Acute Monoarthritis of the Wrist Joint: Tuberculosis or Not?

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Abstract

Background Extrapulmonary tuberculosis (EPTB) is known to have many and varied presentations. However, isolated involvement of bone with tubercular infection is uncommon. The clinical features of such infections are known to mimic chronic pyogenic osteomyelitis, Brodie abscess, or tumors, but not acute monoarthritis.

Case Description We describe here an unusual case of tuberculous osteomyelitis that mimicked features of acute monoarthritis of the wrist joint.

Literature Review Extraspinal tuberculous osteomyelitis is rare and comprises only about 2 to 3% of all cases of osteoarticular tuberculosis, with the hip and knee joints being the most commonly involved. An extensive literature review did not show any published report of tuberculous osteomyelitis presenting as acute monoarthritis of the wrist joint.

Clinical Relevance This case underlines the importance of making EPTB an important differential diagnosis even in cases with clinical features that are completely inconsistent with tubercular infections.

Keywords

- ▶ monoarthritis
- ▶ wrist
- ▶ tuberculosis

Extrapulmonary tuberculosis (EPTB) is known to have many and varied presentations. Extraspinal tuberculous osteomyelitis is rare and comprises only ~2 to 3% of all cases of osteoarticular TB, with the hip and knee joints being the most commonly involved.

Isolated involvement of bone with tubercular infection is uncommon. The clinical features of such infections are known to mimic chronic pyogenic osteomyelitis, Brodie abscess, or tumors, but not monoarthritis. An extensive literature review did not show any published report of tuberculous osteomyelitis presenting as acute monoarthritis of the wrist joint.

We describe an unusual case of tuberculous osteomyelitis that mimicked features of acute monoarthritis of the wrist joint. This case underlines the importance of making EPTB an important differential diagnosis even in cases with clinical features that are completely inconsistent with tubercular infections.

Case Report

A 28-year-old woman presented to the orthopedics department of a local hospital with complaints of pain in the right wrist joint along with stiffness of the joint since 1 month previously. On examination, there was swelling and tenderness around the joint. There was no axillary, supratrochlear, or epitrochlear lymphadenopathy. Skin lesions and ocular signs were not present. With no history of trauma, she was in good general condition. There was also no history of fever, weight loss, or loss of appetite. Laboratory testing showed no abnormalities in hemoglobin and uric acid levels, erythrocyte sedimentation rate, C-reactive protein, and leukocyte counts. Serum was negative for rheumatoid factor, antistreptolysin O, and antinuclear antibody. Blood cultures were sterile. X-ray of right distal forearm and wrist joint showed no abnormalities. With a

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provisional diagnosis of acute monoarthritis, she was treated symptomatically with nonsteroidal anti-inflammatory drugs.

After 3 months, she presented with an abscess on her right wrist joint. Fine-needle aspiration cytology was done. On microscopy, aspirated sample showed acute purulent inflammatory infiltrate against a necrotic background. Incision and drainage was performed, followed by regular dressing and antibiotic cover with amoxicillin.

After 1 month, she came back to the hospital with a discharging sinus on her right wrist. X-ray of the right distal forearm and wrist joint showed signs of osteomyelitis at the lower end of the radius (► Fig. 1). A more detailed history was elicited, which revealed a history of contact with a patient with drug-resistant TB. Curettage material from the sinus was sent for histopathological examination in the same hospital and the material was also sent to our laboratory for Ziehl–Neelsen staining, culture, and cartridge-based nucleic acid amplification test (CBNAAT). Histopathology revealed a granulomatous reaction consistent with TB, though no acid-fast bacilli (AFB) were seen on Ziehl–Neelsen staining. CBNAAT (Xpert MTB/RIF assay, Cepheid India Pvt Ltd, New Delhi, India) detected *Mycobacterium tuberculosis* that was sensitive to rifampicin (► Fig. 2). There was no growth of AFB by automated liquid culture on the MB/BacT system (Organon Teknika, Boxtel, the Netherlands).

The patient was started on antitubercular therapy as per Revised National Tuberculosis Control Programme guidelines. She responded to treatment. The pain subsided, the sinus

healed, and follow-up radiographs showed resolution of the osteomyelitic changes.

Discussion

TB is a major health issue in developing countries, with over 2 billion people being infected with *M. tuberculosis* worldwide. While pulmonary TB is the most common presentation, EPTB is seen in 20% of all TB cases. TB of the spine is the most common pathology among cases with skeletal TB.¹ Extrapulmonary tuberculous osteomyelitis is rare and comprises only ~2 to 3% of all cases of osteoarticular TB, with the hip and knee joints being the most commonly involved.² Skeletal TB is usually a hematogenous infection and therefore should theoretically be able to infect all parts of the bone. Tuberculous osteomyelitis is thought to be caused by *M. tuberculosis* that had become lodged in bone during the original mycobacteremia of primary infection. Usually, the cellular immune response is able to ensure containment, but not eradication, of bacilli in these sites. The rich vascular supply of the growth plate of long bones predisposes it to infection.³ However, involvement of distal metaphysis and epiphysis is a rare presentation.⁴ The case described here is unusual in the sense that there was involvement of the distal metaphysis and epiphysis of the radius.

There was also an unusual clinical presentation: features of acute monoarthritis of the wrist joint. An extensive review of literature did not find any previous report of tuberculous osteomyelitis presenting as acute monoarthritis of the wrist joint. Tuberculous arthritis is known to occur commonly in the weight-bearing joints, particularly the vertebral joints,⁵ followed by the hip and knee joints.⁶ Tuberculous arthritis occurring in the upper extremities is rare, accounting for only 1 to 5% of musculoskeletal TB.^{7,8} A differential diagnosis of TB was made in the present case only after it became apparent that there was a chronic infection at the site of involvement.

Though there was no diagnostic evidence, it is possible that the features of acute monoarthritis of the wrist in this patient were due to Poncet disease, which is reactive arthritis accompanying TB. However, Poncet disease, a rare condition in itself, is usually known to present with polyarthritis.⁹

Definitive laboratory diagnosis of EPTB has always been a challenge, as appropriate specimens from extrapulmonary sites are usually difficult to obtain. Though microscopy and culture remain the cornerstones of laboratory diagnosis of TB, their sensitivity is quite low. This is particularly applicable to clinical samples that contain a very small number of organisms, which is usually the case with EPTB samples.¹⁰ Molecular techniques such as CBNAAT are rapidly proving their worth in such situations.

The present case underlines the importance of making EPTB an important differential diagnosis even in cases with clinical features that are completely inconsistent with tubercular infections. This is particularly applicable to countries that are endemic in TB.

Fig. 1 Plain X-ray of forearm and wrist, anteroposterior (AP) view, showing osteolytic lesion on the lateral side of the distal end of radius with ill-defined sclerosis at the medial aspect of the distal end of radius as represented by arrows.

Conflict of Interest
None.

Fig. 2 Plot of CBNAAT results for the present case. y-axis indicates fluorescence emission of the product. x-axis indicates the number of PCR cycles. The Xpert MTB/RIF assay utilizes molecular beacon technology to detect DNA sequences amplified in a nested, real-time polymerase chain reaction (PCR) assay. Five different nucleic acid hybridization probes are used in the same multiplex reaction. Together, these overlapping probes span the entire 81-bp core region of the *rpoB* gene. The presence of all five fluorescence signals indicates that rifampicin-susceptible *M. tuberculosis* (MTB) DNA has been detected. At least two but fewer than five fluorescence signals indicate the presence of rifampicin-resistant MTB. No fluorescence signal from one or fewer of the *rpoB* probes indicates absence of MTB-DNA (the positive signal for the internal process control indicates that the assay worked). In the test assay shown here, fluorescence signals from all five probes were detectable, indicating that rifampicin-susceptible MTB-DNA was detected.

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