



Tuberculosis of the Wrist a Rare Localization of Tuberculosis

KEYWORDS

Wrist tuberculosis; Infection; TB

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ABSTRACT Tuberculosis (TB) bacteria can infect any bone, joint, tendon, or bursa; however, the most common musculoskeletal site for infection includes the spine and weight-bearing joints of the hip and knee. A tubercular involvement of the wrist is rare. **Aim of the work:** To describe a rare case of tuberculosis of wrist.

Case report:

This is a case report of two female patients having constitutional symptoms and decreased range of movements with pain.

Case I:

A 35-year-old female resident of Saharanpur, Uttar Pradesh was referred to the Orthopaedics department of our Institute with 10 month history of low grade fever, swelling and pain in the right wrist. X-ray and MRI (Magnetic Resonance Imaging) of wrist joint revealed an osteolytic lesion of the wrist. Cold abscess aspiration cytology was negative for acid-fast bacilli but the Polymerase Chain Reaction diagnostic test done on the cold abscess fluid was positive in revealing Mycobacterium tuberculosis. The evolution under specific antibiotic treatment has been favorable, with the disappearance of wrist pain and a regression of swelling.

Case II:

A 26-year-old female resident of Shamli, Uttar Pradesh came to Orthopaedics department of our Institute with pain, swelling, decreased range of movements at the left wrist. Xray shows lytic lesions including involvement of carpal bones. MRI confirms the cause of lytic lesions. Aspiration of swelling was done but there was no fluid collection. ATT (Anti tubercular drugs) was started and results were positive with decreased pain and swelling.

Conclusion:

This case highlights that TB should be taken into consideration when dealing with nonspecific chronic wrist arthritis.

Introduction:

Skeletal involvement occurs in 1–3% of all patients with tuberculosis [1,2]. Tuberculosis (TB) bacteria can infect any bone, joint, tendon, or bursa; however, the most common musculoskeletal site for infection includes the spine and weight-bearing joints of the hip and knee [2]. Wrist osteo-articular TB is uncommon, accounting for, 1% of all cases of skeletal TB [3]. The incidence of extrapulmonary TB has been rising due to the increasing number of immunosuppressed patients [4,5]. TB of peripheral joints and tendons occur infrequently, but if untreated, it can cause serious joint and tendon destruction as well as spread of the infection to the surrounding bursa, muscle, and other soft tis-

sues [6]. The diagnosis of TB of joints is difficult due to the nonspecific clinical manifestations and imaging features [2]. In developing countries in general, the diagnosis of tuberculosis of bones and joints is often a presumption diagnosis because the technical level is insufficient or missing. We report a rare case of tuberculosis of the wrist which was diagnosed by using Polymerase Chain Reaction (PCR) and MRI of wrist joint.

Case report I:

A 35-year-old female presented to our Orthopaedics department with complaints of pain, impaired mobility and progressive swelling of the right wrist which appeared 10 months before presentation. The patient denied any history of wrist trauma, cough or other general diseases such as kidney disease, diabetes mellitus or sickle-cell anemia. There was no tuberculosis contagion found. The patient had not received the Bacillus Calmette Guerin (BCG) vaccine against TB. History of evening rise of temperature and weight loss was present. On physical examination, the patient had no alteration of general condition and had no abnormality on chest or abdominal examination. On local examination, there was a non-painful multiple lobulated swelling located in the dorsal area of the right wrist and hand (Fig. 1). The temperature of the swelling was not raised. Movements of the wrist were limited and painful. This finding suggested the presence of a cold abscess. Radiograph and MRI of the wrist showed marked destruction of the carpal bones and gross soft tissue swelling (Fig. 2). An aspiration of the collection allowed the bacteriological study with research of tuberculosis. Direct examinations and the culture were negative. Polymerase Chain Reaction (PCR) test done on the cold abscess fluid was positive in revealing Mycobacterium tuberculosis. With the presence of cold abscess, chronic infective etiology like tuberculosis was considered as a differential diagnosis and confirmed by the positive PCR diagnostic test. X-ray chest, however revealed no evidence of any pulmonary tuberculosis. Other Laboratory investigations showed a total leukocytic count of 6000/mm with neutrophils (71%) and lymphocytes (29%), hemoglobin was 9.8 g/dl, CD4 count was 353/ll, while erythrocyte sedimentation rate (ESR) was 118 mm/1st h. Extensive drainage and debridement were performed.

Case report II:

A 26-year-old female came to our orthopaedics department with complaints of pain, swelling, decreased range of movements at left wrist from last 6 months. Positive history of decreased appetite, weight loss, pain, evening rise of temperature was present. There was significant history of wrist trauma, cough or other general diseases like Renal disorders, diabetes mellitus. Contact with tubercular patient present as patient's mother was having pulmonary tuberculosis 2 years back for which she completed the full course of ATT (Anti tubercular drugs). On local examination, non painfull minute swelling present on dorsal region of left wrist (Fig II). Local temperature was not raised and painfull decreased range of movements present at left wrist. Radiographs, AP and Oblique views, shows lytic lesions at left wrist which was confirmed by MRI. Laboratory investigations showed haemoglobin 10 g/dl, ESR WAS 125 MM/1ST h and total leucocyte count of 8000/mm with 82% neutrophils and 8% lymphocytes. Nothing significant was found on aspiration and debridment was not done.

Treatment:

Both the patients received TB treatment involving four drugs: Isoniazid (5mg/kg/day), Rifampicin (10 mg/kg/day), Pyrazinamide (30 mg/kg/day) and Ethambutol (25 mg/kg/day) for 2 months followed by 10 months of a double association (Isoniazid (5 mg/kg/day) and Rifampicin (10 mg/kg/day) that corresponds to the standard treatment provided. This treatment allowed a full recovery, and the patient was asymptomatic at the last follow-up after 6 months with improved Hemoglobin and decreased erythrocyte sedimentation rate (ESR) and negative CRP. The follow-up MRI after treatment was not performed because of lower socio-economic level of the patient.

Figure 1: Appearance of the lesion on presentation. Lobulated swelling located in the dorsal area of the wrist.

**CASE I****CASE II**

Figure 2: MRI pictures showing Advanced osteolysis of the wrist, carpal, and bases of the metacarpals with multiple organized abscess of the soft tissue



MRI Report shows - Marked erosions and destruction of various carpal, distal radius and ulna with metacarpal with associated synovial proliferation and tenosynovitis with small ill defined abscesses

Discussion:

Skeletal tuberculosis remains a frequent disease in developing countries [7-10]. Vertebral location is the most common form of skeletal tuberculosis [7-9]. Osteoarticular tuberculosis (OAT) is rare. The major areas of predilection are, in order of frequency, the spine, hip, knee, foot, elbow, hand, shoulder, bursal sheaths, and other sites [2]. Tuberculosis of the wrist is rarely reported [3,11,12]. This scarcity is even more striking in our context, as skeletal tuberculosis is frequent in Asian countries [8,9]. Thus, none of the cases with OAT had a carpal location [13,14,15]. The diagnosis can be easily delayed because of non-specificity of clinical signs and can suggest numerous other disease entities as rheumatoid arthritis [16,3]. The time lapsed till TB diagnosis was 10 months in our case. In the literature the mean of this time was 6.5 ± 2.5 months with a range from 3 to 12 months [3,12,15]. Wrist tuberculosis is rare but it should be the first and foremost differential diagnosis in the presence of atypical clinical and radiological features of a carpal lesion. The most common presenting symptoms are nonspecific pain and

swelling leading to incorrect initial diagnosis and delay in the institution of treatment. In the present case, with the presence of cold abscess, chronic infective etiology like tuberculosis was considered as a differential diagnosis. Diagnosis is often established after culture of mycobacterium from surgical biopsies because direct microscopic examinations are often negative, as in our patient. Molecular biology techniques can also be used to detect and identify the main species of mycobacteria as in our patient.

In this case, the positive result of PCR for *Mycobacterium tuberculosis* was confirmed from the cold abscess aspiration. The PCR assay, a molecular biologic technique using nucleic acid amplification, is a highly sensitive method for detecting *Mycobacterium tuberculosis* and requires only a few days to obtain confirmation [17]. The treatment of TB of the wrist usually involves a combination of appropriate antimicrobial therapy and surgical debridement. Biopsy is of particular importance in determining organism sensitivities in areas in which drug resistance is common. The success of treatment is variable and depends on prolonged treatment with appropriate combination therapy. The total duration of antituberculous therapy was 12 months in our patient. In conclusion, tuberculosis of wrist joint is rare but it should be the first diagnosis in the presence of atypical clinical and radiological features. Our patient had excellent outcome with good range of movements after drug therapy.

References

- [1] Zychowicz ME. Osteoarticular manifestations of *Mycobacterium tuberculosis* infection. *Orthop Nurs* 2010;29:400–6.
- [2] Tuli SM. General principles of osteoarticular tuberculosis. *Clin Orthop Relat Res* 2002;11–9.
- [3] Shanahan EM, Hanley SD, Gibney RG, Fitzgerald O. Tuberculosis of the wrist. *Arthritis Rheum* 1999;42:2724–6.
- [4] Jellis JE. Human immunodeficiency virus and osteoarticular tuberculosis. *Clin Orthop Relat Res* 2002;398:27–31.
- [5] Jellis JE. Orthopaedic surgery and HIV disease in Africa. *Int Orthop* 1996;20:253–6.
- [6] Hsu CY, Lu HC, Shih TT. Tuberculous infection of the wrist: MRI features. *AJR Am J Roentgenol* 2004;183:623–8.
- [7] Godlwana L, Gounden P, Ngubo P, Nsibandé T, Nyawo K, Puckree T. Incidence and profile of spinal tuberculosis in patients at the only public hospital admitting such patients in KwaZuluNatal. *Spinal Cord* 2008;46:372–4.
- [8] Eti E, Daboi'ko JC, Brou KF, Ouali B, Ouattara B, Koffi KD, et al. Spinal Tuberculosis: our experience from a study of 147 cases in the Rheumatology Department of the University Hospital of Cocody (Abidjan, Ivory Coast). *Me'decine d0 Afrique Noire* 2010;57:287–92.
- [9] Oniankitan O, Bagayogo Y, Fianyo E, Koffi-Tessio V, Kakpovi K, Tagbor KC, et al. Spondylodiscitis at a hospital outpatient clinic in Lome, Togo. *Med Trop* 2009;69:581–2.
- [10] Ntsiba H, Makosso E, Ngandeu-Singwe' M, Yala F. Septic arthritis in tropical environment. 176 cases report in Brazzaville. *Le Mali Med* 2006;21:49–53.
- [11] Monchal T, Levadoux M, Pellet N, Nguyen MK, Ottomani S, Gaillard C, et al. White tumor of the wrist: a rare site of tuberculosis involvement. *Med Trop* 2007;67:134.
- [12] Dlimi F, Bellarbi S, Mahfoud M, Berrada MS, El Bardouni A, El Yaacoubi M. Tuberculosis of the hand and wrist: different aspects of 30 cases. *Chir Main* 2011;30:198–204.
- [13] Oniankitan O, Houzou P, Tagbor KC, Fianyo E, Koffi-Tessio VES, Kakpovi K, Mijiyawa M. Etiology of arthritis in Lome' (Togo). *OJRA* 2013;3:154–8.
- [14] Oniankitan O, Bagayogo Y, Fianyo E, Koffi-Tessio V, Kakpovi K, Tagbor KC, et al. Infectious arthritis in hospital patients in Lome', Togo. *Med Trop* 2011;71:61–2.
- [15] Rabesalama SSE, Rakoto-Ratsimba HN, Razafimahandry HJC. Tuberculous arthritis of the wrist: a case report. *Chir Main* 2009;28:243–6.
- [16] Al-Qattan MM, Al-Namla A, Al-Thunayan A, Al-Omawi M. Tuberculosis of the hand. *J Hand Surg Am* 2011;36:1413–21.
- [17] Michos AG, Daikos GL, Tzanetou K, Theodoridou M, Moschovi M, Nicolaidou P, et al. Detection of *Mycobacterium tuberculosis* DNA in respiratory and nonrespiratory specimens by the Amplicor MTB PCR. *Diagn Microbiol Infect Dis* 2006;54:121–6.