

The Stickshift K-Wire Reduction Technique For Lunate And Perilunate Dislocations Of The Wrist: Report Of 2 Cases

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Citation

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Abstract

Manipulation of carpal bones, open or closed, may be facilitated by a kirshener wire used like a car gear lever or "stickshift".

CASE 1

A 41-year-old male injured his non-dominant left wrist following a fall on to his outstretched hand. Physical examination revealed a swollen, tender wrist. Range of motion was restricted and painful. There was paraesthesia in the median nerve distribution of the left hand. Radiographs of the left wrist revealed a perilunate dislocation without any associated fractures (Fig 1a).

Attempts at closed reduction under general anaesthesia were unsuccessful. Hence after preparing and draping, a K-wire was inserted into the dorsum of the lunate under image intensification. The K-wire was then used as a lever to reduce the lunate successfully – "dorsal stickshift" (Fig 1b). The flexed scaphoid was reduced using thumb pressure and by deviating the wrist ulnarwards. The scaphoid was then transfixed to the lunate with another K-wire to control the scapholunate dissociation. A below elbow cast was then applied.

The median nerve paraesthesia completely resolved over two weeks. The K-wire was removed at four weeks but plaster immobilization continued for a further two weeks. At six weeks wrist mobilisation was commenced. At three months, the patient had a reasonable range of movements but x-rays revealed an increased scapholunate interval. The patient has since then undergone a scapholunate ligament reconstruction augmented by dorsal capsulodesis.

Figure 1

Figure 1a: Antero-posterior and lateral radiograph of the wrist showing peri-lunate dislocation.



Figure 2

Figure 1b: Intra-operative radiograph showing K-wire used as a dorsal stickshift lever.

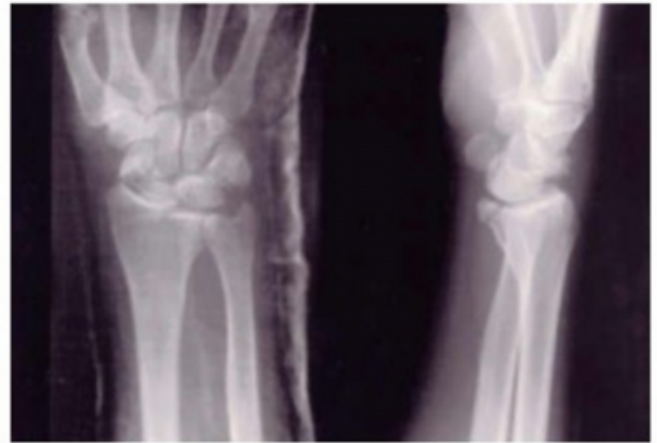


CASE 2

A 22-year-old male was brought to the casualty department after a fall from a height of 25-30 feet sustaining multiple injuries. He also had marked swelling and tenderness of the right wrist. Radiographs revealed a transscaphoid volar lunate fracture-dislocation with intra-articular distal radius fracture (Fig 2a).

Figure 3

Figure 2a Antero-posterior and lateral radiograph of the wrist showing trans-scaphoid volar lunate fracture-dislocation with intra-articular distal radius fracture.



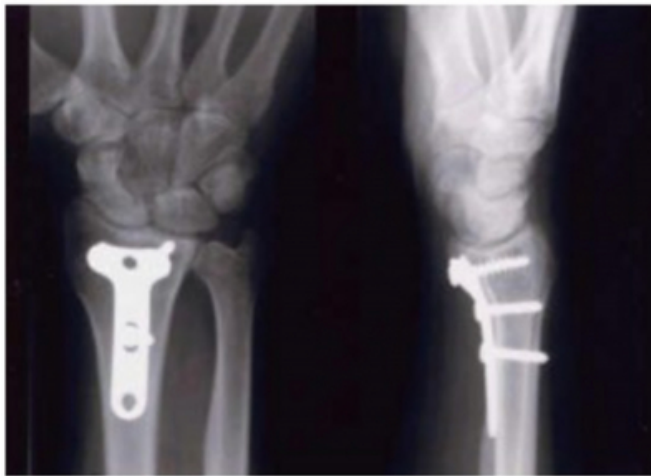
Under general anaesthesia an open reduction was carried out through a volar approach. Reduction of the lunate was achieved using a K-wire inserted into it from the volar aspect and used as a lever arm - “volar stickshift”. The scaphoid fracture was reduced and fixed with two K-wires. The scaphoid was then transfixed to the lunate using another K-wire. Ligament reconstruction was not performed. The distal radius fracture was stabilised with a T-plate. A scaphoid type cast was applied.

The K-wires and plaster were removed at six weeks and gentle wrist mobilisation commenced. At 2 years after surgery, the patient had no pain or limitation of activity.

Palmar flexion of the wrist was 70%, while dorsiflexion and grip strength was 100% of the opposite side. Radiographs revealed that the fracture had healed, scapholunate interval was maintained with no dissociation, and there were no degenerative changes in the carpus (Fig 2b).

Figure 4

Figure 2b: Antero-posterior and lateral radiograph two years after operation.



DISCUSSION

Lunate and perilunate dislocations are comparatively uncommon and constitute about 10% of all carpal injuries [1]. Mouchet and Tavernier first described the pathomechanics resulting in a perilunate dislocation in 1919. The mechanism they described was one of hyperextension. In 1980, Mayfield et al [2] studied the pathomechanics and specific pattern of ligament disruption in progressive perilunate instability that led to first a dorsal perilunate dislocation and subsequently a volar lunate dislocation. They described not only hyperextension but also forced intracarpal supination as being involved in the pathomechanics of these injuries.

Fracture-dislocations of the wrist are, fortunately, unusual injuries. If not properly treated, they may result in persistent wrist instability with severe functional handicap [3,4,5]. Various treatment options exist, including closed reduction and plaster immobilisation, open reduction and internal fixation plus/minus ligament repair, trapeziolunate external fixation, limited wrist arthrodesis, and even primary carpectomy of the proximal row [6,7,8,9,10,11].

Whatever the chosen treatment option, whether closed or open, anatomical reduction of the scaphoid and lunate is of paramount importance. In cases of difficult reduction, the stickshift K-wire technique is a simple but effective method to achieve reduction and can be used both from volar or dorsal aspect as the case may be. The use of K-wires in wrist injuries has been casually mentioned in past literature [12], but no one has formally described a reduction technique

using them.

However, even after successful relocation of the perilunate injury, the scapholunate dissociation may remain as the residual problem, as was evidenced in the first case [13]. Scapholunate ligament reconstruction augmented by dorsal capsulodesis is the recommended treatment in such cases.

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