

64 Wrist injury

64.1 Introduction

There is rarely any indication to intervene surgically for wrist injuries. Even without perfect reduction, many fractures heal with excellent functional result if you pay attention to detail. Most injuries to the wrist result from a fall onto an outstretched hand.

The distal radius can fracture in 2 ways, by hyperextension (which is common) or hyperflexion (which is unusual). These are most easily distinguished on a lateral radiograph.

(a) Hyperextension fractures:

- (1) Usually a transverse fracture <2.5cm from the wrist joint with the distal fragment displaced dorsally (Colles fracture), often with fracture of the ulnar styloid.
- (2) The distal radial fragment is comminuted or T-shaped.
- (3) The fracture line enters the joint, often with fracture of the radial styloid.

(b) Hyperflexion fractures:

- (1) A transverse fracture <2.5cm from the wrist joint with the distal fragment displaced forwards (Smith's or reversed Colles fracture).
- (2) The fracture line enters the joint, with the palmar fragment dislocating proximally (Barton's fracture).
- (3) Comminuted fractures may include a flexion component.

FLEXION & EXTENSION WRIST FRACTURES

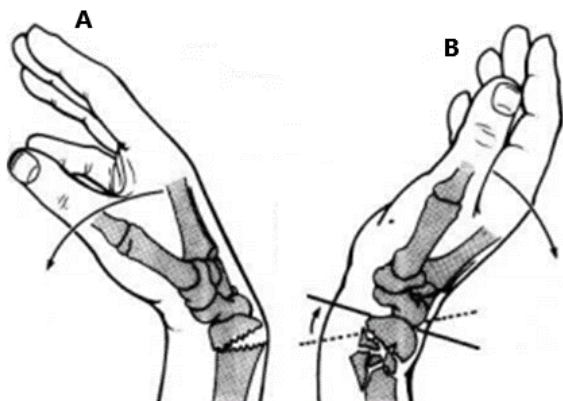


Fig. 64-1 FLEXION AND EXTENSION FRACTURES. A, in the lateral view, the flexion fracture has the distal radial joint surface tilted in flexion more than the norm (10°). B, in an extension fracture it is tilted less to volar, most often even to dorsal.

(c) **Scaphoid fracture**, across its middle, when the wrist is hyperextended & radially deviated. This may result in avascular necrosis of its proximal half (58-8B).

(d) Various types of carpal ligament rupture.

Alone or in combination with scaphoid fracture, this leads to carpal instability. If disarrangement of carpal bones is visible on radiographs, it is called *static carpal instability*. If the deformity becomes only visible under arthroscopy or stress radiographs, it is called *pre-dynamic* or *dynamic carpal instability* respectively. This can cause pain, a limited range of motion and osteoarthritis in the long run.

- (1) The lunate may separate from the scaphoid (scaphoid subluxation). This or a scaphoid fracture may cause avascular necrosis of the lunate (58-8C).
- (2) Dorsal displacement of the carpus may leave only the lunate in contact with the radius (perilunate dislocation), and be associated with a radial styloid fracture or fracture of any carpal bone.
- (3) When the hand snaps forward again, the lunate may be dislocated anteriorly (lunate dislocation).
- (4) The 2 rows of carpal bones may dislocate in relation to each other (mid-carpal dislocation). Small fractures of the triquetrum imply a ligament injury, but are of no consequence.

EXAMINING THE WRIST

Observe the wrist for swelling and deformity, and feel for warmth and tenderness.

Check for movements of ulnar & radial deviation.

Ask the patient to put both palms together, as in a position of prayer, and then to raise the elbows. Then compare the dorsiflexion in both wrists.

Then ask to put the backs of the hands together with the elbows at right angles. Compare palmar flexion in both wrists.

Then with the elbows in this position, check pronation & supination (63-1). If pronation and supination against resistance is pain free, the wrist and carpus are stable, if not, there may be an undetected problem.

CAUTION! Always examine the elbow. There may also be a fracture of the radial head.

If the radial styloid is no longer distal to the ulnar styloid, this implies a radial fracture. Its replacement is a useful sign of adequate reduction.

Is the normal concavity in front of the injured radius filled by a tender hematoma?

Is there dorsal (a 'dinner fork' deformity), or palmar swelling?

SCAPHOID FRACTURE SPECIAL FEATURES:

- (1) Place a finger tip in the 'anatomical snuffbox' with the hand in full ulnar deviation and press (64-2A). Wincing suggests a fractured scaphoid. The radial nerve passes over the 'snuffbox', and pressing on this pressed may be painful, so compare both sides carefully. Occasionally, there is mild swelling in the 'snuffbox'.

- (2) Elicit pain only at the extreme ranges of palmar- & dorsi-flexion (64-2B)
- (3) Deviate the clenched fist radially, and percuss the middle metacarpal head to elicit pain. There may also be tenderness over the knuckles of the index and middle fingers, but none over those of the ring and little fingers (64-2C).
- (4) Pain on pronation & supination against resistance.

FOUR SIGNS OF SCAPHOID FRACTURE

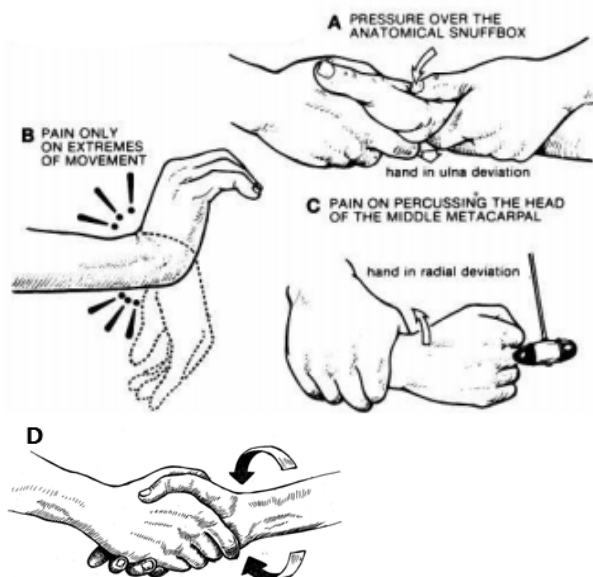


Fig. 64-2 FOUR SIGNS OF A SCAPHOID FRACTURE. A, tenderness at the bottom of anatomical snuff box over the scaphoid. B, pain only at the extremes of wrist extension & flexion. C, painful percussion with a patellar hammer over the head of the middle metacarpal. D, pain on pronation / supination against resistance.

The clinical appearance of carpal dislocations is not much different from that of wrist fractures. Rarely, there may be a gap palpable at the dorsum of the carpus or bony resistance in the ball of thumb region that is not there on a normal hand indicating a dislocated lunate.

Always test for circulation & sensation distally. A hematoma in the carpal tunnel or dislocated carpal bones may compress the median nerve, and cause paraesthesia or sensory loss on the palmar side of the thumb, index, & middle fingers, especially if you hold the wrist palmarflexed for 1min. In this case, swift fracture reduction and/or carpal tunnel release (32.17) are necessary to avoid persistent nerve damage.

Analyse the carpal bones by bone in both views. Compare it to images of normal wrists in books, online or from other patients. As a last resort, x-ray the patient's opposite wrist.

CAUTION! If you suspect a fracture, but the radiograph is normal, repeat it in 7-10days.

NORMAL WRIST ANATOMY & RADIOGRAPH

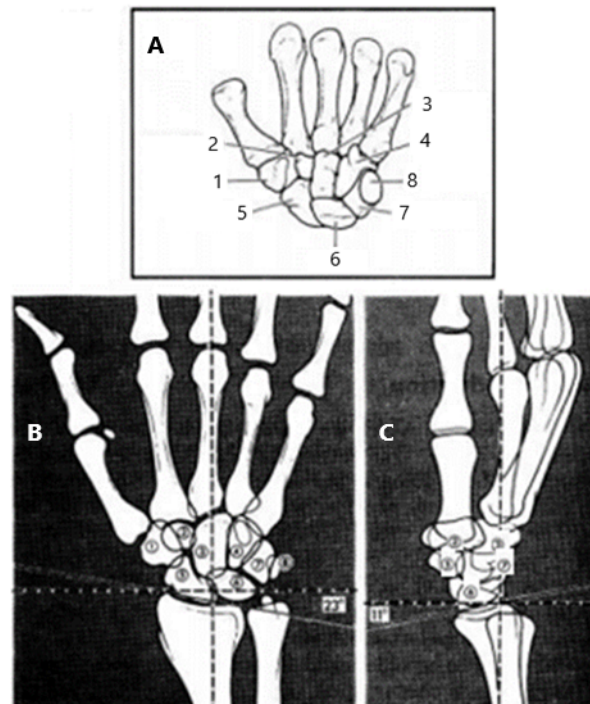


Fig. 64-3 WRIST ANATOMY A, the 4 distal carpal bones (trapezium 1, trapezoid 2, capitate 3, hamate 4) are tightly bound together, but the 4 proximal bones (scaphoid 5, lunate 6, triquetrum 7, pisiform 8) show considerable mobility. The pisiform is in effect a sesamoid bone for the *flexor carpi ulnaris* and plays no role in wrist stability. B, the a-p view and C, the lateral view with the wrist in a neutral position. show the articular surface of the radius to be angled medially c.23° and anteriorly c.11°. The radial styloid tip should be 2mm distal to the ulnar styloid tip.

64.2 Extension (Colles) wrist fracture

These are the most common human fractures. On hyperextension of the wrist, the distal end of the radius, and the tip of the ulnar styloid hits the triquetrum, either of which may break. In all cases, there will be a painful swollen wrist with reduced range of movement.

Radiographs are highly desirable, but if they are unavailable, rely: (1) on the nature of the injury (flexion or extension) and remember that, (2) if there is any displacement, the distal fragment will be displaced dorsally in extension, and anteriorly in flexion.

TREATMENT

Aim to restore as good an anatomical position as possible and maintain it until the fracture has healed well enough not to slip out of position after you remove the cast.

Make sure the fingers are always exercised!

COMMUNUTED COLLES FRACTURE

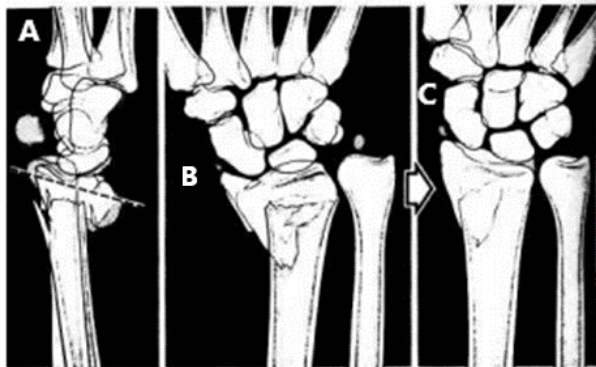


Fig. 64-4 A DISPLACED COMMUNUTED WRIST EXTENSION FRACTURE. A, lateral view with dorsal angulation of the distal radial fragment. B, a-p view before reduction: *N.B. the ulnar styloid is distal to the radial styloid.* C, after reduction.

A satisfactory position (before manipulation or after) is if angulation of the distal radial joint surface is 20-30° medially & 0-10° anteriorly, the ulnar side of the radius is distal or adjacent to the ulna, and there are neither steps nor gaps >2 mm in the articular surface in any view.

A fracture will remain unstable in a cast if >3 of these criteria exist:

- (1) dorsal angulation of the distal fragment >20°
- (2) any element of a flexion
- (3) comminuted metaphyseal fracture
- (4) radio-carpal joint involvement
- (5) radio-ulnar joint involvement
- (6) ulnar fracture as well as radial
- (7) radial shortening >2cm

Stable fractures (<3 criteria apply) you can treat satisfactorily by closed reduction and cast with good expectation of success. Even without perfect reduction, a good functional result is often achievable with exercises *even if a deformity remains.*

However, even a small crack involving the radio-ulnar joint may displace significantly on supination & pronation, and then give severe pain with this essential function of the wrist.

If a fracture is impacted in a reasonably good position with only moderate shift, and less than 15° of dorsal angulation, don't try to reduce it. It is stable enough to enable active movements to start at 4wks and thus reduce stiffness. Until then apply a slab to palmar surface of the arm and wrist suffices.

If the patient is >60yrs, do the same regardless of the fracture position. Osteoporosis will soon spoil your reduction and *function for eating and personal hygiene is what matters foremost.* At 3wks hold the cast in place with crepe bandages, and remove them for exercise. To regain pain-free function is all that matters.

N.B. Disregard fractures of the ulnar styloid.

Reducing a more severely displaced fracture is usually easy, but you must apply the cast properly to minimize the likelihood of the fragments slipping. *A poor end result is more often due to poor cast technique than incorrect fracture manipulation.* Radial instead of ulnar deviation of the distal fragment is the common mistake. Prevent this by making sure the patient's hand is in moderate ulnar deviation when you apply the cast.

If there is gross wrist swelling, it is better to elevate the wrist and wait (up to 48h) till the swelling has reduced, before attempting reduction. If you use Chinese finger splints, though, the fracture may even reduce on its own (59-13)!

ANAESTHESIA

(1) Local anesthesia of the fracture haematoma is very effective if the fracture is recent. Its disadvantages are: (a) risk of infection, and (b) it does not relax the muscles. Using careful aseptic precaution, insert the needle on the back of the forearm well above the wrist. Aim the needle a little proximal to the fracture, and advance it obliquely (64-5), so that it enters the fracture cavity; if you aspirate 'oil', this is emulsified fat; make sure you are then inside the haematoma, and inject 10ml, not more, of 2% lignocaine without adrenaline and wait 15 mins.

- (2) Regional (supraclavicular or axillary) blocks
- (3) Bier's block
- (4) Ketamine.

N.B. Nitrous oxide is rarely adequate.

WRIST FRACTURE REDUCTION (GRADE 1.3)

Lie the patient down. Elevate the forearm (63-11) Put a strap round the upper arm & apply 5 kg counterweight. Wait 10mins while the traction corrects the impaction. Alternatively use Chinese finger traps (59-13). At the end of this time the distal fragment will usually be free, enabling you to move it into position with minimum of effort.

If disimpaction has not occurred, ask an assistant to hold the upper arm and give counter-traction with the elbow flexed 90°.

For a *left* Colles fracture, hold the distal fragment with your *right* thumb on its dorsal surface, whilst gripping the forearm in full pronation with your *left* hand. Apply traction with your right hand, moving it to just distal to the fracture line, and further *increase* the deformity by dorsiflexing the distal fragment in order to free it (64-5A). Use the edge of a table as a fulcrum holding against the external side of forearm just proximal to the fracture. When the fracture is disimpacted, pull the wrist into maximum flexion and ulnar abduction (64-5B) so that the thumb that you are pulling on points to the floor.

If there is still a 'bump' palpable on the dorsal side of the wrist, try to mould it away from proximal to distal with your right thenar eminence (64-5C).

You should now have fully reduced the fracture, *but its position will slip if you release the traction, or the forces applying pressure & counter-pressure to the distal fragment are relaxed.*

N.B. Pronation will then usually maintain the reduction without traction.

Keep your left hand stationary whilst anchoring the reduction in full pronation. Maintain this position and slide your right hand from the position in 64-6C to holding the 1st 3 fingers (64-5D), in moderate ulnar deviation and slight palmarflexion; then get an assistant to apply the cast.

N.B. For a right Colles fracture, swop hands.

DISIMPACTION OF A COLLES FRACTURE

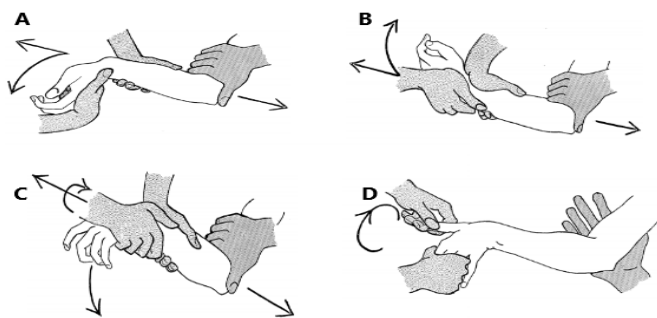


Fig. 64-5 DISIMPACTION OF A LEFT COLLES FRACTURE. A, with countertraction, hold the distal radial fragment with your right thenar eminence whilst holding the forearm with your left hand. Then increase the deformity by dorsiflexion. B, press the distal fragment in a palmar direction & flex the wrist. C, fully pronate the forearm whilst maintain traction & counter-pressure. D, hold the forearm in strong pronation by pulling on the thumb & the 1st three fingers only. After Charnley J, *The Closed Treatment of Common Fractures*. E&S Livingstone, Edinburgh 3rd ed. 1961

IMMOBILIZATION POSITION FOR A COLLES FRACTURE

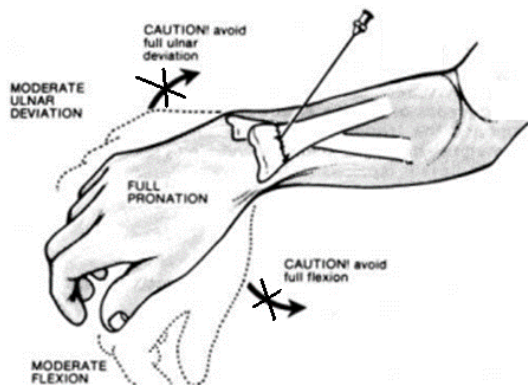


Fig. 64-6 HOW TO MAINTAIN REDUCTION IN A COLLES FRACTURE. Apply the cast in full pronation, in moderate flexion and in moderate ulnar deviation. In this position the extensor tendons passing over the back of the distal fragment hold it reduced. Extreme flexion or extreme ulnar deviation will cause a stiff wrist. (The needle shows the position for entering the haematoma for LA).

CAST TECHNIQUE

Follow the steps carefully and you will have less likelihood of the position slipping. *Remember that the cast should not just be dorsal, but radial.* The cast should reach most way along the forearm in order to achieve three-point action. *On its palmar aspect, the cast should be thick enough to take a permanent impression of your thenar eminence!*

Don't let the cast reach further than the distal palmar crease. Make sure the mcp joints are free, and the tip of the thumb can touch the index finger.

Hold the cast in place with a crepe bandage. *Make sure the plaster is not completely circular initially;* you can complete the plaster when the swelling has subsided, usually after 1wk.

If the fracture is unstable, continue the cast up the upper arm with the elbow at 90° in a young person. Alternatively, augment stability with external fixation:

FOLLOW-UP CARE

Check the cast!

- (1) Make sure the wrist is fully pronated, moderately palmarflexed & moderately ulnar deviated in the cast.
- (2) The mp joints must be free. If the cast extends too far distally, it will splint them in extension, and produce a stiff useless claw-like hand.
- (3) Make sure the fingers are pink and not numb.
- (4) Never put on a complete circular cast without splitting it through *all* its layers! Even if the swelling is not significant at first, *it will recur after your manipulation.* If the cast does not allow for the swelling, a compartment syndrome (49.6) may result.

CAST FOR A COLLES FRACTURE

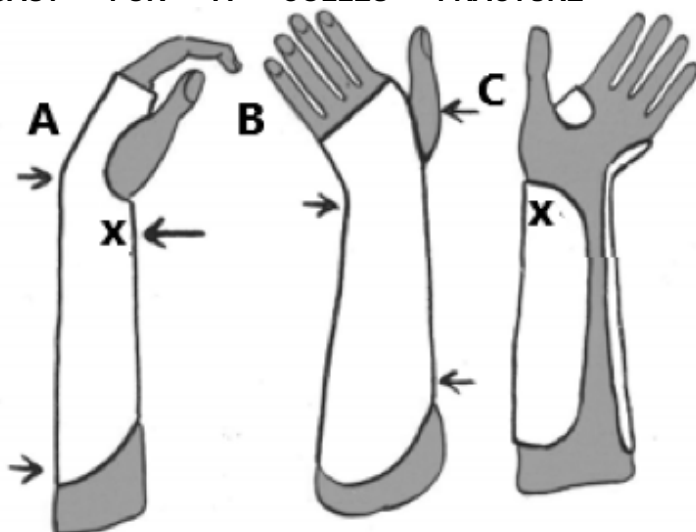


Fig. 64-7 CAST FOR A COLLES FRACTURE. A, make a radial cast, with thickening to allow pressure at point X. B, ensure the mcp joints are free. C, keep the cast open initially. After Charnley J, *The Closed Treatment of Common Fracture*, E&S Livingstone, Edinburgh 3rd ed. 1961

CHECK RADIOGRAPHS

Compare your result to the acceptable anatomical position criteria described before.

If reduction is unsatisfactory, have one further attempt at manipulation. *More attempts will only make the clinical result only worse.*

FINGER EXERCISES

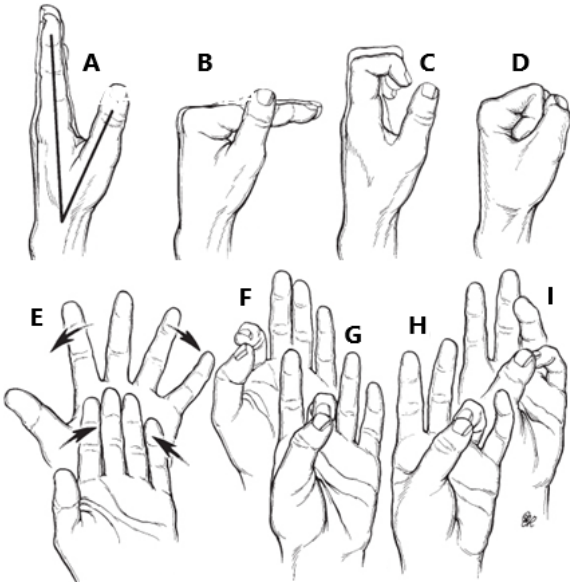


Fig. 64-8 FINGER EXERCISES. The '6-pack' of exercises to keep finger joints mobile and the intrinsic muscle pump active: A, arrow. B, table-top. C, claw. D, fist, E, in & out. F-I, thumb to finger tips. After Elsevier Science

Keep the cast in place for 3wks or up to 6wks for more unstable fractures.

Encourage active finger movements (64-8): this activates the muscle pump and reduces swelling. Also insist on elbow & shoulder exercises.

Where possible, repeat radiographs after 7-10days, to check for re-displacement.

CAUTION! Tell the patient to return immediately if the fingers become painful or numb or the cast feels too tight. Otherwise give instructions how to split the cast with firm scissors or tools.

N.B. The approach to unstable fractures will depend on the facilities available. If you can refer to expert help in a well-equipped resource, which offers a good service, do so before the fracture stiffens at 2wks.

WRIST EXTERNAL FIXATION (GRADE 3.2)

Otherwise stabilize the fracture with an X-fix (64-9)

N.B. it is easy to damage nerves using K-wires at the wrist!

EXTERNAL FIXATION OF THE WRIST

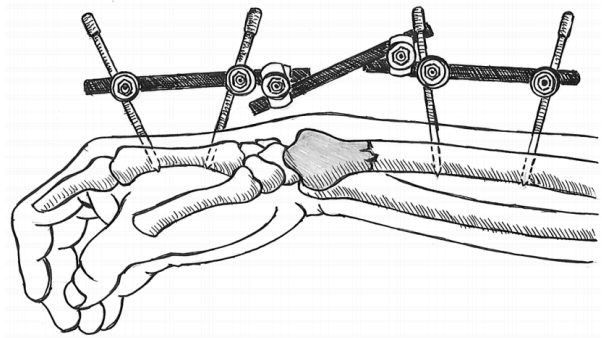


Fig.64-9 EXTERNAL FIXATION OF THE WRIST. Use this to position unstable fractures, especially if you have fluoroscopy.

DIFFICULTIES WITH EXTENSION FRACTURES

If the distal radio-ulnar joint remains subluxed & painful, and rotation at the wrist limited, there is probably persistent radial deviation and a protruding distal ulnar deformity. You can get good results by resecting part of the distal ulna (Darrach operation). Remove only enough bone so that the distal portion of the ulna lies adjacent to the sigmoid notch of the radius. Remove the bone subperiosteally to encourage anatomical and physiological regeneration of its distal end and leave the ulnar styloid and its ulnar collateral ligament attached *in situ*.

If there is sudden inability to extend the thumb weeks or months afterwards, the tendon of *extensor pollicis longus* has ruptured. You can usually repair this.

If pain will not settle or even increases, and there is no other explanation, especially if there are ≥ 2 of these features:

- (1) glove distribution of pain affecting the whole hand distal to the fracture,
 - (2) hypersensitivity to touch or minimal painful stimuli,
 - (3) skin color and temperature different to the collateral hand,
 - (4) oedema and abnormal sweating,
 - (5) stiffness of finger joints,
 - (6) altered hair and nail growth, and a fusiform appearance of the fingers, this may be the Complex Reflex Dystrophy Syndrome.
- Use hydrocortisone 100mg od and reduce the dose over 2-3 weeks

64.3 Flexion wrist fracture

This rare injury arises from a fall onto a flexed wrist, and produces a characteristic deformity on lateral views (64-10).

You may be able to achieve reduction by disimpacting the distal fragment anteriorly and then pressing it dorsally into position, and anchoring it in full supination with dorsiflexion. An above elbow cast is necessary, but this fracture usually needs internal fixation for a good result.

FLEXION WRIST FRACTURES

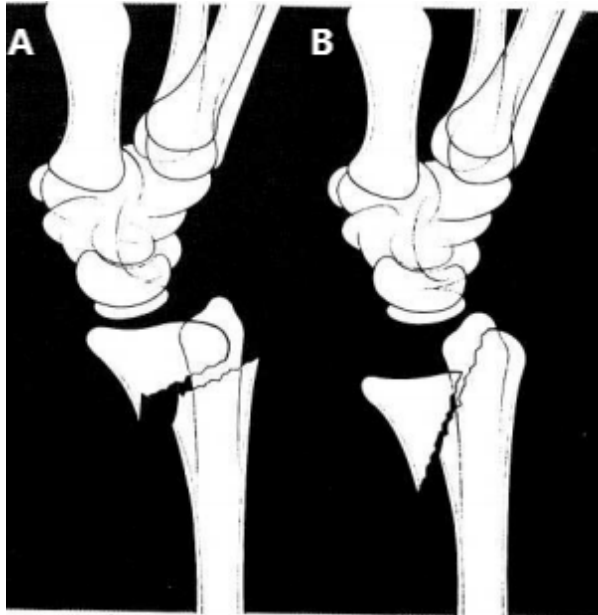


Fig.64-10 FLEXION WRIST FRACTURES. A, Smith's extra-articular fracture. B, Barton's intra-articular fracture. Both are unstable.

64.4 Scaphoid fracture

This can occur at any age, even in children (73.9), but is particularly common in young men. A fall on the hand forcibly dorsiflexes the carpus. Instead of, or in addition to, the distal radius breaking, the scaphoid and/or intra-carpal ligaments (64.5) may rupture.

A scaphoid fractures often results in non- or mal-union, because most of this little bone is covered by cartilage and its blood supply enters through the distal pole and the dorsal crest. Furthermore, this little bone articulates with 5 others and is located deep in the carpus, and so is difficult to immobilize to allow fracture healing.

A scaphoid fracture is too often missed. You need a special view to get a good look at the scaphoid bone.

Get an oblique dorsopalmar view in ulnar abduction with a strongly clenched fist (which stresses the ligaments and may make unusual gaps appear, e.g. between lunate & scaphoid. Always check the 4 signs suggesting a scaphoid fracture (64-2).

SCAPHOID FRACTURES

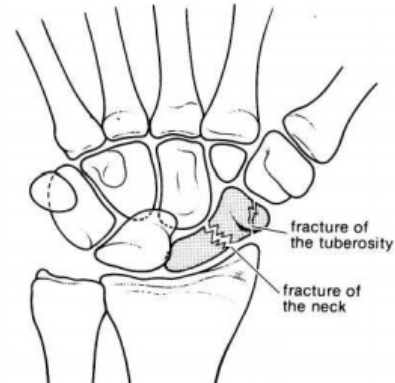


Fig. 64-11 SCAPHOID FRACTURES. The more distal & the less displaced, the less likelihood of avascular necrosis. The fracture of the tuberosity is insignificant, but that of the neck important.

The fracture line may only be a fine crack in the neck of the scaphoid which you can easily miss. Look for it on a good light with a magnifying glass or zoom. If there is clinical evidence but you cannot see a fracture, apply a scaphoid cast and obtain another radiograph after removing the cast 7-10days later. The fracture line will then be much more obvious.

If clinical signs remain strongly suggestive, but the radiograph is still unhelpful, assume there is a scaphoid fracture, and treat it as such. Avascular necrosis of the proximal part (58-8B) often results if the fracture is not kept well immobilized.

TREATMENT

FRACTURE OF THE DISTAL POLE

Strong ligaments help to stabilize the fragments. Therefore this is a benign injury. Apply a dorsal cast until pain subsides (≤ 3 weeks) and arrange for early active movements.

UNDISPLACED FRACTURE

No reduction is necessary, but rigid splinting is. Apply a radio-dorsal cast from below the elbow to the include the mcp joint of the thumb, with the wrist in slight dorsiflexion and the thumb in mild opposition as if holding a glass (64-12). If swelling reduces and the cast becomes loose, it should be replaced by one fitting snugly.

OTHER DISPLACED FRACTURES

Displaced scaphoid fracture of the middle and proximal third are likely to end in non- or mal-union. Both have great potential to limit wrist motion, cause chronic pain and osteoarthritis within a few years.

Immobilize in circular above elbow cast in supination and ulnar deviation of the wrist. While the cast is hardening, mould it by pressing the distal scaphoid pole upwards from the palmar side and at the same time apply counter pressure dorsally over the capitate. Try to refer such a fracture.

A SCAPHOID CAST

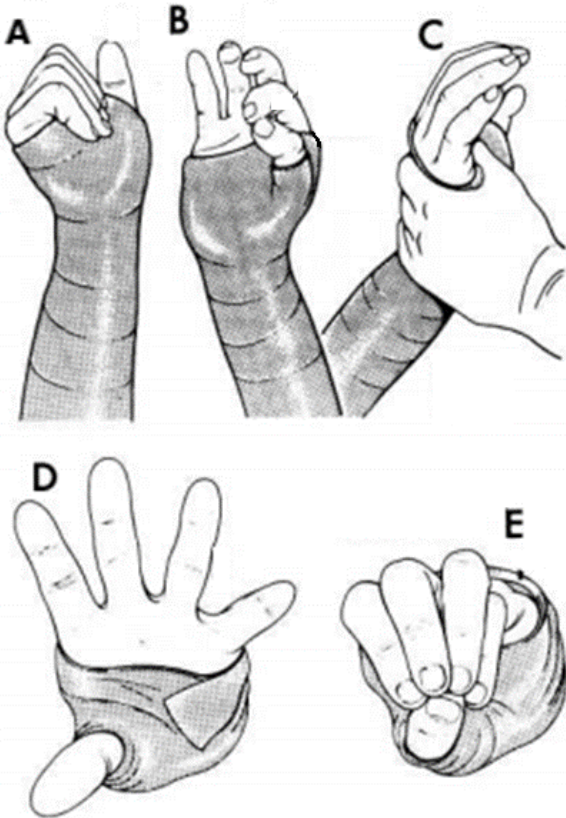


Fig. 64-12 A SCAPHOID CAST. A, the cast includes the mcp joint of the thumb. B, make sure the thumb is in mild opposition, and able to touch the index tip. C, a grip must be possible. D, full spreading of fingers and thumb also. E, all fingers should be able to touch the thumb. Clenching a fist should be possible. Adapted from Perkins G, *Fractures & Dislocations*, Athlone, London 1958 with kind permission.

FOLLOW-UP CARE

Encourage use of all the joints outside the cast. This will soon make it soft, so renew it as necessary. Remove the cast at 6wks for undisplaced fractures and at 10wks for displaced, and obtain more radiographs.

If the fracture has not united, remove the cast, encourage active motion. Your hopes rest with a fibrous non-union or a false joint. There may be none or few symptoms, but if later there is severe disability, try to refer to a specialist hand surgeon who may still find options for repair or a salvage procedure.

64.5 Carpal dislocation

During a fall on an outstretched hand violent dorsiflexion of wrist can cause intra-carpal ligaments to rupture together with an extension fracture of the distal radius or a scaphoid fracture. Many patterns of injury are possible. The most important ones are (1) scaphoid subluxation, (2) perilunate dislocation, (3) lunate dislocation, & (4) mid-carpal dislocation.

(a) Scaphoid subluxation.

Owing to rupture of the 3 scapho-lunate ligaments, an abnormally wide gap between the two bones will appear on AP radiographs (64-13B). The ligaments between the distal pole of scaphoid on one side, and trapezium and trapezoid on the other side, rupture and the lunate rotates into extension and the scaphoid into flexion. On a lateral radiograph, the half-moon of the lunate faces dorsally and the distal scaphoid points anteriorly. *Always compare with the radiograph with the unaffected wrist*, since there is great anatomical variety. If the injury is confirmed try to refer for ligament repair and temporary carpal transfixion. Otherwise treat this like a displaced scaphoid fracture (64.4)

(b) Perilunate dislocation.

When the intra-carpal ligaments on both sides of the lunate give way, the carpus may dislocate dorsally, but the lunate remains in its normal place in relation to the radius. If the injury stays like this, there is a perilunate dislocation.

(c) Lunate dislocation.

This is the 2nd stage of a perilunate dislocation: the displaced carpus springs back and rotates the lunate forwards. As it does so, the weak posterior radio-lunate ligament ruptures, but the strong anterior one remains intact. The displaced lunate presses on the median nerve, and if the fracture is not reduced, permanent neurological deficit may ensue. (Rarely, the lunate dislocates posteriorly.)

(d) Midcarpal dislocation.

If the ligaments between the proximal carpal row (scaphoid, lunate & triquetrum) and the distal row (trapezium, trapezoid, capitate & hamate) are torn, the 2 rows may dislocate from each other. The most obvious sign on a lateral radiograph is the incongruence of the lunate-capitate joint.

These dislocations are important, because you can usually reduce them. If the dislocation is neglected, severe disability follows, and the greater the delay, the worse it becomes. Exactly the same kind of injury fractures the scaphoid, so *always look for a fractured scaphoid too*.

SIGNS

Clinically, all carpal dislocations make the wrist swell. The fingers remain partly flexed, and will not straighten. Wrist movements are impossible, and its antero-posterior diameter is increased. The styloid processes are in their normal places. The radial pulse and the concavity of the lower end of the radius are normal. There may be sensory loss in the thumb & 1st 3 fingers if the median nerve is involved.

RADIOGRAPHS

These are difficult to interpret. Take a lateral view and compare it with one of the normal wrist.

In a perilunate dislocation, the lunate is more or less in its normal place in relation to the radius, and is facing in its proper direction, but its distal cup-shaped articular surface is not in contact with the dome-shaped surface of the capitate. Instead, the hand and the carpus lie in a plane posterior to the radius. So, the radio-scaphoid joint is incongruent. *This dislocation is less easy to see in an AP view.* A useful sign is an increase in the normal space between the lunate and the scaphoid, as in scaphoid subluxation (64-13B), because torn scapho-lunate ligaments are a prerequisite for such a dislocation.

In a lunate dislocation, the proximal dome-shaped surface of the lunate faces posteriorly, and is no longer in contact with the radius (64-14A). Its distal cup-shaped surface faces anteriorly, and is no longer in contact with the capitate. The capitate and the carpus are in the same plane as the radius.

Signs in the AP view are characteristic, but are often missed. The normal lunate appears to have 4 sides in an AP view, but when it is dislocated, it seems only to have 3. So, look for a 'triangular lunate'. Look also for a widened space between the scaphoid and the lunate. Normally they touch. *Dislocations of the lunate are so easily missed that the lunate is always the first bone to look at in any radiograph of the wrist.*

In a midcarpal dislocation, the radiocarpal joint is in place but the dome of the capitate is out of its socket at the distal side of the lunate.

A 'SEVERELY SPRAINED WRIST' IS A FRACTURED SCAPHOID UNTIL PROVED OTHERWISE

LOOK CAREFULLY AT THE LATERAL RADIOGRAPH

TREATMENT

Try to reduce a carpal dislocation immediately; your chances of success will never be better and decrease by the hour. *The median nerve may otherwise be permanently damaged!* After 2wks, closed manipulation is impossible.

2 CARPAL DISLOCATIONS

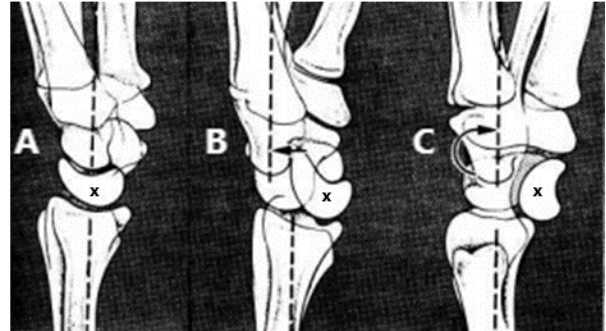


Fig. 64-13 PERILUNATE & LUNATE DISLOCATIONS. A, the normal wrist. B, in the perilunate dislocation, the carpus is pushed backwards leaving the lunate in its normal position in relation to the radius. C, in the lunate dislocation, the carpus has sprung back into its place and has displaced the lunate anteriorly. The lunate is marked 'x'

LUNATE DISLOCATION

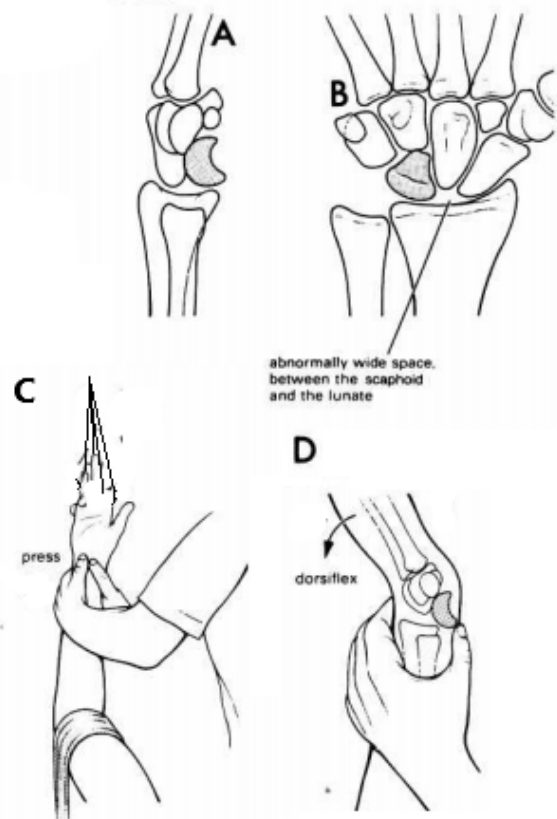


Fig. 64-14 LUNATE DISLOCATION. A, Lateral view of the wrist, showing a 'crescent' shaped lunate, not in contact with the radius, facing posteriorly. B, the lunate takes on a 'triangular' appearance, and the space between it & the scaphoid is enlarged. C, press with both thumbs on the back of the wrist. D, while continuing to press hard, dorsiflex the wrist. then palmarflex the wrist. *After de Palma AF, Management of Fractures and Dislocations, An Atlas, WB Saunders, 2nd ed 1970 with kind permission.*

Reduction of the latter 3 dislocations is similar:

- (1) Use a GA, since this alone will provide enough muscle relaxation.
- (2) Elevate the hand with Chinese finger traps as before (63-11) for ≥ 10 mins.
- (3) Supinate the forearm.
- (4) While your assistant is maintaining very strong traction, you reduce the dislocation:
- (5) For a *perilunate dislocation*, place both your thumbs against the back of the wrist, push forwards, while slowly palmarflexing the wrist.
- (6) For a *lunate dislocation*, place both your thumbs against the front of the wrist over the lunate, and press hard dorsally while dorsiflexing the wrist (64-14D). Then palmarflex the wrist while maintaining traction and pressure.
- (7) For a *midcarpal dislocation* the direction of pressure depends on the direction of displacement of the distal row. If the displacement is dorsal, press anteriorly or *vice versa*.

If your reduction attempt has failed and you cannot refer within a few days, try open reduction yourself: Open the carpal tunnel as for carpal tunnel release and extend the incision proximally into the forearm.

Hold the tendons aside and repeat the reduction maneuver described above but pressing now directly on the lunate, which you should be able to see. *Make sure it is not tilted when attempting to press it into place.*

If the carpus is dislocated dorsally, try again but with the appropriate reduction manoeuvre for perilunate dislocation, applying counter pressure with your thumb to the lunate and the anterior edge of the distal radius.

OPEN CARPAL REDUCTION (GRADE 3.2)

If all this fails as well, make a straight dorsal midline incision centered over Listers' tubercle. Open the 4th extensor compartment, hold the tendons aside and push against the carpus now visibly sitting dorsal to the radius.

Before closing your incision, look at the wrist capsule. Close tears in it with a few interrupted sutures of absorbable 3/0, but *don't overlap it* as this will hinder dorsiflexion later on.

If the diagnosis was missed, this may be because no fracture was spotted on the radiograph despite the patient's complaint that something was wrong with the hand. If nothing is done, permanent disability is inevitable.

EXAMINE THE LUNATE FIRST WHEN YOU LOOK AT A WRIST RADIOGRAPH

POSTOPERATIVE CARE

Apply a cast if the scaphoid is fractured.

Obtain a post-manipulation radiograph to make sure the lunate is not dislocated.

Deficit of the median nerve function should improve quickly after reduction. If it does not, decompress the carpal tunnel (32.17).

If you can, refer the patient for ligament repair and internal fixation even after successful reduction and splinting. If not, maintain a splint for *6wks* to allow some healing of the ligaments by scar formation, & then encourage active movements immediately.