FOREARM AND CARPAL TUNNEL

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Constituents of the Forearm

• Bones
  • Radius and Ulna

• Muscles
  • Flexors (anterior compartment)
  • Extensors (posterior compartment)

• Blood vessels
  • Ulnar and Radial

• Nerves
Anterior (Flexor) Compartment

**Muscles - Superficial Group:**
- Cross elbow joint.
- Possess a common origin (anterior surface of medial epicondyle of humerus).
- Lateral to medial
  - Pronator teres (1)
  - Flexor Carpi Radialis (FCR) 2
  - Flexor Digitorum Superficialis (FDS) 3
  - Palmaris longus 4
  - Flexor Carpi Ulnaris (FCU) 5

- **Nerve supply** – Median nerve except FCU (ulnar nerve)
**Flexor Compartment..**

**Deep Group:**
- Do not have a common origin.
- Do not cross elbow joint.

- **Flexor Digitorum Profundus (FDP)**
  - most powerful & bulkiest muscles.
  - Median nerve to lateral half & ulnar nerve to medial half
- **Flexor Pollicis Longus (FPL)**
  - median nerve
- **Pronator quadratus**
  - median nerve
Actions of muscles in flexor compartment

- Pronators of forearm
  - Pronator teres and Pronator Quadratus
- Supinator of forearm
  - Supinator
- Flexors of wrist
  - FCR (+ abduction), FCU (+ adduction) at wrist
- Flexors of fingers
  - FDS (middle phalanges) and FDP (distal phalanges)
- Flexors of thumb
  - FPL
Posterior (Extensor) Compartment

Muscles – Divided into 3 groups based on origin

**Group A:** Lateral supracondylar ridge of humerus.
- Brachioradialis & ECRL.
  - **Nerve Supply** – Radial nerve

**Group B:** Lateral epicondyle
- ECRB. ED, ECU, Anconeus, Supinator & EDM.
  - **Nerve Supply** – Posterior interosseous nerve (radial nerve)

**Group C:** Radius, ulna & interosseous membrane
- AbPL, EPL, EPB.
  - **Nerve Supply** – Posterior interosseous nerve (radial nerve).
Extensor Compartment...

- Extensors of wrist
  - ECRL, ECRB, ECU

- Extensors of fingers
  - ED, EId, EDM

- Extensors of thumb
  - EPL
  - EPB

- Abductor of thumb
  - AbPL
Nerves of Forearm

- Median
- Ulnar &
- Radial Nerves

- Review their origin and distribution from the cords of the brachial plexus
Arteries of the forearm

- **Ulnar artery** is main artery of forearm
- **Radial artery** is for the hand.

**Ulnar artery**
- Origin: Brachial artery in cubital fossa
Branches – Ulnar artery

- **Common interosseous** - divides into ant. & post. interosseous arteries, & interosseous recurrent
- **Muscular**
- **Anterior ulnar recurrent** – inferior ulnar collateral
- **Posterior ulnar recurrent** – superior ulnar collateral
- **At wrist** – palmar carpal & dorsal carpal
- **In Palm** – superficial palmar arch & deep palmar branch
Radial Artery

**Origin:**
- Brachial artery in cubital fossa

**Branches:**
- Muscular
- Radial recurrent
- Superficial palmar
- At wrist – palmar carpal, dorsal carpal, dorsal metacarpal
- In Palm – Arteria princeps pollicis & arteria radialis indicis
Carpal Tunnel

- Median Nerve
- FPL
- FCR
- Tz
- Td
- FR
- FDS
- FDP
- H
- Ulnar nerve & artery
Carpal Tunnel...Boundaries

- **Roof (Anterior)** – Flexor retinaculum attached to:
  - pisiform & hook of hamate medially;
  - scaphoid & trapezium laterally
- **Posterior:** - Carpal bones
Contents or Structures transmitted

- Flexor Pollicis Longus
- Flexor Carpi Radialis
- Median Nerve
- Anterior interosseous artery
- Tendons of FDS & FDP
- Ulnar and radial bursae

**Carpal tunnel syndrome**
- From pressure on median nerve at this site affecting the distal distribution of the nerve
Ulnar canal (Guyon Tunnel)

• **Boundaries**
  - Hook of hamate
  - Flexor reticulum

• **Content**
  - Ulnar artery, vein and nerve

• **Ulnar canal syndrome**
  - No radial deviation
  - Hypoesthesia medial 1½ fingers
  - Weakness of intrinsic mm of hand
  - Flexion of 4th & 5th digits intact
Anatomical Snuff box

Space at radial side of wrist & visible with full extension of thumb.

**Boundaries**
- Ulnar side - EPL
- Radial side - AbPL & EPB
- Deep – Scaphoid bone

**Contents**
- Deep - radial artery
- Crossing superficially is superficial branch of radial nerve
- Beginning of cephalic vein
Applied Anatomy

• Colle’s fracture
  ➢ Most common fracture of the forearm
  ➢ Complete transverse fracture of the distal 2 cm of radius
  ➢ Distal segment projects posteriorly.

http://upload.wikimedia.org/wikipedia/commons/a/af/Colles_Fractuur.jpg

http://24.media.tumblr.com/66d1d745eee6d8de9f4493375ff2d0d/tumblr_mgj0i5YRdx1rq3lp6o1_1280.jpg
Questions

• Write short note on the origin and branches of the ulnar (or radial) artery
• Write short note on the carpal tunnel and its syndrome
• What are the distinguish features between the carpal tunnel and the ulnar (Guyon) tunnel
• What are the boundaries and contents of the anatomical snuff box.