MEDICAL EDUCATION RESOURCE

Nerves of Front of Forearm, Median Nerve ,Ulnar Nerve ,Radial Nerve

? Nerves of the Front of Forearm

Overview

- The **forearm** receives its nerve supply from three major nerves:
    1. **Median nerve** – main nerve of anterior compartment.
    2. **Ulnar nerve** – supplies medial flexors and some hand muscles.
    3. **Radial nerve** – supplies posterior (extensor) compartment.
- These nerves also contribute to **cutaneous, articular, and muscular branches**.

1. Median Nerve

Root Value

- **C5–T1** (formed by lateral and medial roots from brachial plexus).

Course

1. Enters forearm between the **two heads of pronator teres**.
2. Passes downward between **flexor digitorum superficialis (FDS)** and **flexor digitorum profundus (FDP)**.
3. In lower forearm ? becomes superficial, lying between **tendons of FDS and flexor carpi radialis**.
4. Enters palm beneath **flexor retinaculum** through **carpal tunnel**.

Branches in Forearm

A. Muscular Branches

- Supply all superficial and intermediate flexors **except** flexor carpi ulnaris.
- Supply the **lateral half** of flexor digitorum profundus.

B. Anterior Interosseous Nerve (A.I.N.)

- Arises about 5 cm below the elbow.
- Runs on the **interosseous membrane** with the anterior interosseous artery.
- Supplies:
    - Flexor pollicis longus
    - Lateral half of flexor digitorum profundus

- Pronator quadratus

C. Palmar Cutaneous Branch

- Arises above the wrist.
- Crosses superficial to the flexor retinaculum ? supplies skin of **thenar eminence and central palm**.
- *Not affected in carpal tunnel syndrome.*

Relations

- **Above:** Between two heads of pronator teres.
- **Middle:** Between FDS and FDP.
- **Below:** Superficial near wrist between tendons of FDS and FCR.

Clinical Anatomy

- **Pronator syndrome:** Compression between two heads of pronator teres ? pain/tingling in thumb, index, and middle fingers.
- **Anterior interosseous nerve palsy:** Loss of flexion at thumb IP joint and index DIP joint ? **“Pinch sign” (OK sign defect)**.
- **Carpal tunnel syndrome:** Median nerve compression at wrist ? thenar atrophy, paresthesia in lateral 3½ digits, weakness of thumb opposition.

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2. Ulnar Nerve

Root Value

- **C8–T1** (branch of medial cord of brachial plexus).

Course

1. Enters forearm by passing **between the two heads of flexor carpi ulnaris**.
2. Descends on the **medial side of forearm**, lying on **flexor digitorum profundus**.
3. In the lower one-third of forearm ? accompanied by **ulnar artery**.
4. Passes anterior to **flexor retinaculum**, lateral to **pisiform bone**, through the **ulnar canal (Guyon’s canal)** into the hand.

Branches in Forearm

A. Muscular Branches

- To **flexor carpi ulnaris**.
- To **medial half of flexor digitorum profundus**.

B. Palmar Cutaneous Branch

- Arises in mid-forearm ? supplies **skin of hypothenar region**.

C. Dorsal Cutaneous Branch

- Arises about 5 cm above wrist ? passes backward ? supplies **skin on dorsum of medial hand and 1½ fingers**.

Relations

- **Upper third:** Deep to FCU, medial to ulnar artery.
- **Lower third:** Lies with ulnar artery under deep fascia.
- **At wrist:** Lateral to pisiform and ulnar artery.

Clinical Anatomy

- **Cubital tunnel syndrome:** Compression between heads of flexor carpi ulnaris ? numbness in medial 1½ fingers.
- **Guyon's canal syndrome:** Compression of ulnar nerve at wrist ? sensory loss over medial fingers, weakness of intrinsic hand muscles.
- **Ulnar nerve injury at elbow:** *Claw hand deformity*, loss of finger adduction, positive Froment's sign.

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3. Radial Nerve

Root Value

- **C5–T1** (branch of posterior cord of brachial plexus).

Course in Forearm

1. Enters anterior compartment **between brachialis and brachioradialis** (in cubital fossa).
2. Divides into:
    - **Superficial branch** (sensory).
    - **Deep branch (posterior interosseous nerve)** – motor.

Branches

A. Superficial Branch

- Descends under **brachioradialis**.
- Crosses anatomical snuffbox ? supplies **skin of lateral dorsum of hand and thumb base**.

B. Deep Branch (Posterior Interosseous Nerve)

- Pierces **supinator** ? enters posterior compartment.
- Supplies **all extensor muscles of forearm**, except brachioradialis and extensor carpi radialis longus (supplied by main radial trunk).

Clinical Anatomy

- **Radial nerve injury in cubital fossa:** Loss of finger extension; wrist extension preserved (ECRL & ECRB intact).
- **Superficial branch entrapment (Wartenberg syndrome):** Pain over dorsum of thumb.
- **Posterior interosseous nerve palsy:** Weak finger extension without sensory loss.

Dissection of Nerves of Front of Forearm

Steps

1. Identify **median nerve** between heads of *pronator teres* ? trace it deep between FDS and FDP.
2. Note **branches**:
    - Muscular branches to superficial flexors.
    - **Anterior interosseous nerve** descending on interosseous membrane.
    - **Palmar cutaneous branch** near wrist (superficial to retinaculum).
3. Identify **ulnar nerve** between heads of *flexor carpi ulnaris* ? follow along medial forearm with **ulnar artery**.
4. Expose **radial nerve** between *brachialis and brachioradialis* ? trace to its bifurcation into:
    - **Superficial branch** under brachioradialis.

- **Deep branch** entering supinator.

5. Preserve **companion arteries and veins** while reflecting superficial muscles.