



AN ACUTE COMPLEX PERILUNATE DISLOCATION WITH DEPRESSED DISTAL RADIUS FRACTURE - A CASE REPORT

Orthopaedics

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ABSTRACT

Introduction Perilunate dislocations and fracture–dislocations are the most common forms of wrist dislocation and encompass a spectrum of injuries, which can include both ligamentous and osseous disruption. In clinical practice, the prefix trans is commonly used to refer to associated fractures, whereas the prefix peri- is used to describe a dislocation. Perilunate fracture–dislocations (greater arc injuries) are more frequently seen than perilunate dislocations (lesser arc injuries) with the ratio reported to be two to one, with displacement in a dorsal direction in 97% of cases. Here we present a case of 32 year old male with perilunate fracture dislocation with depressed distal radius fracture, which was managed by open dorsal approach with proper reduction, k wire fixation and good functional outcome

KEYWORDS

INTRODUCTION

Perilunate dislocations and fracture–dislocations are the most common forms of wrist dislocation and encompass a spectrum of injuries, which can include both ligamentous and osseous disruption. In clinical practice, the prefix trans is commonly used to refer to associated fractures, whereas the prefix peri- is used to describe a dislocation. Perilunate fracture–dislocations (greater arc injuries) are more frequently seen than perilunate dislocations (lesser arc injuries) with the ratio reported to be two to one, with displacement in a dorsal direction in 97% of cases [1] However, the importance of identifying these injuries is highlighted by the significant complications produced by missed or improperly treated injuries including median nerve injury, chronic carpal instability, avascular necrosis of the malreduced lunate, complex regional pain syndrome, unreliable return of function, and posttraumatic arthrosis requiring a secondary procedure [2, 3]

Perilunate Dislocations

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, without associated fractures to the carpus and distal radius. Ligament disruption 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. SLD (Scapholunate dislocation) or LTD (Lunotriquetral dislocation) often persists even after relocation, with recurrence of instability common whether the injury involves one or both of the lesser or greater arc. It is important to define any associated ligamentous injuries such as LTD or SLD to prevent late carpal collapse[1].

Perilunate Fracture–Dislocations

Perilunate fracture–dislocations (greater arc injury) combine ligament ruptures, osseous avulsions, and various types of fractures. The most common pattern of perilunate instability is the transscaphoid perilunate fracture–dislocation[1].

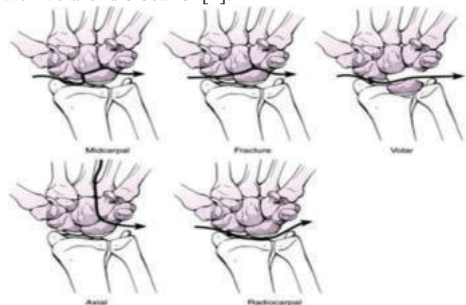


Figure 1. Types of Perilunate dislocation and fracture dislocation

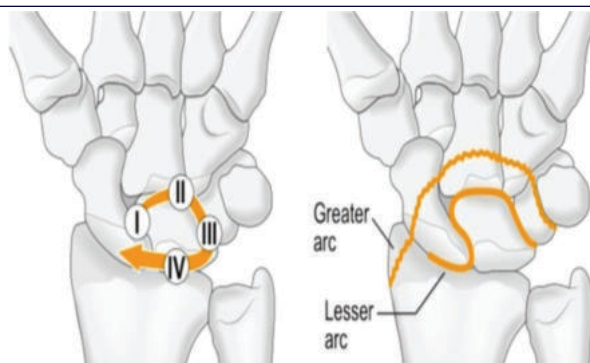


Figure 2. The Mayfield stages of progressive perilunate instability. Stage I results in SL instability. Stages II to IV result in progressively worse perilunate instability

Mayfield suggested that carpal instability predominantly occurs in relation to the lunate, which is the carpal keystone. He put forward a pathoanatomic classification associated with progressive perilunate instability from a radial to ulnar direction[4]

Perilunate injuries may be purely ligamentous and include both Carpal instability dissociative (Mayfield stage I) and Carpal instability combined (Mayfield stages II–IV) types. However, perilunate injuries are often complicated by fractures, reflecting a different location of force dissipation[5]

Here, we present a case of 32 year old male who suffered a complex perilunate fracture dislocation with depressed distal radius fracture treated by metacarpal pin traction and percutaneous pinning through dorsal approach.

To our knowledge, this is the first reported case in the literature for the treatment of an acute perilunate fracture dislocation with depressed distal radius fracture.

Case Report

A 32 year old male farmer by profession presented to Orthopaedic OPD with pain and swelling over right wrist for 1 week after fall on outstretched hand while running after chased by buffalo. Patient also gave H/o tingling and numbness over first 3 and a half finger right hand.

He did not take any medical treatment following the injury and presented to the hospital after 1 week, due to persistent pain and swelling over his right wrist and inability to perform his daily routine activities.

On examination there was diffuse swelling over wrist joint along with tenderness over carpal bones. The wrist movements were grossly restricted. There were tingling and numbness over first 3 and a half finger right hand. Digital X-Ray of wrist joint showed [Figure 3]

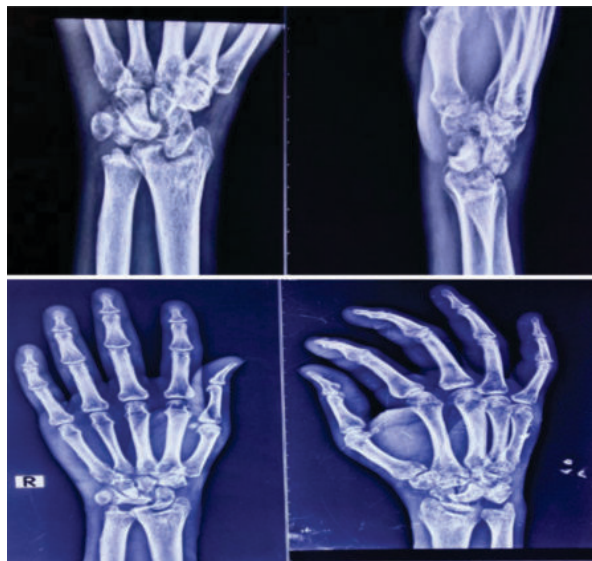


Figure 3 : Digital X-Ray Right wrist joint (AP/Lateral view)

- Disruption of Gilula lines on the AP view
- A section of articular surface impacted below the level of the adjacent cartilage: Die punch fragment
- Increased scapholunate interval in the anteroposterior view
- Characteristic 'spilled teapot sign' in the lateral view
- Disruption of the lunate-capitate articulation
- Increased ulnocarpal translation in AP view

CT scan with 3D reconstruction [Figure 4]

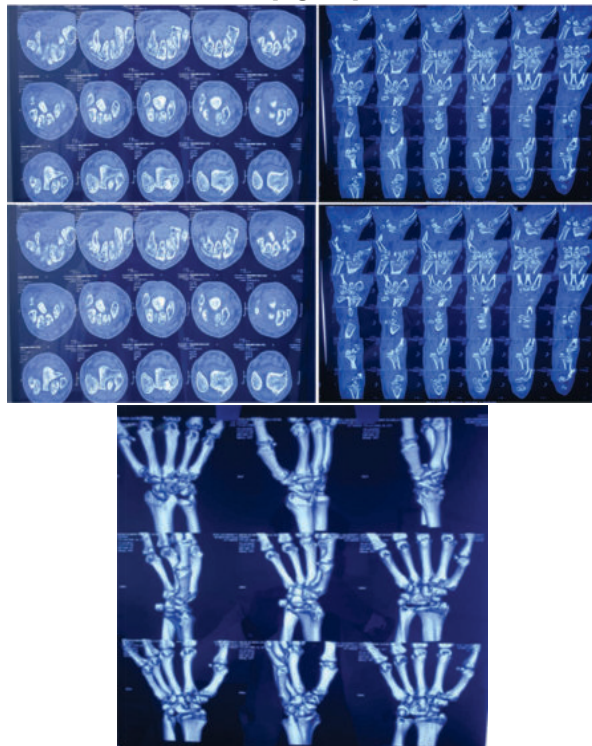


Figure 4. CT scan with 3D reconstruction film showed dorsal subluxation of the distal carpus with loss of congruity of the articular surfaces and depressed intraarticular fracture of distal radius.

After confirming the diagnosis and in view of median nerve compression metacarpal traction planned. Under all aseptic precaution 2.5mm k wire were placed through metacarpal diaphysis

around 2.5 cm proximal to MCP joint of 2nd and 3rd finger and perpendicular to the axis of the radius (Figure 5)



Figure 5. Digital X-Ray of wrist joint on traction showed

- Loss of impaction from scaphoid fossa
- The Piece of pie sign on AP view confirm the diagnosis of perilunate dislocation.

After Obtaining Preanaesthetic Fitness, The Patient Underwent Open Reduction And K Wire Fixation Through Dorsal Approach.

Surgical Procedure

Patient was placed in supine position with arm abducted and placed on side bar, General Anaesthesia was given and tourniquet was applied. Painting and draping was done.

A 8cm longitudinal incision beginning proximal and ulnar to Lister's tubercle, and ending distally at the level of the third carpo-metacarpal joint. Skin and Subcutaneous tissue elevated from the extensor retinaculum, the dorsal superficial branch of the radial nerve identified and elevated with the skin flap.

Third extensor compartment exposed and Extensor pollicis longus tendon is released and retracted radially, together with the extensor tendons of the second compartment, Retracting the fourth extensor compartment in an ulnar direction, joint capsule exposed.

The capsulotomy incision taken deep to the floor of second extensor compartment leaving a fringe of 2-3mm of capsular attachment at the dorsal rim of the radius, for subsequent suture repairing.

The capsule flap is elevated in an ulnar to radial direction, the proximal carpal row, with its intrinsic ligaments, the midcarpal joint and radio ulnar joint exposed. (Figure 6)



Figure 6

Impacted fracture on distal end of radius was identified and with the help of lever punch fracture elevated and two, 2mm k wire is passed in subchondral region parallel to articular surface from lateral to medial to give support to the elevated fragment, an additional 2mm k wire is passed medial to lateral from dorso ulnar aspect to distal end of radius to engage dorsal fragment of radius.

The perilunate dislocation was reduced and fixed with four K-wires through scapholunate, scaphocapitohamate, capitollunate and triquetrolunate junctions. (Figure 7)



Figure 7. C-Arm image showing reduction and k wire

The k wire fixation was confirmed under c-arm in both AP and Lateral view. The scapholunate ligament and dorsal capsule was identified and sutured. Wound washed with normal saline and betadine and skin and subcutaneous tissues were approximated. Dressing done and below elbow slab given.

Follow Up

On Post operative day 2 dressing was done and patient was discharged with advise for followup on Post-operative day 5, day 10 and day 14 On Post-operative day 14 suture was removed Patient was followed weekly for first 6 weeks. On completion of 6 weeks, slab was removed and xray was done. (Figure 8)



Figure 8: At 6 months follow up radiograph of the right wrist joint showed satisfactory alignment of the carpal bones

K wire was removed, Active and Passive Range of motion of wrist joint started and patient followed weekly for assessment of ROM of wrist joint.

Clinically, the patient recovered with range of motion (Dorsiflexion: 0-50 degree, Plantarflexion: 0-50 degree, Ulnar deviation: 0- 15 degree and Radial deviation: 0-15 degree) not normal, but satisfactory at the end of 12 weeks. (Figure 9)



Figure 9: At the end of 12 weeks, patient showed satisfactory results with ROM (Dorsiflexion: 0-50 degree, Plantarflexion: 0-50 degree, Ulnar deviation: 0- 15 degree and Radial deviation: 0-15 degree).

DISCUSSION

Perilunate Dislocations are rare injuries. They constitute less than 10% of all wrist injuries [6].

Adequate clinical history and careful physical examination will help in early detection of these injuries [7].

Careful scrutiny of radiographs is essential with attention to the Gilula's arc of the carpal joints, scapholunate interval, scaphocapitate and capitulunate angles. Early surgical management of these injuries result in a better functional outcome as compared to conservative line of management.

Combined dorsal and volar surgical approach to the wrist joint has usually been advocated for the management of this injury. However,

single dorsal approach helps to preserve the palmar wrist ligaments to the maximum with minimal surgical soft tissue damage [9]. It also gives good exposure of the proximal carpal row, mid-carpal joint and helps in earlier functional return of the patient [7]. Various implants have been used for stabilisation of the dislocation after reduction such as compression screws, cerclage wires and K-wires.

In our case, we treated by open reduction and internal fixation with percutaneous K-wires via a single dorsal approach. Adequate regular follow up of the patient is essential to prevent recurrence of carpal instability.

CONCLUSION

Perilunate fracture dislocation are demanding injuries that require urgent care to achieve the best long-term functional outcomes results

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