Reminder of important clinical lesson

Transscaphoid perilunate dislocation – a tale of two carpals?

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Correspondence to Dr Gordon W Cowell, gordoncowell@nhs.net**Summary**

The authors describe two cases of perilunate dislocation with transscaphoid fractures both presenting following hyperextension injuries within 4 days of each other at a district general hospital. After initial management in accident and emergency, both patients underwent open reduction and internal fixation under general anaesthetic, with plaster cast immobilisation and careful clinical follow-up. Given the relative rarity of this injury, the significance of the radiological findings, the degree of associated bony and ligamentous damage and the need for prompt intervention may be overlooked. Thus, a summary of presentation and management of the condition is given to aid junior emergency staff in diagnosis and initial management.

BACKGROUND

Such injuries are associated with a loss of function including a reduction in grip strength and the range of flexion and extension. These cases are described in order for the significance of this injury and the need for prompt instigation of treatment to be highlighted, particularly among junior medical staff and emergency nurse practitioners who may have a limited experience of the injury, given its rarity.

CASE PRESENTATION

Case 1, a 21-year-old right handed bricklayer, presented the morning after a hyperextension injury to his right wrist. On examination in accident and emergency, there was swelling to the dorsal aspect of the right wrist with bruising around the thenar eminence. He was tender over the distal ulna and anatomical snuffbox. Flexion and extension were both limited with pain on movement. Plain radiographs of the right wrist showed a perilunate dislocation with a displaced mid-pole scaphoid fracture (figure 1a).

Case 2, a 66-year-old right handed retired male, suffered a right wrist hyperextension injury following a fall. On examination of the wrist, there was moderate swelling and tenderness generally over the carpus with minimal flexion and extension possible. Plain radiographs of the right wrist revealed a transscaphoid perilunate dislocation (figure 2a).

INVESTIGATIONS

Figures 1a,b and 2a,b demonstrate the pre and post-treatment appearances of the plain radiographs of both patients.

TREATMENT

For case 1, initial treatment in accident and emergency involved ensuring adequate analgesia prior to immobilisation of the wrist in a backslab. Later that day, he underwent manipulation of the carpus under general anaesthesia to reduce the perilunate dislocation prior to open reduction and internal fixation (ORIF) of the scaphoid fracture with a Herbert screw (figure 1b).

Initial management was very similar for case 2, with suitable analgesia and immobilisation in a backslab following clinical evaluation and imaging. The following morning under general anaesthesia, initial closed reduction of the perilunate dislocation was not successful and an ORIF was subsequently performed, with K-wire fixation of the scaphoid (figure 2b).

OUTCOME AND FOLLOW-UP

At 6-week review, case 1 had no significant complications and had begun mobilisation of the wrist, with regular physiotherapy input.

Case 2 also had a satisfactory 6-week review with union on the scaphoid fracture and maintenance of reduction of the lunate. Given the manual nature of his job, a longer period of absence from work is anticipated in order to maximise the final functional outcome.

DISCUSSION

Perilunate dislocation with a transscaphoid fracture is commonly associated with high-impact falls with the wrist hyper-extended with a degree of ulnar deviation.¹ It is also associated with a significant degree of additional trauma to the wrist, with rupture of the radioscaphocapitate, scapholunate interosseus and lunotriquetral ligaments. In addition to scaphoid fracture, perilunate dislocation also may coexist with fractures of the radial styloid, trapezium, capitate and triquetrum, as well as median nerve injuries. It has been evident for some time that perilunate dislocations with a scaphoid fracture carry a significantly poor prognosis,² with over a half of cases suffering comminuted fractures, with visible cartilage damage in less than one third of cases.³

The true incidence of perilunate fracture dislocations is difficult to estimate. Such injuries have been estimated to account for less than 10% of carpal injuries and 61% of these are associated with a transscaphoid fracture.⁴ The majority reported are of dorsal displacement of the scaphoid, with just 3% of cases displaying volar displacement.⁵

Failure to identify these injuries can lead to several complications, including non-union of the scaphoid, avascular

Figure 1 (a) Case 1's presentation radiographs, demonstrating a mid-pole fracture of the scaphoid and the dorsally dislocated lunate, most evident on the lateral view. (b) Case 1's postoperative radiographs with Herbert screw fixation and reduction of the perilunate dislocation.

Figure 2 (a) Pre and postoperative plain radiographs for case 2, also with a dorsal dislocation of the lunate with a transscaphoid fracture. (b) Postoperative appearances of case 2's wrist, with reduction of the perilunate dislocation and K-wire fixation of the scaphoid fracture.

necrosis, intercarpal collapse and continuing wrist instability. In one study, surgical repair achieved a total range of movement of 91% and 80% of the grip strength of the unaffected wrist.⁴ Patients were followed up for a mean of 44.3 months with average time to union of the scaphoid of 16 weeks. Twenty three of 25 patients returned to their previous employment. This correlates with other studies which have demonstrated generally good functional outcome following surgery, with good functional motion, grip strength and good pain reduction.⁶ However, even with early surgical intervention, the incidence of post-traumatic arthritis is over 50% and loss of reduction and arthrosis are also common complications.⁷ With the diagnosis in 25% of perilunate dislocations and fracture dislocations initially missed,⁴ it is important for the accident and emergency junior doctor to

recognise the hallmarks of this injury, particularly as prompt open surgical reduction and fixation is associated with high patient satisfaction,⁵ and radiological appearances do not correlate well with functional outcome.

Clinical assessment involves ascertaining the patient's age, sex, occupation, previous medical history, as well as hand dominance and the pattern of injury, including the length of time between presentation and the injury, any preceding treatment and the precise mechanism of the injury.⁸ Examination of the injured wrist would often reveal non-specific signs of deformity, swelling, tenderness and restricted movement. Neurovascular status of the hand at presentation should also be carefully documented.

In addition to the routine anteroposterior (AP) and lateral views, lateral radiographic views of the wrist,

two further oblique views or a scaphoid series should be requested to exclude an associated scaphoid fracture. Knowledge of the relevant anatomy is needed. The carpal bones forming the carpus are arranged into two arcs, with a proximal row consisting of the scaphoid, lunate, triquetrum and pisiform, while a distal row contains the trapezium, trapezoid, capitate and the hamate. The carpus is markedly convex from side to side posteriorly and is concave from the anterior. Gilula⁹ described three radiographic arcs that define usual carpal anatomy. The first arc followed the convex curvatures of the proximal surfaces of the scaphoid, lunate and triquetrum, while the second outlined the distal concave curvatures of these bones. The third arc followed the proximal curvatures of the capitate and hamate. Disruption of these three arcs is indicative of damage to the carpus. Widening of the gap between the scaphoid and lunate on an AP film of more than 2 mm suggests scapholunate dissociation and possible injury to the scapholunate ligament.

Management in accident and emergency centres on prompt recognition of the injury with symptomatic relief, temporary volar plaster immobilisation and a referral to an orthopaedic or a hand surgeon. Closed reduction should not be attempted in the accident and emergency setting, and prompt intervention is critical.

Learning points

- ▶ A transscaphoid fracture with associated perilunate dislocation is a serious injury requiring prompt referral to orthopaedics or a hand surgeon.
- ▶ Open reduction under general anaesthetic with fixation is the gold standard treatment.
- ▶ Initial accident and emergency management involves a good clinical history and examination, followed by temporary wrist immobilisation in a cast prior to surgical intervention along with adequate analgesia.
- ▶ Subsequent loss of function is common, with extended clinical follow-up and physiotherapy often required to ensure a successful return to work and normal function.

Competing interests None.

Patient consent Not obtained.

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