

## CASE REPORT

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**Tuberculous tenosynovitis involving wrist and extensor compartment of the forearm: Case presentation****Ali Yuce<sup>1</sup>, Bulent Karslioglu<sup>2</sup>, Mustafa Yerli<sup>2</sup>, Suleyman Semih Dedeoglu<sup>2</sup>, Yunus Imren<sup>2</sup>, Hakan Gurbuz<sup>2</sup>**<sup>1</sup>Basaksehir Pine and Sakura City Hospital, Department of Orthopedic and Traumatology, Istanbul, Turkey<sup>2</sup>Prof. Dr. Cemil Tascioglu City Hospital, Department of Orthopedic and Traumatology, Istanbul, TurkeyReceived 20 September 2020; Accepted 02 November 2020  
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**Abstract**

Musculoskeletal tuberculosis is a rare form of extrapulmonary tuberculosis, constituting <10% of cases even in developing countries. Diagnosis and treatment are usually delayed due to non-specific findings. In this case report, we presented a 55-year-old male butcher who had complaints of pain and tenosynovitis at the dorsal side of the right wrist after trauma, for which we performed surgery upon diagnosis of ganglion cyst secondary to steroid injection. The patient had developed a second lesion on the forearm of the same extremity while waiting for the initial report of the biopsy specimen, which showed positive Ziehl-Neelsen staining, necrotizing granulomatous inflammation, caseating necrosis. No growth was detected in the culture. The patient received anti-tuberculosis treatment for 12 months and no recurrence was observed at a 1-year follow-up. Since tuberculous tenosynovitis can be confused with other diseases, the diagnosis may be established late. Contraindicated procedures such as corticosteroid injection can be applied to the patient due to inaccurate pre-diagnosis, which may activate the disease. It may be important to suspect this disease considering the risk factors and occupational group. Performing ultrasonography and biopsy with a pre-diagnosis of tuberculosis can be a guide for early diagnosis and treatment.

**Keywords:** Extensor compartment, forearm, tuberculous, tenosynovitis, wrist**Introduction**

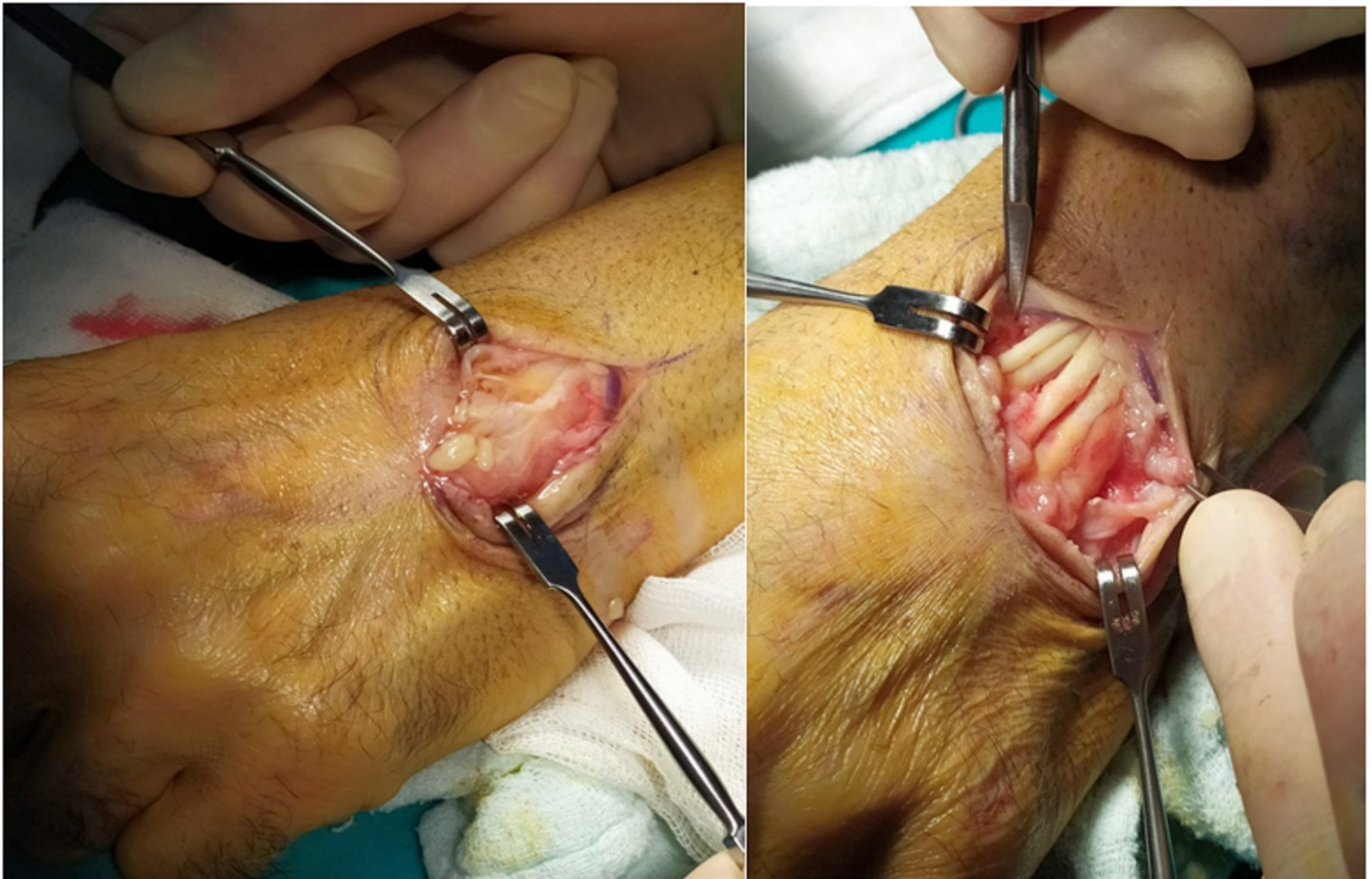
Musculoskeletal tuberculosis is a rare form of extrapulmonary tuberculosis, constituting <10% of cases even in the developing countries [1,2]. This form typically involves flexor tendons while dorsal involvement might also be observed [1-3]. Diagnosis and treatment are usually delayed due to non-specific findings[4], which may result in unwanted complications[5,6].

**Case Presentation**

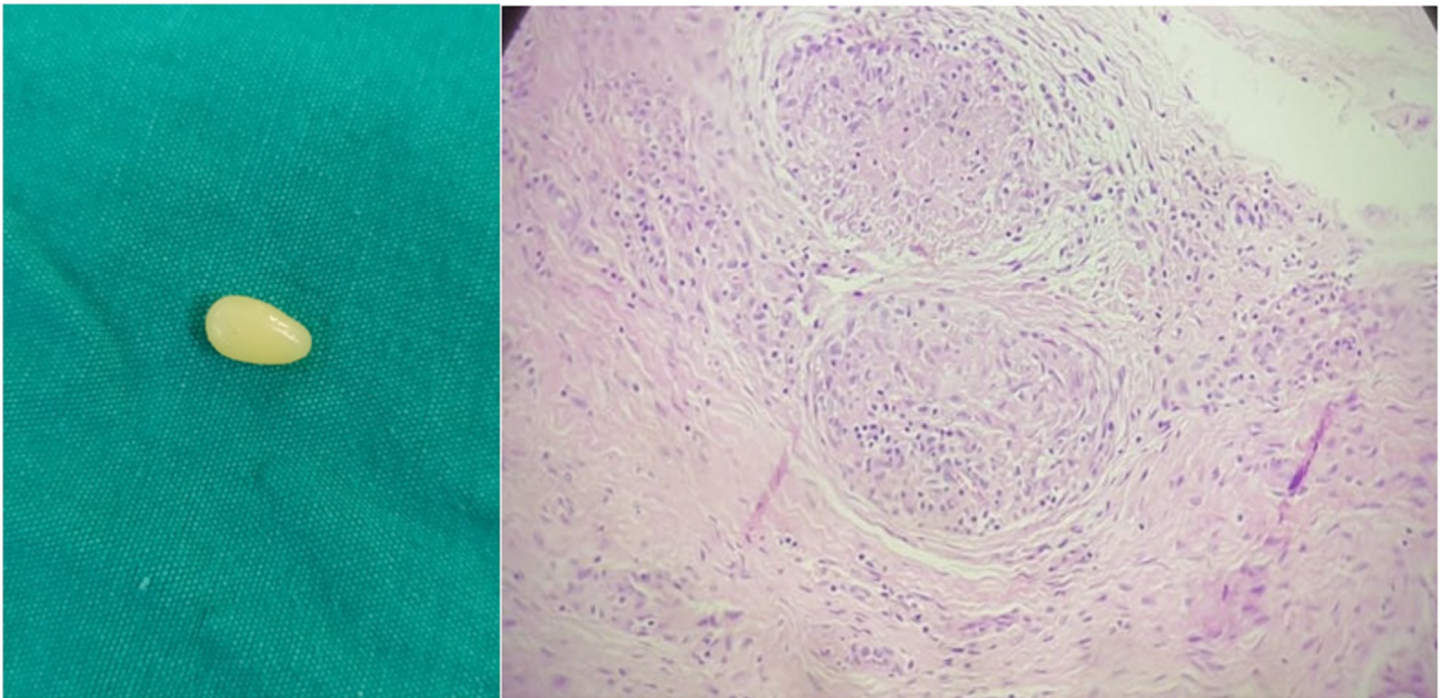
A 55-year-old male butcher was admitted to the outpatient clinic with a complaint of pain at the dorsal side of his right wrist persisting for 1 month after trauma. The pain was described to occur with wrist movements. Medical history showed diabetes mellitus and alcoholism. During the physical examination, there was tenderness on compression of the dorsum of the wrist and direct radiography revealed degenerative changes.

The patient was initially prescribed nonsteroidal anti-inflammatory drugs with splinting and cold application. Upon presenting with persisting pain after one month, blood parameters and ultrasound images were studied: WBC, 8.94 x 10<sup>3</sup>/L (reference: 4-10); C-reactive protein, 4 mg/L; uric acid, 6.4 mg/dL, RF, 0; Rose-Bengal test, (-); and ESR: 18 mm/h, while ultrasonography (USG) was consistent with tenosynovitis. The patient received a corticosteroid injection for this diagnosis. The patient, whose complaints were relieved after a steroid injection, was applied to the outpatient clinic with swelling of the dorsum of the wrist after 2 months. A suspected diagnosis of ganglion cyst was confirmed on USG with additional diffuse tenosynovitis surrounding the cyst. The patient was scheduled for surgical intervention, which showed rice bodies within the cyst after vertical incision (Figure 1). Cyst and rice bodies were excised and tenosynovectomy was performed. Histological examination revealed necrotizing granulomatous inflammation and caseating necrosis with histiocytes as well as PAS (-) and Ziehl-Neelsen (+) staining (Figure 2). The primary diagnosis was tuberculosis infection. The culture result was negative, and the PPD test showed a diameter of 2mm. No lesion was detected in the chest X-ray. Meanwhile, a second lesion had

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**Figure 1.** Rice bodies were observed after the opening of the extensor retinaculum (left). The appearance after total tenosynovectomy and debridement (right).



**Figure 2.** Macroscopic (left) and microscopic (right) appearance of the rice bodies.

occurred on the dorsal of the forearm along the axis of the extensor tendons. USG findings with suspected tuberculosis support the diagnosis. The patient was initiated on a 4-drug antituberculosis regimen (rifampicin, isoniazid, ethambutol, pyrazinamide), which

was continued with dual therapy with rifampicin and isoniazid after the second month to continue till 12 months. The second lesion on the forearm disappeared in the third month of treatment. No recurrence was observed at 1-year follow-up.

## Discussion

Tuberculous tenosynovitis, which usually affects the flexor tendons of the wrist, is an important public health problem, especially in developing countries [6]. Nevertheless, digital flexor sheaths, and the dorsal side of the wrist might also be involved [7]. The diagnosis of tuberculous tenosynovitis is often delayed due to a wide variety of differential diagnoses, including other atypical mycobacterial infections, tuberculosis, systemic lupus erythematosus, pyogenic infections, brucellosis, foreign body tenosynovitis, osteoarthritis, and rheumatoid arthritis [6]. Such delayed diagnosis eventually may lead to serious joint and tendon damage and the spread of mycobacteria to the surrounding bursa, muscle, and other soft tissues [8]. The typical risk factors for tuberculosis include >60 years of age, previous trauma, corticosteroid injections, low socioeconomic status, alcoholism, and immunosuppression [4,9]. While being a risk factor and contraindicated, corticosteroid injections could even be performed for other potential diagnoses as such administration is a nonspecific practice [9]. Our case was a diabetic patient with a history of alcoholism, and his complaints started after trauma. Also, corticosteroid injection was applied due to nonspecific findings, which resulted in wrist edema at the dorsal side. Corticosteroid injection may likely have accelerated the progression of tuberculosis involvement in this area.

Wrist tuberculosis may be associated with several occupations like butchery [9]. However, a dorsal lesion may mimic ganglion cysts. This is one of the situations that can cause a delay in diagnosis; where the initial step in workup is to perform USG. Rice bodies can be detected as a low-level internal echo but it is possible that USG may not distinguish rice bodies [1,4,10]. In our case, which was a butcher, USG was performed after edema development at the wrist and could not differentiate it from ganglion cyst. This differentiation was only revealed after the pre-diagnosis of tuberculous tenosynovitis in the forearm extensor side lesion which developed after the biopsy. Perhaps it is possible to suspect this disease early in the diagnostic work-up in at-risk populations and to inform radiologists before USG. This may yield more accurate reports and help surgeons for early diagnosis and consequent prompt initiation of the treatment.

MR has been reported to help in ruling out differential diagnoses and as a reliable tool for early diagnosis, especially if performed with gadolinium injection [5]. In our study, MR could not be performed due to the hospital protocol. It is possible that the diagnosis can be supported by contrast-enhanced MR in case of doubt and no differentiation by USG could be achieved.

In the early stages of the disease, the clinical and radiological findings may mimic those of arthritis; therefore, biopsy and culture specimens should be obtained from rice bodies for definitive diagnosis [3,11]. Tuberculosis is diagnosed based on histopathological and microbiological examinations. Caseous granulomas, tuberculosis bacilli, and multinucleated Langerhans giant cells may be seen in the histological evaluation of these fibrinous loose bodies. Microbiological studies are generally not sufficient to establish the diagnosis. Hand tuberculosis is a paucibacillary lesion. For this reason, smear, Ziehl-Neelsen staining, and tuberculosis cultures in Lowenstein and BACTEC media are often negative in extrapulmonary involvement [3]. We also detected similar findings in microscopic examination of our

case, but with a positive Ziehl-Neelsen staining. However, there was no growth in culture. Considering the delays in diagnosis in our case and establishment of the definitive diagnosis only after biopsy, we suggest that suspicion of tuberculosis and immediate decision for a biopsy is critical in tenosynovitis cases with risk factors for tuberculosis and inaccurate radiological findings.

Simultaneous active pulmonary tuberculosis is present in less than half of patients with wrist tuberculosis [8]. If remain untreated, tuberculosis leads to severe joint and tendon damage and dissemination of the mycobacteria of the surrounding bursa, muscles, and other soft tissues [8]. Tendon tuberculosis may occur due to direct transmission of the infectious agent or via hematogenous spread [8]. Multifocal involvement was reported previously in a case presentation, where the underlying mechanism was suggested to be direct inoculation or inoculation from the culprit tuberculous lesion in the pulmonary/genitourinary system [5]. In our study, we did not detect pulmonary involvement in thorax computed tomography. Considering the job of the patient, the infection might have occurred via direct transmission. It is also possible that the second lesion might have developed after dissemination through the tendon sheath after being aggravated secondary to the corticosteroid injection.

Case reports are emphasizing the importance of surgical treatment as a biopsy tool for early diagnosis and early chemotherapy; while some advocated performing synovectomy, surgical lavage, curettage, and debridement as part of the treatment [1-4,11]. In our case, surgical debridement, lavage, synovectomy was applied to the lesion on the dorsal of the wrist, and no surgical intervention was performed on the forearm lesion. Three months of chemotherapy provided remission also in the forearm lesion where tenosynovectomy and debridement were not performed. The critical benefit of surgical intervention in tuberculous tenosynovitis maybe its contribution to early diagnosis and initiation of the treatment through the obtainment of biopsy, rather than its potential help to the disease management by tenosynovectomy and debridement. We think that surgery can contribute more to the treatment in selected cases accompanied by nerve entrapment, pain affecting the quality of life, functional impairment, or restricted range of motion.

## Conclusion

The diagnosis of tuberculous tenosynovitis can be established late due to confusion with other diseases. Contraindicated procedures such as corticosteroid injection can be administered to the patient due to inaccurate pre-diagnoses, which may reactivate the infection. The most important factor in the treatment of tuberculous tenosynovitis may be to suspect this disease in patients with risk factors in endemic regions. Performing USG and biopsy with this pre-diagnosis could be a guide for early diagnosis and treatment.

## Conflict of interests

*The authors declare that they have no competing interests.*

## Financial Disclosure

*All authors declare no financial support.*

## Patient informed consent

*Written informed consent was obtained from study participant.*

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