Bones, joints and muscles of the hand

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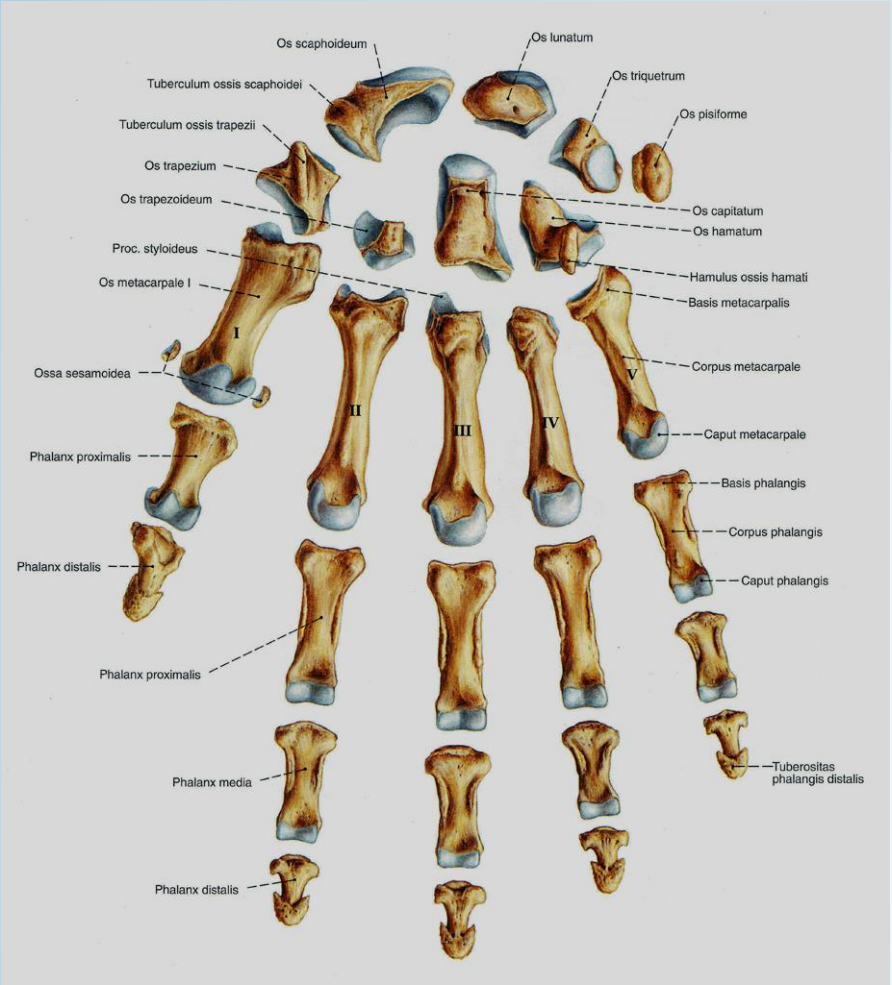
Michelangelo: Die Erschaffung Adams (Detail)


Os scaphoideum
Os lunatum
Os triquetrum
Os pisiforme
Tuberculum ossis scaphoidei
Tuberculum ossis trapezii
Os trapezium
Os trapezoideum
Os capitatum
Os hamatum
Proc. styloideus
Os metacarpale I
Hamulus ossis hamati
Basis metacarpalis
Ossa sesamoidea
Corpus metacarpale
Caput metacarpale
Phalanx proximalis
Basis phalangis
Corpus phalangis
Phalanx distalis
Caput phalangis
Phalanx proximalis
Phalanx media
Tuberositas phalangis distalis
Phalanx distalis
I
II
III
IV
V

Sobotta

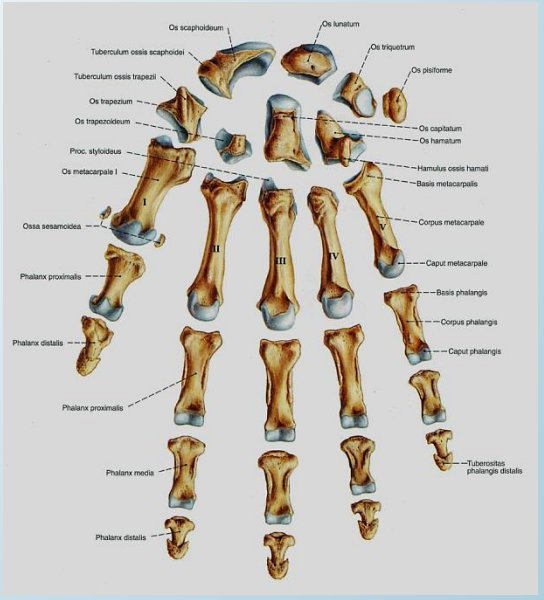
Articulations of the hand (Articulationes manus)

Carpal articulations:
- radiocarpea articulation (proximal)
- intercarpal/ mediocarpal articulation (distal)
- os pisiform articulation

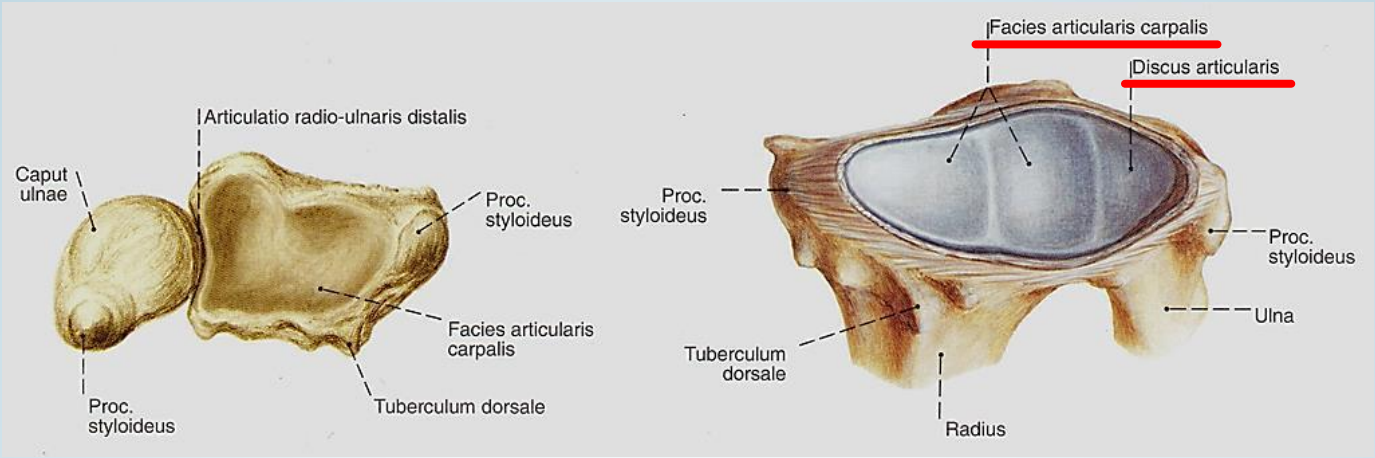
Carpometacarpal articulations:
- common carpometacarpal articulation
- carpometacarpal pollicis articulation

Metacarpophalangeal (MCP) and intermetacarpal articulations

Digital articulations:
- Proximal interphalangeal articulation (PIP)
- Distal interphalangeal articulation (DIP)

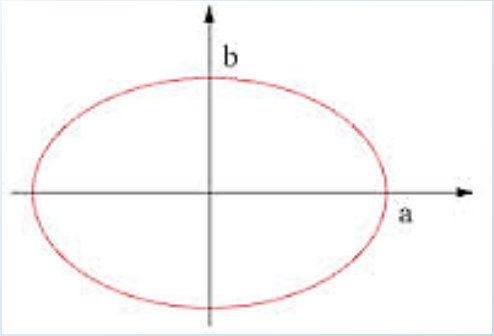


Radiocarpal joint



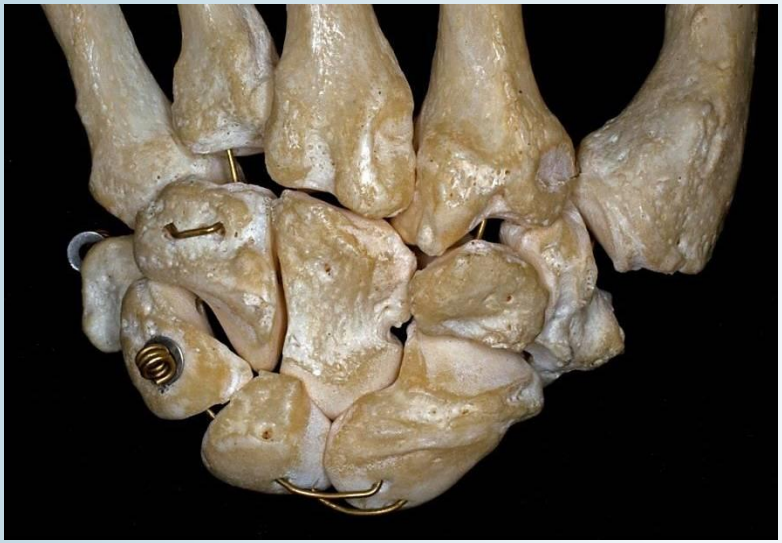
Sobotta

carpal atr. surface of the radius and an articular disc

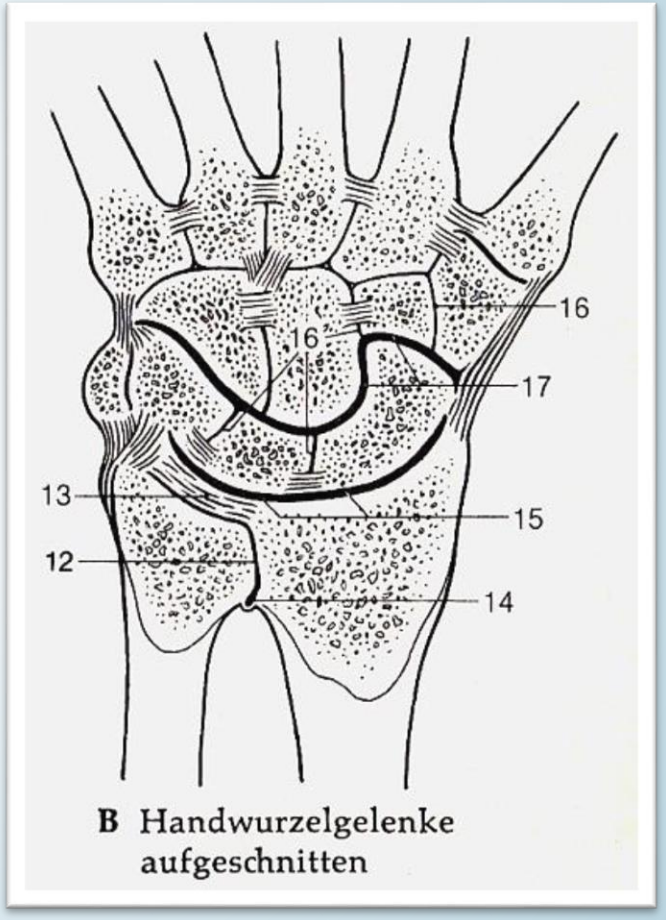


Radiocarpal joint

proximal carpal bones without pisiform bone



12: distal radioulnar articulation
13: articular disc
14: sacciform recess
15: radiocarpal articulation

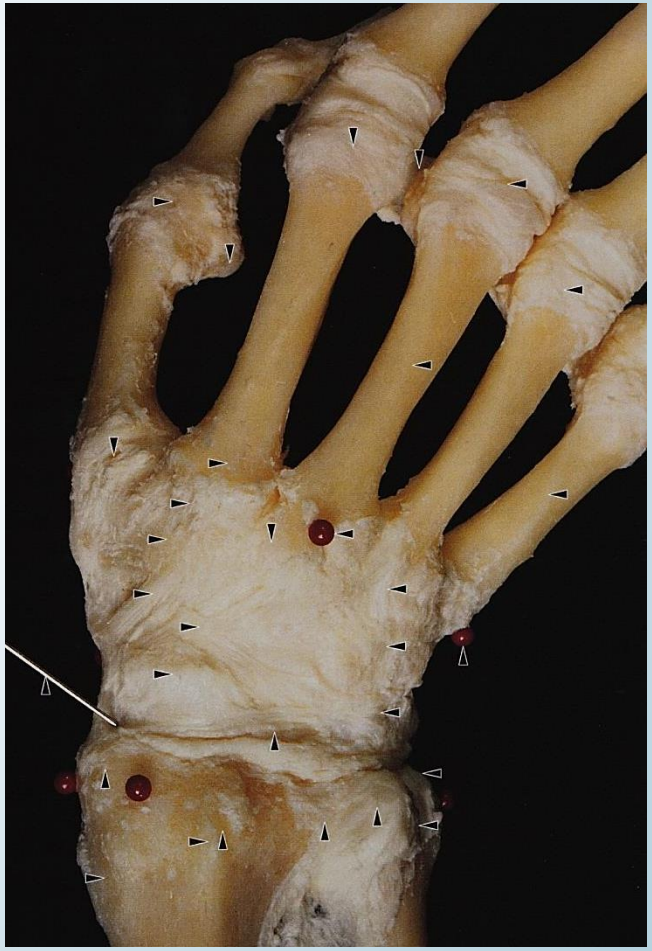


articular disc

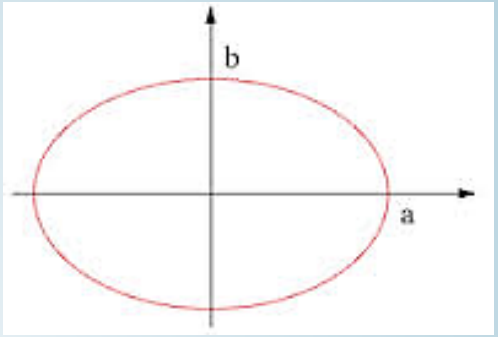
Radiocarpal joint

19: radiocarpal palmar lig.
20: ulnocarpal palmar lig.
22: carpi ulnar collateral lig.

18: dorsal radiocarpal lig.
23: radial carpal collateral lig.



Radiocarpal joint



Die Hand wird palmarflektiert: (60-90º) M. flexor digitorum superficialis, M. flexor digitorum profundus, M. flexor carpi ulnaris, M. flexor carpi radialis, M. flexor pollicis longus, M. abductor pollicis longus (bedeutungslos), M. palmaris longus (bedeutungslos).	Die Hand wird dorsalflektiert: (40-90º) M. extensor digitorum, M. extensor carpi ulnaris, M. extensor carpi radialis longus, M. extensor carpi radialis brevis, M. extensor pollicis longus, M. extensor indicis.
Die Hand wird radial abduziert: (25-30º) M. extensor carpi radialis longus, M. extensor carpi radialis brevis, M. abductor pollicis longus, M. extensor pollicis longus, M. extensor indicis, M. flexor carpi radialis.	Die Hand wird ulnar abduziert: (35-40º) M. extensor carpi ulnaris, M. flexor carpi ulnaris.

Ellipsoid joint (Articulatio ellipsoidea):

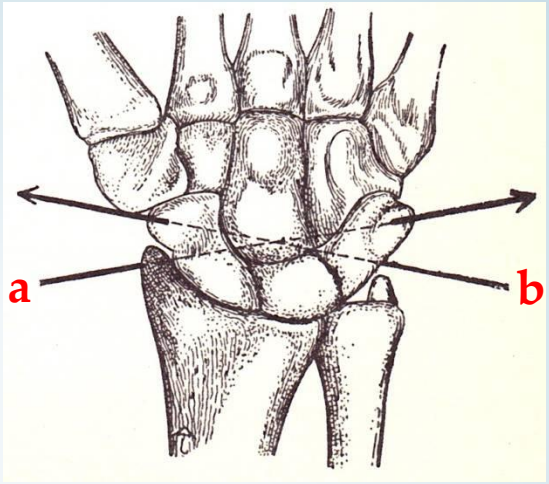
a. dorso-palmar axis
Movements: Radial- and ulnar abduction

together with intercarpal joints!

b. Radio-ulnar axis
Movements: dorsal- and palmar flexion

together with intercarpal joints!

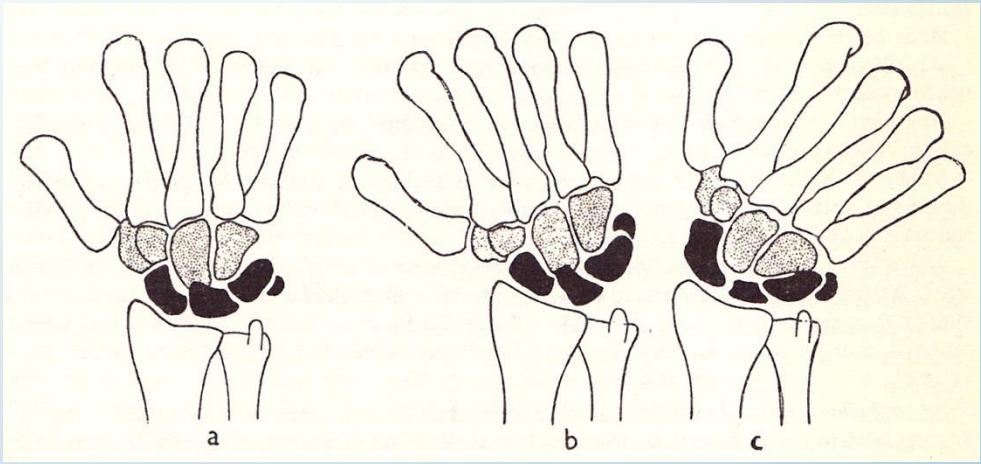
Intercarpal joints



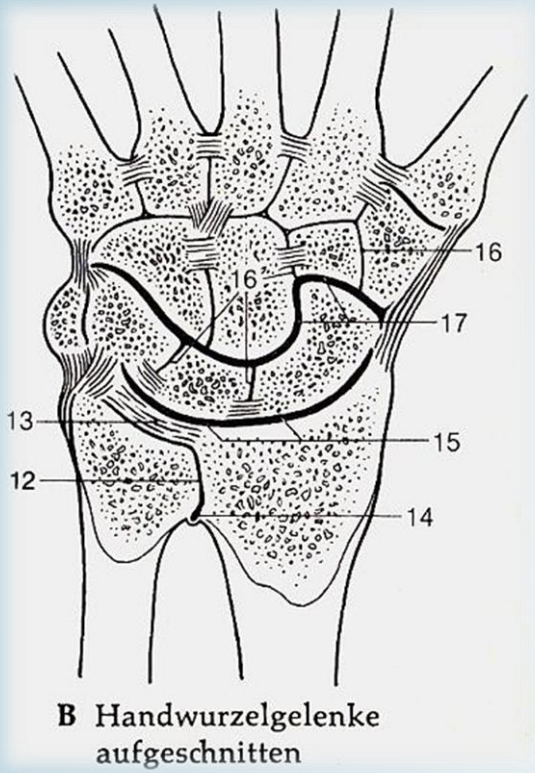
a. Axis of radiocarpal art.
b. Axis of intercarpal art.

Synonyms:
Mediocarpea art.
Proximal joint of the hand

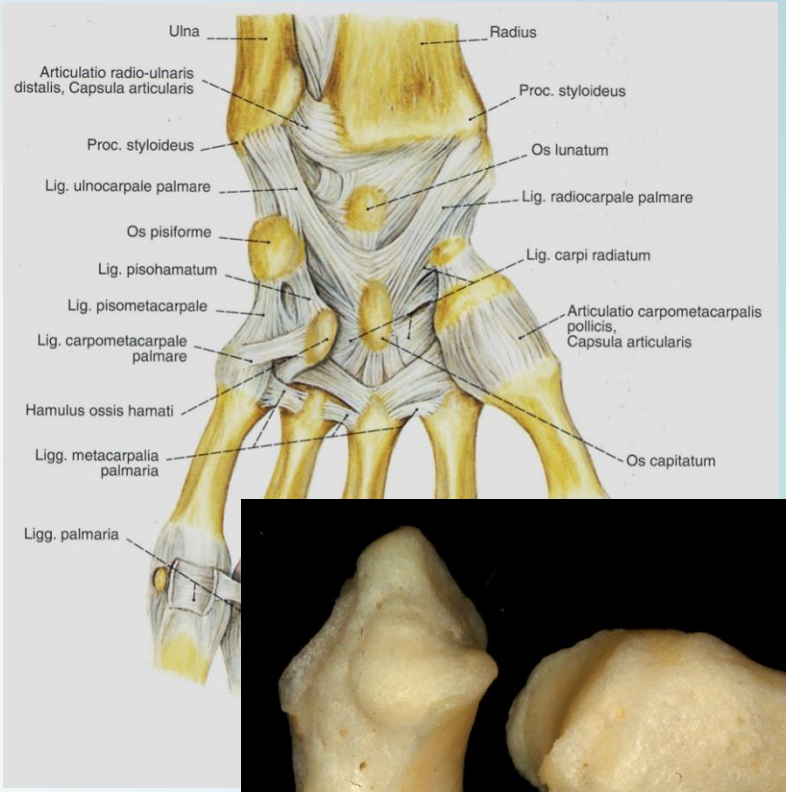
Type: gliding joint



carpometacarpal pollicis- and common articulation



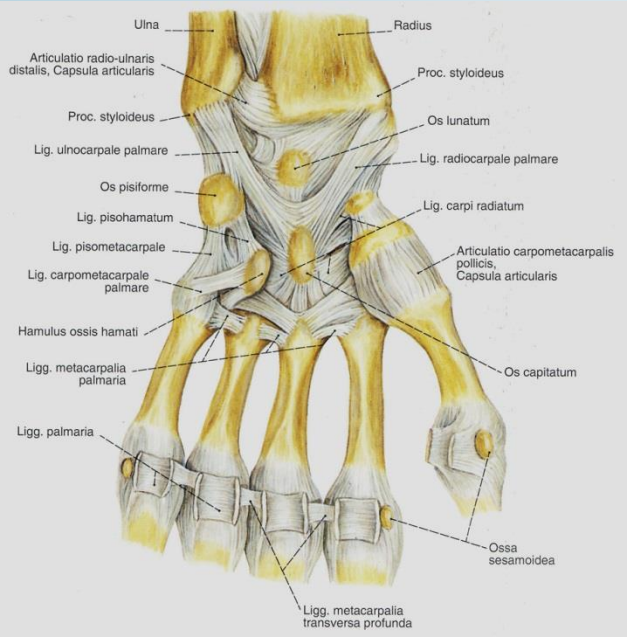
B Handwurzelgelenke aufgeschnitten

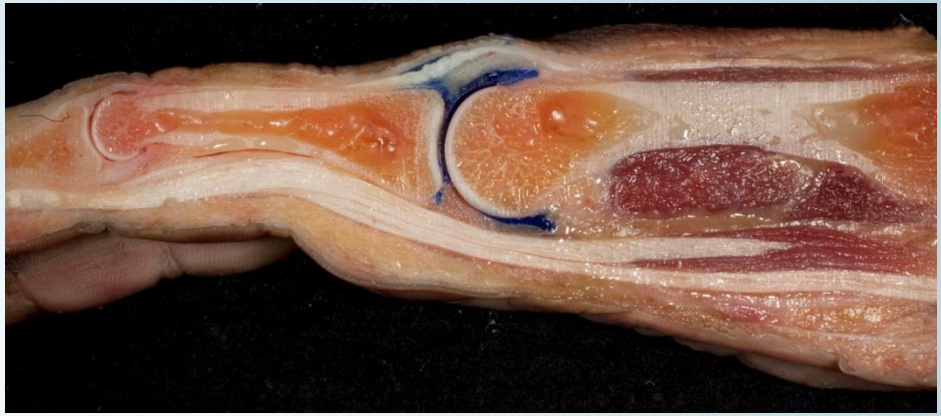


common: II-V. Metacarpal bones
-dorsalia et palmar carpometacarpal ligg.
-communication with ther intercarpal articulation
- tight capsule
-amphiarthrosis

pollex: Os trapezium and Metacarpus I.
no ligaments, loose, wide capsule
Opposition – Reposition
Abduktion – Adduction
Circumduktion
Saddle joint

metacarpo-phalangeal joints



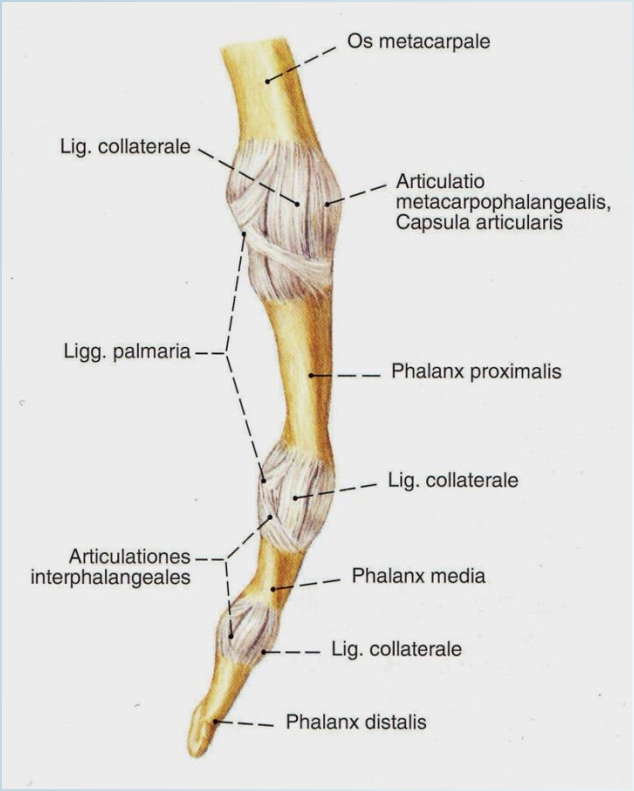


<u>Metacarpophalangeal joints</u>:
Ball & socket joints by collateralia ligaments prevented!

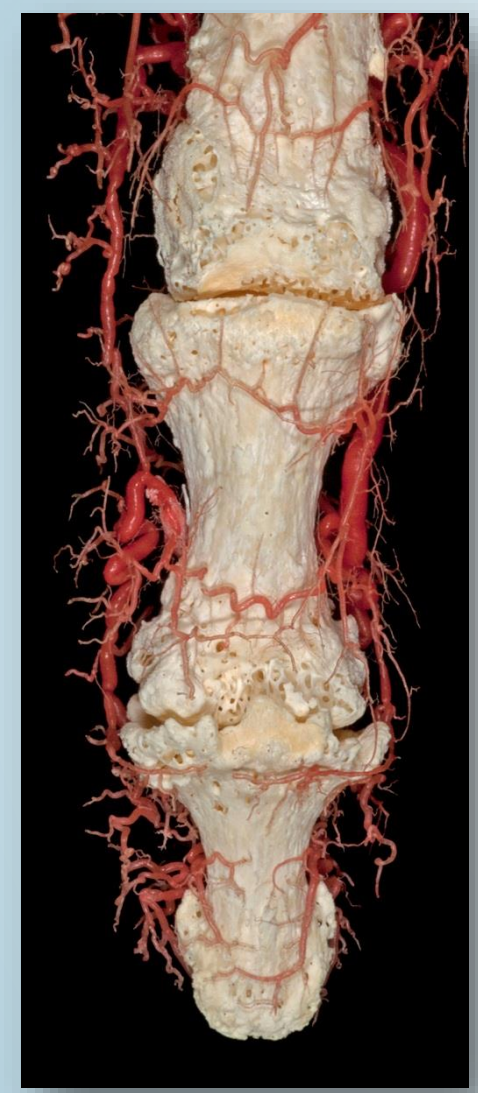
- flexion – extension
- abduction-adduction (open – close)
- passive rotation (to 50°)

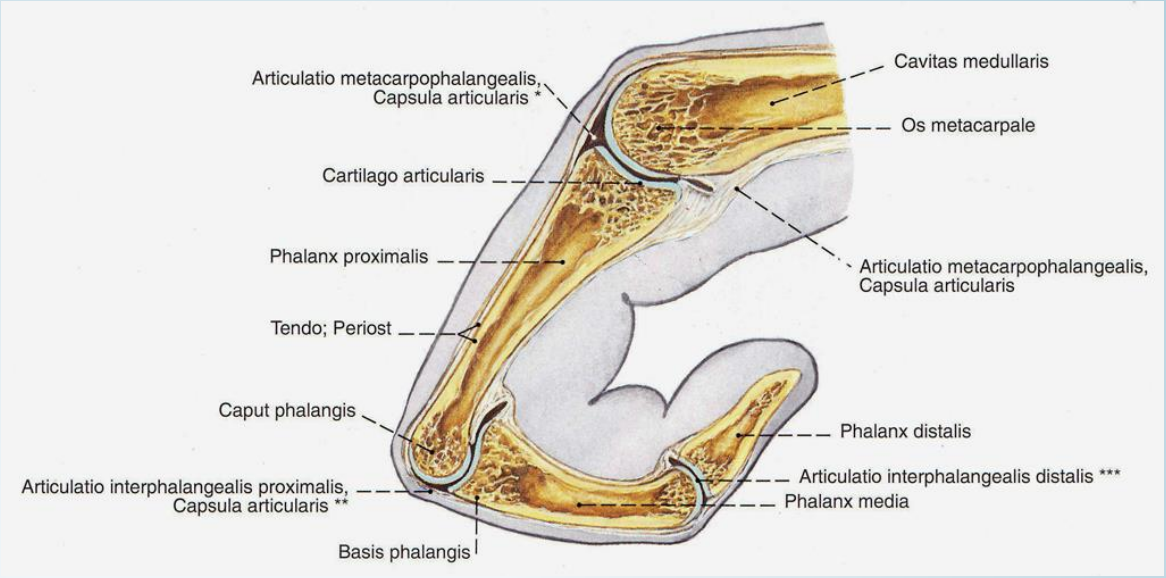
By the thumb: pure hinge joint!

interphalangeal joints

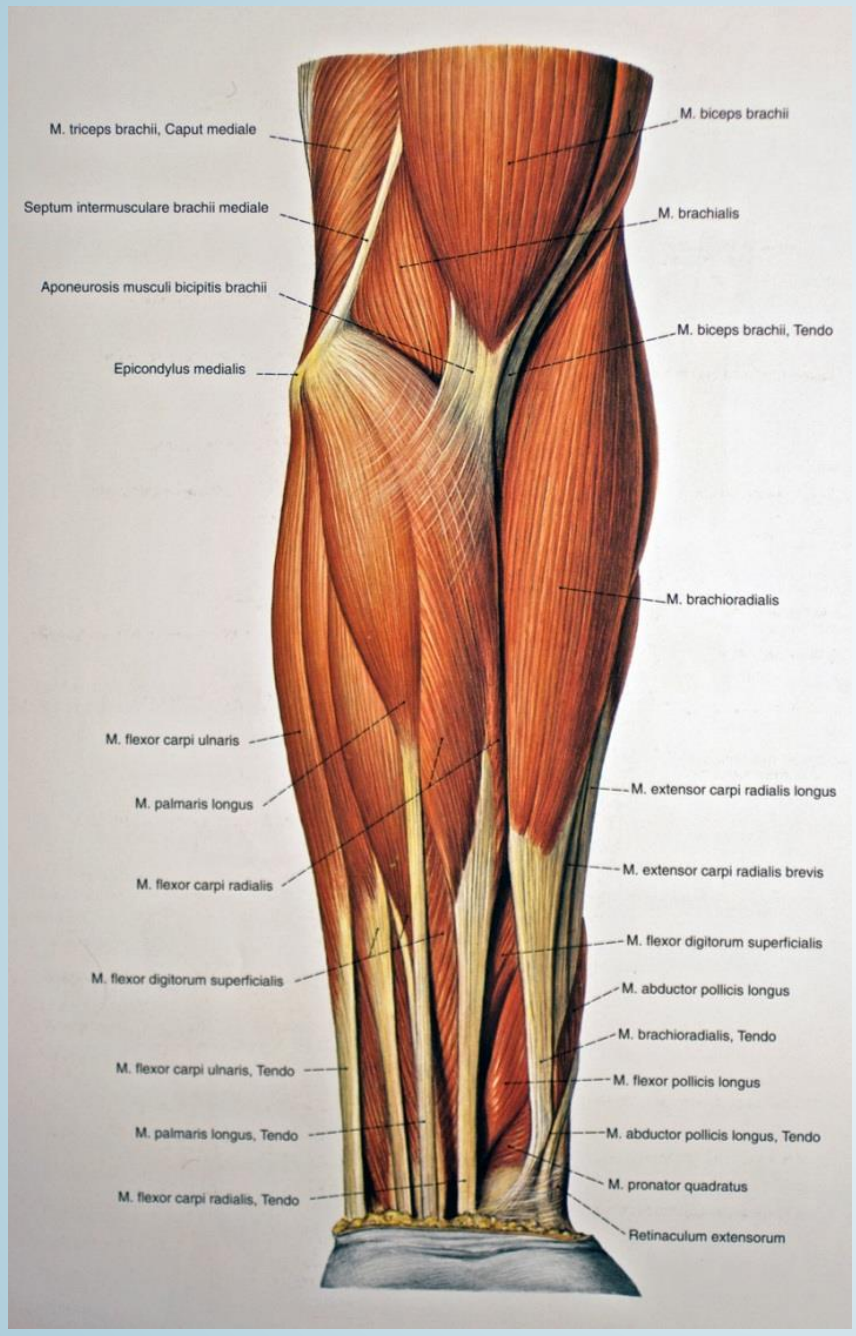


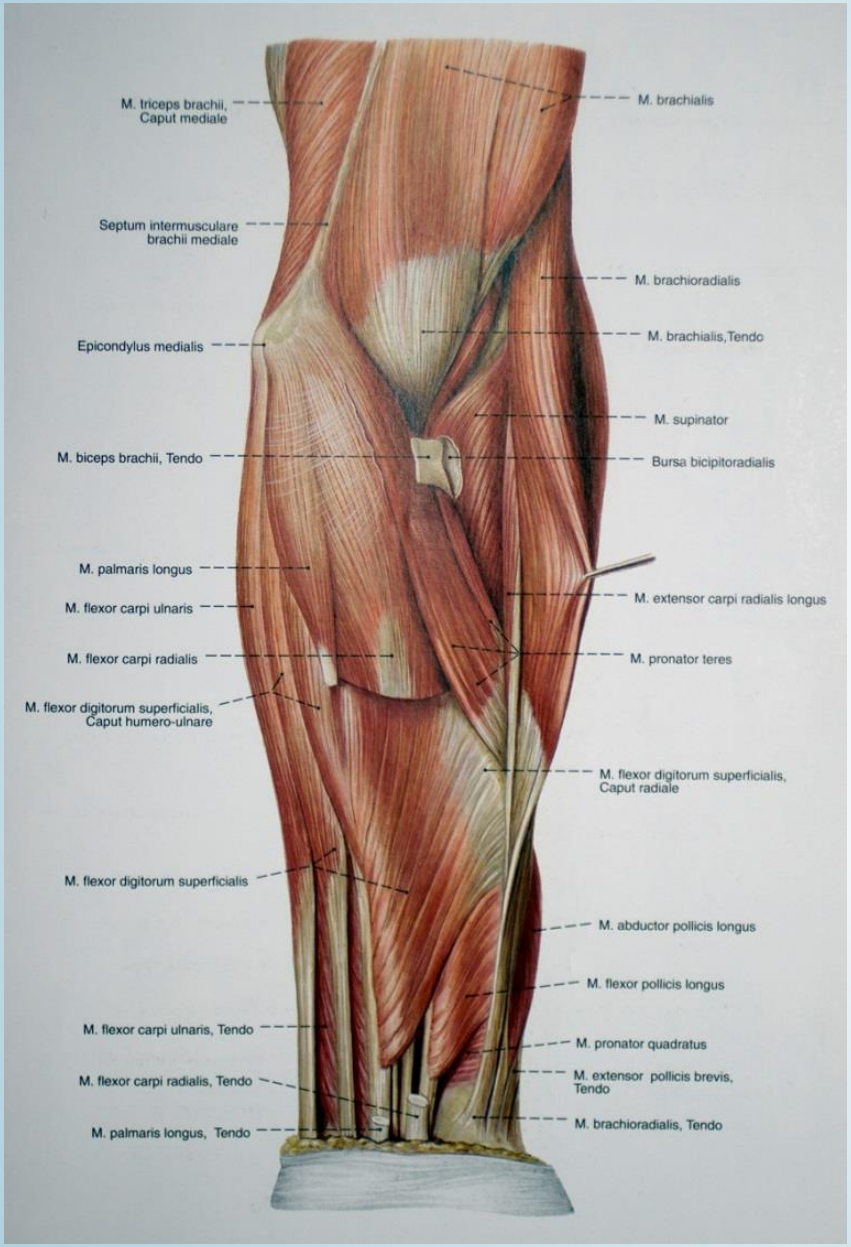
hinge joint
tight capsule
collateral ligaments
flexion and extension

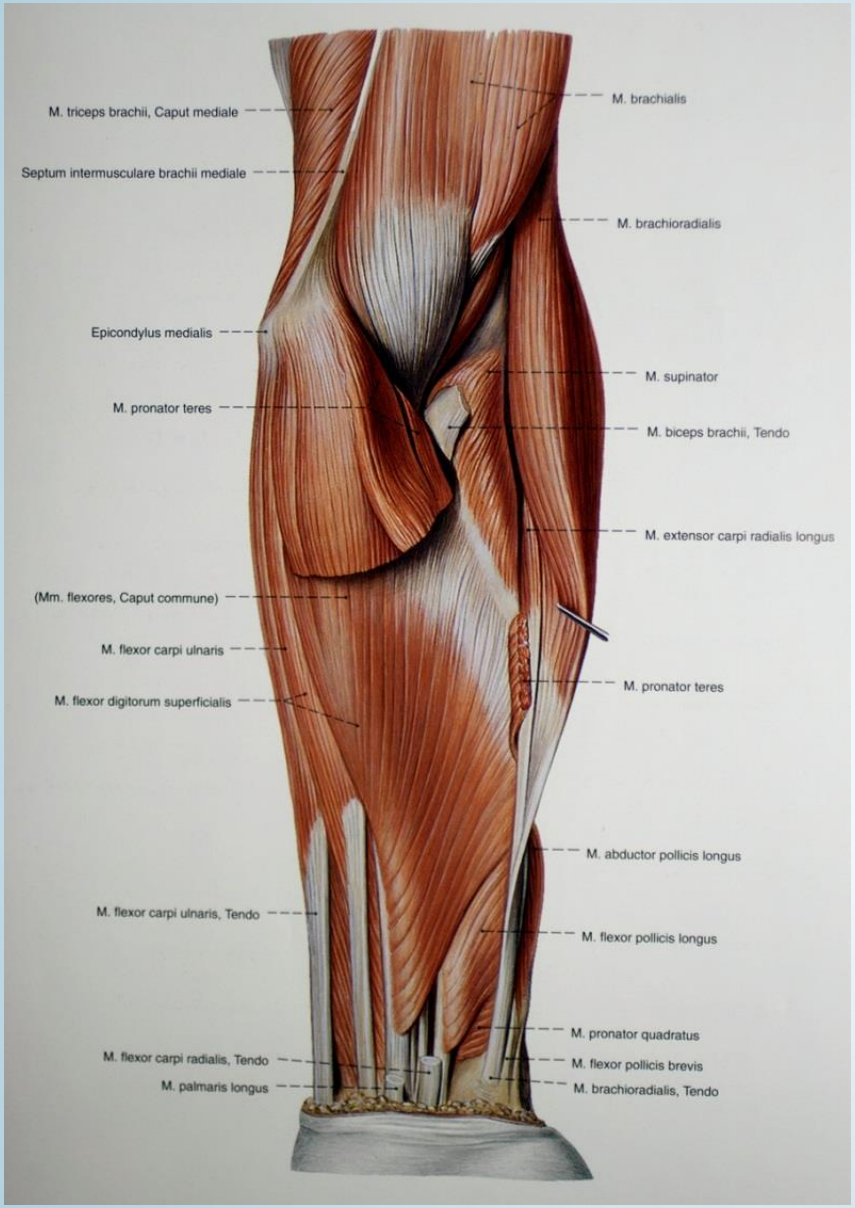


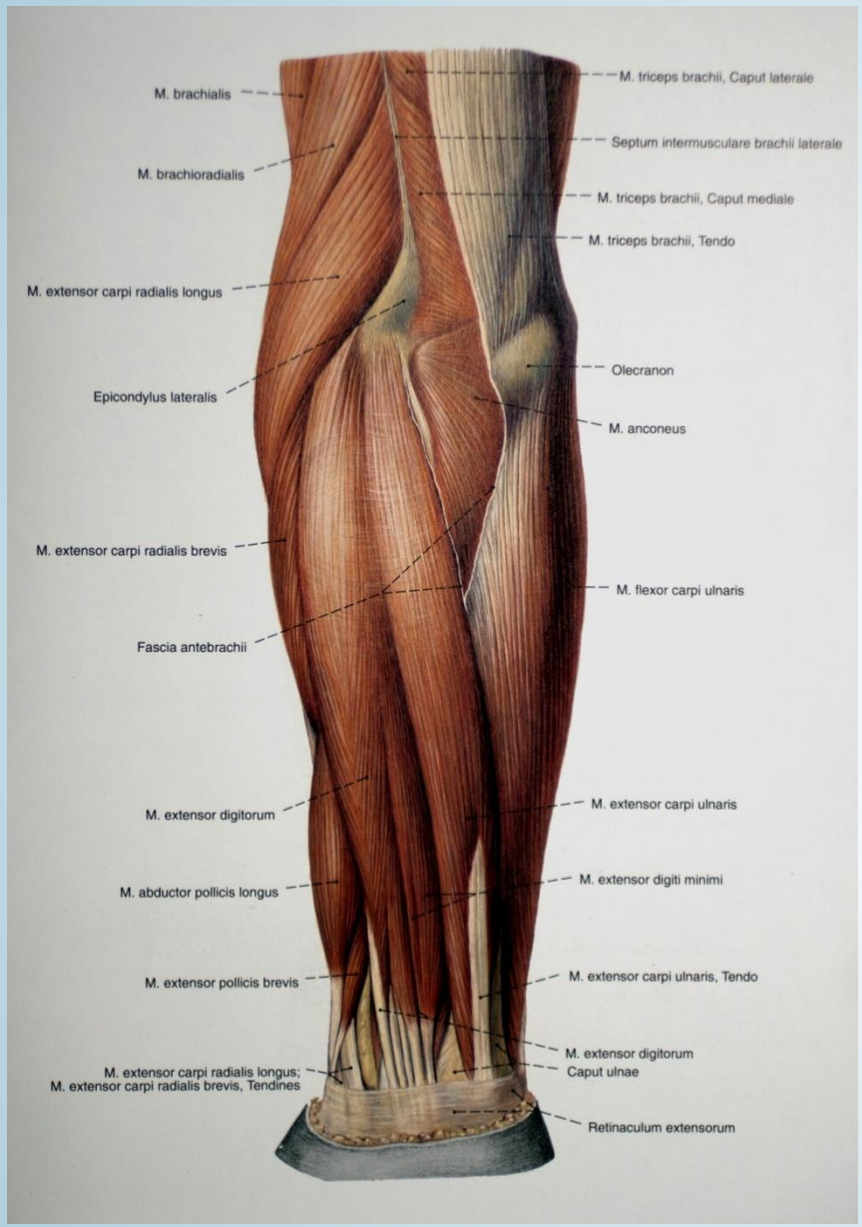

Articulatio metacarpophalangealis,
Capsula articularis *
Cartilago articularis
Phalanx proximalis
Tendo; Periost
Caput phalangis
Articulatio interphalangealis proximalis,
Capsula articularis **
Basis phalangis
Cavitas medullaris
Os metacarpale
Articulatio metacarpophalangealis,
Capsula articularis
Phalanx distalis
Articulatio interphalangealis distalis ***
Phalanx media

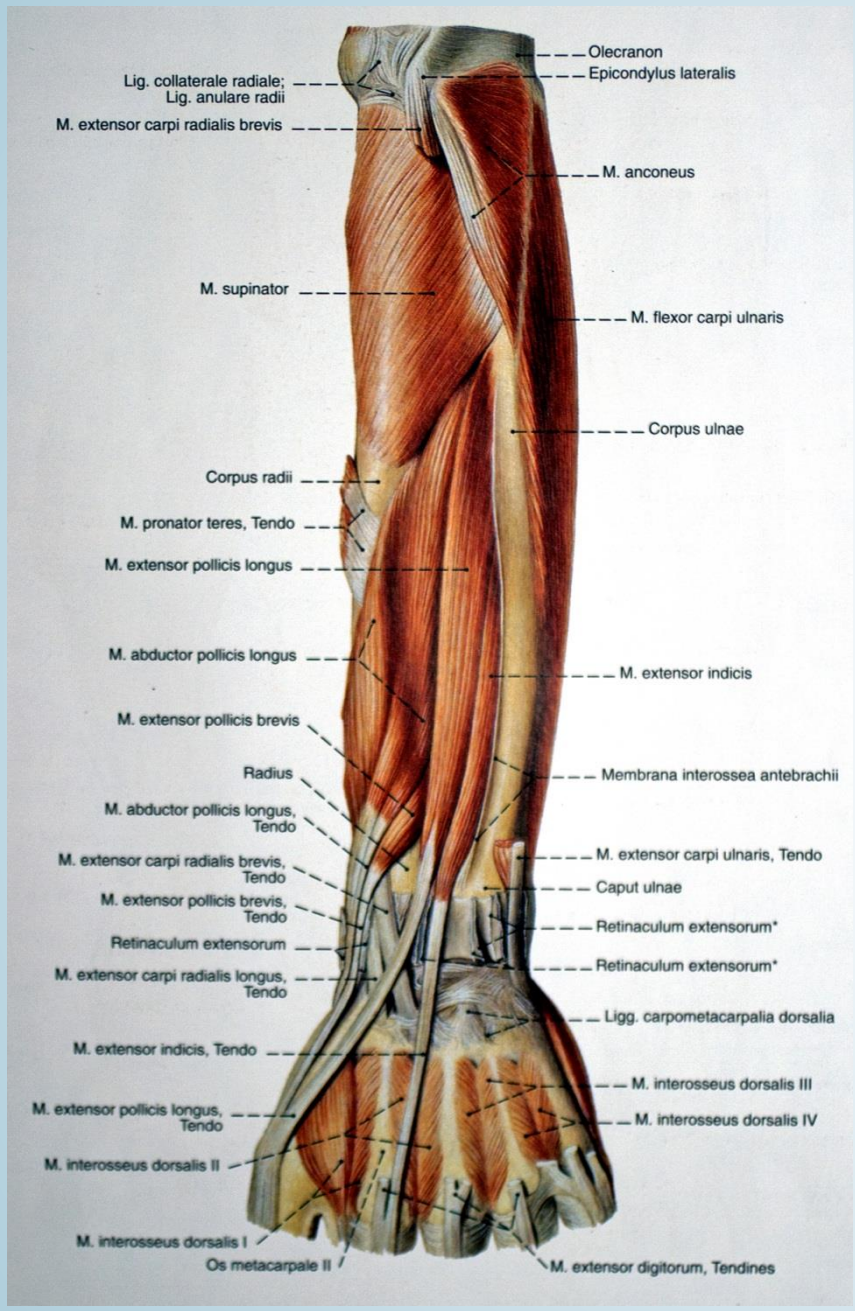
Rembrandt: Die Anatomie des Dr. Tulp

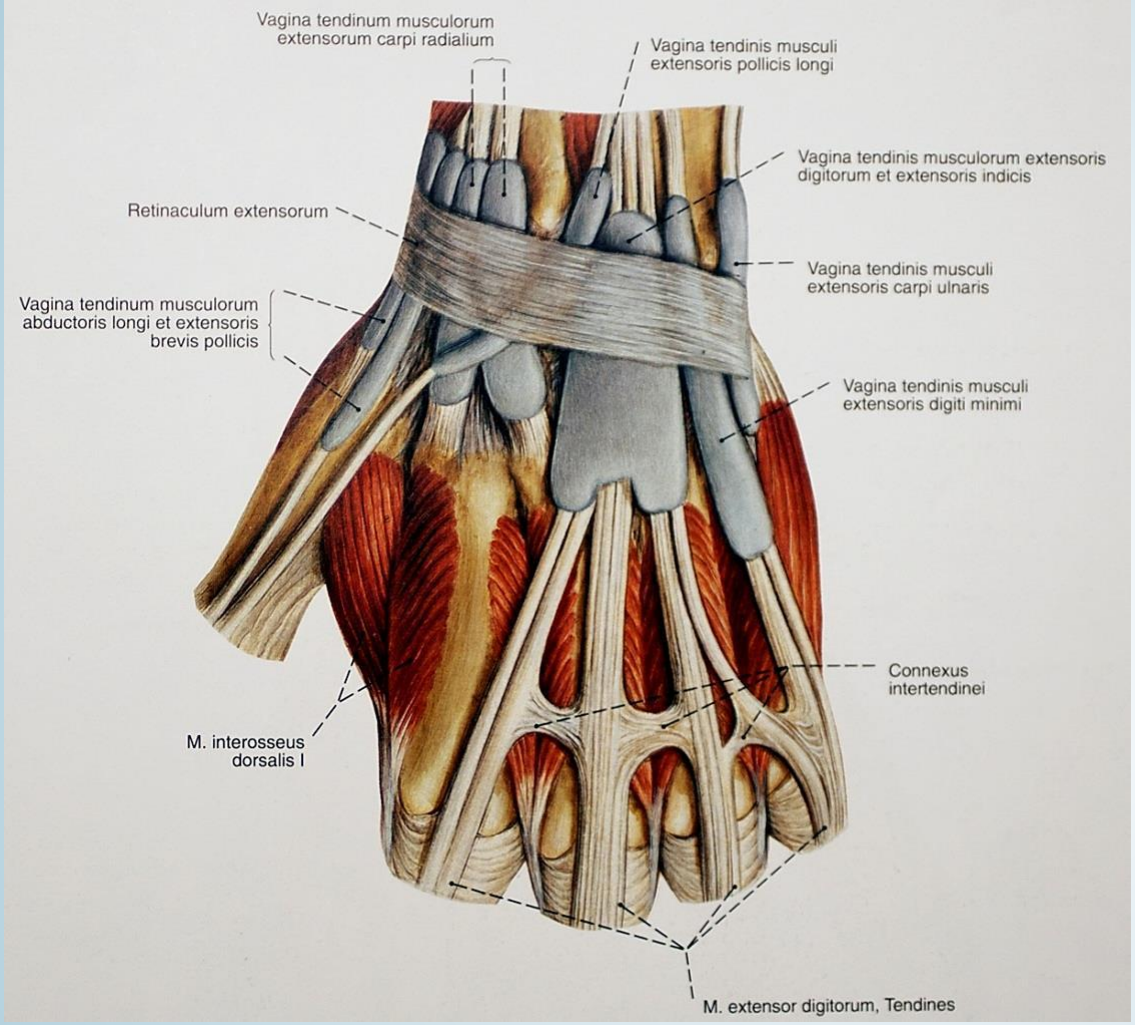

M. triceps brachii, Caput mediale
M. biceps brachii
Septum intermusculare brachii mediale
M. brachialis
Aponeurosis musculi bicipitis brachii
M. biceps brachii, Tendo
Epicondylus medialis
M. brachioradialis
M. flexor carpi ulnaris
M. extensor carpi radialis longus
M. palmaris longus
M. extensor carpi radialis brevis
M. flexor carpi radialis
M. flexor digitorum superficialis
M. flexor digitorum superficialis
M. abductor pollicis longus
M. brachioradialis, Tendo
M. flexor carpi ulnaris, Tendo
M. flexor pollicis longus
M. palmaris longus, Tendo
M. abductor pollicis longus, Tendo
M. pronator quadratus
M. flexor carpi radialis, Tendo
Retinaculum extensorum

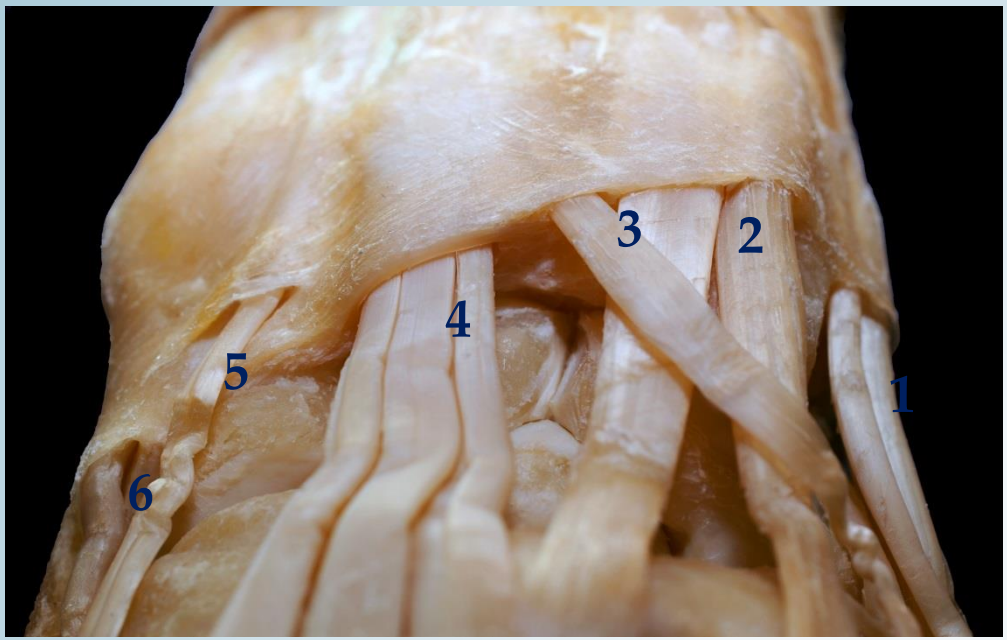

M. triceps brachii, Caput mediale
M. brachialis
Septum intermusculare brachii mediale
M. brachioradialis
M. brachialis,Tendo
Epicondylus medialis
M. supinator
M. biceps brachii, Tendo
Bursa bicipitoradialis
M. palmaris longus
M. extensor carpi radialis longus
M. flexor carpi ulnaris
M. flexor carpi radialis
M. pronator teres
M. flexor digitorum superficialis, Caput humero-ulnare
M. flexor digitorum superficialis, Caput radiale
M. flexor digitorum superficialis
M. abductor pollicis longus
M. flexor pollicis longus
M. flexor carpi ulnaris, Tendo
M. pronator quadratus
M. flexor carpi radialis, Tendo
M. extensor pollicis brevis, Tendo
M. palmaris longus, Tendo
M. brachioradialis, Tendo


M. triceps brachii, Caput mediale
Septum intermusculare brachii mediale
Epicondylus medialis
M. pronator teres
(Mm. flexores, Caput commune)
M. flexor carpi ulnaris
M. flexor digitorum superficialis
M. flexor carpi ulnaris, Tendo
M. flexor carpi radialis, Tendo
M. palmaris longus
M. brachialis
M. brachioradialis
M. supinator
M. biceps brachii, Tendo
M. extensor carpi radialis longus
M. pronator teres
M. abductor pollicis longus
M. flexor pollicis longus
M. pronator quadratus
M. flexor pollicis brevis
M. brachioradialis, Tendo


M. brachialis
M. brachioradialis
M. extensor carpi radialis longus
Epicondylus lateralis
M. extensor carpi radialis brevis
Fascia antebrachii
M. extensor digitorum
M. abductor pollicis longus
M. extensor pollicis brevis
M. extensor carpi radialis longus;
M. extensor carpi radialis brevis, Tendines
M. triceps brachii, Caput laterale
Septum intermusculare brachii laterale
M. triceps brachii, Caput mediale
M. triceps brachii, Tendo
Olecranon
M. anconeus
M. flexor carpi ulnaris
M. extensor carpi ulnaris
M. extensor digiti minimi
M. extensor carpi ulnaris, Tendo
M. extensor digitorum
Caput ulnae
Retinaculum extensorum


Olecranon
Epicondylus lateralis
Lig. collaterale radiale;
Lig. anulare radii
M. extensor carpi radialis brevis
M. anconeus
M. supinator
M. flexor carpi ulnaris
Corpus ulnae
Corpus radii
M. pronator teres, Tendo
M. extensor pollicis longus
M. abductor pollicis longus
M. extensor indicis
M. extensor pollicis brevis
Radius
Membrana interossea antebrachii
M. abductor pollicis longus,
Tendo
M. extensor carpi radialis brevis,
Tendo
M. extensor carpi ulnaris, Tendo
Caput ulnae
M. extensor pollicis brevis,
Tendo
Retinaculum extensorum*
Retinaculum extensorum
M. extensor carpi radialis longus,
Tendo
Retinaculum extensorum*
Ligg. carpometacarpalia dorsalia
M. extensor indicis, Tendo
M. interosseus dorsalis III
M. extensor pollicis longus,
Tendo
M. interosseus dorsalis IV
M. interosseus dorsalis II
M. interosseus dorsalis I
Os metacarpale II
M. extensor digitorum, Tendines


Vagina tendinum musculorum extensorum carpi radialium
Vagina tendinis musculi extensoris pollicis longi
Vagina tendinis musculorum extensoris digitorum et extensoris indicis
Retinaculum extensorum
Vagina tendinis musculi extensoris carpi ulnaris
Vagina tendinum musculorum abductoris longi et extensoris brevis pollicis
Vagina tendinis musculi extensoris digiti minimi
Connexus intertendinei
M. interosseus dorsalis I
M. extensor digitorum, Tendines

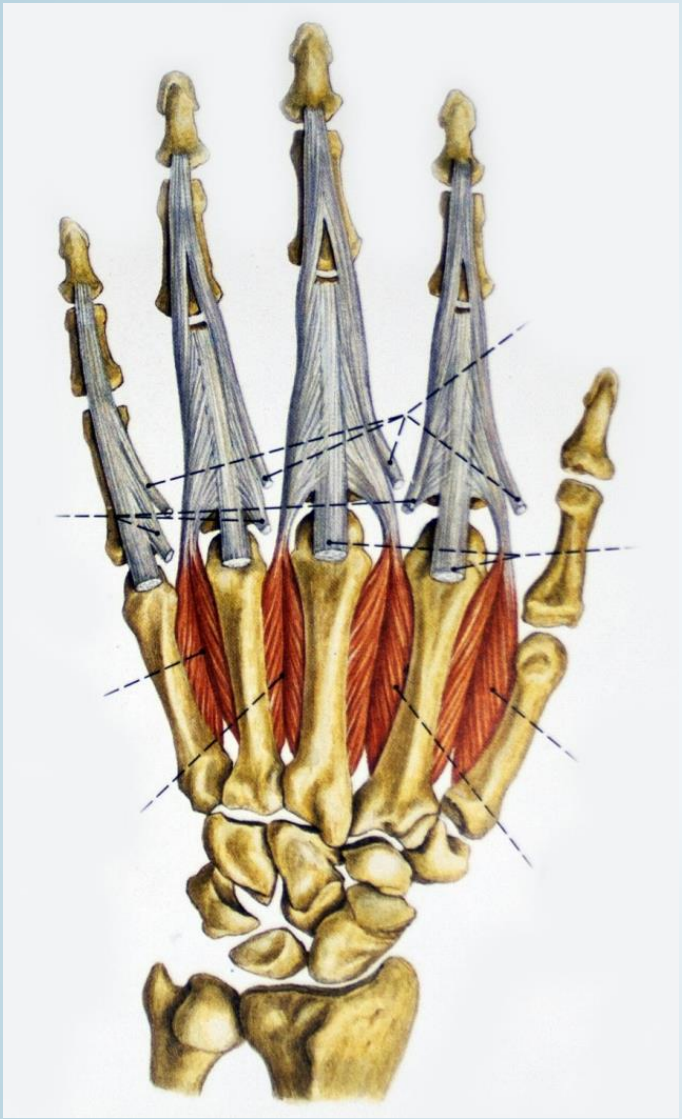


Tendinous compartments of the dorsal side:

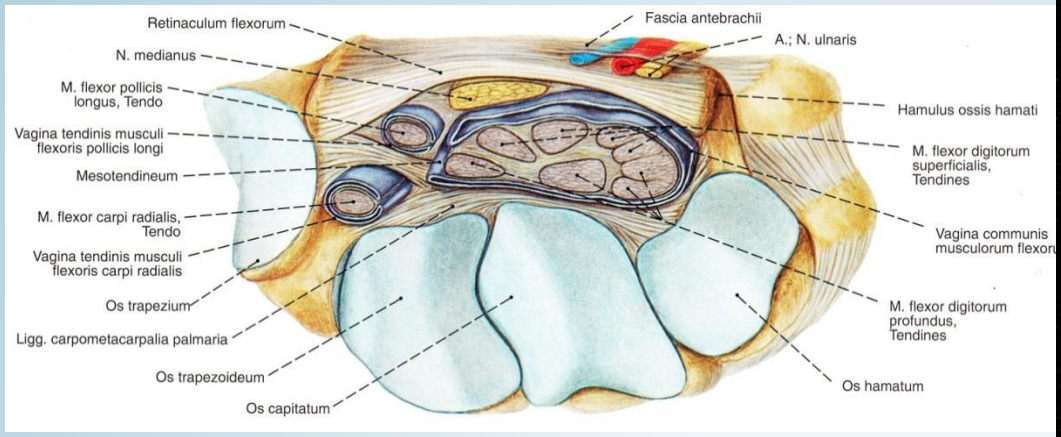
1. abductor pollicis longus m. and extensor pollicis brevis m.
2. extensor carpi radialis longus and brevis m.
3. extensor pollicis longus m.
4. extensor digitorum et indicis m.
5. extensor digiti minimi m.
6. extensor carpi ulnaris m.

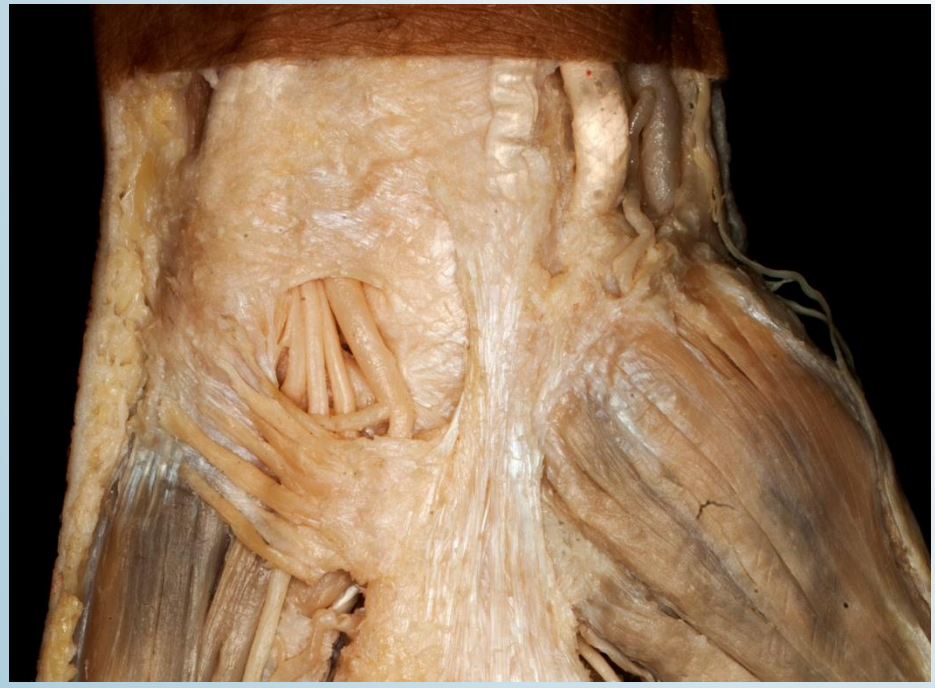
2 and 3: Tuberculum dorsale (Lister)

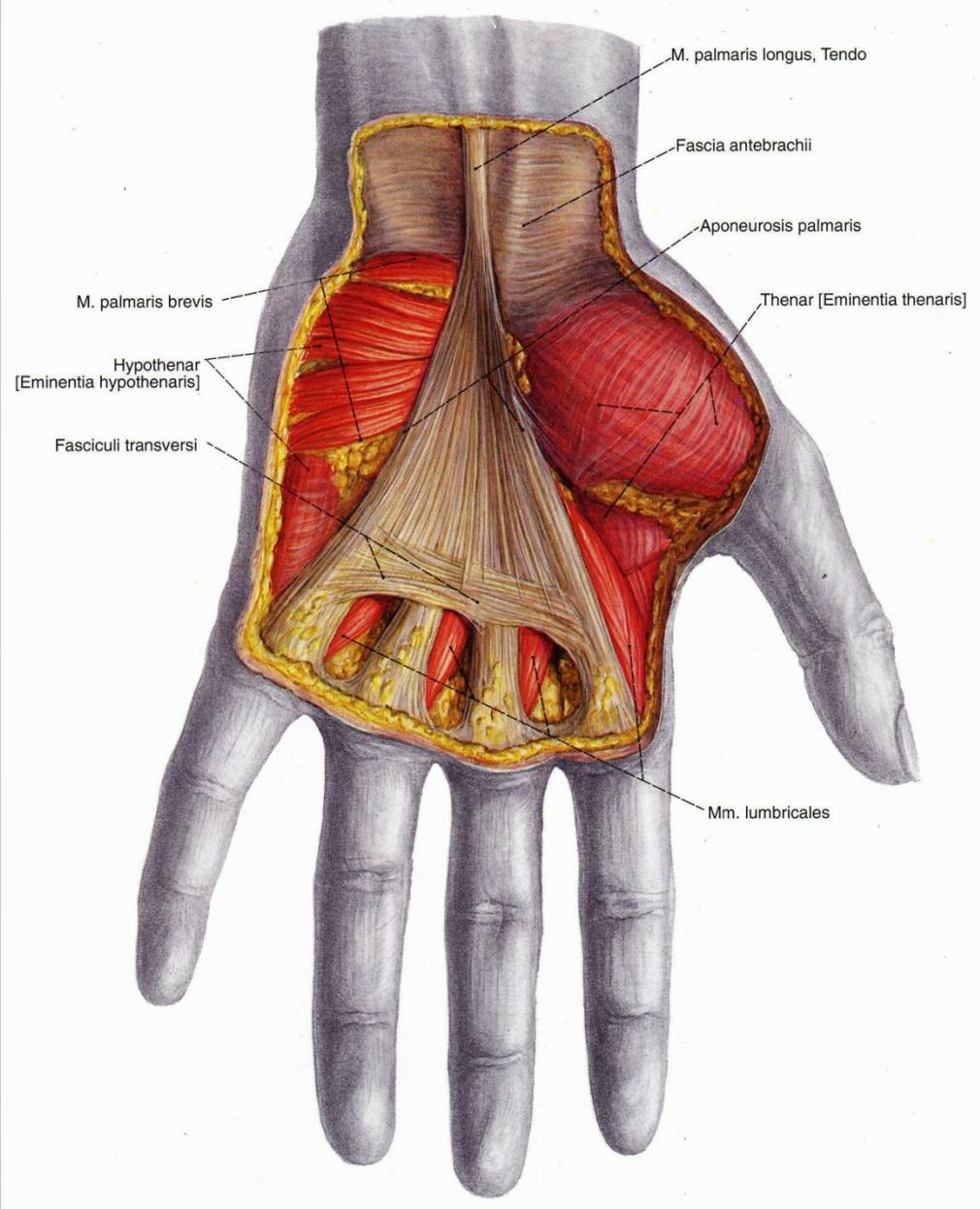
anatomical snuff-box:
between the tendons of
abductor pollicis longus and
extensor brevis m.
extensor pollicis longus m.

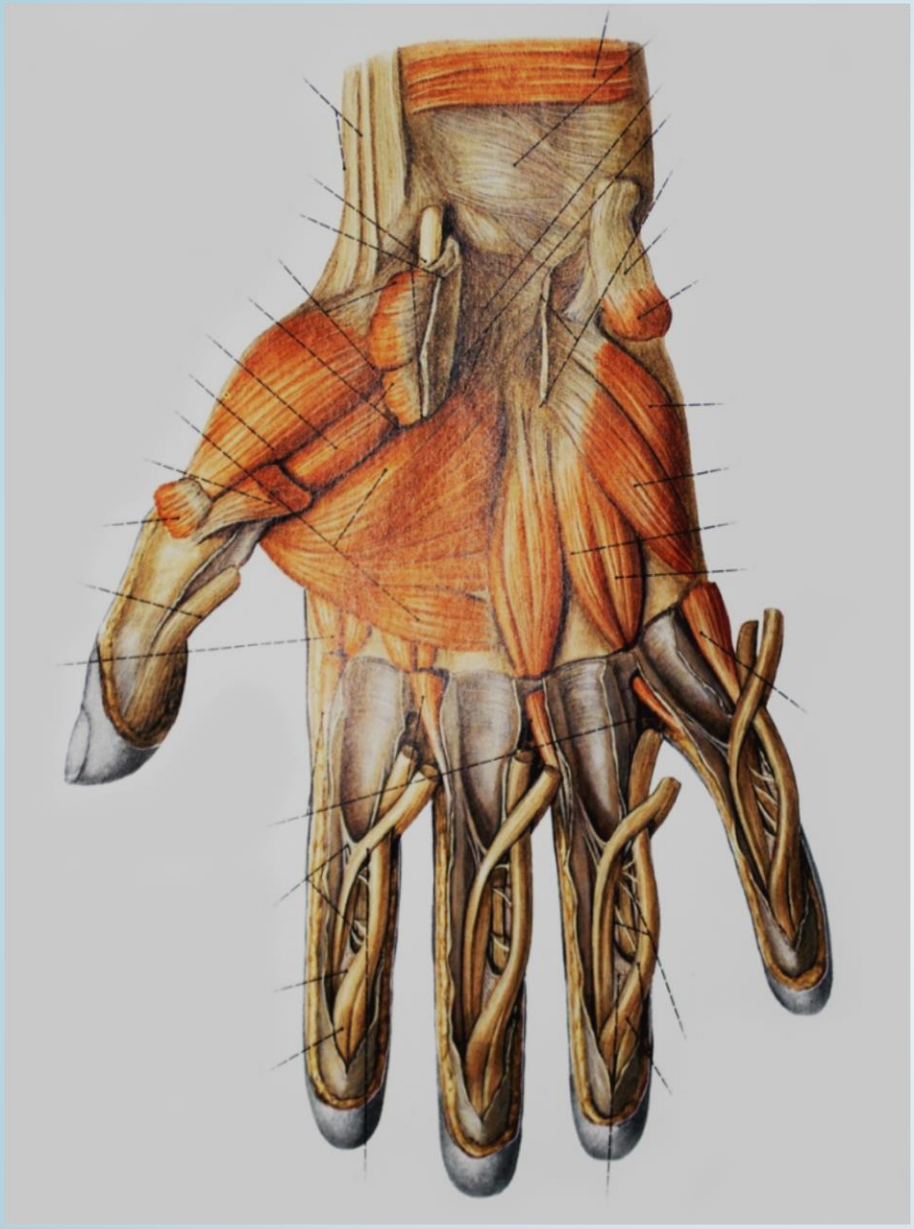


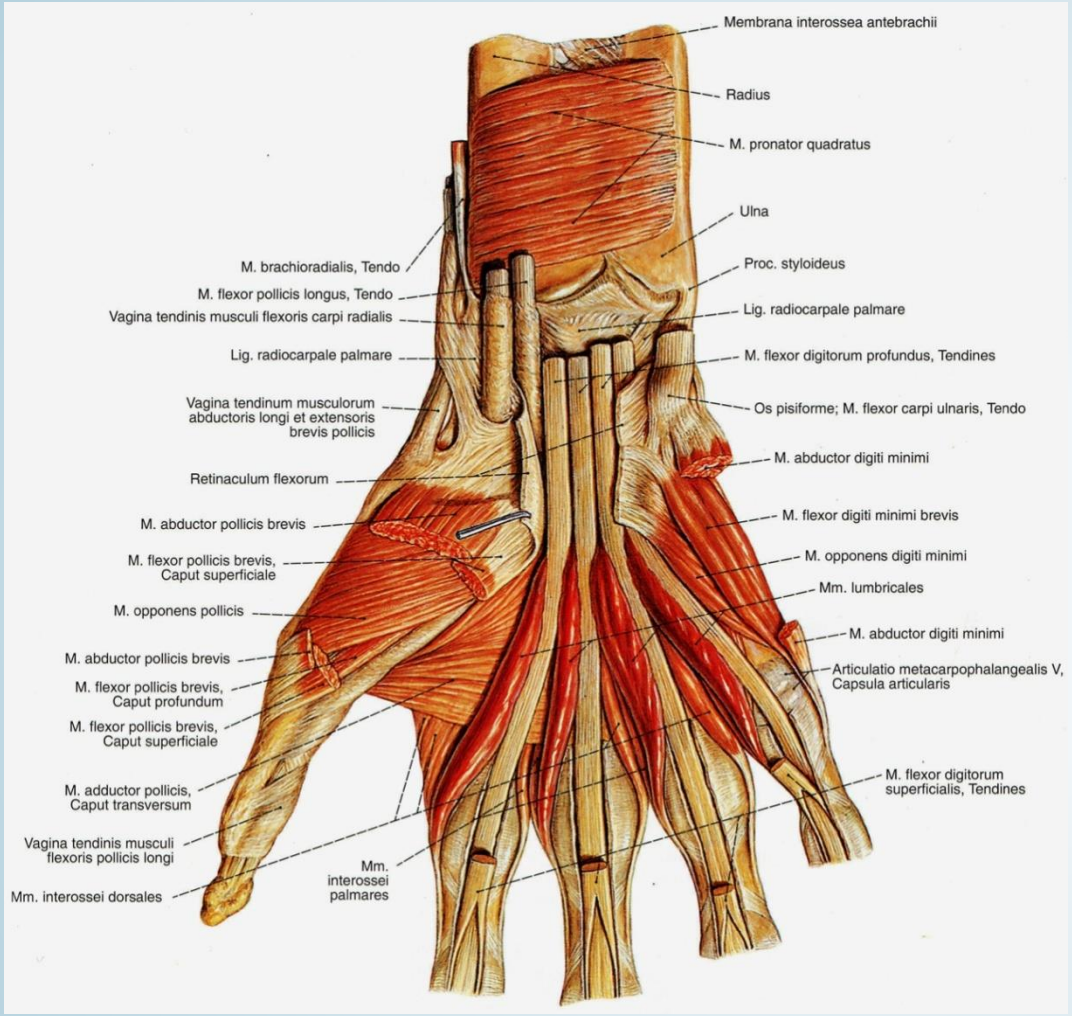
Guyon's canal and carpal tunel

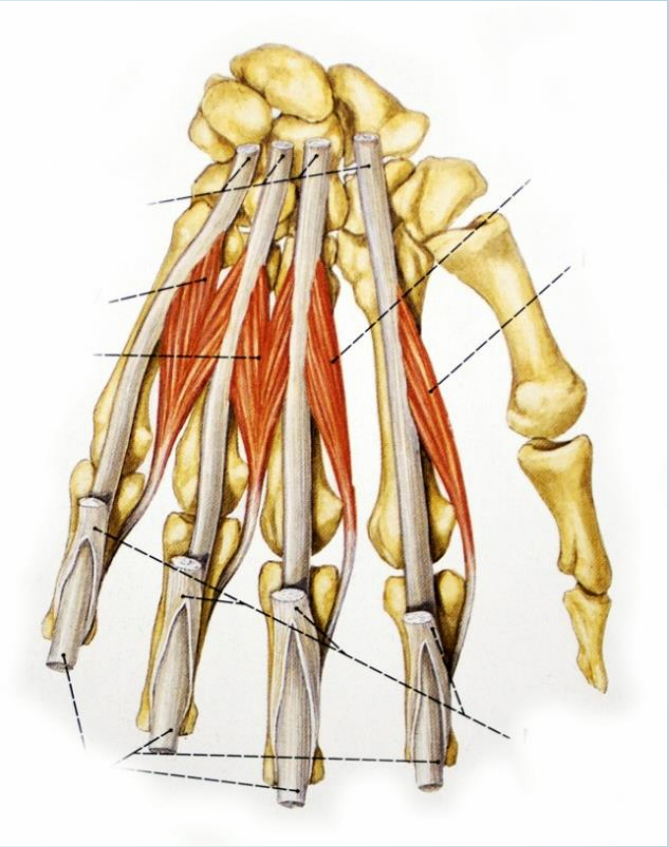


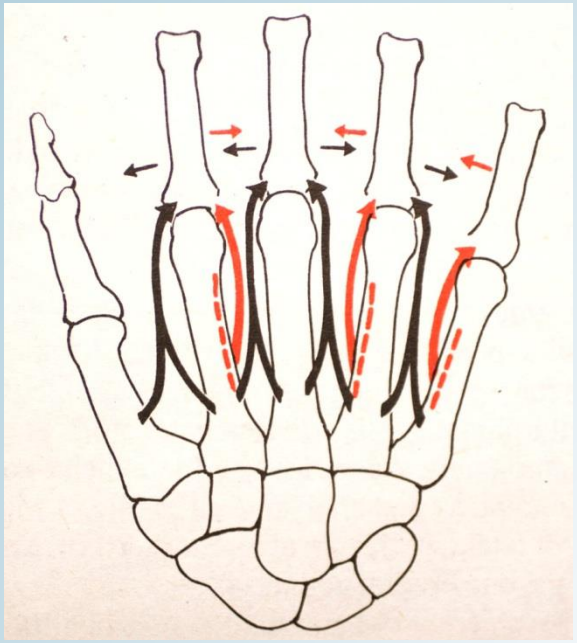


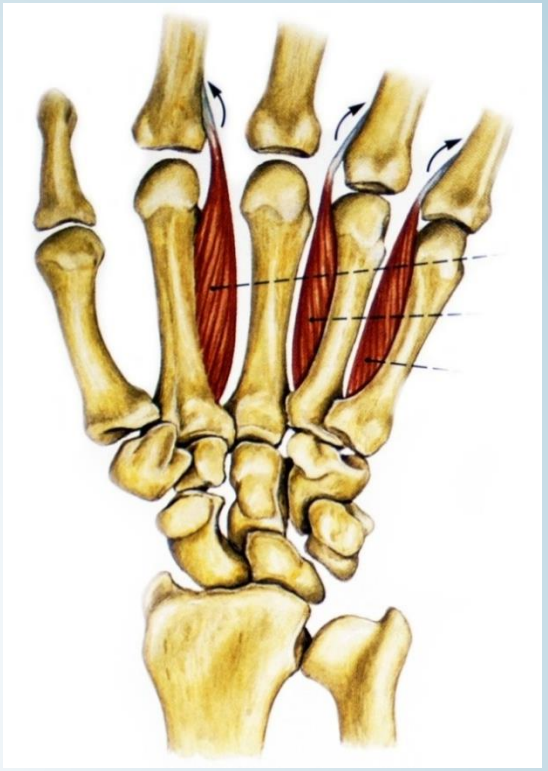

M. palmaris longus, Tendo
Fascia antebrachii
Aponeurosis palmaris
M. palmaris brevis
Thenar [Eminentia thenaris]
Hypothenar
[Eminentia hypothenaris]
Fasciculi transversi
Mm. lumbricales

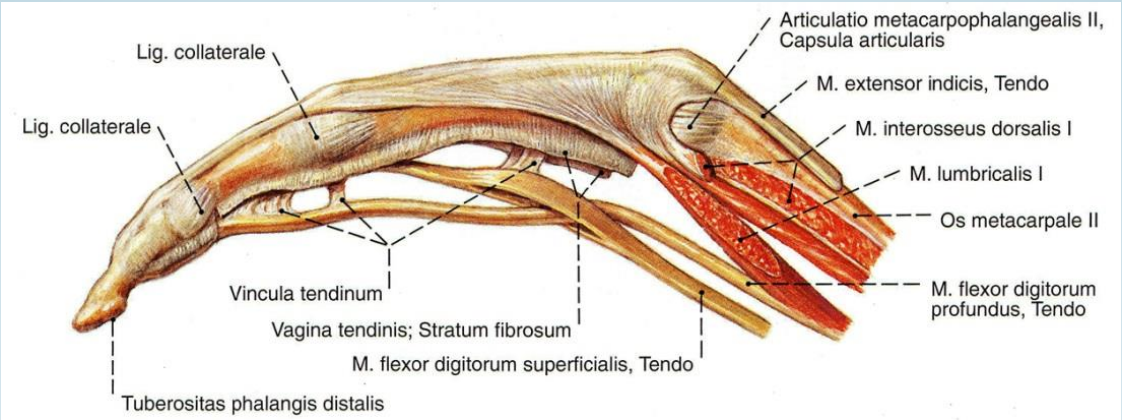



Membrana interossea antebrachii
Radius
M. pronator quadratus
Ulna
M. brachioradialis, Tendo
Proc. styloideus
M. flexor pollicis longus, Tendo
Lig. radiocarpale palmare
Vagina tendinis musculi flexoris carpi radialis
Lig. radiocarpale palmare
M. flexor digitorum profundus, Tendines
Vagina tendinum musculorum abductoris longi et extensoris brevis pollicis
Os pisiforme; M. flexor carpi ulnaris, Tendo
M. abductor digiti minimi
Retinaculum flexorum
M. abductor pollicis brevis
M. flexor digiti minimi brevis
M. flexor pollicis brevis, Caput superficiale
M. opponens digiti minimi
Mm. lumbricales
M. opponens pollicis
M. abductor digiti minimi
M. abductor pollicis brevis
Articulatio metacarpophalangealis V, Capsula articularis
M. flexor pollicis brevis, Caput profundum
M. flexor pollicis brevis, Caput superficiale
M. flexor digitorum superficialis, Tendines
M. adductor pollicis, Caput transversum
Vagina tendinis musculi flexoris pollicis longi
Mm. interossei palmares
Mm. interossei dorsales








Articulatio metacarpophalangealis II,
Capsula articularis
Lig. collaterale
M. extensor indicis, Tendo
Lig. collaterale
M. interosseus dorsalis I
M. lumbricalis I
Os metacarpale II
M. flexor digitorum
profundus, Tendo
Vincula tendinum
Vagina tendinis; Stratum fibrosum
M. flexor digitorum superficialis, Tendo
Tuberositas phalangis distalis

Literature:

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