



Transradial, Transscaphoid, Transcapitate, Perilunate Dislocation; A Case Report and Approach to the Patient

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► ABSTRACT

Carpal injuries are uncommon and are mainly seen in the younger age group. The incidence is unclear as many of the cases go undiagnosed. A 22-year-old male patient coming to the hospital after road traffic accident with head, face and left wrist injury. After immediate primary management the patient was taken up for a definitive procedure 4 days after the injury. Scaphoid fracture was fixed with the help of Herbert's screw via the dorsal approach. The base of the first metacarpal was fixed with the help of JESS fixator and the distal end radius was fixed with the help of K-wires. The scapholunate and lunato triquetral ligaments were repaired. The whole construct was stabilized with the help of an external fixator. Postoperative period was uneventful. The external fixator was removed after 4 weeks and patient had a good functional outcome with the patient related wrist evaluation score coming out to be 11 at the end of the third month. This uncommon case of Transradial, Trans scaphoid, transcapitate, and perilunate dislocation was managed successfully with no postoperative complications and a good functional outcome.

Keywords: Carpal injuries; Patient; Wrist evaluation score; JESS external fixator.

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Introduction

Carpal injuries are more commonly seen in the younger age group [1,2]. The mechanism of injury includes fall on an outstretched hand. Diagnosis on plain radiograph is difficult and requires a certain degree of expertise. Hence, many cases of the carpal injuries go undiagnosed; the incidence of the carpal fractures is unclear. The first case report of

perilunate fracture dislocation was published in 1855 [3] following which about 10% of the carpal injuries have shown perilunate dislocations. Incidence rates for males (per 100,000 persons per year) were 54.6 and 15.9 for scaphoid and non-scaphoid fractures, respectively. In females, the corresponding rates were 10.6 and 4.5 [2]. The position of the wrist determines the actual injury. Here we present a case of the transradial, transscaphoid, transcapitate,

perilunate dislocation. This case report also shows the systematic approach towards the diagnosis and the successful treatment of the carpal dislocation.

Case Report

A 22-year-old man presented to our emergency department following a road traffic accident. At the time of admission the patient was stable and had sustained head injury, facial injury and left wrist injury. Examination of the left wrist revealed obvious swelling, deformity, and tenderness to palpation. There were nonnoticeable paresthesias and tingling numbness in the median nerve distribution. Radiographs showed transscaphoidal perilunate dislocation with scaphoid fracture, intrarticular distal end radius fracture, base of first metacarpal fracture, hook of hamate fracture (Figure 1). The initial management was carried out by providing a plaster of Paris (POP) slab and transferring the patient to the ward where the patient

was managed haemodynamically. Limb elevation was performed and anti-inflammatory drugs were given. CT-scan was done to assess the fracture and plan the definitive procedure. CT-scan confirmed the radiological findings.

The patient received a definitive procedure 4 days after the initial trauma. Intraoperatively the dorsal approach was taken for the scaphoid and scaphoid was fixed with headless screw. The base of the first metacarpal was fixed with the help of Joshi's external stabilization system (JESS) fixator and the distal end radius was fixed with the help of K-wires. The scapholunate and lunatotriquetral ligaments were repaired. The whole construct was stabilized with the help of an external fixator (Figure 2). There were no postoperative complications and the patient was visited in a regular follow-up schedule.

The external fixator was removed after 4 weeks of operation. This was followed by gentle mobilization of the wrist. Initially the patient complained of

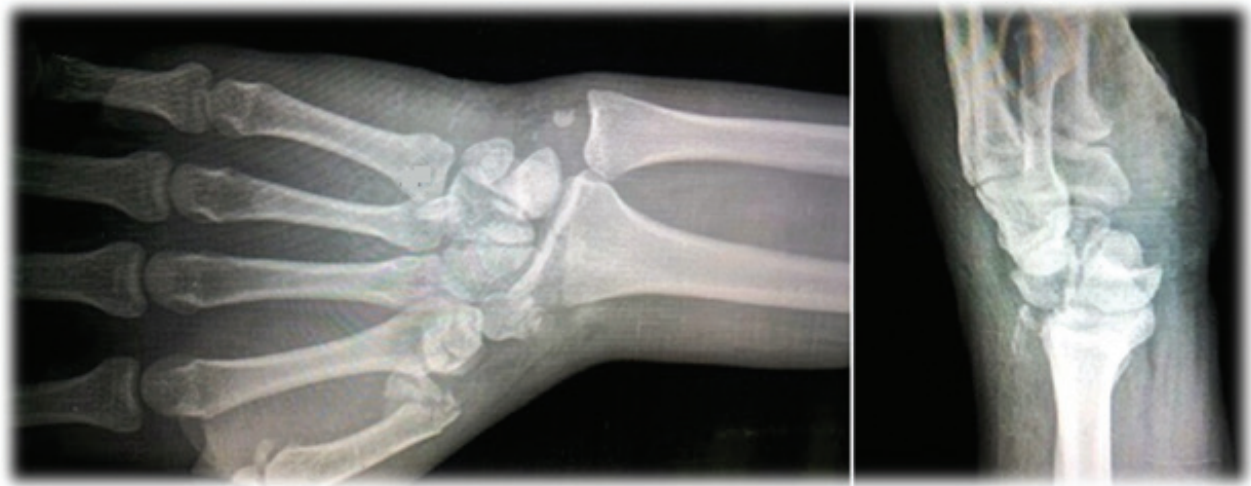


Fig. 1. Anteroposterior radiography of the left wrist demonstrating fracture of radial styloid, base of first metacarpal and scaphoid with discontinuity of Gilula lines (A). Lateral radiography of the left wrist demonstrating perilunate dislocation (B).



Fig. 2. Postoperative anteroposterior and lateral radiography of left wrist demonstrating Herbert screw fixation for scaphoid fracture, K-wire fixation for radial styloid and external fixator.

stiffness which quickly resolved after 2 weeks of regular physiotherapy. The range of motion at the end of 18 weeks was (Figure 3):

- Wrist flexion: 30 degrees
- Wrist extension: 50 degrees
- Pronation/supination: 90/70
- Finger grip: Good

For a quantitative assessment of the functional status of the wrist the patient was evaluated using the Patient related wrist evaluation score [3] (PRWE) after the removal of the external fixator. The score was found to be 53. This clinical assessment was done every 2 weeks and by the end of 12 weeks the score had decreased to a score of 11. The patient suffered from no late complications like infection and also there was no pin tract infection.

Discussion

Fracture dislocation of the carpal bones is quite uncommon. This case constituting transradial,

transscaphoid, transcapitate, perilunate dislocation and managed successfully is even more uncommon. Mostly the perilunate fracture dislocation consist of axial loading with hyperextension and ulnar deviation, it seems that in our patient there was axial loading with radial deviation based on the injury and position of the wrist at the time of admission. In fact we have not been able to find out any case report even after extensive search of the literature. This reported fracture pattern had a unique set of circumstances. This constituted the entire greater arc of injuries (Figure 4).

Conway *et al.*, [4] reported in a small case series of three translunate palmar perilunate fracture subluxations of the wrist in which 2 of the fractures were associated with scaphoid waist fractures. This paper concluded that the longitudinal force through the capitate is the primary reason for the proximal lunate fracture. In our case, axial loading was accompanied with radial deviation which would explain the radial styloid fracture.



Fig. 3. Postoperative clinical exam after 18 weeks demonstrating full range of motion (A) and complete grip strength (B).

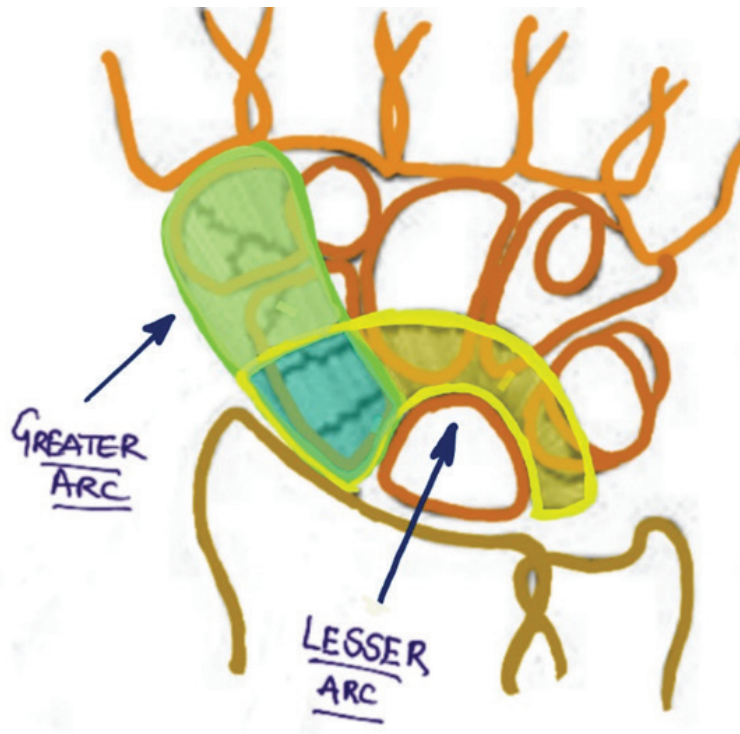


Fig. 4. Diagram demonstrating greater arc injuries which includes injuries passing through the scaphoid, capitate, and triquetrum and often results in transscaphoid or transscaphoid transcapitate perilunate fracture-dislocations as seen in our case.

In our case the scaphoid was fixed which provided the stability along with JESS fixators. We made every effort to get the soft tissue as anatomical as possible. Intraoperative analysis revealed the injury to the lunatotriquetral and the scapholunate ligament. Since there was no involvement of the median nerve, a common complication, hence the fracture dislocation was approached from the dorsal aspect. In such cases the volar incision is preferred if there are signs of median nerve neuropathy. This volar approach is advantageous in releasing the flexor retinaculum.

Complex fractures dislocations of the wrist are a challenge for any surgeon. To this effect many surgeons have even advocated proximal row carpectomy [5,6]. This has been advised to prevent late complications like decreased range of motion, loss of grip strength and severe pain. PRC would also increase the range of motion and decrease the chances of arthritic changes later on in life. Our patient was a student and did not require doing any heavy lifting and also considering

the age and the durability of the PRC we decided to go ahead with the repair as fine movements were required of the patients. The outcome in our patient was satisfactory and he achieved good functional range of motion [7]. The quantitative functional analysis showed marked improvement as observed by the decreasing score of the Patient related wrist evaluation score. The lower the score of the PRWE, the better is the functional outcome. The score at the end of 3 months showed good functional recovery and justified our use of this treatment modality.

In conclusion, carpal injuries are difficult to diagnose and require good clinical and radiological acumen for the correct diagnosis. No generalized treatment can be formulated for such fractures. These fractures should be tailor made for specific fractures and according to the functional needs of the patients to attain full satisfaction and complete recovery of the patients.

Conflict of Interest: None declared.

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