

The image features five human hands in various poses, arranged around a central text area. The hands are light-skinned and appear to be from different individuals. They are positioned at the top-left, top-right, middle-right, bottom-right, and bottom-left, with palms facing different directions. The background is plain white.

Hand Infections and Conditions

Most complex structure in MSS
Fine movements

Usually the occurrence of hand infections are very minimal
due to the profuse blood supply which wash out the bacteria

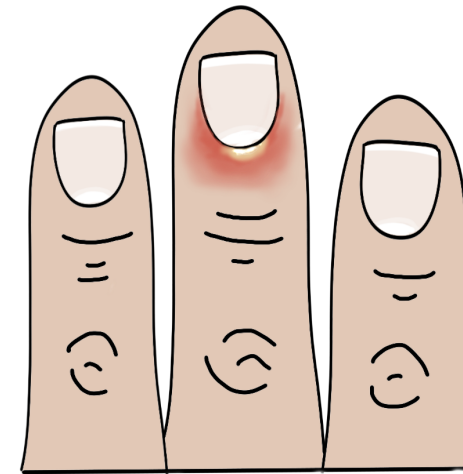
Opposition= thumb rotation

Hand infections usually occur in well-defined compartments:

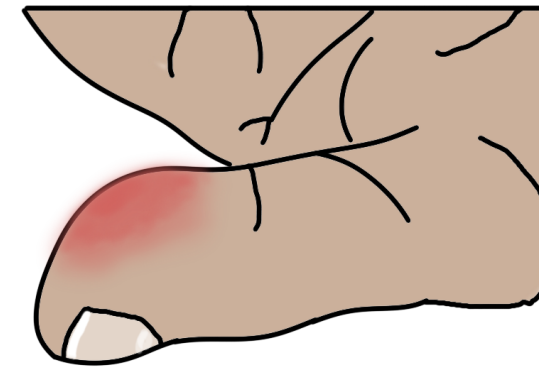
- Under the nail fold (paronychia).
- Pulp space (felon).
- Subcutaneous tissues.
- Deep fascial space.
- Tendon sheaths.
- Joints.

Hand is the most complex structure in the MSS, its structures are very crowded, so any injury/fracture will have a lot of consequences

Hand infections should be considered seriously because they can damage nearby structures such as tendons, ligaments, blood vessels, nerves...



Paronychia



Felon

- Hand infections Usually occur due to a trauma.
- Occurs more in diabetic and immunocompromised patients.
- The most common organism to cause these infections are staphylococcus bacteria.
Any infection in bones, 90% it's caused by staph aureus, because it presents on our skin
And it is virulent microorganism
- The infected area is red, swollen, hot, and painful.
- If left untreated, infection can spread to other compartments with a risk of hematological and lymphatic spread.

Skin G +ve species
S aureus
S epidermidis
Streptococcal species
Micrococcus
Dephteroids

Lymphangitis

Paronychia

- It's an infection under the nail-fold.
- The most common hand infection. More common in women
- Risk factors:
 - 1) Hangnails.
 - 2) Nail biting and sucking.
 - 3) Manicures.
 - 4) Penetrating trauma.



Fungal: بتصير اكثر اشبي بالمزارعين والناس يلي بيعتمدوا على الهايجين مش المي والصابون بالتعسيل

Treatment:

- Antibiotics. Specifically augmentin (amoxicillin clavulanic acid)

- Drainage (if abscess is present).

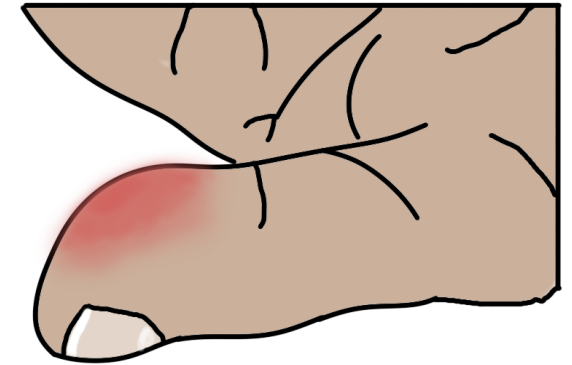
inadequate drainage of an acute infection can lead to a **chronic paronychia.**



-Subcutaneous abscess in the fingertip pulp
-15-20% of hand infections.
-Mostly in the thumb/index finger

Felon

- It's a closed-space infections of the fingertip pulp.
- Usually causes by a prick injury.
- Treatment: antibiotics and drainage.
- If left untreated could cause:
 - 1) osteomyelitis
 - 2) necrosis of the finger pad.



Finger pad necrosis

Herpetic whitlow

- **Painful Lesions** on a finger or thumb caused by the **herpes** simplex virus.
- Risk factors:
 - 1) genital or **oral herpes**. 15% Recurrent herpes simplex with every febrile illness
 - 2) **health care worker**. Most common
- Lesion are small vesicles on fingertips that starts to ulcerate.
- It's **self limiting**, subsides within 10 days. Painful For months
- **Acyclovir** can be effective in early stages. Vesicular stage



Top emergency,
we might lose
the tendon or its
movement

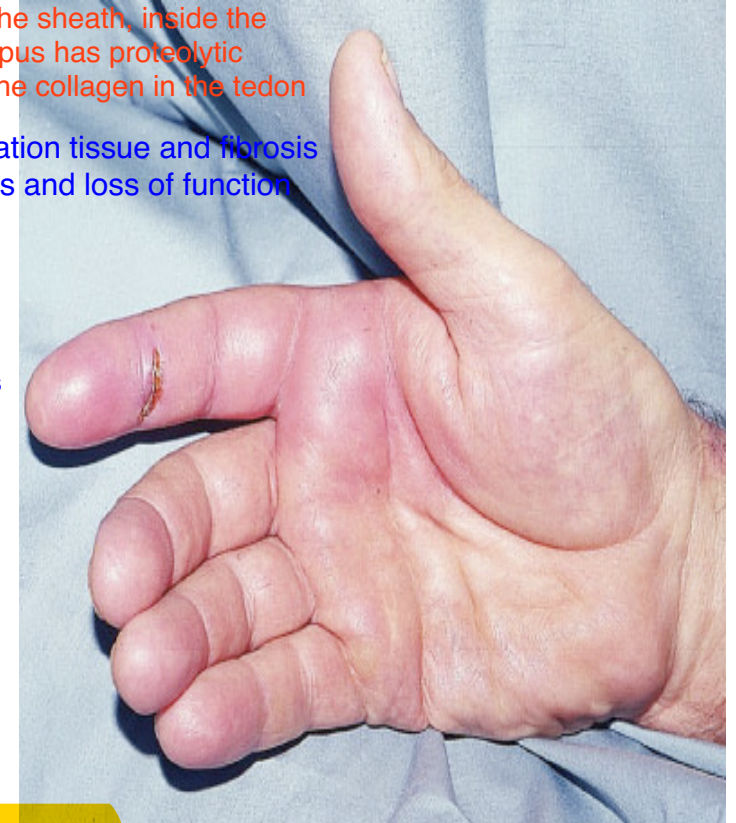
Suppurative Tenosynovitis

TOP
EMERGENCY

- Inflammation of a tendon and its sheath.
The bacteria enters inside the sheath, inside the sheath there is tendon, the pus has proteolytic enzymes which will digest the collagen in the tendon
- Common organisms: staphylococcus aureus and streptococcus.
Or granulation tissue and fibrosis
-> stiffness and loss of function
- The affected digit will be painful and swollen, held at a flexion position.
Semi-flexed position; in order to reduce the pressure, in addition to tenderness that end in the tendon sheath (DIP), sausage shape.
- Treatment:
 - 1) elevation and splinting of hand.
 - 2) IV antibiotics.
 - 3) surgical drainage (if no improvement).
- If left untreated it can cause vascular occlusion and tendon necrosis.

Semiflexed
To relieve the
compartment
pressure
Painful passive
extension

Sausage shape fingers
Hotness, redness
Tip of fingers=spared
(no tendon sheath)



Note: middle three fingers the tendon sheath ends on the DIP, little finger and thumb tendon sheath extends to the wrist which appear as horseshoe abscess

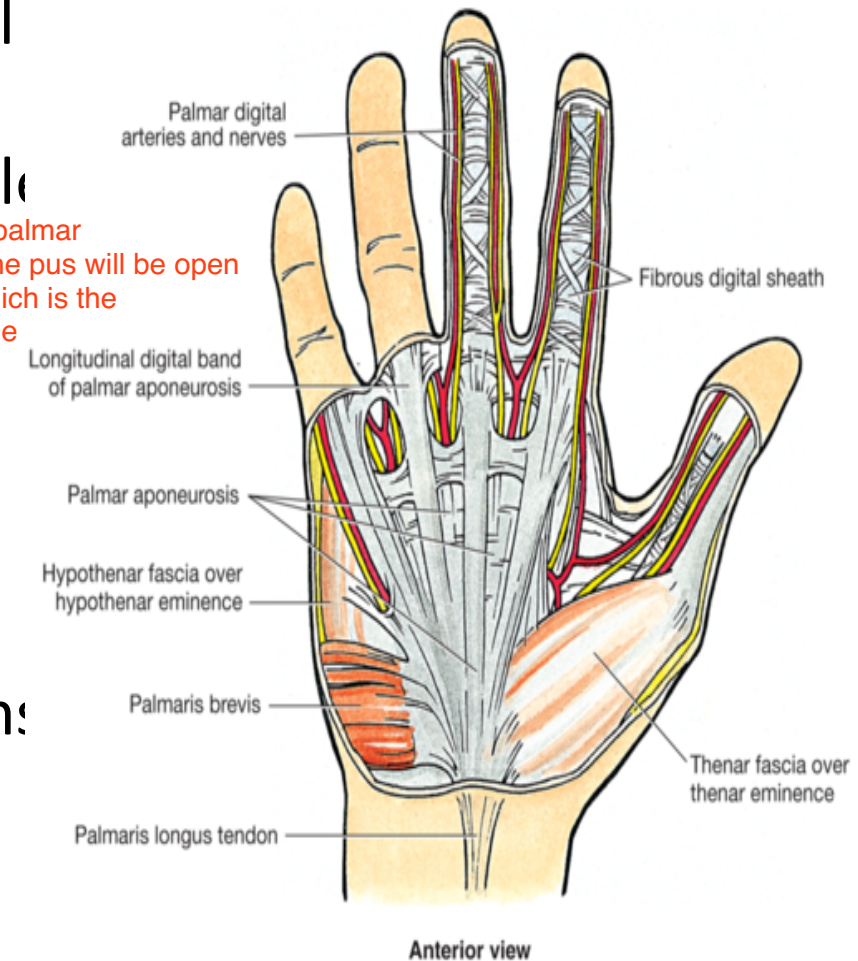
Top emergency

Deep fascial space infection TOP EMERGENCY

There are 2 septae in the palm, one circulate the hypothenar muscles and the other circulates thenar muscles, so the palm will be divided into thenar, hypothenar and midpalmar muscle. Any one of these spaces might be injured and enters bacteria that cause infection in the deep space.

- Infection of the large thenar and mid palmar fascial spaces.
- The palm area will be painful , but usually not swollen while the Dorsum part of the hand will be.
- Treatment:
 - 1) antibiotics.
 - 2) splitage. If we do splitage, stiffness will occur so the patient should start moving his had from the first day
 - 3) drainage.
- Infection could extend proximally causing symptoms median nerve compression.

Because there is palmar aponeurosis, so the pus will be open in a weak area which is the interosseae muscle



Septic arthritis

- Infection of any MCP or finger joint.
- Contamination occurs via the bloodstream, iatrogenically, or penetrating trauma.
- patients with damaged or prosthetic joints have an increased risk.
- Acute in onset, Classical **triad** of ^{In 60%} fever, joint pain, and restricted range of motion
- Joint may be swollen, red, and warm.
- **Treatment:**
 - 1) antibiotics.
 - 2) splintage.
 - 3) drainage.
- If left untreated: ^① Joint destruction, ^② osteomyelitis and ^③ Sepsis can occur.

Serum analysis: WBC>10,000, ESR and CRP
Joint aspirate should be investigated

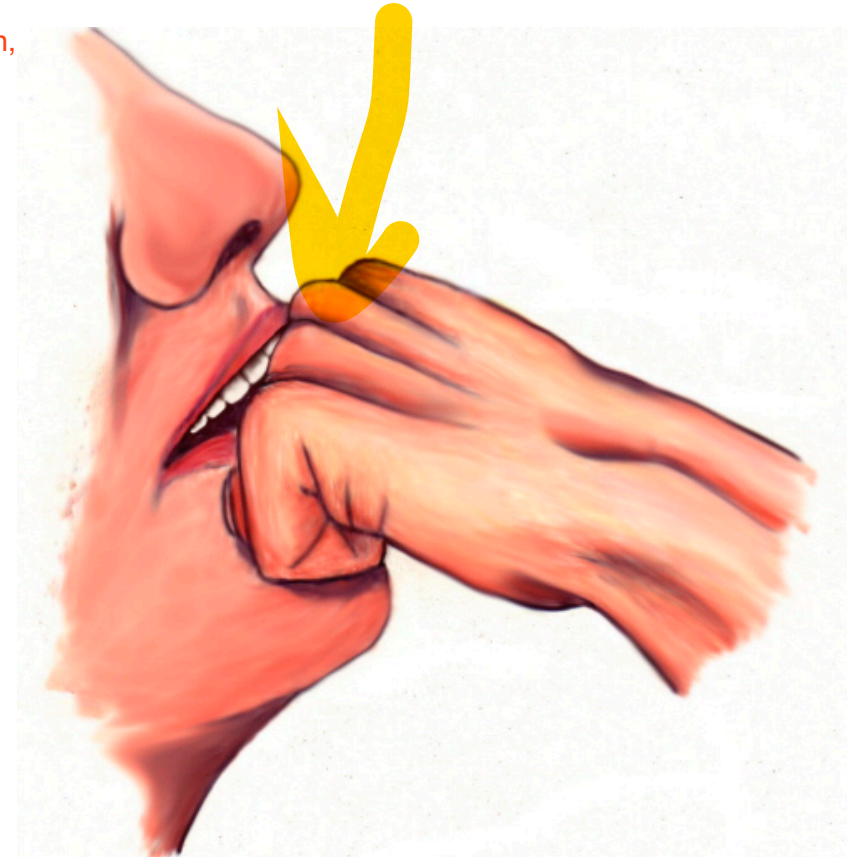


Bites

Fist injury

Risk of infection more in human bite
Mechanical damage more in animal bite

- Laceration from either an Animal or a human bite.
- Usually occurs during fist fighting.
The tip of the teeth will enter the skin, under the skin there is extensor expansion
- Human bites are considered more infectious.
- X-ray ^① should be obtained to exclude fracture or the presence of tooth fragments, along with swabs ^② for culture.
- **Treatment:** When the patient comes to the hospital, immediately I should irrigate the laceration and give antibiotic, even before I know there is infection
 - 1) debridement.
 - 2) antibiotics.
 - 3) elevation and splintage.
- In animal bites a person should rule out rabies.



Note: tetanus vaccine is only given if there is gross soil contamination, here we give booster dose (dt)



Common hand conditions

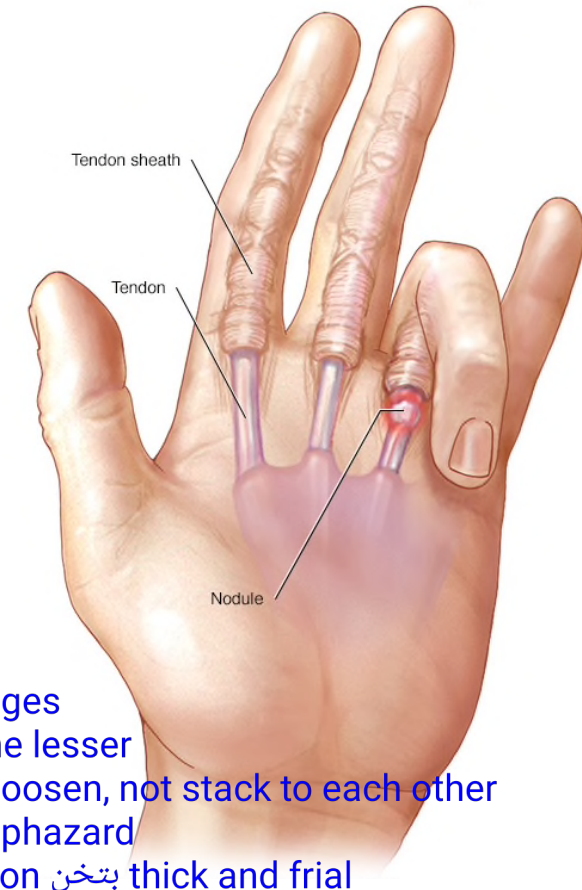
- 1 ➤ • Trigger finger .
- 2 ➤ • Osteoarthritis .
- 3 ➤ • Dupuytren's contracture .
- 4 ➤ • Carpal tunnel syndrome .

The first part of tendon sheath is called A1 pulley, which will constrict the tendon

Trigger finger

Degenerative or traumatic

- **painful locking** of a finger in flexed position it's released suddenly with a snap/pop on extension.
- Local swelling from inflammation or ¹scarring of the tendon sheath (tenosynovium) around the flexor tendons ²
- Mostly affects **thumbs** and **ring** fingers.
- **Treatment:** Start conservatively (physiotherapy)
 - 1) injection of corticosteroid at the mouth of the tendon sheath. ^{2/3}
(recurrence after 6 months is >30%).
 - 2) surgery (refractory cases). ^{1/3}

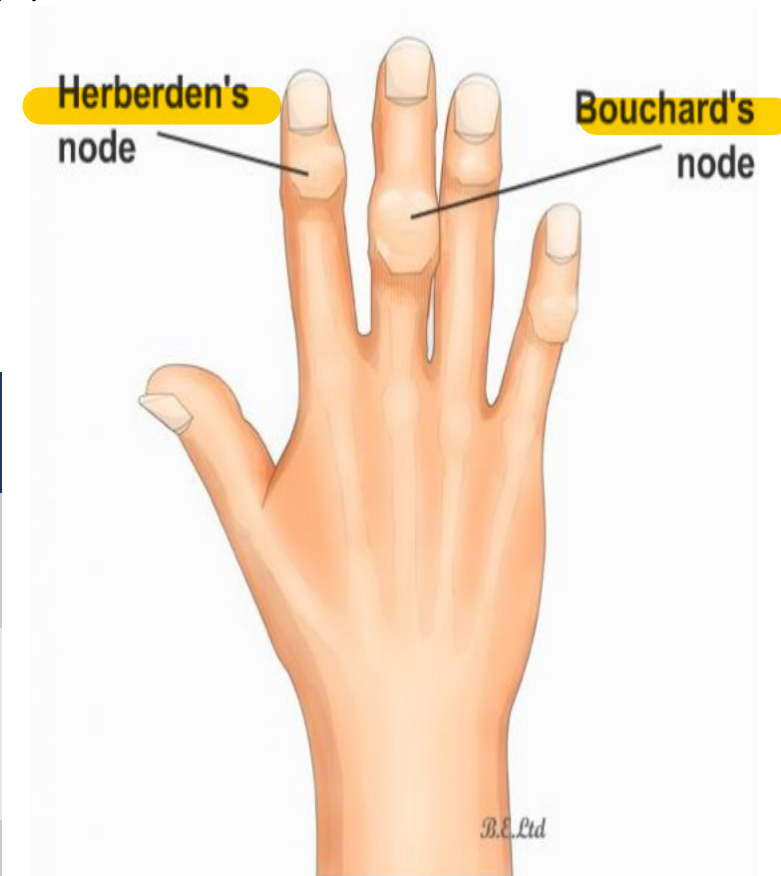


More in older ages
Healing become lesser
Collagen fiber loosen, not stack to each other
Not parallel, haphazard
Ligament/tendon ^{بتخن} thick and frial

Osteoarthritis

- noninflammatory degeneration of the joint complex (articular cartilage, subchondral bone, and synovium) that occurs with old age or from overuse.
- One of the most common joint joint disorders.
- Treatment is usually Symptomatic treatment (cortisone injections in severe pain)

Distal interphalangeal joints	Proximal interphalangeal joints.
Most common in <u>postmenopausal women</u>	Less common
Swollen <u>painful distal joints</u> , <u>spreads to all fingers of both hands</u>	Swollen painful joints , associated with osteoarthritis elsewhere in the body
Bony thickening (Heberden's nodes) Those are osteophytes	Bony thickening (Bouchard's nodes)



Dupuytren's contractur

Secondary causes: alcoholism, HIV, DM, Antiepileptic (phentoin)

- Dupuytren's contracture is a common fibroproliferative disorder affecting the palmar fascia mainly of the 4th, and 5th fingers
Palmar aponeurosis
- The cause is still unknown , but it's genetic.
- Males>females.
- **Features:**
 - Skin puckering near the proximal flexor crease is the earliest sign.
 - Flexion contracture of affected finger/s.
- **Treatment:**
 - 1)Conservative therapy.
 - 2)Corticosteroids injections.
 - 3)Surgery:
Indicated in patients with functional disability due contractures.
(Fasciotomy, Fasciectomy). إذا المريض بطل يقدر يحط ايده flat على الطاولة



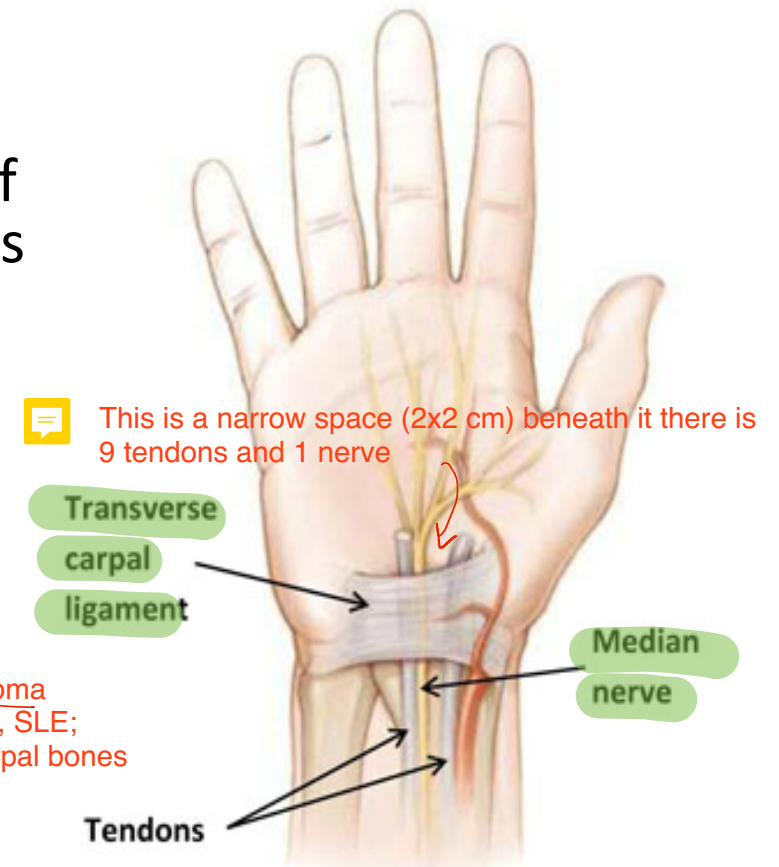
Most common orthopedic condition

Carpal tunnel syndrome

- Carpal tunnel syndrome is a peripheral neuropathy caused by compression of the **median nerve** by the **transverse carpal ligament**. (Flexor retinaculum)
- carpal tunnel is a narrow fibrous structure at the level of the palmar aspect of the wrist. It contains flexor tendons and the median nerve.
- It occurs **more commonly** in
 - 1) previous distal radius fracture. (Traumatic)
 - 2) Manual workers (vibrating tools).
 - 3) Pregnancy. And obesity; lead to fluid retention
 - 4) Diabetes. Hypothyroidism, Hypergrowth hormone
 - 5) Tumors (Masses): Ganglion cyst, Lipoma
 - 6) Inflammatory conditions: Rheumatoid, SLE; causing synovitis and dislocation of carpal bones

Most common cause is idiopathic, some theories say it's caused by synovitis, other say that with aging ligaments weaken so collagen fibers will become haphazard not packed

Note: Most common fracture is distal radius in all age groups



• Clinical features:

Motor symptoms are irreversible even with surgery,
sensory symptoms are reversible in the beginning
then they will become irreversible

1) **Sensory symptoms** on the palmar surface of the thumb, index, and middle finger; and radial half of the ring finger (paresthesia, numbness)

Pins and needles

Anesthesia

Hypesthesia (decrease sensation)

2) **Weakened grip.**

3) **Thenar atrophy.**

vibration and 2 point discrimination أول اشي بيخسرده المريض هو ال

P/E:

1. Tinel sign; percussion proximal to carpal tunnel(which begins in the distal wrist crease) 1 min

2. Phalen test: rest flexion 1-2 min

3. Direct compression test (most accurate) 1 min

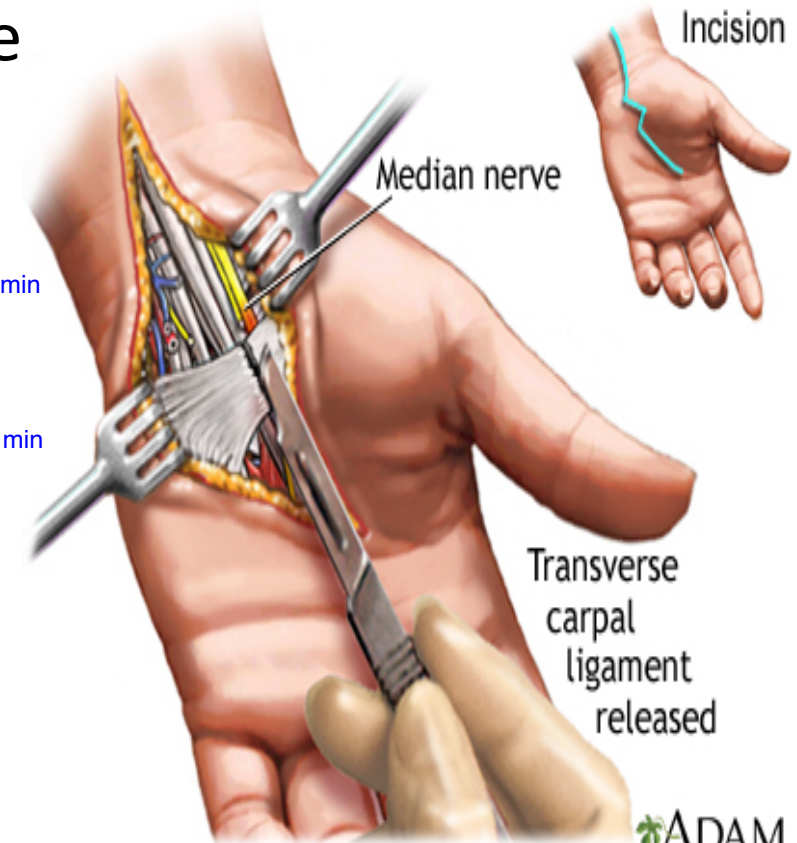
4. Nerve conduction for follow up

• Treatment :

1) conservative treatment: immobilization with splints, steroid injections, NSAID. Gabapentin

Prevent wrist flexion

2) surgical release of the transverse carpal ligament.



Tenosinovitis of first extensor compartment

(De Quervain)

This compartment includes: extensor pollicis brevis and Abductor pollicis longus, which moves the thumbs.

Mainly affects young ladies after delivery

Tx: local steroid injection, NSAIDs

P/E: I do ulnar deviation of thumb (I ask the pt to put his thumb in the middle of palm and close his fingers on it)

Thank
you

