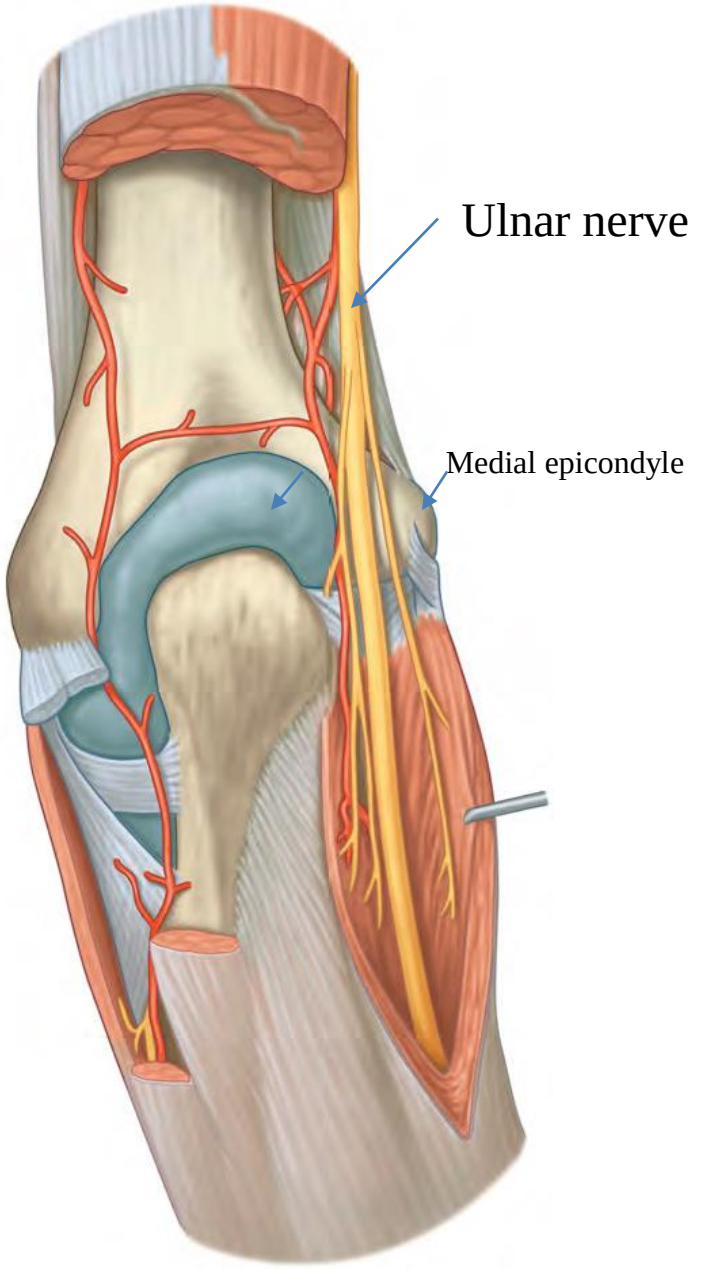
Ulnar Nerve Injury

Ulnar nerve injury usually occurs in one of four places:
(1) Posterior to the medial epicondyle of the humerus (most common)
(2) in the cubital fossa formed by the tendinous arch connecting the humeral and ulnar heads of the FCU
(3) at the wrist
(4) in the hand



Posterior view

Ulnar nerve division at the wrist

Motor

Paralyses all the intrinsic muscles of the hand (apart from the 1st and 2ed lumbricals)

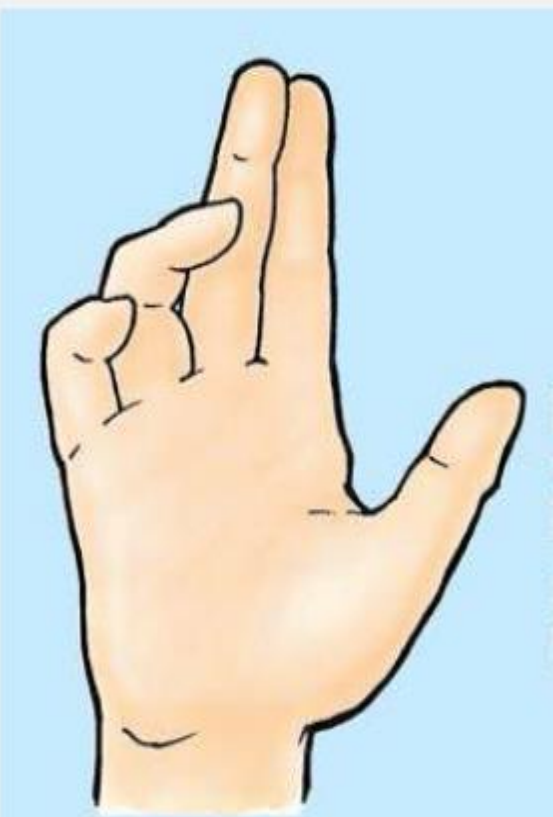
The intrinsic muscle action of flexing the metacarpophalangeal joint and extending the interphalangeal joints is **therefore lost**

The unopposed action of the long extensors and flexors of the fingers cause the hand to assume

a clawed appearance with extension of the metacarpophalangeal joints and flexion of the interphalangeal joints.

However

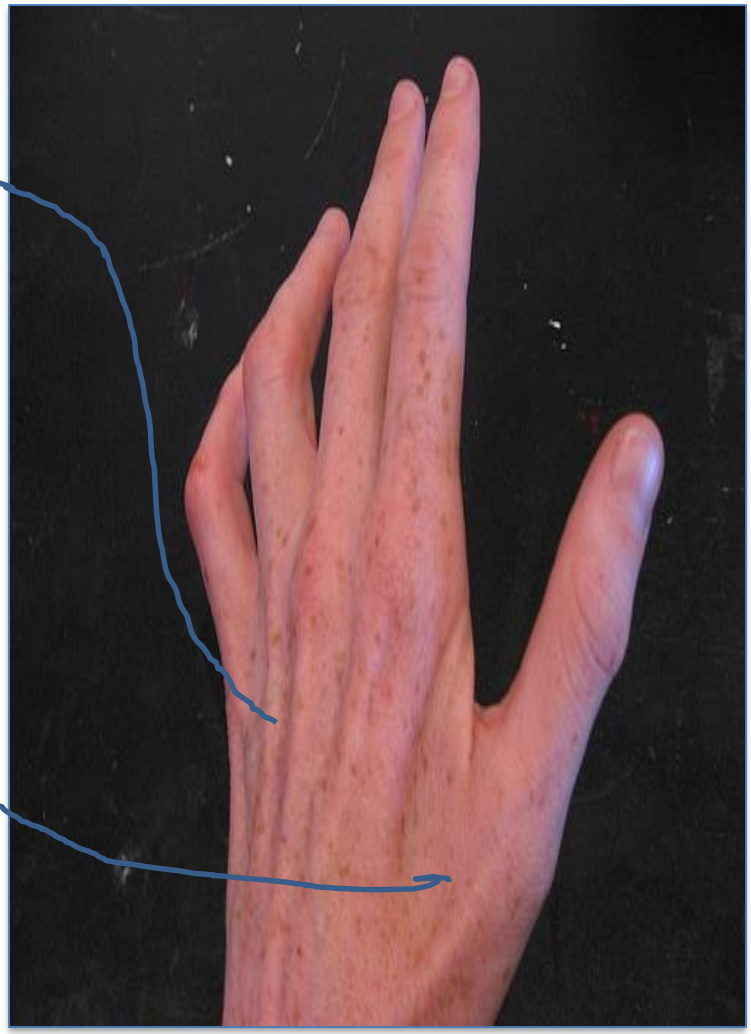
The clawing is less intense in the index and middle fingers because of their intact lumbricals, supplied by the median nerve



A Claw hand

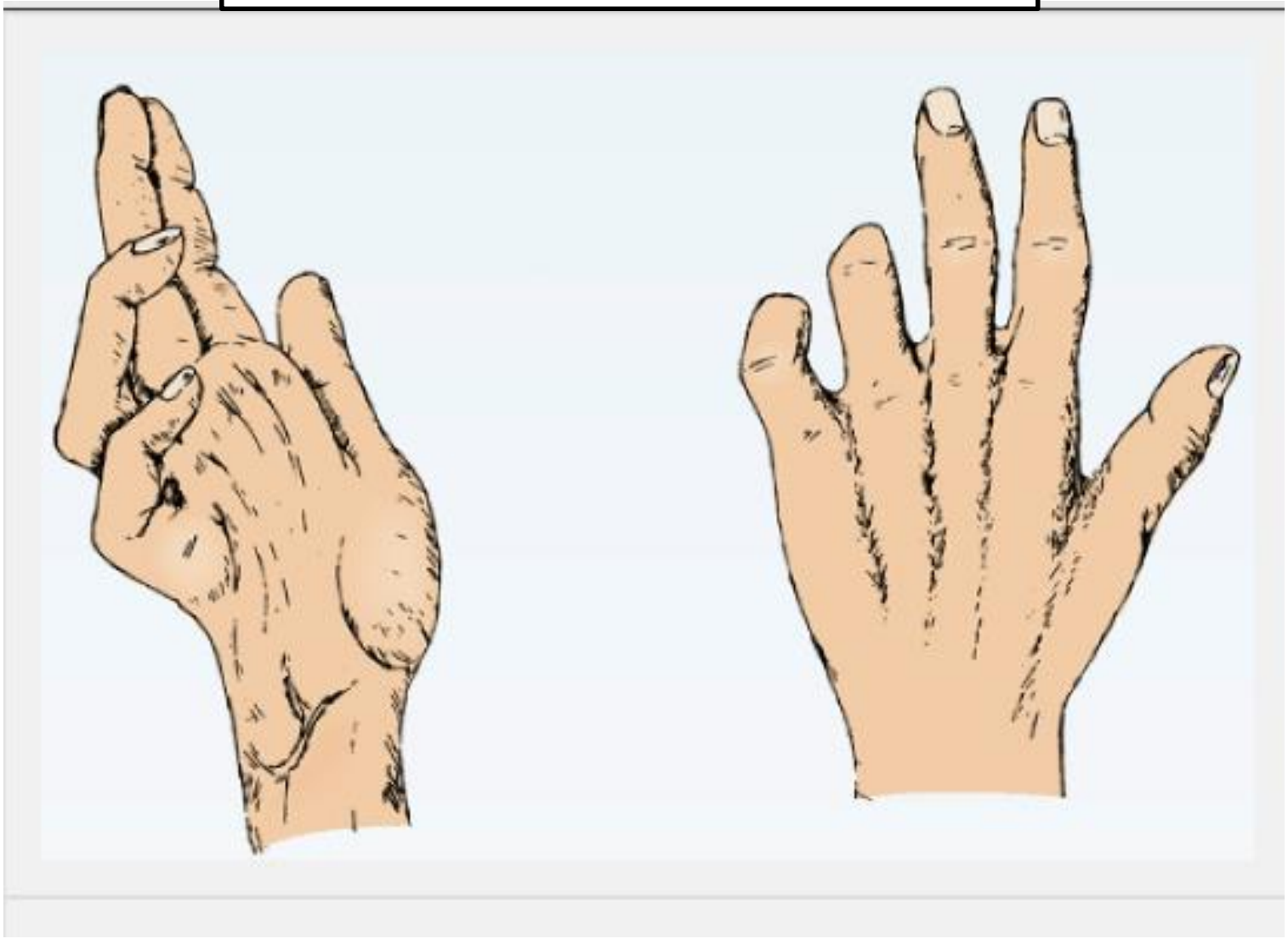
- The small muscles of the hand will be paralyzed and show wasting, *except for the muscles of the thenar eminence and the first two lumbricals.*

Look at the interossei muscles, especially, the first dorsal interosseous muscle, with ulnar nerve injury they become atrophied (wasting)



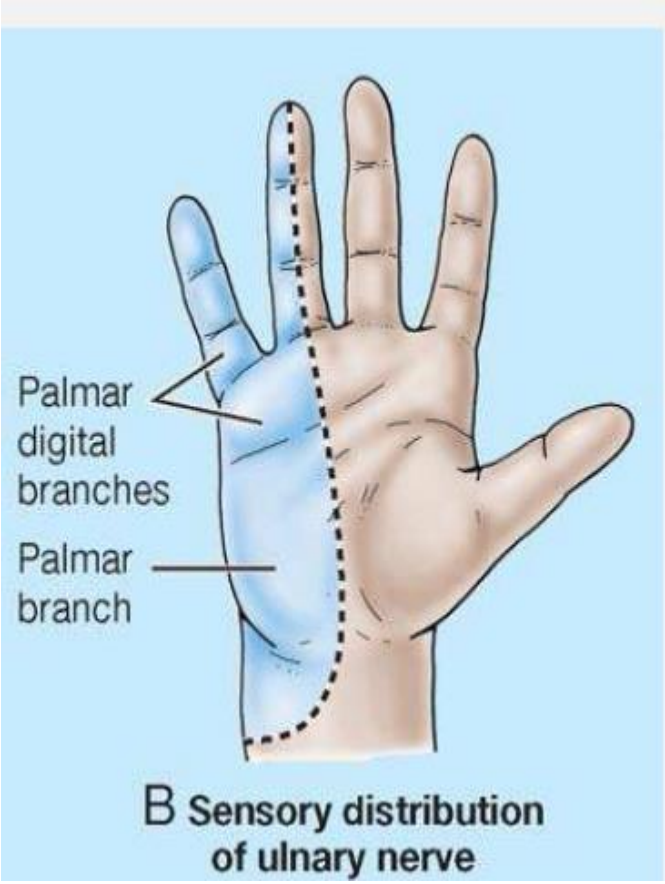
Ulnar paradox

The clawhand is much more obvious in wrist lesions because the flexor digitorum profundus muscle is not paralyzed, and marked flexion of the terminal phalanges occurs.



sensory loss

There is sensory loss over the little finger and the ulnar half of the ring finger.



Posterior to the medial epicondyle of the humerus
(most common)

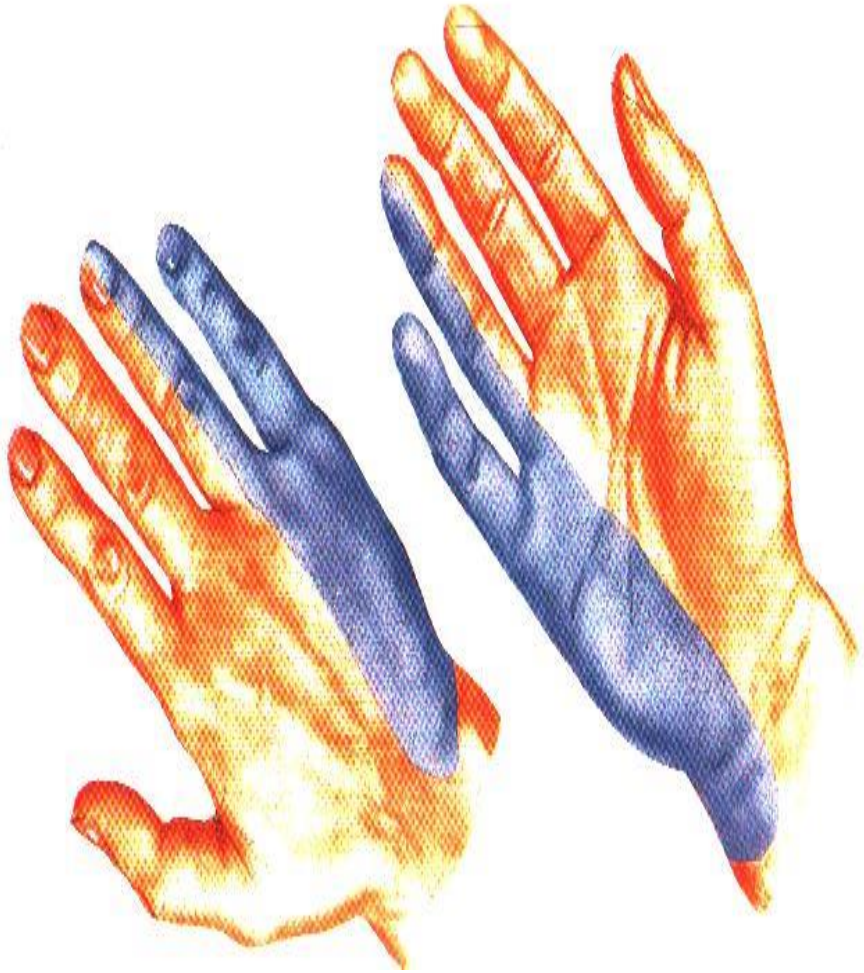
- Loss of hypothenar muscles, third and fourth lumbricals, all interossei and adductor pollicis
- With elbow lesion there is minimal weakening of wrist flexion with radial deviation
- Loss of **abduction** and **adduction of digits 2–5** (interossei muscles)
- Weakened interphalangeal (IP) extension of digits 2–5 (more pronounced in digits 4 and 5)
- Loss of thumb adduction
- Atrophy of the hypothenar eminence

the hand to assume

a clawed appearance

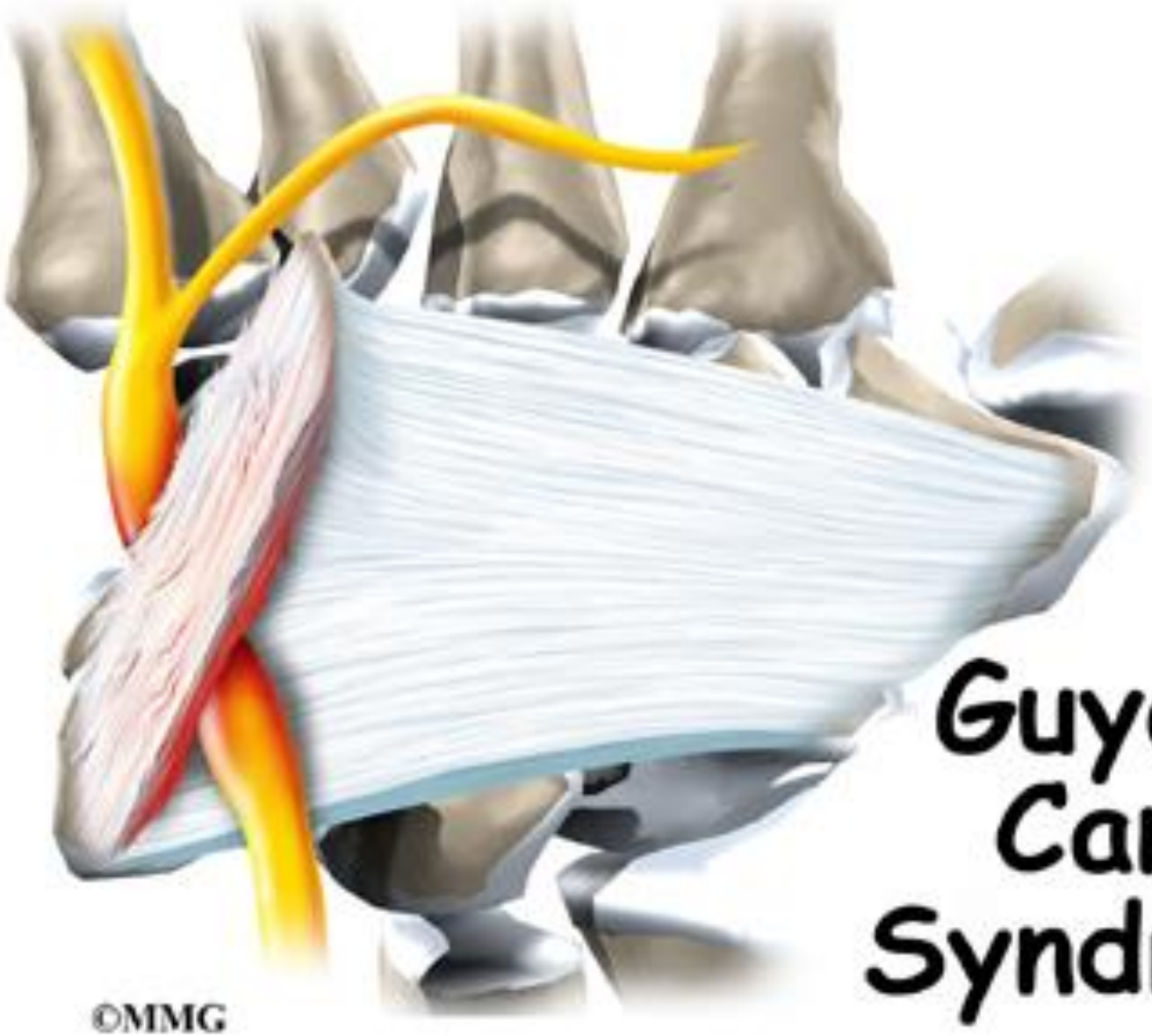
Sensory loss in Ulnar Nerve injury

- Loss of skin sensation will be observed over the anterior and posterior surfaces of the medial third of the hand and the medial one and a half fingers.



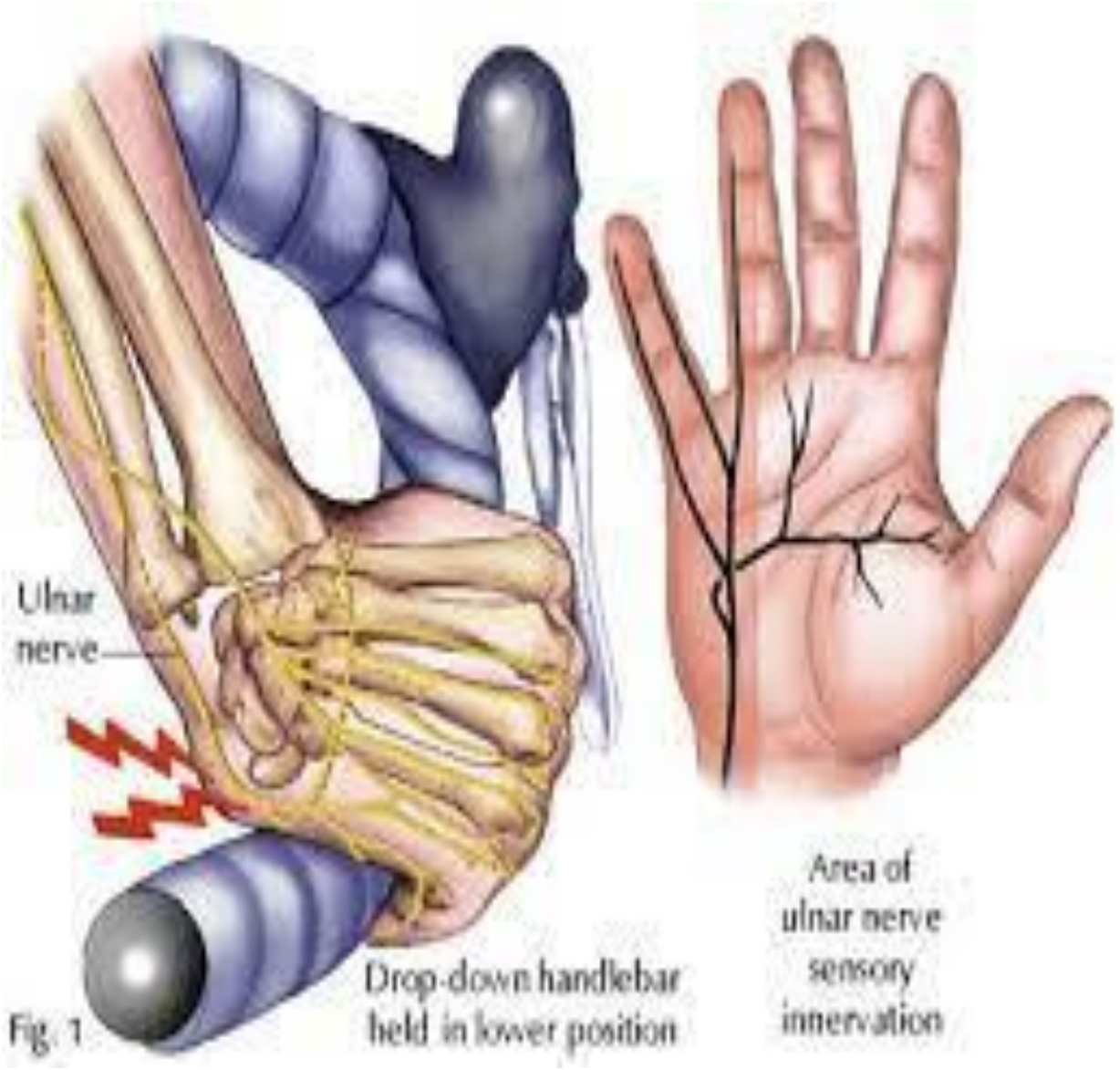
Ulnar tunnel syndrome

Ulnar tunnel syndrome is an entrapment neuropathy of the ulnar nerve as it passes through Guyon's canal at the wrist.
Causes of compression at this site include a ganglion or trauma (This is common in cyclists and weight lifters from the pressure of gripping).
. The symptoms include pain in the hand or forearm and sensory changes in the palmar aspect of the little and ulnar half of the ring fingers***, however sensation on the ulnar aspect of the dorsum of the hand is normal.***
In addition there may be weakness and wasting of the intrinsic muscles of the hand supplied by the ulnar nerve, with clawing posture in extreme cases.
Surgical treatment involves decompression of the nerve by division of the roof of Guyon's canal and removal of the causative lesion, e.g. ganglion.



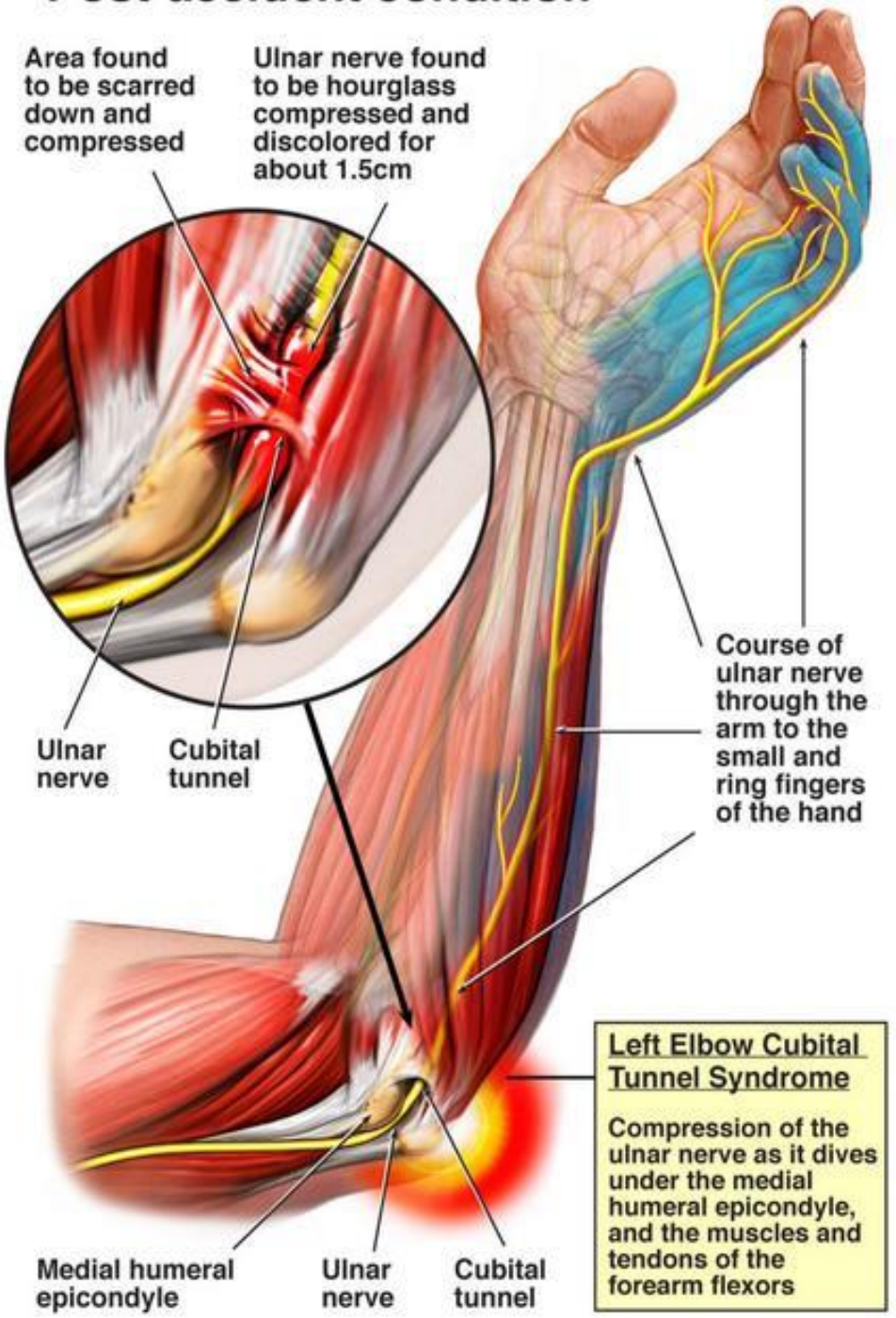
Guyon's Canal Syndrome

Ulnar tunnel syndrome



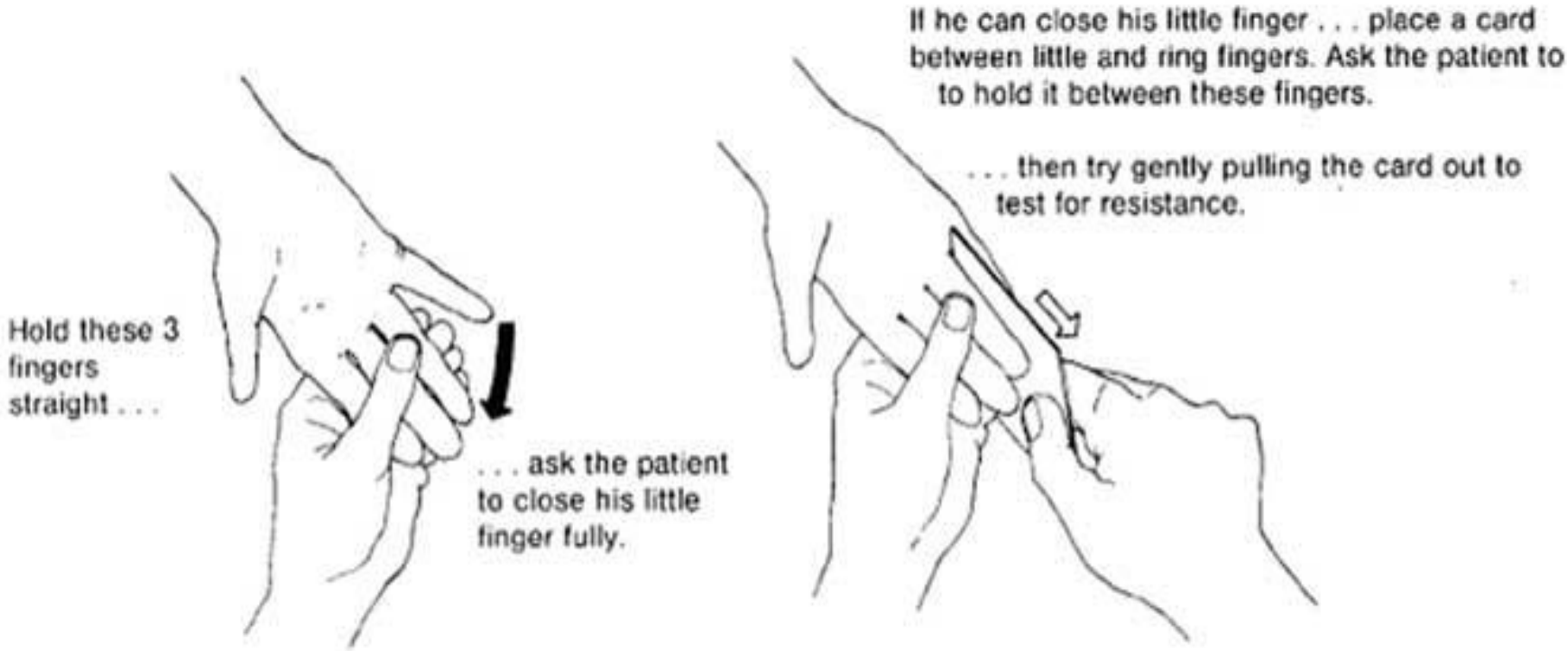
Cubital tunnel syndrome

happens when the ulnar nerve, which passes through the cubital tunnel (a tunnel of muscle, ligament, and bone) on the inside of the elbow, is injured and becomes inflamed, swollen, and irritated



Ulnar nerve test

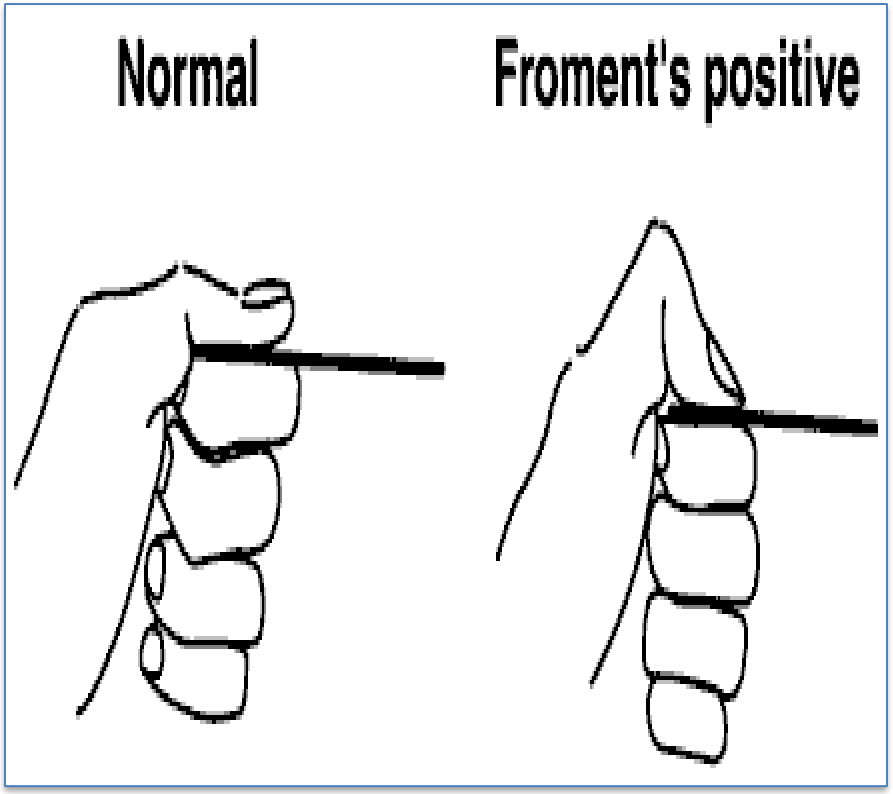
Paper test



The patient is unable to adduct and abduct the fingers and consequently is unable to grip a piece of paper placed between the fingers.

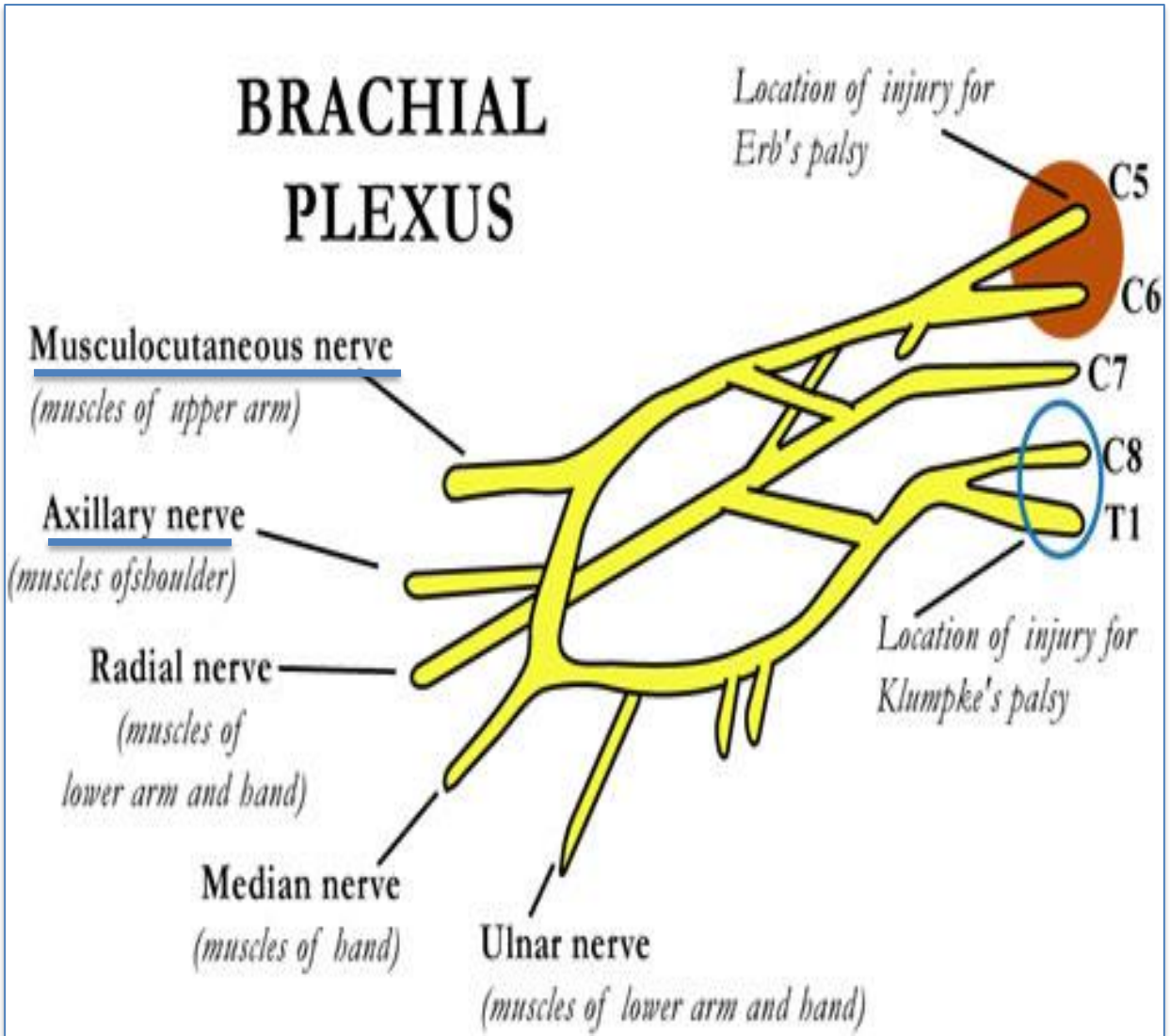
It is impossible to adduct the thumb because the adductor pollicis muscle is paralyzed.

If the patient is asked to grip a piece of paper between the thumb and the index finger *(Froment's sign).*



BRACHIAL PLEXUS INJURY

- Upper lesions of the brachial plexus **(Erb's/ Erb's Duchenne palsy).**
- Lower lesions of the brachial plexus **(Klumpke's palsy).**



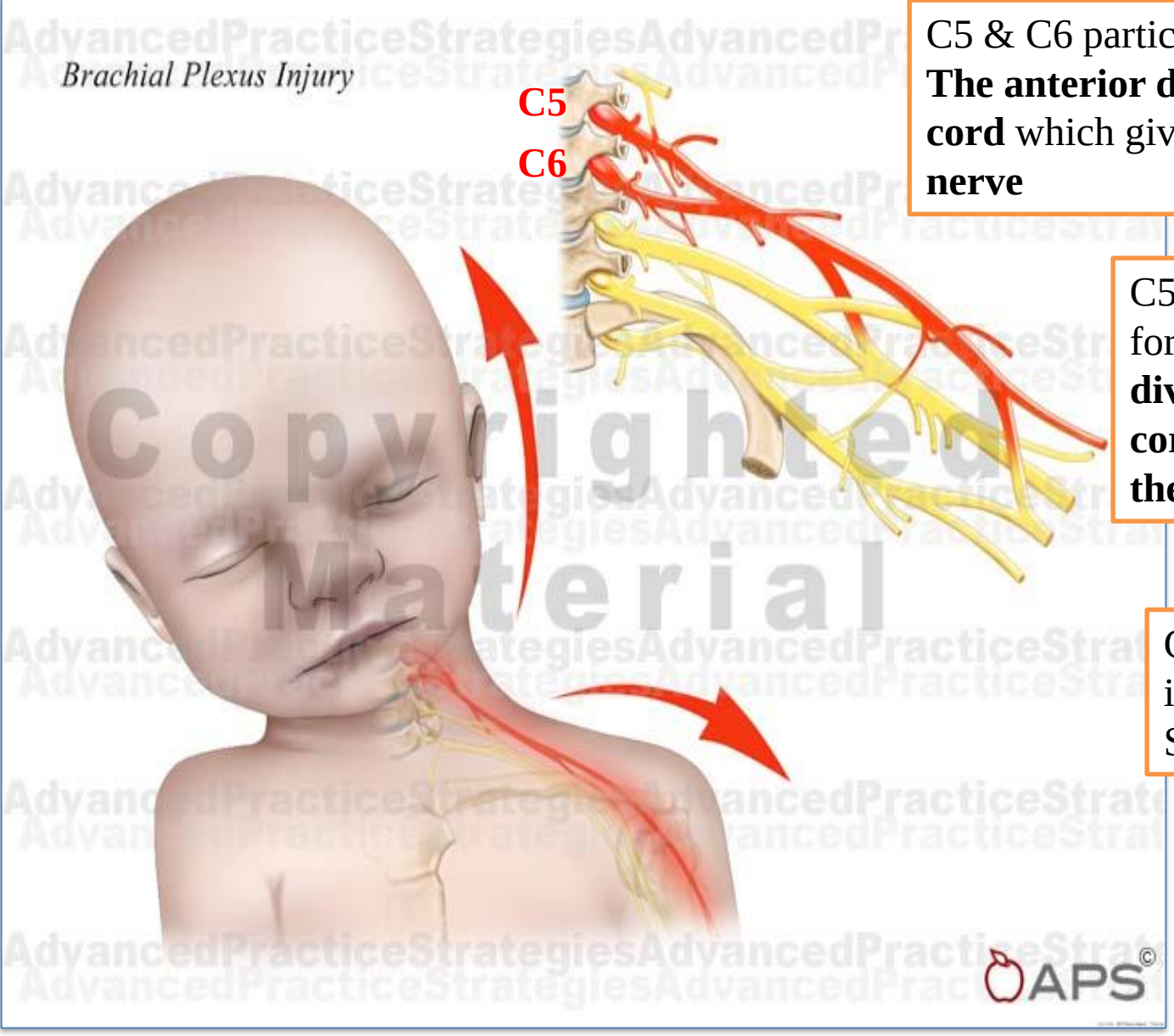
❑Upper lesions of the brachial plexus (Erb's/ Erb's Duchenne palsy).

Injuries to superior parts of the brachial plexus (C5 and C6) usually result from an excessive increase in the angle between the neck and the shoulder.

These injuries can occur in a person who is thrown from a motorcycle or a horse and lands on the shoulder in a way that widely separates the neck and shoulder

OR

Can also occur in a newborn when excessive stretching of the neck occurs during delivery



C5 & C6 participate in the formation of **The anterior division** that forms **lateral cord** which gives off **musculocutaneous nerve**

C5 & C6 participate in the formation of **The posterior divisions** that forms **posterior cord** which gives off **mainly the axillary nerve**

C5 & C6 also participate in the formation of Suprascapular nerve

Primarily affects the **axillary, suprascapular, and musculocutaneous nerves** with the loss of intrinsic muscles of the shoulder and muscles of the anterior arm

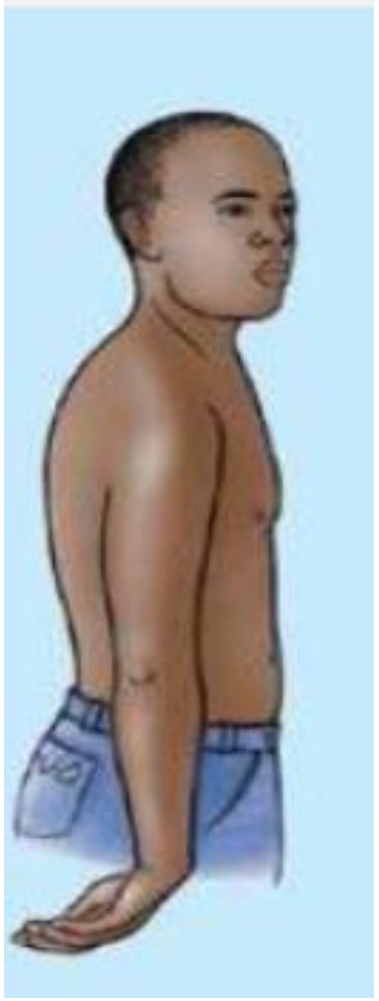
A Arm is medially rotated and adducted at the shoulder: Loss of **axillary** and **supra-scapular** nerves. The unopposed latissimus dorsi and pectoralis major muscles pull the limb into adduction and medial rotation at the shoulder.

B The forearm is extended and pronated: loss of **musculocutaneous** nerve.

A Sensory loss on lateral forearm to base of thumb: loss of musculocutaneous nerve

A B

Sign is "waiter's tip."

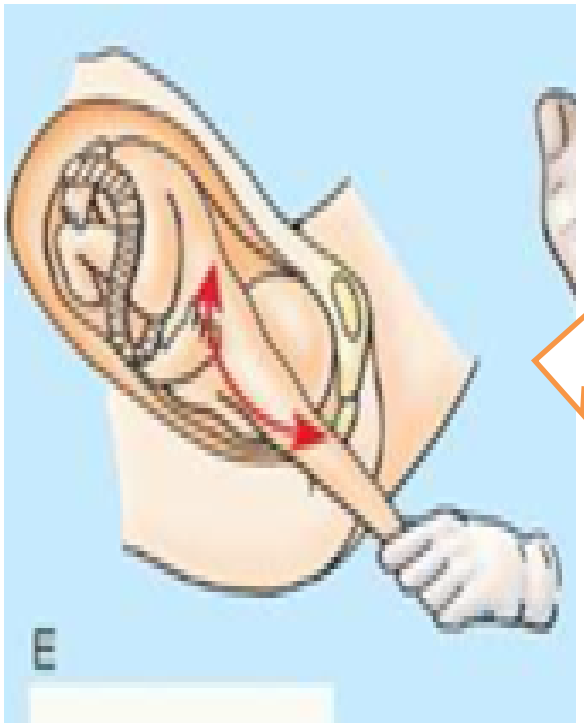


https://youtu.be/lNNO3x6nPAs

❑Lower lesions of the brachial plexus **(Klumpke's palsy).**

- *They* are much less common.
- These injuries may occur when the upper limb is suddenly pulled superiorly—for example

when a person grasps something to break a fall

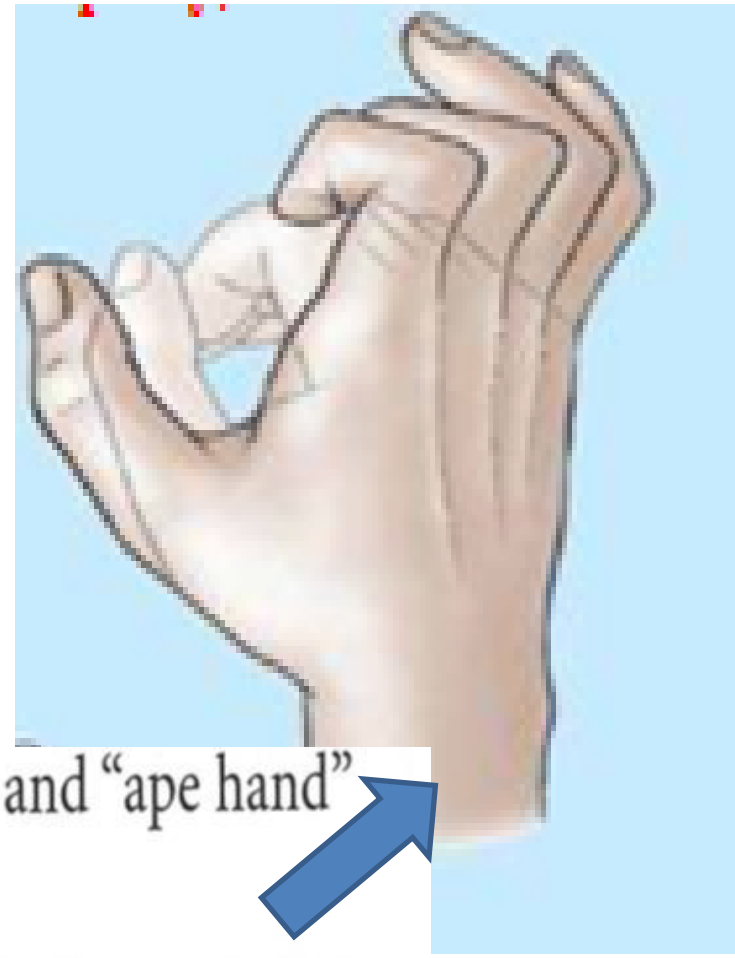


or when a baby's limb is pulled excessively during delivery

- These events injure the inferior trunk of the plexus (C8 and T1) and may avulse the roots of the spinal nerves from the spinal cord.

Primarily affects the ulnar nerve and the intrinsic muscles of the hand with a weakness of the median innervated muscles of the hand

Resulting in



Sign is combination of "**claw hand**" (**ulnar nerve**) and "ape hand" (median nerve).

Axillary Nerve

Fracture of the surgical neck of the humerus or inferior dislocation of the shoulder

- Loss of abduction of the arm to the horizon
- Sensory lost over the deltoid muscle

Musculocutaneous Nerve

- Loss of elbow flexion and weakness in supination
- Loss of sensation on lateral aspect of the forearm