

**Case Report**

Volume 10 Issue 4 - February 2018  
DOI: 10.19080/OROAJ.2018.10.555792

Ortho & Rheum Open Access J

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# Tuberculosis Tenosynovitis of Flexor Digitorum Tendons: A case Report



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**Submission:** January 25, 2018; **Published:** February 15, 2018

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## Abstract

Tuberculosis infections in developing countries like Vietnam are currently the one of the most challenging problems. Among musculoskeletal involvement, upper limb affection is relatively rare. A 46 year-old female patient came to our department of Upper Limb Surgery because of a progressive swelling of her Right wrist in six months with no response to oral anti-inflammatory medications. Two years before, she had a surgery to treat her carpal tunnel syndrome of the same wrist with a satisfactory result. On clinical examination, beside a scar from previous operation, a 3 x 4 cm lump with well define margin and normal overlaying skin was noticed. Blood tests were normal except a rise of ESR and C-reactive protein. Ultrasound suspected a ganglion of the wrist.

T2 MRI showed synovial fluid collection in flexor tendon sheath, thickened tenosynovium with heterogeneous signal, highly suspecting a condition of tuberculosis tenosynovitis. The patient underwent a surgical treatment with synovectomy and thorough debridement. The biopsy result showed a synovial and fibro collagenous tissue infiltrated by multiple epitheloid aggregates, Langerhans giant cells with presence of central caseous necrosis, which confirm the diagnosis of tuberculosis. Nine-month chemotherapy was indicated and at final follow-up, there was no sign of recurrence and the patient was satisfied with the treatment result. Tuberculosis tenosynovitis of the wrist area can occur with insidious onset and confusing clinical symptoms and therefore, early diagnosis remains a challenge for physicians and surgeons. MRI is considered as a useful imagery test to orient the diagnosis.

**Keywords:** Tuberculous synovitis; Anti-tuberculous chemotherapy; Caseous necrosis

**Abbreviations:** ESR: Erythrocyte Sedimentation Rate; MRI: Magnetic Resonance Imagery

## Introduction

Tuberculosis infections in developing countries like Vietnam are currently the one of the most challenging problems. Musculoskeletal involvement represents 10–15% of all extra pulmonary cases. Upper extremity involvement is relatively rare. Tuberculosis tenosynovitis is usually misdiagnosed as nonspecific tenosynovitis. Therefore, it is important to correct diagnosis in order to avoid mistreatment. This article is going to describe one case of tuberculosis tenosynovitis.

## Case Report

A 46 year-old female patient was admitted to our department of Upper Limb Surgery due to a progressive swelling at her Right wrist. Two years ago the patient was diagnosed tunnel carpal syndrome on right hand and operated by releasing the tunnel carpal. The result was satisfying and the postop follow-up was uneventful. All her signs and symptoms have disappeared overtime. However, 6 months ago, she has noticed a swelling on her right wrist just proximal to the scar of the carpal tunnel operation. Despite that she had no numbness or pain, the

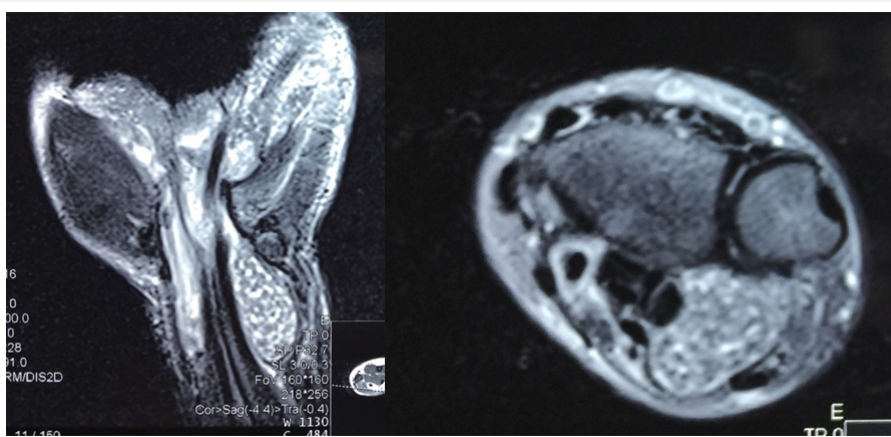
progression of the condition made her worry and she has visited hospitals and private clinics before visiting our hospital. She was treated with oral medications for months without any obvious results. No constitutional symptoms such as loss of weight, loss of appetite, night fever have been noticed. She had no past history of pulmonary tuberculosis and family history was irrelevant. No history of local steroid injection in the right hand or wrist, either before or after the previous surgery.

At admission, physical examination revealed (Figure 1):

- i. A scar at her Right wrist.
- ii. An approximately 3x 4cm lump proximal to the wrist line with well defined margin and normal overlying skin, relatively soft with no tenderness at palpation.
- iii. A normal range of motion of Right wrist and hand with full strength of extrinsic and intrinsic hand muscles.
- iv. A negative Phalen and Tinel tests.
- v. No thenar atrophy.



**Figure 1:** Scar from previous carpal tunnel surgery and a lump at the wrist.



**Figure 2:** T2-weighted MR image shows synovial fluid collection in flexor tendon sheath and heterogeneous intermediate to low signal intensity of thickened tenosynovium.



**Figure 3:** A number of rice bodies inside the flexor tendon sheath.

Systemic examination was normal. Blood tests including blood count test, C-reactive protein and erythrocyte sedimentation rate were within normal values. The wrist ultrasound revealed a suspected ganglion at right wrist. The T2 weighed MRI of affected area showed synovial fluid collection in flexor tendon sheath, thickened tenosynovium with heterogeneous signal,

highly suspecting a condition of tuberculosis tenosynovitis (Figure 2). The surgical management involved exploring the Right wrist by using the previous incision line, which revealed a swelling tendon sheath of both flexor digitorum superficialis and profundus containing synovial fluid and numerous yellowish rice bodies inside (fig 3). Pathological tissue was removed and

thorough debridement was preformed. Care was taken in order to protect the tendons. Specimen of rice bodies and synovium were sent to the Pathology department for histopathological study.

The biopsy result showed a synovial and fibro collagenous tissue infiltrated by multiple epitheloid aggregates, Langerhans giant cells with presence of central caseous necrosis. The

conclusion confirmed a tuberculous tenosynovitis. Polymer chain reaction and culture of tuberculosis were negative. With a confirmation from the biopsy test, antituberculous chemotherapy was started immediately postop with a nine-month protocol. There was no sign of recurrence at final follow-up (Figure 4). She could return to her previous job and was satisfied with the treatment result.



Figure 4: Final follow-up.

## Discussion

With an onset often insidious and a slow and benign progression, early diagnosis of tuberculosis tenosynovitis can be challenging for physician. Non specific symptoms including swelling, pain, and diminished range of motion at later stages can occur in other musculoskeletal conditions. Patients may be admitted because of symptoms of tenosynovitis, peripheral carpal tunnel syndrome and a non-specific synovitis mimicking De Quervain's disease or gout [1].

The disease may present in one of four stages depending on the duration of the infection and host immunity [2].

- i. Stage 1 which involves a thin synovitis with free synovial may be seen.
- ii. Stage 2 can occur up to 2 years after the onset, characterized by granulation tissue, thick tenosynovial proliferation, and rice bodies appear.
- iii. Stage 3 is defined when the infection invades the tendons. They may be frayed, ruptured, or becomes caseated. Fraying of tendons occurs at an average of 3 years and rupture of tendons occurs at an average of 4 years from the onset of tenosynovitis.
- iv. Stage 4 occurs very late, the infection spreads to the adjacent joints or bone and a sinus may be present with or without superimposed pyogenic infection.

In our case, rice bodies appeared, and the flexor tendons still had a smooth surface and especially there was no evidence of the

invasive infection into. According to the above classification, the condition of our patient is classified as second stage. The disease probably started more than 2 years with the onset which was tunnel carpal syndrome. The patient was operated by released the tunnel carpal (transverse carpal ligament was released). All signs of the tunnel carpal syndrome were reduced such as Phalen test and Tinel test negative; however, the treatment may be inadequate and therefore the disease would have been progressing.

The differential diagnosis for tuberculosis tenosynovitis includes rheumatoid arthritis, pyogenic infection, gouty arthritis, giant cell tumor of the tendon sheath, and fungal tenosynovitis. Diagnosis of articular involvement depends on the isolation of the organism from synovial fluid or synovial biopsy. Prompt diagnosis is critical to preserve joint function and anatomy. The patients who have tuberculosis tenosynovitis are usually misdiagnosed for having nonspecific tenosynovitis. Rheumatoid synovitis is another condition that should be taken into consideration for differential diagnosis. Misdiagnosing as rheumatoid or nonspecific tenosynovitis could lead to steroid injections, which aggravates the infection. [3].

The confirm diagnosis of tuberculosis is made by histologic and microbiologic studies [4]. Blood tests and imaging before biopsy may be helpful for the diagnosis. Wrist X-ray imaging in tenosynovitis may show soft tissue swelling and osteoporotic changes around the wrist joint. T2-weighted MRI is the most useful imagery test to orient the diagnosis. On T2-weighted sequences, hypointense focus, hypointense synovial membrane together with central erosion, and abscesses with surrounding

contrast are significant for distinguishing tuberculosis from other genres of inflammatory arthritis [5].

There are different reports regarding the treatment options of hand and wrist tuberculous tenosynovitis. Surgical treatment without antituberculous chemotherapy often results in recurrence. Bush and Schneider [6], Cramer et al. [7], and Regnard et al. [8] had reported good clinical results with surgical treatment and antituberculosis chemotherapy combination. Visuthikosol et al. [9] had compared antituberculous chemotherapy and surgery chemotherapy combination. No recurrence occurred in both groups. Kotwal & Khan [2] had reported successful clinical results with only antituberculous chemotherapy. Surgery should be considered if there is no response up to 8 weeks of antituberculous chemotherapy. However, in daily clinical practice in our country, most of these cases are diagnosed after histological examination following the surgical debridement and synovectomy. If the formation of rice bodies was noticed, the wide surgical debridement would be indicated to avoid the recurrences [10].

In our case, the patient was managed by synoviectomy and debridement of the inflammatory tendon sheath (2<sup>nd</sup> stage: the present of rice bodies) associated with the 9-month antituberculous chemotherapy protocol. At final follow-up, there was no sign of recurrence and the patient was satisfied with the treatment result.

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DOI: [10.19080/OROAJ.2018.10.555792](https://doi.org/10.19080/OROAJ.2018.10.555792)

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