{ قَالُواْ سُبْحَٰنَكَ لَا عِلْمَ لَنَآ إِلَّا مَا عَلَّمْتَنَآ ۖ إِنَّكَ أَنتَ ٱلْعَلِيمُ ٱلْحَكِيمُ }

اللهُمَّ احفظ مُقاومينا أينما حلَّت خُطاهم فأنتَ خيرُ الحافظين، نسألك اللهُمَّ بنورِ وجهك الذي ملأ أركان عرشِك، وبعزّك الذي لا يُرام، وبمُلكك الذي لا يُضام، يا ذا الجلال والإكرام، أن تنصُرهم نصراً عزيزاً مُؤزراً وتُثبِّت أقدامهم على الثُغور، وتُسدِّد رميهم، وتأوي طريدهم، وتداوي جريحهم، اللهُمَّ إنّا نستودعكَ إيّاهُم يا مَن لا تضيع عنده الودائع، فاحفظهم بعينِك التي لا تنام.

Nerve injuries

اللي مو هطل الدكتور ما قرأه .

- we should know for each nerve :-

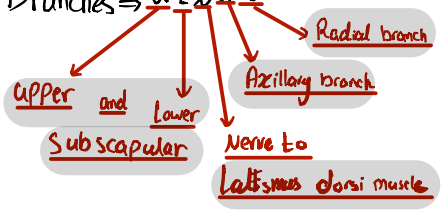
1) Site of injury.

2) any injury end with 2 result depends on nerve (motor / sensory), So we should know:
   - Muscles that are supplied by motor nerve. injury in these nerves lead to Paralysis.
   - Part of skin that are supplied by sensory nerve. injury in these nerves lead to Loss of sensation.

Root injury = Brachial Plexus Injuries

- The roots, trunks, and divisions of the brachial plexus reside in the lower part of the posterior triangle of the neck
  Seen in posterior triangle of neck. (behind clavicle).
- whereas the cords and most of the branches of the plexus lie in the axilla
  Seen in Axilla.
- Complete lesions involving all the roots of the plexus are rare
- Incomplete injuries are common and are usually caused by traction or pressure
- individual nerves can be divided by stab wounds.

- Posterior cord branches ⇒ "ULNAR"



Upper Lesions of the Brachial Plexus (Erb-Duchenne Palsy)

= upper trunk injury.

- Upper lesions of the brachial plexus are injuries resulting from excessive displacement of the head to the opposite side and depression of the shoulder on the same side

- This causes excessive traction or even tearing of C5 and 6 roots of the plexus

upper trunk supplied by: ↵

Cause:

- It occurs in infants during a difficult delivery or in adults after a blow to or fall on the shoulder.

trauma

عادة الولادة بتكون Chephalic (راس الطفل)
لكن اذا الطبيب شد الطفل من ايده
بقوة ممكن يعمل upper trunk injury

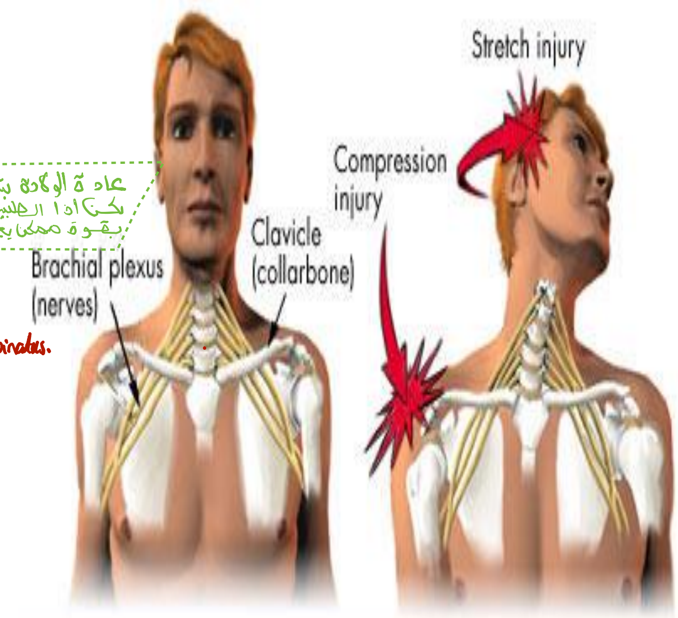
nerves that branched from c5/c6 that will be affected if upper trunk injury occur: → supply supraspinatus / infra spinatus.

- The suprascapular nerve, the nerve to the subclavius, and the musculocutaneous and axillary nerves all possess nerve fibers derived from C5 and 6 roots and will therefore be functionless

Come from posterior cord but its origin C5, C6. root value

- The following muscles will consequently be paralyzed: the supraspinatus (abductor of the shoulder) and infraspinatus (lateral rotator of the shoulder);

- the subclavius (depresses the clavicle)



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* هاي الوقفة تشمل: extension, Adduction, Medial rotation, Pronation.

This condition is : porter or waiter hinting tip or policeman .

Supplied from musculocutaneous nerve, Action of this muscle → supination, flexion

هاي العضلة ما اشتغلت بالتالي ما في اشي يعمل supination أو flexion فرح تظهر الحركة المعاكسة extension, pronation.

- the biceps brachii (supinator of the forearm, flexor of the elbow, weak flexor of the shoulder) and the greater part of the brachialis (flexor of the elbow) and the coracobrachialis (flexes the shoulder

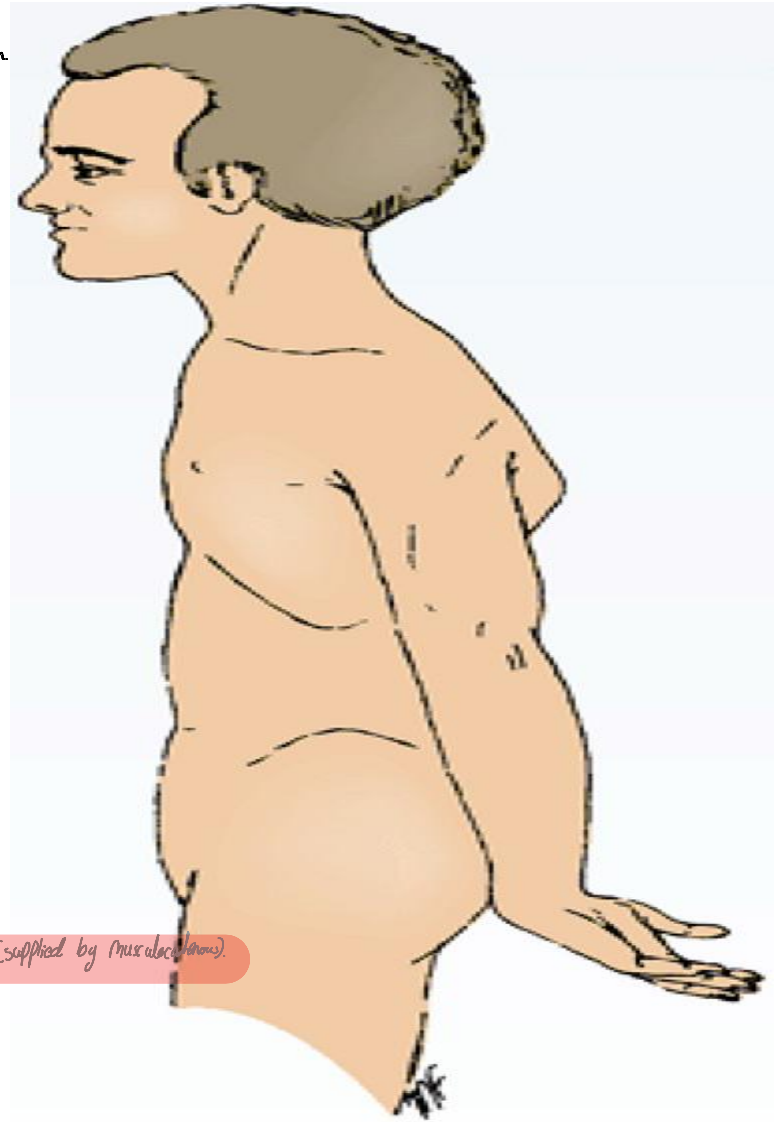
الحركة الي بتعملها العضلة بالوضع الطبيعي.

- and the deltoid (abductor of the shoulder) and the teres minor (lateral rotator of the shoulder)

The result of injury :-

- Thus, the limb will hang limply by the side, medially rotated by the unopposed sternocostal part of the pectoralis major
- the forearm will be pronated because of loss of the action of the biceps
- The position of the upper limb in this condition has been likened to that of a porter or waiter hinting for a tip

- In addition, there will be a loss of sensation down the lateral side of the arm. + Skin over deltoid + lateral side of forearm. (supplied by musculocutaneous).

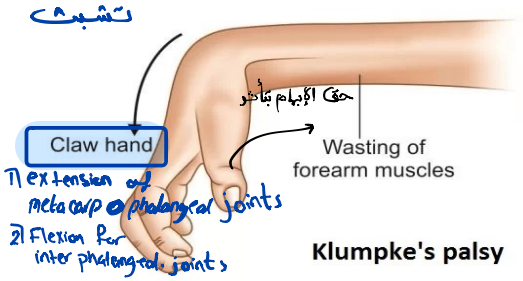


Pronator muscles > Supinator muscle (biceps)

Lower Lesions of the Brachial Plexus (Klumpke Palsy)

Lower trunk is affected, it comes from C8, T1. Branches → ulnar.N, median.N

- Lower lesions of the brachial plexus are usually traction injuries caused by excessive abduction of the arm, as occurs in the case of a person falling from a height clutching at an object to save himself or herself



- The first thoracic nerve is usually torn.
- The nerve fibers from this segment run in the ulnar and median nerves to supply all the small muscles of the hand
- The hand has a clawed appearance caused by hyperextension of the metacarpophalangeal joints and flexion of the interphalangeal joints.

intercostobrachial nerve (from T2) supply axilla

- The extensor digitorum is unopposed by the lumbricals and interossei and extends the metacarpophalangeal joints
- the flexor digitorum superficialis and profundus are unopposed by the lumbricals and interossei and flex the middle and terminal phalanges, respectively
  - C8: supply medial side of forearm.
  - T1: supply lower part of medial side of Arm.
- In addition, loss of sensation will occur along the medial side of the arm.
- If the eighth cervical nerve is also damaged, the extent of anesthesia will be greater and will involve the medial side of the forearm, hand, and medial two fingers.
- Lower lesions of the brachial plexus can also be produced by the presence of a cervical rib or malignant metastases from the lungs in the lower deep cervical lymph nodes.

A cervical rib is an extra rib that can develop above the first rib, usually arising from the seventh cervical vertebra will compress on lower trunk , usually surgical removal for this rib is the treatment.

Usually seen after mastectomy while they remove 6 lymph nodes during this surgery, injury may happen for long thoracic nerve

Long Thoracic Nerve

= Winged Scapula.

- The long thoracic nerve, which arises from C5, 6, and 7 and supplies the serratus anterior muscle,
- can be injured by blows to or pressure on the posterior triangle of the neck or during the surgical procedure of radical mastectomy
- Paralysis of the serratus anterior results in the inability to rotate the scapula during the movement of abduction of the arm above a right angle
- The patient therefore experiences difficulty in raising the arm above the head
- The vertebral border and inferior angle of the scapula will no longer be kept closely applied to the chest wall and will protrude posteriorly, a condition known as winged scapula

*Cause of injury:
1) Injury for surgical neck of humerus (since Axillary N passes here).
2) crutch pressure

Axillary Nerve

4

• supply Deltoid, Teres minor.

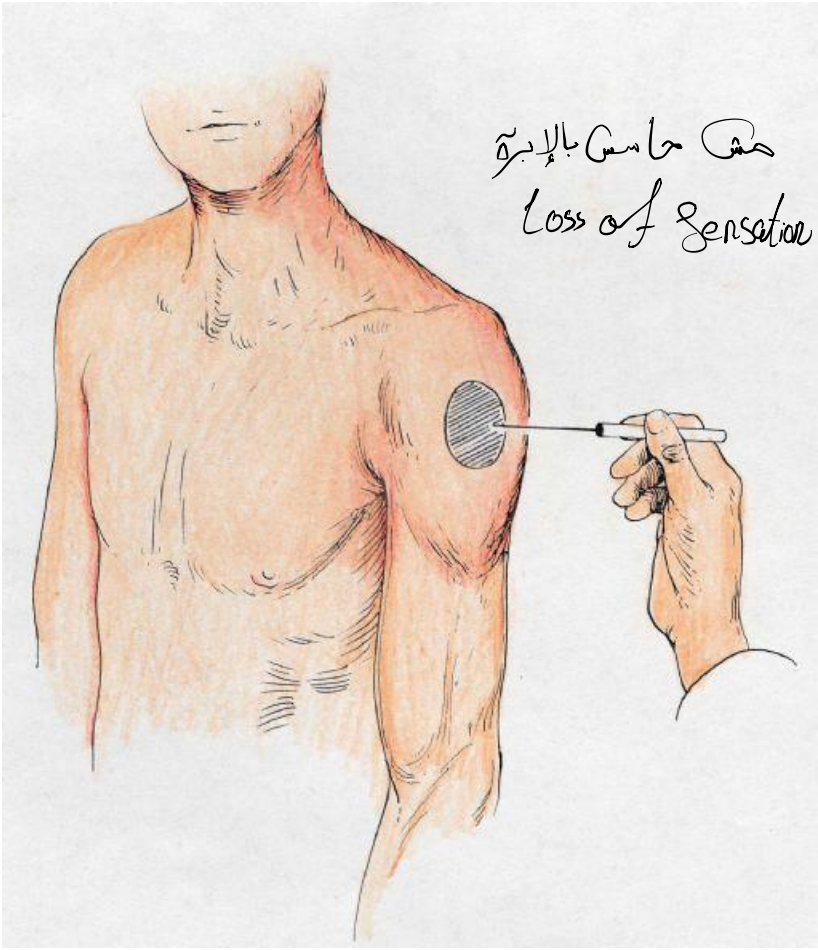
- The axillary nerve which arises from the posterior cord of the brachial plexus (C5 and 6), can be injured by the pressure of a badly adjusted crutch pressing upward into the armpit

- The passage of the axillary nerve backward from the axilla through the quadrangular space makes it particularly vulnerable here to downward displacement of the humeral head in shoulder dislocations or fractures of the surgical neck of the humerus.

- Paralysis of the deltoid and teres minor muscles results

Deltoid → Lateral / Medial rotation. (can be compensated by other muscles)
→ Abduction (only from middle fiber). Paralysis init = Adduction occur.

- The cutaneous branches of the axillary nerve, including the upper lateral cutaneous nerve of the arm, are functionless, and consequently there is a loss of skin sensation over the lower half of the deltoid muscle
- The paralyzed deltoid wastes rapidly, and the underlying greater tuberosity can be readily palpated
- Because the supraspinatus is the only other abductor of the shoulder, this movement is much impaired.
- Paralysis of the teres minor is not recognizable clinically.



• Median N ⇝ No branches in arm.
• Ulnar N ⇝ No branches in arm.

حكي اقرأوه مهم.

(Axilla → Spiral groove) Arm الوحيد الي بيعطي branches بال
medial → lateral من بنتقل فيه
⇓
injury in these area lead to
Hand / Rest drop الوضع الطبيعي عادي إيدنا تكون نازلة بسبب الجاذبية لكن لو طلبت منه يعمل extension ما بيقدر

Radial Nerve

→ Supply 1) Triceps.
2) Extensor muscle in posterior compartment.

Action: Extension

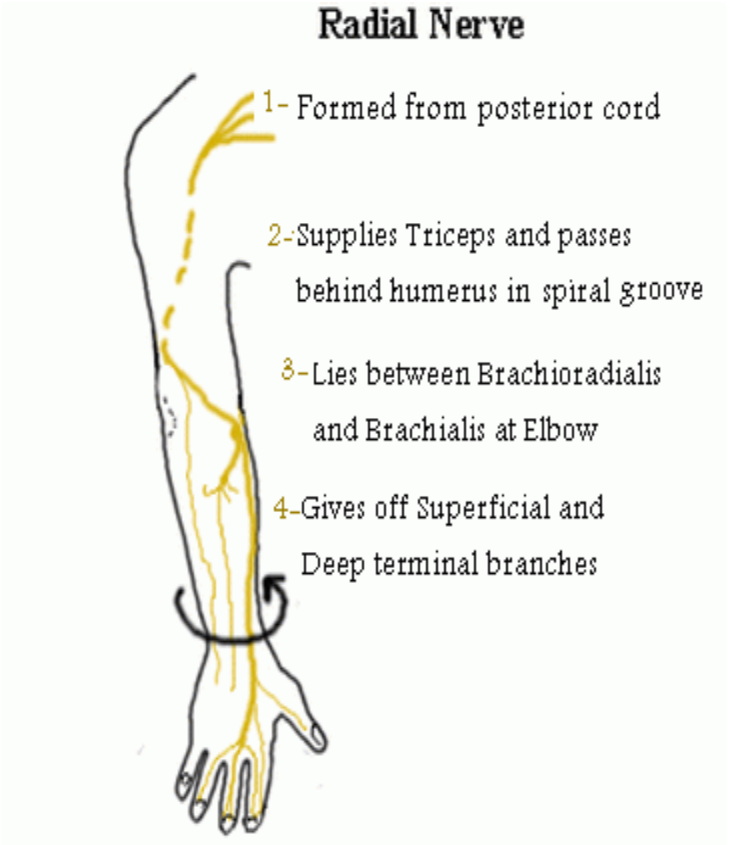
- The radial nerve which arises from the posterior cord of the brachial plexus, characteristically gives off its branches some distance proximal to the part to be innervated.

• In cubital fossa Radial N give
- Superficial (sensory for lateral 2/3 of dorsum + proximal Phalanx for 3+½ fingers)
- deep (motor)

- In the axilla it gives off three branches:
- the posterior cutaneous nerve of the arm, which supplies the skin on the back of the arm down to the elbow
- the nerve to the long head of the triceps
- and the nerve to the medial head of the triceps.

• في فرق بين:
hand drop ← injury of Radial N
finger drop ← injury of braches of Radial N.

- In the spiral groove of the humerus it gives off four branches:
- the lower lateral cutaneous nerve of the arm, which supplies the lateral surface of the arm down to the elbow
- the posterior cutaneous nerve of the forearm, which supplies the skin down the middle of the back of the forearm as far as the wrist
- the nerve to the lateral head of the triceps
- and the nerve to the medial head of the triceps and the anconeus.



- In the anterior compartment of the arm above the lateral epicondyle it gives off three branches:
- the nerve to a small part of the brachialis
- the nerve to the brachioradialis
- and the nerve to the extensor carpi radialis longus

- In the cubital fossa it gives off the deep branch of the radial nerve and continues as the superficial radial nerve

Radial neck fracture ⟹ deep branch injury.

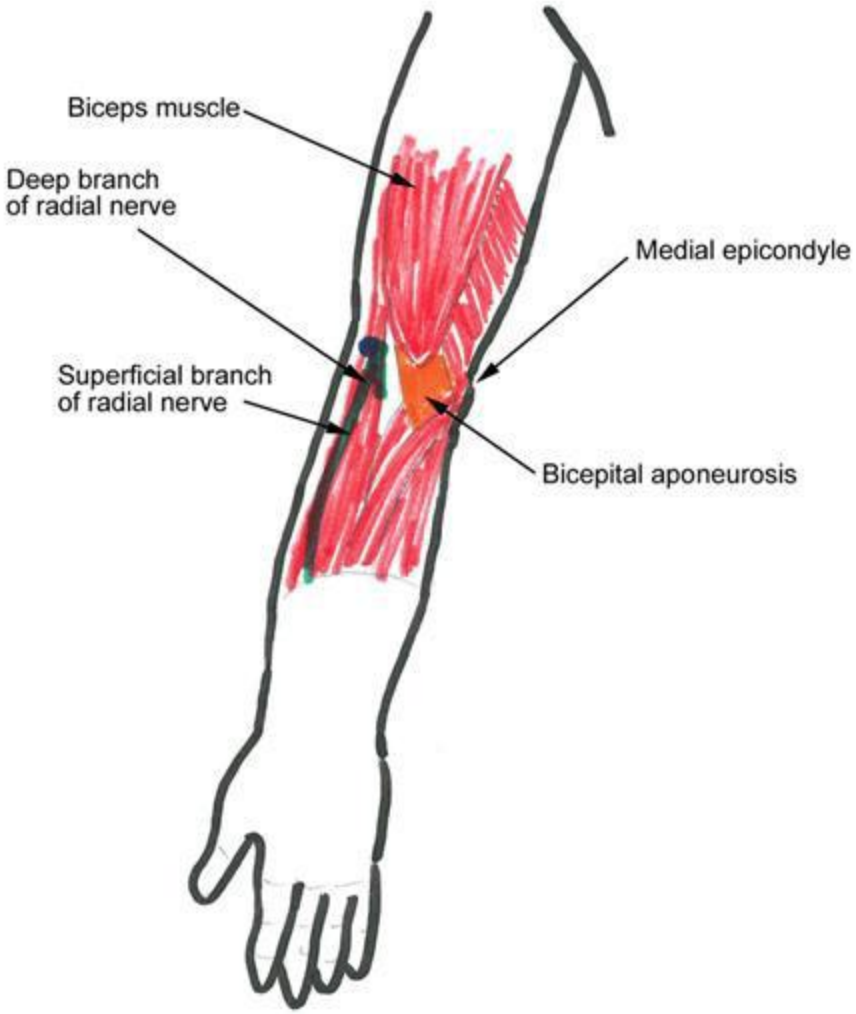
- The deep branch supplies the extensor carpi radialis brevis and the supinator in the cubital fossa and all the extensor muscles in the posterior compartment of the forearm.

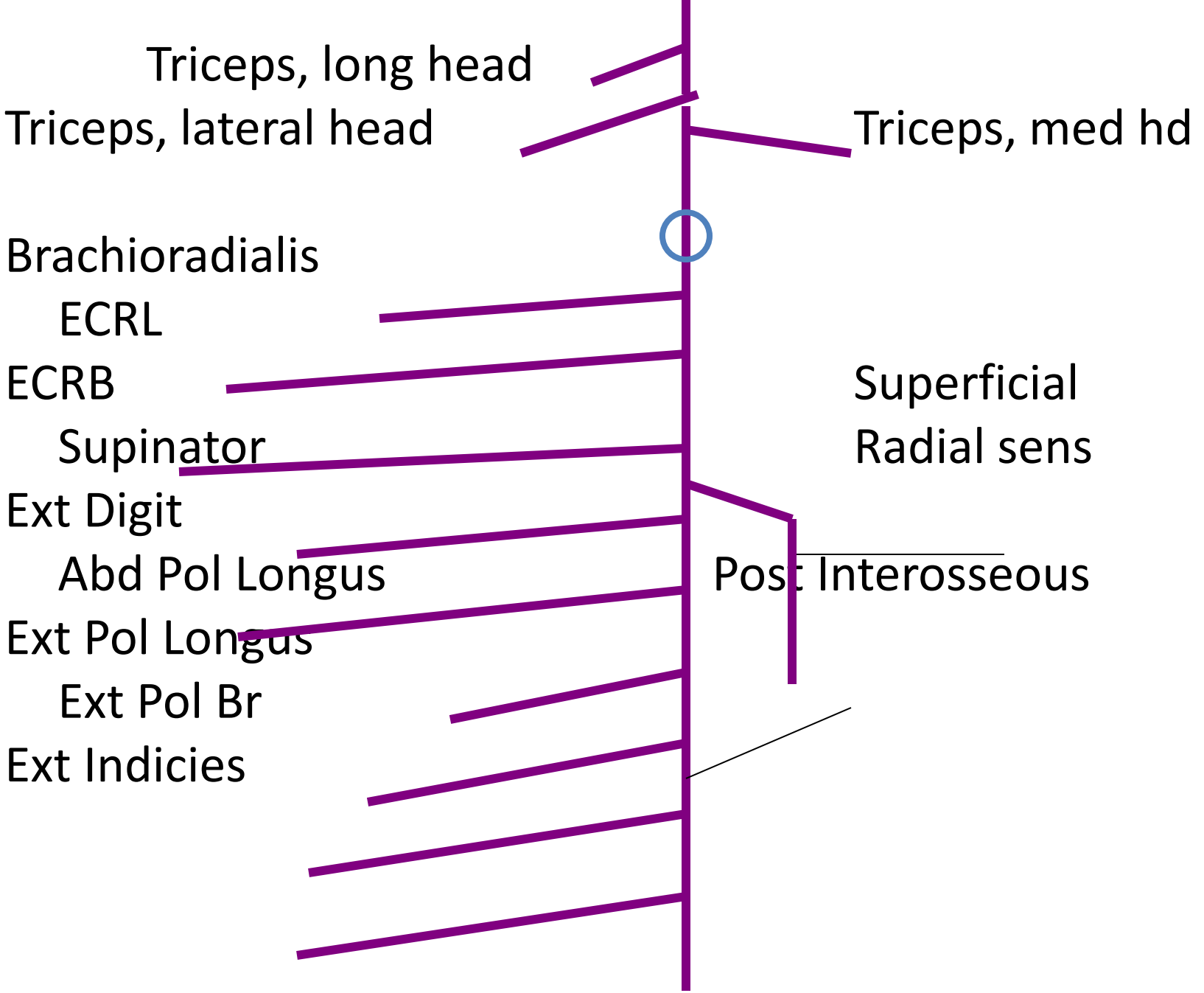
deep branch lead to finger drop not wrist drop.

↳ because extensor carpi radialis (extensor muscle) is still working. supplied by Radial nerve.

- The superficial radial nerve is sensory and supplies the skin over the lateral part of the dorsum of the hand and the dorsal surface of the lateral three and a half fingers proximal to the nail beds

- The radial nerve is commonly damaged in the axilla and in the spiral groove




Triceps, long head
Triceps, lateral head
Triceps, med hd
Brachioradialis
ECRL
ECRB
Supinator
Superficial
Radial sens
Ext Digit
Abd Pol Longus
Post Interosseous
Ext Pol Longus
Ext Pol Br
Ext Indicies

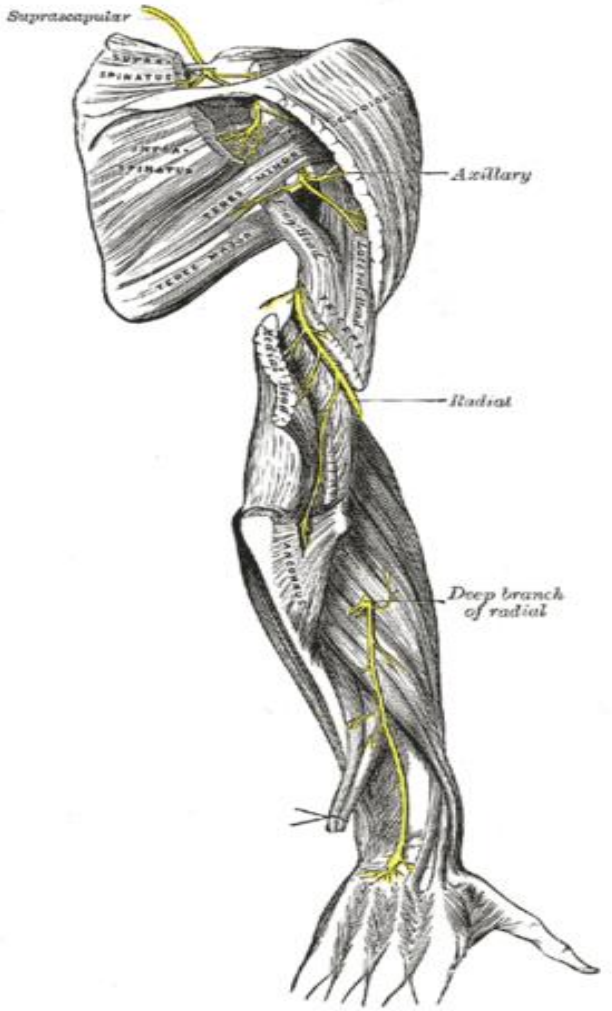
Injuries to the Radial Nerve in the Axilla

- In the axilla the nerve can be injured by the pressure of the upper end of a badly fitting crutch pressing up into the armpit or by a drunkard falling asleep with one arm over the back of a chair
- It can also be badly damaged in the axilla by fractures and dislocations of the proximal end of the humerus.
- When the humerus is displaced downward in dislocations of the shoulder, the radial nerve, which is wrapped around the back of the shaft of the bone, is pulled downward, stretching the nerve in the axilla excessively.
- The clinical findings in injury to the radial nerve in the axilla are as follows

• Superficial branch:
Csensory for lateral 2/3 of dorsum + proximal Phalanx for 3+½ fingers

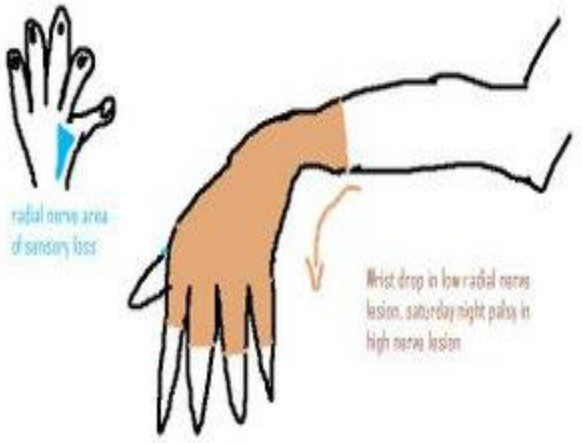
• injury of Axilla : leads to loss of Sensation in back side of arm + lateral side below deltoid + back of forearm.

أكيد حادث يبطل يشتغل كمان.



Motor = Hand drop

- The triceps, the anconeus, and the long extensors of the wrist are paralyzed
- The patient is unable to extend the elbow joint, the wrist joint, and the fingers. Wristdrop, or flexion of the wrist
- occurs as a result of the action of the unopposed flexor muscles of the wrist
- Wristdrop is very disabling because one is unable to flex the fingers strongly for the purpose of firmly gripping an object with the wrist fully flexed
- If the wrist and proximal phalanges are passively extended by holding them in position with the opposite hand, the middle and distal phalanges of the fingers can be extended by the action of the lumbricals and interossei, which are inserted into the extensor expansions.
- The brachioradialis and supinator muscles are also paralyzed, but supination is still performed well by the biceps brachii



Radial nerve lesion -Wrist drop, make sure by checking that there is no ulnar or median nerve palsy...which you can see if you get them to rest their hands on a pillow - and one will see that they are unable to straighten their fingers, because the flexor action of the lubricals supplied by the ulnar and median nerve, are unopposed by the failed radial nerve supplied muscles.

How do you know if it is a high or low lesion?

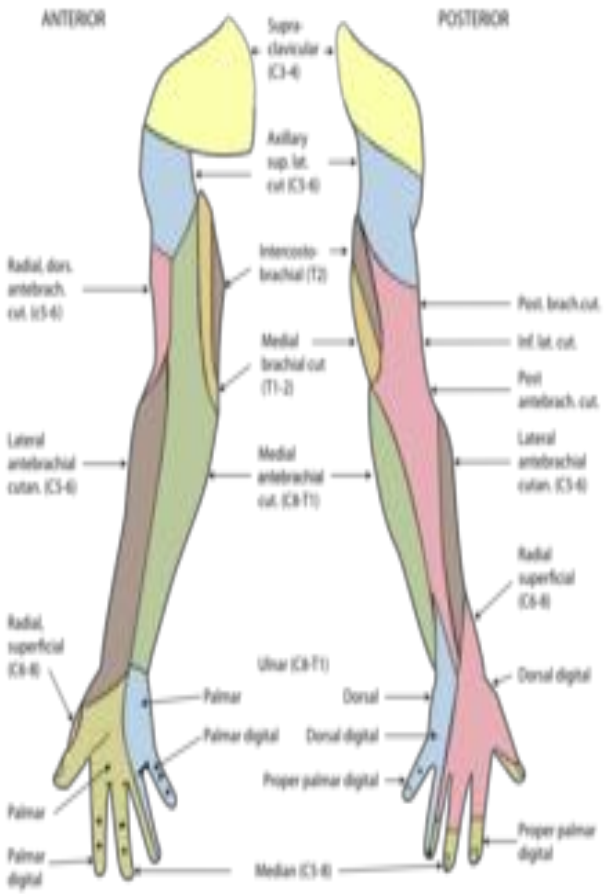
Test for the triceps reflex (C7) which if present will indicate that the lesion is below the spinal groove of the humerus, and if it is absent implies the lesions is higher up in the axilla - what we then call a saturday night palsy -- the reflex arc is conserved in a lower lesion.

One can confirm that it is radial by ensuring there are no ulnar or medial nerve lesions, or just to rule them out- quick tests of thumb up to ceiling, stop me from pushing it down (Abd.Pol.Brevis for median) and the push on first finger, stop me from pushing that in - (first dorsal interosseus for ulnar nerve).

If you were delineating between median or ulnar,
the thumb would be weak = median,
the first finger would be weak = radial

Sensory

- A small loss of skin sensation occurs down the posterior surface of the lower part of the arm and down a narrow strip on the back of the forearm.
- A variable area of sensory loss is present on the lateral part of the dorsum of the hand and on the dorsal surface of the roots of the lateral three and a half fingers
- The area of total anesthesia is relatively small because of the overlap of sensory innervation by adjacent nerves.
- Trophic changes are slight.



Spinal groove injury Same as Axilla injury except some triceps heads are still innervated.

Injuries to the Radial Nerve in the Spiral Groove

- In the spiral groove of the humerus, the radial nerve can be injured at the time of fracture of the shaft of the humerus, or subsequently involved during the formation of the callus

- The pressure of the back of the arm on the edge of the operating table in an unconscious patient has also been known to injure the nerve at this site.

- The prolonged application of a tourniquet to the arm in a person with a slender triceps muscle is often followed by temporary radial palsy.

- The injury to the radial nerve occurs most commonly in the distal part of the groove, beyond the origin of the nerves to the triceps and the anconeus and beyond the origin of the cutaneous nerves.

- The clinical findings in injury to the radial nerve in the spiral groove are as follows
- Motor: The patient is unable to extend the wrist and the fingers, and wristdrop occurs
- Sensory: A variable small area of anesthesia is present over the dorsal surface of the hand and the dorsal surface of the roots of the lateral three and a half fingers.
- Trophic changes: These are very slight or absent

finger drop.

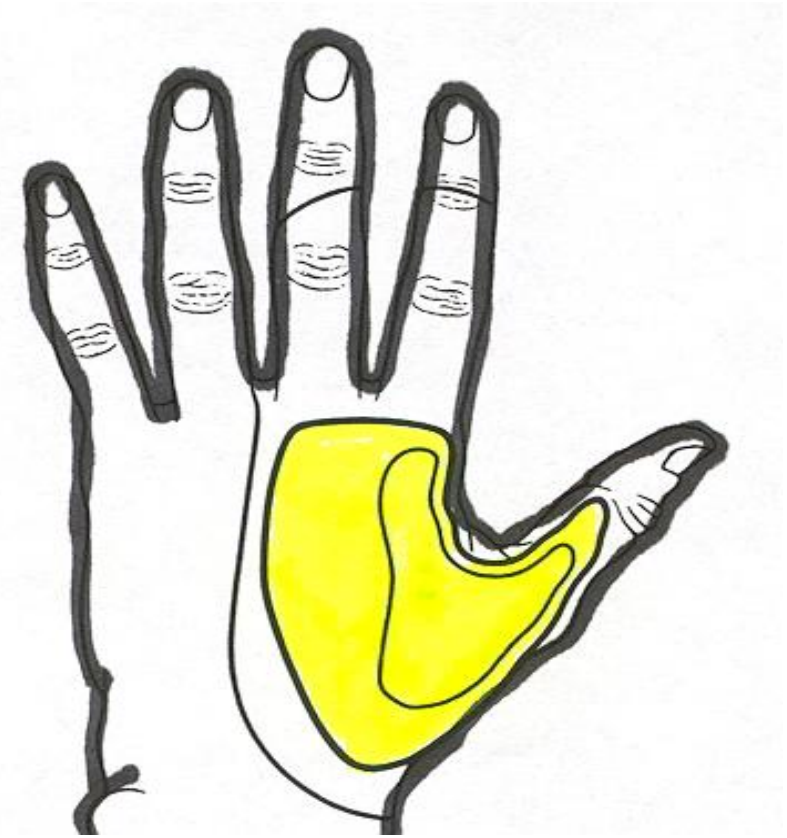
Injuries to the Deep Branch of the Radial Nerve

- The deep branch of the radial nerve is a motor nerve to the extensor muscles in the posterior compartment of the forearm.
- It can be damaged in fractures of the proximal end of the radius or during dislocation of the radial head.
- The nerve supply to the supinator and the extensor carpi radialis longus will be undamaged
- and because the latter muscle is powerful, it will keep the wrist joint extended, and wristdrop will not occur.
- No sensory loss occurs because this is a motor nerve

Injuries to the Superficial Radial Nerve

- Division of the superficial radial nerve, which is sensory, as in a stab wound

- results in a variable small area of anesthesia over the dorsum of the hand and the dorsal surface of the roots of the lateral three and a half fingers + Proximal Phalanx.



6

motor
Sensory

Musculocutaneous Nerve

- supply : biceps , 1/2 brachialis (extension)
- injury in it lead to → flexion
  → pronation (can't do screwing)

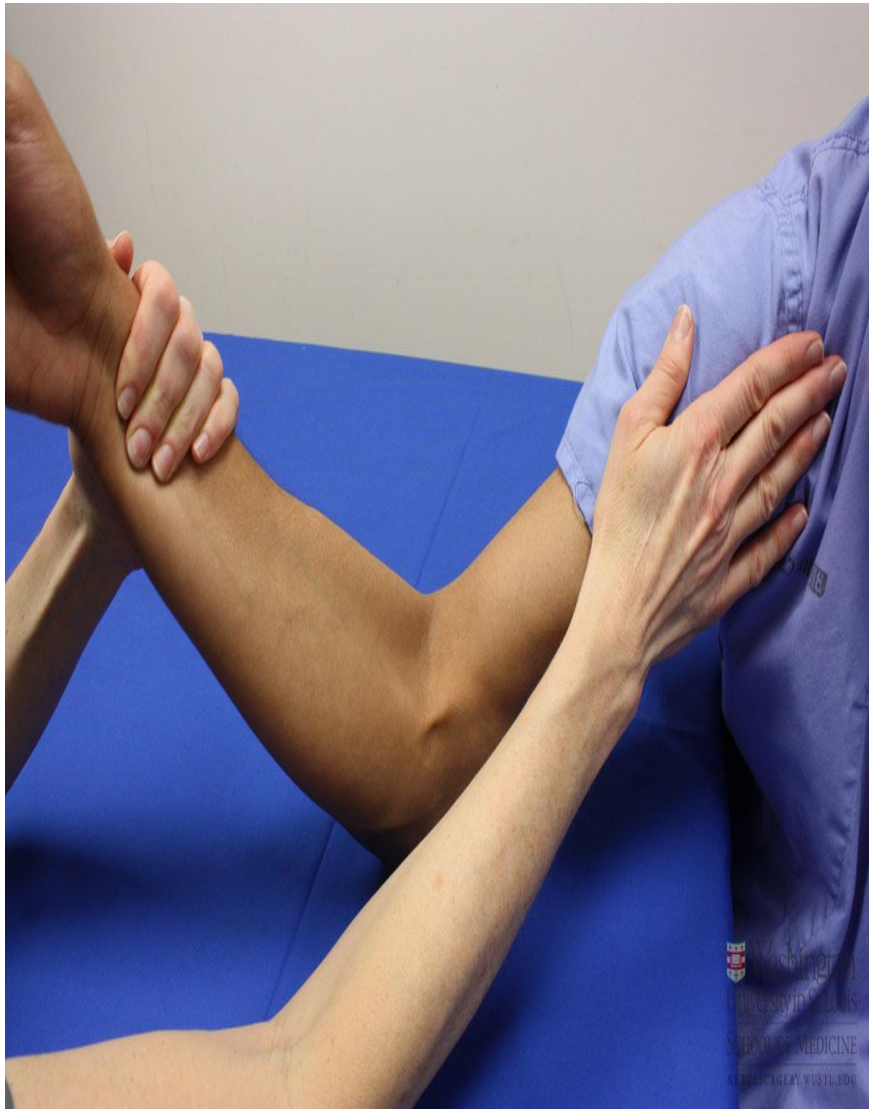
- The musculocutaneous nerve is rarely injured because of its protected position beneath the biceps brachii muscle

- it is injured high up in the arm, the biceps and coracobrachialis are paralyzed and the brachialis muscle is weakened (the latter muscle is also supplied by the radial nerve).

- Flexion of the forearm at the elbow joint is then produced by the remainder of the brachialis muscle and the flexors of the forearm.

- When the forearm is in the prone position, the extensor carpi radialis longus and the brachioradialis muscles assist in flexion of the forearm

- There is also sensory loss along the lateral side of the forearm.
- Wounds or cuts of the forearm can sever the lateral cutaneous nerve of the forearm, a continuation of the musculocutaneous nerve beyond the cubital fossa
- resulting in sensory loss along the lateral side of the forearm.

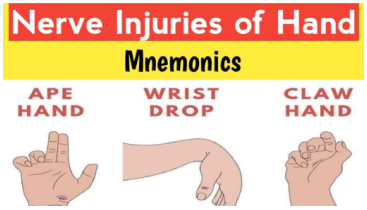


Median Nerve

-Site of injury: 1) Supracondylar of humerus
2) wrist joint posteriorly to Palmaris longus tendon.

- The median nerve which arises from the medial and lateral cords of the brachial plexus, gives off no cutaneous or motor branches in the axilla or in the arm.
- In the proximal third of the front of the forearm, by unnamed branches or by its anterior interosseous branch, it supplies all the muscles of the front of the forearm except the flexor carpi ulnaris and the medial half of the flexor digitorum profundus, which are supplied by the ulnar nerve
- In the distal third of the forearm, it gives rise to a palmar cutaneous branch, which crosses in front of the flexor retinaculum and supplies the skin on the lateral half of the palm
- In the palm the median nerve supplies the muscles of the thenar eminence and the first two lumbricals and gives sensory innervation to the skin of the palmar aspect of the lateral three and a half fingers, including the nail beds on the dorsum.

Surgeons sometimes confuse the tendon of the Palmaris Longus with the median nerve. This confusion can lead to accidental cutting of the median nerve, resulting in extended wrist position and adduction of the thumb as well as ulnar deviation due to paralysis of the affected muscles , this condition known as "Median Nerve Palsy" or "Ape Hand Deformity.". Additionally, the median nerve has a sensory branch in the palm.



- From a clinical standpoint, the median nerve is injured occasionally in the elbow region in supracondylar fractures of the humerus.

- It is most commonly injured by stab wounds or broken glass just proximal to the flexor retinaculum

- here it lies in the interval between the tendons of the flexor carpi radialis and flexor digitorum superficialis, overlapped by the palmaris longus.

Injuries to the Median Nerve at the Elbow

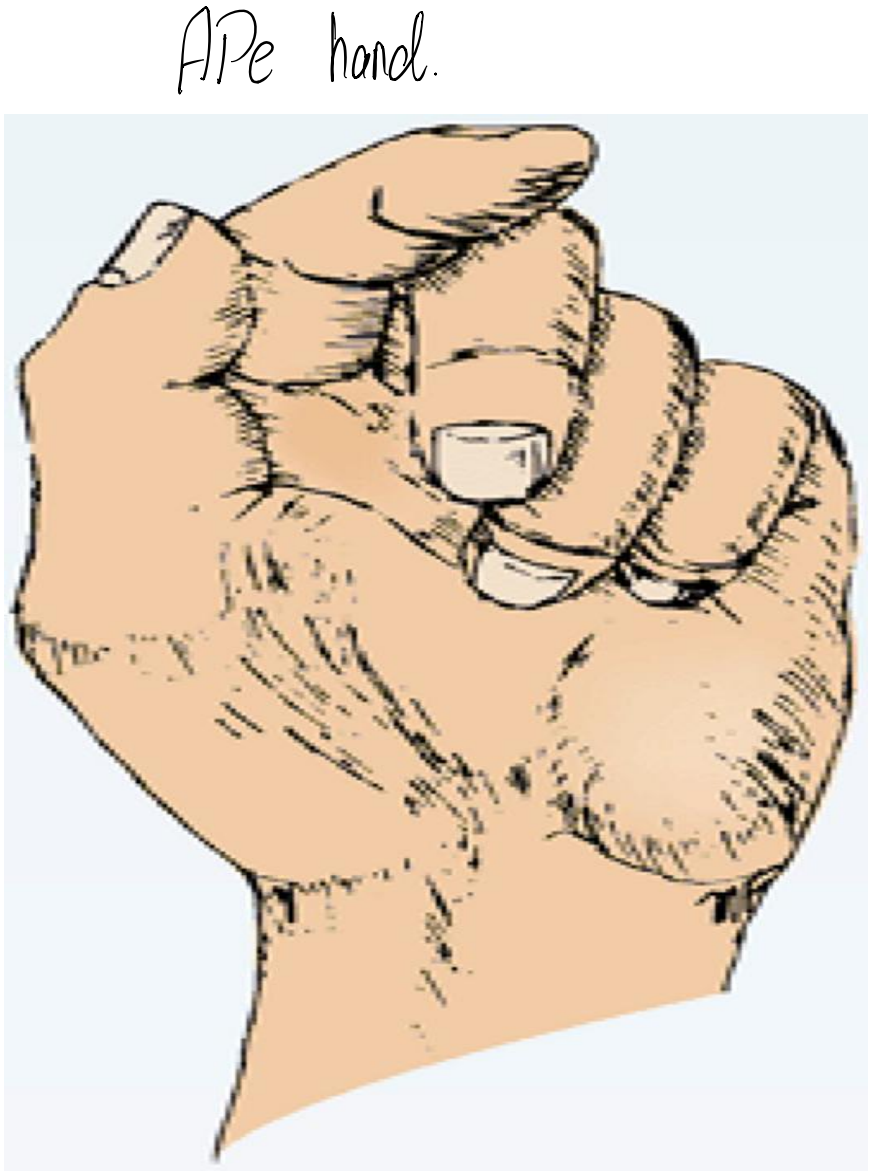
- Motor
- The pronator muscles of the forearm and the long flexor muscles of the wrist and fingers, with the exception of the flexor carpi ulnaris and the medial half of the flexor digitorum profundus, will be paralyzed

- As a result, the forearm is kept in the supine position; wrist flexion is weak and is accompanied by adduction.

- The latter deviation is caused by the paralysis of the flexor carpi radialis and the strength of the flexor carpi ulnaris and the medial half of the flexor digitorum profundus.

- No flexion is possible at the interphalangeal joints of the index and middle fingers, although weak flexion of the metacarpophalangeal joints of these fingers is attempted by the interossei

- When the patient tries to make a fist, the index and to a lesser extent the middle fingers tend to remain straight, whereas the ring and little fingers flex
- The latter two fingers are, however, weakened by the loss of the flexor digitorum superficialis.
- Flexion of the terminal phalanx of the thumb is lost because of paralysis of the flexor pollicis longus
- The muscles of the thenar eminence are paralyzed and wasted so that the eminence is flattened.
- The thumb is laterally rotated and adducted. The hand looks flattened and apelike



Sensory

- Skin sensation is lost on the lateral half or less of the palm of the hand and the palmar aspect of the lateral three and a half fingers
- Sensory loss also occurs on the skin of the distal part of the dorsal surfaces of the lateral three and a half fingers
- The area of total anesthesia is considerably less because of the overlap of adjacent nerves.

Vasomotor Changes

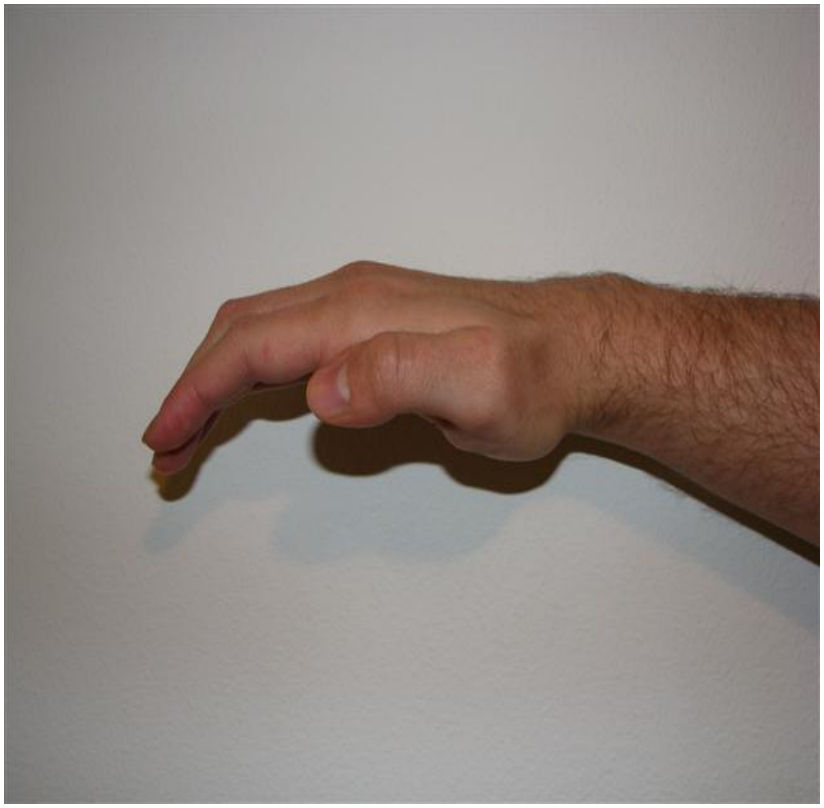
- The skin areas involved in sensory loss are warmer and drier than normal because of the arteriolar dilatation and absence of sweating resulting from loss of sympathetic control.

- Trophic Changes for skin of distribution of the nerves.
- In long-standing cases, changes are found in the hand and fingers
- The skin is dry and scaly, the nails crack easily, and atrophy of the pulp of the fingers is present.

Injuries to the Median Nerve at the Wrist

- Motor:
- The muscles of the thenar eminence are paralyzed and wasted so that the eminence becomes flattened. The thumb is laterally rotated and adducted
- The hand looks flattened and apelike.
- Opposition movement of the thumb is impossible
- The first two lumbricals are paralyzed, which can be recognized clinically when the patient is asked to make a fist slowly, and the index and middle fingers tend to lag behind the ring and little fingers.
- Sensory, vasomotor, and trophic changes: These changes are identical to those found in the elbow lesions.
- Perhaps the most serious disability of all in median nerve injuries is the loss of the ability to oppose the thumb to the other fingers and the loss of sensation over the lateral fingers. The delicate pincerlike action of the hand is no longer possible.

Adduction of the thumb



Carpal Tunnel Syndrome

- The carpal tunnel, formed by the concave anterior surface of the carpal bones and closed by the flexor retinaculum, is tightly packed with the long flexor tendons of the fingers, with their surrounding synovial sheaths, and the median nerve
- Clinically, the syndrome consists of a burning pain or pins and needles along the distribution of the median nerve to the lateral three and a half fingers and weakness of the thenar muscles
- It is produced by compression of the median nerve within the tunnel
- The exact cause of the compression is difficult to determine, but thickening of the synovial sheaths of the flexor tendons or arthritic changes in the carpal bones are thought to be responsible in many cases
- no paresthesia occurs over the thenar eminence because this area of skin is supplied by the palmar cutaneous branch of the median nerve, which passes superficially to the flexor retinaculum.
- The condition is dramatically relieved by decompressing the tunnel by making a longitudinal incision through the flexor retinaculum.

Carpal Tunnel Syndrome differs from median nerve injury in that the palmar branch, which innervates the lateral 2/3 of the palm, is not affected in Carpal Tunnel Syndrome. Therefore, sensation in this area remains intact. In Carpal Tunnel Syndrome, the compression of the median nerve affects the motor function of the hand, especially the thenar muscles, but does not lead to sensory loss in the palm. However, in a more severe median nerve injury, the palmar branch may be affected, leading to sensory loss in the lateral 2/3 of the palm.

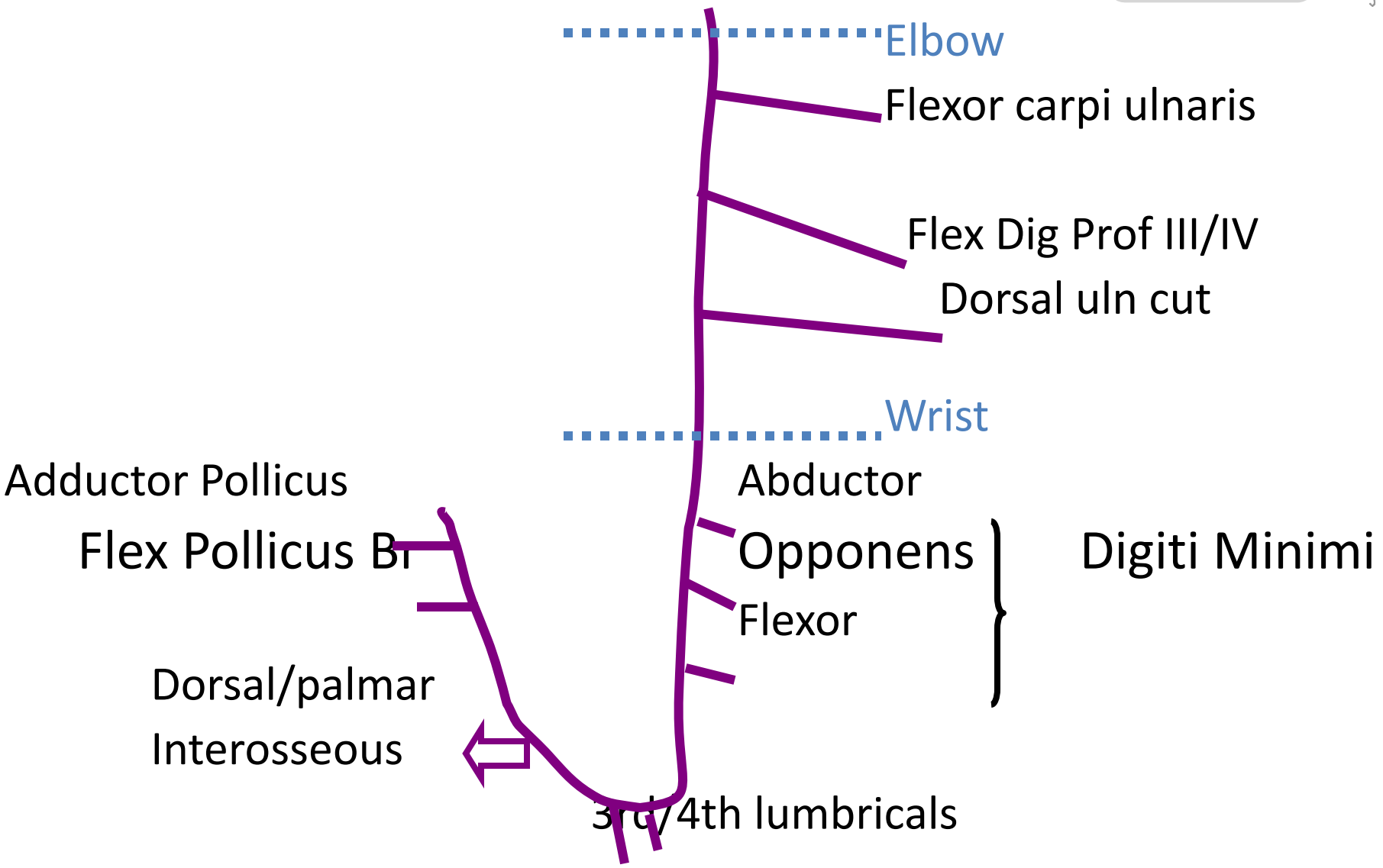
Ulnar Nerve

- The ulnar nerve which arises from the medial cord of the brachial plexus (C8 and T1), gives off no cutaneous or motor branches in the axilla or in the arm
- As it enters the forearm from behind the medial epicondyle, it supplies the flexor carpi ulnaris and the medial half of the flexor digitorum profundus
- In the distal third of the forearm, it gives off its palmar and posterior cutaneous branches.
- The palmar cutaneous branch supplies the skin over the hypothenar eminence; the posterior branch supplies the skin over the medial third of the dorsum of the hand and the medial one and a half fingers
- Not uncommonly, the posterior branch supplies two and a half instead of one and a half fingers
- It does not supply the skin over the distal part of the dorsum of these fingers.

- Having entered the palm by passing in front of the flexor retinaculum, the superficial branch of the ulnar nerve supplies the skin of the palmar surface of the medial one and a half fingers
- including their nail beds; it also supplies the palmaris brevis muscle
- The deep branch supplies all the small muscles of the hand except the muscles of the thenar eminence and the first two lumbricals, which are supplied by the median nerve
- The ulnar nerve is most commonly injured at the elbow, where it lies behind the medial epicondyle, and at the wrist, where it lies with the ulnar artery in front of the flexor retinaculum
- The injuries at the elbow are usually associated with fractures of the medial epicondyle.
- The superficial position of the nerve at the wrist makes it vulnerable to damage from cuts and stab wounds.

Ulnar nerve distribution

- Supply:
  - 14 muscles in hand.
  - 1.5 muscle in forearm. [little finger + ring finger]



Site of injuries :- (1)

Injuries to the Ulnar Nerve at the Elbow (Medial Epicondyle)

- Motor
- The flexor carpi ulnaris and the medial half of the flexor digitorum profundus muscles are paralyzed
- The paralysis of the flexor carpi ulnaris can be observed by asking the patient to make a tightly clenched fist
- Normally, the synergistic action of the flexor carpi ulnaris tendon can be observed as it passes to the pisiform bone
- the tightening of the tendon will be absent if the muscle is paralyzed
- The profundus tendons to the ring and little fingers will be functionless, and the terminal phalanges of these fingers are therefore not capable of being markedly flexed
- Flexion of the wrist joint will result in abduction, owing to paralysis of the flexor carpi ulnaris
- The medial border of the front of the forearm will show flattening owing to the wasting of the underlying ulnaris and profundus muscles

- The small muscles of the hand will be paralyzed, except the muscles of the thenar eminence and the first two lumbricals, which are supplied by the median nerve.
- The patient is unable to adduct and abduct the fingers and consequently is unable to grip a piece of paper placed between the fingers
- the extensor digitorum can abduct the fingers to a small extent, but only when the metacarpophalangeal joints are hyperextended.
- 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, he or she does so by strongly contracting the flexor pollicis longus and flexing the terminal phalanx (Froment's sign).

- The metacarpophalangeal joints become hyperextended because of the paralysis of the lumbrical and interosseous muscles, which normally flex these joints

- Because the first and second lumbricals are not paralyzed (they are supplied by the median nerve),

- the hyperextension of the metacarpophalangeal joints is most prominent in the fourth and fifth fingers

- The interphalangeal joints are flexed, owing again to the paralysis of the lumbrical and interosseous muscles, which normally extend these joints through the extensor expansion.

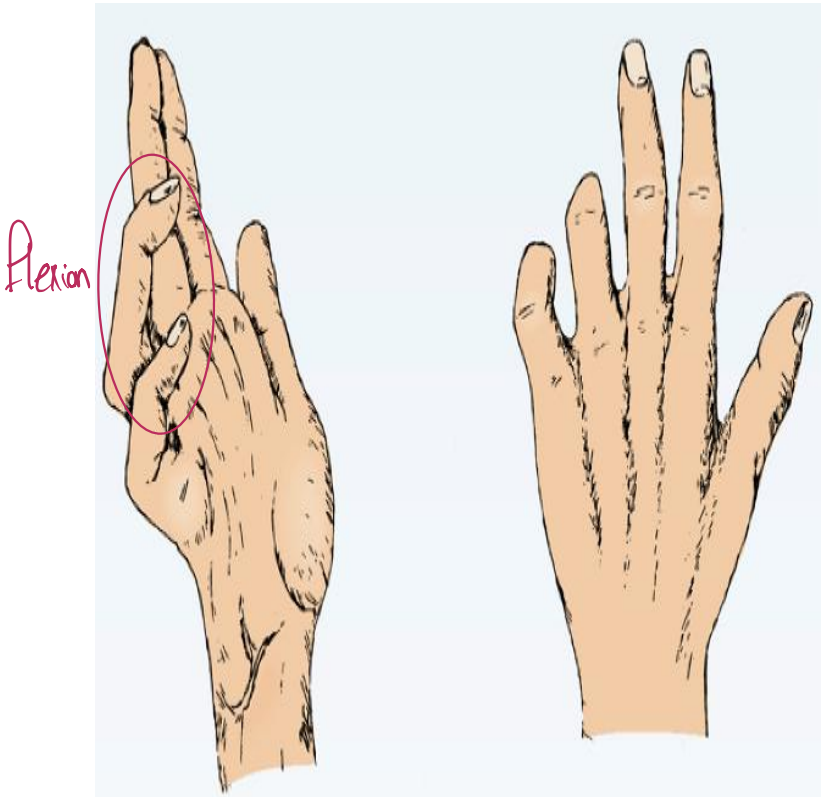
- The flexion deformity at the interphalangeal joints of the fourth and fifth fingers is obvious because the first and second lumbrical muscles of the index and middle fingers are not paralyzed

- In long-standing cases the hand assumes the characteristic claw deformity (main en griffe).

- Wasting of the paralyzed muscles results in flattening of the hypothenar eminence and loss of the convex curve to the medial border of the hand.

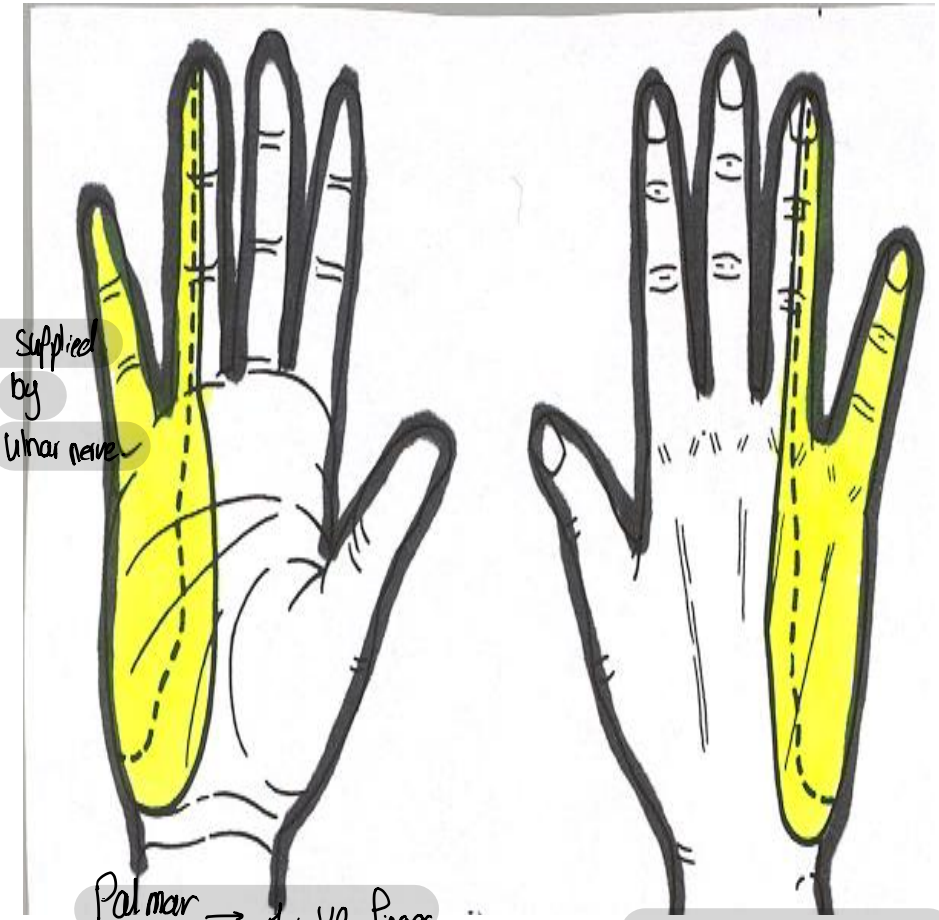
- Examination of the dorsum of the hand will show hollowing between the metacarpal bones caused by wasting of the dorsal interosseous muscles

lead to claw hand



- Sensory
- 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.

- Vasomotor Changes for areas that are supplied by ulnar nerve
- The skin areas involved in sensory loss are warmer and drier than normal because of the arteriolar dilatation and absence of sweating resulting from loss of sympathetic control.



Injuries to the Ulnar Nerve at the Wrist

- Motor:
- 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

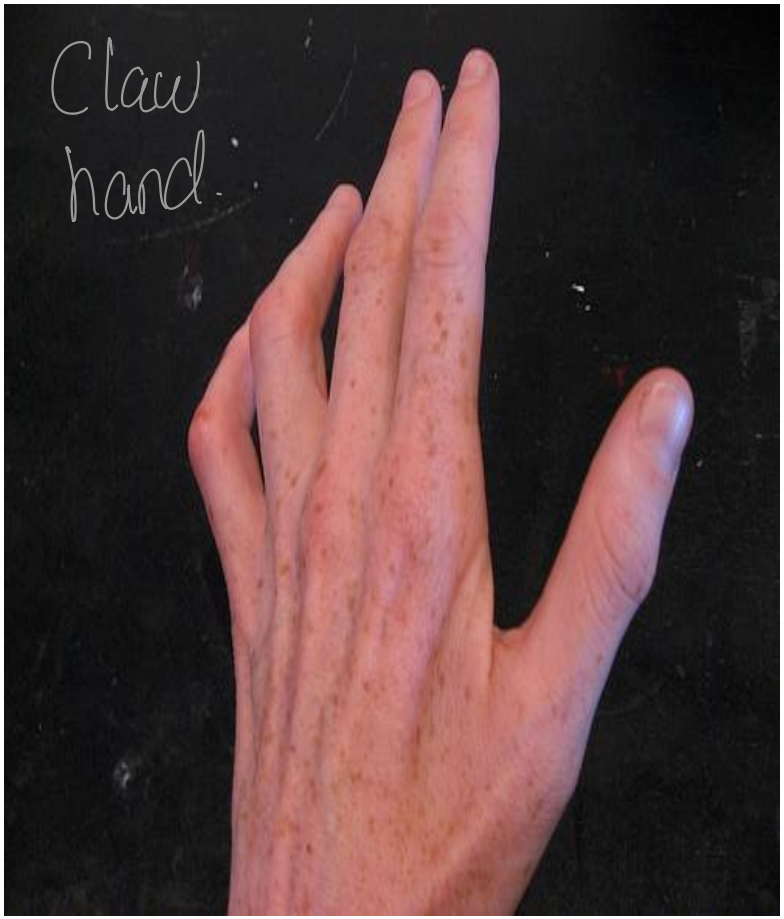
- The clawhand is much more obvious in wrist lesions because the flexor digitorum profundus muscle is not paralyzed, and marked flexion of the terminal phalanges occurs.

- Sensory:
- The main ulnar nerve and its palmar cutaneous branch are usually severed

- the posterior cutaneous branch, which arises from the ulnar nerve trunk about 2.5 in. (6.25 cm) above the pisiform bone, is usually unaffected

- The sensory loss will therefore be confined to the palmar surface of the medial third of the hand and the medial one and a half fingers and to the dorsal aspects of the middle and distal phalanges of the same fingers.

- Vasomotor and trophic changes:
- These are the same as those described for injuries at the elbow.
- It is important to remember that with ulnar nerve injuries, the higher the lesion, the less obvious the clawing deformity of the hand



- Unlike median nerve injuries, lesions of the ulnar nerve leave a relatively efficient hand
- The sensation over the lateral part of the hand is intact, and the pincerlike action of the thumb and index finger is reasonably good
- although there is some weakness owing to loss of the adductor pollicis.

اللَّهُمَّ لَكَ الْحَمْدُ كُلُّهُ ، اللَّهُمَّ لَا قَابِضَ لِمَا بَسَطْتَ وَلَا بَاسِطَ لِمَا قَبَضْتَ ، وَلَا هَادِيَ لِمَا أَضْلَلْتَ وَلَا مُضِلَّ لِمَنْ هَدَيْتَ ، وَلَا مُعْطِيَ لِمَا مَنَعْتَ وَلَا مَانِعَ لِمَا أَعْطَيْتَ ، وَلَا مُقَرِّبَ لِمَا بَاعَدْتَ وَلَا مُبَاعِدَ لِمَا قَرَّبْتَ ، اللَّهُمَّ ابْسُطْ عَلَيْنَا مِنْ بَرَكَاتِكَ وَرَحْمَتِكَ وَفَضْلِكَ وَرِزْقِكَ ، اللَّهُمَّ إِنِّي أَسْأَلُكَ النَّعِيمَ الْمُقِيمَ الَّذِي لَا يَحُولُ وَلَا يَزُولُ ، اللَّهُمَّ إِنِّي أَسْأَلُكَ النَّعِيمَ يَوْمَ الْعَيْلَةِ وَالْأَمْنَ يَوْمَ الْخَوْفِ ، اللَّهُمَّ إِنِّي عَائِذٌ بِكَ مِنْ شَرِّ مَا أَعْطَيْتَنَا وَشَرِّ مَا مَنَعْتَ ، اللَّهُمَّ حَبِّبْ إِلَيْنَا الْإِيمَانَ وَزَيِّنْهُ فِي قُلُوبِنَا وَكَرِّهْ إِلَيْنَا الْكُفْرَ وَالْفُسُوقَ وَالْعِصْيَانَ وَاجْعَلْنَا مِنْ الرَّاشِدِينَ ، اللَّهُمَّ تَوَفَّنَا مُسْلِمِينَ وَأَحْيِنَا مُسْلِمِينَ وَأَلْحِقْنَا بِالصَّالِحِينَ غَيْرَ خَزَايَا وَلَا مَفْتُونِينَ ، اللَّهُمَّ قَاتِلْ الْكَفَرَةَ الَّذِينَ يُكَذِّبُونَ رُسُلَكَ وَيَصُدُّونَ عَنْ سَبِيلِكَ ، وَاجْعَلْ عَلَيْهِمْ رِجْزَكَ وَعَذَابَكَ ، اللَّهُمَّ قَاتِلْ الْكَفَرَةَ الَّذِينَ أُوتُوا الْكِتَابَ إِلَهَ الْحَقِّ

Anatomy and histology

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