Isolated Tuberculosis of Capitate and Triquetrum

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Abstract

Musculoskeletal system is involved in about 20% of the patients diagnosed with tuberculosis. Although musculoskeletal tuberculosis generally affects spine and large joints (hip and knee), hand involvement of the tuberculosis is seen in 10% of the patients with musculoskeletal involvement and also isolated tuberculosis of hand or wrist is much rarer.

In the following report, we discuss the case of a 23-year-old male patient who was diagnosed with isolated tuberculosis of the capitate and triquetrum bone. The patient presented with a nonhealing sinus on the left wrist joint. Imaging revealed lytic lesions of the capitate and triquetrum. The diagnosis of tuberculosis was confirmed by histopathological examination on the bone specimen obtained from the debridement and curettage. Antituberculosis therapy was started postoperatively and 1 month later, healing of the sinus was observed. There was no sign of reactivation seen at follow-up 22 months after treatment.

Keywords

- tuberculosis
- wrist
- capitatum
- triquetrum

Tuberculosis remains a major source of morbidity and mortality worldwide, especially in certain areas in Asia, the Middle East, and Africa. Tuberculosis is most common in areas with crowding, poor sanitation, and malnutrition.¹ Incidence worldwide is even rising due to increased immigration and the increasing number of immunosuppressed people.^{2,3} Bone is the third most frequent site of tuberculosis after lung and lymph node, approximately 10 to 20% of all cases of extrapulmonary disease.^{1–3} Because a primary focus is not always found, it can be difficult to make a diagnosis of skeletal tuberculosis. Unawareness of the existence of this disorder and absence of distinct signs and symptoms often lead to considerable delay in diagnosis and treatment. Even though reports about isolated tuberculosis infections of the wrist have increased, it remains rare condition which account for only 1% of the peripheral osteoarticular tuberculosis cases.^{2,4–7} Isolated tuberculosis infection of carpal bones is even more uncommon; to our knowledge this is the first report about an isolated tuberculosis of the capitate and triquetrum bone.^{2,6,7}

Case Report

A 23-year-old male patient was referred to our clinic with pain, reduced range of motion, swelling, and a nonhealing sinus in the ulnar aspect of the left wrist joint. The complaints of the patient were persisting for more than 2 months. There was no history of any wrist trauma, surgical intervention or drug abuse, and also general medical history was not significant: no family history of tuberculosis infection, no clues for a systemic infection, such as fever, weight loss, night sweats, or fatigue were present. Also, family history of rheumatic or autoimmune disease was negative. At presentation, patient had been given symptomatic treatment with nonsteroidal anti-inflammatory drugs and oral antibiotics in another clinic.

Swelling, erythema, and tenderness of the left wrist were noticed during the physical examination. Besides, movements of the wrist were very painful and the range of motion was significantly restricted. Three sinuses were present at the ulnar site of the wrist (►Fig. 1). Laboratory investigations were

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Fig. 1 Clinical photograph at presentation showing sinuses on the ulnar aspect of left wrist.

normal. Erythrocyte sedimentation rate (ESR) was 6 mm in 1 hour, white blood cell count (WBC) was $5,500/\text{mm}^3$ and C-reactive protein (CRP) was 0.3 mg/dL. Also, other serological tests for rheumatic diseases, hepatitis B and C, HIV, Brucella and Salmonella were negative. Gram staining, Ziehl–Neelsen staining, and aerobic cultures could not reveal any pathogen. Furthermore, no signs of respiratory or systemic diseases were detected during the physical examination. A plain radiograph of the chest and computed tomography (CT) showed no features of current or past tubercular infection. The patient had been previously vaccinated with bacillus Calmette–Guérin vaccine.

Anteroposterior and lateral X-ray of left wrist showed lytic lesions of the capitate and triquetrum (►Fig. 2). CT of the left wrist showed lytic-sclerotic lesions and subchondral erosions

Fig. 2 Anteroposterior radiograph showing lytic lesions of the capitate and triquetrum (arrows).

of the capitate and triquetrum with soft tissue swelling (►Fig. 3). The magnetic resonance imaging (MRI) revealed that osteomyelitis of the capitate and triquetrum with adjacent tenosynovitis of the extensor tendon and extensive synovitis (►Fig. 4).

The patient was operated under general anesthesia. Debridement and curettage were performed for triquetrum and capitate, samples for histopathologic and microbiological investigations were taken. Initial diagnosis was made with histopathological examination which showed epithelioid granulomatous reaction and central caseous necrosis (►Fig. 5). Multidrug antituberculous chemotherapy with rifampicin 10 mg/kg/day, isoniazid 5 mg/kg/day, pyrazinamide 25 mg/kg/day, streptomycin 15 mg/kg/day and ethambutol 15 mg/kg/day was initiated in patient diagnosed with tuberculosis. By that time, a specific tuberculosis culture confirmed the diagnosis of tuberculosis. Streptomycin, ethambutol, and pyrazinamide were discontinued after 3 months and treatment continued with isoniazid and rifampicin for 6 more months. The hand was immobilized for 3 weeks postoperatively. After the surgery, sinuses on the left wrist healed in 4 weeks. His wrist became nontender and regained excellent range of motion and normal wrist function. At 22-month follow-up there was no sign of reactivation.

An informed consent has been obtained from the patient for publication, including any necessary photographs.

Discussion

Tuberculosis is an infectious disease caused by *Mycobacterium tuberculosis* and mainly affects the respiratory system.⁴ However, tuberculosis can also be manifested as an osteoarticular infection. In these cases, it mainly concerns a spondylitis or a monoarthritis of weight-bearing joints such as hip, knee, shoulders, or elbow.^{1,4,5} The wrist is a more unusual site for osteoarticular tuberculosis and accounts for only 1% of all cases of peripheral osteoarticular tuberculosis.⁵ Because of the infrequency and atypical features of wrist tuberculosis, diagnosis of this disease is often difficult.^{2,5} Skeletal osteomyelitis can manifest with systemic features of fever, night sweats and weight loss in addition to the local site of involvement. In this case medical history was not significant for a tuberculosis infection and constitutional symptoms were absent. Also, infection markers in the blood, CRP, ESR, and WBC were negative. The ESR is almost always elevated in tuberculosis. Although this is not specific but it is an important test because patients with atypical mycobacterial infections of the hands have a normal ESR.² In laboratory investigations, a normal ESR and negative skin tests do not exclude a diagnosis of tuberculosis.^{3,8} Primary bone involvement in tuberculosis is often diagnosed late because the symptoms are typically minimal and only one-third of patients have concomitant active pulmonary disease.^{1,2} Chest X-ray is usually normal in cases of hand tuberculosis.^{6,8,9} It is important for physicians to keep in mind that tuberculosis of the bone and joint can be a primary, isolated lesion. Chest X-ray was negative, as is the case in two-third of the patients with bone tuberculosis.⁴ Furthermore Ziehl–Nelson staining

Fig. 3 Axial (A) and coronal (B) CT scan images show osteolytic lesion of the capitate and triquetrum with bone erosion (long arrows) and soft tissue swelling (arrowheads). CT, computed tomography.

and aerobic cultures were negative. In hand tuberculosis, microbiological studies are usually insufficient in the diagnosis of bone and joint tuberculosis. Hand tuberculosis is a paucibacillary lesion. Because of this, smears, Ziehl–Nelson stains, and tuberculosis cultures in Lowenstein–Jensen (Salubris AŞ, İstanbul) and BACTEC media (Becton Dickinson, Sparks Glencoe, MD) are frequently negative in extrapulmonary tuberculosis.^{2,9} Therefore, negative results in micro-

scopic evaluation should not exclude the diagnosis of tuberculosis in endemic areas with typical clinical, radiological, and histopathological features.^{2,9} In regions where tuberculosis is not endemic, histopathologic or microbiologic confirmation should be mandatory.⁸

In this case tuberculosis was even harder to suspect, due to some unique features. There were no precipitating factors such as trauma, radial artery cannulation, immunosuppression or

Fig. 4 Coronal T1-weighted (A) and fat-saturated T2-weighted (B) MR images of the left wrist show osteomyelitis of the capitate and triquetrum (long arrows). Intravenous contrast-enhanced fat-saturated T1-weighted (C and D) MR images also show peripheral enhancement of the fluid collection around the extensor tendons and also flexor retinaculum (arrowheads). MR, magnetic resonance.

Fig. 5 Histopathological microphotograph showing the granulomas with central necrosis and Langhans type giant cell (hematoxylin-eosin stain, magnification $\times 400$).

malnutrition, are commonly identified.² Furthermore, this case concerns an otherwise healthy 23-year-old male patient. Radiographic appearance of tuberculous bony lesions is variable. Radiologically, such a lesion may show osteoporosis, soft-tissue swelling, diminished joint space, reactive sclerosis, and progressive joint destruction.^{8,10} There may be marked bone expansion, sclerosis, periosteal reaction, and sinus formation. CT scans and MRI are helpful in making a diagnosis. MRI, although nonspecific, was helpful in the differential diagnosis, in evaluating the extent of the lesion, and in demonstrating lesions before they were evident on plain radiography.^{8,10} However, wrist tuberculosis was suspected because of the aspect of the lesion and the suspicious radiological findings. In this case lytic lesions, soft tissue swelling and subchondral erosion were seen. Because the clinical and radiological features of tuberculous osteomyelitis are nonspecific, to reach a definitive diagnosis, a bone biopsy should be taken for microscopy, culture, and histology.^{4,10} Tuberculous bacilli are rarely seen (with Ziehl–Neelsen staining) or grown in culture, and the diagnosis often has to be made based on the granulomatous appearance histologically along with high clinical and radiographic suspicion.^{4,8,9}

Although surgical debridement is controversial for hand and wrist tuberculosis.^{2,5,6,9} Some authors suggests that management is essential by conducting a bony debridement combined with antitubercular drugs, rest of the involved part

in functioning position and early active exercise.^{4,7,11} Because early osteoarticular tuberculosis heals without significant residual problems. Tuberculosis should be kept in mind when making the differential diagnosis of several osseous pathologies. We think that surgical intervention for biopsy and debridement contributed to rapid diagnosis and early treatment.

There are few other case reporting an isolated carpal tuberculosis (TBC) infection.^{6,7} Even though isolated carpal TBC infection is thus very rare and knows various (aspecific) clinical manifestations, one should be aware of the existence of this disorder since early diagnosis and treatment is of greatest importance for a good clinical outcome.

Conflict of Interest
None.

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