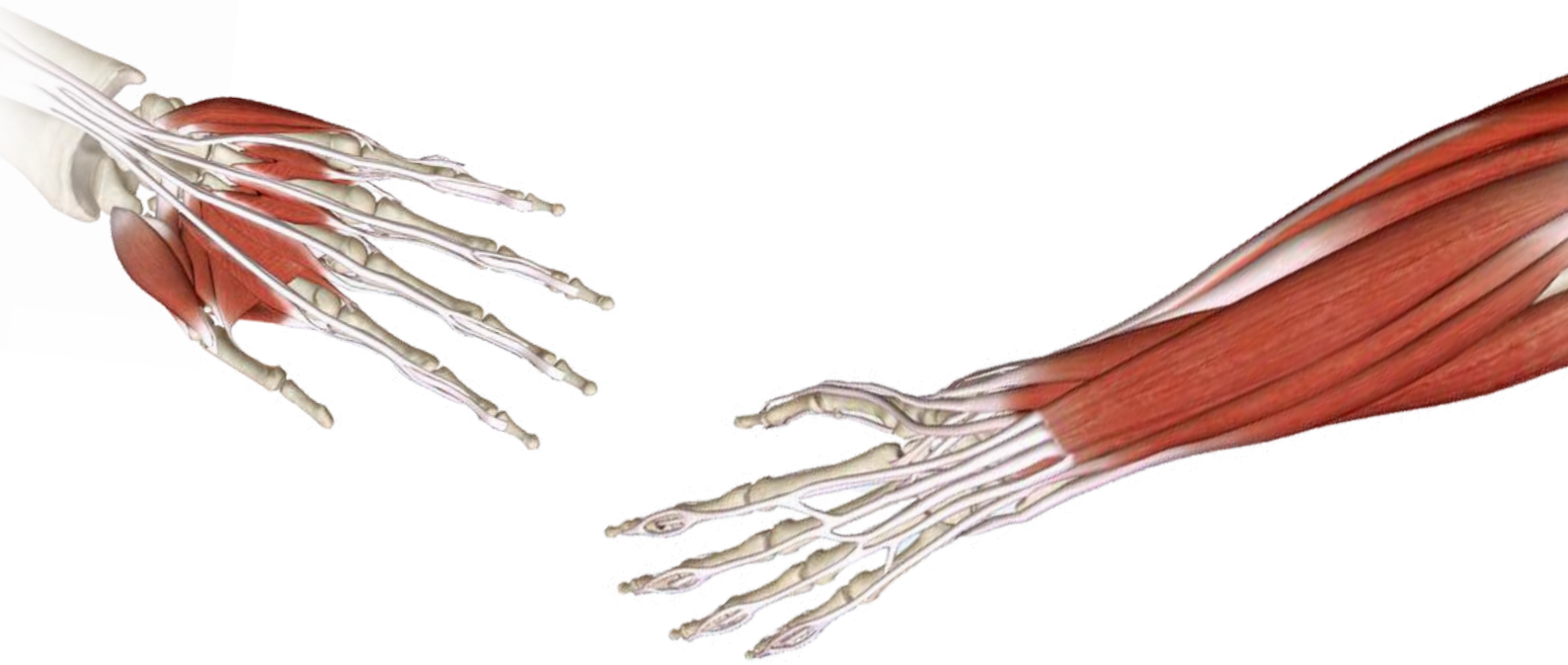


Course Handbook

Wrist and Hand Anatomy BootCamp

Lesson 5: Muscles of the Wrist and Hand



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Overview: The Muscles

Introduction

In this tutorial, we are going to analyse the crucial different muscles acting on the wrist and hand.

We are going to split this tutorial into **two different parts**:

- Muscles of the wrist
- Muscles of the hand

It goes without saying that with so many muscles to go through, it will be very difficult to memorise all the origins and insertions immediately after watching this tutorial once.

So as a result, **we suggest that your focus is to learn the anatomy in layers or levels**:

- Level 1 may be learning the muscles by their actions
- Level 2 may be learning global origin and insertion points
- Level 3 may be learning the nerve supply
- Level 4 may be learning more precise origin and insertion points

Another tip would be to watch the nerve and blood supply tutorials before coming back to watch the muscles tutorial again, as understanding the nerve and blood supply will absolutely help learning them in the muscles tutorial.

Ultimately, you can choose any order of levels that you wish. But don't be afraid to learn in this way, rather than thinking that you should learn everything and memorise it fully on the first time you watch the tutorial.

For each muscle you will see the following note next to the picture. These letters stand for...

- O:** Origin
- I:** Insertion
- A:** Action
- N:** Nerve Supply
- B:** Blood Supply



Extensor Muscles of the Wrist

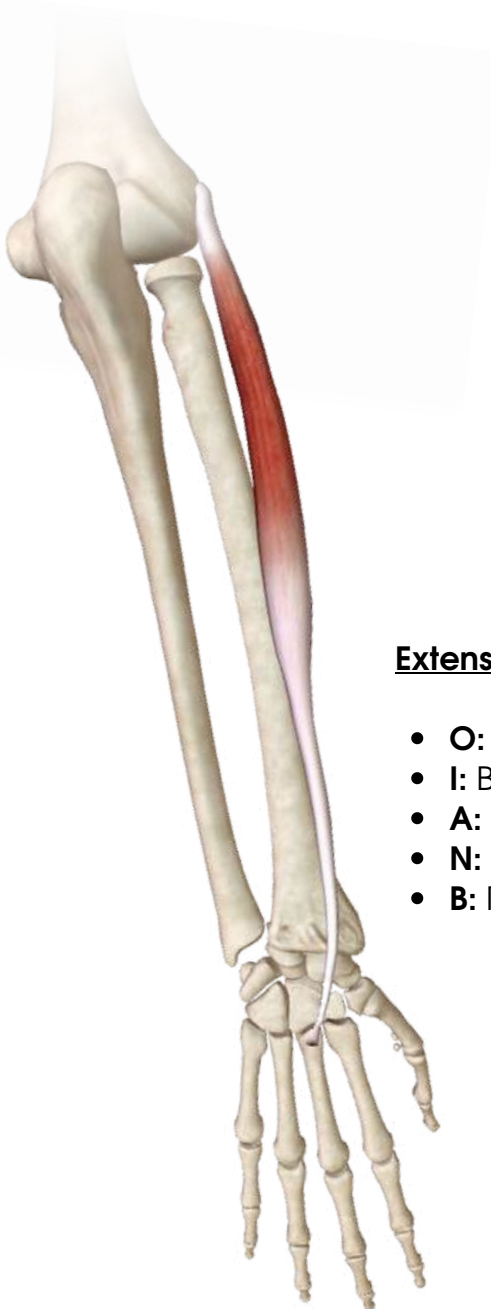
Extensor Carpi Radialis Longus:

- **O:** Lateral supracondylar ridge of the humerus (anterior side)
- **I:** Base of 2nd metacarpal
- **A:** Wrist extension and radial deviation
- **N:** Radial nerve
- **B:** Radial recurrent artery, radial collateral artery, radial artery



Extensor Carpi Radialis Brevis:

- **O:** Lateral epicondyle of humerus
- **I:** Base of 3rd metacarpal
- **A:** Wrist extension and radial deviation
- **N:** Radial nerve
- **B:** Radial recurrent artery, deep brachial artery, radial artery



Extensor Muscles of the Wrist

Extensor Carpi Ulnaris:

- **O:** Lateral epicondyle of the humerus, posterior border of the ulna
- **I:** Base of metacarpal bone 5
- **A:** Wrist extension and ulnar deviation
- **N:** Posterior interosseous nerve
- **B:** Radial recurrent artery, posterior interosseous artery



Flexor Muscles of the Wrist

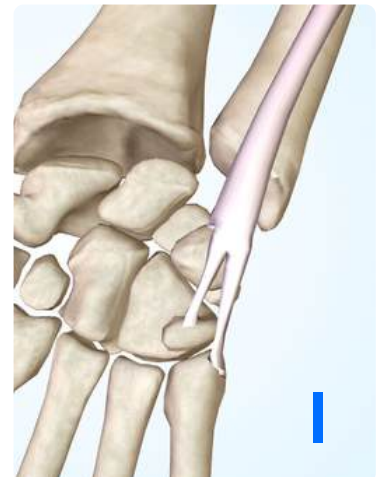
Flexor Carpi Radialis:

- **O:** Medial epicondyle of the humerus
- **I:** Bases of metacarpal bones 2 and 3
- **A:** Wrist flexion and radial deviation
- **N:** Median nerve
- **B:** Anterior and posterior recurrent ulnar artery



Flexor Carpi Ulnaris:

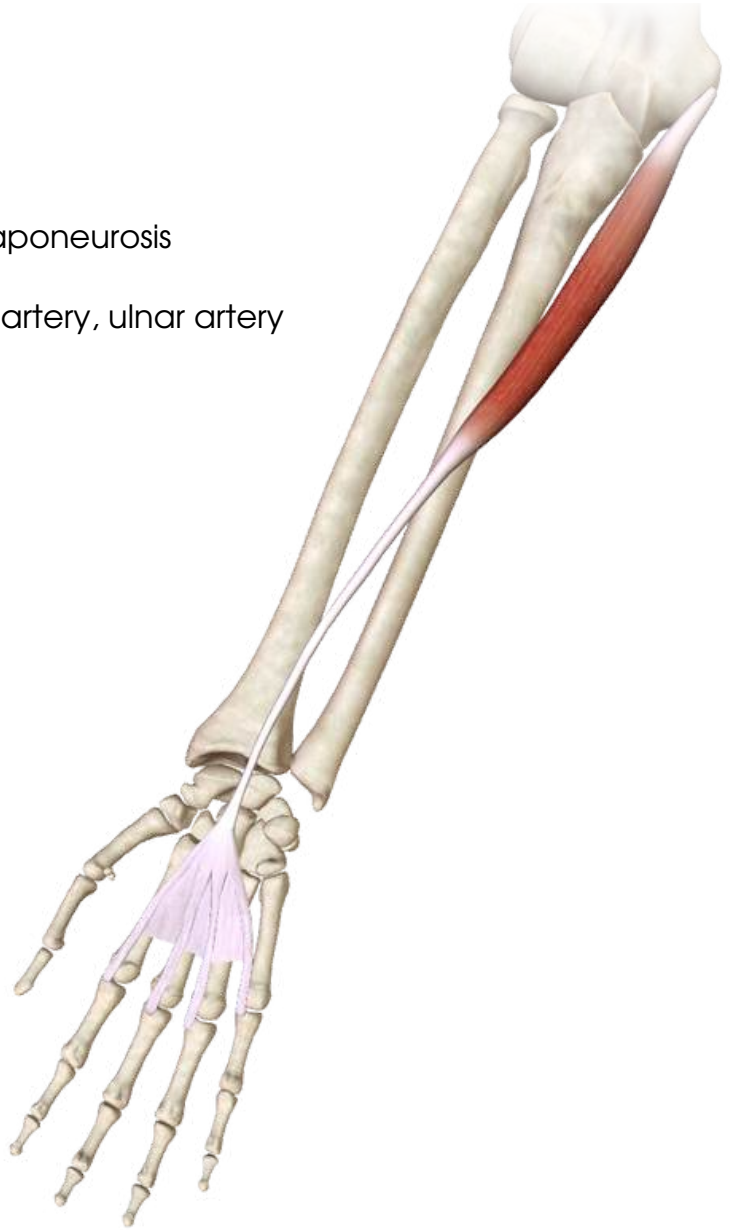
- **O:** Medial epicondyle of the humerus, olecranon, and posterior border of the ulna
- **I:** Pisiform bone, hamate bone, base of 5th metacarpal
- **A:** Wrist flexion and ulnar deviation
- **N:** Ulnar nerve
- **B:** Posterior ulnar recurrent artery, ulnar artery



Flexor Muscles of the Wrist

Palmaris Longus:

- **O:** Medial epicondyle of the humerus
- **I:** Flexor retinaculum, palmar aponeurosis
- **A:** Wrist flexion, and to tense the palmar aponeurosis
- **N:** Median nerve
- **B:** Anterior ulnar recurrent artery, median artery, ulnar artery



Digit Flexor Muscles

Flexor Digitorum Profundus:

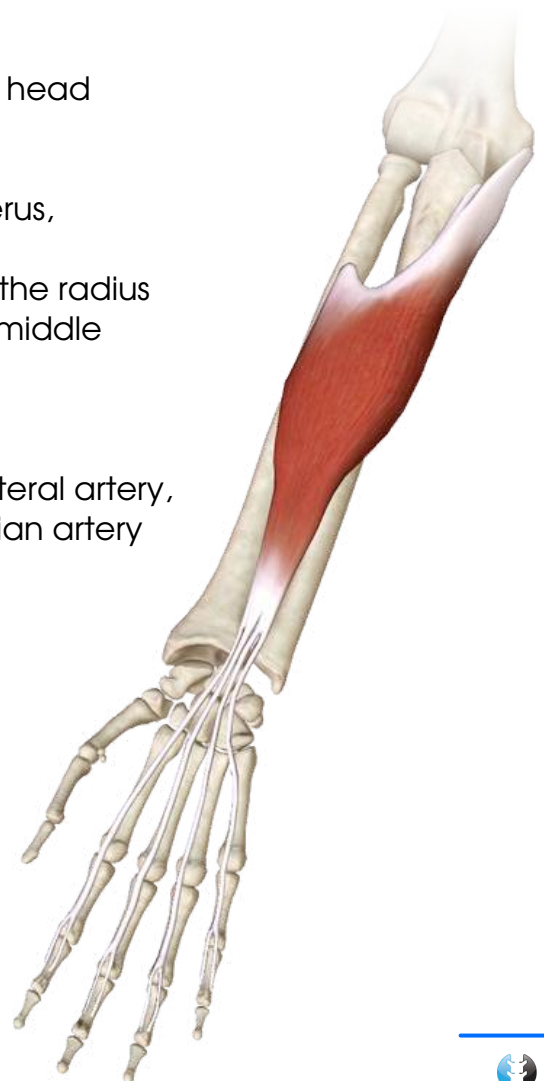
- **O:** Proximal half of the anterior surface of the ulna and interosseous membrane
- **I:** Palmar surface of distal phalanges of digits 2-5
- **A:** Flexion of MCPJ's, PIPJ's and DIPJ's of digits 2-5
- **N:**
 - Tendons for digits 2 and 3 = Median nerve (via anterior interosseous nerve)
 - Tendons for digits 4 and 5 = Ulnar nerve
- **B:** Ulnar artery, median artery, radial artery



Flexor Digitorum Superficialis:

This muscle has 2 heads; a humeroulnar head and a radial head

- **O:**
 - Humeroulnar head: Medial epicondyle of the humerus, coronoid process of the ulna
 - Radial head: Proximal half of the anterior border of the radius
- **I:** Both heads join to insert into radial and ulnar sides of middle phalanges of digits 2-5
- **A:** Flexion of MCPJ's and PIPJ's for digits 2-5
- **N:** Median nerve
- **B:** Ulnar artery, common interosseous artery, ulnar collateral artery, ulnar recurrent artery, anterior interosseous artery, median artery

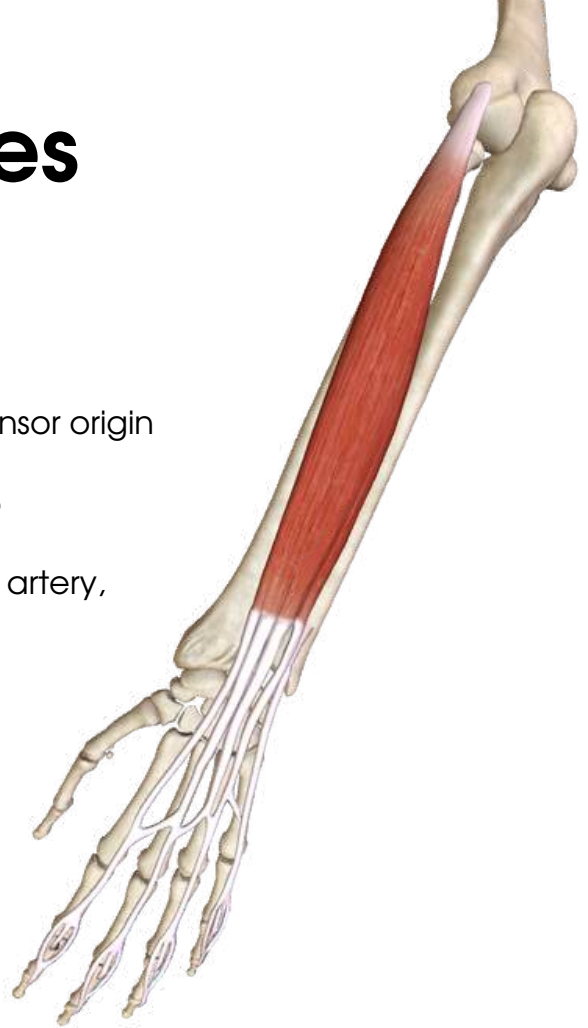


Digit Extensor Muscles

Extensor Digitorum:

(also known as Extensor Digitorum Communis):

- **O:** Lateral epicondyle of humerus via common extensor origin
- **I:** Extensor expansions of digits 2-5
- **A:** Extension of MCPJ's, PIPJ's and DIPJ's of digits 2-5
- **N:** Posterior interosseous nerve
- **B:** Anterior interosseous artery, posterior interosseous artery, radial recurrent artery,



Extensor Indicis:

- **O:** Posterior surface of distal third of ulna and interosseous membrane
- **I:** Extensor Expansion of 2nd digit
- **A:** Extension of 2nd digit
- **N:** Posterior interosseous nerve
- **B:** Anterior and posterior interosseous artery

Extensor Digiti Minimi:

- **O:** Lateral epicondyle of the humerus
- **I:** Extensor expansion of 5th digit
- **A:** Extension of 5th digit
- **N:** Posterior interosseous nerve
- **B:** Radial recurrent artery, anterior interosseous artery, posterior interosseous artery



Thumb Muscles

Flexor Pollicis Longus:

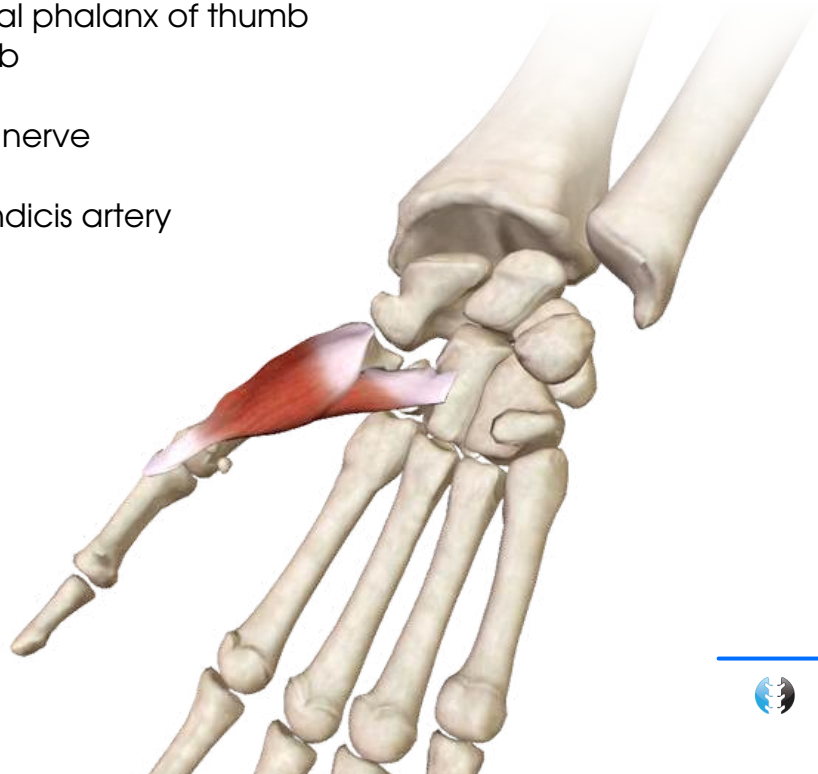
- **O:** Anterior surface of the radius and interosseous membrane
- **I:** Palmar surface of the distal phalanx of the thumb
- **A:** Flexion of the MCPJ and IPJ of thumb
- **N:** Median nerve (via anterior interosseous nerve)
- **B:** Anterior interosseous artery, radial artery and ulnar artery



Flexor Pollicis Brevis:

This muscle has 2 heads; a deep head and a superficial head

- **O:**
 - Deep head: Trapezoid and capitate bones
 - Superficial head: Flexor retinaculum, tubercle of trapezium bone
- **I:** Lateral aspect of the base of proximal phalanx of thumb
- **A:** Flexion of CMCJ and MCPJ of thumb
- **N:**
 - Deep head: Deep branch of ulnar nerve
 - Superficial head: Median nerve
- **B:** Princeps pollicis artery and radialis indicis artery



Thumb Muscles

Extensor Pollicis Longus:

- **O:** Posterior surface of the middle third of the ulna and interosseous membrane
- **I:** Base of distal phalanx of thumb
- **A:** Thumb extension and weak extensor of wrist joint
- **N:** Posterior interosseous nerve
- **B:** Anterior and posterior interosseous arteries



Extensor Pollicis Brevis:

- **O:** Posterior surface of the distal third of the radius and interosseous membrane
- **I:** Base of the proximal phalanx of the thumb
- **A:** Thumb extension
- **N:** Posterior interosseous nerve
- **B:** Anterior and posterior interosseous arteries



Thumb Muscles

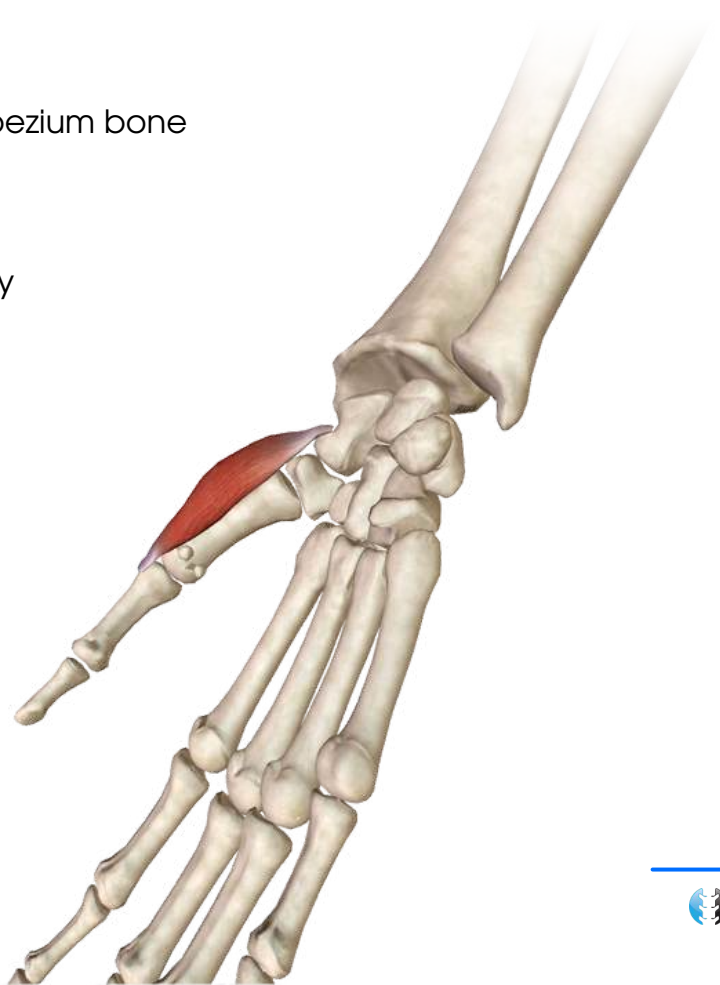
Abductor Pollicis Longus:

- **O:** Posterior surface of the proximal half of the radius, ulna, and interosseous membrane
- **I:** Base of 1st metacarpal and trapezium bone
- **A:** Thumb abduction, suggested roles also in thumb extension and radial deviation
- **N:** Posterior interosseous nerve
- **B:** Anterior and posterior interosseous arteries



Abductor Pollicis Brevis:

- **O:** Flexor retinaculum, scaphoid bone, trapezium bone
- **I:** Base of proximal phalanx of thumb
- **A:** Thumb abduction
- **N:** Median nerve
- **B:** Superficial palmar branch of radial artery

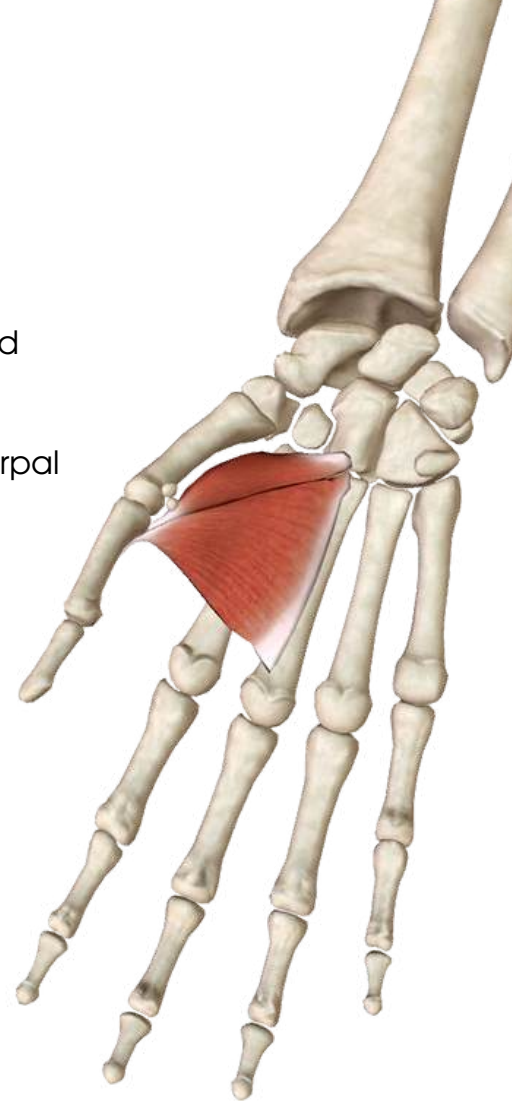


Thumb Muscles

Adductor Pollicis:

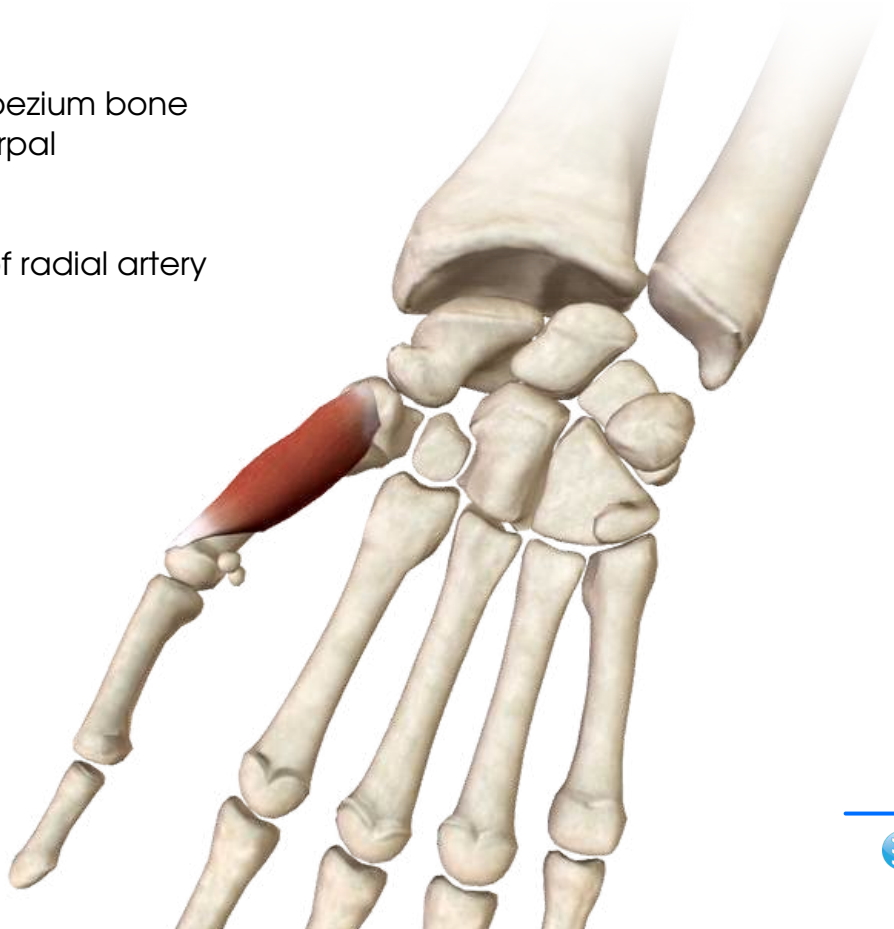
This muscle has 2 heads; a transverse head and an oblique head

- **O:**
 - Transverse head = palmar aspect of base of 3rd metacarpal
 - Oblique head = capitate bone and palmar aspect of metacarpals 2 and 3
- **I:** Base of proximal phalanx of thumb
- **A:** Thumb adduction
- **N:** Deep branch of ulnar nerve
- **B:** Deep palmar arch



Opponens Pollicis:

- **O:** Flexor retinaculum and trapezium bone
- **I:** Radial border of 1st metacarpal
- **A:** Opposition of thumb
- **N:** Median nerve
- **B:** Superficial palmar branch of radial artery

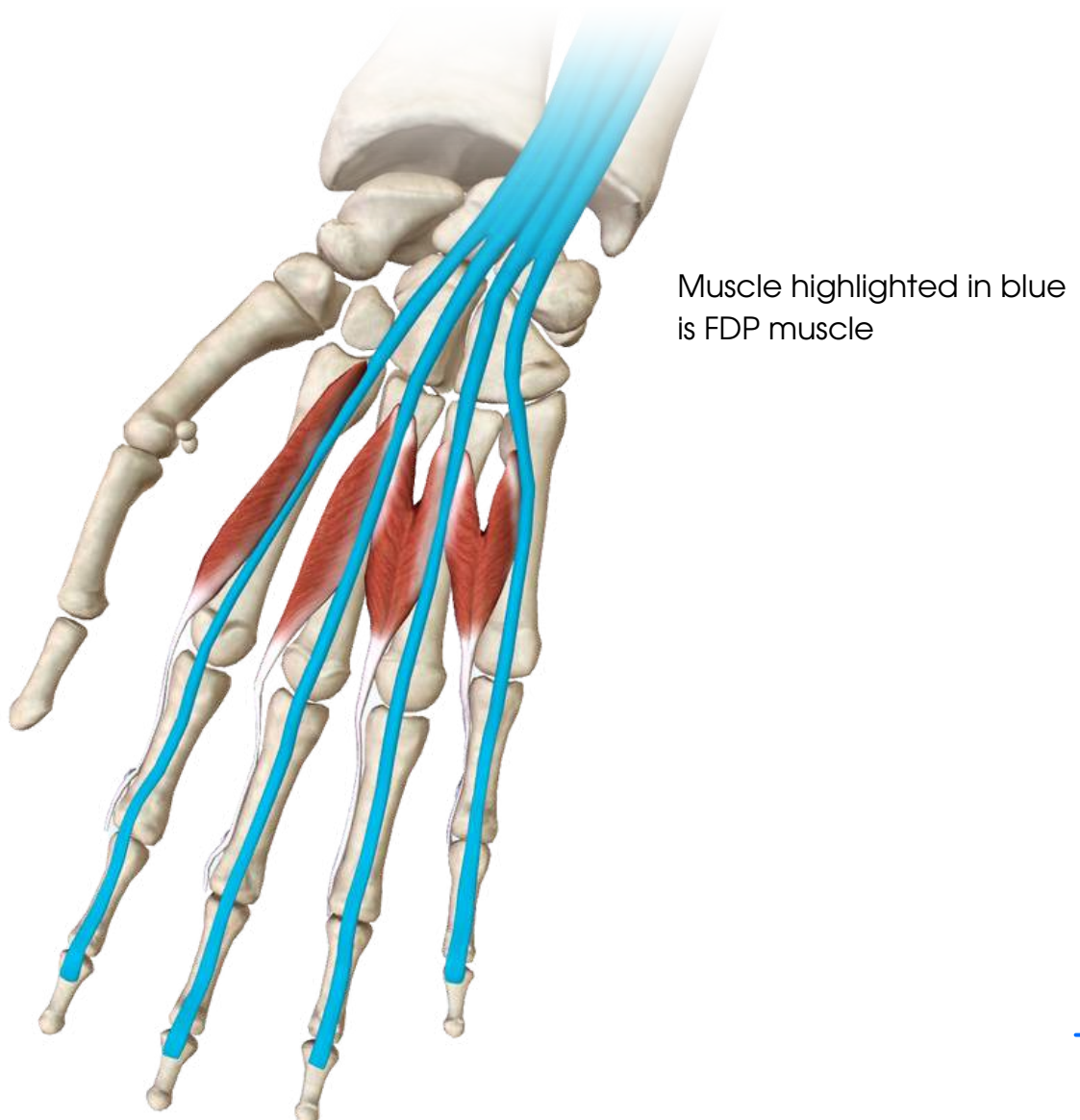


Deep Muscles of the Hand

Lumbricals:

We have 4 lumbricals which are positioned between digits 2-5

- **O:**
 - 1st lumbrical = radial aspect of FDP tendon for digit 1
 - 2nd lumbrical = radial aspect of FDP tendon for digit 2
 - 3rd lumbrical = opposing sides of FDP tendons for digits 2 and 3
 - 4th lumbrical = opposing sides of FDP tendons for digits 4 and 5
- **I:** Radial aspect of lateral bands (of extensor expansion for digits 2-5)
- **A:**
 - MCPJ flexion for digits 2-5
 - PIPJ and DIPJ extension for digits 2-5
- **N:**
 - 1st and 2nd lumbricals = median nerve
 - 3rd and 4th lumbricals = deep branch of ulnar nerve
- **B:** Dorsal carpal arch (dorsal metacarpal arteries and dorsal digital arteries), superficial palmar arch (common palmar metacarpal arteries)

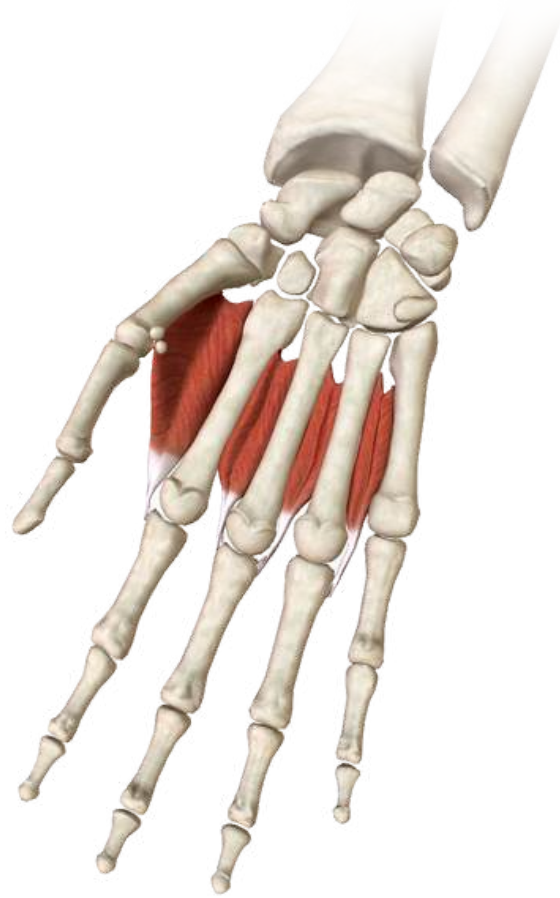


Deep Muscles of the Hand

Dorsal Interossei:

There are 4 dorsal interossei which are located on the dorsal side of the hand

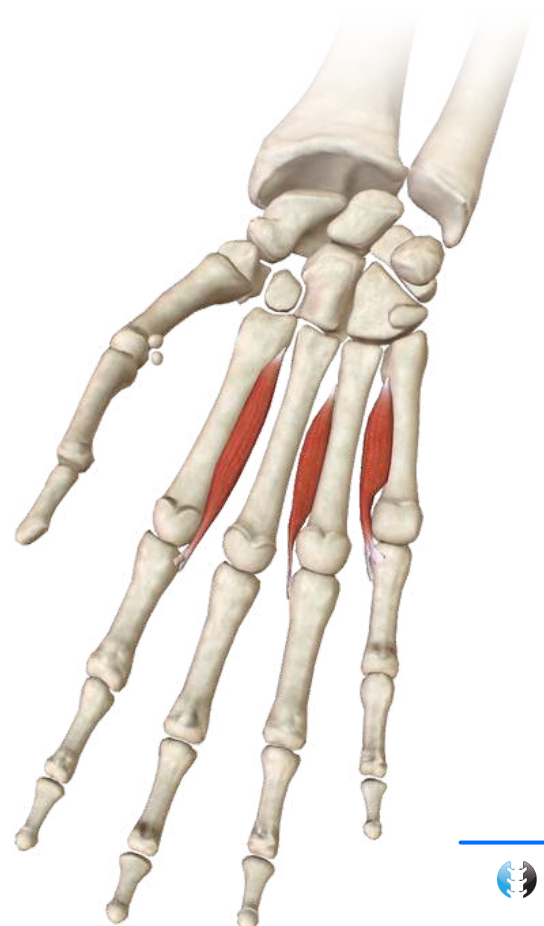
- **O:** Adjacent sides of metacarpal bones 1-5
- **I:**
 - 1st and 2nd = radial bases of proximal phalanges and extensor expansions of digits 2 and 3
 - 3rd and 4th = ulnar base of proximal phalanges and extensor expansions of digits 3 and 4
- **A:** Finger abduction, flexion of MCPJ's for digits 2-4, extension of PIPJ and DIPJ for digits 2-4
- **N:** Deep branch of ulnar nerve
- **B:**
 - 1st = dorsal metacarpal artery
 - 2nd, 3rd, 4th = 2nd, 3rd and 4th metacarpal arteries



Palmar Interossei:

There are 3 palmar interossei which are located on the palmar side of the hand

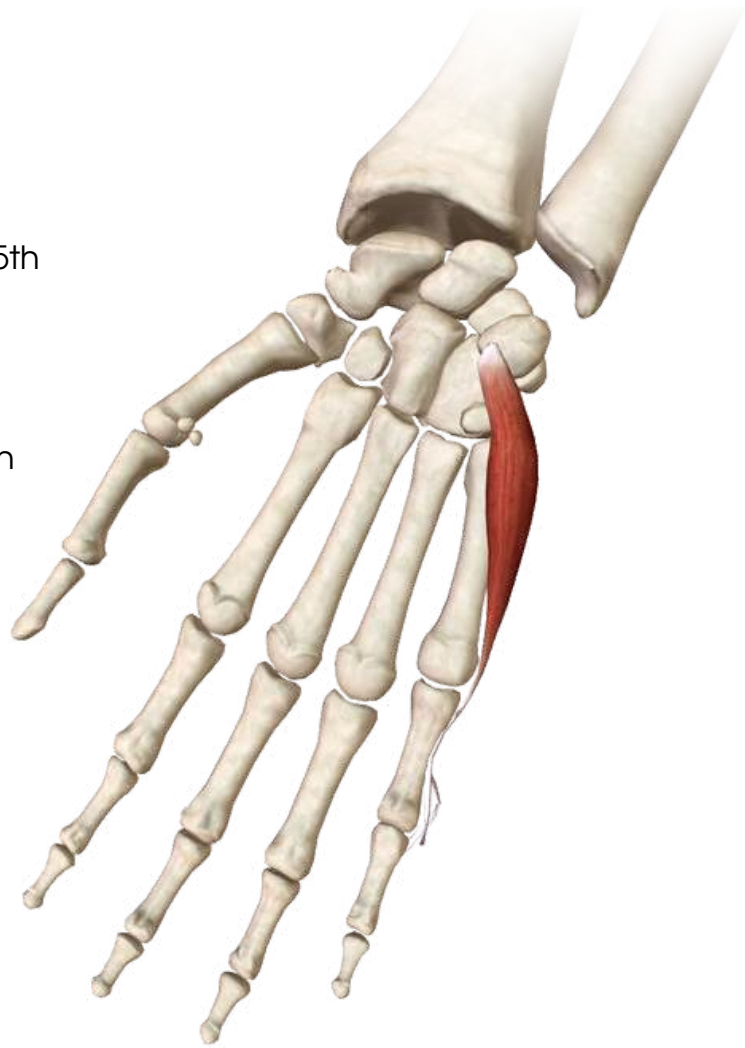
- **O:** Ulnar side of 2nd metacarpal bone, and radial side of metacarpal bones 4 and 5
- **I:**
 - 1st = ulnar base of proximal phalanx and extensor expansion of 2nd digit
 - 2nd and 3rd = radial base of proximal phalanx and extensor expansions of 4th and 5th digits
- **A:** Acting on digits 2, 4, 5 - finger adduction, MCPJ flexion, PIPJ and DIPJ extension
- **N:** Deep branch of ulnar nerve
- **B:** Deep palmar arch, radialis indicis artery, palmar metacarpal arteries, proximal and distal perforating arteries, common and proper palmar digital arteries



Deep Muscles of the Hand

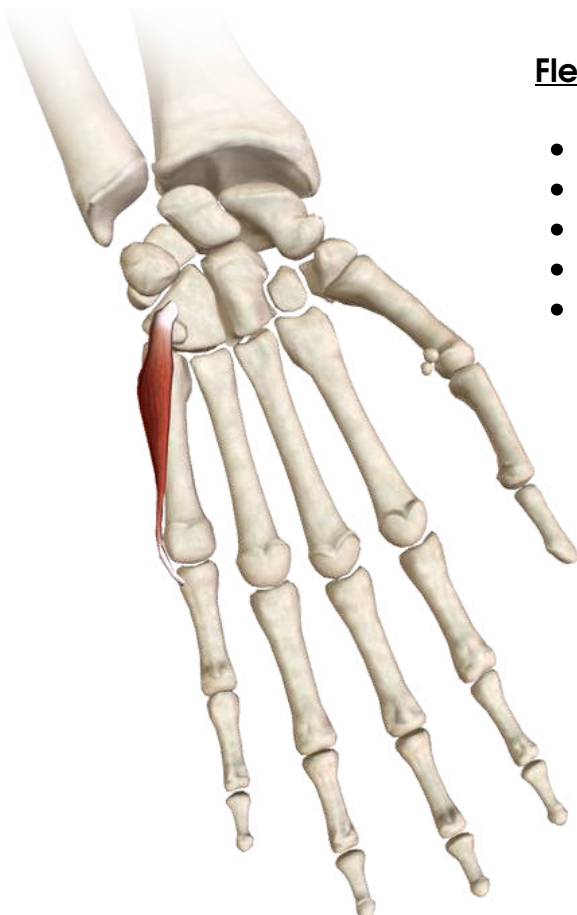
Abductor Digiti Minimi:

- **O:** Pisiform bone
- **I:** Ulnar side of base of proximal phalanx of 5th digit and extensor expansion of 5th digit
- **A:** 5th digit abduction
- **N:** Deep branch of ulnar nerve
- **B:** Palmar branch of ulnar artery, common palmar digital artery, superficial palmar arch



Flexor Digiti Minimi:

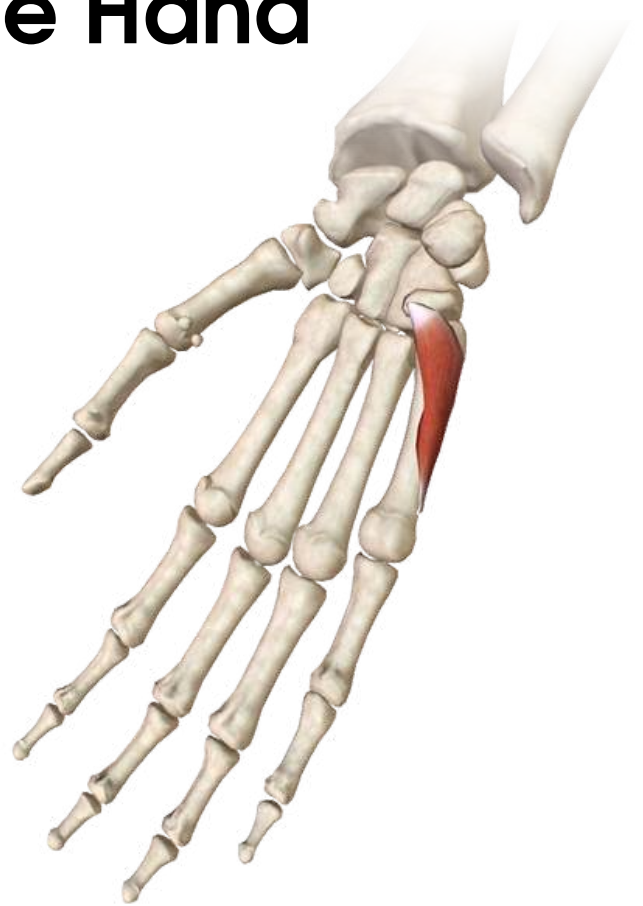
- **O:** Hook of hamate bone and flexor retinaculum
- **I:** Ulnar aspect of 5th metacarpal
- **A:** 5th digit flexion and opposition
- **N:** Deep branch of ulnar nerve
- **B:** Deep palmar branch of ulnar artery



Deep Muscles of the Hand

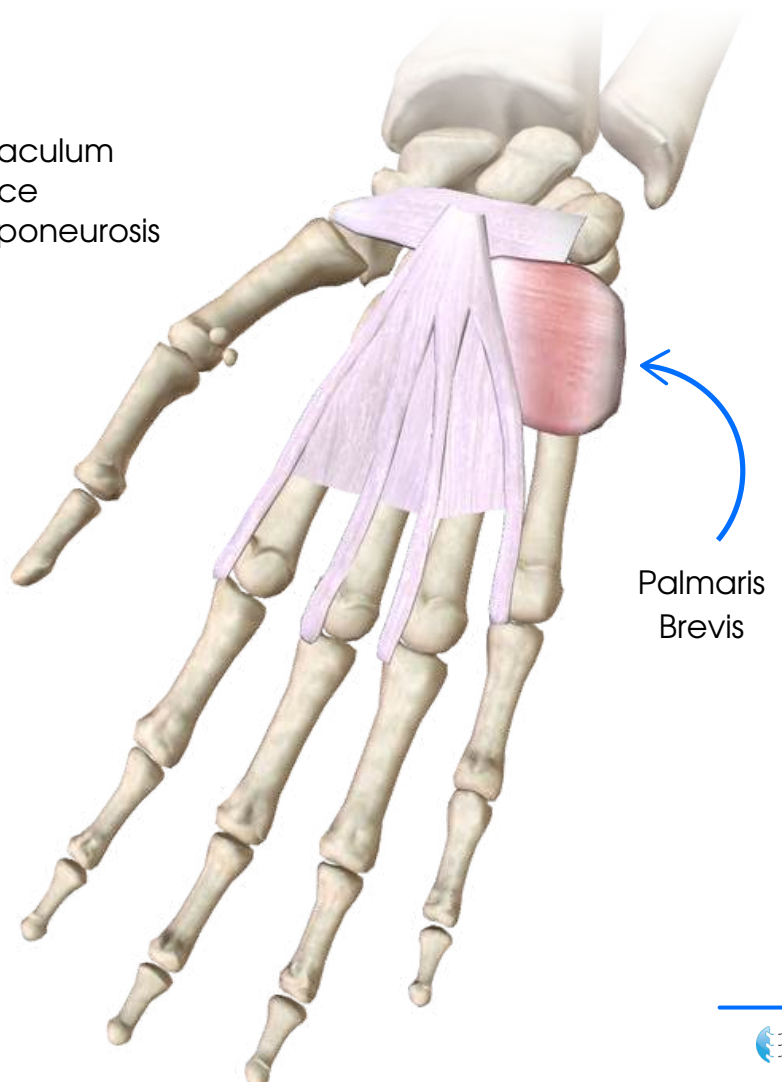
Opponens Digiti Minimi:

- **O:** Hook of hamate and flexor retinaculum
- **I:** Ulnar aspect of 5th metacarpal
- **A:** 5th digit flexion and opposition
- **N:** Deep branch of ulnar nerve
- **B:** Deep palmar branch of ulnar artery



Palmaris Brevis:

- **O:** Palmar aponeurosis and flexor retinaculum
- **I:** Dermis of skin of hypothenar eminence
- **A:** Tightens grip and tightens palmar aponeurosis
- **N:** Superficial branch of ulnar nerve
- **B:** Superficial palmar arch



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