

# TENOSYNOVITIS AND CARPAL TUNNEL SYNDROME FROM MYCOBACTERIUM TUBERCULOSIS – A RARE MANIFESTATION OF EXTRAPULMONARY TUBERCULOSIS

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## Abstract

Tenosynovitis caused by tuberculosis (TB) is a rare presentation of this disease usually reported in immunocompromised patients. We describe a patient diagnosed with TB tenosynovitis of the left upper limb with no history of immunodeficiency. Although appearing in an endemic area the time to diagnosis was 6 years due to the absence of acid-fast stained bacilli in the first cultures despite histopathology showing a granulomatous lesion. Institution of pharmacological treatment and surgical *debridement* led to improvement within one month. The authors emphasize the need for early intervention in order to halt disease progression and avoid sequelae.

**Keywords:** Tuberculosis; Tenosynovitis; Carpal Tunnel Syndrome; Extrapulmonary Tuberculosis.

## Introduction

With almost 2 million deaths yearly, tuberculosis (TB) has the highest death toll among infectious diseases. In developing countries it is the fourth-most important avoidable cause of death<sup>1</sup>.

While pulmonary TB is by far the most common clinical presentation of the disease, extra-pulmonary TB currently accounts for 10-20% of cases in immunocompetent and 60% in immunosuppressed patients.<sup>2</sup> Well-known manifestations of TB in the musculoskeletal system include spondylitis, septic arthritis, osteomyelitis, myositis, bursitis, subcutaneous abscess, and tenosynovitis. The last of these manifestations is rare and may be overlooked as the cause of chronic tenosynovitis.

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We describe a case of chronic tenosynovitis and carpal tunnel syndrome from TB in an adult immunocompetent patient, followed by a review of the literature.

## Case Report

In 2002, a previously healthy 60-year-old housewife from a rural area of the northeast of Brazil reported the spontaneous emergence of a node in her left wrist associated to paresthesia in the fourth and fifth ipsilateral fingers. An electroneuromyographic examination of the upper limbs was compatible with carpal tunnel syndrome. Blood tests were normal (blood cell counts, erythrocyte sedimentation rate, C-reactive protein, antinuclear antibodies, rheumatoid factor, anti-SS-A, anti-DNA, anti-HIV, anti-HVC, VDRL, TSH, and T4). An excisional biopsy of the node revealed chronic granulomatous synovitis. No other procedure was instituted at this time. A year later the node recurred along with two other nodes in the tenar and hypotenar regions of her left hand. A second excisional biopsy showed a dense acid-fast stain (AFS)-negative lymphocyte-, histiocyte- and granulocyte-rich infiltrate and granulomas with multinucleate giant cells. Management was again limited to the surgical excision. In 2004, the lesion recurred and an ultrasound scan of her left wrist revealed another node near the volar flexor tendons. In 2007, an ultrasound scan of her left elbow disclosed expansive lesions involving the flexor tendons and the synovial tendon sheath. In February 2008, the elbow node developed into a fistula with abundant purulent discharge and signs of inflammation in the left forearm. The patient was then admitted to the rheumatology service of the Walter Cantídio University Hospital (Universidade Federal do Ceará, Brasil) in March 2008. Test results included PPD= 7 mm, ESR=26mm; blood cell counts as well as a chest x-ray were normal. The patient reported no other symptoms, no family history of rheumatological disorders and no al-



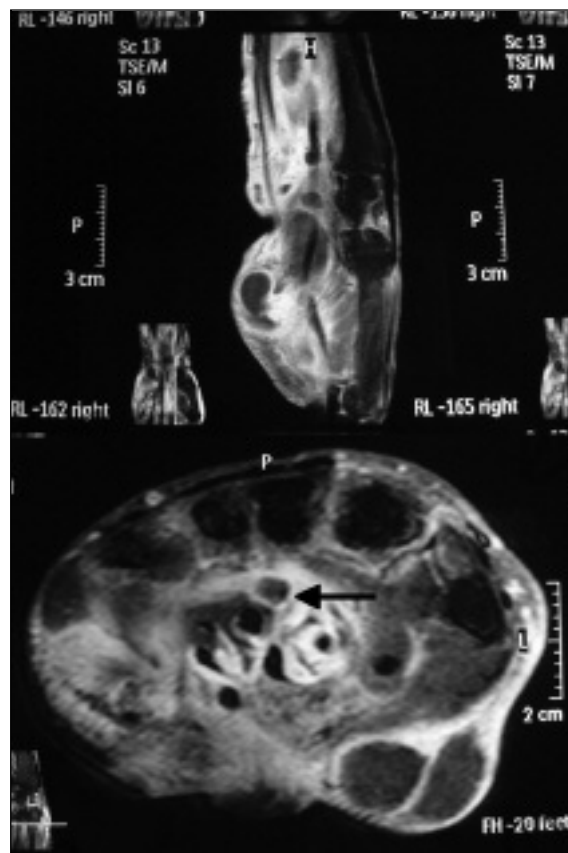
**Figure 1.** Wrist prior to treatment. March 2008.

coholism. No changes were observed on the general physical examination except for a node in her left wrist covered by a crusty wound as well as ipsilateral nodes in the tenar and hypotenar regions accompanied by a fistula with purulent discharge and inflammatory signs (Figure 1). An ultrasound scan of the left hand and forearm showed synovial thickening around the flexor tendons. The tendons displayed tumor changes, retinacular bulging, median nerve thickening (cross section  $33 \text{ mm}^2$  vs  $6 \text{ mm}^2$  in normals) with no effusion. Magnetic resonance imaging revealed signs of chronic tenosynovitis (synovial thickening and sheath liquid) in the flexor tendons with superficial fluid pockets connected to the tendon sheath suggestive of infection, median nerve edema and thickening, associated to signal changes in the lunate and hamate that were attributed to the adjacent inflammatory/infectious process (Figure 2). The lesion in the left wrist was surgically drained and cleaned. Cultures of this material were positive for *Mycobacterium tuberculosis* and *S. aureus*. The patient was started on oxazolidinone plus TB therapy (rifampin, isoniazid and pyrazinamide) leading to improvement of the lesions within one month (Figure 3). She was kept on TB therapy for 6 months and is currently asymptomatic.

## Discussion

Musculoskeletal involvement occurs in only 1-15% of all cases of TB<sup>3</sup> and in 1-3% of all cases of extrapulmonary TB.

The present case is unusual in that chronic tenosynovitis from TB and carpal tunnel syndrome



**Figure 2.** Magnetic resonance image (T2 SPAIR/T1 SPIN post-contrast) of wrist in March 2008, showing synovial thickening, post-contrast enhancement and liquid in the flexor tendon sheath by the carpal tunnel. Median nerve thickening and edema



**Figure 3.** Wrist following treatment. August 2008.

were observed in an immunocompetent 60-year-old woman with no evidence of pulmonary infection. Diagnosis and start of treatment took 6 years, despite two wrist node biopsies revealing alterations

suggestive of TB. TB is still a very prevalent disease in the northeast of Brazil so that empiric chemotherapy is justified in our hands to patients with a clinical and histological picture clearly compatible with TB after excluding other granulomatous causes. The localized nature of the lesion, the high prevalence of TB and positive culture for *Mycobacterium tuberculosis* led us to virtually exclude other granulomatous causes and start TB treatment.

In developing countries skeletal TB tends to affect children and young adults while tenosynovitis from *Mycobacterium tuberculosis* is predominantly observed in men over 60 years of age. The largest case series of flexor tenosynovitis from *Mycobacterium tuberculosis* with median nerve involvement published so far reported 12 cases followed up for 10 years<sup>4</sup>. Previous reports describing tenosynovitis from TB associated with carpal tunnel syndrome make up a total of 17 cases<sup>5</sup>. The disease may be associated with several factors, including older age, male gender, low income, poor nutrition, history of or exposure to TB, immunosuppression, alcohol abuse, permanence in endemic areas and corticosteroid infiltration<sup>8</sup>. It commonly affects the upper limbs, especially the wrist flexor compartments, and ? for unknown reasons ? most often occurs on the right side. The clinical presentation is usually that of an indolent mass along the tendon associated with pain and restriction of movements, sometimes, as in the present case, with development of carpal tunnel syndrome<sup>6</sup>. The average time to diagnosis of tenosynovitis from TB varies from months to years, but was estimated to be 19 months by Walker in 1968<sup>7</sup>. Laboratory results are generally normal, with the exception of ESR levels which tend to be raised. The vast majority of patients test positive for tuberculin while chest x-rays are normal in 50% of cases<sup>3,8</sup>. Ultrasound and magnetic resonance imaging may be useful to evaluate lesion extension and severity with visualization of synovial thickening and relatively small effusions. Similar to what happens in other sites, local effusions test negative for AFS bacilli and specific culture may take 8 weeks to reveal bacilli. In the present case M. tuberculosis culture was positive after 4 weeks, indicating high bacilli loads. Typical histopathology shows caseous granulomas surrounded by epithelioid histiocytes and multinucleate giant cells associated to the presence of bacilli. However, in a study on arthritis from TB by Garrido and coworkers, 12% of the patients presented no granulomas and, among the remainder, 27% had non-caseous gra-

nulomas<sup>9</sup>. Those authors suggested that older age was an important variable since 40% of the senior patients were *Mycobacterium tuberculosis*-positive on histopathology while none of the lesions displayed granuloma formation. Tenosynovitis from TB tends to recur locally in over 50% of cases within one year after treatment<sup>9</sup>. The fact that our patient did not recur after more than 1 year of TB treatment suggests that she is cured.

In conclusion, in several aspects the case reported matches descriptions in the literature. The importance of early diagnosis and institution of clinical treatment is warranted since it may prevent functional impairment. In the present of a clinical-histopathological picture compatible with TB in endemic areas empiric therapy should be considered. Patients should be followed for at least 1 year after stopping TB chemotherapy due to the high risk of recurrence.

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