

## Cubital fossa and forearm

- *Cubital fossa is the triangular space in front of elbow joint.*
  - The Cubital fossa has boundaries: apex, base, roof and floor and it has contents.
- **The base:** an imaginary horizontal line between the medial epicondyle and the lateral epicondyle of the humerus.
- **The apex:** apex is the crossing or meeting point of **brachioradialis muscle** and **pronator teres muscle**.
- **Floor:** It has two deep muscles:
  - 1- Brachialis (medially): recognizable by being deep to biceps brachii tendon.
  - 2- Supinator (laterally): recognizable by being pierced by the deep branch of radial nerve.
- **Contents:** from medial to lateral:
  - 1- Median nerve (the most medial structure/content).
  - 2- Brachial artery that gives two terminal branches near the apex to radial (superficial) artery and ulnar (deeper) artery.
  - 3- Biceps brachii tendon.
  - 4- Radial nerve that gives two branches: superficial and deep branch beside some other branches.

- **The roof:** the roof of cubital fossa is very important clinically and it consists of :

1- Skin.

2- Superficial fascia that contains:

- Veins: 1- Basilic vein on the medial side.  
2- Cephalic vein on the lateral side.

3- And they are connected in between by the median cubital vein.

- Cutaneous nerves:

1-Lateral cutaneous nerve of the forearm: this is a continuation of musculocutaneous nerve from the lateral cord.

2- Medial cutaneous nerve of the forearm: from the medial cord.

And both of them they give anterior branches to the skin in front of the cubital fossa.

- Lymph nodes: 1- Supratrochlear lymph nodes:  
They do lymphatic drainage to the medial side of the hand and the forearm.

Lateral side of the hand and the forearm lymphatic drainage is by infraclavicular lymph nodes found beside the cephalic vein but not in the cubital fossa.

3- Bicipital aponeurosis (extension from the biceps brachii tendon found in the roof).

4- Deep fascia: reinforced by the bicipital aponeurosis.

- Examples on the clinical importance of the cubital fossa:

1- The median cubital vein for blood sampling and injection of medicine (intravenous injection).

2- When measuring blood pressure, we put our three middle fingers medial to the biceps brachii tendon (recognizable) to feel the pulsation of the brachial artery. (Laterally no pulsation)

The two arteries in the thumb aren't continuous( spaces between them) but the arteries are continuous in the three middle fingers that why we use them for measuring.

- **Forearm:** we divided forearm to anterior and posterior compartments by radius and ulna and the interosseous membrane that connects these two bones.

Interosseous membrane is a connective tissue that extends from radius to ulna obliquely.( not straight)

- The anterior compartment is called flexor compartment because the function of all of its muscles is flexion to the joint. The tendon of these flexor muscles lies in front of

the joints. (like: elbow, wrist, carpometacarpal, interphalngeal joints).

These muscles' function depends on their insertion. For example if the insertion was in the metacarpal bones it will flex the carpometacarpal, wrist and elbow joint)

Notice: flexor digitorum profundus

Flexor: flexion of the joint/ digitorum: to the 4 digits/

profundus: deep / pollicis: to the thumb/ radialis:

abduction/ulnaris: adduction/ quadrates: square shaped

- The common tendon (origin) for the flexor group is the medial epicondyle of humerus. And the common tendon for the extensor (posterior) group is the lateral epicondyle of humerus.
- The muscle can have more than one origin.

Muscles of the flexor compartment are divided to:

1-Four superficial muscles: pronator teres, flexor carpi radialis, palmaris longus and the flexor carpi ulnaris.

2-One intermediate muscle: flexor digitorum superficialis .

3- Three deep muscle: flexor pollicis longus, the flexor digitorum profundus, and the pronator quadratus.

The difference between flexor digitorum profundus and flexor digitorum superficialis is that superficialis ends in

the middle phalanges whereas the profundus ends in the distal phalanges. Profundus is longer and deeper.

The main nerve supply for these flexor muscles is by two nerves: **Ulnar and medial.**

1-Ulnar nerve supplies the flexor carpi ulnaris and the medial half of profundus. (A muscle and a half)

2- Median nerve and its large branch (anterior interosseous nerve located on the interosseous membrane) supply the other muscles.

- The interosseous nerve supplies the deep muscles except the medial half of profundus.
- And the median nerve for pronator teres, flexor carpi radialis, Palmaris longus, and flexor digitorum superficialis.

These nerves give cutaneous branches to the hand not to the forearm.

- The cutaneous nerves in the forearm are:

1- Lateral cutaneous nerve of the forearm.

2- Medial cutaneous nerve of the forearm.

3- Posterior cutaneous nerve of the forearm from the radial nerve.

## Flexor muscles:

### 1-Pronator Teres:

- Two origins:

1-Humeral head: Medial epicondyle of humerus

2- Ulnar head: Medial border of coronoid process of ulna.

- Insertion: Lateral surface, midshaft, of radius.
- Nerve Supply Median nerve C6, 7
- Action: Pronation of the hand and flexion of forearm (because the origin above the elbow joint).

### 2- Flexor carpi radialis:

- Origin : Medial epicondyle of humerus.
- Insertion: At the base of the second metacarpal bone and sometimes second and third.
- Nerve supply: median nerve **C6, C7**.
- Action: Flexes and abducts hand at wrist joint because it is in front of the joint.

### 3- Palmaris longus:

- Origin: Medial epicondyle of humerus.
- Insertion: Apex of **palmar aponeurosis** which is deep fascia in front the palm of the hand and protects the palm.
- Nerve supply: Median nerve **C7, C8**.
- Action: Flexes hand.
- It is surgically important for orthopedics because sometimes it is absent that means its action is not very important and other muscles can do the action. And when it is present they use its tendon for other muscles in case of injury. (reconstruction of other muscles).

### 4-Flexor Carpi Ulnaris:

- Two origins:
  - 1- Humeral head: Medial epicondyle of humerus.
  - 2- Ulnar head: from olecranon process and the upper part of the shaft of ulna.

- Insertion: Pisiform bone, base of fifth metacarpal bone and has an extension with the hook of hamate.
- Nerve supply: Ulnar nerve C7, **C8**, T1. (The only whole muscle from ulnar nerve).
- Action: Flexes and adducts hand at wrist joint

#### 5-Flexor Digitorum Superficialis: (intermediate)

- Two origins :

1- Humeroulnar head: Medial epicondyle of humerus; medial border of coronoid process of ulna.

2- Radial head : Oblique line on anterior surface of shaft of radius.

- Insertion: Middle phalanges of medial four fingers (thumb is lateral) . It splits into two branches each goes to one side of the middle of the phalanges. So that the tendon of profundus can come in between and end in the distal phalanges.
- Nerve supply: Median nerve **C8**, T1.
- Action: Flexes middle phalanges of fingers and assists in flexing proximal phalanges and the hand.



- The median nerve is found between profundus and superficialis like a sandwich.

#### 6-Flexor pollicis longus:

- Origin : Anterior surface of shaft of radius.
- Insertion: base of Distal phalanx of thumb
- Nerve supply: Anterior interosseous branch of median nerve C7, **C8**.
- Action: Flexes interphalngeal and metacarpophalangeal joints of the thumb.

#### 7-Flexor digitorum profundus:

- Origin : Anteromedial surface of shaft of ulna .
- Insertion:base of Distal phalanges of medial four fingers.
- Nerve supply: Ulnar (medial half) and anterior interosseous branch (lateral half) nerves **C8**; T1
- Action: Flexes distal interphalngeal and metacarpophalangeal joints of medial fingers and wrist joint.

- The ulnar nerve supplies the little finger and the ring while the median supplies the index and the middle and this is important for injuries.

#### 8-Pronator quadrates:

- Origin : Anterior surface of the lower third of ulna
- Insertion: Anterior surface of the lower third of radius
- Nerve supply: Anterior interosseous nerve (branch of median nerve) C7, **C8**.
- Action: pronation of the hand.

Important landmark: the anterior interosseous nerve and vessels when they reach the upper border of quadrates they supply it and pierce the interosseous membrane and go to the posterior compartment.

Review:

in the anterior compartment there are 3 groups

1-superficial (pronator teres, flexor carpi radialis, flexor carpi ulnaris and Palmaris longus)

2 intermediate group (flexor digitorum superficialis)

these two groups are innervated by median nerve except ulnaris by ulnar nerve

3- deep muscles (pronator quadratus ,flexor digitorum profundus ,flexor pollicis longus)

deep group are innervated by anterior interosseous except medial half of profundus from the ulnar nerve )

نصيحه ادرسوا من السلايدات

**blood supply :**

radial and ulnar artery

1-ulnar artery

\*division from brachial artery (at the level of neck of radius )

\*ulnar is larger than radial

\*branches of ulnar artery

1-common interosseous (divides into anterior interosseous and posterior interosseous that goes to the posterior compartment by piercing the membrane.)

2-recurrent branches (anterior and posterior ulnar recurrent branches ) they participate in the anastomoses in the elbow joint( medial side)

3-muscular branch (for muscles )

4- in the hand give superficial palmar arch

5-in carpals give anterior and posterior carpal arteries

\* Superficial to the flexor retinaculum( deep fascia

anterior to the tendons of the flexor compartment to protect and fix the tendons) until it reaches the hand.

6- gives nutrition for ulna

ulnar nerve medial to ulnar artery and superficial to the flexor retinaculum

- \*radial artery

goes laterally and covered by brachioradialis muscle ,superficial branch of radial nerve lateral to the artery

((ulnar artery accompanied with ulnar nerve and radial artery accompanied with superficial branch of radial nerve )))nerves are superficial to arteries

### **branches of radial artery**

1-radial recurrent which takes part in the arterial anastomoses around the elbow joint on the lateral side.

- 2- muscular branches to the muscles

3- nutrient for bone (radius)

4- The radial artery crosses snuff box( dorsum of the hand) which is the depression between the tendons of the thumb and terminates as deep palmar arch in

the hand. The deep palmar arch is proximal to the superficial palmar arch. Check the slides

- We feel the pulsation from the radial artery at wrist joint because the radial artery at the lower 7 cms it passes directly on radius and it becomes subcutaneous whereas the ulnar artery is located between muscles so no clear pulsation.
- we feel the pulsation by putting the three middle nerves on the radial artery and we can also determine the blood pressure.

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☺ من اطلال الامل اساء العمل

- Median and ulnar nerves better from slides.

لا تنسونا من الدعاء بالجنه

الزميل علي العناسوه

كل التوفيق و شدولنا حيلكوا

P:واسف على اي خطا بس ماكو وقت

