
**E-ISSN:** 2707-8353
**P-ISSN:** 2707-8345
IJCRO 2022; 4(1): 97-99
Received: 26-11-2021
Accepted: 13-01-2022

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# Tuberculosis of the wrist: A rare case of osteoarticular tuberculosis

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**DOI:** https://doi.org/10.22271/27078345.2022.v4.i1b.102

**Abstract**
Tuberculosis is an infectious disease which represents a real public health problem. Bone and joint involvement is rare. Although its location in the wrist is exceptional, it should always be considered in case of chronic pain especially in endemic countries. We report the case of a 22-year-old young man, from urban origin, who suffered from a painful and inflammatory right wrist developed after a benign trauma. Tuberculin skin test was positive. The search of *Mycobacterium tuberculosis* in sputum and urine was negative. Laboratory tests showed an inflammatory syndrome without hyper-leukocytosis. A destructive osteo-arthritis was showed by radiological exploration which has been well analyzed by MRI. Surgical drainage and immobilization by external fixation were done. Microbiological culture of per-operative sampling was negative. The search of *Mycobacterium tuberculosis* on direct examination and culture was negative. Surgical biopsy confirmed the tuberculous origin showing a giant cell granuloma centered by a caseous necrosis indicating then the initiation of anti-tuberculous therapy. After four years of follow-up, a good evolution was noted and the patient had an acceptable useful function. Tuberculosis of the wrist remains a rare location of the disease. It has to be suspected in case of every chronic wrist pain in endemic area. Conservative management offers good results only at early stages.

**Keywords:** Tuberculosis, wrist, osteoarthritis

## Introduction
Tuberculosis is an infectious disease which presents a real public health problem. Bone and joint tuberculosis represents 1-3% of extra-pulmonary tuberculosis. The location of the wrist is exceptional. We should always think about tuberculosis in case of chronic pain of the wrist especially in endemic countries. Its insidious evolution characterized by a well-tolerated pain explains the constant delay in diagnosis and treatment.
Based on a case of wrist tuberculosis, we try to describe this pathological entity, its clinical and paraclinical particularities, its therapeutic management and its evolutive modalities.

## Materials and Methods
Our case consists of a 22- year- old patient who came from an urban environment and consulted for a pain and swelling of the right wrist.
At the interview, we found a notion of Benin wrist trauma, three months before swelling appearance. There was no concept of tuberculosis contagion and BCG vaccination was given to him in his childhood.
At the exam, the patient had a good general state. A rounded swelling on the dorsal surface of the wrist was founded. It was inflammatory with redness and local heat. The mobilization of the wrist was slightly painful. A trochlear lymphadenopathy was noted but there was no fistula to the skin.
The Tuberculin skin test was positive measuring 25 mm.
An inflammatory syndrome was noted in the biology exploration with Protein C Reactive 14.5 mg/l but there was no hyper-leukocytosis (WBC 7700 element/dl).
The search of Mycobacterium tuberculosis in sputum and urine was negative.
Standard radiography of the wrist showed a destructive osteoarthritis of the right wrist with osteolysis of the carpal bones, articular and peri-articular bone demineralization and pinch joint spaces.
The radiological exploration was completed by an MRI of the wrist for better analysis. It showed a destructive osteoarthritis of the right wrist, especially of the capitatum and

hamateum with heterogeneous synovial thickening, spongy edema and peri-articular collections and abscess (shown in Fig. 1).

A surgical decision was taken. He had benefitted from joint drainage by a posterior approach of the wrist with washing and excision of infected tissues. Per-operative exploration founded a thick cheesy liquid. A biopsy for histological examination was realized to him. The wrist was immobilized with an external fixation for 2 months.

The bacteriological examination of per-operative sampling, carried in standard media, was negative. It was completed by a search of Mycobacterium tuberculosis both on direct examination after Zhiel Neelson coloration and after culture in Lowenstein Jhonson medium and it was negative.

The histological examination of the specimen founded a giant cell granuloma centered by a caseous necrosis, justifying the introduction of anti-tuberculosis therapy which consists on four-drug anti tuberculosis antibiotics (isoniazid, rifampicin, ethambutol and pyrazinamide) for 2 months then dual therapy (isoniazid, rifampicin) for 10 months.

The tolerance and adherence to the tuberculosis therapy was good.

The patient was followed in a regular manner. One year after surgery and at the end of the anti-tuberculosis treatment, healing was achieved.

Clinically, the patient had an acceptable useful function, with effective gripping despite a lightly stiffness of the wrist. The scarring of the surgical wound was good.

The Radiological control showed a good reconstruction of the wrist with restoration of bone mineralization.

**Figure format**

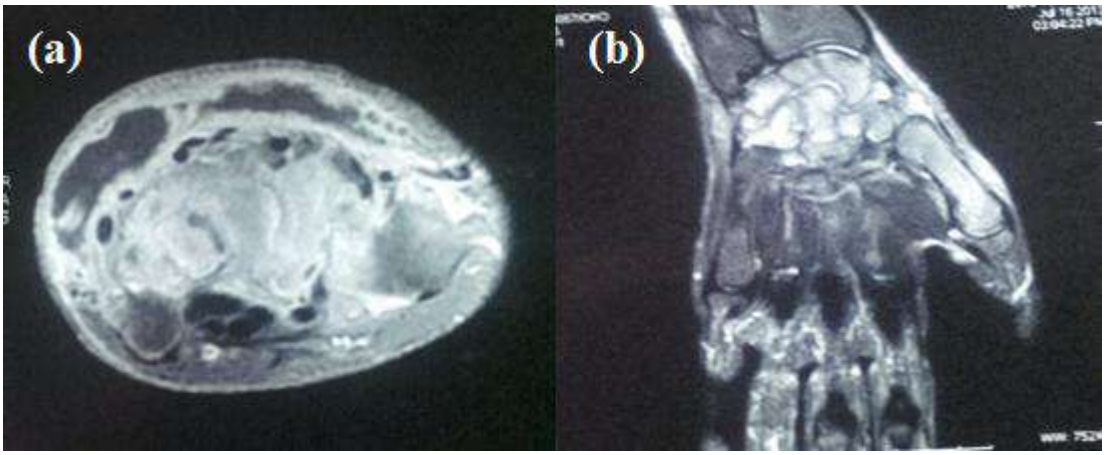


**Fig 1:** MRI of the wrist (a: axial cross-section, b: frontal cross-section) Osteoarthritis of the wrist was showed with Spongy edema of the carpal bones, synovial thickening, liquid articular effusion and peri-articular abscess

**Discussion**

The wrist is a rare localization of tuberculosis. It represents 1% of bone and joint tuberculosis [1-3]. The disease generally begins in the scapho-lunar joint following haematogenic inoculation of the articular synovium in two thirds of cases, or inoculation by contiguity from tuberculosis tenosynovitis in third of cases [4, 5]. The radial side of the wrist (distal radius, scaphoid, trapezius, capitatum, and bases of the second and third metacarpals) is most frequently affected [6].

Its clinical picture is characterized by a painful and discreetly inflammatory swelling. Cold abscesses, with or without fistulae, may occur in 20 or 25% of cases. The extension of the edema to the dorsal surface of the wrist represents an obstacle to the lymphatic and venous drainage of the hand explaining the frequent spread of the edema to the fingers and the repercussion on their extension, especially of the metacarpophalangeal joints [7]. A satellite, epitrochlear or axillary lymphadenopathy, radio-carpal subluxation or compression of the median nerve may be associated [7-11]. Exceptional pseudo-tumor forms have been reported by E. Fianyo [2], and K.C. Wu [12].

This clinical symptomatology, of insidious evolution, lacks specificity and may evoke other affections such as chronic osteomyelitis, chondroma, osteoid osteoma, villo-nodular synovitis, sarcoidosis, Paget's disease or hyperparathyroidism [8, 9].

Usually, biology shows an increase in inflammation parameters without hyper-leukocytosis. The tuberculin skin test is often positive. It does not exclude the diagnosis if it is negative.

Carpal bone involvement is radiologically indicated by marginal erosions or cystic lesions due to intra-osseous granulomas [6]. At advanced stages, the involvement is more destructive with multi geodes of all the carpal bones, the lower extremity of the two bones of the forearm and the base of the metacarpals [2, 4, 8, 9]. A non-traumatic fracture of the carpal bones can be objectified. D. Mishra reports a rare case of a pathological fracture of the carpal scaphoid revealed by chronic pain with swelling of the wrist which tuberculous origin has been confirmed by PCR in synovial articular fluid [6]. Thus, in front of any destructive mono-arthritis of the wrist or fracture of the carpal bones without the notion of trauma, especially in tuberculous endemic areas, the tuberculosis of the wrist must be evoked [8].

CT-scan is used to specify the bone and joint damage and perform percutaneous biopsy. The MRI is useful in the diagnosis of inflammatory synovial and musculotendinous lesions. The diagnostic certainty is provided by bacteriological proof and / or the presence of a tuberculous granuloma in the histological examination.

The treatment is essentially medical, varying in duration, depending on the practitioner, from 8 to 13 months [2, 4, 6, 8, 9]. Under medical treatment alone, with or without immobilization, the evolution can be made towards healing.

Surgery includes biopsy, fistulectomy, abscess drainage, sequestrectomy, synovectomy, carpal tunnel decompression,

or arthrodesis if there is significant joint destruction [9]. According to F. Dlimi, surgery, which is useless for a curative purpose, finds its place essentially for diagnostic or functional purposes [7]. On the other hand, A.Goel recommends debridement surgery if there is a significant destruction of the wrist [1]. P. Borman [3] and M. Komurcu [13] allow resection of the first row of carpal bones destroyed by tuberculosis for better control of infection in advanced stages.

Immobilization by a plaster splinter for a period of 4 to 6 weeks, until the disappearance of the clinical signs, is recommended by some practitioners. This immobilization is followed by rehabilitation in order to recover the articular amplitudes especially in the forms with high stiffness. M.A. Sbai considers that medical treatment is a wise therapeutic attitude avoiding the use of an unnecessary surgical procedure with good functional results [4]. I.B. Ozelik recommends debridement surgery only after 4 to 5 months of failed anti-tuberculous treatment [14]. Pseudo-tumor forms have a good response to surgery with a mono block resection of the cold abscess associated with joint washing [2]. In the case of advanced destructive osteoarthritis of the wrist, obtaining an ankylosis by plaster immobilization of the wrist in functional position may replace surgical arthrodesis [8].

After a well followed treatment, the prognosis is good with recovery of a useful function and reconstruction of the radiological osteolysis [4]. The prognosis is favorable under medical treatment associated or not with immobilization, but the functional outcome remains dependent on early diagnosis and appropriate treatment [7].

## Conclusion

Tuberculosis of the wrist is rare. It has to be suspected in case of every chronic wrist pain in endemic area. Despite evocative context, only bacteriological or histological proof provides the evidence of diagnosis and justifies an anti-tuberculous treatment which good adherence remains the best guarantee for healing.

## Author's contribution

Mohamed Ben Jemaa: Acquisition, analysis and interpretation of data
Wassim Zribi: Critical revising of the article
Lajmi Achraf: Conception and design of the study
Abid Ameur: Surgical management of this case

## Acknowledgments

Pr. Hassib Keskes: Head of Orthopedis surgery Department of Habib Bourguiba University Hospital of Sfax-Tunisia

## Conflict of Interest

Authors declare no conflict of interest

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