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A case of acute trans-scaphoid volar dislocation of the lunate into the distal forearm

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ABSTRACT

Trans-scaphoid volar dislocation of the lunate with displacement into the distal forearm proximal to the radiocarpal joint is an extremely rare, high energy injury with extensive ligament disruption. They are unstable and require open reduction and internal fixation with repair of ligaments. They are associated with significant morbidity and loss of function. We report the case of a patient with this injury. Open reduction, internal fixation and ligament repair were done. The patient had a good functional outcome.

1. Introduction

Trans-scaphoid volar dislocation of the lunate with displacement of the trans-scaphoid-lunate unit into the volar aspect of the distal forearm is extremely rare with only few similar cases reported in the literature so far^[1–3]. Here the lunate and proximal pole of scaphoid are displaced proximal to the radiocarpal joint and lie in the superficial soft tissues of the forearm. This is a high energy injury with extensive ligamentous disruption which is usually caused by falling on the outstretched hand with the wrist hyper extended. It is unstable and requires open reduction and internal fixation^[1,3,4]. Early surgery gives better results^[1,3,4]. These injuries are associated with significant morbidity and loss of function. Open injuries and delayed treatment are associated with poor results^[3,4].

We report the case of a patient with this injury for whom open reduction and internal fixation with repair of the volar resulted in a good functional outcome.

2. Case report

A 40-year-old right hand dominant male air conditioning technician presented to the emergency room after falling from a height of 4 m with multiple injuries.

He had multiple rib fractures with hemopneumothorax, fractures of the 12th dorsal and first lumbar vertebra and unstable pelvic fracture.

His right wrist X-rays showed trans-scaphoid fracture dislocation with displacement of the lunate and proximal pole of scaphoid into the volar distal forearm 5 cm proximal to the radiocarpal joint (Figure 1). There was no neurovascular deficit.

At admission, the patient was hemodynamically unstable. After initial stabilisation with intravenous fluids and blood transfusion, the pelvic fracture was fixed. Wrist surgery was performed the following day. Through the volar extended carpal tunnel approach, the carpal tunnel was decompressed. The proximal pole of the scaphoid and the lunate were found lying as a unit under the flexor digitorum superficialis muscle bellies in the distal forearm about 5 cm proximal to the radiocarpal joint. There was a transverse rent in the volar capsule. The scaphoid fracture was reduced and fixed with Kirschner wires. The lunate was reduced and fixed with Kirschner wires into the capitate, triquetrum and distal radius (Figure 2). The volar capsule was repaired.

Postoperatively, the limb was kept in a below elbow plaster cast for 8 weeks after Kirschner wires were removed and mobilisation started. A wrist support was continued for an additional 4 weeks. At ten years of follow-up, the patient was pain free. He had full range of supination and pronation. Wrist extension was 50° and flexion was 52° as compared to 55° of extension and 55° of flexion, respectively, on the opposite side, with full radial and ulnar deviation. His grip strength as measured with the Jamar dynamometer (J A Preston, Jackson, Michigan, USA) was 80% as compared to the normal side. He has a Mayo Wrist Score of 80. He was back to his old job as air

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Figure 1. Lateral and AP views of the wrist showing trans-scaphoid volar dislocation of the lunate with displacement of the trans-scaphoid-lunate unit into the distal forearm 5 cm proximal to the radiocarpal joint.



Figure 2. Immediate postoperative X-rays showing open reduction and internal fixation with Kirschner wires.



Figure 3. At 5 years of follow-up, X-ray showing arthritic changes in the wrist.

conditioning technician. X-rays showed scaphoid nonunion with advanced collapse (SNAC) changes (Figure 3). However, despite the radiological changes, the patient had a good functional outcome.

3. Discussion

Trans-scaphoid volar dislocation of the lunate with displacement of the trans-scaphoid-lunate unit into the distal forearm proximal to the radiocarpal joint is a rare injury. It has the worst prognosis among all carpal dislocations^[5]. The usual mechanism of injury in these cases is a fall from height on the outstretched hand leading to forced hyperextension of the wrist. There is considerable tearing of volar capsule and carpal interosseous ligaments^[5]. Closed reduction is difficult to achieve and maintain when a scaphoid fracture accompanies dislocation^[3]. Early open reduction gives better results. In our case, the patient was hemodynamically unstable at arrival. Life threatening injuries needed priority and he was taken for definitive surgery of the wrist at the earliest possible time. The volar extended carpal tunnel approach was used. It has its advantages. The dislocated bones lying on the volar aspect of the distal forearm can be easily accessed. The carpal tunnel can be decompressed. Usually, there is a transverse rent in the capsule which can be repaired through this approach. We feel that repair of this capsular tear is very important as this increases the stability. Immobilisation has to be continued for at least 8 weeks. Early mobilisation can lead to loss of reduction. Delay in reduction, severity of soft tissue injury, open wounds, inadequate reduction and fracture nonunion all have negative influence on results^[3,4].

Radiographic evidence of arthritic changes does not necessarily mean a poor functional outcome^[2]. Despite the ten years postoperative X-ray showing features of SNAC wrist, our patient had a good range of pain free motion and he was able to go back to his original work. He was happy with the final outcome. So open reduction with internal fixation, capsular repair and ligament repair, if possible, should be the initial treatments for such injuries rather than a proximal row carpectomy^[2]. We feel that PRC could be done in cases of failed open reduction with internal fixation or cases that have arthritic changes with poor functional outcome.

Conflict of interest statement

The authors report no conflict of interest.

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