

Uncommon Presentation of Isolated Triquetral Osteomyelitis: A Rare Case Report

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ABSTRACT

Osteomyelitis in the wrist is a rare musculoskeletal infection, accounting for about 1-6% of all wrist disorders. It generally relates to the carpal bones, metacarpals, or phalanges and frequently resembles other disorders such as acute synovitis. Timely diagnosis is difficult owing to ambiguous clinical and radiological indicators. Magnetic Resonance Imaging (MRI) is essential for early detection of bone involvement, although histology is the definitive diagnostic criterion. This case report describes the case of a 50-year-old male welder who experienced sudden pain, oedema, and limited mobility in the right wrist, absent any trauma history. The clinical assessment and MRI indicated osteomyelitis of the triquetral bone. Analysis in the laboratory revealed increased inflammatory markers. Surgical investigation disclosed necrotic dorsal interossei muscles and compromised synovium. Osteo decompression and debridement were carried out, and histopathological analysis verified acute-on-chronic osteomyelitis. The patient was administered culture-sensitive intravenous antibiotics, followed by oral antibiotics, resulting in excellent healing of the wound and full functional recovery around six weeks postoperatively. This case underscores the necessity of a heightened awareness of osteomyelitis in unusual presentations of wrist pain and emphasises the significance of prompt imaging, surgical intervention, and histological verification for timely diagnosis and effective therapy.

Keywords: Bone necrosis, Musculoskeletal sepsis, Osteo decompression, Wrist infection

CASE REPORT

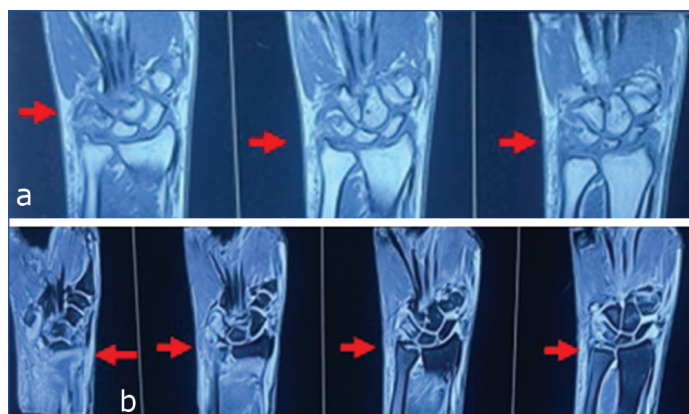
A 50-year-old man, a welder by occupation, came to the emergency department with complaints of pain in the right wrist for five days. The patient lacked any history of trauma or prior falls. He denied the presence of constitutional signs, such as weight loss, nocturnal diaphoresis, or fatigue. He reported a mild, intermittent fever for the last two days. No pertinent familial history of musculoskeletal infections, autoimmune diseases, or tuberculosis was noted. His medical records were unremarkable, devoid of any apparent comorbidities, immunosuppression, or current infections.

Upon initial clinical examination, the right wrist exhibited swelling and warmth upon palpation, accompanied by discomfort on the dorsal surface. The swelling was widespread on the dorsal side of the right wrist, exhibiting mild to moderate soft-tissue swelling spreading roughly 2-4 cm both proximal and distal to the radiocarpal joint. The oedema was confined, without any involvement of the fingers or forearm. The range of motion was markedly diminished due to discomfort, especially during dorsiflexion, palmar flexion, and ulnar deviation. The patient felt discomfort irrespective of slight passive mobilisation. There were no indications of joint instability or deformity. The neurovascular assessment of the hand was unremarkable. Also, other joints were normal.

Right wrist X-ray revealed intact carpal bones with no significant bony injury [Table/Fig-1]. Magnetic Resonance Imaging (MRI) revealed the possibility of osteomyelitis of the triquetral bone [Table/Fig-2a,b]. The patient reported no alleviation of pain despite administering over-the-counter analgesics, comprising 500 mg paracetamol tablets thrice daily for three days. Notwithstanding this, he experienced exacerbating, intense wrist pain, necessitating a visit to the emergency hospital. Laboratory investigations revealed white blood cell count: 13,689/cumm, haemoglobin: 15.1 g/dL and platelets 2,26,000/cumm. Renal and liver profiles were normal. Inflammatory markers were significantly high, with an Erythrocyte Sedimentation Rate (ESR) of 68 mm/hr and a C-Reactive Protein (CRP) level of 96 mg/L.



[Table/Fig-1]: Preoperative X-ray of the wrist showing the affected triquetral bone: a) Anteroposterior.



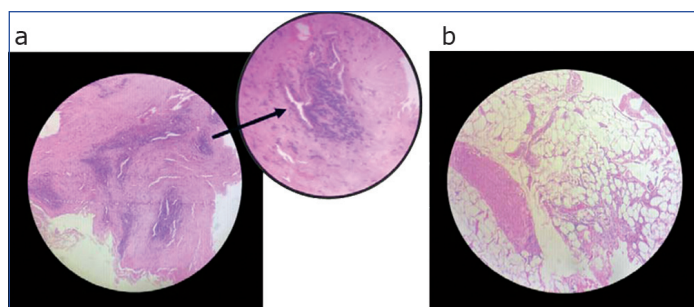
[Table/Fig-2a,b]: MRI images showing bony destruction involving the triquetral bone. Associated fluid collection is noted in the surrounding soft tissue spaces, indicating active osteomyelitis.

The patient received a comprehensive pre-anaesthetic evaluation, encompassing vital sign evaluation, systemic health evaluation,

and standard investigations, all of which were normal. He was considered suitable for surgery with regional anaesthesia. During the surgery, signs of compromised synovial tissue and necrotic dorsal interossei muscles were observed [Table/Fig-3a-d]. Wound debridement and bone decompression of the triquetral bone with several perforations were carried out, followed by extensive irrigation. Histopathological examination of the intraoperative tissue sample showed fibrocollagenous tissue with focal acute on chronic inflammation and focal microabscess [Table/Fig-4a,b]. The diagnosis of osteomyelitis of the triquetral bone was conducted.



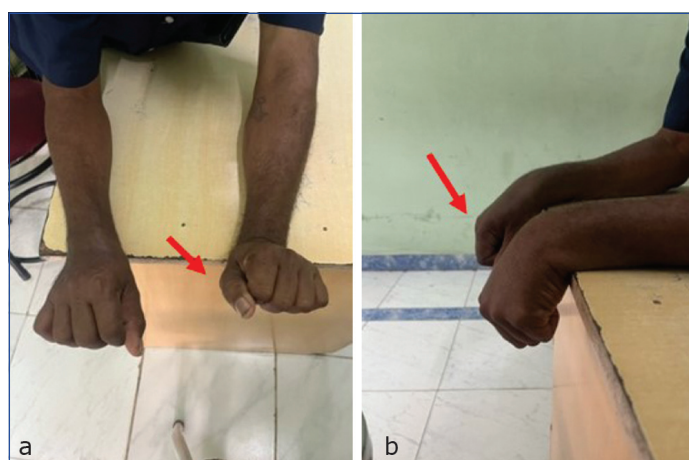
[Table/Fig-3]: Intraoperative image showing incision marking over the dorsal aspect of the wrist a); Superficial dissection performed to access the affected triquetral bone b); Intraoperative image showing unhealthy dorsal interosseous muscle fibers indicating underlying infection c); Frank purulent discharge observed emerging from the dorsal row of carpal bones, confirming osteomyelitis d).



[Table/Fig-4]: a) Fibrocollagenous tissue with inflammatory cells (magnification: 4x); b) Fibroadipose tissue with inflammatory infiltrate and congested blood vessels (Haematoxylin and Eosin (H & E stain), magnification 100x).

Postoperatively, the patient was put on a below-elbow slab. The differential diagnoses evaluated included infectious arthritis, tuberculous arthritis, and inflammatory arthropathy. The final confirmation of triquetral osteomyelitis was corroborated by intraoperative and histological evidence. The patient was administered culturally appropriate intravenous antibiotics (Tab. Ceftriaxone 1g i.v. twice daily) for two weeks, followed by oral antibiotics (Inj. Clindamycin 300 mg i.v. twice daily for 2 weeks) for four weeks. Regular postsurgery dressings were done, and two

weeks post-surgery, the patient's wound was inspected and found to be completely healed. The patient commenced treatment with intravenous clindamycin 300 mg for two weeks, followed by oral clindamycin 300 mg two times daily for four weeks, as determined by culture sensitivity results. Following suture removal, the patient commenced physiotherapy and occupational hand training, encompassing various ranges of movement and strengthening exercises. The protocol comprised five sessions weekly over four weeks, with each session lasting about 30 to 45 minutes. Therapeutic interventions centered on both active and passive range of motion exercises, grip enhancement, wrist flexion-extension drills, and activities aimed at fine motor coordination. Increasing resistance workouts were implemented in the third week. At the conclusion of six weeks, the patient exhibited adequate wrist movement and effective hand utilisation in daily tasks. The patient's range of motion was found to be satisfactory six weeks postoperative [Table/Fig-5a,b]. X-ray taken at six weeks follow-up revealed stable height of the dorsal row of carpal bones as compared to the first X-ray [Table/Fig-6].



[Table/Fig-5]: Six-week follow-up clinical images demonstrating improved wrist mobility. Satisfactory range of motion achieved in flexion (a) and extension (b) without residual pain or stiffness.



[Table/Fig-6]: Postoperative radiograph at six weeks showing maintained height and alignment of the proximal carpal row.

DISCUSSION

Hand and wrist osteomyelitis accounts for approximately 1-6% of upper extremity infections, representing about 10% of all osteomyelitis cases in the upper limb [1,2]. Diagnosing and managing carpal osteomyelitis can be difficult due to its rarity, lack of systemic symptoms, and non-specific laboratory findings [3,4]. In cases of hand pain, especially without evident trauma, osteomyelitis is often considered with lower suspicion, leading to frequent delays in

diagnosis from the initial onset of symptoms [5,6]. This underscores the necessity of including osteomyelitis in the differential diagnosis of perplexing wrist discomfort. Enhanced clinical awareness is essential to promote early investigation and treatment [7].

This patient showed symptoms similar to other cases of hand and wrist osteomyelitis, including localised pain, stiffness, and fever, but did not exhibit chills, malaise, or night sweats, although CRP levels were consistently elevated. Initial radiographic imaging, such as X-rays, may not always reveal acute changes, necessitating follow-up imaging since lytic lesions may take time to become visible despite the progression of infection. When clinical suspicion for osteomyelitis is high, MRI serves as a valuable diagnostic tool, offering approximately 90% sensitivity, though specificity is lower at 70-80% [8]. A common MRI finding on T1-weighted images is bone marrow oedema. However, a bone biopsy remains the gold standard for diagnosis, and bone cultures should be obtained to guide targeted treatment and rule out other potential conditions. Early detection and timely treatments are essential in averting joint deterioration and maintaining functionality. Comprehensive management, incorporating infectious disease consulting and physiotherapy, is crucial for maximum recovery [7].

The differential diagnoses in the present case encompassed infective arthritis, tubercular arthritis, and inflammatory arthropathy, all of which were excluded through imaging, culture, and histopathological analysis. The probable cause was haematogenous dissemination, considering the lack of trauma or localised illness. Management included prompt surgical debridement and bone decompression, accompanied by culture-specific antibiotic therapy and organised physiotherapy. The physiotherapy approach emphasised progressive wrist mobilisation, grip enhancement, and fine motor coordination to rehabilitate function.

At six weeks, the patient achieved adequate wrist movement, underscoring the need for early therapy in the recovery process. Comparable cases also stated that isolated lunate or capitate osteomyelitis has also shown diagnostic delays and underscored the significance of MRI and histological validation [9]. A study reported an identical case with a person with triquetral osteomyelitis, who was effectively treated alone with antibiotics [10]. Another investigation emphasised the significance of early MRI and biopsy for confirming the diagnosis of carpal osteomyelitis [11]. This example underscores the need for early identification, timely surgical intervention, and specific antibiotic treatment in maintaining wrist function and averting long-term impairment. Ongoing clinical attention is crucial for recognising such uncommon presentations and enhancing patient outcomes.

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CONCLUSION(S)

Osteomyelitis of the carpal bones is an uncommon and sometimes ignored illness owing to its vague presentation and lack of characteristic systemic symptoms. The present case of solitary triquetral osteomyelitis, in the absence of prior trauma, underscores the necessity of sustaining a heightened level of suspicion in patients exhibiting chronic wrist pain and oedema. Prompt MRI imaging, timely surgical intervention, and histological verification are crucial for precise diagnosis. Culture-directed antibiotic therapy and systematic physiotherapy are essential for achieving full healing and maintaining wrist functionality. A multidisciplinary approach is essential for positive outcomes in these rare and complex cases.

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