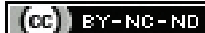


Radiological Overview of Tubercular Arthritis of Wrist Joint: A Case Report

SUSMITA RANI GHOSH¹, RAMACHANDRA DASAR², SOUMYABRATA DEBNATH³, ASHU CHAKMA⁴, ASIM DE⁵

ABSTRACT

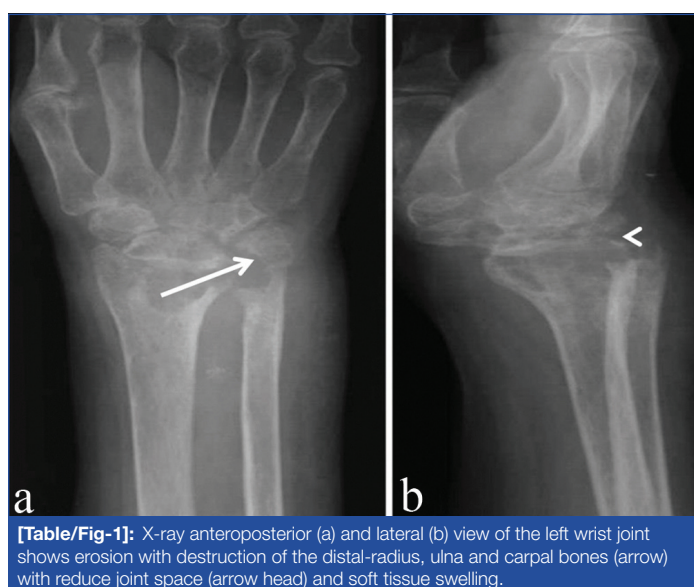
Musculoskeletal Tuberculosis (TB) involving the wrist is very rare worldwide. Most cases of tuberculous arthritis arise in patients born in and migrated from endemic regions, particularly in patients who are co-infected with Human Immunodeficiency Virus (HIV). The authors present a rare case of tuberculous arthritis of the wrist joint in a 64-year-old male who had pain, swelling, and decreased range of motion in the left wrist for six months. X-ray and Computed Tomography (CT) showed erosion of carpal bones, reduced joint space, and soft tissue oedema and abscess. Ultrasonography (USG) showed joint effusion and soft tissue oedema were seen around the wrist joint, and on Magnetic Resonance Imaging (MRI) along with this marrow oedema were also noted. Aspirated fluid culture from abscess suggested *Mycobacterium* positive culture and Ziehl-Neelsen (Z-N) staining showed acid-fast bacilli. Antitubercular therapy was the mainstay of treatment. A high level of suspicion should be kept for TB in every infection of the wrist joint.

Keywords: Acid-fast bacilli, Antitubercular therapy, Magnetic resonance imaging

CASE REPORT

A 64-year-old male from Khowai, Tripura part of the northeastern states (tubercular endemic zone), complained of pain, swelling and decreased range of motion in the left wrist for six months which was insidious in onset and progressive in nature. History of on and off fever for last 8-10 month, no history of cough, no history of diabetes and hypertension was there. On inspection, there was round to oval shaped swelling involving the left wrist, measuring approximately 7.09×6.11 cm in size extends upto the palmar aspect with signs of inflammation, including redness and warmth. On palpation, the swelling was tender, with a limited wrist joint range of motion (difficult to do flexion and extension at the wrist joint).

On X-ray, erosion with the destruction of the distal radius and ulna, erosion of carpal bones and soft tissue swelling were noted at the distal end of the radius [Table/Fig-1].



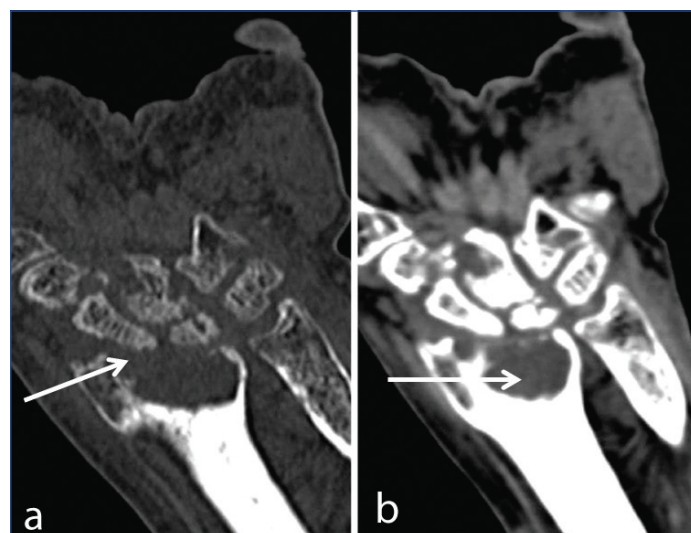
[Table/Fig-1]: X-ray anteroposterior (a) and lateral (b) view of the left wrist joint shows erosion with destruction of the distal-radius, ulna and carpal bones (arrow) with reduce joint space (arrow head) and soft tissue swelling.

USG showed joint effusion and soft tissue oedema around the wrist joint. CT showed erosion, destruction of the distal radius and ulna, reduction in the height of carpal bones with erosion, decreased intercarpal joint space, and soft tissue attenuated lesion with the collection and peripheral enhancement noted around the distal

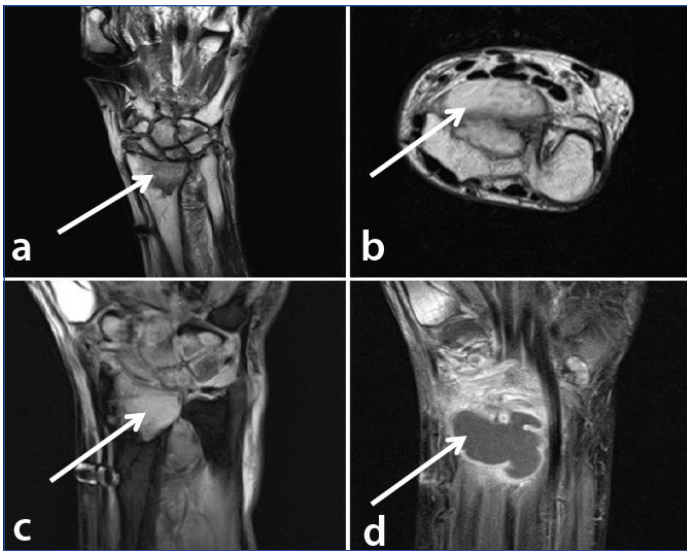
radius suggesting the possibility of abscess [Table/Fig-2]. MRI showed ill-defined irregularly marginated signal altered lesions involving the carpal bones, distal end of the radius with linear tract seen in the metaphysis of radius, which appears hypointense on T1 and hyperintense on T2 and Proton Density Fat-Suppressed (PDFS) and shows peripheral enhancement on postcontrast images. This lesion was communicating with multiple peripheral thin smooth rim-enhancing, irregularly marginated lesion in the periosteal region of the distal end of the radius; suggestive of abscess [Table/Fig-3]. T1-weighted postcontrast image showed even and thin synovial thickening of wrist joint and around the flexor tendon [Table/Fig-3].

Marrow oedema was seen in the carpal, radius, and ulna, which appeared to be T2 hyperintense. Tendons were spared.

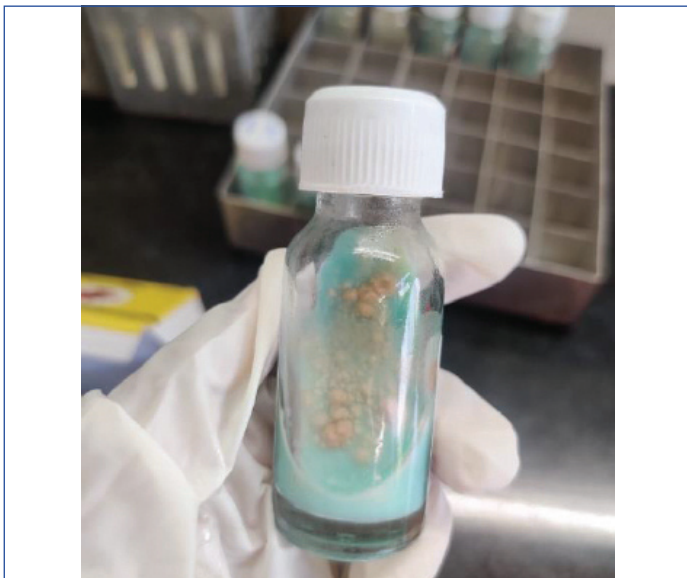
Aspirated fluid culture from abscess suggested colonies of *Mycobacterium tuberculosis* growth on Löwenstein-Jensen (L-J) media, and Z-N staining showed acid-fast bacilli [Table/Fig-4,5]. The final diagnosis was tubercular arthritis of the left wrist joint. The patient underwent antitubercular treatment for 18 months and follow-up was done after six months and the response was good.



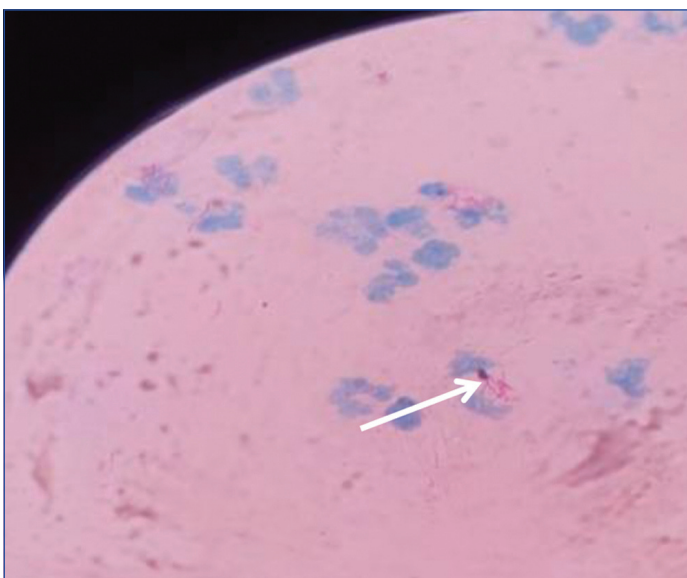
[Table/Fig-2]: CT Scan coronal image of the left wrist joint, (a) bone window and (b) soft tissue window shows erosion with destruction of the distal radius, ulna (arrow) and carpal bones with reduces joint space, abscess and soft-tissue oedema (arrow).



[Table/Fig-3]: MRI (a) T1 W coronal image show well-defined altered signal lesion in the distal end of radius, erosions of multiple carpal bones and distal end of radius which appears hypo intense (arrow); (b) T2W axial image shows well-defined loculated hyperintense lesion arising from distal end of radius; (c) PDFS coronal image shows ill-defined irregularly margined lesions involving the carpal bones distal end of the radius with linear tract seen in the metaphysis of radius (arrow); (d) T1 postcontrast images shows well-defined peripherally enhancing abscess arising from distal end of radius (arrow). Even and thin synovial thickening of wrist joint and around the flexor tendon (arrow head).



[Table/Fig-4]: Colonies of *Mycobacterium tuberculosis* growth on Löwenstein-Jensen media (arrow).



[Table/Fig-5]: Acid fast bacilli in Ziehl-Neelsen (Z-N) stained smear (arrow).

DISCUSSION

The TB is still an important public health problem in the world. TB arthritis accounts for approximately 1-3% of all cases of TB and 10-11% of extrapulmonary TB cases [1], non spinal skeletal TB is rare and insidious in onset that is often difficult to diagnose, elbow and wrist involvement is even rarer [2]. It mimics rheumatoid arthritis of small joints. Early diagnosis of tubercular arthritis is crucial now-a-days because disabling joint deformities can be averted by rapid and excellent response to anti-tubercular therapy [2].

USG allows a quick evaluation of soft tissue masses, abscess and joint effusions and degree and extent of tendon and tendon sheath involvement, USG and CT scan are particularly useful for guiding fine needle aspiration or biopsy to provide materials for histopathological evaluation. Excellent soft-tissue detail and multiplanar capability make MRI a definitive imaging technique for the evaluation of musculoskeletal TB [3-5].

In approximately, 50% of the cases, signs, symptoms and radiographic evidence of pulmonary TB are absent and TB is frequently missed as a differential diagnosis of the chronic inflammation of joints in the absence of active pulmonary disease. The differential diagnoses of TB arthritis include pyogenic arthritis, rheumatoid arthritis. In rheumatoid arthritis uneven, thick synovial proliferation and extensive bone marrow enhancement is noted [6]. In pyogenic arthritis less bony erosion and thick and irregular rim enhancing abscess is noted [7].

Multidrug antitubercular therapy (for 12-18 months) and active/assisted non weight-bearing exercises of the involved joint during healing is the primary mode of treatment. Synovectomy and debridement is required in musculoskeletal TB when the patient is not responding after 4-5 months of antitubercular therapy [2].

Recently, a case was reported where a 70-year-old women's X-ray of the left wrist showed erosion and a lytic lesion around the bony skeleton at the wrist. A mild reduction of the bony density was seen at the carpals and metacarpals. MRI film of the left showed shows erosive arthritis with a gas-forming abscess along the ulnar side [8], similar to the present case.

Pain and swelling are the most common presenting features, followed by discharging sinuses. A similar case was recently reported where a 12-year-old boy presented with pain, swelling, and restriction of movement for six months [9], similar presentation to the present case except for age (64 years).

CONCLUSION(S)

The main task in identifying TB arthritis is to consider the possibility of differential diagnosis. A high level of suspicion should be kept for TB in every infection of the wrist joint. Radiological imaging with microbiological confirmation is the mainstay of diagnosis for tubercular arthritis. MRI may demonstrate intraosseous involvement earlier than other imaging modalities.

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PARTICULARS OF CONTRIBUTORS:

1. Postgraduate Trainee, Department of Radiodiagnosis, Agartala Government Medical College, GB Hospital, Agartala, Tripura, India.
2. Postgraduate Trainee, Department of Radiodiagnosis, Agartala Government Medical College, GB Hospital, Agartala, Tripura, India.
3. Postgraduate Trainee, Department of Radiodiagnosis, Agartala Government Medical College, GB Hospital, Agartala, Tripura, India.
4. Postgraduate Trainee, Department of Radiodiagnosis, Agartala Government Medical College, GB Hospital, Agartala, Tripura, India.
5. Professor and Head, Department of Radiodiagnosis, Agartala Government Medical College, GB Hospital, Agartala, Tripura, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Susmita Rani Ghosh,
Postgraduate Trainee, Department of Radiodiagnosis, Agartala Government
Medical College, Girls Hostel, GB Hospital, Post Office-Kunjaban,
Agartala-799006, Tripura, India.
E-mail: susmitaghosh.agt@gmail.com

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