CASE REPORT

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Tubercular Synovitis of the Wrist with Rice Bodies: A Case Report

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Abstract

Tubercular synovitis of the wrist is a rare form of musculoskeletal tuberculosis, often presenting with nonspecific symptoms leading to delayed diagnosis. We report a case of a 69-year-old male with chronic painless swelling of the wrist and distal forearm. Imaging revealed synovial proliferation with rice bodies and bony erosions. Surgical synovectomy and biopsy demonstrated caveating granulomatous inflammation, and culture confirmed Mycobacterium tuberculosis. The patient was treated with anti-tubercular therapy and showed good recovery. This case highlights the importance of considering tuberculosis in chronic wrist swelling and emphasizes early diagnosis and treatment to prevent further joint destruction and functional impairment.

Keywords: Mycobacterium tuberculosis, Tubercular synovitis, Wrist

Introduction

Musculoskeletal tuberculosis is rare, accounting for around 1 to 5% of all tuberculosis cases, and among these, tubercular tenosynovitis is even rarer.[1] The first published article on tubercular tenosynovitis was by Kanavel in 1923.[2] In the endemic region like Nepal, chronic painless swelling, with non-specific symptoms in the joints, warrants the suspicion of tuberculosis.[3] Classical findings include multiple loose fibrinous "rice bodies" within the synovium.[4] Early recognition and biopsy are crucial to prevent joint destruction. To increase awareness and prevent diagnostic delays, we present a case of flexor tubercular synovitis in an elderly Nepali farmer, illustrating its features.

Case report

A 69-year-old right-handed, well-nourished male farmer from far-western Nepal presented with a 2-year history of mild, intermittent pain in the left wrist, with visual analogue score (VAS) of 4/10. Seven months before presentation, painless swelling of the volar aspect of left wrist and distal forearm, which progressively increased in size. There is no history of fever, weight loss, cough, or trauma. Notably, his wife had pulmonary tuberculosis (TB) treated successfully 4 years prior. On exam, a 5 cm × 9 cm firm, smooth swelling occupied the volar aspect of the left wrist. It was non-tender, compressible, and fixed to deep tissues,

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with the overlying skin being normal. Wrist motion was preserved. The superficial lymph nodes were not palpable. Examination of the chest and spine was normal.

Laboratory tests were within normal limits except mildly elevated erythrocyte sedimentation rate (ESR) at 15 mm/h (reference range, 0–9 mm/h). Plain X-rays revealed subtle osteolytic changes in the distal radius/ulna and carpal bones. A chest radiograph was normal. MRI of the left wrist showed diffuse synovial and tenosynovial thickening at the radiocarpal and distal radioulnar joints with extension along the flexor tendon sheaths, along with multiple low-signal foci suggestive of rice bodies and areas of marrow edema. Associated erosions of the distal radius and carpal bones with reduced joint spaces were noted, consistent with tuberculous infection of the wrist (Figure1A-D).

Rheumatoid synovitis, chronic gouty tophaceous arthritis and other inflammatory synovial disorders were initially considered. However, the absence of other joint involvement or systemic inflammatory features, normal C-reactive protein, only mildly elevated erythrocyte sedimentation rate, osseous erosion and extensive tendon sheath involvement raised suspicion of a chronic infective process.

At surgery, the synovium was found thickened and adherent to superficial and deep flexor tendons, extending into the distal radioulnar joint. The volar cortex of the distal radius showed cortical erosion. Copious synovial tissue, white fibrinous bodies (melon seed and rice bodies) were excised (Figure 2A-B). An open biopsy of the mass was performed, and specimens were sent for microbiology and histopathology. Histopathological examination of the synovium revealed multiple well-formed granulomas composed of epithelioid histiocytes and Langerhans-type giant cells around foci of caseous necrosis. A chronic lymphoplasmacytic infiltrate was present in the tissue (Figure 3A-B). Cultures confirmed the presence of Mycobacterium tuberculosis.

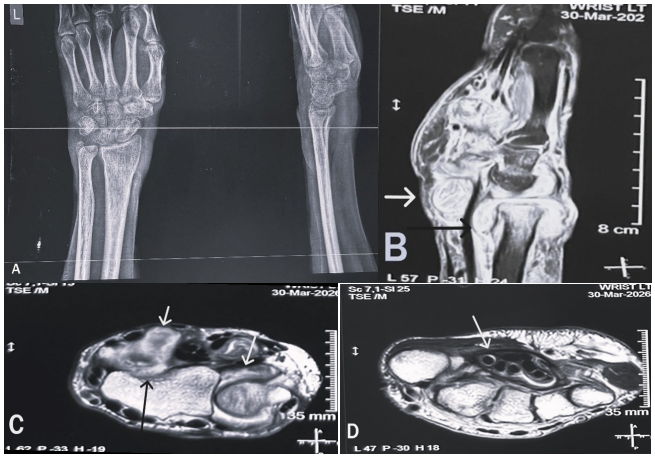


Figure 1 (A) Plain radiograph of the wrist demonstrates diffuse osteopenic changes involving the carpal bones and distal radius and ulna. (B) Sagittal fast spin-echo T2-weighted MRI reveals a mass-like synovial proliferation encasing the flexor tendons (white arrow). A dorsal ganglion cyst is also identified, extending across the posterior aspect of the carpal bones from medial to lateral (black arrow). (C) Axial T2-weighted MRI demonstrates extensive synovial proliferation involving the flexor tendon sheaths, adjacent osseous structures, and the radiocarpal and ulnocarpal joints. Associated cortical erosion of the distal radius is evident (black arrow). (D) Axial T2-weighted MRI further delineates circumferential thickening of the synovium surrounding the flexor tendons, consistent with tenosynovial involvement (arrow).

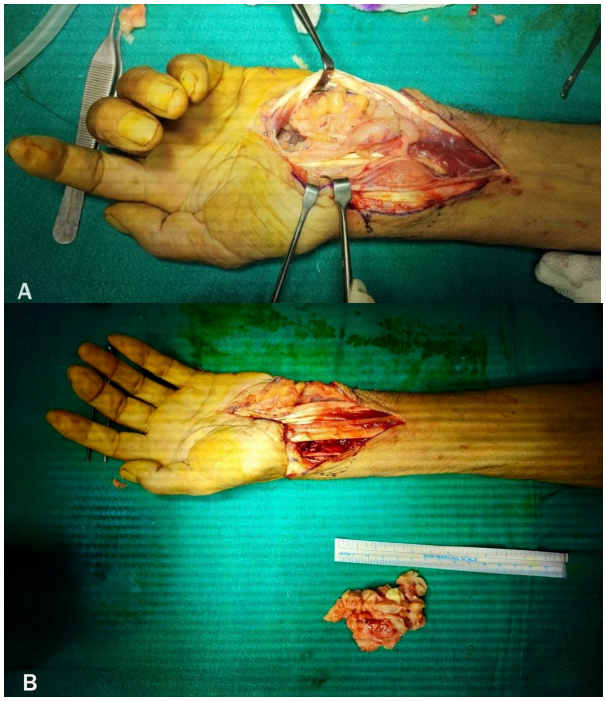


Figure 2 (A) Intraoperative photograph demonstrating markedly thickened synovium with multiple "rice bodies" (melon seed–like structures) surrounding the flexor tendons, consistent with chronic tenosynovial inflammation. (B) Intraoperative photograph following surgical debridement, showing the flexor tendons after complete excision of rice bodies and melon seed–like loose bodies with synovectomy.

Postoperatively, the patient was started on four-drug ATT (isoniazid, rifampicin, ethambutol, pyrazinamide) as per national TB guidelines. The wrist was immobilized in a splint, and physiotherapy was successfully initiated with gradual mobilization of fingers and wrist, followed by progressive functional use of hand. At 3 month follow up he gained functional use of the wrist and hand and achieved complete clinical recovery.

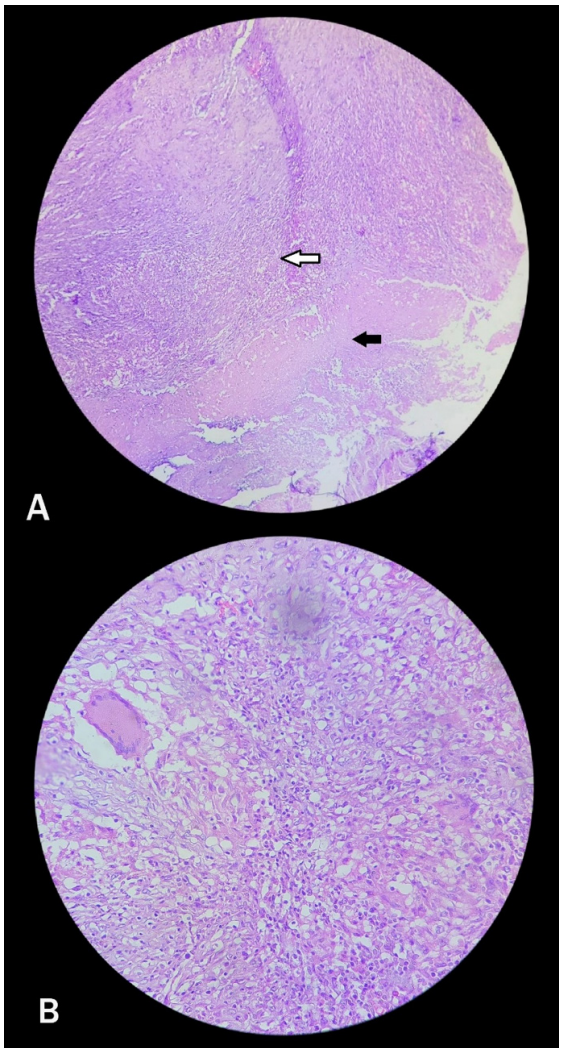


Figure 3 (A) Histopathological section demonstrates a well-formed granuloma characterized by central amorphous eosinophilic caseous necrosis (black arrow), surrounded by aggregates of epithelioid histiocytes (white arrow) and a peripheral rim of lymphocytic infiltration (H&E stain; ×10 magnification). (B) Higher magnification reveals multinucleated Langhans giant cells, along with foamy macrophages and epithelioid histiocytes, consistent with granulomatous inflammation (H&E stain; ×40 magnification).

Discussion

According to the World Health Organization Global Tuberculosis Report 2025, tuberculosis remains one of the leading infectious causes of death worldwide, with approximately 10.7 million cases and over 1.2 million deaths annually.[5] Tubercular tenosynovitis represents a rare manifestation often misdiagnosed as conditions such as seronegative rheumatoid arthritis, De Quervain's tenosynovitis, or carpal tunnel syndrome due to its insidious and atypical presentation.[1,6] Tubercular tenosynovitis commonly involves the flexor tendon sheath of the wrist and hand.[7] The risk factors for this disease are male, dominant hand, overuse of the hand, advanced age, low socio-economic status, malnutrition, extremity trauma, and immunosuppression.[6]

The pathogenesis of tuberculous tenosynovitis is generally attributed to the hematogenous dissemination, with other sources being the lymph nodes, bone, genitourinary system or direct inoculation.[8] Laboratory findings were mostly normal, with mildly elevated CRP and ESR levels as an inflammatory response of the body to tuberculosis.[7] MRI can suggest the diagnosis with extensive synovial proliferation, "rice bodies," and destructive changes, as seen here.[9] The finding of rice bodies intraoperatively reinforced TB (though rice bodies also occur in rheumatoid arthritis; TB is common in endemic areas).[4] Bacteriological evidence is present in direct examination only in 20% of cases, and cultures are negative in 35–45% of cases.[2] Histopathological evaluation shows necrotizing granulomatous inflammation is diagnostic in most of the cases in comparison to other tests (66% yields in one series), with the right context of a suggestive history and examination, histological analysis will reveal TB.[10]

In the present case, tuberculosis involved both the wrist joint synovium and the flexor tendon sheaths. MRI demonstrated involvement of the radiocarpal and distal radioulnar joints, with extension along the flexor tendons, while intraoperative examination confirmed synovial continuity between these structures considering this condition as a combined intraarticular synovitis and flexor tenosynovitis rather than isolated tenosynovitis. Histopathology was used to confirm the diagnosis through caseous granuloma inflammation and Langerhans giant cells in biopsy specimens.

Regarding histology, Kanavel described three stages: Stage 1 corresponds to a serous exudate, stage 2 is characterized by granulation tissue with or without the appearance of "rice bodies" (our case), and the third stage corresponds to fungosities associated with extensive caseous necrosis.[2] Early initiation of anti-tubercular therapy is essential once the pathological diagnosis is confirmed to prevent complications and recurrence.[7] As per national protocol, standard treatment includes four drugs for two months followed by maintenance therapy for at least seven months, though longer courses may be required.[11] Surgery is reserved for selected cases, and recurrence remains possible despite treatment.

Summary

Tubercular synovitis of the wrist, though rare, must be considered in chronic cases with nonspecific symptoms, culture-negative monoarthritis of the wrist, especially in TB-endemic. MRI findings of synovial proliferation with low-signal "rice bodies"

and bone erosions should raise suspicion. Biopsy with histopathology is the gold standard for diagnosis. Early initiation of ATT leads to favorable outcomes and prevents joint damage. A high index of suspicion and timely treatment are crucial for this uncommon but treatable condition.

Patient consent:
The patient provided written informed consent for publication of this case and accompanying details.

Conflict of Interest: None
Acknowledgement: None
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