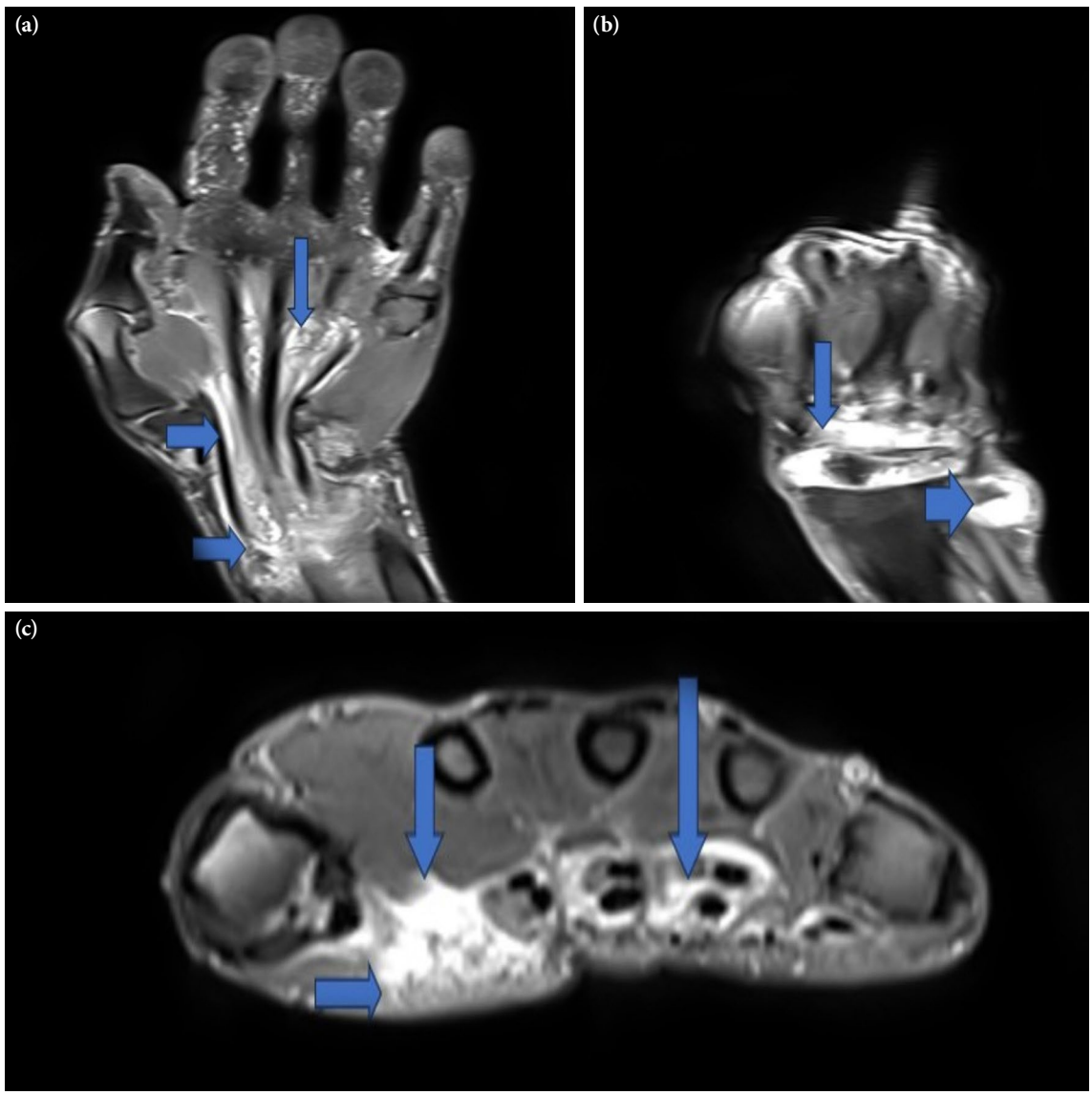

Figure 1. **(a)** On the coronal fat-suppressed T2-weighted images, fluid accumulation is observed extending along the flexor tendons from the wrist level. **(b)** Fluid accumulation is seen around the dorsal aspect of the wrist joint and distal ulnar bone. **(c)** On the axial fat-suppressed T2-weighted image, fluid accumulation is observed around the flexor digitorum superficialis and profundus tendons at the metacarpal bone level. It appears to have spread into the abductor brevis pollicis muscle.

ultrasound guidance, a synovial fluid sample was collected from the joint. The cell count in the sample revealed 6900/mm^3 leukocytes, with 70% polymorphonuclear leukocytes. Microbiological analysis of the joint fluid was negative for acid-fast bacilli, and no growth was observed in aerobic or anaerobic cultures. During clinical follow-up, partial symptom improvement was observed with the use of nonsteroidal anti-inflammatory drugs. However, after the growth of *M. tuberculosis* bacilli in the Lowenstein-Jensen culture, a confirmation analysis was conducted, resulting in a definitive diagnosis of tuberculosis. Subsequently, the patient was evaluated by the departments of chest diseases and infectious diseases, and no additional involvement of tuberculosis was identified. Therefore, a diagnosis of primary tuberculosis tenosynovitis was established, and the patient was started on a four-drug antituberculosis treatment regimen comprising rifampicin, isoniazid, ethambutol, and pyrazinamide. After two months of treatment, significant improvement was observed in the patient's symptoms, and antituberculosis treatment was continued as a two-drug regimen with rifampicin and isoniazid. A written informed consent was obtained from patient.

DISCUSSION

Tuberculosis infection continues to be a significant public health concern in today's world. Despite the widespread use of potent antituberculosis treatments, challenges in diagnosis can lead to delays in initiating treatment.[4] The ability of tuberculosis to mimic various pathologies may contribute to late diagnosis and treatment. While tuberculosis is commonly known to affect the respiratory system, extrapulmonary involvement can also occur. A study reported that extrapulmonary involvement accounted for 14% of all tuberculosis cases.[5] Another study showed that tuberculosis tenosynovitis made up 5% of osteoarticular involvement cases.[6]

Although primary tuberculosis tenosynovitis is rare, it is frequently reported to involve the upper extremities. The pathogenesis is not well understood, but it has been reported to result from hematogenous spread or direct implantation. Risk factors for tuberculosis tenosynovitis include trauma, low socioeconomic status, malnutrition, corticosteroid injections, advanced age, immunosuppression, and alcoholism.[7-9] In our case, the patient had none of these risk factors, and the disease mechanism was unclear. However, it is possible that our patient, who did not exhibit risk factors, had a latent tuberculosis infection, and the recurrent minor trauma resulting from frequent use of the dominant right hand might have contributed to the onset of the disease.

Latent tuberculosis infection is defined as the development of an immune response to antigens of the tuberculosis bacillus without active disease symptoms. This condition varies from 5 to 10% in transitioning to active disease. Immunosuppression and children under five years of age are identified as the most significant risk factors for the development of active disease.[10] Alongside various other risk factors, we believe that excessive use of the joint could also contribute to the development of active disease.

In the direct examination of synovial fluid, the positivity rate is around 20%. However, culture samples from synovial fluid yield negative results in approximately 35 to 45% of cases. The absence of *M. tuberculosis* growth in culture material does not rule out the disease. In such cases, rapid and effective results can be reached through gene amplification methods.[8] In our case, the detection of *M. tuberculosis* growth in the synovial fluid and the positive confirmation result eliminated the need for additional testing. If results cannot be obtained from direct examination and culture tests and clinical suspicion persists, we strongly recommend histopathological sampling. The disease undergoes three stages histopathologically, including serous exudate, granulation, and necrosis.[8]

When reviewing the literature, primary tuberculosis tenosynovitis commonly affects the flexor tendon sheath, with a frequent involvement of the hand and wrist.[11] This involvement is often reported to be accompanied by tuberculosis arthritis and osteomyelitis. The presence of nonspecific symptoms, as well as examination and laboratory findings, can lead to delayed diagnosis, potentially resulting in severe functional losses associated with complications. In cases of wrist and hand joint involvement, it may manifest as carpal tunnel syndrome and De Quervain's tenosynovitis due to ganglion formation characterized by soft tissue swelling in the flexor retinaculum. Its presentation as a cold abscess formation can lead to misdiagnosis as a tumoral formation, complicating early detection.[1,7,12]

In our case, the positive Finkelstein test during the physical examination initially suggested a diagnosis of De Quervain's tenosynovitis. No

symptoms were detected other than swelling, mild erythema, and pain. In patients presenting with arthritis signs such as swelling and redness in the joint, the disease may be mistaken for disease activation in individuals undergoing multiple immunosuppressive treatments for rheumatic diseases, leading to delayed diagnosis.[3,13]

The infection typically begins slowly and insidiously, resulting in patients seeking medical attention in advanced stages. Treatment usually starts with a four-drug antituberculosis regimen (rifampicin, isoniazid, ethambutol, and pyrazinamide) and continues with a two-drug regimen (rifampicin and isoniazid) after two months. However, there is no clear consensus on the minimum duration of treatment.[12]

In conclusion, tuberculosis tenosynovitis is a rare condition that can easily mimic various pathological entities, leading to delayed diagnosis and even complications due to incorrect treatments. When patients present with arthritis and tenosynovitis symptoms and the underlying etiological cause cannot be explained, tuberculosis should be considered in the diagnosis, particularly if conservative treatments yield no response. Sampling for differential diagnosis and proceeding to histopathological diagnosis with synovectomy in advanced stages can contribute to early diagnosis and treatment. The primary approach in treatment is to start antituberculosis therapy, although surgical intervention may be necessary based on the patient's condition.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Author Contributions: Idea/concept, design, control/supervision, data collection and/or processing, analysis and/or interpretation, literature review, writing the article: M.S.T.; Critical review, materials: M.S.T.; M.Y.

Conflict of Interest: The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding: The authors received no financial support for the research and/or authorship of this article.

REFERENCES

1. Pigrau-Serrallach C, Rodríguez-Pardo D. Bone and joint tuberculosis. Eur Spine J 2013;22 Suppl 4:556-66. doi: 10.1007/s00586-012-2331-y.
2. Rodriguez-Takeuchi SY, Renjifo ME, Medina FJ. Extrapulmonary tuberculosis: Pathophysiology and imaging findings. Radiographics 2019;39:2023-37. doi: 10.1148/rg.2019190109.
3. Leonard MK, Blumberg HM. Musculoskeletal tuberculosis. Microbiol Spectr 2017;5. doi: 10.1128/microbiolspec.TNMI7-0046-2017.
4. Baidoo PK, Baddoo D, Ocloo A, Agbley D, Lartey S, Baddoo NA. Tuberculous tenosynovitis of the flexor tendons of the wrist: A case report. BMC Res Notes 2018;11:238. doi: 10.1186/s13104-018-3343-4.
5. Mihalko MJ Martine SF. Tuberkulosis and other unusual infections. In: Canale ST, Beaty JH, editors. Campbell's operative orthopedics. 11th ed. Philadelphia: Mosby; 2018. p. 753-71.
6. Sbai MA, Benzarti S, Boussen M, Maalla R. Tuberculous flexor tenosynovitis of the hand. Int J Mycobacteriol 2015;4:347-9. doi: 10.1016/j.ijmyco.2015.06.003.
7. Mrabet D, Ouenniche K, Mizouni H, Ounaies M, Khémiri C, Sahli H, et al. Tuberculosis tenosynovitis of the extensor tendons of the wrist. BMJ Case Rep 2011;2011:bcr0620114347. doi: 10.1136/bcr.06.2011.4347.
8. Lall H, Nag SK, Jain VK, Khare R, Mittal D. Tuberculous extensor tenosynovitis of the wrist with extensor pollicis longus rupture: A case report. J Med Case Rep 2009;3:142. doi: 10.1186/1752-1947-3-142.
9. Le Meur A, Arvieux C, Guggenbuhl P, Cormier M, Jolivet-Gougeon A. Tenosynovitis of the wrist due to resistant Mycobacterium tuberculosis in a heart transplant patient. J Clin Microbiol 2005;43:988-90. doi: 10.1128/JCM.43.2.988-990.2005.
10. Fortún J, Navas E. Latent tuberculosis infection: Approach and therapeutic schemes. Rev Esp Quimioter 2022;35 Suppl 3:94-6. doi: 10.37201/req/s03.20.2022.
11. Cohen-Tanugi S, Wright ML, Kadiyala RK. Flexor tenosynovitis of the hand caused by mycobacterium tuberculosis. J Am Acad Orthop Surg Glob Res Rev 2018;2:e083. doi: 10.5435/JAAOSGlobal-D-17-00083.
12. Sbai MA, Bouaicha W, Sbei F, Mrad SB, Hafdhallah FB. An extensor tenosynovitis complicated with extensor tendon rupture revealing a hand tuberculosis. Int J Mycobacteriol 2023;12:200-3. doi: 10.4103/ijmy.ijmy_82_23.
13. Lim SL, Ong PS, Khor CG. Multifocal osteoarticular tuberculosis in a systemic lupus erythematosus (SLE) patient: A rarity or an underdiagnosed condition? Mod Rheumatol Case Rep 2020;4:237-42. doi: 10.1080/24725625.2020.1754567.