

## CASE REPORT

# Volar Perilunate Dislocation with Acute Median Nerve Compression: A Case Study and Literature Review

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## ABSTRACT

**Introduction:** Perilunate dislocations, lunate dislocations, and perilunate fracture-dislocations are rare injuries (< 10% of all wrist injuries). Volar lunate dislocations are severe carpal injuries occurring after high-energy trauma to a wrist and fall on outstretched hyperextended hand.

**Case study:** We present a case of a 35-year male who developed paraesthesia in the distribution of median nerve after injury. On examination, there was the prominence of lunate on the volar aspect of the hand. Wrist dorsiflexion was 30°, volar flexion 45°, radial deviation 10°, and ulnar deviation 20°. A full range of pronation and supination was possible. The sensation was reduced in the distribution of the median nerve. No thenar, hypothenar or intrinsic muscle wasting was present. Plain radiograph and CT scan revealed volar lunate dislocation.

**Management and results:** Manual reduction was tried in an emergency under sedation. Then the patient was shifted to the operating room for open reduction and stabilization. The volar approach was used. Carpal tunnel release was done simultaneously. Lunate was reduced and stabilized with scapholunate and lunotriquetral K-wires. Scapholunate ligament was repaired. Above elbow, slab support was given postoperatively. Sutures were removed two weeks after surgery. Slab support was removed after four weeks. Wrist splint was given for further four weeks. Gentle wrist physiotherapy was started. At final follow-up, wrist dorsiflexion was 45°, palmar-flexion was 70°, the ulnar deviation was 30°, and the radial deviation was 20°.

**Conclusion:** Volar lunate injuries are uncommon. Compression of the median nerve can occur due to a volar displacement of lunate. These injuries need to be identified and treated appropriately for better outcomes.

**Keywords:** Compression, Dislocation, Median nerve, Perilunate

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**Conflict of interest:** None

## INTRODUCTION

Perilunate or lunate or such perilunate fracture-dislocations are uncommon injuries (< 10% of all wrist injuries).<sup>1</sup> Volar lunate dislocations can occur after high-velocity trauma. These are due to fall on outstretched hand which is hyperextended.

## CASE STUDY

### Clinical History

We present a case of a 35-year male who had high energy injury to the wrist. There were acute swelling and severe pain in the wrist. There was paraesthesia along the median nerve distribution. On examination, lunate was prominent on the volar side. Wrist dorsiflexion was 30°, volar flexion 45°, radial deviation 10°, and the ulnar deviation was 20°. Pronation and supination were full. There was a decreased sensation in the distribution of the median nerve. There was no muscle wasting being an acute injury.

### Radiology

Plain radiographs posteroanterior (PA) and lateral views of the wrist showed a break in Gilula's lines or arcs. There was an overlap between the capitate and lunate bones. The lunate looked triangular like a "piece of the pie." Usually, the radius, lunate and capitates are in one line. This colinearity is lost in lunate dislocation.<sup>2</sup> The scapholunate angle is greater than 70 degrees (Fig. 1). CT scan was done for better anatomical understanding.

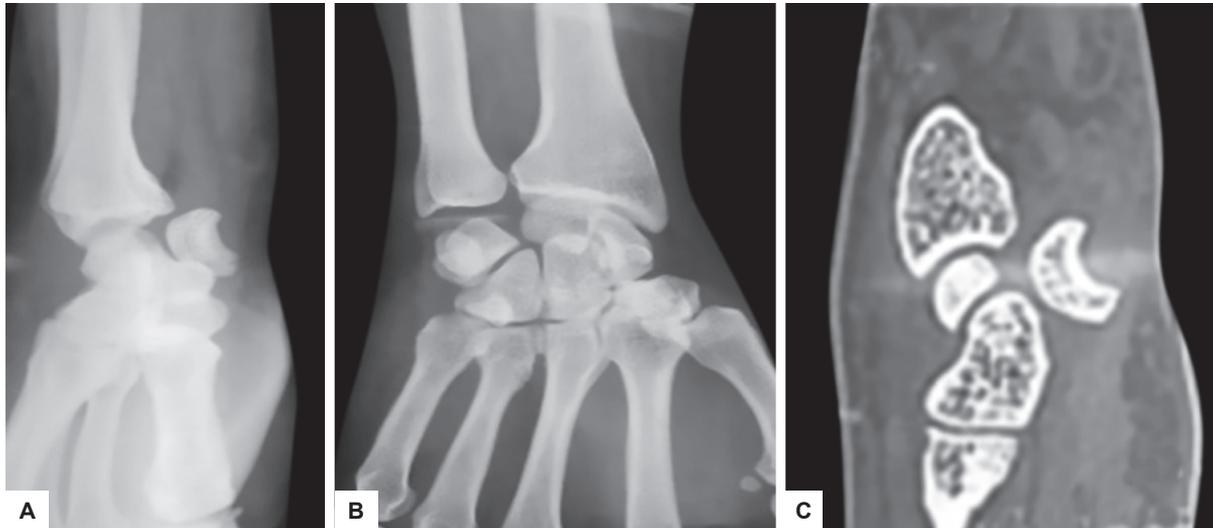
## MANAGEMENT AND RESULTS

The manual reduction was tried in an emergency under sedation. Then the patient was shifted to the operation theatre for open reduction and stabilization. The volar approach was used. Carpal tunnel release was done simultaneously. Lunate was reduced and stabilized with scapholunate and lunotriquetral K-wires (Fig. 2). Scapholunate ligament was repaired. Above elbow, slab support was given postoperatively. Sutures were removed two weeks after surgery. Slab support was removed after four weeks. Wrist splint was given for further four weeks. Gentle wrist physiotherapy was started. At final follow-up, wrist dorsiflexion was 45°, palmar-flexion was 70°, the ulnar deviation was 30°, and the radial deviation was 20°.

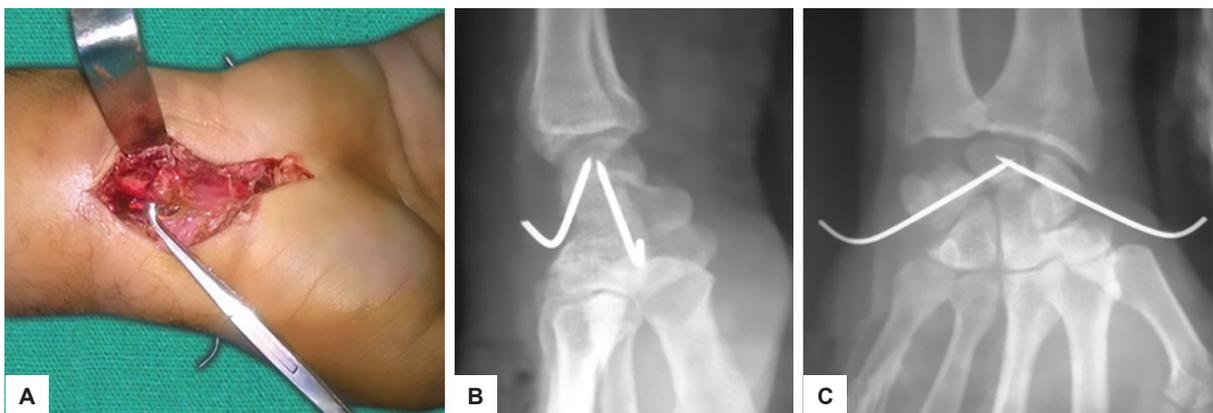
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**Figs 1A to C:** (A and B) Plain radiographs and CT scan (C) Volar lunate dislocation



**Figs 2A to C:** (A) Intraoperative volar approach and (B and C) After reduction and fixation by K-wires

## DISCUSSION

Lunate dislocation/perilunate dissociation is high-energy injuries with poor functional outcomes. These are one of the commonly missed injuries on early presentation. This missed injury rate may be quite high as 25 percent.<sup>3</sup> Various categories have been described—(a) perilunate dislocation where lunate stays in position while the carpus dislocates and (b) lunate dislocation where lunate is forced volar or dorsal while the carpus remains aligned. Perilunate dislocations are additionally divided into following types—trans-scaphoid-perilunate, perilunate, transradial styloid and trans-scaphoid transcarpitate-perilunar dislocations.

**Injury mechanism:** It is usually due to high energy trauma when the wrist is extended and deviated ulnarward causing supination force between carpals (intercarpal supination). Pathoanatomic progression involves initial disruption of scapholunate ligaments followed by disruption of capitulunate joint; lunotriquetral joint and finally failure of the dorsal radiocarpal ligament. These ligaments are major stabilizers of the proximal carpal row. When these are disrupted, lunate rotates

and dislocates, usually into the carpal tunnel. This may lead to median nerve compression as in the present case. Median nerve injury signifies Mayfield progression stage IV injury.<sup>4,5</sup>

The dislocation can course through the greater arc with ligamentous disruptions and associated fractures of the radius, ulna or carpal bones. It can also course through the lesser arc where the injury is purely ligamentous in nature. Management is usually operative as nonoperative treatment has universal poor outcomes in such injuries.

## Surgical Approach

In acute injuries presenting within 6-8 weeks, immediate closed reduction and splintage are done. This is followed by open surgery, repair of ligaments and bony fixation. Also, carpal tunnel release is also done when indicated. The approach whether it is dorsal, volar or combined is controversial. We approached by extended volar incision to facilitate carpal tunnel release. In spite of operative management, return to full function is very unlikely. Wrist stiffness and decreased grip strength are common.

Chronic neglected or missed injuries may need proximal row carpectomy or wrist arthrodesis.<sup>6</sup>

## CONCLUSION

Volar lunate injuries are uncommon. Compression of the median nerve can occur because of a volar displacement of lunate. These injuries need to be identified and treated appropriately for better outcomes.

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