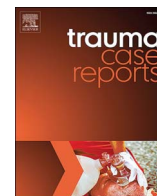


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Case Report

Trans-triquetral Perilunate fracture dislocation

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A B S T R A C T

Perilunate dislocations and perilunate fracture dislocations are rare and serious injuries. Perilunate dislocations represent less than 10% of all carpal injuries of which 61% represent transscaphoid fractures. Because of their rarity, up to 25% of perilunate dislocations are initially missed on first assessment. We present the case of a 66-year-old-gentleman who sustained an isolated trans-triquetral perilunate fracture dislocation while walking his dog. This was diagnosed in the emergency department and he underwent open reduction internal fixation after failed attempts at closed reduction in the ED and in theatre under general anaesthesia. After further removal of his Kirschner wires and physiotherapy he is noted to have had a successful outcome with his treatment at 9 months follow up post operatively. We found that this is the first case of its kind reported in the literature highlighting the rarity of this injury pattern.

Introduction

Perilunate dislocations are rare injuries, when they are associated with fractures of the carpal bones as part of a greater arc injury they usually progress from radial to ulnar with the scaphoid most commonly affected [1]. We report an isolated fracture of the triquetrum associated with perilunate dislocation. We have found that this is the first case reported in the literature highlighting the rarity of this injury pattern. This creates further evidence in addition to Leung et al. that isolated carpal injuries can occur and progress ulnarly to radial contrary to Mayfield's classification. Both cases support the evidence that early open reduction internal fixation provides the best outcomes post operatively for the patient [2].

Case Presentation

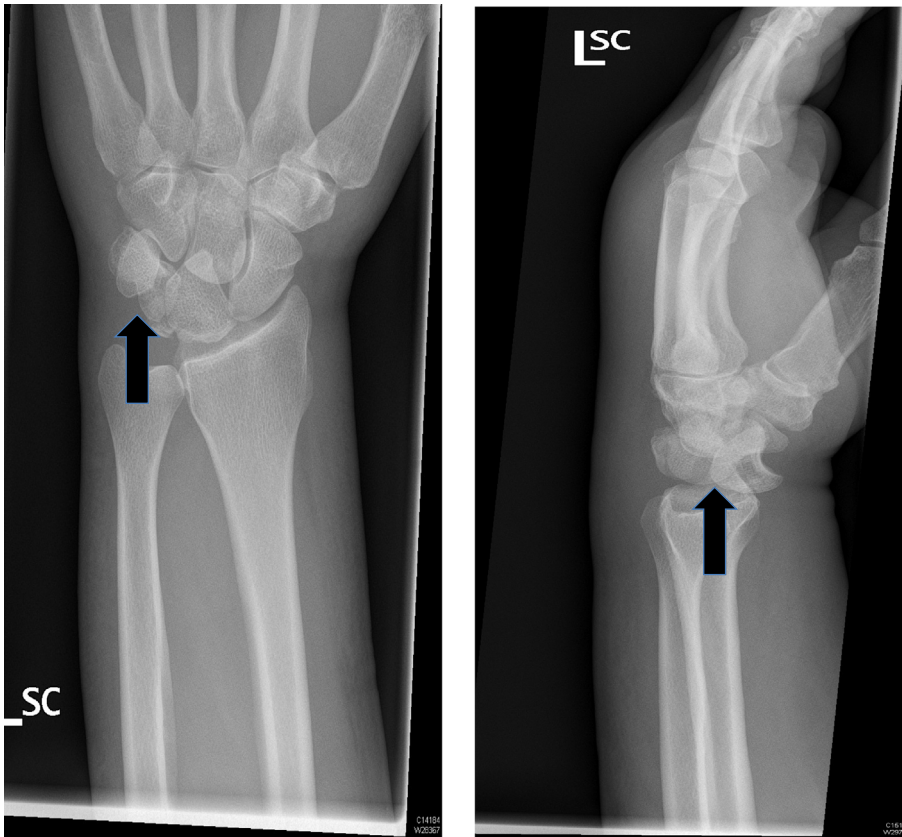
A 66-year-old left hand dominant gentleman, initially presented to the Emergency department one day after sustaining a fall as a result of being pulled down by his dog while on the lead. He fell on his left outstretched hand and impacted the heel of his hand. He complained of pain and swelling in his left hand and was unable to move the wrist. Plain radiographs (Figs. 1 & 2) demonstrated a peri-lunate dislocation with a Triquetral fracture and these findings were confirmed with a CT scan. Attempts at closed reduction were unsuccessful both in the Emergency department under sedation and in the operation theatre under general anaesthesia.

Investigations

Initial radiographs conducted in the emergency department as well as a CT scan of the wrist. Intraoperatively, imaging was used

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Figs. 1, 2. Preoperative AP and lateral Radiograph, initial x-rays taken in the A&E department on presentation, triquetrum fracture present with perilunate dislocation.

and repeat radiographs were taken at follow up in clinic.

There was no pre-operative MRI as the diagnoses of a ligament injury was made clinically, based on the pattern of injury. It was not possible to reduce the fracture-dislocation in the emergency department and a MRI would have likely delayed treatment. Additionally, the injury occurred during a bank holiday where MRI was not available.

Differential diagnosis

1. Perilunate dislocation
2. Transscaphoid perilunate fracture dislocation

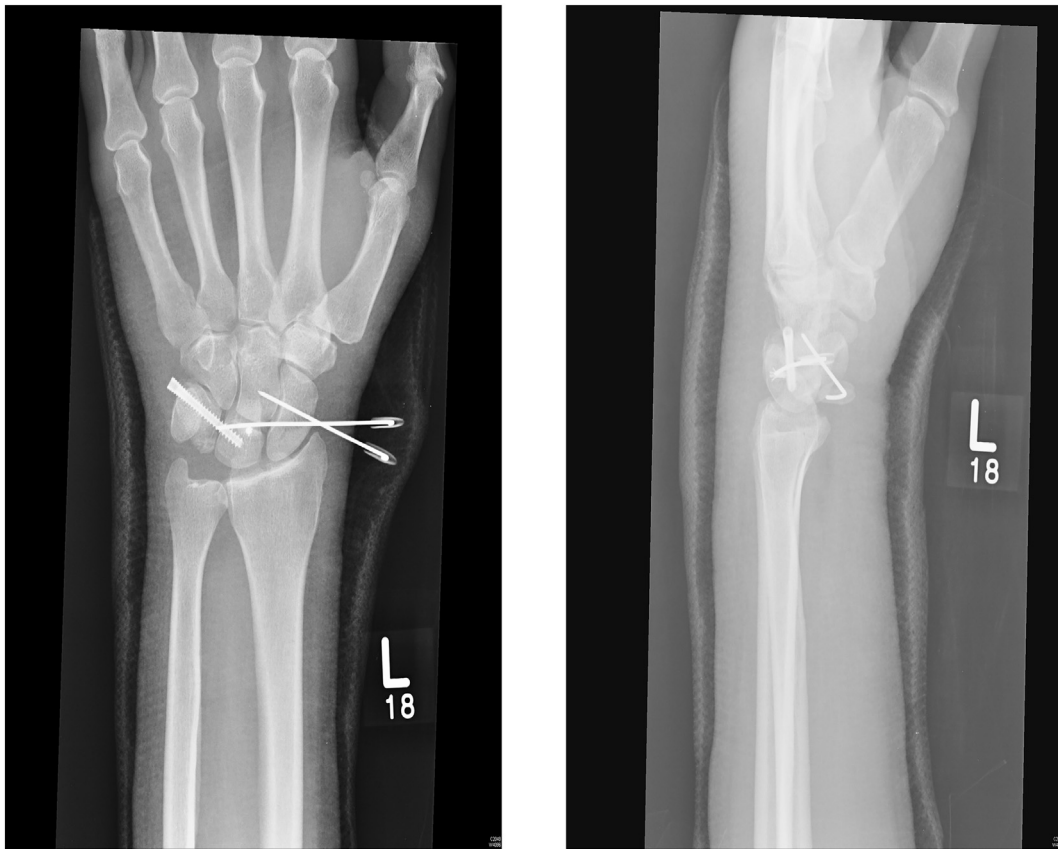
Outcome and follow up

Thereafter an open reduction of the lunate was performed using a volar bed of FCR approach and a carpal tunnel decompression was performed simultaneously. A dorsal approach to the wrist using a Burger's flap was used to approach the scapho-lunate articulation. The previously described joystick technique was used to restore normal alignment between the scaphoid and the lunate and the scapho-lunate ligament was repaired using suture anchors. The repair was protected with two Kirschner wires from the scaphoid to the Capitate and scaphoid to the Lunate. The Triquetrum fracture and the Trapezio-lunate articulation was stabilised using a headless compression screw (Acutrak). Figs. 3 & 4 show the postoperative radiographs.

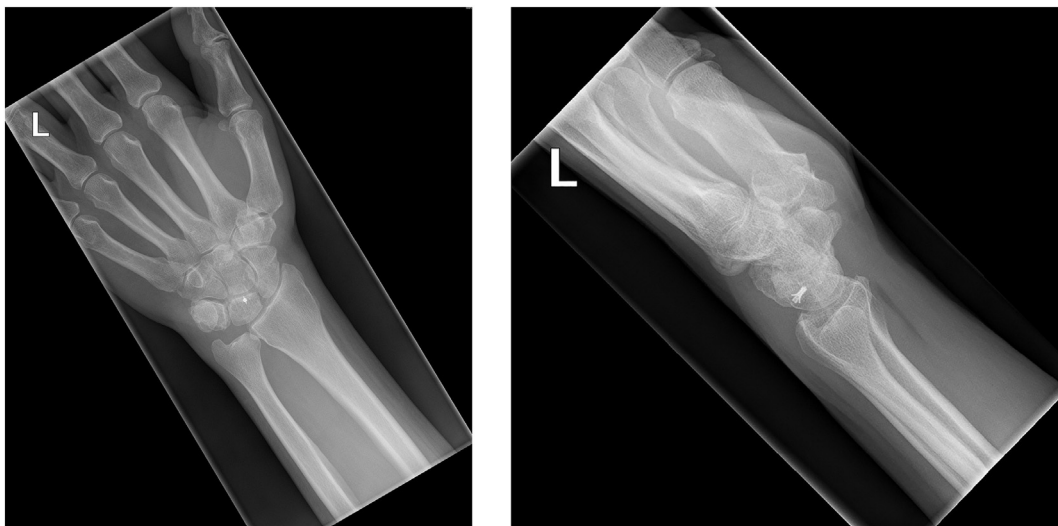
The wrist was immobilised in a below elbow backslab post operatively which was changed to a short arm cast on follow up at two weeks time. The Kirschner wires and the cast were removed in the out-patient clinic 6 weeks post operatively and the screw was removed under general anaesthetic at 8 weeks. This gentleman was then referred for hand physiotherapy and at final follow up 9 months post operatively, he was noted to have good function and no pain with an excellent score of 1.7 from the 100-point DASH questionnaire. Flexion in the left wrist was noted to be slightly reduced at 60°, compared to 75° on the right. Other wrist movements had a normal range of motion with no comparable difference to the right (Figs. 5 & 6).

Discussion

Perilunate dislocations and perilunate fracture dislocations are rare and serious injuries. Perilunate dislocations represent less



Figs. 3, 4. Post-operative AP and lateral Radiograph, acutrak screw in triquetrum, suture anchors visible used to repair scapho-lunate ligament, repair protected with two Kirschner wires from scaphoid to capitate and scaphoid to lunate.



Figs. 5, 6. Final post-operative AP and lateral radiographs at 8 months follow up, acutrak screw and kirschner wires removed suture anchor still present.

than 10% of all carpal injuries of which 61% represent transscaphoid fractures [3], Because of their rarity, up to 25% of perilunate dislocations are initially missed on first assessment [2]. They are associated with the development of radio carpal arthritis, carpal dislocation and median nerve damage if missed.

We could not find any previously described cases of an isolated Triquetral fracture and a peri-lunate dislocation. Leung et al. [4], described a transtriquetral dorsal perilunate fracture dislocation with avulsion fractures of the radial and ulnar styloids. Unlike our

case the scapholunate ligament was preserved, as were other ligaments.

Mayfield [1], described four stages of progressive perilunar instability wherein the injury progresses from stage 1 to 4 with increasing traumatic force from radial to ulnar side. In this case, however, it is possible that the injury may have started ulnarly with the Triquetral fracture and progressed radially towards the scapho-lunate ligament or the Triquetral fracture may represent stage 3 of the Mayfield classification instead of Luno-triquetral ligament injury.

This may be due to the unusual mechanism of injury. If the traumatic force was directed primarily towards the triquetrum on the ulna aspect of the wrist this could explain the unusual pattern of injury and how it could have progressed from the ulna aspect contrary to the Mayfield Classification. The concept of a reverse greater arc injury may be possible.

Level of evidence: 4.

Learning points

1. Perilunate dislocation is an important and easily missed rare diagnosis in the emergency department.
2. Perilunate dislocation can be isolated or associated with a fracture, the majority of which are transscaphoid.
3. According to the Mayfield classification of perilunar instability the injury progresses from radial to ulna however in this case the pattern of injury may progress from the ulna side.

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