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Tuberculosis tenosynovitis with multiple rice bodies of the flexor tendons in the wrist: A case report



Serkan Bayram*, Ali Erşen, Murat Altan, Hayati Durmaz

Department of Orthopaedics and Traumatology, Istanbul University Faculty of Medicine, İstanbul, Turkey

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ABSTRACT

INTRODUCTION: One of the infectious causes of wrist tenosynovitis is *Mycobacterium tuberculosis*. Tendon sheath involvement is rare. Herein, we report the diagnosis and treatment of a patient with neglected wrist flexor tendon sheath tuberculosis.

PRESENTATION OF CASE: We report the diagnosis and treatment of a man aged 50 years with neglected wrist flexor tendon sheath tuberculosis.

DISCUSSION: In patients with tendon sheath involvement, symptoms are generally non-specific such as pain and swelling; therefore, it can be diagnosed late due to the lack of systemic symptoms. Wrist X-ray imaging in tenosynovitis may show soft tissue swelling and osteoporotic changes around the wrist joint. T2-weighted sequences in magnetic resonance imaging are more successful in supporting the diagnosis. **CONCLUSION:** *M. tuberculosis* should be kept in mind as an infectious agent, especially in developing countries. In order to prevent any delay in diagnostic evaluation, all steps should be taken carefully.

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1. Introduction

Tenosynovitis, one of the common reasons of wrist pain, may have various etiologies. One of the infectious causes of the wrist tenosynovitis is *M. tuberculosis*. Although antituberculosis drugs reduced the incidence of *M. Tuberculosis* infections, its prevalence is again increasing due to immune deficiency syndromes. It is mainly known as a pulmonary disease, but it may involve the musculoskeletal system and rarely tendon sheaths. Herein, we report the diagnosis and treatment of a patient with neglected wrist flexor tendon sheath tuberculosis.

2. Case report

A man aged 50 years was admitted to the rheumatology department with symptoms of right wrist volar pain, swelling, redness, and palmar pain, which had started in 2011. He had no comorbidities. Laboratory tests revealed C-reactive protein (CRP): 18 mg/L, erythrocyte sedimentation rate (ESR): 24 mm/h, and white blood cells (WBC): $6460 \times 10^3 \text{ mm}^3$. A diagnosis of seronegative arthritis was made and deltacortril 4 mg 1*1 and salazopyrin 500 mg 1*1 was administered. During the follow-up period, pain was relieved

but redness and swelling remained. In 2013, an wrist X-ray was performed (Fig. 1), which revealed soft tissue density increase, soft tissue swelling, and periarticular osteoporosis. Magnetic resonance imaging (MRI) (Fig. 2) showed millimetric and nodular images in flexor group tendon sheath in T2A series and wrist images were consistent with synovitis. The patient was referred to our department. On March 19th, 2013, right wrist synovitis resection and flexor retinaculum release was performed. Multiple rice bodies around the wrist flexor tendons were seen during the operation (Figs. 3 and 4). Specimens were sent to microbiology and aerobic-anaerobic cultures and liquid media remained sterile. The patient's symptoms regressed after the operation. However, in the postoperative 6th month, symptoms of right hand volar pain, swelling, and redness started. Laboratory tests and MRI findings showed recurrence. The patient underwent surgery again on November 11th, 2014, using the same incision line. There were multiple rice bodies again (Fig. 3). Flexor tendons were widely debrided. Perioperative specimens were sent to pathology and microbiology. A tuberculosis culture was analysed in addition. Pathologic examination showed granulomatous synovitis and the microbiologic examination in Lowenstein Jensen medium revealed *M. tuberculosis*. There was no history of lung tuberculosis. After thorough debridement, antituberculosis therapy was administered and maintained for twelve months.

After completion of antituberculosis therapy, there was no wrist pain and redness. Wrist range of motion was full. Laboratory tests revealed CRP: 1 mg/L, ESR: 2 mm/h, and WBC: $6600 \times 10^3 \text{ mm}^3$.

* Corresponding author at: Istanbul University, Istanbul Faculty of Medicine, Department of Orthopedics and Traumatology, Çapa Fatih Istanbul 34050, Turkey. E-mail address: dr.serkanbayram89@gmail.com (S. Bayram).

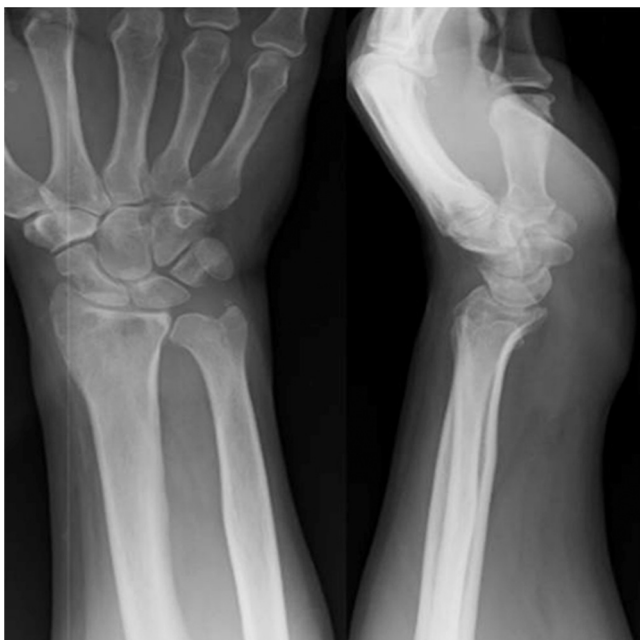


Fig. 1. The wrist AP and lateral X-ray shows us soft tissue density increase, soft tissue swelling and periarticular osteoporosis.



Fig. 3. Multiple rice bodies around the flexor tendons in the wrist.

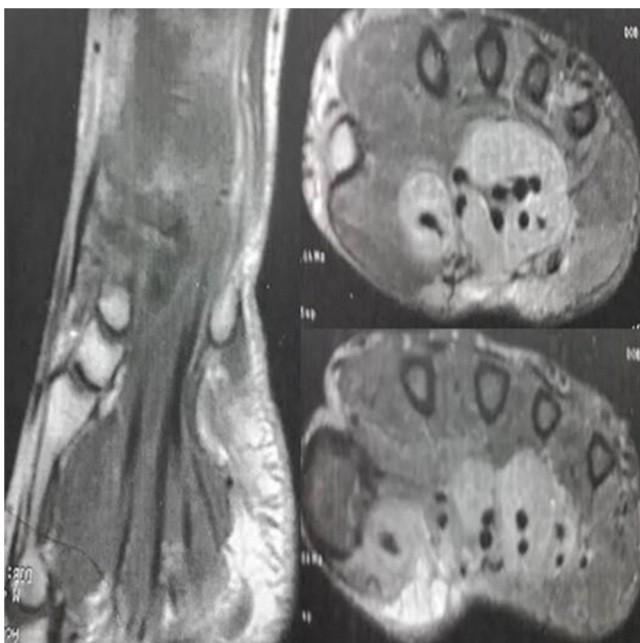


Fig. 2. MRI showed millimetric and nodular images in flexor group tendon sheath in T2A series and wrist images were consistent with synovitis.

Wrist X-ray in the control visit (Fig. 5) showed that soft tissue density decreased and swelling disappeared. Wrist MRI (Fig. 6) revealed that synovitis findings were fully recovered.

3. Discussion

M. tuberculosis infection was no longer a problem for humans after the discovery of antituberculosis drugs. However, it is still important because its diagnosis and treatment pose several challenges. Almost one third of the world's population is infected with tuberculosis bacilli.



Fig. 4. After large debridement.

Five to 10 percent of infected people become sick in one period of their lifetime. According to the “Global Tuberculosis (TB) 2015 Report” of the World Health Organization (WHO), the incidence, prevalence, and mortality rates of tuberculosis have been decreasing worldwide. However, global TB load is still very high. In 2014, there were 9.6 million new cases and 1.5 million deaths due to TB [1]. Tuberculosis infection is important especially in patients with immune deficiency syndromes, HIV infection, drug addiction, renal failure and in citizens of developing countries. Our patient did not have an immune deficiency.

Tuberculosis infection primarily affects the respiratory system. It is generally accepted as a lung infection but it may infect other organs. The infection spreads via lymphohematogenous route, and extrapulmonary involvement occurs at rate of around 14%. Osseous



Fig. 5. Soft tissue density decreased and swelling disappeared.



Fig. 6. Synovitis findings MRI were fully recovered.

tuberculosis has been reported in 1–8% of these patients [2]. Of the patients with bone tuberculosis, 50% have pulmonary tuberculosis. The most common location in musculoskeletal system is the vertebrae with a 30–50% occurrence rate. It may also affect the pelvis, ankle, and wrist. Tendon sheath involvement is rare. Tendon sheath involvement is generally due to hematogenous spread. Lymphogenous or direct contamination may also lead to infection [3].

Following tissue invasion of tuberculosis bacilli, tissue exudation and granulation occur. The same reaction occurs in bursae tissues. With the progression of inflammation, rice bodies are formed (Fig. 3). Rice body formation can be seen in rheumatoid arthritis, seronegative arthritis, systemic lupus erythematosus, and osteoarthritis. Thus, differential diagnosis is difficult [4]. Woon et al.

reported that operative findings of rice bodies, millet seeds, or melon seeds are highly suggestive of tuberculous tenosynovitis [5].

In patients with tendon sheath involvement, symptoms are generally non-specific such as pain and swelling; therefore, it can be diagnosed late due to the lack of systemic symptoms. Some patients may present with carpal tunnel syndrome [6]. The diagnosis of musculoskeletal tuberculosis may be delayed, an average 16–19 months from symptom onset to diagnosis [7,8]. In our patient, the diagnosis was made 45 months later. Wang et al. reported a series of 15 patients with mycobacterial infection of upper extremities and only 2 patients were initially suspected of tuberculosis [9]. In our patient, the initial clinical and radiographic evaluation led to the diagnosis of seronegative arthritis. Villonodular synovitis, seronegative arthritis, rheumatoid arthritis, tumors, and other causes of chronic infectious tenosynovitis should be considered in the differential diagnosis.

The diagnosis of tuberculosis is made through histologic and microbiologic examinations [10]. Blood tests and imaging before biopsy may help to verify diagnosis. Wrist X-ray imaging in tenosynovitis may show soft tissue swelling and osteoporotic changes around the wrist joint. T2-weighted sequences in MRI are more successful in supporting the diagnosis. On T2-weighted sequences, hypointense focus, hypointense synovia together with central erosion, and abscesses with surrounding contrast are significant for distinguishing tuberculosis from other kinds of inflammatory arthritis [11,12].

Kanavel stated that tendon sheath tuberculosis consisted of three stages. In the first stage, serous exudation due to sheath thickening occurs. The second stage is the proliferative phase of granulomatous tissues forming rice bodies, and the third stage is necrosis [13]. Our patient was in the second stage.

Antituberculosis drugs are used in the treatment of tuberculosis. Surgical treatment only provides symptomatic relief for patients, which we observed in our case; debridement without antibiotherapy led to disease recurrence. However, surgery may be useful in patients who are stage 2 or 3. Benchakroum et al. treated 11 patients with wrist tuberculosis using antituberculosis drugs and performed surgery in patients with abscesses when the medical treatment failed [14]. Surgery has also been suggested for patients who are resistant to chemotherapy [15].

Formation of rice bodies complicates treatment because rice bodies require wide debridement to prevent recurrence. It is also suggested to remove all bursae (rice) [16,17].

4. Conclusion

M. tuberculosis should be kept in mind as an infectious agent especially in developing countries. In order to prevent any delay in diagnostic evaluation, all steps should be taken carefully. This case shows that tuberculosis is an infectious disease in which surgical treatment is not adequate alone, antituberculosis drugs should also be used.

Conflict of interest

The presence or absence of the conflict of interest (COI) should be declared for the individual authors like “Serkan BAYRAM, Ali ERŞEN, Murat ALTAN, Hayati DURMAZ”, declare that they have no conflict of interest.”

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Ethical approval

Advocate Health Care Institutional Review Board does not require review for case reports.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

(1) Serkan Bayram, MD: drafting of the article, critical revision of the article for important intellectual clinical content; (2) Ali Erşen, MD: equal contribution as lead author, drafting of the article, revision of the article for important intellectual clinical content; (3) Murat Altan, MD: revision of the clinical and intellectual content of the article. (4) Hayati Durmaz, MD: revision of the clinical and intellectual content of the article.

Guarantor

Ali Erşen, MD.

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