

# Palmar Aspect of Wrist and Hand

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### Introduction

- The **palm** forms the **anterior aspect of the hand**, specialized for **grip and precision**.
- It contains **muscles, tendons, nerves, arteries, and fascia** arranged in distinct compartments.
- The structures passing from forearm into the palm are protected by the **flexor retinaculum** at the wrist.

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## Dissection of Palmar Aspect of Wrist and Hand

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### Steps

1. Place the hand supine and make an **incision along the wrist crease** and another along the mid-palmar line.
2. Reflect the **skin and superficial fascia** to expose:
  - **Palmar cutaneous branches** of median and ulnar nerves.
  - **Superficial veins** and **superficial palmar arch**.

3. Note **palmar fascia** – thin over thenar and hypotenar areas, thick centrally forming the **palmar aponeurosis**.
4. Divide the palmar aponeurosis to reveal **flexor tendons** and **lumbricals**.
5. Observe the **flexor retinaculum** at the wrist – forming the **roof of the carpal tunnel**.
6. After incising the retinaculum, identify structures **deep to it** (in the carpal tunnel).

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## Flexor Retinaculum (Transverse Carpal Ligament)

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### Definition

A strong **fibrous band** bridging the anterior concavity of the carpus, converting it into the **carpal tunnel**.

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### Attachments

- **Medially:** Pisiform and hook of hamate.
- **Laterally:** Tuber of scaphoid and crest of trapezium.

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### Relations

#### Superficial (Above)

- **Palmar cutaneous branch of median nerve.**

- **Palmaris longus tendon** (if present).
- **Ulnar artery and nerve** (pass superficial to it, through Guyon's canal).

### Deep (Below)

- Forms the **roof of carpal tunnel** enclosing:
  - **Median nerve.**
  - **Four tendons of flexor digitorum superficialis.**
  - **Four tendons of flexor digitorum profundus.**
  - **Tendon of flexor pollicis longus.**

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### Function

- Converts the carpal groove into a **tunnel**, preventing "bow-stringing" of tendons.
- Maintains **proper alignment** and provides mechanical efficiency for flexor tendons.
- Protects the **median nerve** and tendons from displacement during wrist movement.

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### Structures Superficial to Flexor Retinaculum

- Palmaris longus tendon (when present).
- Ulnar nerve and artery (in Guyon's canal).

- Palmar cutaneous branches of median and ulnar nerves.

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## Structures Deep to Flexor Retinaculum (Within Carpal Tunnel)

- Median nerve.
- Tendons of FDS, FDP, and FPL enclosed in **synovial sheaths**.

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## Clinical Anatomy of Palmar Aspect and Flexor Retinaculum

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### 1. Carpal Tunnel Syndrome

- **Cause:** Compression of **median nerve** beneath the flexor retinaculum.

- **Symptoms:**

- Numbness and tingling in lateral 3½ fingers.
- Weakness and wasting of *thenar muscles*.
- Difficulty in thumb opposition.

- **Tests:**

- *Phalen's test* (wrist flexion reproduces symptoms).
- *Tinel's sign* (tapping over tunnel causes tingling).

- **Treatment:** Surgical decompression by *incising flexor retinaculum*.

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## 2. Guyon's Canal Syndrome (Ulnar Tunnel Syndrome)

- Compression of **ulnar nerve** in canal superficial to retinaculum ? causes *hypothenar weakness* and sensory loss in medial 1½ fingers.

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## 3. Palmaris Longus Variations

- Absent in about **10–15% of individuals**.
- Commonly used for **tendon grafting** (e.g., facial reanimation, thumb reconstruction).

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## 4. Synovial Sheath Infections

- Infection of **ulnar or radial bursae** can spread rapidly due to continuity with digital synovial sheaths.
- **Ulnar bursa:** Surrounds tendons of FDS and FDP.
- **Radial bursa:** Surrounds tendon of FPL.
- *Clinical sign:* swelling and tenderness along palm and wrist ? may require drainage.

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## 5. Flexor Retinaculum in Surgery

- Must be carefully divided during **carpal tunnel release**.
- *Palmar cutaneous branch* of median nerve lies **superficial**, hence preserved.

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## 6. Pulsations at Wrist

- **Radial pulse:** lateral to tendon of flexor carpi radialis.

- **Ulnar pulse:** lateral to pisiform bone.