



Trans-Scaphoid Perilunate Fracture Dislocation - A Rare Entity

¹Dr. Somashekar, ²Dr. Santosh Kumar K, ³Dr. Vijay Bharadwaj, ⁴Dr. Kiran Kumar H.V, ⁵Dr. Amith Kamath, ⁶Dr. Pranay Kumar

¹Professor and Unit Head, ^{2,4}Assistant Professor, ³Post graduate 3rd Year Resident, ⁵Senior Resident, ⁶Junior Resident,

Department of Orthopaedics, Kempegoda Institute of Medical Science and Hospital, Bangalore, Karnataka

***Corresponding Author:**

Dr. Vijay Bharadwaj

Post Graduate 3rd Year Resident, Department of Orthopaedics, Kempegowda Institute of Medical Science And Hospital, Bangalore, Karnataka

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Abstract

Trans-scaphoid peri lunate fracture dislocations (TSPLD) are uncommon and constitute about 3% of all carpal injuries. Most of these high energy trauma cases go undiagnosed. They have the potential to cause lifelong disability of the wrist, early recognition and diagnosis are crucial to restore patient function and prevent morbidity. Understanding the related wrist anatomy and pathomechanics may help surgeons evaluate and diagnose patients. Early operation to reduce and fix the injuries should be considered to achieve optimal clinical and radiological outcomes This study describes the management of such injury.

We report an unusual carpal fracture-dislocation. There was trans-scaphoid fracture and lunate dislocation. It was completely stabilized after open reduction and fixation using several pins and Herbert screw.. After two days, neural symptoms were completely recovered and the patient was discharged. Postoperative radiographies revealed complete restitution of lesser and greater arcs and normalization of Gilula's line. Scapholunate and lunatocapitate angles were satisfactory. The combined approach had favorable results for treatment of this unusual type of carpus fracture dislocation. However longer follow up is need to evaluate the arthritis and degenerative changes in wrist.

Keywords: lunate, perilunate dislocations, k wire fixation, carpal injuries, rare injuries

Introduction

A 40 years old male patient presented with the history of fall on outstretched hand with complaints of pain and difficulty in movement of left wrist. Physical examination revealed swelling and deformity, without sensory and motor changes or bone exposure. tenderness present on palpation and finger extension. Radial and ulnar pulse were present. Range of motion was restricted. Radiographs revealed a trans-scaphoid perilunate fracture dislocation beyond the type 2 according to Mayfield. The lunate was dislocated anteriorly showing classical "split tea cup sign". Additionally, a fracture of the scaphoid middle third was evidenced.. After

the pre-operative evaluation the patient was taken to the operation theatre for assessment and treatment. Under general anaesthesia Inspection of the volar surface revealed only a small intact portion of the palmar fascia. Similarly, almost the entire transverse carpal ligament was avulsed from the ulnar to the radial side. The median nerve had no structural injuries though edema was present. The lunate, as well as the proximal pole of the scaphoid, were displaced and rotated completely out of their normal position. Capitate joint was found intact. Decompression of the carpal tunnel, repair of the rent in the Space of Poirier, and direct internal fixation of the scaphoid fracture was done which was fixed by a

Herbert screw and multiple pins were used for lunate dislocation to keep it back in place. Realignment of the carpal bones was assisted through a second, dorsal "T-shaped" incision. Primary ligament reconstruction was done.

Postoperatively, the wrist was immobilized. Stitches were removed on the 14th postoperative day and a plaster was kept in place for 6 weeks with

instructions to perform active and passive exercises of fingers and elbow. The plaster and k wire pins were subsequently removed and physical therapy was started. After one year, the patient was asymptomatic and able to perform his daily activities normally (flexion of the left wrist 86/Extension 80/ulnar deviation 30/radial deviation 15)



Figure 1 Fracture dislocation Xray



Figure 2 CT film (Spilled tea pot sign)

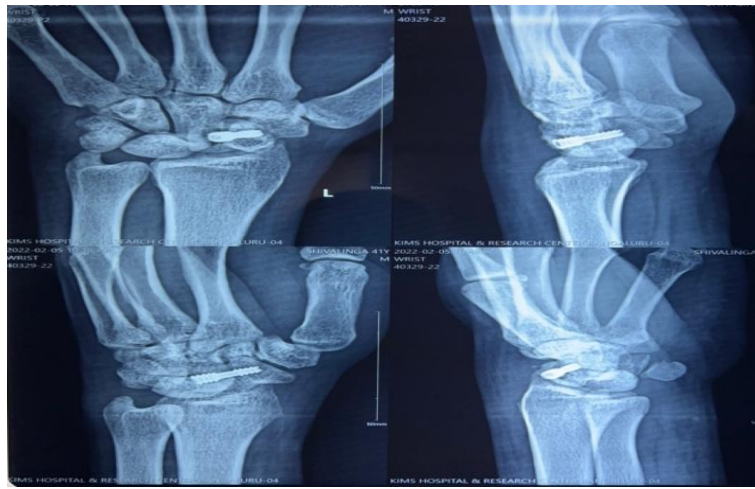


Figure 3 CT film (Classical)



Post-operative xray

6th week post op



6th month post

Range of motion at 1 year followup



Discussion:

A peri lunate dislocations are rare injuries. The prefix trans is used to refer to associated fractures, and prefix peri is used to describe dislocations.. Prompt management improves the chance of a good long term outcome; however, all patients should be advised regarding the severity of these injuries and the guarded prognosis. Late diagnosis delays

treatment and the delay in treatment worsens the prognosis resulting in pain, weakness, stiffness, carpal tunnel syndrome, and posttraumatic osteoarthritis. Perilunate dislocations (lesser arc injury) are characterized by a progressive disruption of capsular and ligamentous connections of the lunate to the adjacent carpal bones and radius. They typically begins radially and propagates around or

through the lunate to the ulnar side of the carpus. Classically, the distal row dislocates in a dorsal or dorsoradial direction followed by the entire scaphoid and triquetrum in pure perilunate dislocations or just by the distal portion of these bones in perilunate fracture dislocations. Perilunate fracture dislocations (greater-arc injury) combine ligament ruptures, osseous avulsions and various types of fractures. The most common pattern of peri lunate instability is the trans scaphoid perilunate fracture-dislocation. Fractures of the other carpals can also occur.

Perilunate dislocations may be seen several months or years after the initial injury. The patient is more likely to present because of increasing nerve symptoms or tendon rupture than because of wrist deformity to which the patient has often become accustomed. Primary assessment uses standard scaphoid radiographs with the following appearances suggestive of an perilunate dislocation-

Disruption of Gilula lines on the PA view indicative of an altered intercarpal relationship.

1. "Spilled teapot sign" on the lateral view due to palmar rotation of the lunate and disruption of the lunate-capitate articulation
2. Triangular appearance of lunate secondary to rotation
3. Increased ulnocarpal translation
4. Neutral PA and radial deviation radiographs recommended
5. Subtle signs of disruption may include loss of carpal height and increased intercarpal spaces.

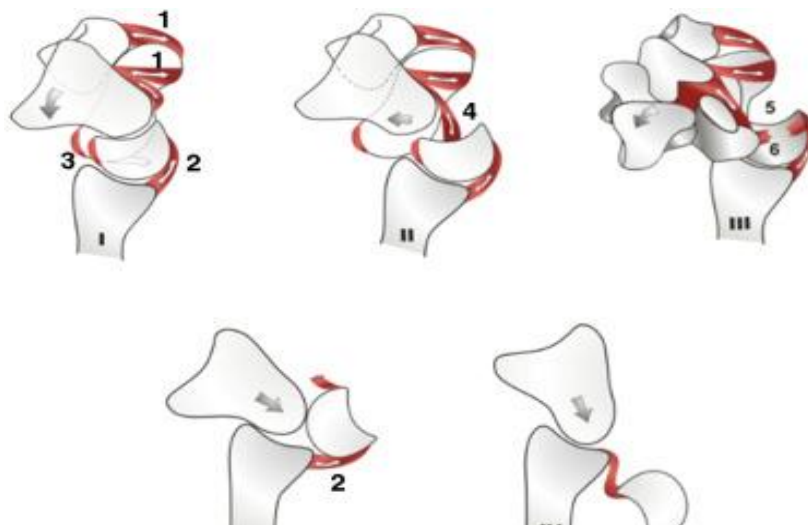
Stress radiographs or an EUA may be necessary. Often secondary imaging modalities are necessary including CT and MRI, useful in determining the extent of the injury.

The most frequent systems for describing perilunate injuries include the Mayfield classification

In the transscaphoid fracture-dislocation, the distal scaphoid dislocates with the distal row leaving the proximal scaphoid and lunate in near-normal relationship. When the perilunate ligaments rupture, the lunate usually remains within the radiocarpal joint and the remainder of the carpus dislocates, usually dorsally but occasionally in a volar direction. Occasionally, the lunate is displaced and rotated palmarly and the remainder of the carpus settles into a seminormal alignment with the distal radius. Rarely, even the palmar attachment of lunate is torn, allowing extrusion into the forearm or through the skin.

Management mainly includes closed reduction and percutaneous fixation for 6-8 weeks. Trans-scaphoid fracture dislocations are treated with open reduction and internal fixation of the scaphoid through a volar approach. In the multi-centre review of perilunate dislocations good results were achieved by operative fixation of associated scaphoid fractures, whereas cases treated with closed reduction and plaster immobilisation can end up in scaphoid non-union and subsequent carpal instability. The outcome can be significantly worse for those patients who underwent surgical treatment much later after the initial injury.

Mayfield Classification



Conclusion :

Perilunate injuries are one of the rare entities of carpal bones. These injuries should be taken seriously and the mainstay of treatment is early reduction and fixation to prevent the avascular necrosis of the carpal bones. So early detection and management is the mainstay of treatment.

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