



Figs 4a and b. Dorsal perilunate dislocation. Despite a relatively normal looking AP view (a), the empty lunate can be seen on the lateral view (b).

Scaphoid fractures

An established scaphoid non-union is an extremely difficult problem to deal with and is associated with high complication rates. Like many orthopaedic conditions, the correct primary management results in the best and optimal outcome. Scaphoid fractures are unfortunately commonly missed. The patient often considers the initial injury relatively trivial, and 2 or 3 days after the injury the wrist seems to be improved and the patient does not seek further attention. The second scenario is that the initial treating clinician sees the patient for radiographs. The original radiographs might fail to reveal the scaphoid fracture and the patient is discharged. The correct management will be discussed. Pointers to a suspected scaphoid fracture are extreme tenderness over the anatomical snuffbox. Tenderness in this area points to a scaphoid waist fracture. A more distal fracture of the scaphoid towards the tubercle will result in tenderness over the scaphoid tubercle. Firm thumb pressure flexion should be applied to the scaphoid tubercle of the volar aspect of the wrist and thumb base. Proximal pole fractures are difficult to diagnose clinically. A high index of suspicion should be maintained. If, after clinical suspicion of a scaphoid fracture is aroused, the radiographs are negative, the clinician has two options. The first would be to place the arm in a scaphoid plaster for 2 weeks and then X-ray again when the arm is out of plaster. This is a reasonable option and will have to be discussed with the patient regarding time off work and financial implications. A more sensitive and timeous way of confirming or denying a scaphoid fracture would be with an MRI scan. Almost immediately the

MRI scan will show some evidence of bone oedema in the scaphoid and the radiologist will be able to comment on the likelihood of a fracture based on the type of MRI sequence performed (Figs 5a and 5b).



Figs 5a and b. Crack fracture of the scaphoid (a) develops into a difficult-to-treat non-union (b) if not recognised and immobilised.

Hand immobilisation and rehabilitation

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The hand is a beautifully designed sensate and extremely mobile structure, which if compromised leads to marked morbidity and disability. Therefore, all clinicians should have a clear understanding of the techniques and strategies used to minimise hand swelling.

Injury to the hand can vary widely from a clean incision to a dirty crush injury, from burns to the damage caused by infection.

All causes of tissue injury result in the predictable response of inflammation, which is characterised by pain, swelling and loss of function.

The swelling results in a large amount of exudative fluid being deposited into the interstitial tissues. It is therefore both pain and mechanical obstruction that limit movement. Inflammation heals by fibrosis, with resultant stiffness and loss of function.

The two mainstays of avoiding or limiting the amount of swelling that will affect the hand are elevation and early motion. Starting immediately after an injury, the hand should be above the level of the heart 24 hours a day. Therefore, elevation should be maintained while walking, standing, sitting and lying. Over and above elevation, early motion has been shown to be a major determinant of the amount of swelling. It has been shown that opening and closing the fist a single time is equivalent to 6 hours of elevation in terms of oedema control. Most hand injuries are extremely painful and the use of analgesics to control pain will facilitate early active motion. In addition, immediate referral to a physiotherapist will help with the early mobilisation programme.

Despite an understanding of the need for early motion, the degree of trauma and accompanying pain to the hand is sometimes severe and may restrict the ability to mobilise early. Extreme swelling and resultant fibrosis is therefore unavoidable. It is up to the treating clinician to then 'allow' the development of stiffness, but in a physiological chosen position. It is recognised that the traumatised hand will immediately adopt the 'wounded paw position' (Fig. 1). In this position, the intrinsic muscles of the hand are completely relaxed. The metacarpophalangeal (MP) joints are held in full extension, and the interphalangeal (IP) joints of the fingers are flexed. This is the exact opposite of the 'safe position' of the hand (Fig. 2). In this position, the MP joints are flexed 90°, the wrist is extended 30° and the IP joints are fully extended. The thumb may be placed in any position as long as it is away from the palm. Allowing the thumb to become stiff against the palm results in a contracted first web space, which is a difficult condition to overcome. It might take a substantial analgesic dosage and/or regional or general anaesthesia to manipulate the hand into the safe position and thereafter apply a dorsal plaster of Paris slab or thermoplastic splint to maintain this position.



Fig. 1. 'Wounded paw' hand after sepsis. Note the MP joints in extension and the proximal IP joints in flexion.



Fig. 2. The 'safe position' held in place with a splint.

With the hand now in the safe position, elevation can be maintained until there is early reduction of the swelling (this is normally noted by wrinkling of the skin). Thereafter, the splint can be judiciously removed. Administration of analgesics must be maintained and the physiotherapist can start early active and passive range of motion exercises.

Summary

- The first goal is elevation and early motion. This might require analgesic support and physiotherapy intervention.
- If the trauma is excessive, the patient will not be able to mobilise and will invariably end up developing stiffness in a non-anatomical position.
- The hands of these patients need to be manipulated into the 'safe position' and immobilised temporarily.
- The safe position is with the MP joints flexed 90° and the IP joints fully extended. The thumb is kept away from the palm.
- Once the initial swelling subsides, the

splint can be removed intermittently for active exercises and rehabilitation.

- Rehabilitation needs to be continued until maximum or normal range of motion is achieved. The judicious use of physiotherapy and occupational therapy by a dedicated hand therapist is advised.

Wrist pain

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Like many musculoskeletal joint pathologies, the wrist may be affected by a wide variety of clinical entities. This, combined with the

Table I. Summary of wrist pain

Zone of discomfort Pathology	Brief clinical description	History pointers	Examination	Special investigations
Dorsal Dorsal wrist syndrome/ occult ganglion	Diffuse clinical spectrum ranging from partial injury to scapholunate ligament to early ganglion formation	Age 15 - 35	Point tenderness over dorsal scapholunate ligament	Ultrasound/MRI
Kienböck disease (uncommon)	Avascular necrosis of lunate bone	Gradual onset of pain	Loss of extension together with dorsal swelling/synovitis	X-ray/MRI
Dorsoradial De Quervain's	Tendon entrapment of APL and EPB in 1st dorsal compartment	Often mothers with young infant	Often nil to find except strongly positive Finkelstein's test (thumb in palm, forced ulna deviation of wrist)	Nil
Wartenberg's syndrome	Radial nerve neuritis – uncommon	Direct blow to radial side of wrist or tight band around wrist	Positive Tinel over the radial sensory nerve Decreased sensation dorsum 1st web space	Nil
Intersection syndrome (very uncommon)	Inflammation between wrist extensors and thumb extensors	Paddlers/rowers/sailors		Nil
Radial Scaphoid pathologies	Can range from acute fracture to non-union	Usually a history of trauma		X-ray
Radioscaphoid arthritis	Can present years later			X-ray
Scaphotrapezial trapezoid (STT osteoarthritis)	Often occurs in combination with thumb arthritis	Severe pain on forced radial deviation (reverse Finkelstein test)		X-ray
Volar radial Volar ganglion	More common in women 2nd most common wrist ganglion which originates from the volar wrist ligaments		Point tenderness between FCR and radial artery	Nil
Flexor carpi radialis tendinitis	Nil	Pain usually associated with STT arthritis	Nil	Nil
Base of thumb osteoarthritis	Very common cause of wrist & thumb pain	Pain on pinching, writing, opening jars, etc.	Tender base of thenar muscles. Strongly positive crank and grind test	X-ray
Volar Carpal tunnel syndrome	Most common entrapment neuropathy involving median nerve	Nocturnal symptoms Pins and needles	Positive Tinel test and positive Phalen's test	Nil