

HAND INJURIES

Who should treat?

There can be no hard and fast rules. This will depend on the skill and experience of the medical staff at the time and the nature of the injury in any individual patient

General Principles of Management

The ultimate goal of treatment is good function

Initially healing and stability are important

However normal hand function requires maximum flexibility and sensibility

Immobilisation, oedema and scar formation → **STIFFNESS**

Oedema can cause

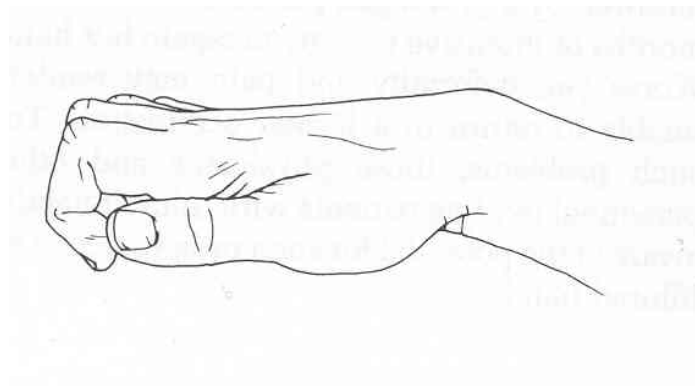
- reduced arterial flow
- reduced venous drainage
- more scar formation
- pressure and discomfort
- limit movement

Scar contraction leads to joint stiffness, fixation and deformity

Pain contributes to the cycle

Eventual result is the hand in a position of **non function**

The position of non function is unacceptable



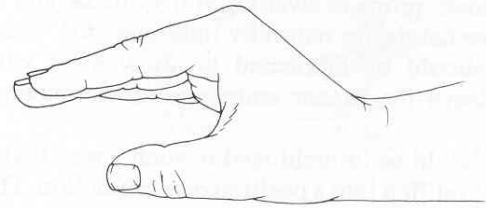
This is avoided by

Splintage in an appropriate position

Initial rest

Elevation

As early mobilisation as the injury will allow

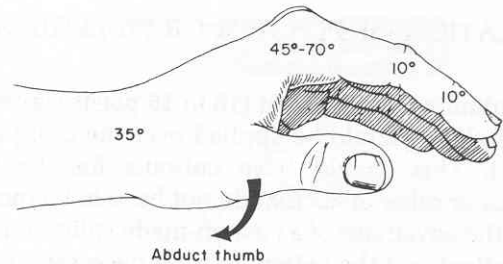


The Intrinsic Plus or the Protected Position

i.e. the position from which recovery of function is most likely

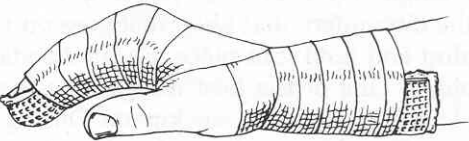
splints and bandages must not constrict

the minimum number of joints required to support the injured part should be immobilised

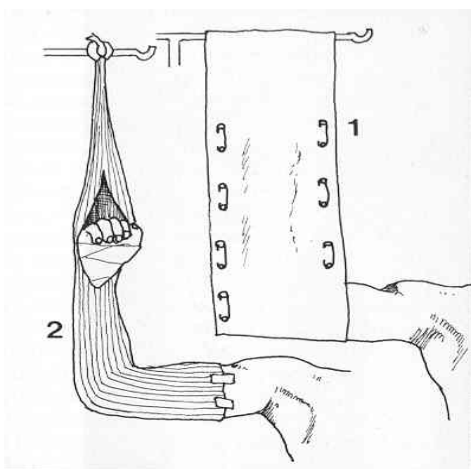


movements of adjacent joints **MUST** be encouraged especially in the elderly

when splintage is applied simply for pain relief, it should be removed at the earliest opportunity to allow early mobilisation



Elevation should be to the level of the heart or above

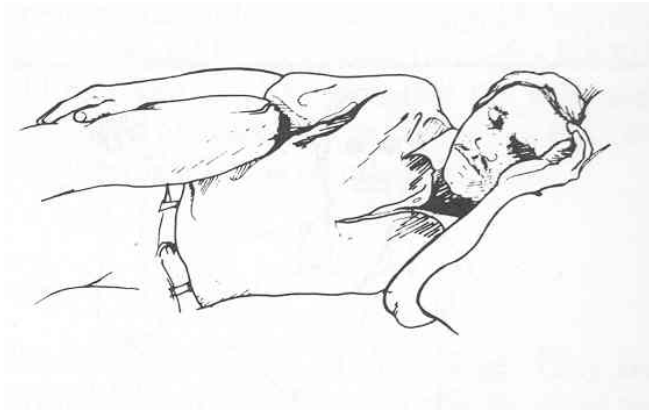
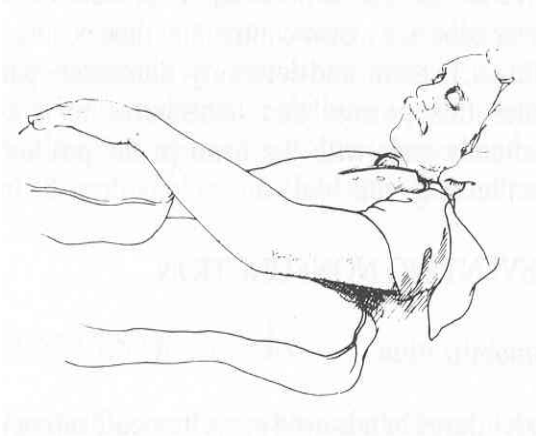


In hospital



The outpatient

Elevation in bed



Examination

Note mechanism site, size, type (incised etc)

Check movement and sensation distally

This may be difficult due to pain-try

If any doubt about nerve or tendon injury-refer

If radio-opaque foreign body possible-x-ray

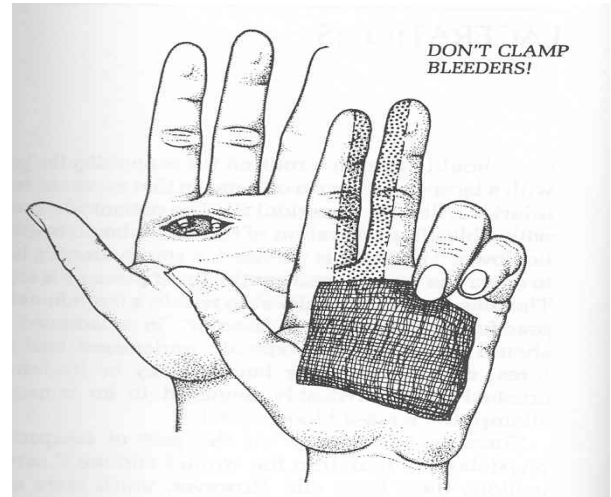
If biological foreign body possible-refer

If wound clean and simple treat and refer to GP

If burst or flapped-minimum or no sutures

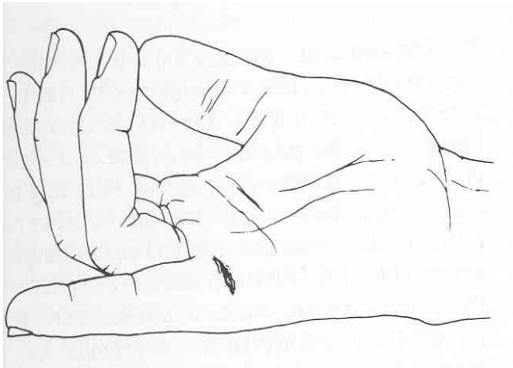
No tension-arrange follow up

Major injuries-refer ortho or plastics

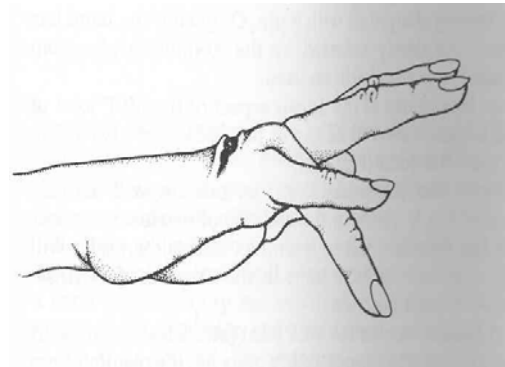


Typical appearance in nerve injury

Sensation may be 'different' or absent



Typical appearance Flexor tendon injury



Typical appearance Extensor tendon Injury

Closed Injuries

If very swollen, bruised or deformed-minimal gentle exam-x-ray early

If swelling, bruising minimal

Careful gentle thorough palpation

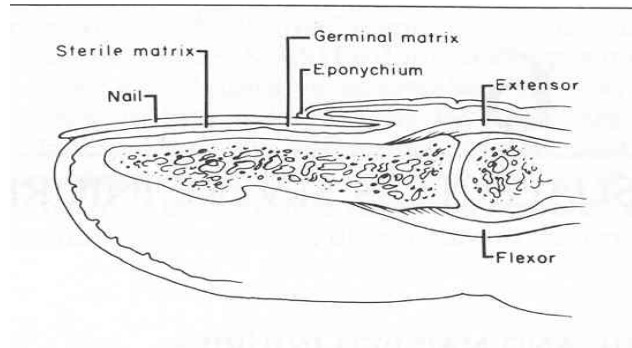
Try to make diagnosis.

At least try to pinpoint damaged structure-will allow rational x-ray request

FINGER TIP INJURIES

Nail Injuries

Anatomy



Fractures

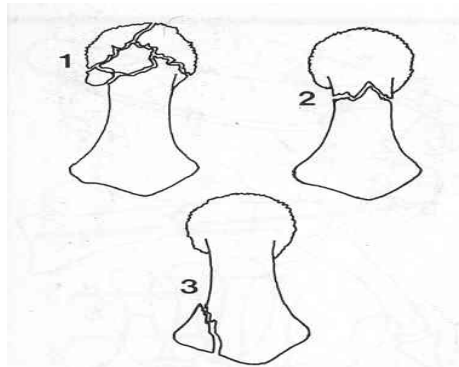
Most closed fractures are of no serious significance

Most are very painful-protect with padded dressing

Subungual haematoma should be trephined (A below)

Injury to the sensitive pulp plus swelling often produces prolonged persistent tenderness

Angulated fractures are more serious and should be treated as below.



Repair of nailbed

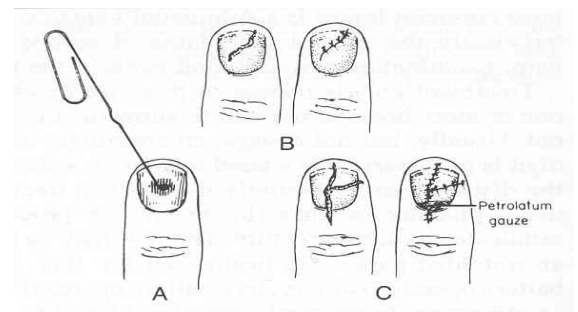
Poor healing produces scars which cause

troublesome nail deformity

Careful repair with a 6.0 absorbable suture is necessary

This requires exposure by removal of the nail

We tend not to replace the nail after removal

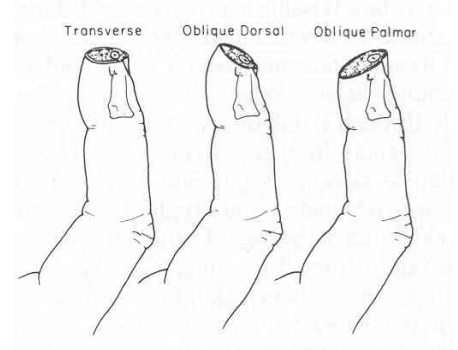


Repair of nail bed with phalanx fracture

The nail bed along with the germinal matrix is often avulsed as the fracture angulates. The germinal matrix should be sutured back into the proximal nail fold.

Amputation of fingertip

Most pulp amputations can be treated conservatively
With antiseptic cream in an occlusive dressing
-plastic glove-
More extensive tissue loss may require skin grafting
or local flaps e.g. V-Y advancements
seek advice



Finger amputations

As much length as possible should be preserved-**REFER**

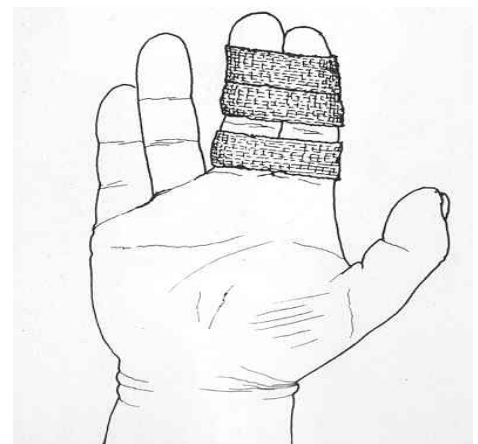
Thumb amputations

The thumb should be regarded as a vital organ. Reconstruction should always be considered-see advice re Plastic referral

FRACTURES

General Principles

Most fractures are stable and can be treated by a short
Period of immobilisation and then rapid mobilisation with
two-finger strapping
clinical examination should differentiate **STABLE** and
Unstable injuries. Unstable injuries will require
fixation with k-wires, screws and or external
fixator devices. These should be referred
beware of rotatory deformity.

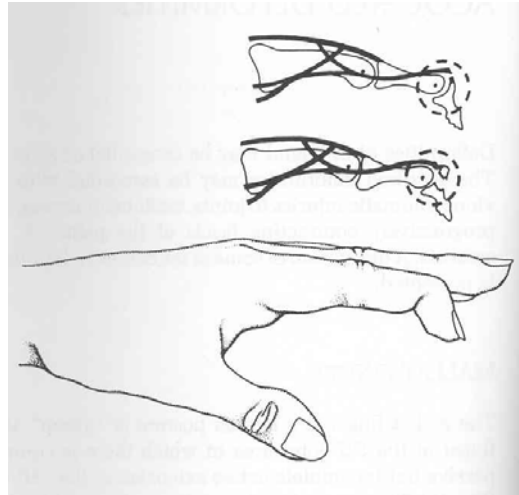


Distal Phalanx

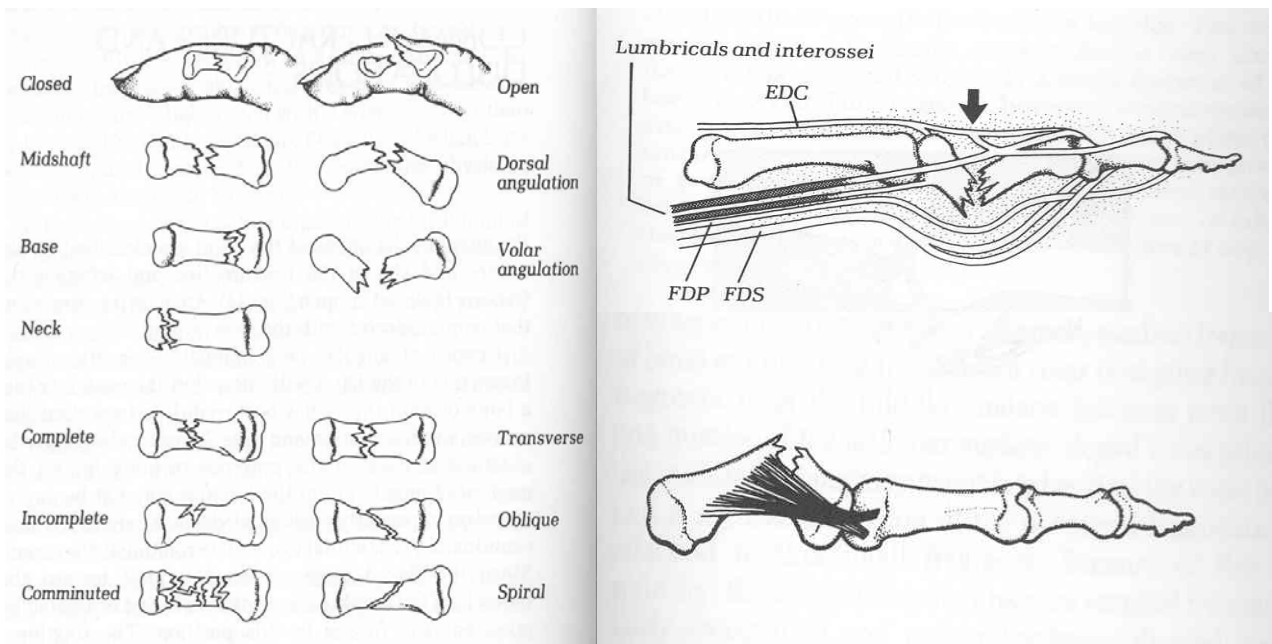
Treat soft tissue injury as above. If fracture is transverse and unstable then fixation with k-wire required.

Mallet Injury

If no fracture or small fragment treat with mallet splint, give advice card and refer to clinic at 2 weeks. Usually require 6 weeks splintage-2 weeks night splintage. With large fragments joint may be unstable-require fixation-refer



Fractures(cont.)

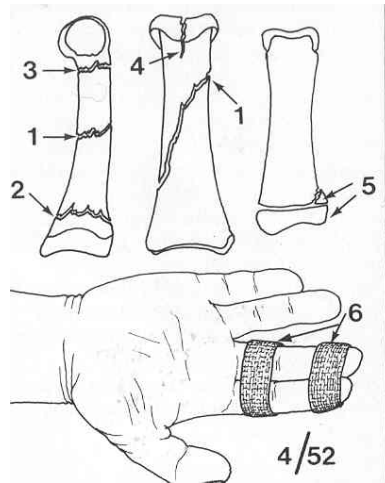


Fracture terminology

deforming forces in hand fractures

Middle and Proximal Phalanges

Neck and condyles	almost always unstable-refer
Shaft-stable	buddy strap & refer next # clinic
Shaft-unstable	refer
Base-transverse	often angulated-refer
Base-fracture-dislocation (PIPJ)	very unstable-refer

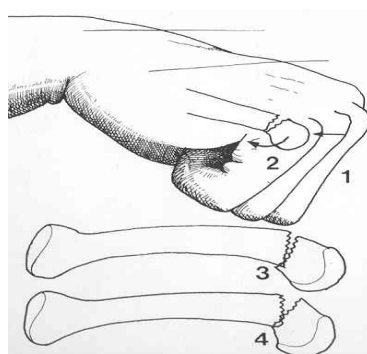
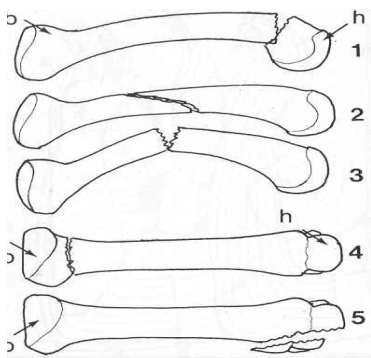


Metacarpals

From little to index and with multiple fractures these is increasing soft tissue swelling, restriction of motion and longer recovery

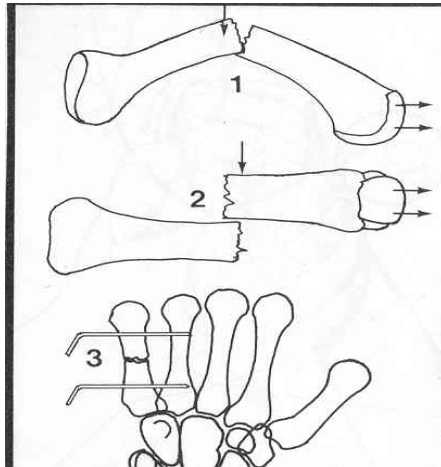
Neck of 5th metacarpal

Angulation and impaction are common. When angulation is slight or moderate (<30 degrees) it should be accepted. Always check for and document presence/absence of rotational deformity of little finger. If reasonably comfortable treat with buddy strapping/padded crepe. If very painful requires volar slab. Ortho # clinic follow up
If very angulated attempt to correct and splint MPJ in flexion



Shaft and basal metacarpal

Most are satisfactorily treated in volar or colles' casts-ortho # clinic follow up
NB rotation at oblique and spiral fractures and marked angulation or displacement will require reduction and internal fixation. Obtain a true lateral hand x-ray if any doubt regards position of fracture.



Thumb metacarpal base

Easily mistaken for scaphoid fracture clinically

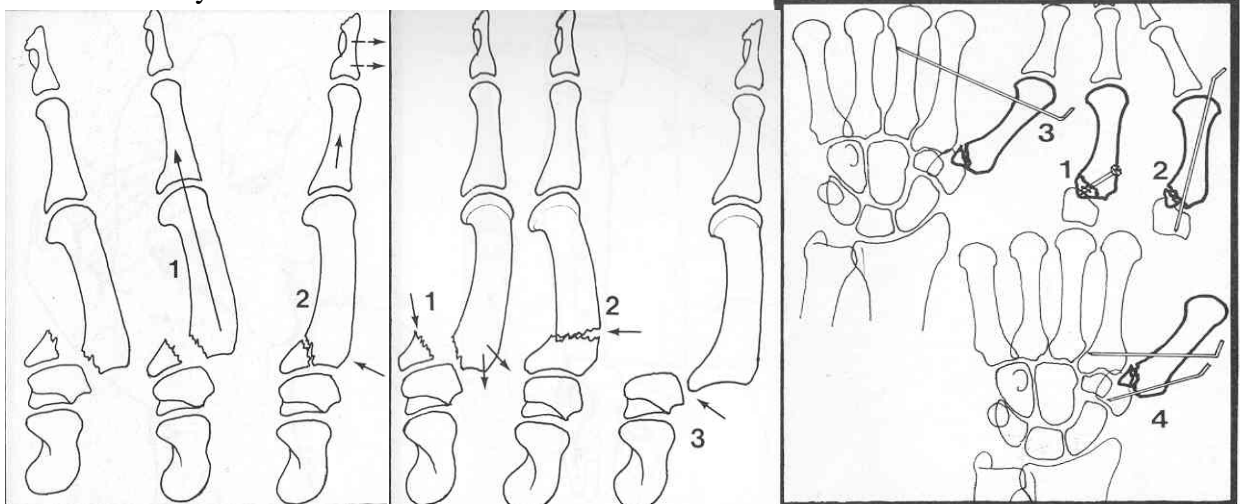
Basal shaft

If angulated should be manipulated and fixed in cast

If unstable may require k-wire fixation usually under GA

Bennet's fracture

Best treated by reduction and k-wire fixation-refer ortho

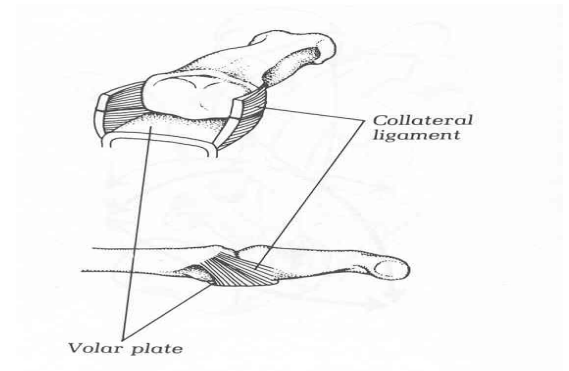


Sprains and dislocations

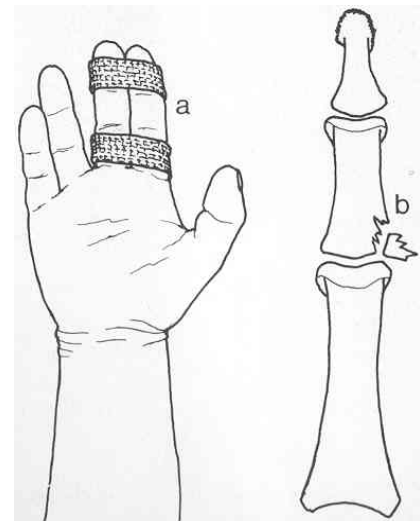
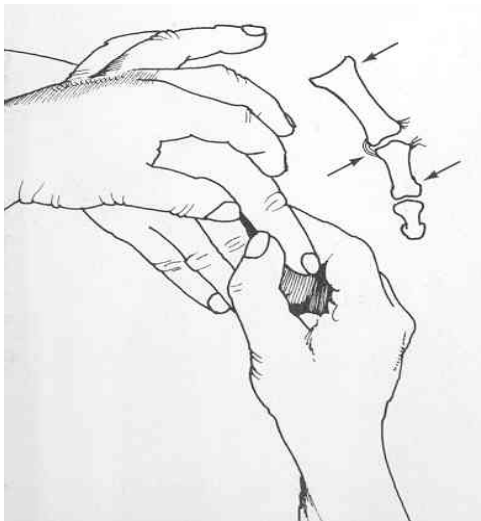
NB finger joints have a volar plate and collateral

ligaments with 2 parts

Stable collateral ligament injuries are treated with buddy strapping for 3 weeks. Pain stiffness and fusiform swelling can take many months to settle. The patient must be advised of this and encouraged to persist with mobilisation. Stability should be checked-under LA if necessary

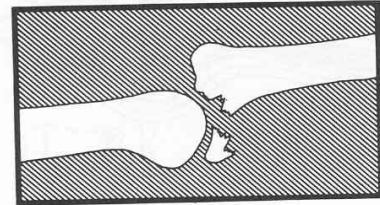


Unstable injuries should be referred. Look out for avulsion fractures-if rotated-refer-will require fixation



Thumb MPJ

Complete tears of the ulnar collateral ligament are always unstable. Always check stability under LA if necessary and refer. Always check for rotated avulsion fragments. If stable support in volar slab or scaphoid cast-ortho # clinic follow up



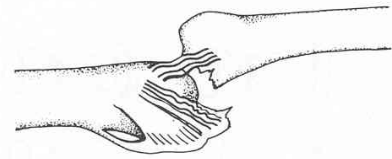
Thumb MPJ cont.

Dislocations

Most dislocations are easily reduced under LA.

Always check the integrity of the collateral ligaments and volar plate. If unstable-refer

Irreducible dislocations are uncommon but require skilled operative reduction-refer



Fracture-dislocations

PIPJ most commonly. Major injuries. Usually very unstable must be splinted in flexion after reduction-refer

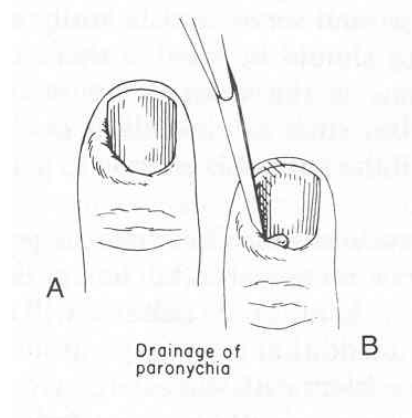
Hand Infections

Paronychia

If no pus present treat with antibiotics

If pus present drain under ring block may require removal of nail. Generally don't require antibiotics after drainage unless tracking cellulitis/lymphangitis

NB LA often ineffective in presence of inflammation-inject well away from septic area

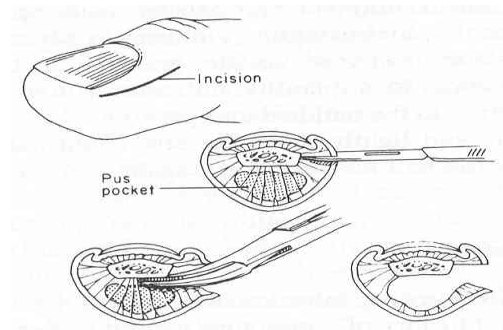


Finger Pulp Abscess

Very painful. Rapid invasion of bone (osteitis)

Incise immediately

Ensure the pus has drained



Flexor sheath Infection

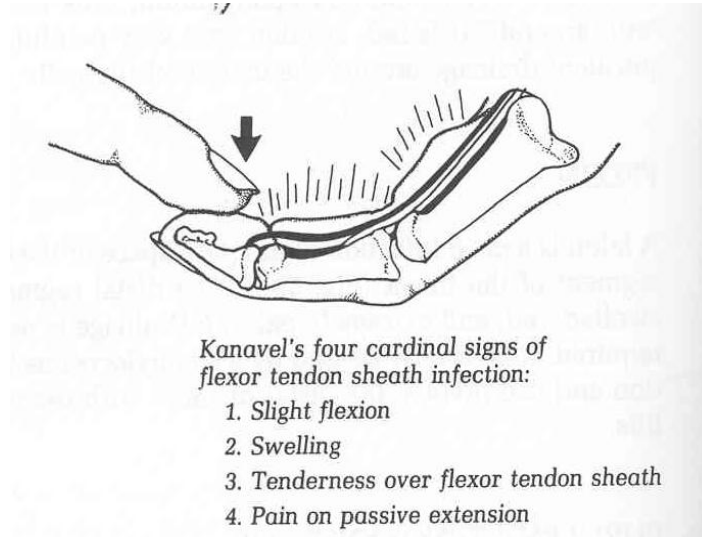
Serious infection with rapid spread and destruction of finger-spread to palmar spaces leads to septicaemia

Admit immediately.drain-IV antibiotics

Elevate-splint in protected position



Kanavel's Signs of flexor tendon sheath infection



Pathways of spread of flexor sheath infection

Index flexor sheath	thenar space
Ring and mid sheaths	mid palmar space
Thumb and little finger	Parona's space

Palmar space infection

Rare-dorsal swelling can be misleading

Septic Arthritis

Primary-uncommon. Can occur with flexor sheath infection

Common 'bite' punch injury. If presents on day of injury x-ray for tooth fragment.

Thorough cleaning of wound. **If the wound is thought to have penetrated the joint capsule or the extensor tendon is exposed, these wounds should be referred to the orthopaedic surgeons for formal exploration.**

Osteitis

Uncommon-usually after pulp abscess

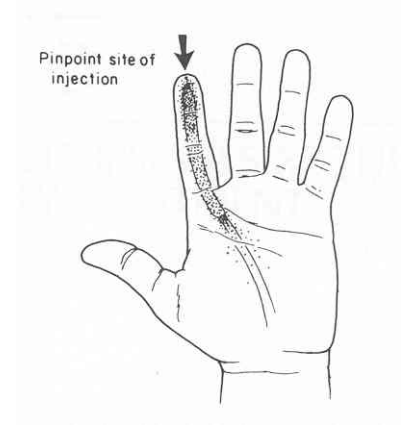
High Pressure Injection Injuries

BEWARE-may seem innocuous

x-ray for lead in paint etc

refer ortho as rapid destruction of tissues can occur

wounds need opened and cleaned in theatre



MAJOR INJURIES

Crush Injuries

Deep Abrasions

Complex Injuries

All can involve multiple tissues: skin, tendon, vessel, bone/joint
Refer orthopaedics or plastics

Vascular Injuries

Amputations, ring avulsions and degloving injuries
Refer orthopaedics or plastics

Indications for Replantation

Indications

1. Injuries to multiple digits which includes the single digit amputations in which the remaining digits are still attached although severely injured
2. Most amputations of the thumb, particularly if it is proximal to the IP joint
3. Amputations in children, sometimes even single digits
4. Clean amputations at hand, wrist or distal forearm level

Relative contraindications

1. Amputations due to severe crush or avulsion injuries
2. Single digit amputations in adults, particularly if severed between the MP and PIP joints. Here occupation, hobbies, cultural considerations and informed patient choice play a large role in determining the advisability of replantation
3. Heavily contaminated amputations
4. A significant smoking history

Absolute contraindications

1. Severe associated medical problems or injuries
2. Severe multi-level injury in the amputated part