Forearm

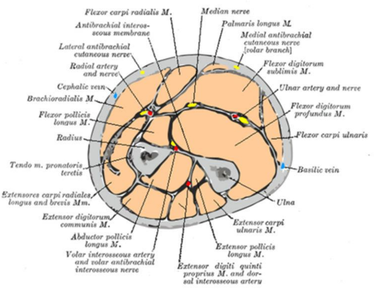
Two Compartments

- 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

Septa and Flexor Retinaculum



Anterior (Flexor) Compartment

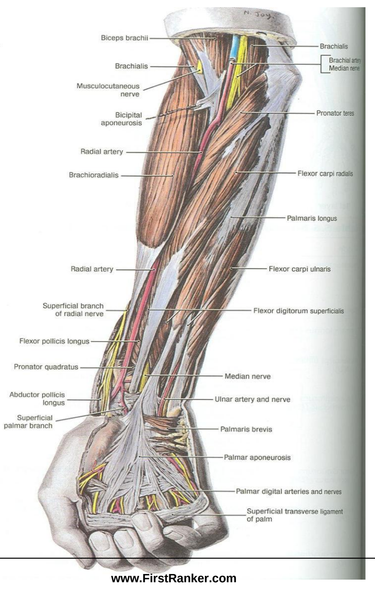
Demarcated from post. compartment

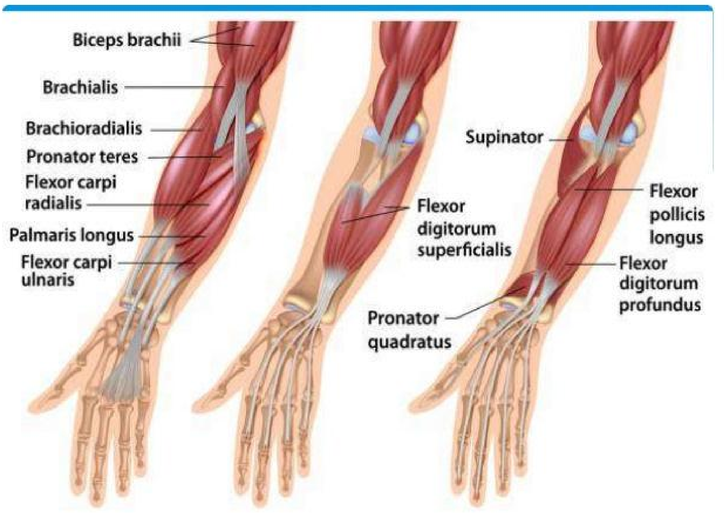
Medially
Olecranon process and post. border of Ulna

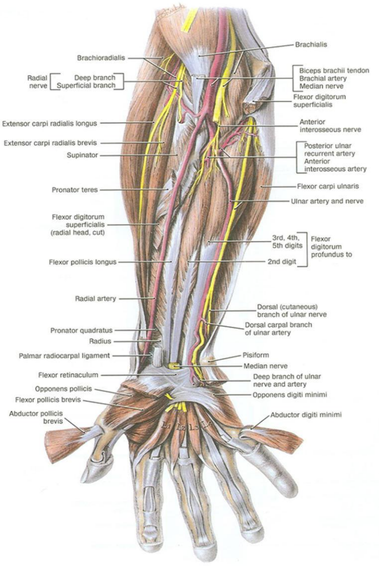
Laterally
by anterior border of radius

Floor of Anterior Compartment

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





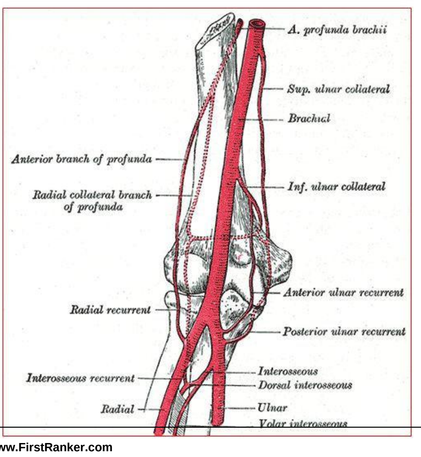


Muscles of Forearm [Deep Layer]

Anterior View

- Anastomosis occurs between branches of
- **Brachial, Radial and Ulnar arteries:**
  - Branches from Brachial Artery:
    - Profunda Brachii artery
    - Superior ulnar collateral artery
    - Inferior ulnar collateral artery
  - Branches from Ulnar and Radial Arteries:
    - Radial & ulnar recurrent arteries
    - Posterior interosseous recurrent artery

Anastomosis around elbow joint



Contents

Muscles – 8 muscles
-- arrranged 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

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

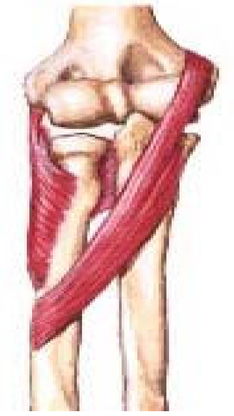
Origin
by Humeral (Superficial) And Ulnar (deep) Heads
Humeral Head

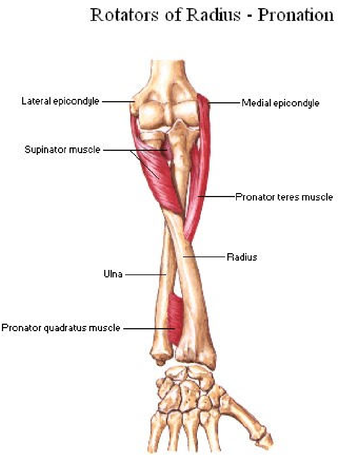
Ulnar Head
Medial border of coronoid process of ulna

Insertion
By a flat tendon to the middle of the lateral surface
Radius

N. Supply

Median nerve , before it pass b/w two heads





Action : Pronation of Forearm , Weak Flexor of Elbow

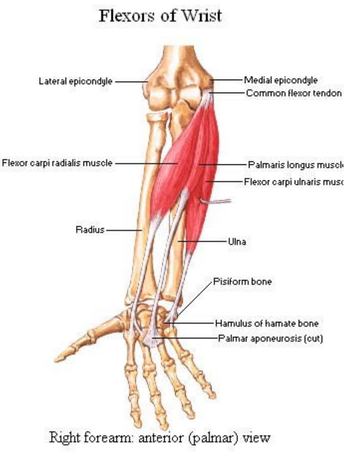
Flexor Carpi Radialis

Origin
- Medial epicondyle
- from adjoining deep fascia

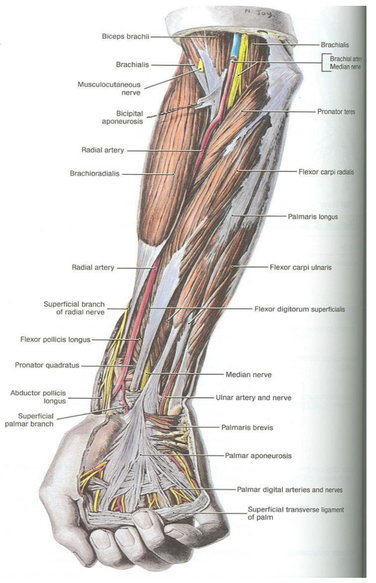
Insertion
Palmer surface of base of second and third metacarpal bones

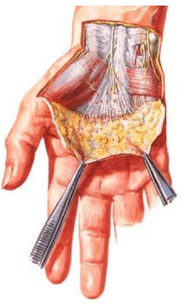
Nerve supply
Median nerve

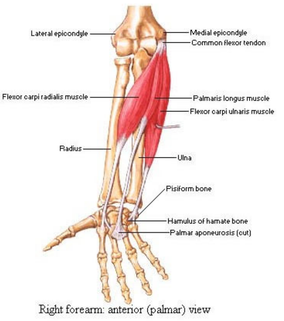
Action
Flexor of wrist
Along with ECRL & ECRB – abduction of wrist



Right forearm: anterior (palmar) view







Right forearm: anterior (palmar) view

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

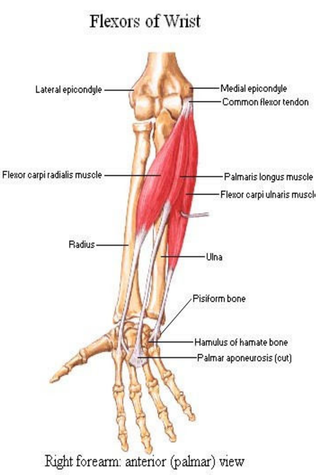
Origin
Two heads
Humeral head

Ulnar head
Medial margin of olecranon process and 2/3rd of the post border of ulna

Insertion
To pisiform bone
through pisohammate and pisometacarpal l
hook of hamate and base of fifth metacarp

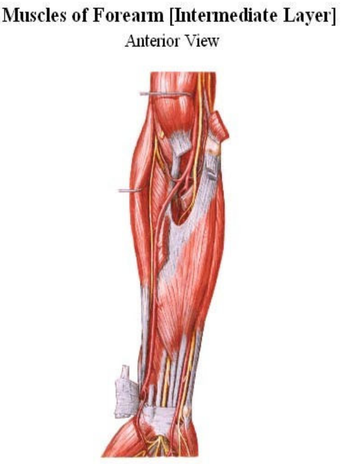
Nerve supply
Ulnar nerve

Action
Flexor of wrist,along with ECU – adduction of wrist



Right forearm: anterior (palmar) view

Flexor digitorum Superficialis

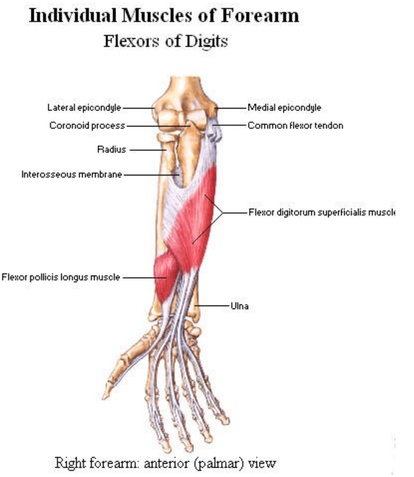


Origin
Two heads

Humero-ulnar
Medial epicondyle of humerus and medial margin of coronoid process

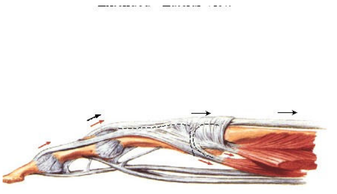
Radial head
Whole length of ant. Oblique line of radius

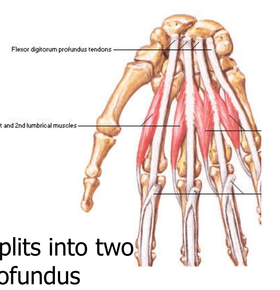
Course



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

Nerve supply
Median nerve





Insertion
At base of proximal phalanx each digit tendon splits into two
Allow the passage of tendon of F. digitorum porofundus
Slips reunite again, and split again to be attached to side of the shaft of middle phalanx

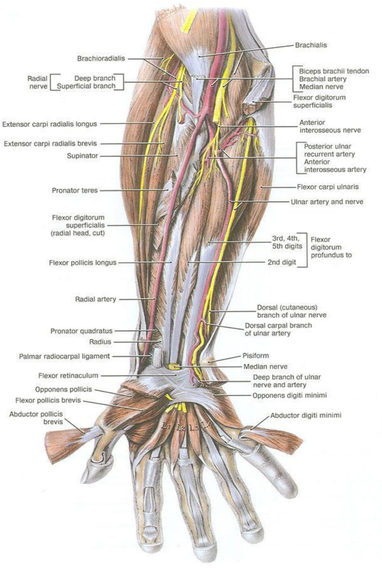
Action
Flexion of middle phalanx at proximal interphalangeal joint
In prolonged contraction – Flexion of metacarpophalangeal joint and wrist joint

Deep Flexors

► Flexor Pollicis Longus

► Flexor Digitorum Profundus

► Pronator Quadratus



Flexor Poliicis Longus

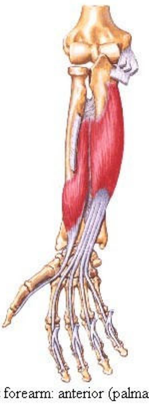
Origin
Ant. Surface of shaft of radius below anterior oblique line
and adjoining Interosseous membrane Passes below Fl. Retinaculum

Insertion
Palmer surface of base of distal phalanx of thumb

Nerve supply
Ant. Interosseous branch Of Median Nerve

Action
Flexor of Thumb

Flexors of Digits



Right forearm: anterior (palmar) view

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 upper3/4th of post. border of ulna

Flexors of Digits

Right forearm: anterior (palmar) view

Course

Form four tendons

Remain united except the tendon for index finger

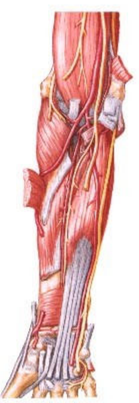
Passes deep to flexor retinaculum

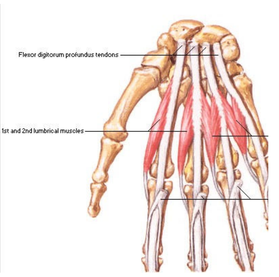
Diverge in palm

Passes in b/w slips of superficialis

Give origin to four lumbricals

Muscles of Forearm [Deep Layer]
Anterior View

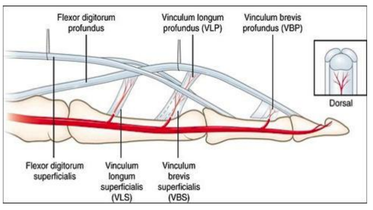


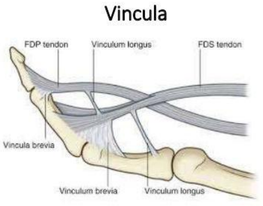


Insertion
Palmer surface of base of terminal (distal) phalanx of medial four fingers

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

Action - Flexes terminal phalanx





In anatomy, a vinculum (pl. vincula) is a band of connective tissue, similar to a ligament, that connect a flexor tendon to a phalanx bone. They contain tiny vessels which supply blood to the tendon.[1] In vertebrate anatomy, they are referred to as mesotendons.
These vincula are four folds in the synovial membrane

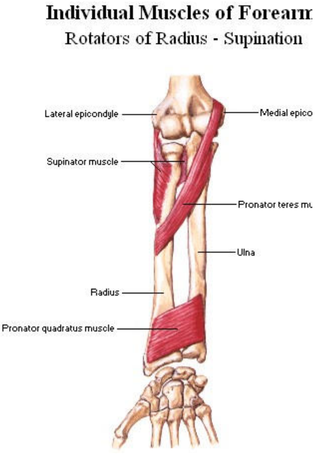
Pronator Quadratus

Origin
Bony ridge on antero-medial surface of lower1/4th of ulna

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

Deep Fibres
Tiangular area just above the ulnar notch

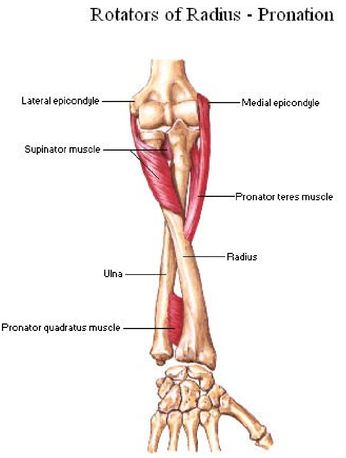
Nerve Supply
Anterior Interosseous branch of Median Nerve



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

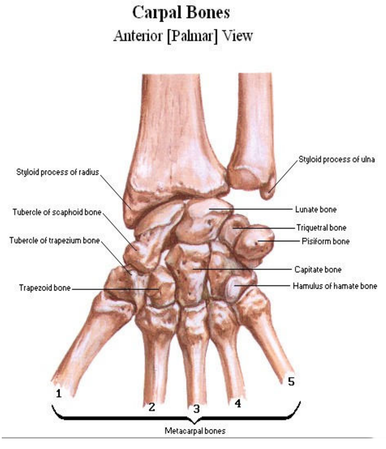
Flexor retinaculum of the hand

- **Flexor retinaculum** - strong, fibrous band that covers the carpal bones on palmar side of hand near wrist.
- Attachment –

Ulnar side- attaches to the pisiform bone and hook of hamate bone.

Radial side- attaches to the tubercle of scaphoid bone, and to medial part of the palmar surface and the ridge of the trapezium bone.

Flexor Retinaculum



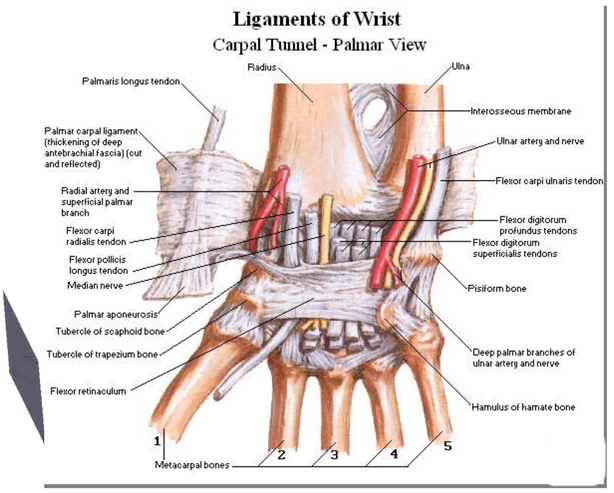
Attachment

Medially

Pisiform
Hook of Hamate

Laterally

Tubercle of Scaphoid Crest of Trapezium

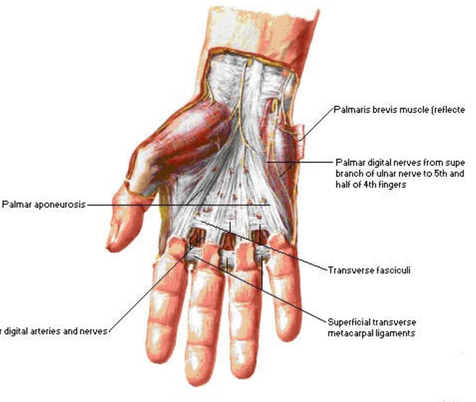


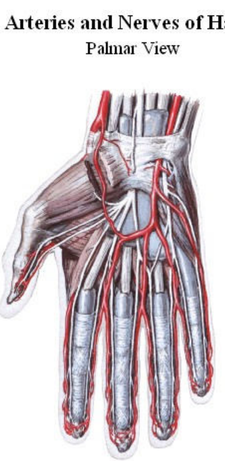
Structures passing superficial to flexor retinaculum

- 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

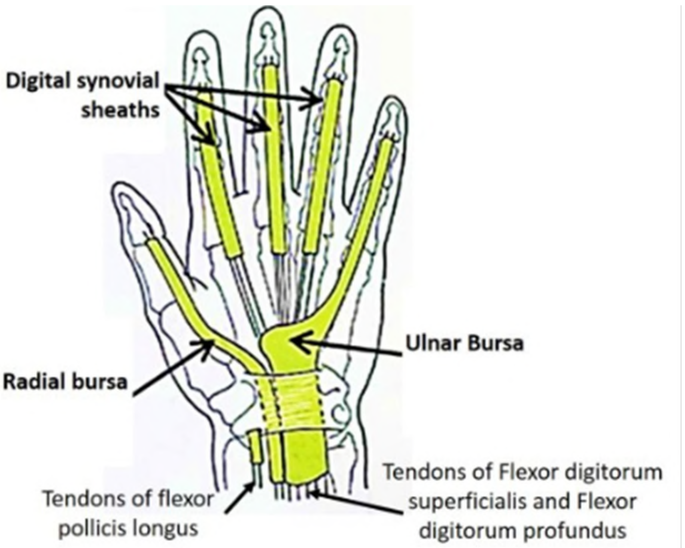


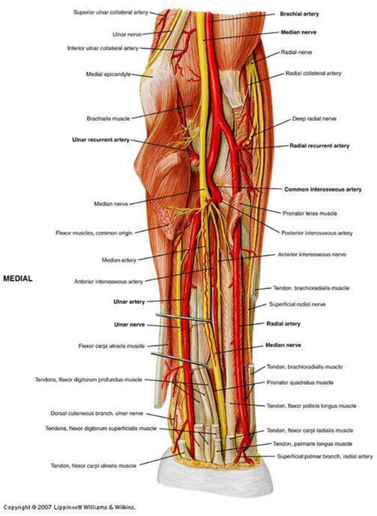


Fibrous Flexor Sheath of Digits

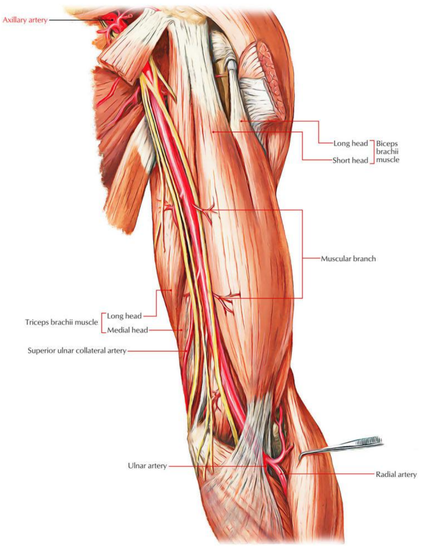
Extend from head of metacarpal to Base of distal phalanx

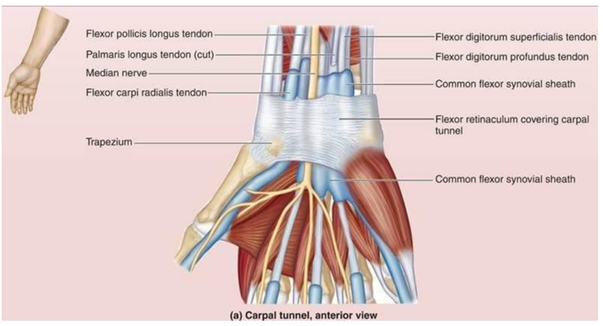
Form osteofibrous canal for tendons



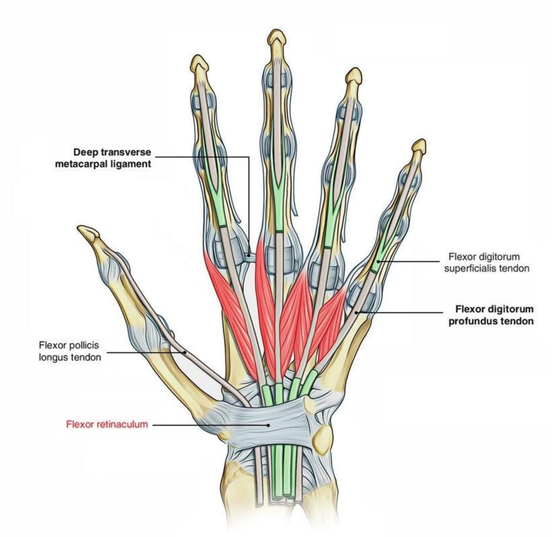


Forearm – Vessels/Nerves





(a) Carpal tunnel, anterior view



Fore arm space

- Space of parona
- Space in between flexor tendons & pronator quadratus ,interosseous membrane
- Boundaries
- Anterior- flexor digitorum profundus with its synovial sheath
- - flexor pollicis longus in its synovial sheath

- Posterior-pronator quadratus,interosseous membrane
- Distal- reaches level of wrist
- Proximal- continuous withintermuscular spaces of fore arm
- Cause- spread of infection from ulnar /radial bursa

Clinical features ..

- Swelling in front of wrist or lower fore arm
- Treatment
- Incisions & drainage at lateral/medial borders of forearm

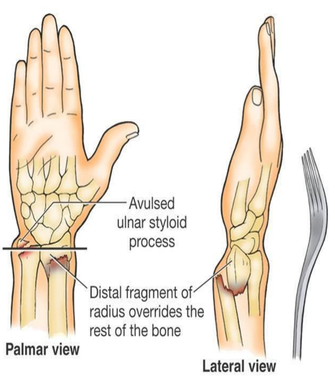
4-c.Parona space Infection

- It is deep in the distal forearm between the PQ muscle & the FDP tendons.
- This space is contiguous with the radial bursa, ulnar bursa and midpalmar space.
- A flexor tendon sheath infection may extend proximally to involve the bursae and Parona's space.
- Swelling, tenderness, & occasionally fluctuance of the distal volar forearm. Digital flexion may be painful.

Mechanism of injury In Colles' fracture

Colles' fracture

Colles' fracture

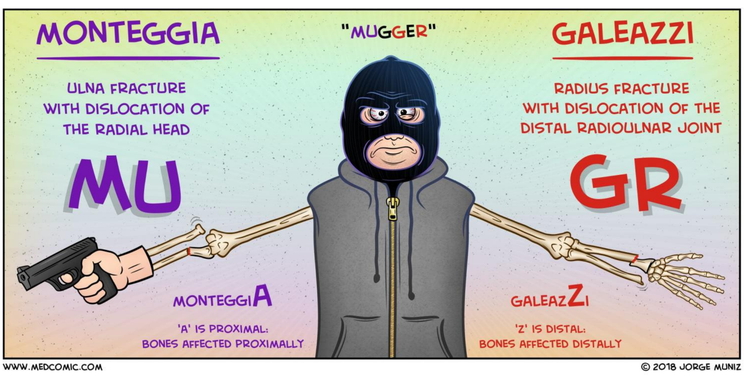


Colles fracture of distal radius ("dinner fork deformity")

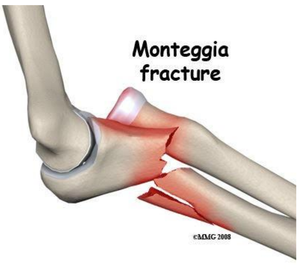
- Colles' fracture - fracture of the distal forearm in which broken end of the radius is bent backwards.
- **The fracture is also referred to as a "dinner fork" or "bayonet" deformity due to the shape of the resultant forearm.**
- Symptoms may include pain, swelling, deformity, and bruising.
- Complications may include **damage to the median nerve**.

Smith's fracture

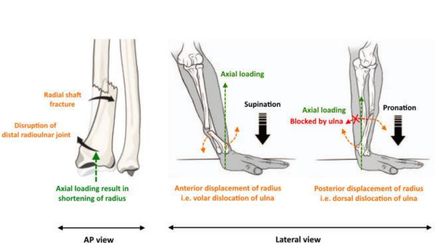
Monteggia and Galeazzi Fracture



Monteggia Fracture



Galeazzi Fracture



Anastomosis around Elbow joint

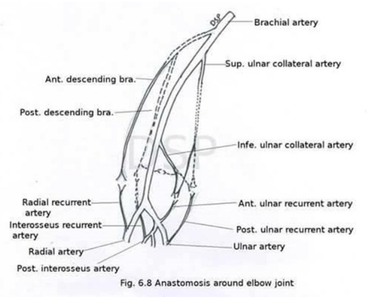
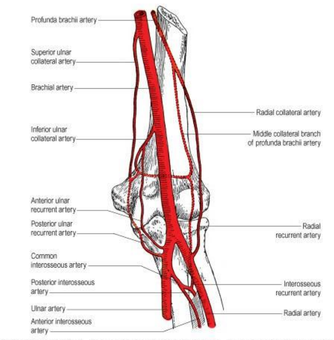
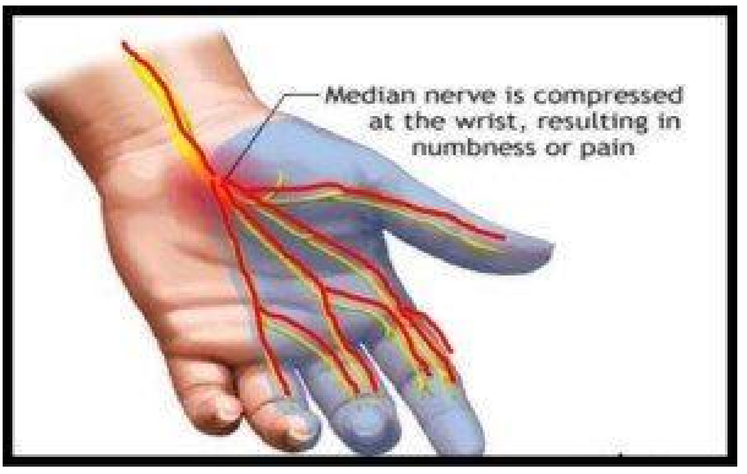


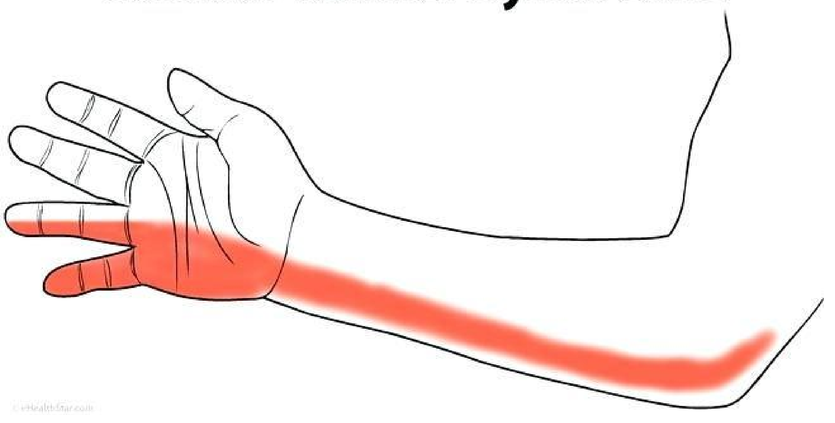
Fig. 6.8 Anastomosis around elbow joint



Carpal Tunnel Syndrome



Cubital Tunnel Syndrome



MCQ

- All structures passing superficial to flexor retinaculum except

a) Tendon of Palmaris longus
b) Palmer cutaneous branch of Median nerve
c) Median nerve
d) Ulnar nerve

MCQ

- All structures passing superficial to flexor retinaculum except

a) Tendon of Palmaris longus
b) Palmer cutaneous branch of Median nerve
c) Median nerve
d) Ulnar nerve

MCQ

- All statements regarding Colles' fracture are true except -

a) Colles' fracture - fracture of the distal radius in which broken end of the radius is bent backwards.
b) The fracture is also referred to as a "dinner fork" or "bayonet" deformity due to the shape of the resultant forearm.
c) Symptoms may include pain, swelling, deformity, and bruising.
d) Complications may include damage to the ulnar nerve.

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a) Median nerve
b) Tendon of flexor digitorum superficialis
c) Tendon of flexor carpi radialis
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