Radial nerve palsy & Mx

- Dr.Priyanka Sharma
- Reconstructive and plastic surgeon, DNB
- Oncoplasty, Tata Memorial Mumbai

ANATOMY:

Posterior cord of brachial plexus
C5 to T1.

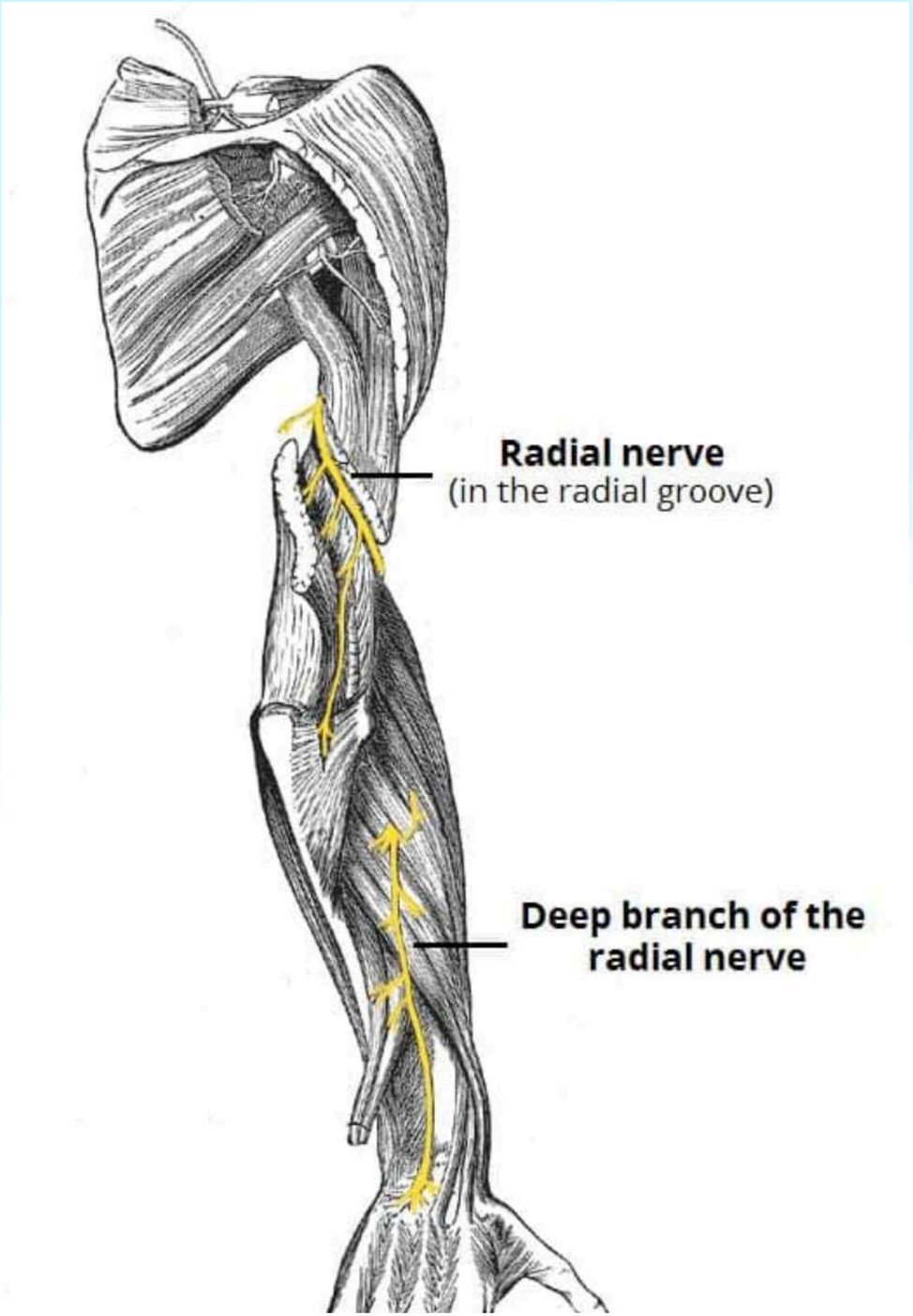
Axilla : Posterior to the **axillary artery**.
Exits inferiorly (via the triangular interval)
Br. to long and lateral heads of the triceps.

Radial groove in humerus : Br. to medial head of the triceps.
Close relation to deep branch of the **brachial artery**.

Anterior to the **lateral epicondyle** through the **cubital fossa.**

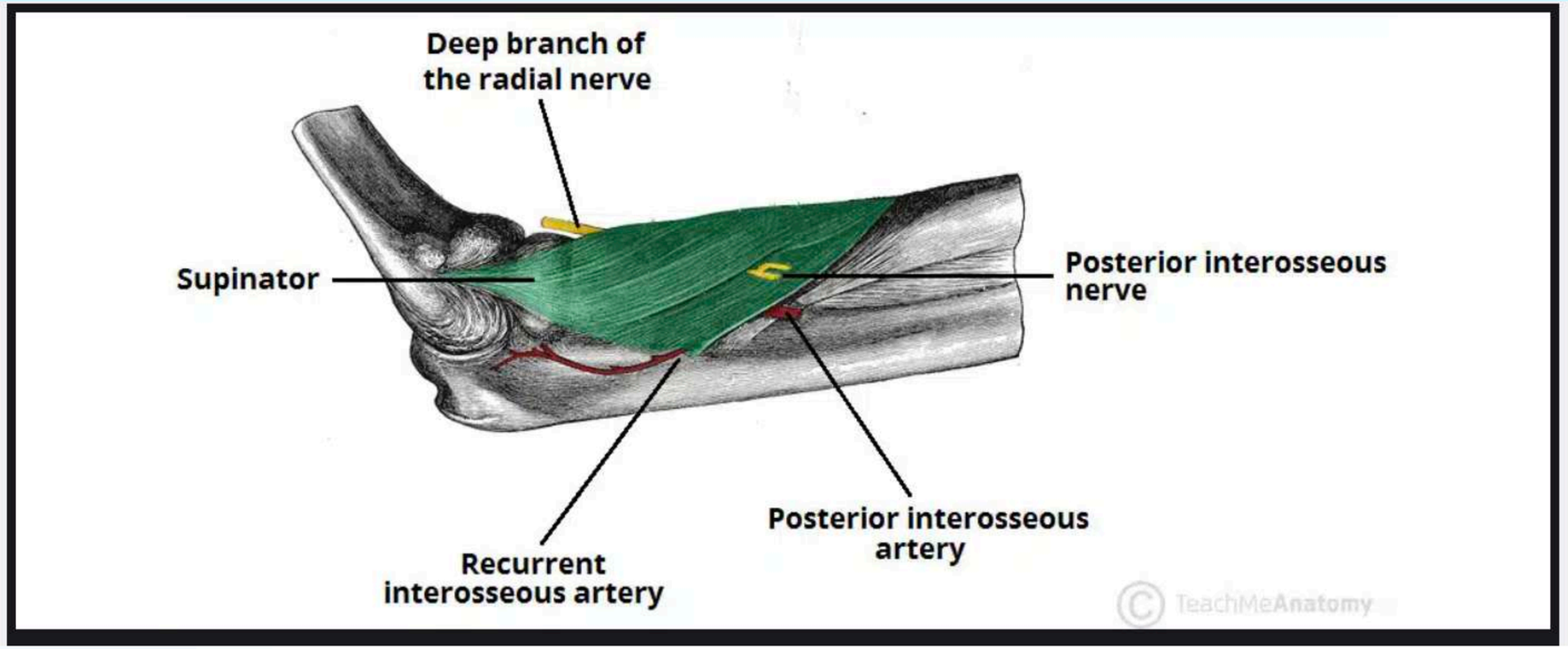
Termination:

- **Deep branch** (motor) – muscles in the posterior compartment of the forearm.
- **Superficial branch** (sensory) – cutaneous innervation of the dorsal hand and fingers.



POSTERIOR INTEROSSEOUS NERVE : *PIN*

Penetrates the supinator



MOTOR:

- Triceps brachii
- Anconeus
- Brachioradialis
- ECRL

Deep branch of the radial nerve:

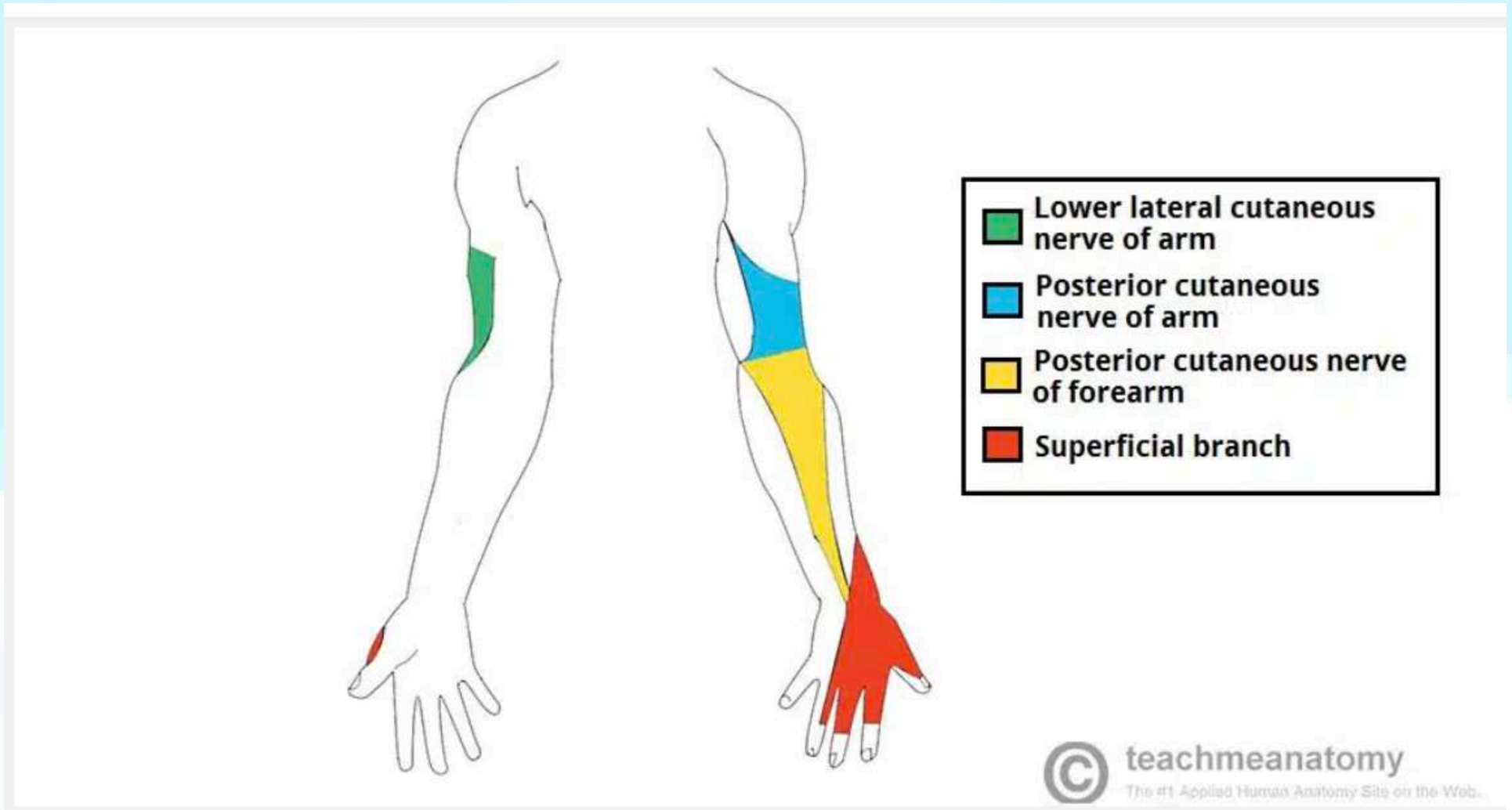
- ECRB
- Supinator

Posterior interosseous nerve (a continuation of the deep branch after the supinator):

- APL, EPB, EPL
- ECU
- EIP
- EDC
- EDM

SENSORY

- **Lower lateral cutaneous nerve of arm**
- **Posterior cutaneous nerve of arm**
- **Posterior cutaneous nerve of forearm**
- Terminal To hand



Etiology:

- Saturday night palsy
- Crutch paralysis
- Fracture humerus
- Wartenberg syndrome (Brachioradialis)
- PIN palsy
- Supinator syndrome(Arcade of Frosch)

Loss of elbow extension

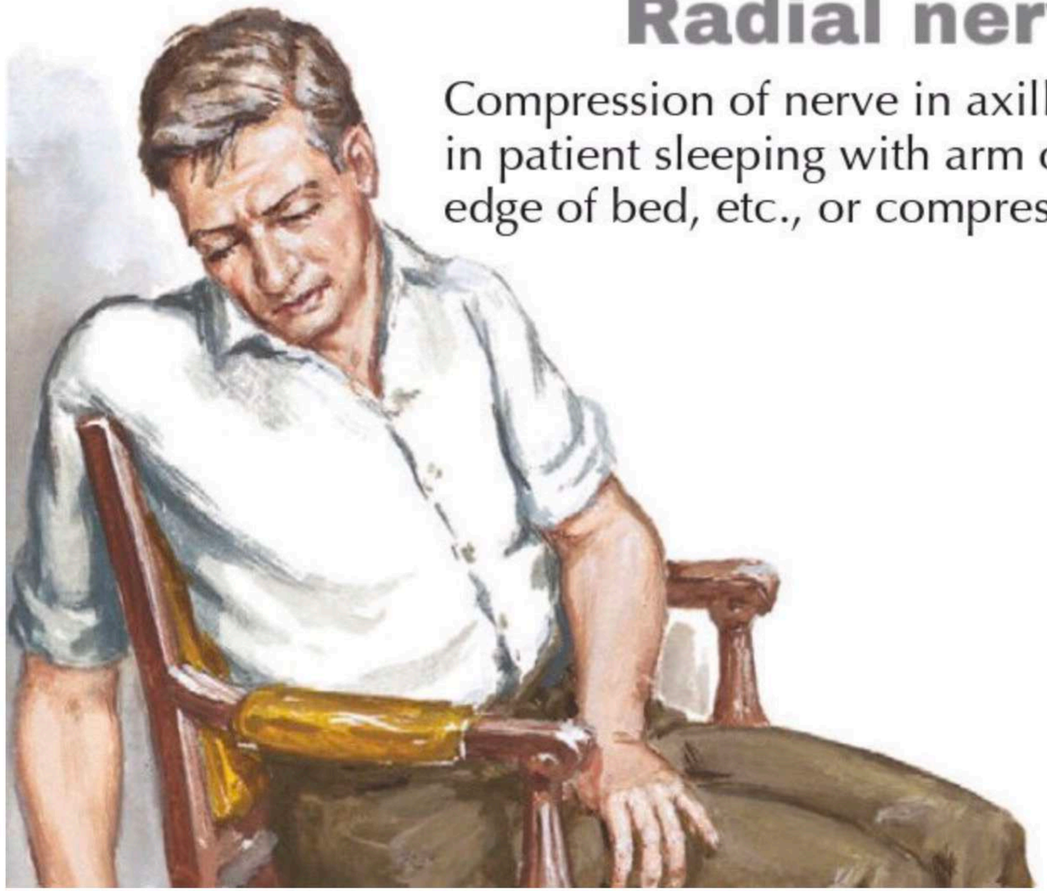
Weak supination

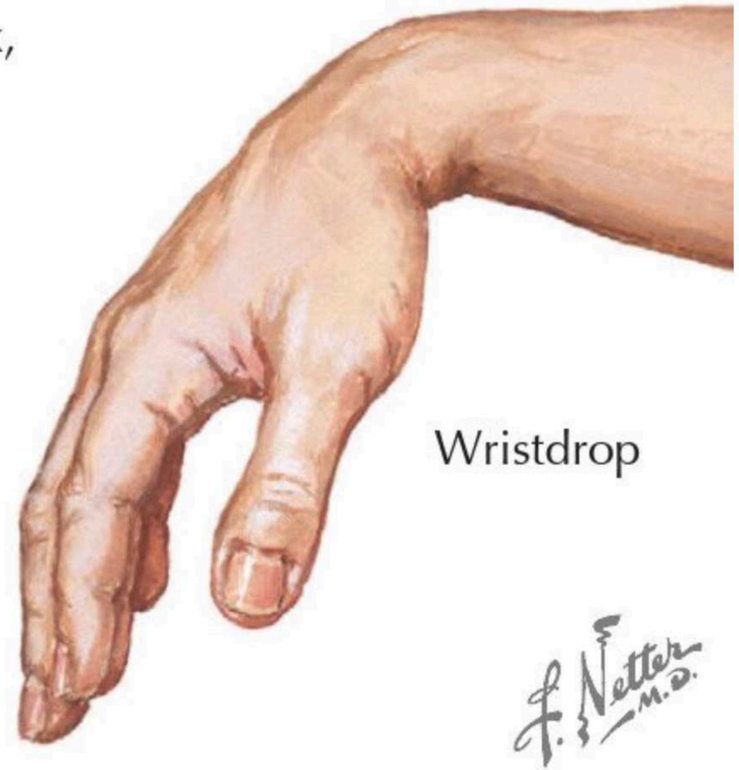
Wrist drop

Finger drop

Radial nerve

Compression of nerve in axilla or upper arm in patient sleeping with arm over chair back, edge of bed, etc., or compression by crutch





Wristdrop

F. Netter M.D.

DIAGNOSIS:

Clinical

Nerve conduction studies

Electromyography

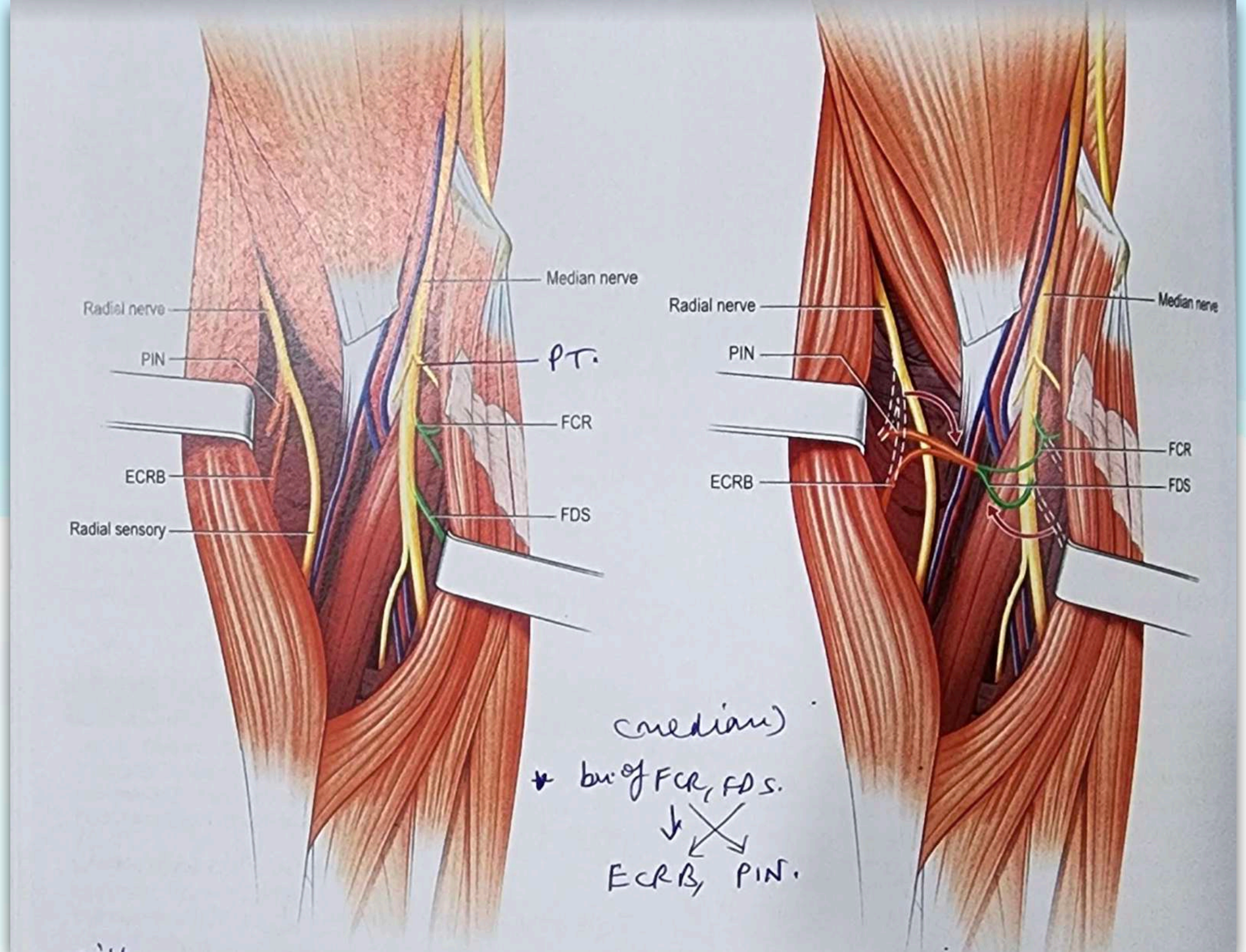
MRI

NERVE REPAIR:

Epineural repair
Cable nerve graft

MOTOR NERVE TRANSFER:
Median nerve to radial nerve
Fascicles of to FDS or FCR to PIN & ECRB
Br. to Pronator teres and AIN must be carefully preserved

SENSORY TRANSFER:
Webspace transfers from ulnar and median nerve
to radial nerve fascicles



LABC for sensory transfer:

Radial nerve injury causes numbness on dorsal of hand and wrist
Painful phantom pain

Lateral antebrachial cutaneous nerve to denervated radial sensory nerve

Not complete restoration of sensation
Reduction in pain

TENDON TRANSFER PRINCIPLES:

1) supple joints prior to transfer

2) soft tissue equilibrium

3) donor of adequate excursion

4) donor of adequate strength

5) expendable donor

6) straight line of pull

7) synergy/ tenodesis

8) single function per transfer

TENDON TRANSFER GOALS:

WRIST EXTENSION

FINGER EXTENSION

THUMB EXTENSION AND RADIAL ABDUCTION

STABILISATION OF WRIST

INTERNAL SPLINTING ???

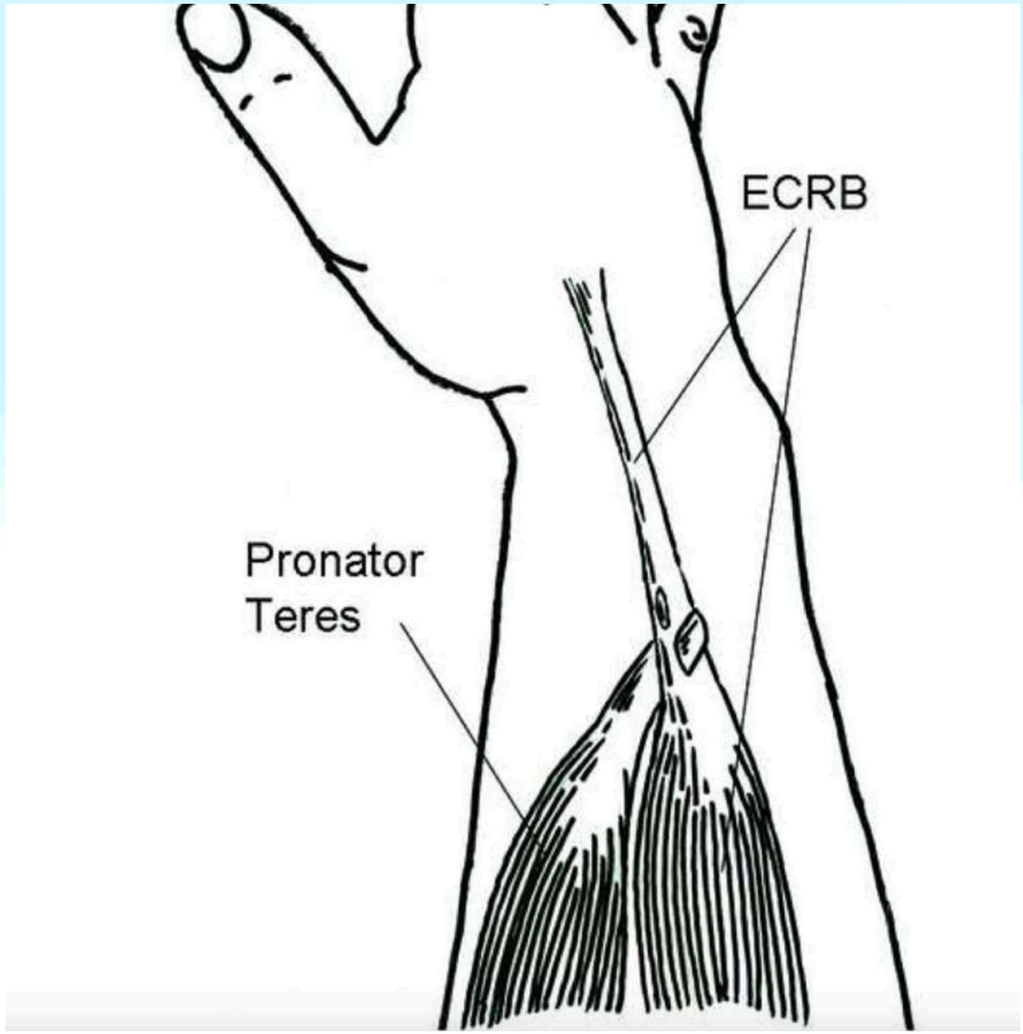
Early tendon transfer
Repair of radial nerve
Restoration of power grip, wrist stabilisation, preventing stretch of extensors

PT to ECRB

Difference with formal tendon transfer?

PT to ECRB is end to side

ECRB innervation expected



MODIFIED ROBERT JONES:

PT —> ECRL, ECRB

FCU —> EDC of 3,4,5 finger

FCR —> EDC of 2nd, EIP, EPL

“ Debate: FCU NOT EXPENDABLE”

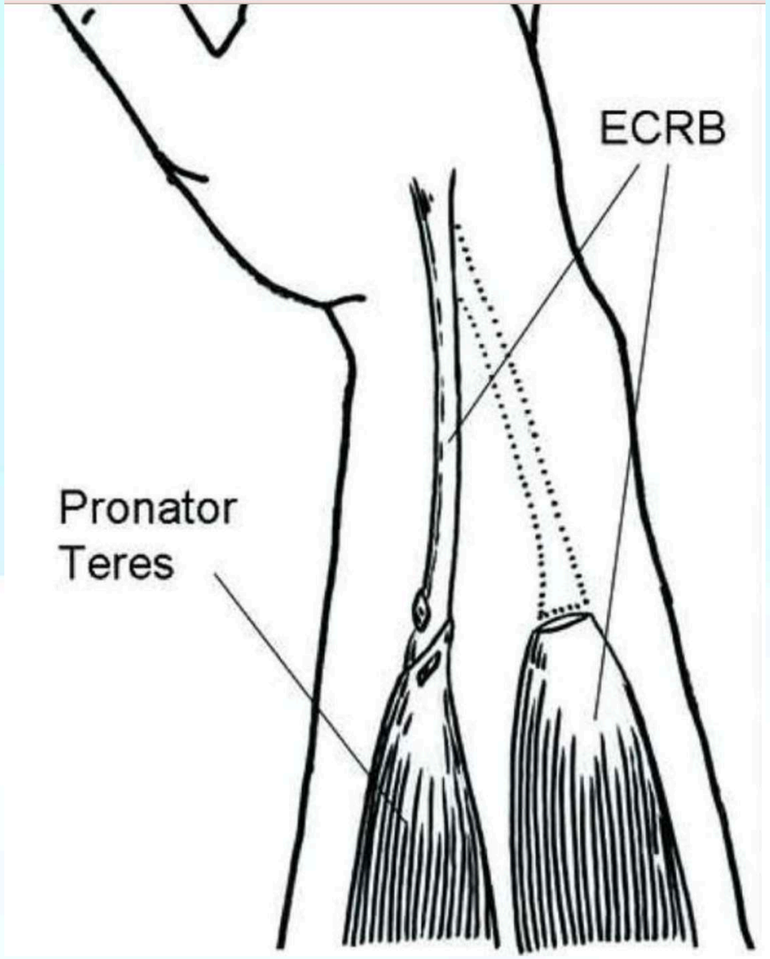
STANDARD FCU TRANSFER:

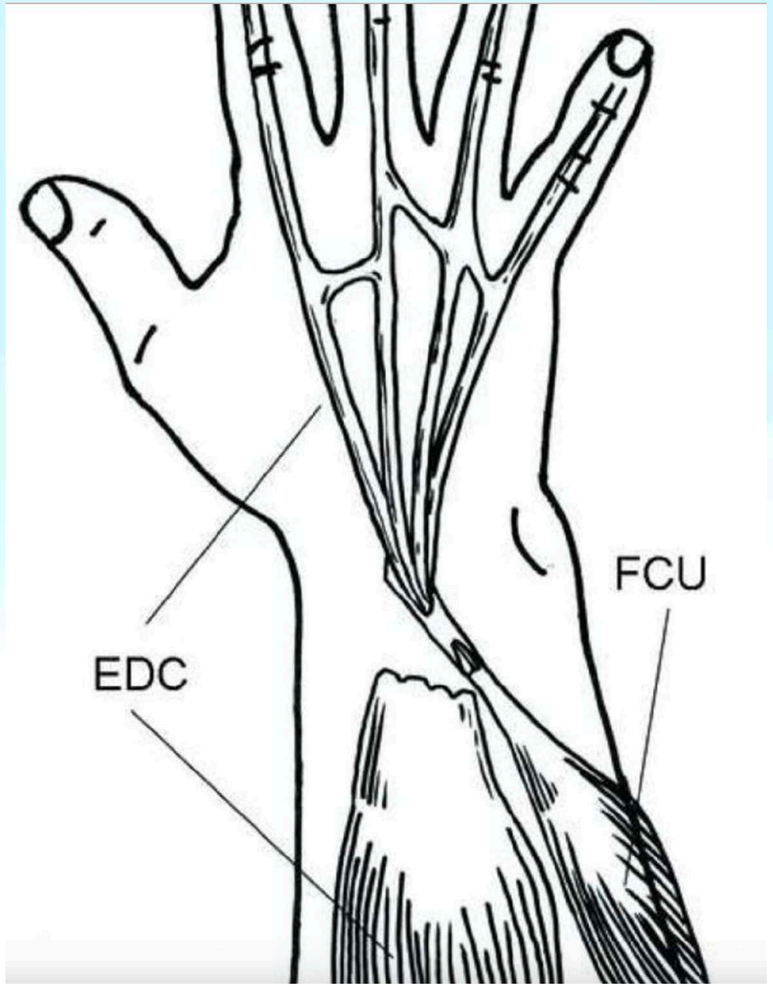
PT —> ECRB

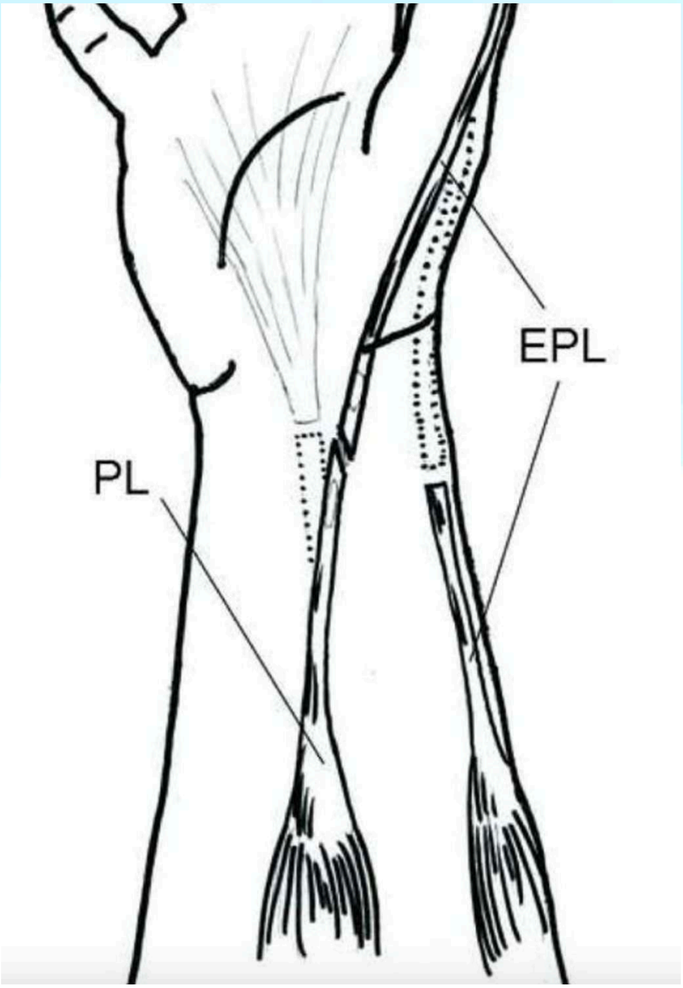
FCU —> EDC

PL —> EPL

SINGLE FCU SPLIT Transfer to EDC and EPL

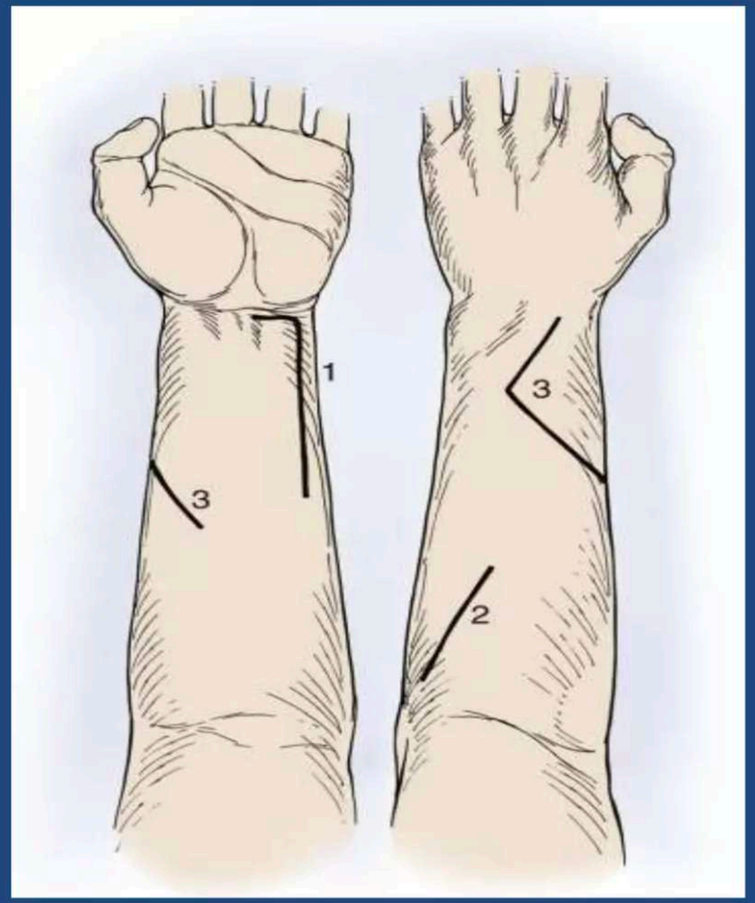




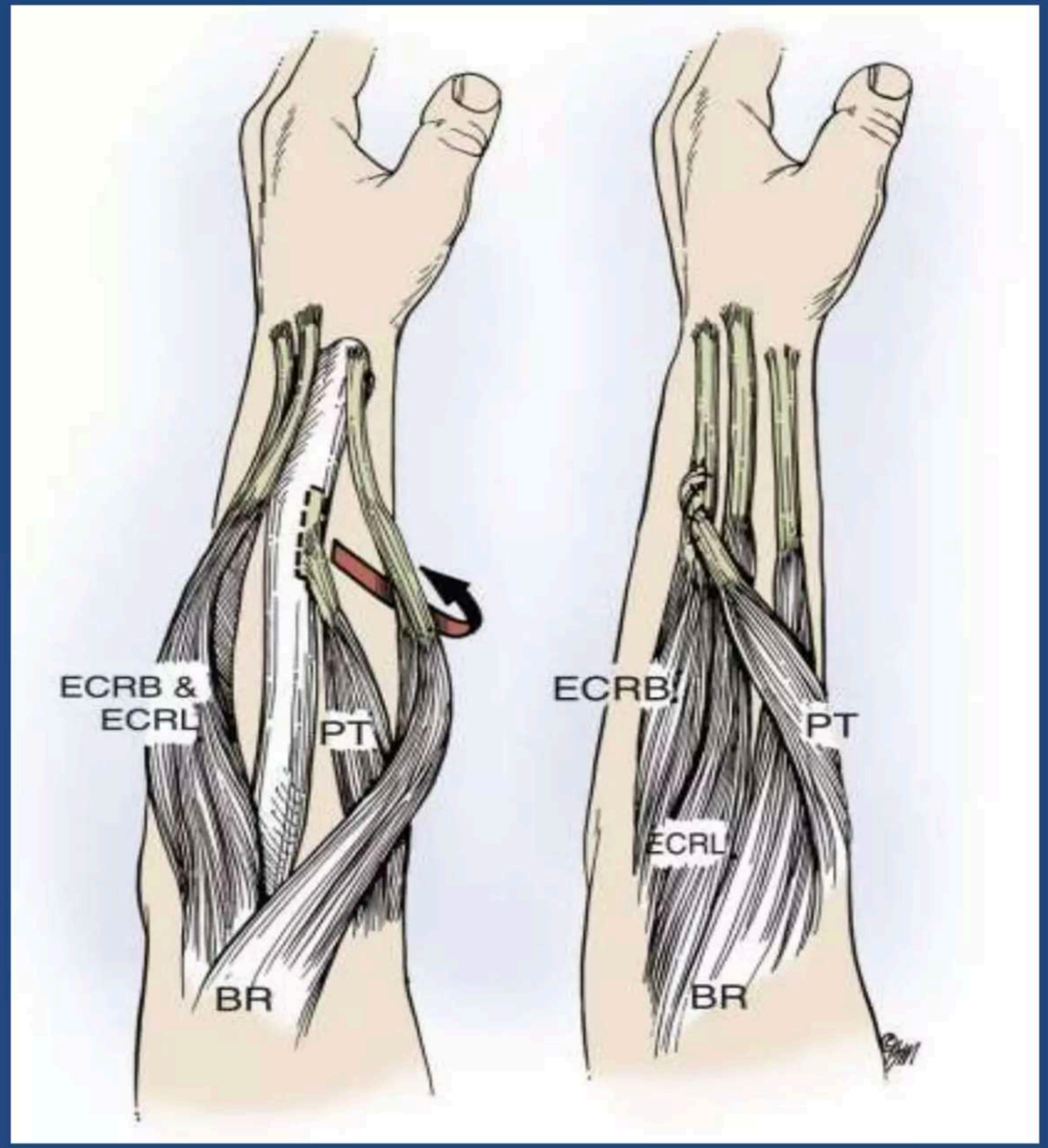


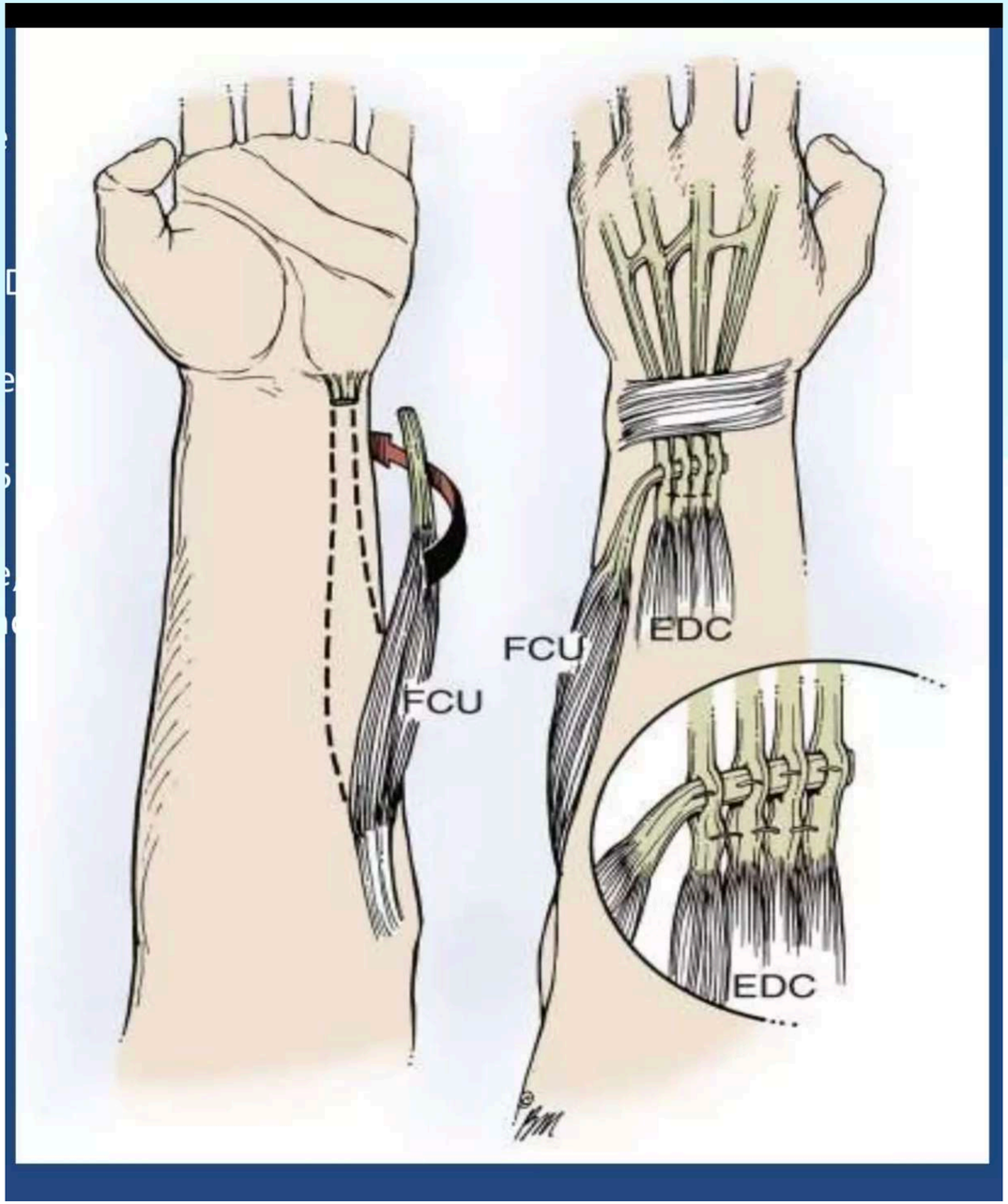
Operative technique

Incisions used in the FCU combination of transfers

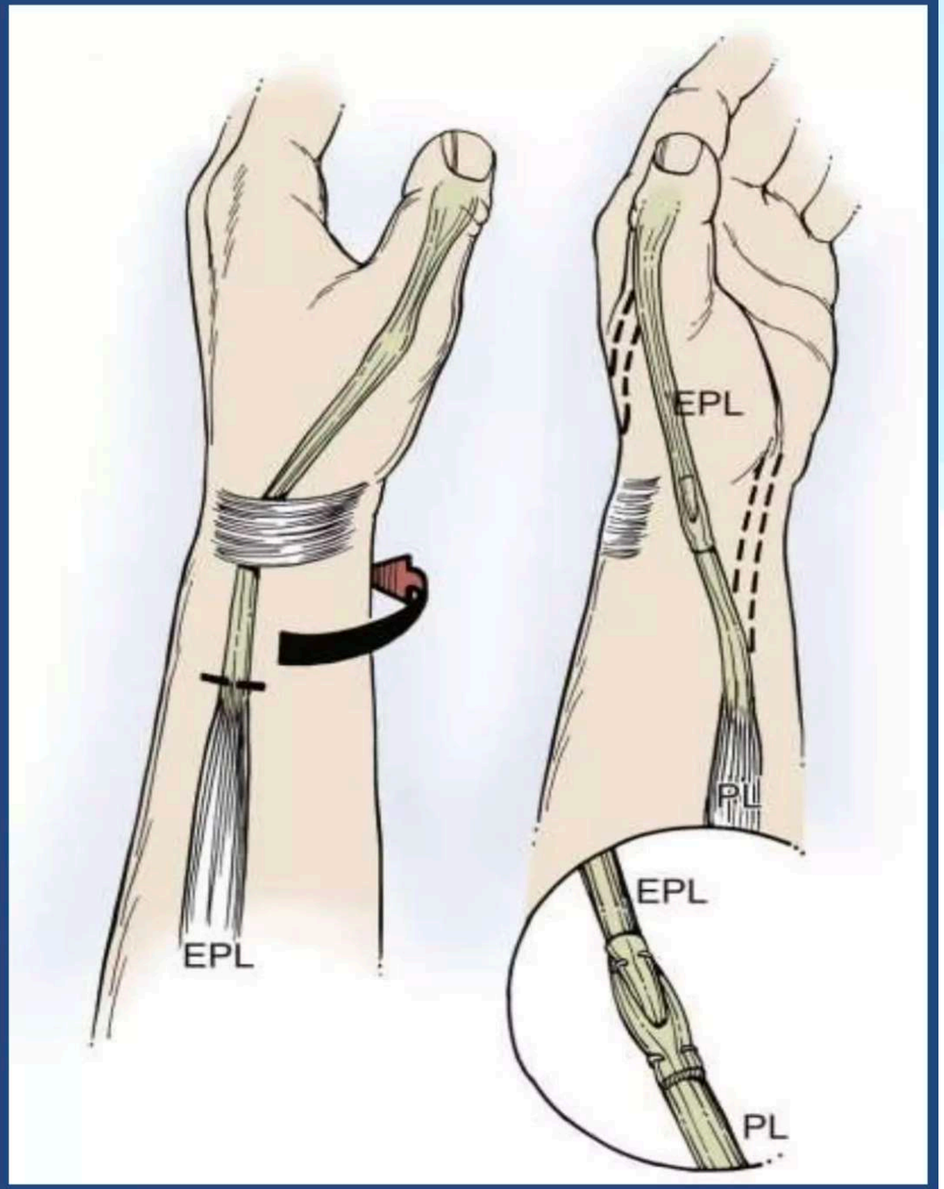


PT to ECRB transfer. It is important to take a strip of periosteum in continuity with PT insertion
to ensure adequate length for transfer





PL to rerouted EPL transfer. By rerouting EPL out of dorsal retinaculum, the transfer creates a combination of abduction and extension force on thumb.



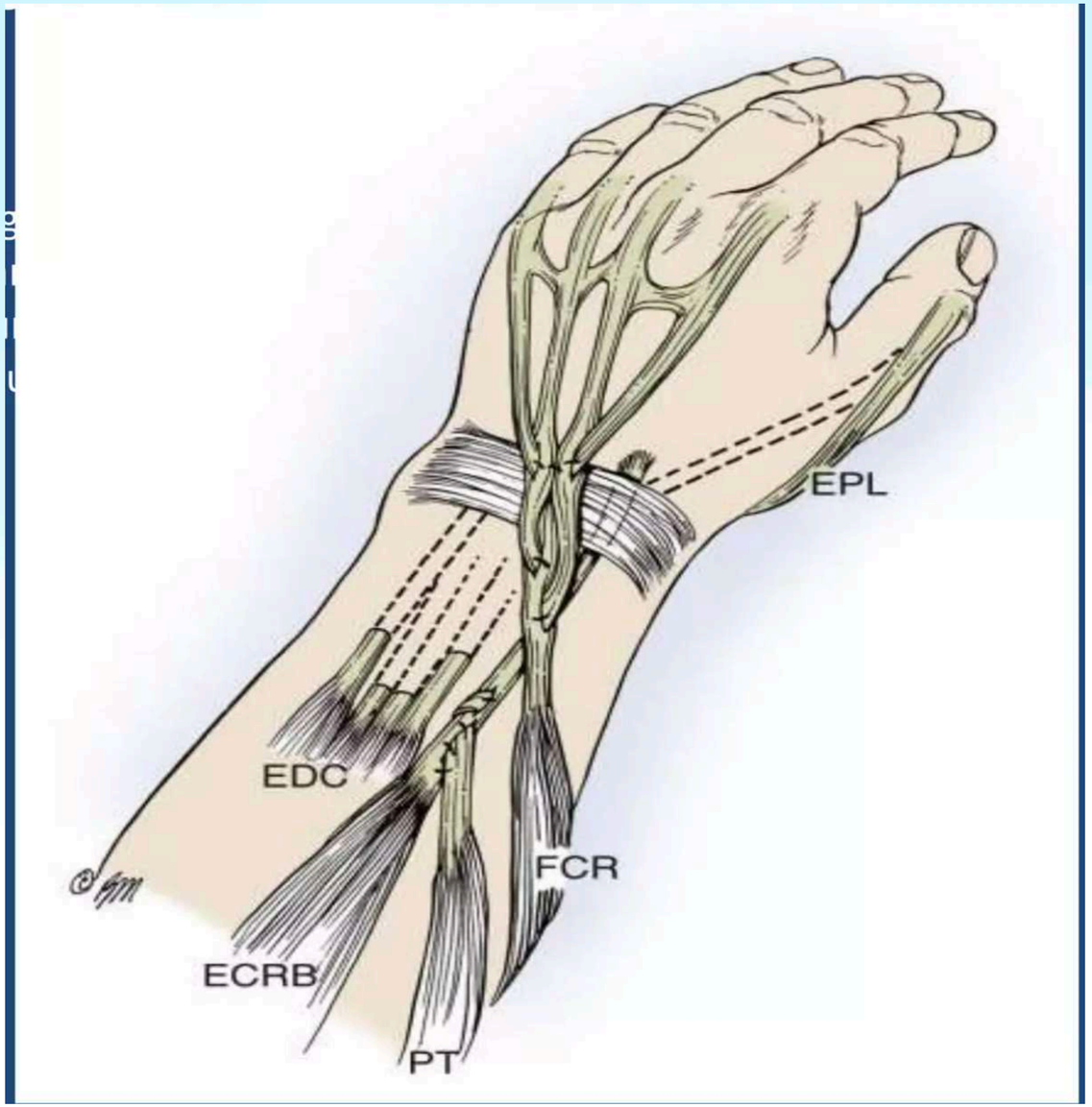
BRAND FCR transfer:

PT —> ECRB

FCR —> EDC

PL —> EPL

FCR transfer



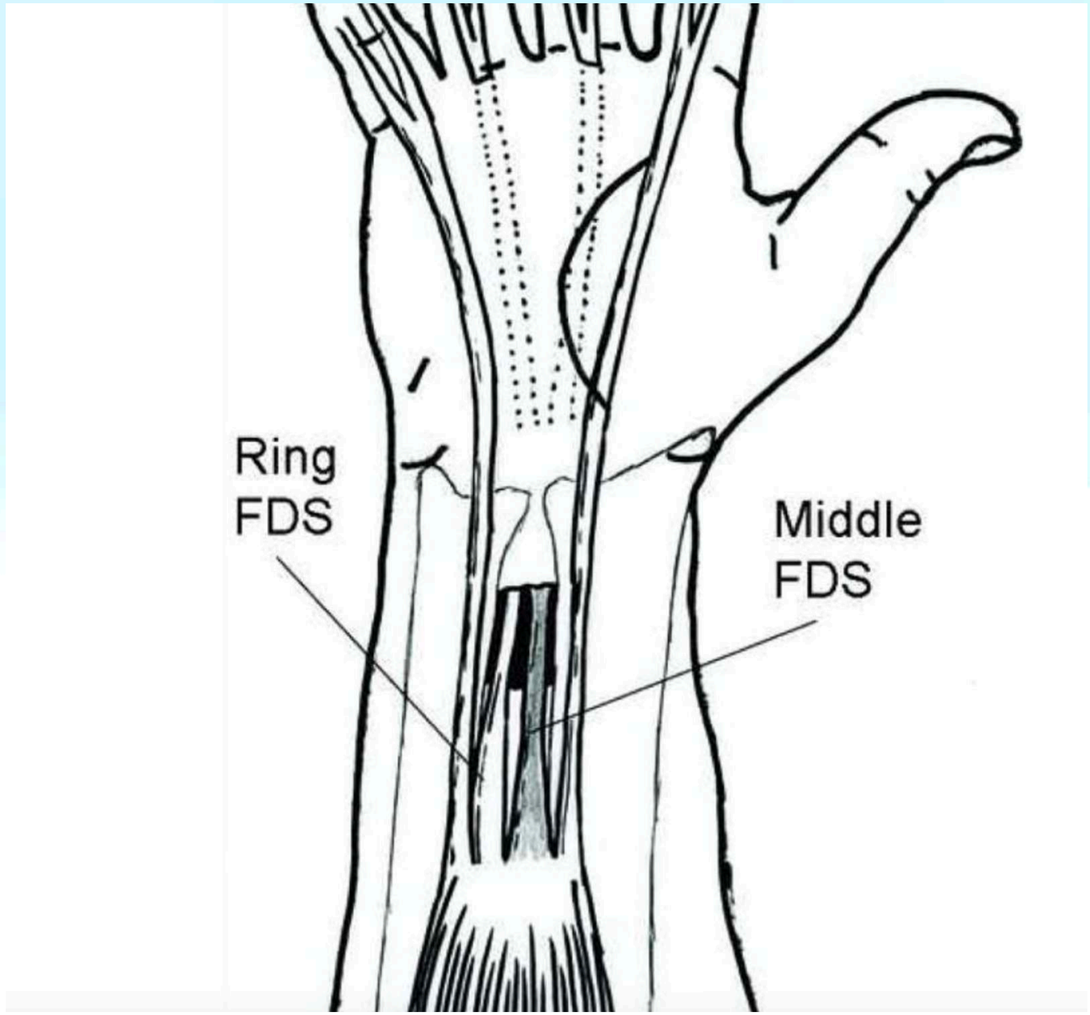
BOYES SUPERFICIALIS TRANSFER

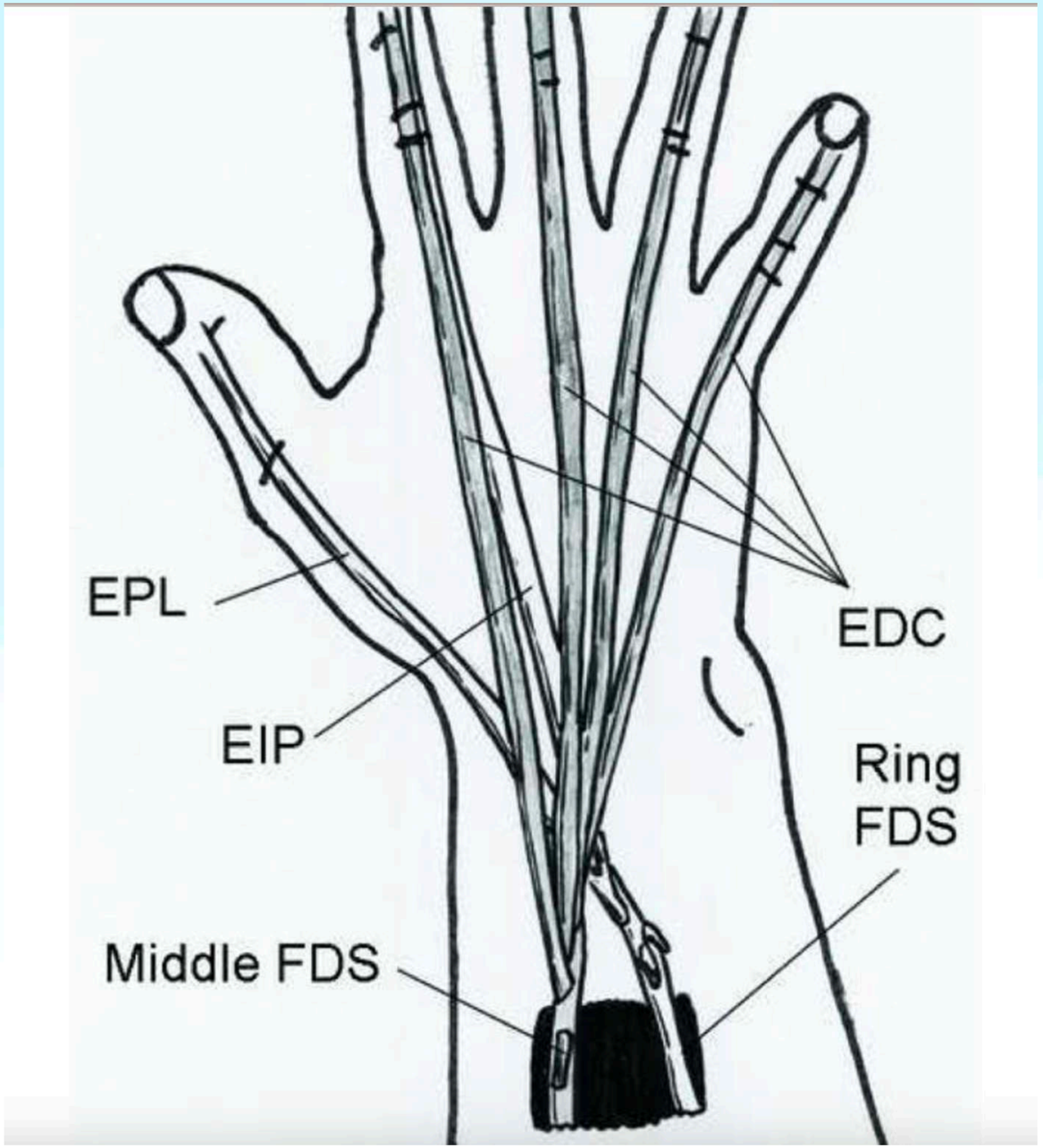
PT —> ECRB

FDS ring —> 3,4,5 EDC

FDS mid —> EIP , EPL

FCR —> APL, EPB





Postoperative Management

a long arm splint is applied that

- immobilizes the forearm in 15 to 30degrees of pronation.
- the wrist in approximately 45 degrees of extension.
- the MP joints in slight (10 to 15 degrees) flexion.
- the thumb in maximum extension and abduction.
- The proximal interphalangeal joints of the fingers are left free.

The cast is removed 4 weeks postoperatively; removable short arm splints to hold the wrist, fingers, and thumb in extension are made, which the patient wears for an additional 2 weeks, removing them only for exercise.

Free Flap for finger extension

In certain cases where there is loss of muscle function e.g VIC

GRACILIS transfer to EDC/ Wrist extensor
PIN used as motor
PIA / radial artery recurrent branch
Venae comittantes

THANK YOU

Linkedin - Dr.Priyanka Sharma

Instagram - drps_plastics

Youtube - Dr.PS