

CONTINUED... Table I. Summary of wrist pain

Scaphoid tubercle injury	Fracture or bone bruise of scaphoid tubercle	Uncommon. Usually following a direct fall	Point tender over scaphoid tubercle	X-ray
<b>Volar ulna</b> Flexor carpi ulnaris tendonitis (uncommon)		Acute calcific tendonitis of FCU tendon. Acute severe pain	Can mimic infection	X-ray
Hamate fracture		Always after golf, baseball, cricket Occasionally due to fall	Pain on resisted flexion of little and ring fingers in ulna deviation at wrist	CT scan
Pisiform/triquetrum osteoarthritis	A not uncommon osteoarthritis between the pisiform of triquetrum bones	Elderly patients	Pain and crepitus between bones	X-ray
<b>Ulna</b> TFC	The triangular fibrocartilage complex of the wrist is a critical and often injured anatomical structure	Acute, severe pain on loading and rotating the wrist	Points to ulna side of wrist. Severe pain on end range pronation and supination	X-ray & MRI arthrogram
Extensor carpi ulnaris tendonitis		Uncommon	Swelling, crepitus ± subluxation of tendon can be palpated	Ultrasound/MRI
Distal radio-ulnar joint pathology	The distal radio-ulna joint can be an important cause of pain	Nil		X-ray
Ulna impaction syndrome	In patients with a positive ulna variance, the ulna can impact against the lunate causing pain	Complex and uncommon injury		X-ray & MRI
Lunato triquetral ligament tear	Lunato triquetral ligament is the 2nd most common ligament instability after the scapho-lunate ligament	Might be associated with avulsion fracture of triquetrum	Pain on ulna deviation of wrist	X-ray
Radiotriquetral ligament tear	Common injury after fall onto outstretched hand		Point tender over dorsal triquetrum	X-ray

fact that the wrist is packed with multiple anatomical structures, has the potential to make the clinical diagnosis of wrist pain difficult. Luckily, more than 90% of all wrist pain presentations fit into clear 'pattern recognition' entities. The diagnosis, as always, is facilitated by a pertinent history, a focused examination, and the judicious use of special investigations.

### History

- Where is the pain?
- What exacerbates the pain (i.e. what specific actions and/or postures or time of day worsens the pain)?

These two questions are by far the clearest pointers to the possible problem. The clinician must make a note of where the patient points. The wrist is divided into discrete zones: dorsal, dorso-radial, radial, volar-radial, volar, volar-ulna, ulna and dorso-ulna. Each of these zones has a few common clinical entities that have specific pain presentations (Table I).

### Other relevant questions

- Sports/hobbies?
- How long has the pain been there?
- Any history of trauma or so-called 'sprained wrist'?
- Is an infant being nursed?

### Examination

Following standard orthopaedic practice, the wrist is examined in the following order: look, feel, move. Swelling can sometimes be seen

with ganglions or de Quervain's tendonitis. Palpation reveals the area of maximum tenderness, which is important for some conditions but notoriously unreliable for others (Table I). Active and passive range of motion should be noted, specifically looking for pain at the end ranges:

- pain on end flexion: occult ganglion
- pain on end extension: occult ganglion, Kienböck disease, flexor carpi radialis (FCR) tendonitis
- pain on end pronation and/or supination: triangular fibrocartilage complex tear
- pain on end ulna deviation: de Quervain's
- pain on end radial deviation: scapho-trapezoid-trapezoid (STT) arthritis.

### Special investigations (Table I)

- These are commonly over-requested.
- Standard posteroanterior (PA) and lateral radiographs are usually sufficient for screening.
- An ultrasound scan can be done for tendonitis/occult ganglion.
- An MRI scan may be done for intrinsic pathology on specialist request.

### Summary

- Wrist injury is a common cause of upper limb pain.
- It usually occurs after a fall.
- Ninety per cent fit into pattern recognition entities.
- Divide the wrist into distinct zones.
- There are very specific pathologies in each zone.
- If in doubt about diagnosis, then

immobilise and repeat the examination in one week.

## Common hand conditions

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Other than hand injuries and infections, the general practitioner and those involved in primary health care should be able to correctly diagnose, manage and treat where appropriate the common conditions affecting the hand. Many systemic diseases such as diabetes, rheumatoid arthritis and gout can, and often do, present with secondary hand involvement. This article focuses on five common primary hand conditions. These five pathologies cover more than 90% of all patients presenting with hand-related symptoms.

### Carpal tunnel syndrome

- There is median nerve compression at the wrist level.
- It is the most common form of nerve entrapment.
- It commonly occurs in middle-aged

women and in the last trimester of pregnancy.

- It is occasionally associated with rheumatoid arthritis (RA), hypothyroidism, diabetes or gout.
- The carpal tunnel is a fibro-osseous tunnel comprised of U-shaped bones bridged by the transverse carpal ligament.
- The contents of the carpal tunnel includes all the long flexors and the median nerve.
- The tunnel is either too tight for the contents or the contents are too large for the tunnel.

#### History

- Classic nocturnal waking with burning paraesthesia
- Need to shake/hang hands out
- Recovers after 20 minutes
- Sometimes exacerbated by driving and prolonged holding of objects in hand.

#### Examination

- Abnormal light touch and pin-prick sensibility in median nerve distribution (thumb, index, middle and half of ring fingers)
- Weakness/wasting of thenar muscles, especially the abductor pollicis brevis (APB)
- Tinel test – firm tap over wrist crease elicits ‘electric shock-like’ symptoms
- Phalen’s test – full flexion of wrist and held for up to 60 seconds results in symptoms.

#### Special investigations

- History and examination usually classic and diagnostic
- If presentation is atypical consider nerve conduction studies by neurologist
- Fasting blood glucose and thyroid function tests if suspicious.

#### Differential diagnosis

- Cervical spine pathology
- Many others, but all very rare.

#### Treatment

- Can try night splints and injection into carpal tunnel with steroid (Fig. 1)
- Especially useful when reversible cause, such as pregnancy
- Unfortunately only 10 - 15% long-term response to these modalities
- Most patients will require surgical decompression of the transverse carpal ligament



Fig. 1. Injection technique for carpal tunnel syndrome.

- Can be done as open or endoscopic procedure
- Highly successful operation with rapid resolution of symptoms (days) and good recovery of function (~ 6 weeks).

#### De Quervain's tendonitis

- Very common wrist condition
- Compartment of abductor pollicis longus (APL) and extensor pollicis brevis (EPB) becomes thickened and tight
- Severe pain on radial side of the wrist and base of the thumb
- More common in women 30 - 50 years old and in mothers with young infants.

#### Examination

- Local tenderness and swelling over radial styloid might/might not be present
- Finkelstein test always positive
  - hold thumb in palm
  - forced ulnar deviation associated with pain compared with other side
  - test can be uncomfortable on normal side; therefore do this side first to establish ‘normal’.

#### Treatment

- Direct infiltration with cortisone injection 70% effective
- Technique: Patient to gently extend thumb. Identify gap between APL and APB distal to radial styloid. Inject 1 ml lignocaine + 1 ml cortisone into sheath from distal to proxima (Fig. 2)
- Combine injection with dorsal thumb splint
- If this fails or recurs then simple release under local/regional anaesthetic.



Fig. 2. Injection technique for De Quervain's tendonitis.

#### Trigger digits

- Results from localised tenosynovitis of superficial and deep flexor tendons adjacent to A1 pulley at a metacarpal head.
- Inflammation causes nodular enlargement of tendon distal to pulley.
- Occurs most often in long or ring finger (occasionally in thumb).
- Produces a painful clicking as inflamed tendon passes through constricted sheath as finger is flexed and extended.
- Digit may lock in flexion, extension, or may be arrested in the middle range.
- Determine if there is normal passive range of motion in the metacarpophalangeal

(MP), proximal interphalangeal (PIP), and distal interphalangeal (DIP) joints.

- Palpation may reveal tender nodule over metacarpal head.

#### Treatment

- 90% effective response to local injection of steroid
- 10% require surgical release of A1 pulley.

#### Ganglions

Ganglions are the most common soft-tissue swelling of the hand.

#### Pathology

- Ganglions are mucinous-filled cysts arising from a joint capsule or tendon sheath.
- Ganglions consist of an outer fibrous coat and an inner synovial lining and contain a clear, colourless, gelatinous fluid.
- They are more common in young women.

#### History

- Painless swelling on dorsum (80%) and palmar (20%) aspect of wrist
- Can vary in size
- Can follow traumatic event such as fall on outstretched wrist
- Pain on loaded wrist in extended position, such as pushing out of swimming pool or bath.

#### Examination

- Firm smooth mass – can feel like ‘extra bone’
- Can be tender to palpation
- Usually fixed to deep structure, i.e. not mobile
- Usually not fluctuant
- Transilluminates.

**Treatment**

- Worth attempting aspiration with a 16G needle despite high recurrence rate (90%)
- Surgery indicated for symptomatic ganglions.

**Osteoarthritis of the thumb**

**Pathology**

- Part of primary generalised osteoarthritis (OA) with Heberden's nodes of DIP joints
- First carpometacarpal (CMC) joint is involved with loss of cartilage
- Results in bone-on-bone deformity
- Very common problem
- Affects 1 in 4 postmenopausal women.

**History**

- Pain – base of thumb
- Difficulty opening jars/taps/ door handles
- Weakness of pinch grip.

**Examination**

- Almost always associated with other stigmata of primary generalised OA, including Heberden's nodes of DIP joints
- Subluxation and osteophyte formation cause prominence of thumb base
- Called 'shoulder sign'
- Crank and grind test very painful
- Can get fixed adduction deformity of thumb with compensatory hyperextension at MP joint – so-called Z-thumb.

**Special investigations**

Radiographs are diagnostic and should include the fully pronated or Roberts' view.

**Treatment**

- Splints
- Simple analgesics
- Cortisone injection into joint (NB: sterile technique)
- Surgery for failed conservative management
- Excision of trapezium bone with ligament stabilisation is often performed with predictably good results.

**Summary**

- Five conditions comprise the bulk of primary hand disorders.
- Carpal tunnel syndrome has a very typical presenting picture and special tests are usually not necessary.
- Conservative measures are usually unsuccessful and surgery is eventually required (90%).
- De Quervain's tendonitis is a cause of severe pain on the dorso-radial aspect of the distal forearm.
- Surprisingly there is very little to find except for a positive Finkelstein test.
- Cortisone is highly effective.
- Triggering of the digits responds well to cortisone injections.
- Ganglions are fluid-filled sacs associated with joints or tendon sheath.
- Arthritis at the base of the thumb is

the most common site for primary osteoarthritis.

- One in four postmenopausal women will be afflicted, but less than one-third of these will be symptomatic.

**Current concepts in rotator cuff management**

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This article will look at two aspects of the current management of the rotator cuff tear. The first will be the most recent evidence-based approach and the second will be the experimental biological approach.

The risks, outcomes and the ability to undertake treatment by either the conservative or the surgical route need to be understood by the patient and treating physician.

Conservative treatment comes with the concern that we may miss the boat in terms of tendon healing. Several studies have shown that the longer the tear has been present the more likely it is that there will be irreversible changes.<sup>1</sup> These changes include rotator cuff muscle atrophy and fatty changes (Figs 1 and 2), as well as changes in collagen fibre composition, which do not reverse with successful repair. The tear may progress with time and larger tears have been shown to have higher failure rates with surgery. Therefore it is preferable to intervene prior to these changes occurring.

The concern in the surgical group is the morbidity of the surgery and the long rehabilitation required for tendon healing. This requires 6 weeks in a shoulder immobiliser followed by another 6 weeks to regain range of motion before starting the strengthening programme that allows them to return to full function at 6 months after surgery. For the elderly or those at anaesthetic risk, the questions that need to be asked are whether the surgery is



Fig. 1. Sagittal MRI cut of the rotator cuff muscles. The dotted line showing the 'Y' of the scapula body and fossae showing normal bulk of the rotator cuff muscles: 1=supraspinatus, 2=subscapularis, 3=infraspinatus. Compare with Fig. 2.

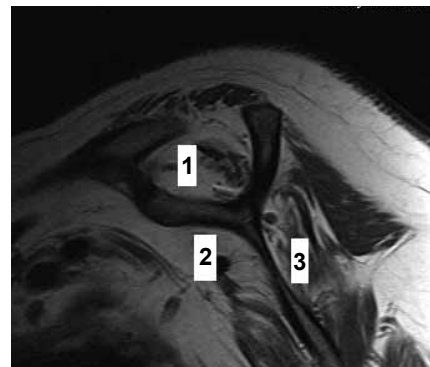


Fig. 2. Sagittal MRI cut at the level of the fossa showing marked atrophy of supraspinatus (1), subscapularis (2) and infraspinatus (3) in a massive long-standing tear. There is 'white' fat replacing the atrophied dark muscle. Compare with Fig. 1.

necessary and whether the patients can safely be treated conservatively.

**Evidence-based medicine**

The American Academy of Orthopaedic Surgeons' review of the best evidence-based