Lunate Dislocation

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Abstract

Carpal dislocations are wrist injuries and Lunate dislocation is its severe form. Lunate and perilunate dislocations are uncommon. These injuries have significant clinical impact on the patient but are easily missed and lead to potentially devastating effect if mismanaged. This case report outlines the important clinical aspects and management of Lunate dislocation.

Key words: Lunate, dislocation.

Introduction

Wrist has a complex anatomy with multiple bones and joints that lead to infinite combination of positions and movements. Although wrist fracture/dislocation is a rare entity among all cases of extremity trauma, but a number of specific injuries should be looked for to rule out their presence. Lunate dislocation is such injury.1

The morbidity of carpal dislocation is frequently associated with missed diagnosis of lunate dislocation in the emergency department due to the complex structure of the wrist. Unfortunately, missed injuries of the wrist are associated with a high incidence of long-term pain and disability.2

The true incidence of lunate dislocation is unknown, but the carpal dislocations are estimated to account for 10% of all wrist injuries.3 Lunate dislocation results from hyperextension of the wrist due to high energy trauma to the wrist. This often results from fall on the outstretched hand, motor vehicle and motorcycle crash.4

In lunate dislocation, there is disruption between the lunate bone and the lunate fossa of the radius. This requires emergent reduction and stabilization using either closed or open surgery with internal fixation. A lunate dislocation with median nerve symptomatology requires immediate surgical reduction, carpal tunnel release and ligamentous reconstruction.5

Case Report

A 45 years old male presented to the Accident & Emergency department of Armed Forces Hospital, Southern Region, Khamis Mushayt, Kingdom of Saudi Arabia, with the complaints of left wrist pain. He was involved in sports activities and had a history of fall on an outstretched left hand. He complained of pain, swelling, trouble in moving his left wrist along with numbness of his left thumb, index and middle finger. His past medical history was insignificant and had no previous injuries to his left wrist. Examination of his left wrist revealed a moderate swelling, mainly over the volar aspect with marked volar tenderness. All his left wrist movements were severely restricted and he was unable to make a fist secondary to pain. There was paraesthesia in the distribution of median nerve but there was no motor deficit or circulatory compromise.

Plain radiographs of left wrist (PA and lateral views) showed dislocated lunate volarly while radius and capitate remained in a straight line with a characteristic “spilled tea cup sign” due to volar rotation. There was characteristic triangular appearance of lunate on PA view (normally a quadrangular appearance) known as “piece of pie” sign due to rotation of lunate in volar direction (Figure-1 & 2). A diagnosis of lunate dislocation was made. It was differentiated from perilunate dislocation on the lateral view where the whole carpus apart from lunate was dislocated while the lunate and radius remained in articulation. On PA view it was differentiated from scapholunate dissociation where there was widening of space between lunate and scaphoid.

Closed reduction under general anesthesia was unsuccessful therefore, he was operated via volar approach to gain access to lunate. Carpal tunnel release was performed as part of volar approach to wrist and to decompress median nerve because of volar swelling and paraesthesia in the distribution of median nerve.

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Hematoma in the space of Poirier was evacuated, and a small osteochondral fracture of lunate was identified in addition to complete dislocation of lunate. The osteochondral fragment was excised. After anatomical reduction the instability of wrist was identified under image intensifier. Stability was achieved with the help of a trans-scapholunate 1.25 mm k-wire (Figure-3 & 4). After repair of volar arcuate ligament, tourniquet was deflated and hemostasis secured. After skin closure, wrist was immobilized in a short arm volar slab in neutral position. There was significant pain relief and improvement in paraesthesia on the 1st postoperative day.

After 2 weeks sutures were removed and check x-ray done. Volar slab was re-applied for another 4 weeks. At 6 weeks k-wire was removed (Figure-5) and the patient was referred for physiotherapy to start gentle range of movement of his left wrist.

![Figure-1& 2: Pre-operative x-rays.](image1)

![Figure-3 & 4: Immediate post-operative x-rays.](image2)

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![Figure-5: At 6-weeks post removal of k-wire.](image3)

At 3 months postoperatively (Figure-6), the patient had regained the majority of his pain free motion and strength, and returned to normal activities. He was advised to avoid sports for another 3 months. His motion showed 65 degree of extension, 70 degree of flexion, 15 degree of radial deviation and 30 degree of ulnar deviation. His grip strength on the affected side was almost comparable to contralateral side. His functional outcome according to Wrist Mayo Score was 80% (Good).

![Figure-6: X-rays at 3 months.](image4)

Lunate and Perilunate fracture dislocations typically occur in young people due to high-energy trauma. The mechanism of injury is an excessive loading force applied to a dorsiflexed and ulnarly deviated wrist. Mayfield classified carpal dislocations in to 4 stages, each representing a sequential intercarpal injury. A scapholunate disruption is stage-1 injury; stage-2 injury involves dislocation of the lunocapitate joint. Stage-3
Lunate Dislocation

On the PA view of the wrist, three arcs should be identified. The first arc consists of the radiocarpal row; disruption of this indicates lunate dislocation. The second arc consists of midcarpal row, disruption of indicates perilunate dislocation. The third arc outlines the proximal surface of the distal carpal row. On the lateral view of the wrist, the radius, lunate and capitate all lie in a row. Loss of this axis implies lunate or perilunate dislocation.

In one study two case of palmar lunate dislocations were treated with longitudinal volar approach and stabilized with k-wires. The satisfactory functional outcome having mayo wrist score of 75% was achieved in these cases.

Lunate and perilunate dislocations require urgent identification and reduction to avoid a poor outcome. Closed reduction and immobilization is usually not successful but closed reduction with percutaneous fixation are acceptable if reduction achieved with accuracy. Open reduction and fixation give the best results in term of anatomical restoration.

In summary, acute lunate dislocations are uncommon. When left unrecognized and untreated, can lead to a high incidence of long-term functional disability and chronic wrist pain and to our knowledge there is limited literature regarding isolated lunate dislocation to compare.

References