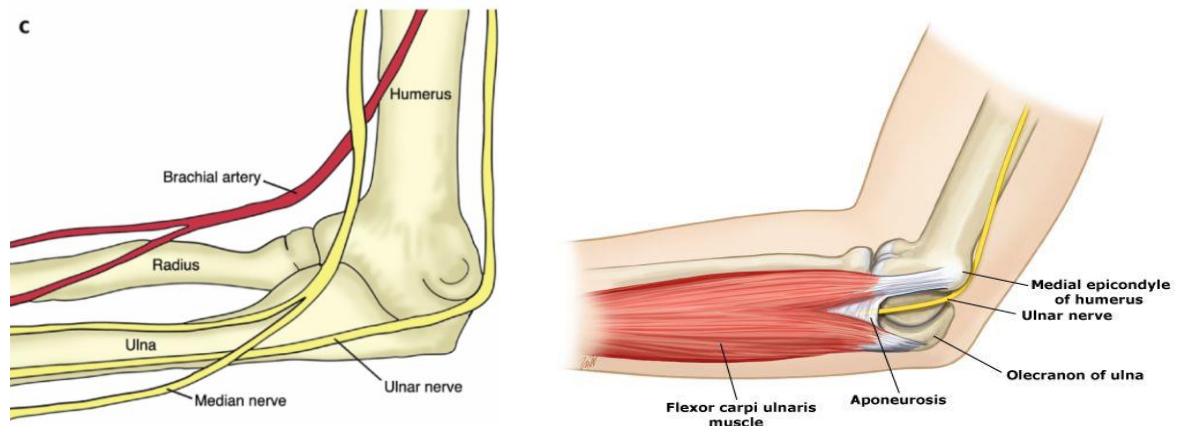


### Ulnar nerve injury

#### ★ Cause:

- Usually due to **cut wrist**, supracondylar **fracture** or fracture medial epicondyle of humerus.
- Rarely, compression of ulnar nerve in the **cubital tunnel** by a tendinous arch connecting the humeral and ulnar head of flexor carpi ulnaris .



#### ★ Results :

##### I) Effect of injury at the wrist:

##### A) Motor manifestations :

##### 1) Deformity:

- **Partial claw hand** : due to paralysis of interossei and medial 2 lumbricals of little & ring fingers → extension of M/P joints (by extensor digitorum) and flexion of interphalangeal joints (by flexor digitorum superficialis and profundus) .
- The deformity is more severe in case of injury at the level of the wrist (intact flexor digitorum profundus ) than that at the level of elbow ( **ulnar paradox** ).

##### 2) Paralysis of muscles supplied by ulnar nerve . The most important sequels are :

- Loss of writing position of medial 2 fingers due to paralysis of **interossei and medial 2 lumbricals** .
- Loss of adduction of medial 4 fingers due to paralysis of **palmar interossei** .
- Loss of adduction of thumb due to paralysis of **adductor pollices**
- Loss of abduction of middle 3 fingers due to paralysis of **dorsal interossei** .
- Loss of abduction of little finger due to paralysis of **abductor digiti minimi**.

3) **Wasting of muscles** supplied by ulnar nerve leading to flattening of hypothenar eminence , hollow dorsal interosseous spaces and wasting of adductor pollicis.

#### **B) Sensory manifestations :**

- **Theoretically** , there is sensory loss on the anterior aspect of medial 1 1/2 fingers.
- **Practically** , there is associated injury of palmar cutaneous branch of ulnar nerve leading to sensory loss in the anterior aspect of medial 1/3 of palm of the hand.

#### **II) Effect of injury at the elbow:**

##### **A) Motor manifestations :**

- 1) **Deformity:** clawing is less severe with extension of distal phalanges of little and ring fingers due to paralysis of flexor digitorum profundus.
- 2) **Paralysis** of muscles supplied by ulnar nerve.
  - The same manifestations as injury at the wrist with addition of the followings:

- Weak flexion of wrist and loss of ulnar deviation of flexed wrist due to paralysis of flexor carpi ulnaris.
  - Loss of flexion of distal phalanges of little and ring fingers due to paralysis of medial 1/2 of flexor digitorum profundus.
- 3) In addition to **wasting of muscles** of the hand supplied by ulnar nerve, the wasting of muscles on the medial aspect of front of forearm.

**B) Sensory manifestations :**

- Sensory loss over the anterior and posterior aspect of medial 1/3 of the hand and medial 1 1/2 fingers .

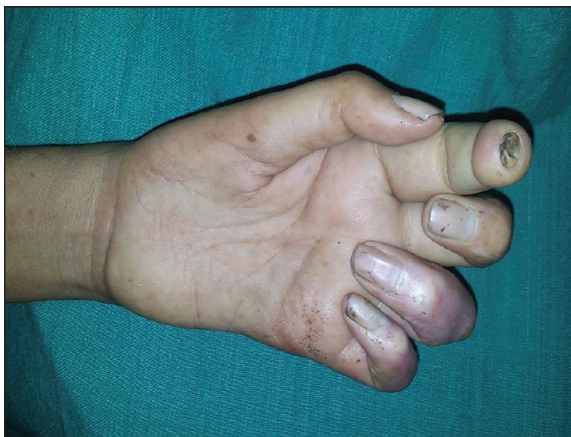
★ **Special tests:-**

**1 - Card test :** The patient can not hold a piece of paper between extended fingers due to paralysis of adductors of fingers (**palmar interossei** ) .

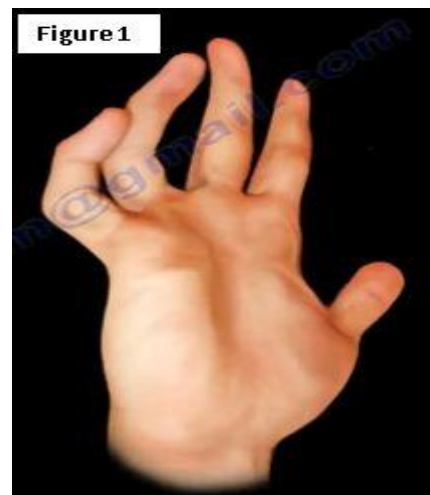
**2- Froment's test :** ask the patient to hold a piece of paper between the thumbs and the index fingers ( due to paralysis of **adductor polices** the patient can do this only by flexion of thumb not by adduction .

***\*Ulnar paradox\****

Ulnar nerve injury  
at the level of wrist



Ulnar nerve injury  
at the level of elbow



## Card test

### 11. Test for palmar interossei: Card Test

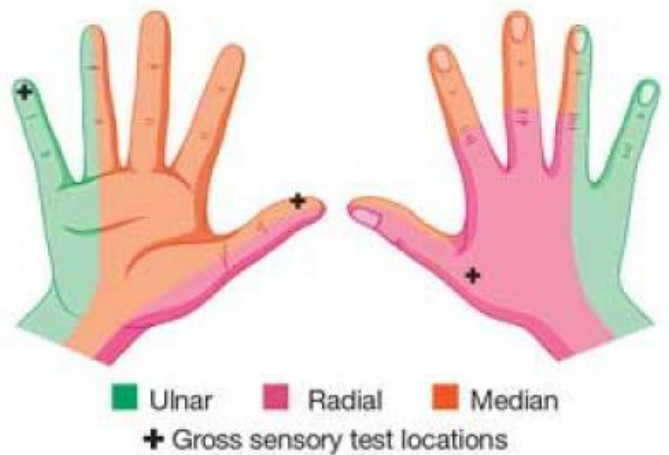
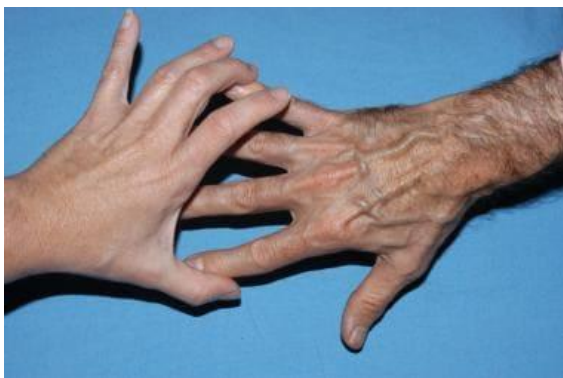
▶ A card inserted between two extended fingers and the patient is asked to grasp it between the fingers while the clinician gently tries to pull the card.



## Froment's test



## Abduction of fingers





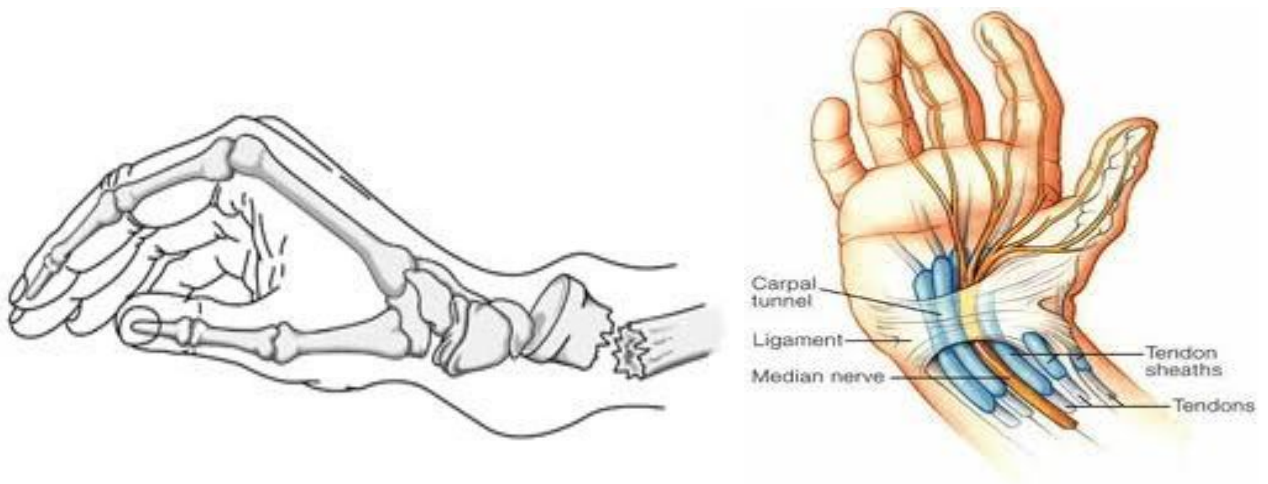
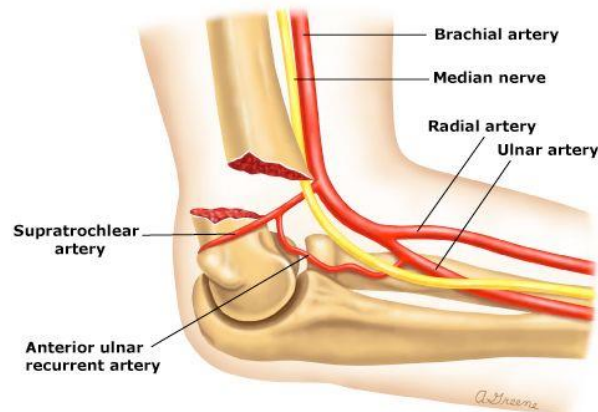
**Muscles wasting in ulnar nerve injury**



## Median nerve injury

### ★ Cause:

- **At the elbow:** Supra-condylar fracture of the humerus
- **Pronator syndrome:** It is compression of median nerve between the 2 heads of pronator teres due to trauma ,fibrosis or hypertrophy of muscles.
- **At the wrist:** Colle's fracture of radius , cut wound at the wrist or **Carpal tunnel syndrome** ( median nerve compression in the carpal tunnel due to oedema, myxoedema , tumors, teno-synovitis... etc.).



★ **Results :**

**I) Effect of injury at the wrist:**

**A) Motor manifestations :**

**1) Deformity: Ape or Monkey's hand** (adduction of extended laterally rotated thumb with wasting of thenar eminence → the thumb becomes at same level of the palm).

**2) Paralysis** of muscles supplied by median nerve in the hand with the following sequale :

- Loss of opposition , lateral rotation of 1<sup>st</sup> metacarpal bone and the thumb becomes at same level of the palm due to paralysis of **opponens pollicis**.
- Adduction of the thumb due to paralysis of **abductor pollicis brevis** (with intact adductor pollicis which is supplied by ulnar nerve).
- Weak flexion of thumb due to paralysis of **flexor pollicis brevis**.

**3) Wasting of thenar muscles** & flattening of thenar eminence which becomes at same level of the palm.

**B) Sensory manifestations :**

- **Paresthesia** in carpal tunnel syndrome **or sensory loss** in traumatic median nerve injury in the anterior aspect of the **lateral 3 ½ fingers** as well as the dorsal aspect of distal and middle phalanges of these fingers.
- **If the palmar cutaneous branch** of median nerve is included in the injury → loss of sensation in the **lateral 2/3 of the palm of the hand**.

### III) Effect of injury at the elbow:

#### A) Motor manifestations :

1) **Deformity:** The same as injury at the wrist.

2) **Paralysis** of muscles supplied by median nerve

- The same manifestations as injury at the wrist with addition of the followings:

- Loss of pronation due to paralysis of **pronator teres and quadrates** .

- Weak flexion of the wrist and ulnar deviation of the wrist on flexion of wrist against resistance due to paralysis of **flexor carpi radialis** .

- Loss of flexion of interphalngeal joints of index and middle fingers due to paralysis of **flexor digitorum superficialis** and **lateral 1/2 of flexor digitorum profundus**.

- ♣ If the patient is asked to make a fist , the index and middle fingers remain extended and pointing (**benediction attitude**).

- Loss of flexion of all joints of the thumb due to paralysis of **flexor polices longus & brevis**

3) In addition to **wasting of muscles** of the hand, there is wasting along the lateral aspect of forearm.

#### B) Sensory manifestations :

- Sensory loss in the **lateral 2/3 of the palm of the hand**.

- Anterior aspect of the **lateral 3 1/2 fingers** as well as the dorsal aspect of distal and middle phalanges of these fingers.



## Ulnar & Median nerve injuries

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**Ape hand deformity**



**Ape**





**Benediction attitude**

