American Journal of Surgical Techniques and Case Reports

ISSN: 2694-4901

Case Report

Tuberculosis of Lunate Mimicking Kienbock's Disease

Vivek Singh, Shivam Bansal, Saptarshi Barman, Nivesh Kumawat, Anil Regmi and Bishwa Bandhu Naraula*

Department of Orthopaedics, All India Institute of Medical Sciences, India

Abstract

Background: A vascular necrosis of lunate (Kienbock's disease) is a chronic debilitating disease of the wrist joint occurring as a result of Incompetence of vascular supply. Hypo-intensity on T1-weighted images on MRI is pathognomonic of disease. We present one case such case of tuberculosis of lunate mimicking Kienbock's disease.

Case report: A 23-year-old female with chronic pain over the right wrist joint and decreased hand grip (26 lb) for the past 4 years. The patient has a preoperative VAS (Visual Analog Scale) score of 5, PRWE (patient-related wrist evaluation) of 68.5 and DASH (disability of shoulder, arm and hand) questionnaire of 57.4. Clinically and radiologically a diagnosis of Kienbock's was made and the patient was managed with excision of lunate and Scapho-capitate fusion. At the final follow up (6 months), VAS reduced to 2, PRWE of 24 and DASH of 26. Grip strength also improved to 37 lb on the right side at the end of 12 weeks. Intra-operative biopsy was suggestive of a vascular necrosis with no granulomas where as CBNAAT suggested low levels of *Mycobacterium Tuberculosis*.

Conclusion: The presentation of tuberculosis as Kienbock disease is extremely rare. ATT is the mainstream of management but collapse of lunate and development of carpal arthritis warrant for surgical intervention. Our case report further enlightens how easily carpal tuberculosis can be misdiagnosed and therefore routine intra operative HPE examination of resected lunate should be a done in Kienbock disease.

Keywords: Kienbock's disease; MRI; Computed Tomography; Granulomas

Introduction

A vascular necrosis of lunate, also known as Kienbock's disease is a chronic debilitating disease of the wrist joint. It is a rare condition with radiographic prevalence of just 0.27% [1]. Repetitive micro trauma between radius and lunate is speculated to be one of the most common causes. It could be due to ulna shortening or decreased radial inclination. Incompetence of vascular supply to lunate increases the likelihood of disease. Most common presentation is chronic pain over dorsal aspect of wrist with painful wrist movements. Patients might also present with swelling and tenderness over dorsolateral aspect of wrist with loss of grip strength [1].

Lichtman classified the disease based on radiographic changes. The disease is not easily picked up on an early radiograph but only when sclerosis, cystic changes and collapse of either lunate or particular surface develop. Magnetic Resonance Imaging (MRI) serves as an important investigation in early detection. Diffuse hypointense signals in lunate bone marrow on T1 a weighted image is a path gnomonic sign. Role of Computed Tomography (CT) is confined to planning of surgery.

The aim of management is to provide the patient with a pain-free joint with good grip strength and wrist range of motion. In early stages restriction of joint movement using splint age and cast immobilization often suffice. But once sclerosis develops, conservative management is not of much use. Surgical procedures like radial shortening osteotomy vascularized bone graft, radius core decompression and limited carpal fusion are described in the literature. End stage disease is often managed with proximal row carpectomy, wrist fusion or total wrist arthroplasty.

We present an unusual case of a vascular necrosis of lunate, secondary to tuberculosis of lunate bone. There is no such case described in the literature and with this case report we would like to highlight the diagnosis and possible treatment.

Case Presentation

We present a case of a 23-year-old female, homemaker by occupation and right hand dominant. The patient presented to us with complaint of chronic pain over the right wrist joint associated with decreased hand grip for the past 4 years. The pain was described to be insidious in onset and gradually progressive, more severe since the last 3 months. The patient did not report any limitation of wrist range of motion however; her quality of life and activities of daily living were hampered due to pain. There was no constitutional sign or symptoms or relevant medical history suggestive of any chronic systemic disease. Due to lack of constitutional symptoms, the possibility of tuberculosis was not considered earlier and pre-operative biopsy was not taken.

On physical examination, we could not appreciate any swelling, deformity, scar or skin changes. We could elicit tenderness at dorsolateral aspect of wrist, moderate in intensity. Wrist range of movements was found to be comparable to the other side. Hand-held dynamometer revealed decreased grip strength over right hand (26 lb) compared to left (48 lb). The patient has a preoperative VAS (Visual Analog Scale) score of 5, PRWE (patient-related wrist evaluation) of 68.5 and DASH disability of shoulder, arm and hand questionnaire of 57.4. Plain radiograph revealed sclerosis and collapse oflunate with proximal radio-lunate joint space reduction and osteolysis. Ulna showed neutral variance and radial inclination was within normal range. MRI revealed T1 hypo intensity at lunate with lysis of lunate bone and edematous changes along with collapse of lunate bone (Figure 1). Our patient fits into Lichtman type III A where role of

Citation: Singh V, Bansal S, Barman S, Kumawat N, Regmi A, Naraula BB. Tuberculosis of Lunate Mimicking Kienbock's Disease. Am J Surg Tech Case Rep. 2024;4(1):1027.

Publisher Name: Medtext Publications LLC

Manuscript compiled: May 07th, 2024

***Corresponding author:** Vivek Singh, Department of Orthopaedics, All India Institute of Medical Sciences, Rishikesh, 249203, India

conservative management is very bleak.

We planned for complete lunate excision along with limited carpal fusion (scapho-capitate fusion). Intra-operative biopsy was done and CBNAAT was sent. Biopsy was suggestive of a vascular necrosis whereas CBNAAT detected very low levels of Mycobacterium Tuberculosis. The patient has been followed up to 6 months at 4,8,12 and 24 weeks since the time of surgery. Patient-reported outcomes improved drastically. VAS reduced to 2, PRWE of 24 and DASH of 26. Grip strength also improved to 37 lb on the right side at the end of 12 weeks. Post-operative radiograph showed optimal scapho-capitate fusion (Figure 2).

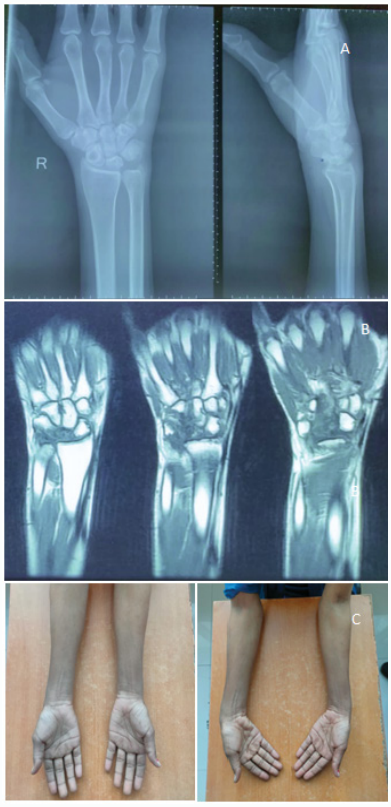

Figure 1: Pre-operative. a) Radiograph shows lunate collapse and sclerosis. b) Coronal T1- Weighted MR image shows diffuse hypo intensity of lunate bone. c) Pre-op Clinical Images.

Surgical technique

Under general anesthesia with tourniquet support longitudinal dorsal skin incision was applied over the wrist from base of 3rd metacarpal to 2 cm to 3 cm proximal to Lister tubercle of radius. Incision was kept slightly curved to avoid contracture formation over wrist joint. Careful dissection of the soft tissue done, hemostasis achieved using monopolar cautery superficial sensory nerves were dissecting out intact as far as possible. Extensor pollicis longus tendon was encountered in the field and retracted out. Inflamed synovium and synovial hypertrophy were found intra operatively. After removal of synovium, periosteum cleared using a periosteal elevator. Lunate was found collapsed. Using a sharp osteotome and mallet, Lunate was broken down and extracted in a piecemeal fashion.

After that attention was given for autologous bone graft. Ipsilateral distal radius was exposed and cancellous bone graft material was obtained after elevating unicortical flap of 1 cm × 1 cm, following

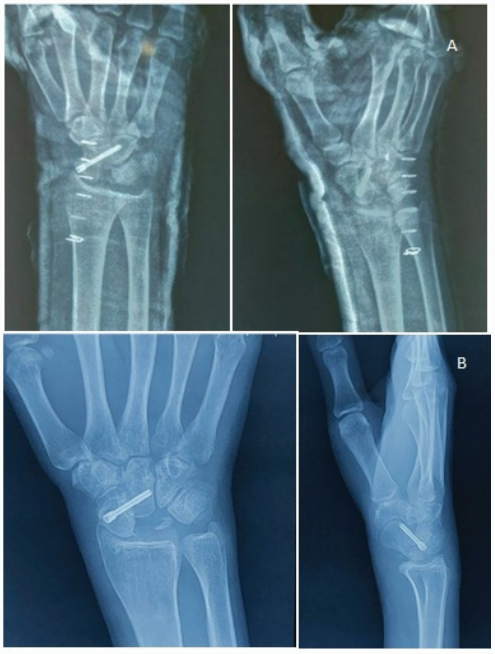

Figure 2: Post-operative Radiographs. a) Immediate Post op- Scapho Capitate fusion with Herbert screw. b) 6 months follow-up showing optimal Scapho-Capitate fusion.

which flap was again repositioned in place. After lunate excision thorough wash was given and bone graft was inserted. Cartilage of scaphoid and capitate was removed and raw bone was denuded using a curette beforehand. After suitable placement of bone graft and fluoroscopic evaluation of acceptable positioning of carpal alignment, scapho-capitate fusion was done using Herbert screw. Post screw fixation, carpal stability and anatomy was evaluated fluoroscopically and layered wound closure done. After dressing, thumb spica was applied for additional support of the wrist joint and kept for 6 weeks postoperatively.

Discussion

Kienboch's disease, also known as a vascular necrosis of the lunate bone, is caused by a complex interaction between anatomical and vascular abnormalities as well as varied degrees of insults and micro trauma [2].

Wrist and hand involvement in osteoarticular TB patients is extremely uncommon, occurring in approximately 1% to 2% of cases [3]. Scapholunate joint or synovium can be the source of Tuberculosis (TB) affecting the wrist joint. Additionally, it could spread directly from wrist tendon tenosynovitis. Because of their high vascularity the phalanges and metacarpals are the bones that are frequently involved in wrist and hand injuries three. The most often impacted carpal bone by TB, according to reports, is the capitates solitary lunate involvement is quite uncommon [3]. Therefore, a strong index of suspicion is needed to diagnose wrist and hand tuberculosis. A common diagnostic technique for these pseudo-Kienbock illnesses is MRI. Lack of distinctive signs or symptoms and absence of constitutional symptoms frequently cause a delay in diagnosis, leading to severe joint deterioration before the condition is diagnosed and a poor prognosis.

Very few cases of carpal TB have been documented in the literature. A 23-year-old male with a non-healing sinus in his left wrist had both the capitate and triquetrum involved in a case that was reported by Karakaplan et al. [4] following receiving ATT for nine months

following debridement and curettage, he did not reactivate after 22 months of follow-up care. In a case described by Prakash a 12-year-old child with capitates also recovered with ATT administered for a year and showed no signs of recurrence at the 18-month follow-up [5]. Grenho et al. [6] reported a successful outcome in a 10-year-old child who had a similar instance of capitate infection. A 42-year-old man who had decreased mobility and pain at the radial side of his right wrist was the subject of a case reported by Siddiquiet al. After receiving ATT for six months after debridement and curettage the infection completely resolved in him [7].

An example of tuberculosis of lunate in a 35-year-old lady is described by Prasoon Kumar et al. In lunate it appeared as a single intraosseous osteolytic lesion [8]. Out of 44, Prakash and Tenosynovitis of the wrist's extensor tendons in conjunction with Scapholunate joint tuberculosis was documented by Sbai [9]. In a case of Scapholunate dissociation brought on by tuberculosis, all of the carpal bones and the radial particular surface were grossly destroyed, as reported by Sabat et al. [10]. Jaiswal and Agnihotri [11] reported a case akin to this one involving a 30-year-old female who had been experiencing discomfort in her left wrist for seven months. Ganesh Singh documented a case of osseous TB of lunate 12 in a 65-year-old female patient who had minor a traumatic wrist pain [12].

The mainstay of therapy is long-term use of many ATT medications. In our instance, we underwent capitate fusion due to the development of wrist arthritis and the collapse of lunate. The decision to surgically remove the lunate and fuse the capitate was made earlier since the diagnosis of TB lunate was not made until after intra operative HPE and CBNAAT examination. In our situation, there was no preoperative difference between tuberculosis of the lunate and Kienbocks disease based on clinical or radiological findings. This highlighted even more how difficult it is to accurately diagnose tuberculosis lunate.

Conclusion

The presentation of tuberculosis as Kienbock disease is extremely rare and only few studies has depicted in the literature that also as isolated case studies. No clinical or radiological examination is reliable for the diagnosis of TB lunate and only a high index of suspicion is the key. ATT is the mainstream of management but collapse of lunate and development of carpal arthritis warrant for surgical intervention. Our case report further enlightens how easily carpal tuberculosis can be misdiagnosed and therefore routine intra operative HPE examination of resected lunate should be a done in Kienbock disease.

References

1. Lutsky K, Beredjiklian PK. Kienböck disease. J Hand Surg Am. 2012;37(9):1942-52.
2. Cross D, Matullo KS. Kienböck disease. Orthop Clin North Am. 2014;45(1):141-52.
3. Tuli SM. Tuberculosis of the Skeletal System. JP Medical Ltd. Indian J Orthop. 2016;50(3):337.
4. Karakaplan M, Köroğlu M, Ergen E, Aslantürk O, Özdemir ZM, Ertem K. Isolated tuberculosis of capitate and triquetrum. J Wrist Surg. 2017;6(01):70-73.
5. Prakash J. Tuberculosis of capitate bone in a skeletally immature patient: a case report. Malays Orthop J. 2014;8(1):72-4.
6. Grenho A, Arcângelo J, Jordão P, Gouveia C. Carpal synovitis with capitate bone tuberculosis in a child. BMJ Case Rep. 2018;2018:bcr2017223459.
7. Siddiqui MA, Rizvi SWA, Rizvi SAA. Isolated tubercular scaphoid osteomyelitis: a case report. Orthop Surg. 2012;4(1):64-6.
8. Kumar P, Aggarwal S, Rajnish RK, Agarwal S. Tuberculosis of lunate as an isolated intraosseous osteolytic lesion in an adult: a diagnostic challenge. BMJ Case Rep. 2019;12(7):e229597.
9. Sbai MA, Benzarti S, Bouzaidi K, Sbei F, Maalla R. A rare localization of tuberculosis of the wrist: The scapholunate joint. Int J Mycobacteriol. 2015;4(2):161-4.
10. Sabat D, Kumar V, Gupta A. Scapholunate dissociation: a rare presentation of TB wrist in a case of multi-focal skeletal tuberculosis. Indian J Tuberc. 2008;55(3):149-52.
11. Jaiswal Y, Agnihotri A. Tuberculosis wrist mimicking Kienbock's disease. J Clin Orthop Trauma. 2015;6(1):78.
12. Dharmshaktu GS. Osseous tuberculosis mimicking Kienböck's disease of the wrist. Eur J Rheumatol. 2018;6(3):165-6.