

Trans-scaphoid and trans-capitate perilunate fracture-dislocation of the wrist with concomitant ipsilateral fractures: a case report

Hooman Shariatzadeh¹, Davood Jafari², Mehdi Ramezan Shirazi³,
Mohammad Ghorban Hoseini⁴

Department of Trauma Surgery, Shafa Yahyaian Hospital, Tehran University of Medical Sciences, Tehran, Iran.

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Abstract

All perilunate fracture-dislocations combine bone avulsions, ligament disruption and fractures in different forms. The most frequent pattern is the dorsal trans-scaphoid perilunate fracture-dislocation. The reported risk of missed initial diagnosis in perilunate dislocations is as high as 20%. Concerning pathomechanics of the perilunate fracture-dislocation, it should be noted that most dorsal injuries usually result from a fall on the outstretched hand or motor vehicle accidents although other mechanisms are also mentioned. We describe here a case of dorsal trans-scaphoid trans-capitate perilunate fracture-dislocation together with posterior olecranon fracture-dislocation of the left upper extremity. To the best of the authors' knowledge, such a case with this concomitant elbow fracture-dislocation has not been previously reported in the literature.

Keywords: Perilunate, fracture-dislocation, posterior, olecranon fracture-dislocation

Introduction

Of all wrist dislocation, the perilunate is the most common type of dislocation. There is ligament disruption typically begins radially and propagates around the lunate. It may be associated with different carpal fractures which the most common pattern is the trans-scaphoid perilunate fracture-dislocation [1,2] which constitutes approximately 50% of these injuries [1-5].

Injury to the distal radius, ulna and carpal bones may accompany the perilunate dislocations which depend on the mechanism and the type of injury involved [6].

We describe a case of dorsal trans-scaphoid trans-capitate perilunate fracture-dislocation together with posterior olecranon fracture-dislocation of the left upper extremity. The clinical,

radiologic, and surgical approaches related to this case are discussed.

Case report

An informed written consent was obtained from the patients. A 19-year-old male patient was brought by ambulance to the emergency department. He was a right hand dominant manual worker and sustained a severe injury of his left upper extremity due to a fall from approximately five meters height. The patient could not describe the incidence thoroughly but remembered that he fell on the outstretched hand. The chief complaints were pain, swelling of the non dominant elbow and wrist.

On physical examination, the patient was hemodynamically stable and no evidence of head and chest injuries was detected. There was no

1. Assistant Professor of Orthopedic Surgery, Tehran University of Medical Sciences, Tehran, Iran. Email: h-shariatzadeh@tums.ac.ir

2. Associate Professor of Orthopedic Surgery, Tehran University of Medical Sciences, Tehran, Iran. Email: d_jafari@tums.ac.ir

3. **Corresponding author**, Resident of Orthopedic Surgery, Tehran University of Medical Sciences, Tehran Iran. Tel: +9821 33542022, email: Mehdi.shirazi@yahoo.co.uk

4. Resident of Orthopedic Surgery, Tehran University of Medical Sciences, Tehran Iran. Email: dr_ghhoseini@yahoo.com

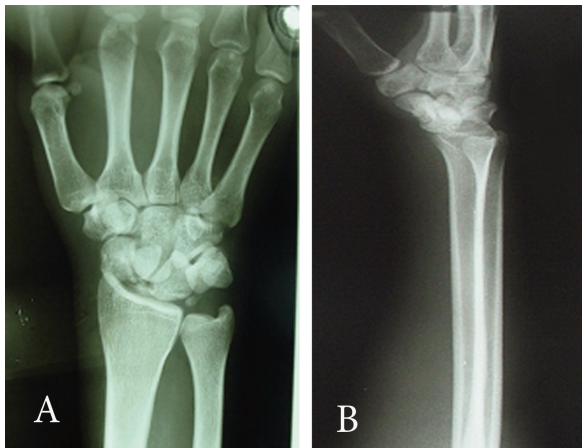


Fig. 1. The AP (A) and Lateral (B) x-rays of the wrist showing dorsal trans-scaphoid trans-capitate perilunate fracture dislocation.

history of unconsciousness. On examination of the left elbow, there were marked swelling, tenderness, deformity and limitation of active and passive motion. Also, left wrist tenderness, marked swelling and slight paresthesia over the median nerve territory of the left hand were found. Radial and ulnar pulses could be palpated. Apart from superficial abrasion on the palm of the right hand, no other apparent injuries were observed.

The x rays of left upper extremity revealed a dorsal trans-scaphoid trans-capitate perilunate fracture-dislocation - Stage IV Mayfield (Figure 1) together with posterior olecranon fracture-dislocation (Fig. 2). The CT scan of the el-

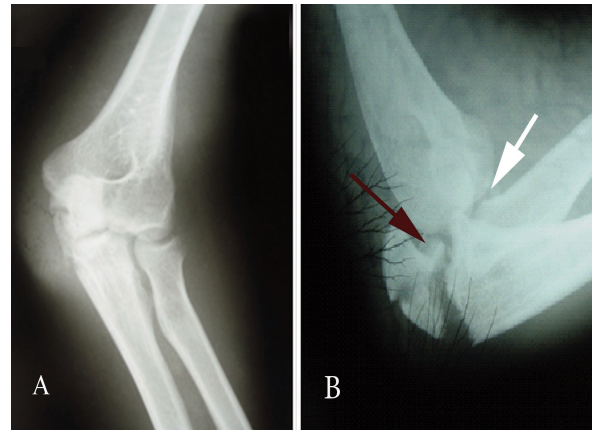


Fig. 2. The AP (A) and lateral (B) x-rays of the left elbow showing posterior olecranon fracture-dislocation. The thin arrow shows coronoid avulsion while the thick one notes the radial head fragment.

bow and wrist were done to delineate the exact pattern of the fracture-dislocation (Fig. 3).

The patient was taken to the operating room for closed reduction in the night. Closed reduction of perilunate fracture-dislocation by Tavernier's maneuver was attempted [7] and elbow dislocation under general anesthesia seemed unsuccessful. Therefore, the patient was scheduled as the first case for the morning.

Initially, fracture-dislocation of the elbow was exposed through a posterior midline approach. The olecranon was fixed with tension band wiring. Following this, elbow open reduction performed which was unstable due to Lateral collateral ligament (LCL) tear. Radial head

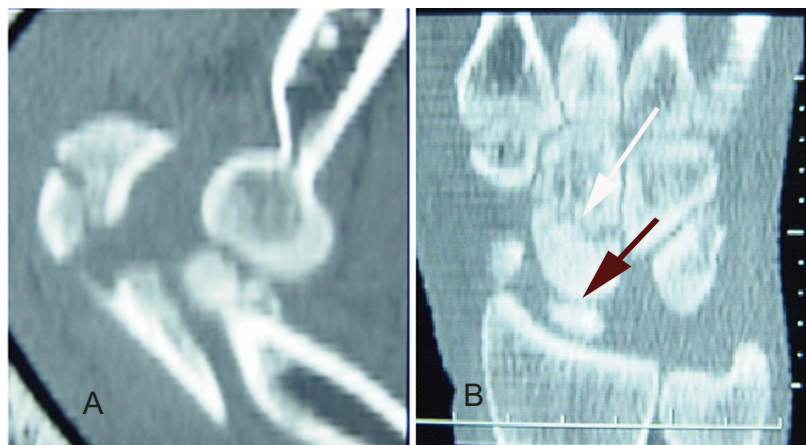


Fig. 3. The CT scan of the elbow and wrist; A. The CT scan of the elbow (Sagittal section). B. The CT scan of the wrist (Coronal section). The thin arrow shows capitate fracture. The thick one reveals locking of the scaphoid proximal fragment between the radius and capitates.

fracture was anatomically reduced and fixed with a T-plate 1.5 and LCL repaired (Fig. 5B). The dorsal incision was then carried out for the perilunate fracture-dislocation. Interestingly, the proximal portion of the scaphoid was locked between the proximal fragment of the capitate and radius (Fig. 5A). This can be an explanation of the unsuccessful attempted for closed reduction. At first, the proximal fragments of the scaphoid and capitate were anatomically reduced respectively. The lunate was aligned and pinned to the distal radius. The lunotriquetrum joint was fixed by a second k-wire. Nonetheless, capitate and scaphoid were fixed by two pins separately. Bone grafting of the scaphoid harvested from distal radius was also performed. Scapholunate interosseous ligament was intact. Postoperatively, the patient had an above elbow plaster cast (Fig. 4).

Discussion

Concomitant dorsal perilunate fracture-dislocation and ipsilateral elbow fracture-dislocation are extremely rare injuries. The reported risk of missed initial diagnosis in perilunate dislocations is as high as 20% [1] which may increase with elbow injury in the high energy setting.



Fig. 4. The AP and lateral postop x-rays of the wrist showing the radiolunate and lunatocapitate pinning and fixation of scaphoid/capitate with 2 k-wires.

Concerning pathomechanics of the perilunate fracture-dislocation, it should be noted that most dorsal injuries usually result from a fall on the outstretched hand or motor vehicle accidents although other mechanisms are also mentioned [3,4,5]. It seems that in the present case, the mechanism of the perilunate fracture-dislocation is extension and ulnar deviation of the hand. Moreover, the axial compressive load causes posterior olecranon fracture-dislocation.

The type of surgical approach is also controversial. Some authors [1,8,9] prefer a dorsal ap-

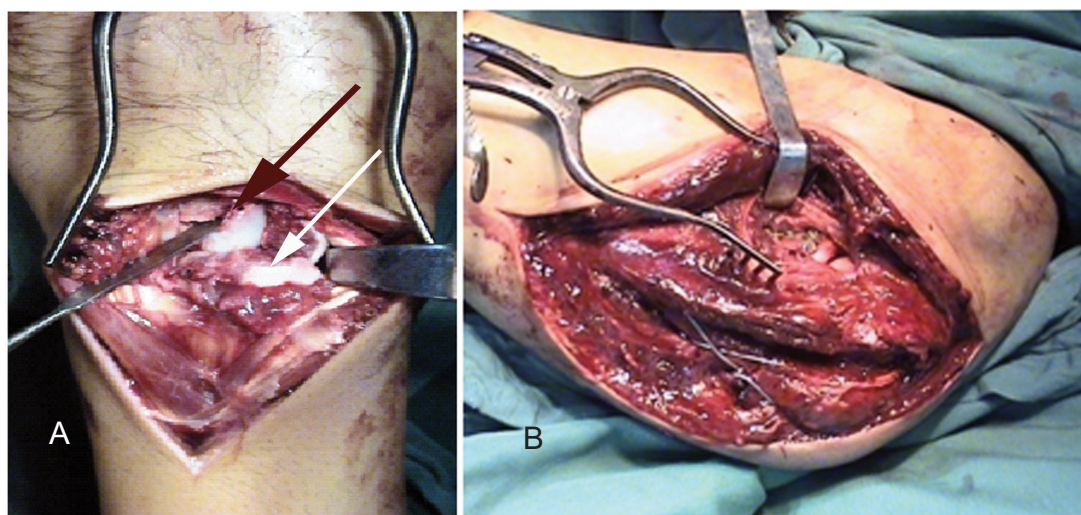


Fig. 5. Intraoperative photography. A. The intraoperative photography of the wrist. The thick arrow shows capitate fracture while the thin one reveals scaphoid fracture. B. The intraoperative photography of the elbow fracture-dislocation showing tension band wiring of the olecranon fracture and plate fixation of the radial head (Arrow).

proach as it provides good exposure of proximal carpal row and midcarpal joint. An additional palmar approach should be applied if there is any neurovascular problem. In contrast to the above authors' opinion, Moneim [10] found that median nerve injury is not an indication to add a volar incision due to the definite nerve recovery. This was also observed in the case.

Many variations can be detected depending upon the amplitude and direction of forces. This case has many interesting and unusual aspects. The combination of different injuries in the present case has not been previously reported in English literature.

In summary, we reported a case of dorsal trans-scaphoid trans-capitate perilunate fracture-dislocation associated with concomitant elbow fracture-dislocation with its peculiar clinical and radiographic features which revealed an extremely rare variant of one of the most common perilunate instability.

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