



Management of Common Hand Conditions



Zachary Moaveni
Plastic Surgeon

Overview



∞ Hand Anatomy and Examination

∞ 'Acute' Hands

∞ 'Elective' Hands

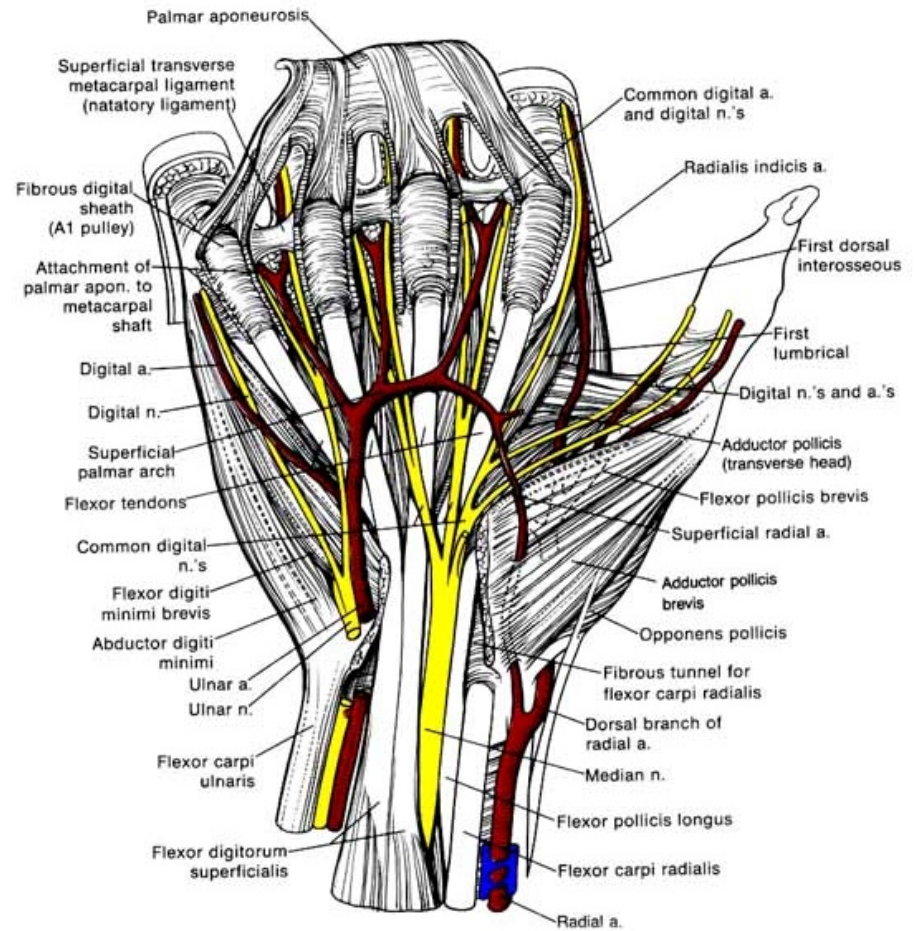
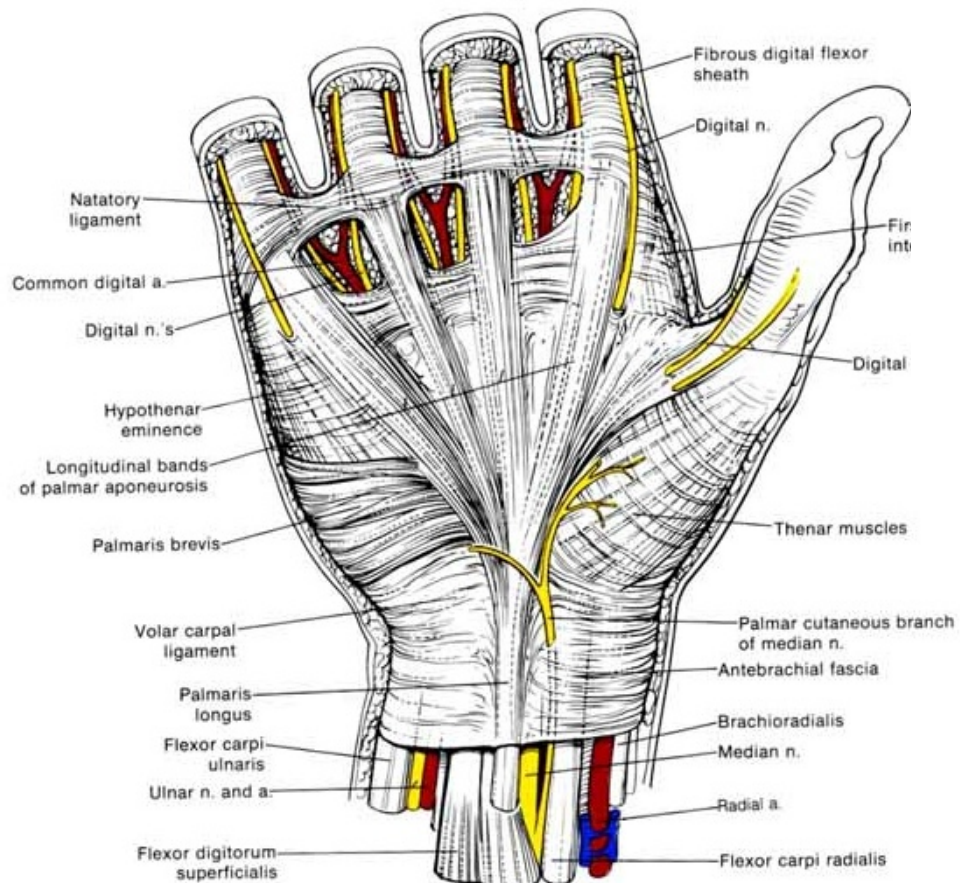
Hand Anatomy



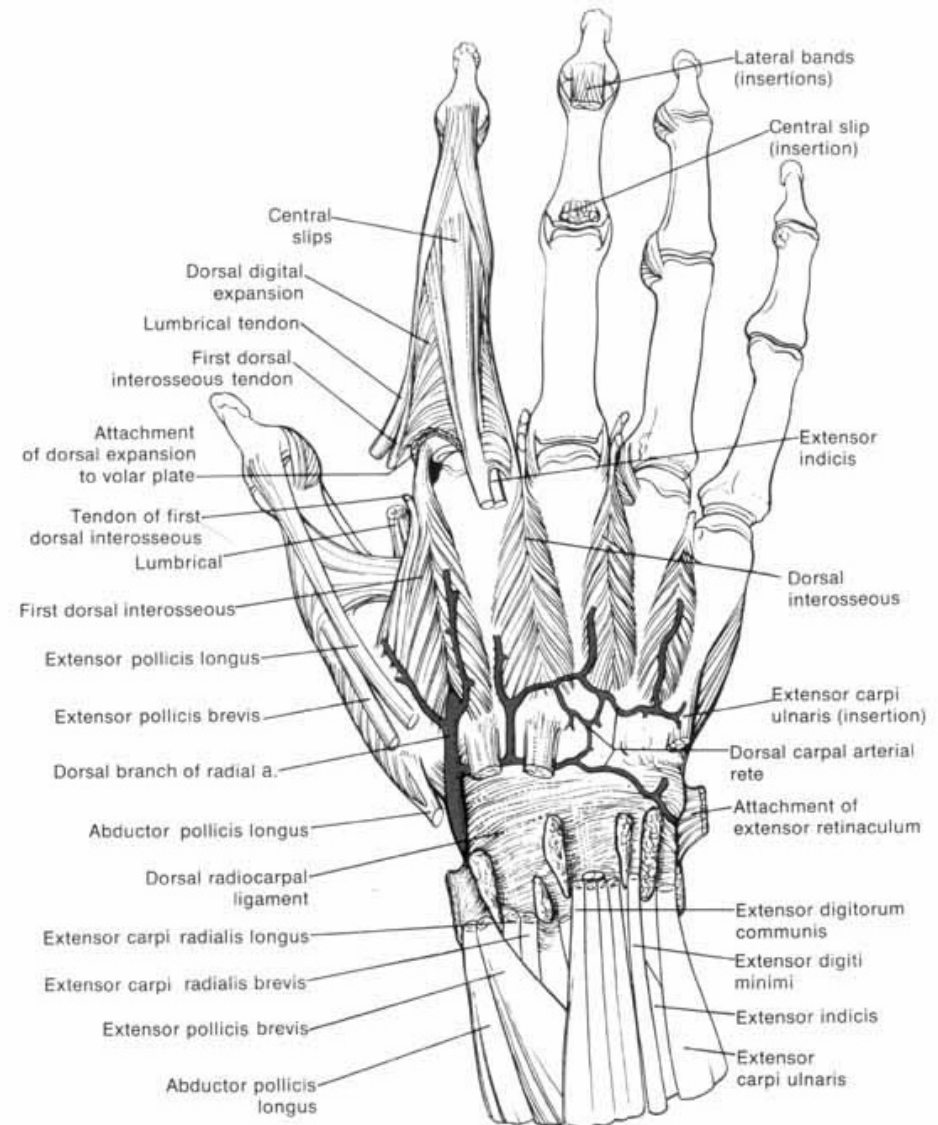
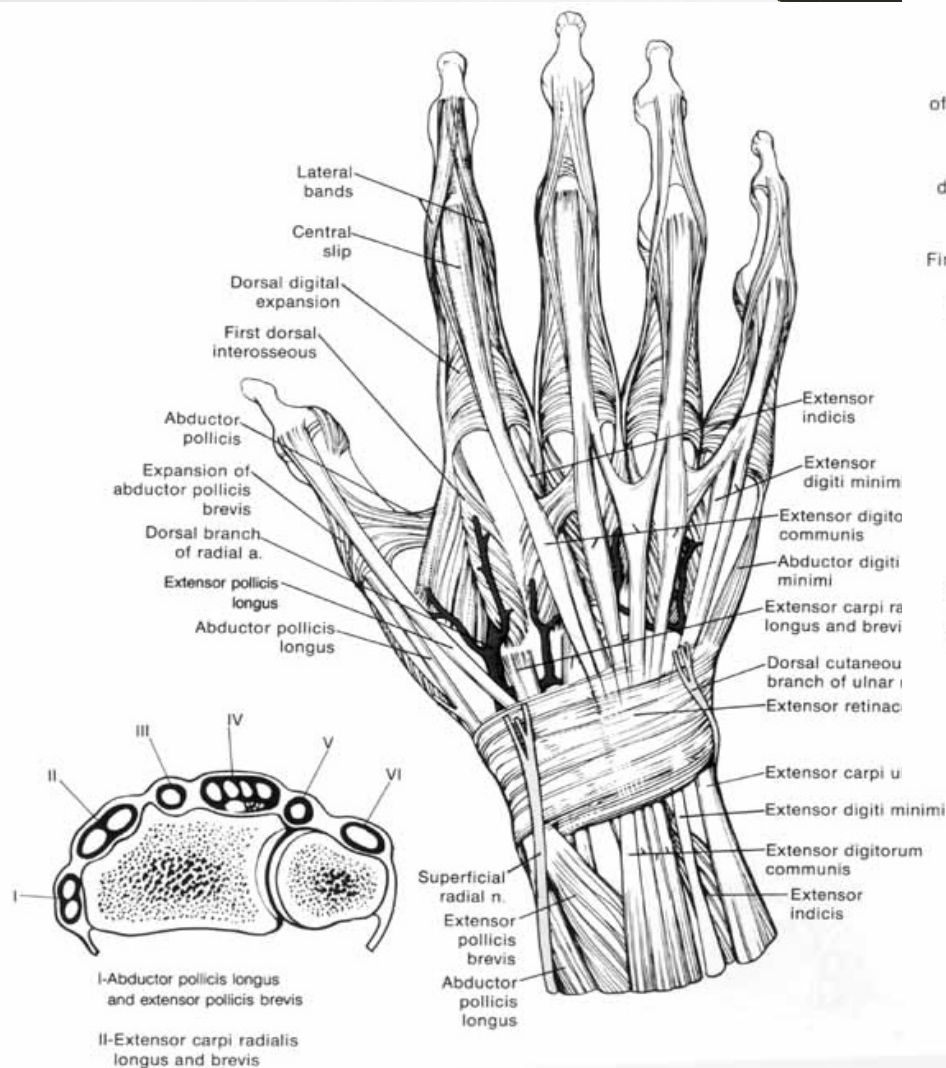
Terminology



Volar View



Dorsal view



Acute Injuries



- ❧ Assume every structure in zone of injury is damaged & systematically test each
- ❧ Gain information from both observation & manipulation
- ❧ Often examine DISTAL to the injury
- ❧ Some examinations are best left for the OT

History of Injury



- ❧ When?
- ❧ How?
- ❧ Where?
- ❧ Treatment to date (or lack of)?
- ❧ Other injuries?



Important Patient Factors



- ❧ Dominant hand?
- ❧ Occupation?
- ❧ 'Extra-curricular' activities?
eg musician
- ❧ Concomitant diseases?
eg diabetes

Examination : observation



- ❧ Position of hand & fingers
- ❧ Colour of hand & fingers
- ❧ Configuration of wounds
 - ❧ degree of soft tissue loss,
 - ❧ possible underlying structures,
 - ❧ degree of contamination
- ❧ THE PATIENT AS A WHOLE



Examination : order



- ∞ Skin
- ∞ Neurology – sensory and motor
- ∞ Tendons
- ∞ Skeleton

Examination : bones



- ❧ Location of fracture
 - ❧ Base, midshaft, neck, intra-articular

- ❧ Type of fracture
 - ❧ Transverse, oblique, spiral, comminuted

- ❧ Displacement of fracture

- ❧ Rotational malalignment

Examination : bones : rotation



Summary for Examination



*Quality of initial care is the
single most important determinant
of final degree of recovery*

&

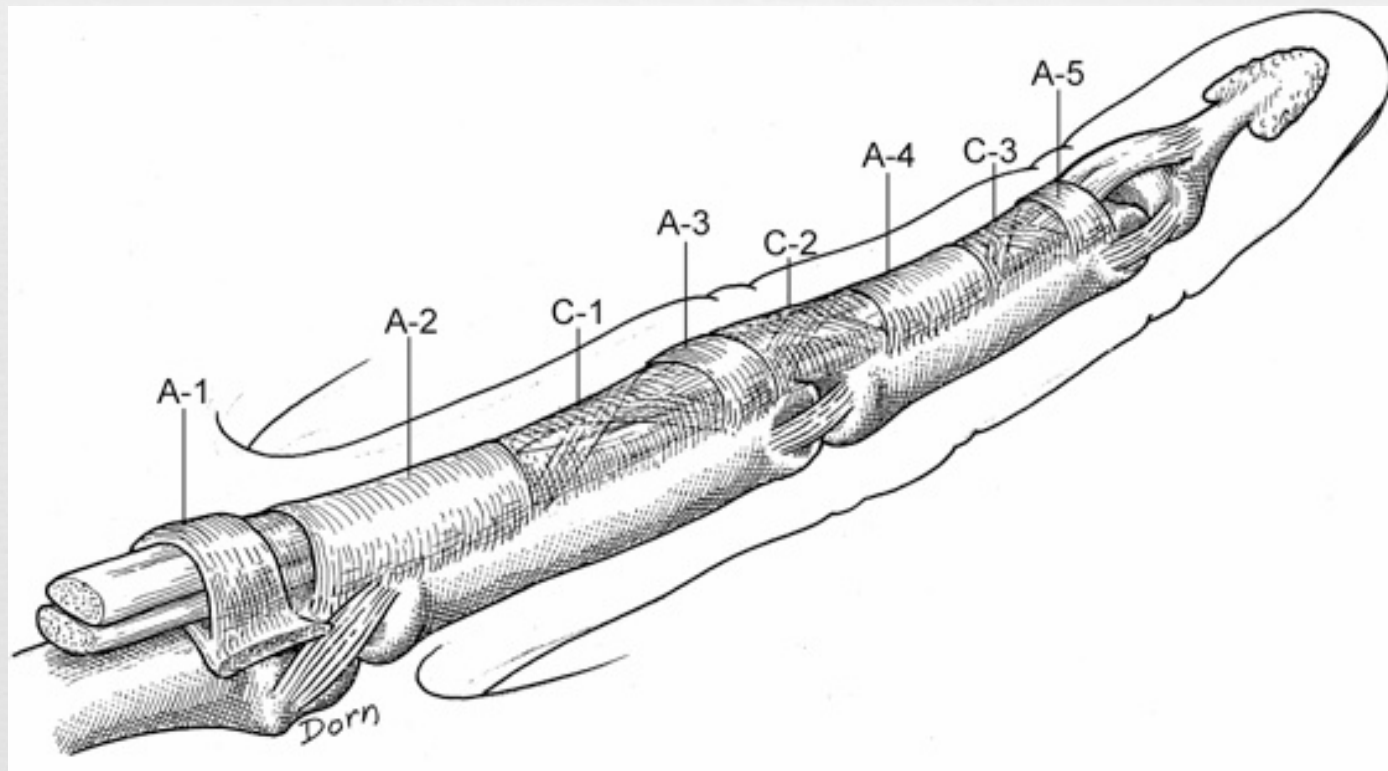
This begins in ED, NOT THE OT



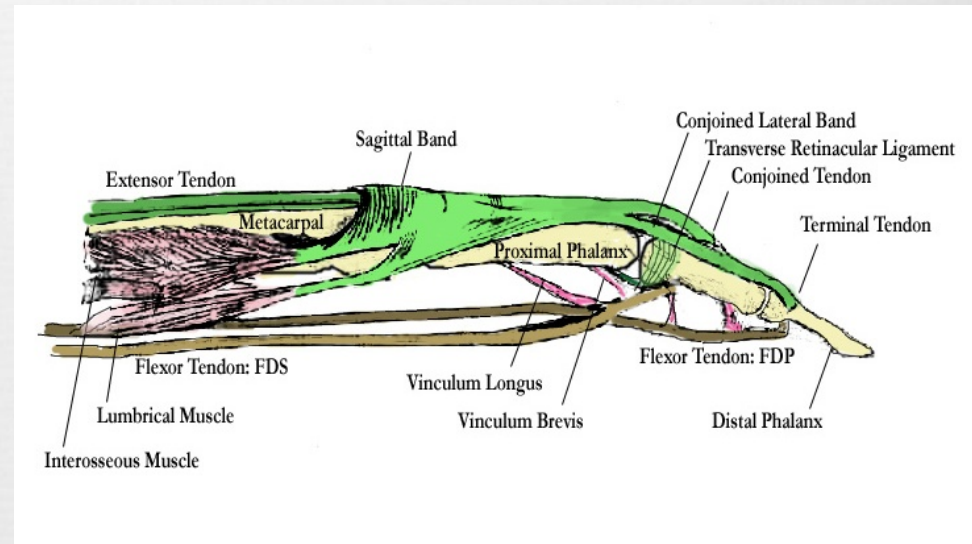
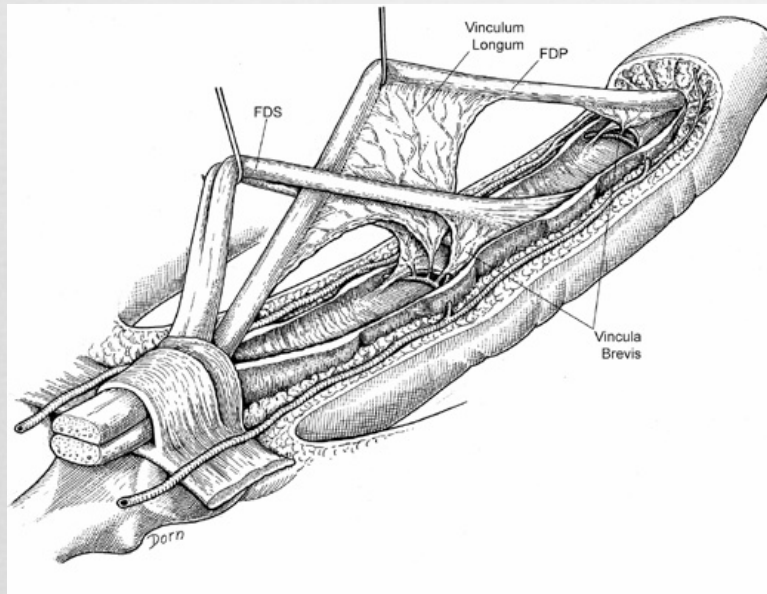
Tendons



Anatomy - Fibrous Sheath



Anatomy– Flexors and Extensors



Points to note



- ❧ All finger lacerations – suspect tendon laceration!
- ❧ It is (almost) impossible to have a dorsal finger laceration without lacerating the extensor mechanism
- ❧ It is quite reasonable to suture extensor tendons in the acute setting under LA
- ❧ All (suspected) flexor tendon injuries should be referred to your local hand unit
- ❧ Splinting /hand therapy essential for a good outcome



Hand Fractures



Metacarpals



- ❧ II & III form a fairly immobile complex
 - ❧ intolerant of deformity

- ❧ IV & V more mobile
 - ❧ more tolerant of deformity

- ❧ I lies on very mobile CMC joint
 - ❧ very tolerant of deformity

Metacarpals - intervention if...



- ∞ ANY rotational deformity
- ∞ Shortening
- ∞ Displacement

● **ANGULATION**

- II & III shaft & neck: $>10^{\circ}$
- IV shaft & neck: $>20^{\circ}$
- V shaft: $>20^{\circ}$ neck: $>30^{\circ}-45^{\circ}$
- volar angulation (volar apex)

Phalanges



❧ Similar techniques to metacarpal fractures

BUT

❧ Important conceptual differences

❧ importance of tendon gliding

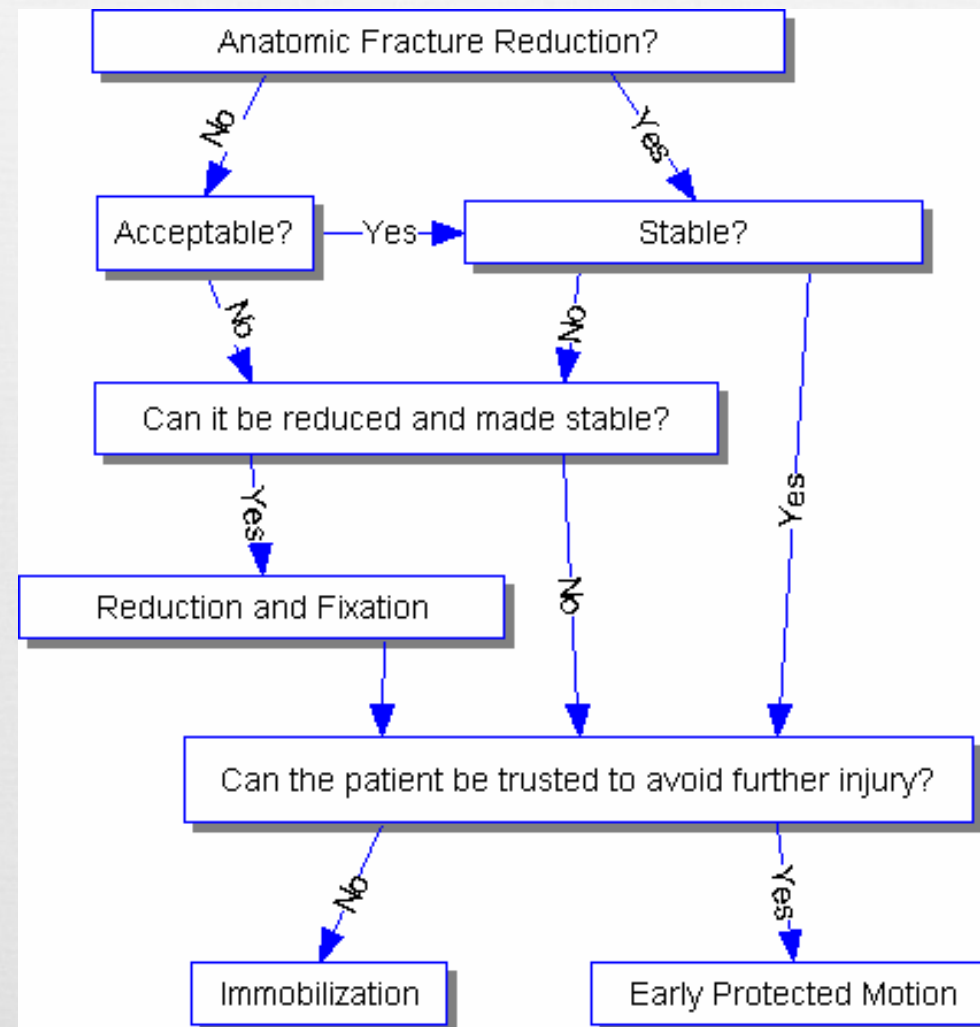
❧ interdependence of length & extensor tendon function

Summary for Fractures



- ❧ Evaluate clinically & radiologically
 - ❧ rotational deformity
- ❧ Individualise treatment to patient
 - ❧ functional demands
 - ❧ previous fractures
 - ❧ compliance with treatment

Hand Fracture Treatment



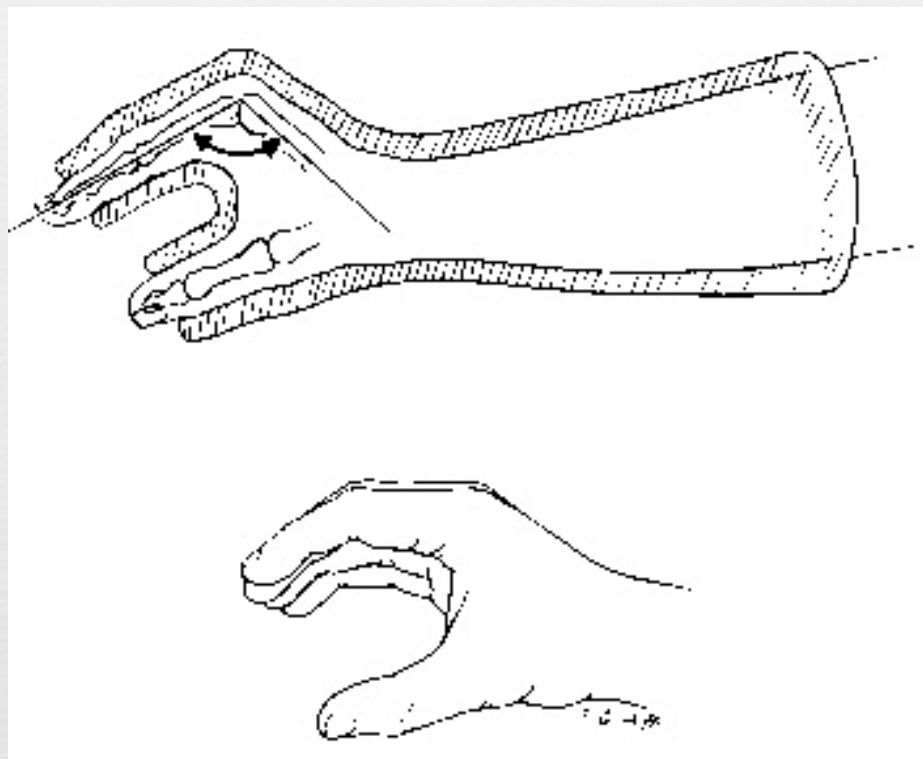
Summary



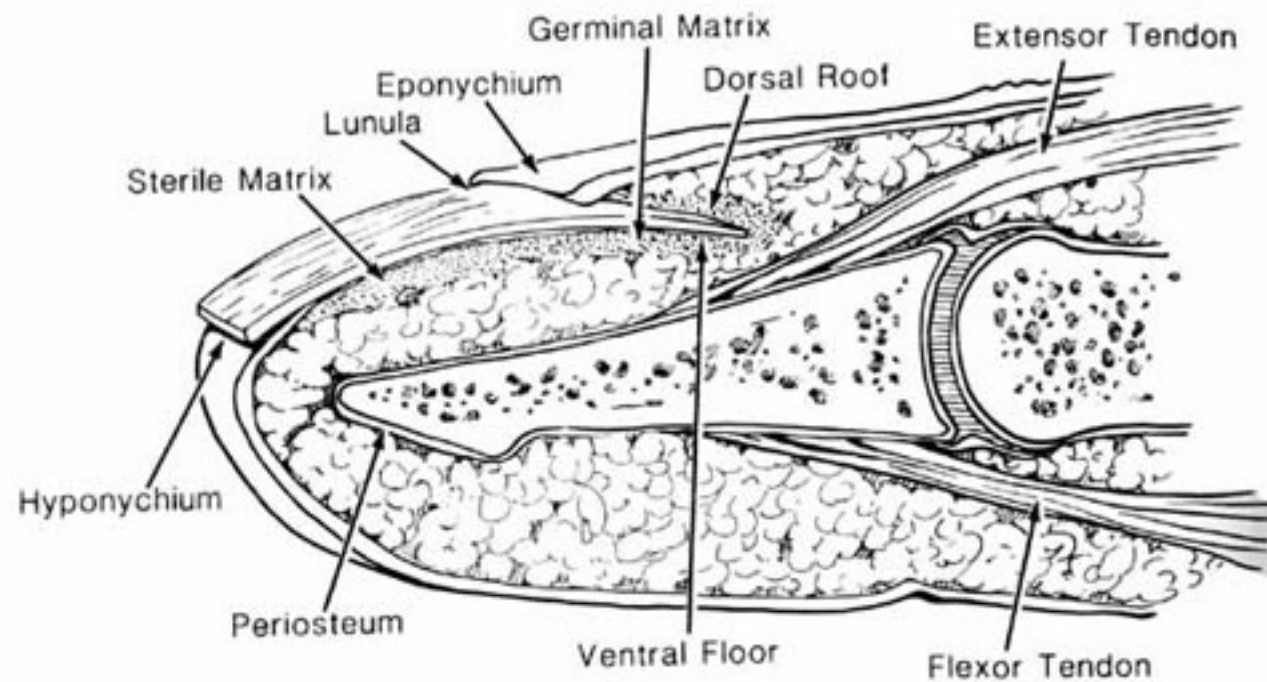
- ❧ Accurate assessment of hand injury
 - ❧ tendon, nerve, soft tissue, bone
 - ❧ assume disrupted if not normal

- ❧ Treat the patient & aim for a functional hand

Hand Splintage



Nail Bed Injuries



Infections



UCL injury



Secondary Surgery for 'Acute' Hands



- ❧ May be required to:
 - ❧ Optimize tendon function and excursion
 - ❧ Correct bony alignment
 - ❧ Tendon transfers for nerve injuries
 - ❧ Correct chronic ligament laxity
 - ❧ Deal with post-traumatic osteoarthritis



Replantation in the Upper Limb



Considerations



SUITABLE

- ❧ Thumb
- ❧ Multiple Digits
- ❧ Any in children
- ❧ Transmetacarpal
- ❧ Wrist
- ❧ Forearm

UNSUITABLE

- ❧ Advanced age / Smoking
- ❧ Avulsion injuries
- ❧ Prolonged warm ischaemia
- ❧ Massive contamination
- ❧ Psychiatric
- ❧ Single digits

“First Aid”



- ❧ Evaluate patient
- ❧ Analgesia / Tetanus / Antibiotic
- ❧ Discuss case with plastic surgeon on call
- ❧ Amputated part – keep cool and dry (plastic bag, wrapped in moist gauze, in icy water)
- ❧ Time-critical transfer to hospital







‘Elective’ Hands



Dup

ease



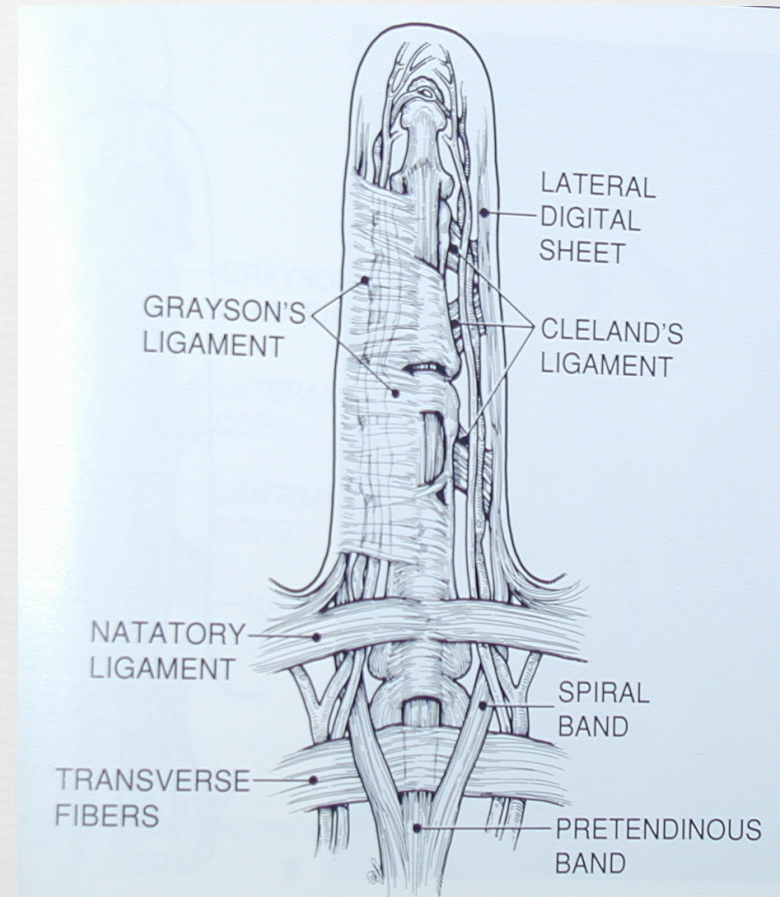
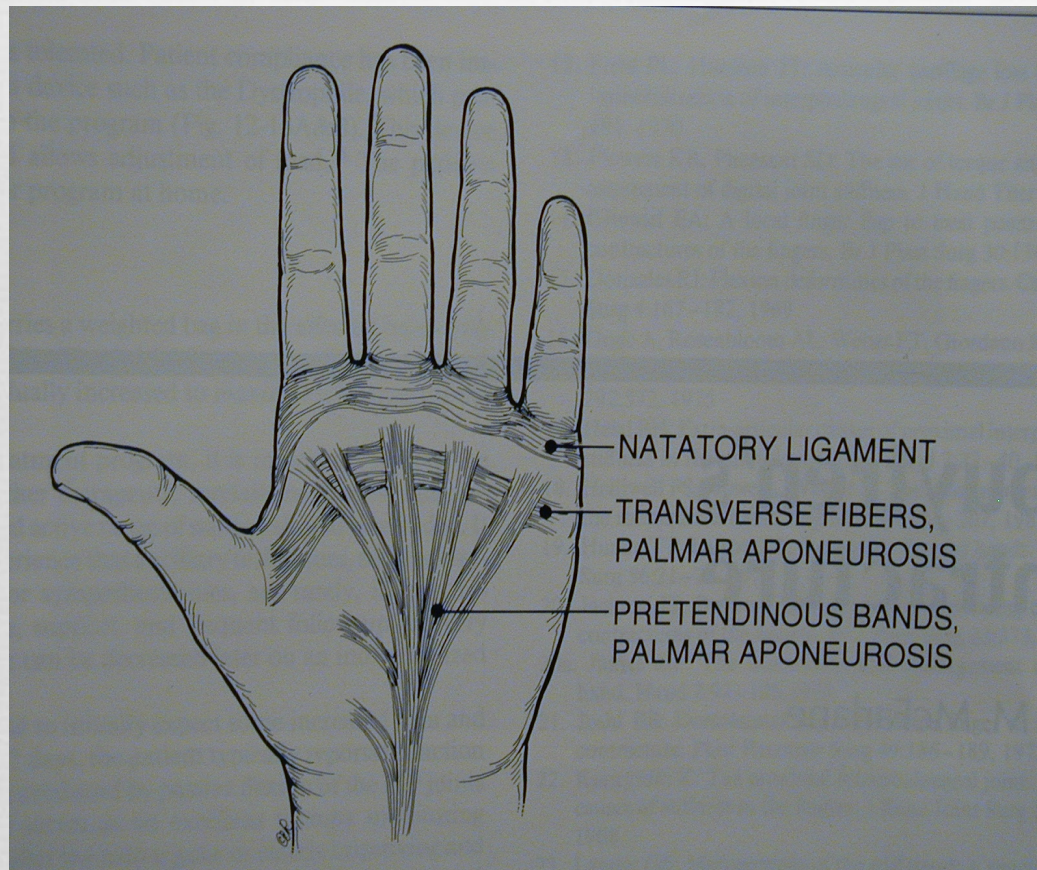
History



- ❧ Icelandic Sagas
- ❧ Swiss Physician Platter in 1614
- ❧ Sir Astley Cooper in 1824
- ❧ Baron Guillaume Dupuytren 1834



Anatomy of Palmar Fascia



Incidence



- ❧ Virtually a disease of Caucasians usually of northern European extraction (up to 26% in one European study)
- ❧ men 15 times more likely to need surgery
- ❧ Peak incidence in 40 to 60 age group
- ❧ associated with diabetes, heavy alcohol ingestion, and epilepsy.
- ❧ Ring finger > little > middle > thumb > index

Dupuytren's Diathesis



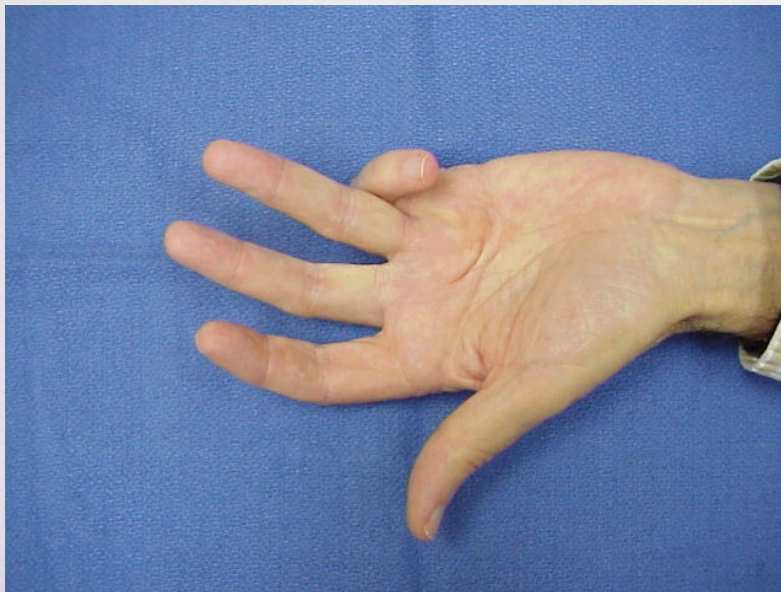
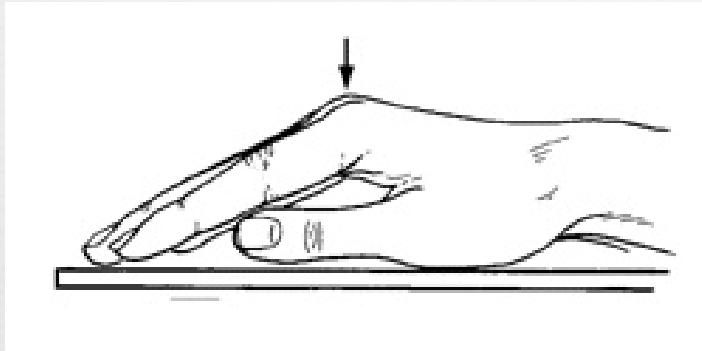
- ❧ early age of onset (3rd to 4th decade)
- ❧ aggressive disease and usually bilateral
- ❧ positive family history
- ❧ recurrence
- ❧ often have knuckle pads, plantar fibromatosis (Lederhose's Disease), Penile fibromatosis (Peyronie's disease).

Cause : The Myofibroblast



- ∞ Fibroblast phenotypic variant
- ∞ 1971 Gabbiani - contracting in-vitro granulation tissue
- ∞ Present in Dupuytren's tissue, also frozen shoulder, HT and Keloid scar, implant capsules, desmoplastic tumour
- ∞ Appears then disappears in normal wound healing but persists in desmoplastic and fibroproliferative diseases - ?failure of apoptosis

Assessment



Treatment options



- ❧ Non-surgical options
- ❧ Surgery

Non-surgical Options



- ❧ Allopurinol - anti-free radical
- ❧ Vitamin E - anti-free radical
- ❧ Steroids
- ❧ Enzymatic fasciectomy
- ❧ Intralesional injection of triamcinilone slowed progression (Ketchum)
- ❧ 5 Fluorouracil been used recently with some success

Indications for surgery



- ❧ MP joint contracture > 20 degrees
- ❧ PIPJ joint contracture of any degree
- ❧ severe adduction deformity
- ❧ disturbed neurovascular function
- ❧ **Most people use the table top or reverse table top test**



Special problems



- ❧ PIPJ joint contracture resistant to fasciectomy
- ❧ Recurrent disease
- ❧ Severe contracture with joint changes
- ❧ disease of the little finger

Post operative care



- ❧ Volar splint with well padded hand and dressing. Pip joints kept straight and hand elevated.
- ❧ Splint usually taken down at 1 week and mobilisation begun. Keep in splint when not mobilising.
- ❧ Splints at night to maintain extension 3-6/12



1st CMC OA



Osteoarthritis



- ❧ **DIP Joints** (Heberden's nodes) – rarely symptomatic
- ❧ **Basal joints of thumb (1st CMC OA)**
 - ❧ Pain, stiffness, thumb adduction
 - ❧ “loss of strength” eg turning a key or opening jars
 - ❧ Mainly a disease of postmenopausal women
 - ❧ Usually post-traumatic in men
 - ❧ Examination – tenderness and crepitus with axial grinding of thumb

1st CMC OA



1st CMC OA



∞ Treatment Options:

∞ Splinting

∞ Steroid injections (often useful)

∞ Surgery

1st CMC OA

Surgery





Ganglions and Mucous Cysts



Ganglia



- ❧ Commonest 'tumours' of the hand, esp in women
- ❧ Most common types are:
 - ❧ Dorsal wrist ganglia
 - ❧ Volar wrist ganglia
 - ❧ Ganglia of flexor sheath
 - ❧ Mucous cysts

Mucous Cysts



- ❧ Arise from DIPJ
- ❧ Usually in 5th-7th decades
- ❧ Earliest sign maybe longitudinal nail grooving
- ❧ Often related to OA



Management



❧ Non – surgical

- ❧ Benign ‘neglect’ – some may resolve spontaneously
- ❧ Aspiration and steroid injection
- ❧ Pressure

❧ Surgical



Trigger Finger

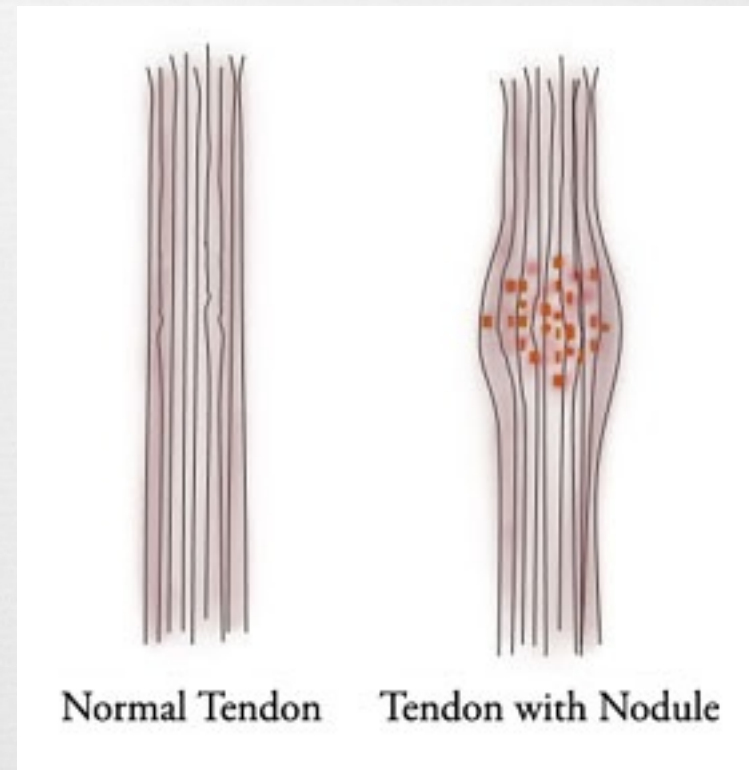
(Digital Flexor Tenosynovitis)



Trigger Finger



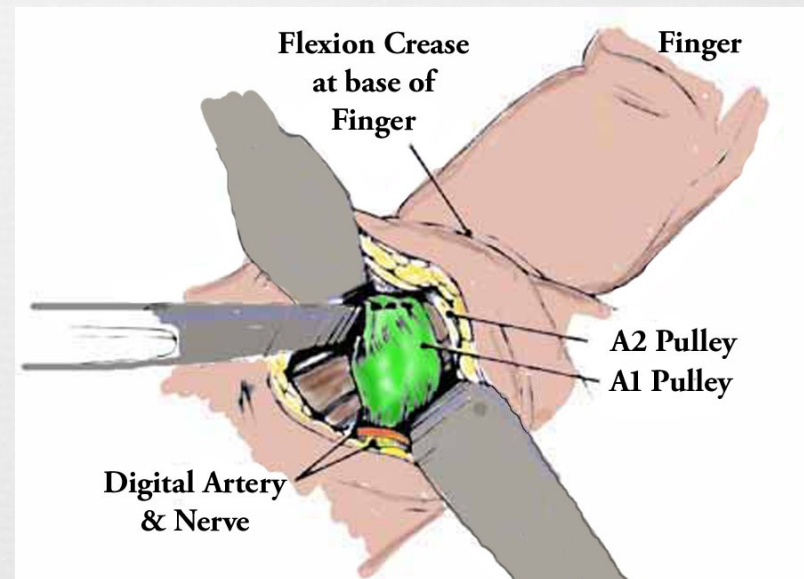
- ❧ Painful nodule palpable over flexor tendon
- ❧ 'Triggering' leads to 'locking' in flexion
- ❧ Congenital trigger thumb (often bilateral)



Treatment Options



- ❧ Splinting
- ❧ Steroid injection
- ❧ Pulley release (LA procedure)





Nerve Compression Syndromes



Nerve Compression Syndromes



- ❧ **Carpal tunnel syndrome (median)**
- ❧ (Proximal median nerve entrapment)
- ❧ **Cubital tunnel syndrome (ulnar)**
- ❧ **Ulnar tunnel syndrome**
- ❧ (Radial nerve entrapment)

Carpal Tunnel Syndrome



- ❧ 'Classic' symptoms and signs
- ❧ Caused by Reduction in tunnel size or Increase in volume of its contents
- ❧ Look for motor signs (generally irreversible)
- ❧ Response to steroids and splinting depends on duration of symptoms and etiology
- ❧ Surgical release under LA if 'classic history'

Cubital Tunnel Syndrome



- ❧ Maybe post-traumatic (single or repetitive) or spontaneous
- ❧ Generally related to repetitive elbow flexion
- ❧ Symptoms of pain and intermittent paraesthesia
- ❧ Tests: Tinel's test, Forced elbow flexion. Look for motor signs. Nerve studies may be unreliable.
- ❧ Treatment: Splinting. Surgery if splinting fails.

Ulnar Tunnel Syndrome



- ❧ Typically in patients with repetitive trauma (paraplegics, cyclists, hammering activities)
- ❧ Differentiate from Cubital Tunnel by testing dorsal sensory branch of ulnar nerve
- ❧ Look for hypothenar wasting (Motor signs more common than sensory signs).

Questions??

