Forearm

Two Compartments

- Anterior (flexor) Compartment
- Posterior (extensor) compartment

Invested by deep fascia
Attached to olecranon & post. Border of ulna
Sending no. of septa
Deep fascia - thichened to form Fexor and Extensor

    Retnaculum close to wrist to retain digital
tendons in position
Anterior (Flexor) Compartment
demarcated from post. compartment

Medially
Olecranon process and post. border of Ulna

Laterally
by anterior border of radius

Floor of Anterior Compartment

• Ant. Surface of Radius
• Ant. and Medial surfaces of Ulna
• Interosseous Membrane
  (Fibres – downwards & medially)
Contents

Muscles – 8 muscles
  -- arranged in two groups
    – Superficial (Five)
    -- Deep (Three)

Vessels – Radial and Ulnar

  Common interosseous branch of ulnar artery
  dividing into
  Ant. & post. interosseous branches

Nerves – Median and Ulnar nerves

  -- Anterior interosseous branch of median nerve
Flexor Muscles of the Forearm

**Superficial flexors**
Five (5) in number
common origin -- medial epicondyle of Humerus
All crosses Elbow Joint
- Pronator Teres
- Flexor Carpi Radialis
- Palmaris Longus
- Flexor Carpi Ulnaris
- Flexor Digitorum Superficialis

Muscles with additional origin – PT, FCU, FDS

**Deep Flexors**
Three (3) in number
Origin confined to radius and Ulna
- Flexor Pollicis Longus
- Flexor Digitorum Profundus
- Pronator Quadratus
**Pronator Teres**

**Origin**
- by Humeral (Superficial) And Ulnar (deep) Heads

**Humeral Head**
- Lower Part of medial supracondylar ridge
  - And ant. And lower part of medial epicondyle

**Ulnar Head**
- medial border of coronoid process of ulna

**Course**
- two heads join, proceed downward and laterally forming medial boundary of cubital fossa

- median nerve passes in b/w two heads

**Insertion**
- by a flat tendon to the middle of the lateral surface of Radius

**N. Supply**
- median nerve, before it pass b/w two heads
Action: Pronation of Forearm, Weak Flexor of Elbow
Flexor Carpi Radialis

**Origin**
- Medial epicondyle
- from adjoining deep fascia

**Course**
Form fusiform belly
form tendon in middle of forearm
At wrist
accompanied by tendon of brachioradialis
laterally
radial artery intervenes in b/w two tendons
Perforates Fl. Retinaculum

**Insertion**
Palmer surface of base of second and third
metacarpal bones

**Nerve supply**
Median nerve

**Action**
Flexor of wrist
Along with ECRL & ECRB – abduction of wrist
**Palmaris longus**

**Origin**
- Medial epicondyle of humerus

**Course**
- Long tendon
- Passes in front of flexor retinaculum

**Insertion**
- Continues as central part of Palmer aponeurosis

**Nerve Supply**
- Median Nerve

**Action**
- Weak flexor of wrist
**Flexor Carpi Ulnaris**

**Origin**
- Two heads
  - Humeral head: Medial epicondyle of humerus
  - Ulnar head: Medial margin of olecranon process and 2/3rd of the post border of ulna

**Course**
- Two heads form a tendinous arch
- Ulnar nerve and post ulnar recurrent artery passes below it

**Insertion**
- To pisiform bone through pisohammate and pisometacarpal ligaments
- Hook of hamate and base of fifth metacarpal bone

**Nerve supply**
- Ulnar nerve

**Action**
- Flexor of wrist, along with ECU - adduction of wrist
**Flexor digitorum Superficialis**

**Origin**
Two heads

Humero-ulnar
   - Medial epicondyle of humerus and medial margin of coronoid process
Radial head
   - Whole length of ant. Oblique line of radius
Nerve supply
Median nerve

Course
Form four tendons above wrist arranged in superficial (mostly radial) and deep group of two each
Passes below fl. Retinaculum and diverge in palm
Superficial – for middle and ring finger
Deep – for index and ring finger
**Insertion**
At base of proximal phalanx each digit tendon splits into two
Allow the passage of tendon of F. digitorum profundus
Slips reunite again, and split again to be attached to
side of the shaft of middle phalanx

**Action**
Flexion of middle phalanx at proximal interphalangeal joint
In prolonged contraction - Flexion of metacarpophalangeal joint and wrist joint
Deep Flexors

- Flexor Pollicis Longus
- Flexor Digitorum Profundus
- Pronator Quadratus
Flexor Pollicis Longus

**Origin**
Ant. Surface of shaft of radius below anterior oblique line and adjoining Interosseous membrane
Passes below Fl. Retinaculum

**Insertion**
Palmer surface of base of distal phalanx of thumb

**Nerve supply**
Ant. Interosseous branch Of Median Nerve

**Action**
Flexor of Thumb
Flexor Digitorum Profundus

Origin

Ant. and Medial surface of upper 3/4th of shaft of ulna

Including medial surface of coronoid and olecranon process

Adjoining Interosseous memb

And upper 3/4th of post. border of ulna
**Course**

Form four tendons

Remain united except the tendon for index finger

Passes deep to flexor retinaculum

Diverge in palm

Passes in b/w slips of superficialis

Give origin to four lumbricals
**Insertion**
Palmer surface of base of terminal (distal) phalanx of medial four fingers

**Nerve Supply**
Medial part - Ulnar nerve
Lateral part - Ant. Interosseous branch Of Median Nerve

**Action** - Flexes terminal phalanx
Pronator Quadratus

Quadrilateral muscle
Extend anteriorly in front of Interosseous membrane to both bones of Forearm

**Origin**
Bony ridge on antero-medial surface of lower 1/4th of ulna

**Insertion**
Superficial fibres
Ant. Surface of lower 1/4th of radius and adjoining anterior border of radius

Deep Fibres
Triangular area just above the ulnar notch

**Nerve Supply**
Anterior Interosseous branch of Median Nerve
Action

Superficial fibres
principal pronators

Deep fibres
prevent separation of
two bones on thurst
Functional Classification of Flexor Muscles

Flexors of Wrist
- Fl. Carpi Radialis
- Fl. Carpi Ulnaris

Flexors of Middle Phalanges
- Fl. Digitorum Superficialis

Flexors of Distal Phalanges
- Fl. Digitorum Profundus
- Fl. Pollicis Longus

Pronator of the Forearm
- Pronator Teres
- Pronator Quadratus
Flexor Retinaculum

Attachment

Medially
Pisiform
Hook of Hamate

Laterally
Tubercle of Scaphoid
Crest of Trapezium
Structures passing superficial to flexor retinaculum

- Tendon of Palmaris longus
- Palmer cutaneous branch of Median nerve
- Palmer cutaneous branch of Ulnar nerve
- Ulnar vessels
- Ulnar nerve
Structures passing deep to Flexor retinaculum

- Median nerve
- Tendon of flexor digitorum superficialis
- Tendon of flexor digitorum profundus
- Tendon of flexor pollicis longus
- Ulnar bursa
- Radial bursa
Wrist and Hand
Superficial Palmar Dissections [Continued]

- Palmaris brevis muscle (reflectae)
- Palmar digital nerves from super branch of ulnar nerve to 5th and half of 4th fingers
- Palmar aponeurosis
- Transverse fascioulis
- Palmar digital arteries and nerves
- Superficial transverse metacarpal ligaments
Palmer Aponeurosis

- Central thickened part of deep fascia of palm
- Triangular in shape
- Apex proximal, blend with distal border of Fl. Retinaculum
- Is continuous with tendon of palmaris longus
- Distally fans out
- At base of fingers split in four digital slips
- Attached to palmer ligaments
- Protects vessel and nerves, tendons
Fibrous Flexor Sheath of Digits

Extend from head of metacarpal to Base of distal phalanx

Form osteofibrous canal for tendons
**Median Nerve**

**In Cubital Fossa**
- Lies medial to brachial artery and Biceps tendon
- And rests on Brachialis

**Enter Forearm**
- b/w two heads of Pronator teres
- Passes down along post surface of FDS in between sup. and deep flexors
- Descends vertically along midline of forearm
- 5 cm above Fl. Retinaculum
- Emerges from medial border of FDS and lies between and deep to tendon of FCR and PL
- Enter palm deep to Fl. Retinaculum

**Branches**
- Muscular
  - Anterior Interosseous arise distal to PT
  - Descend in front of Interosseous membrane between FPL and FDP
  - along with ant. Int. artery
Ulnar Nerve

► Enter forearm b/w two heads of FCU
► Pass straight downward along medial side of front of forearm resting on FDP
► In upper half covered by FCU
► In lower half pass lateral to FCU
► Along Ulnar artery laterally
► Enter palm passing superficial to flexor retinaculum
► Supply FCU and medial ½ of FDP