Extensor tendon injuries

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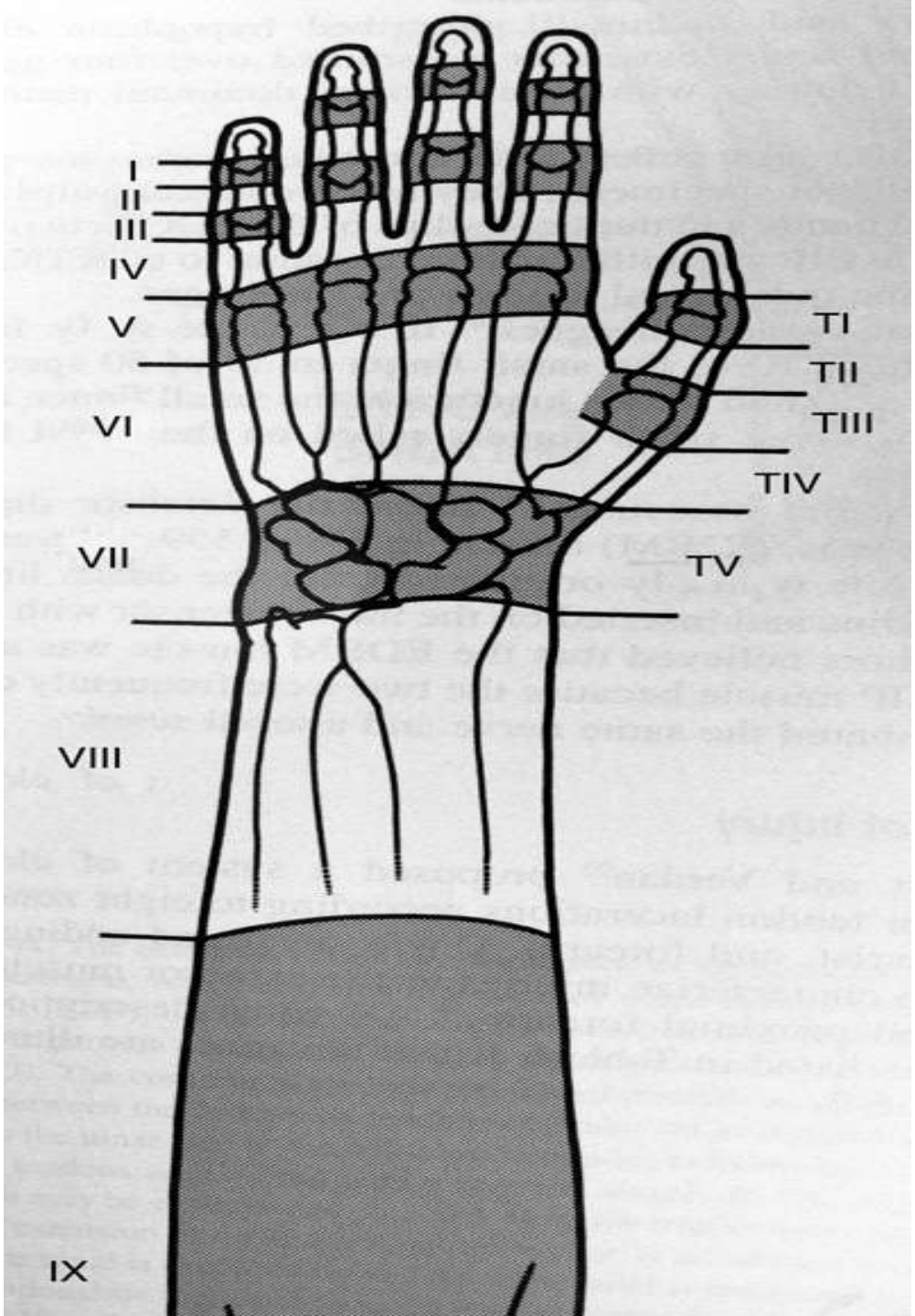
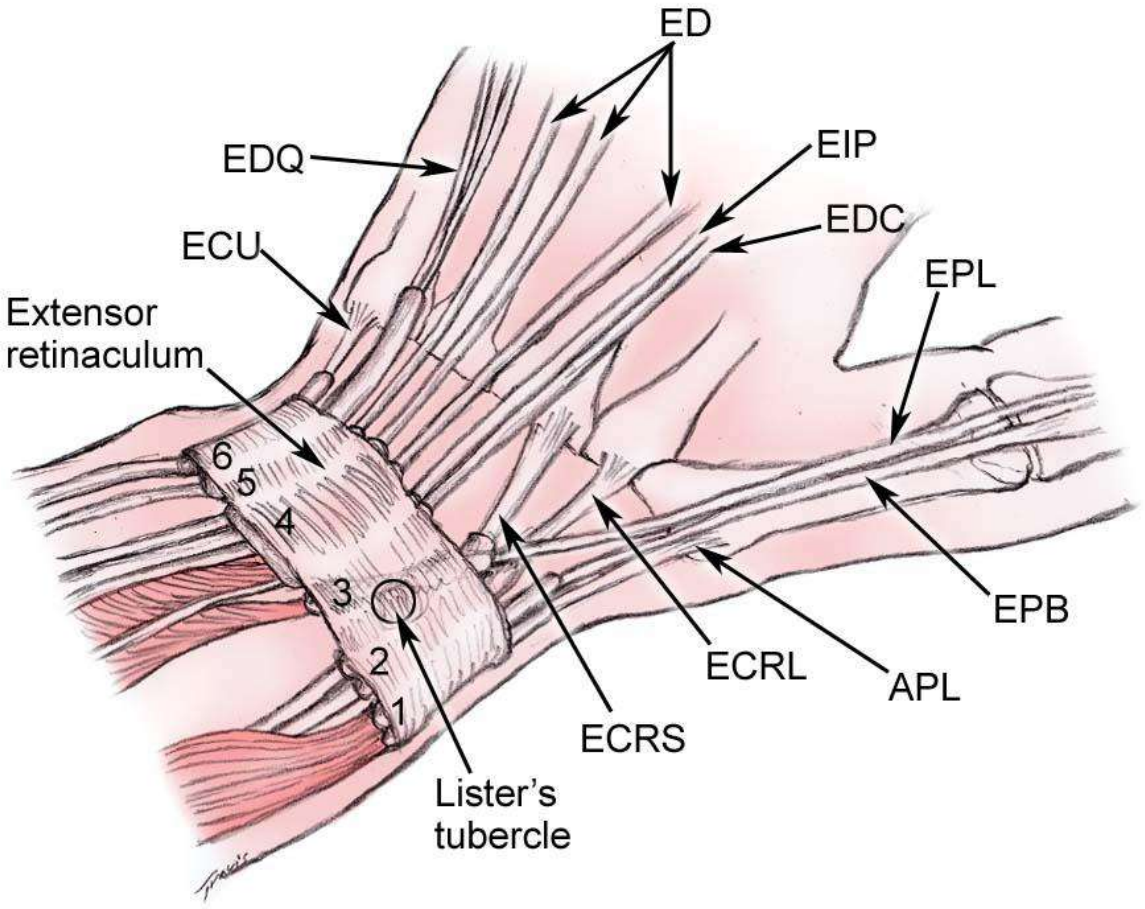
EBDH


I
II
III
IV
V
VI
VII
VIII
IX
TI
TII
TIII
TIV
TV


ED
EDQ
EIP
EDC
ECU
EPL
Extensor
retinaculum
6
5
4
3
2
1
EPB
ECRL
APL
ECRS
Lister's
tubercle

Indications

- Tendon laceration more than 50%
- Tendon laceration less than 50% with significantly decreased strength in comparison with contralateral finger
- Tendon laceration associated with significant overlying skin loss, joint space penetration, or bony fracture

Caution

- Contaminated injury, particularly open zone 5 "fight bite" injury
- Presence of bony fracture, open joint space, or significant overlying skin loss
- Injuries proximal to zone 6
- Injury chronicity, associated fracture, joint stability, injury mechanism, and underlying arthritis complicate this simple algorithm.

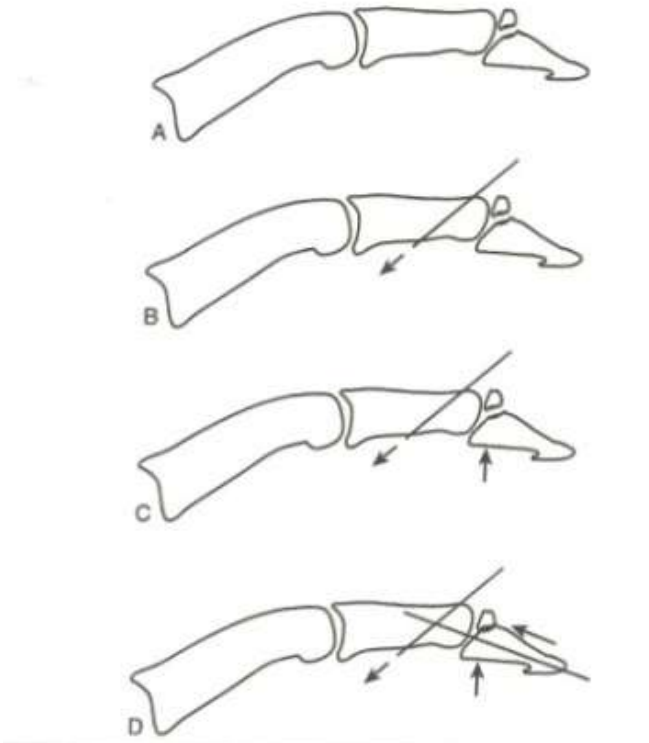
Doyles' Classification of Zone 1 Injuries

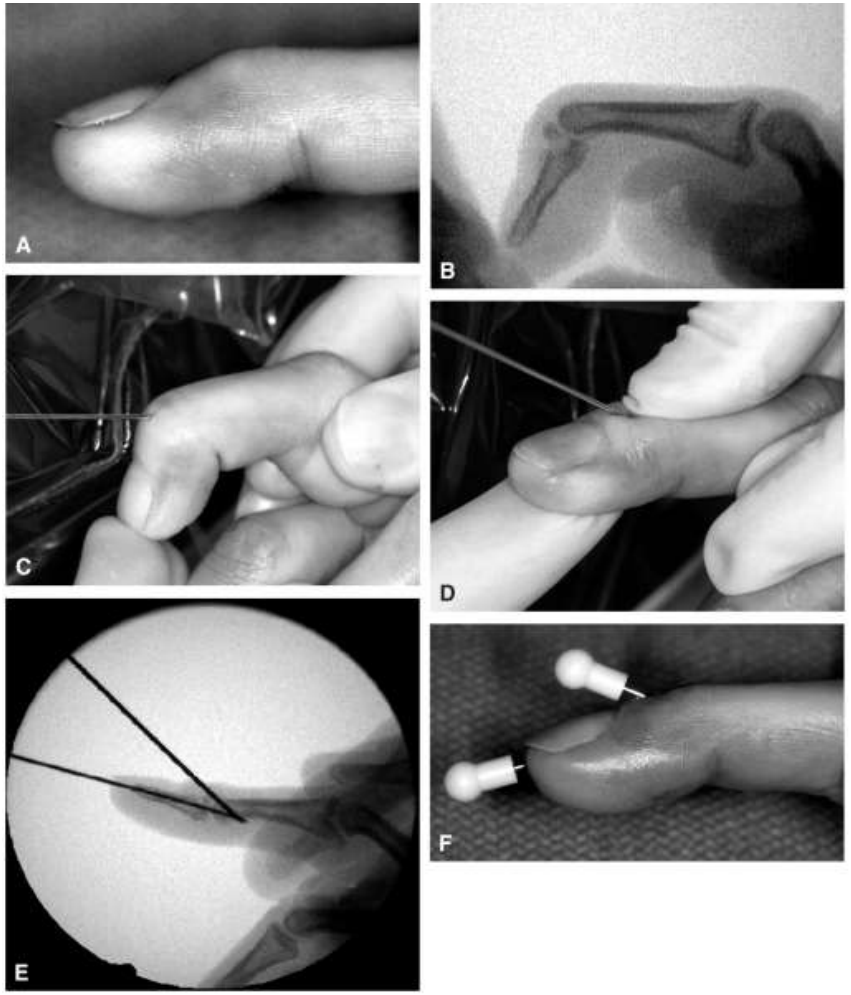
- 1- Closed
- 2- Open
- 3- Open with loss of skin and tendon substance
- Large mallet fractures

Zone 1 management

- In general: closed injury = splint
- Open injury= repair
- Injury chronicity, associated fracture, joint stability, injury mechanism, and underlying arthritis complicate this simple algorithm.
- Fracture subluxation : fragment > 1/3 articular surface

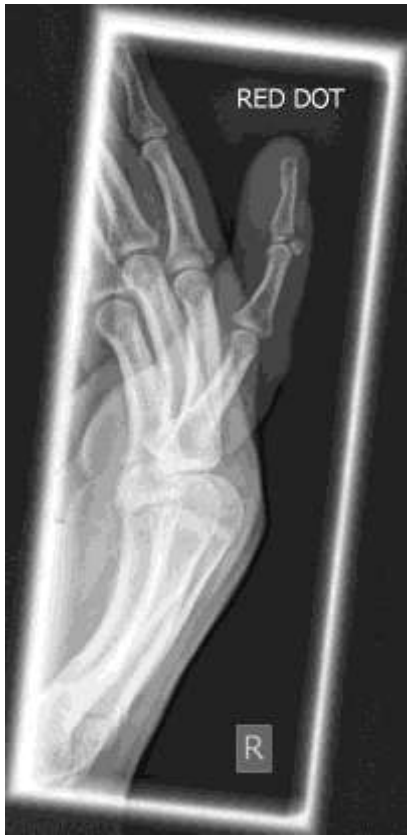
Mallet type 4- Pinning



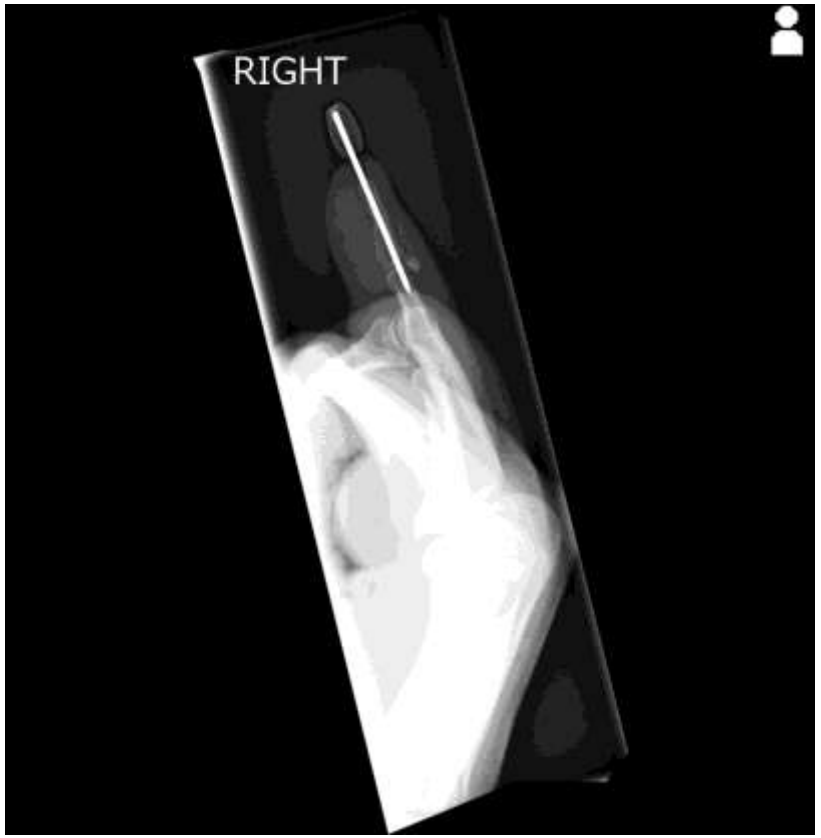


Mallet Pinning

preop

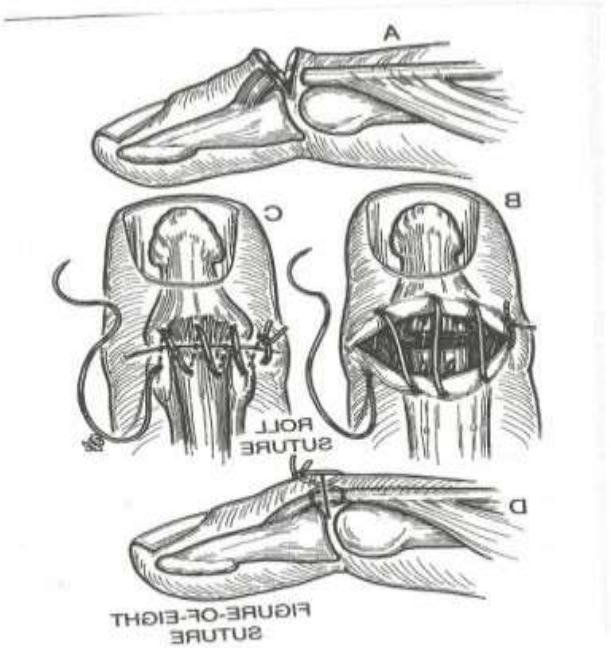


Post op



ZONE 1 OPEN

- Dermatotenodesis
- Mallet finger splint/Kirschner wire (K-wire) fixation



Zone 2

- Incomplete tendon injuries can be treated non-surgically with a short, 1-to 2-week course of splinting, if greater than 50% of the tendon is intact, if no extensor lag exists, and if active

  extension occurs without weakness

- Complete tendon injuries should be treated with primary repair.

- Options include a running stitch over-sewn with a Silfverskiöld

  cross stitch, a figure-of-eight stitch, or tenodermodesis.

Zone 3

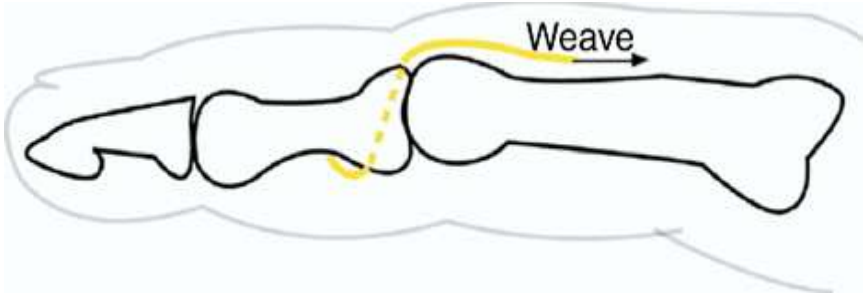
- The Elson test for an early central slip injury
- Can occur several weeks after injury
- Treatment similar to zone 1.

Zone 3 open

- Consider surgery for open injuries, displaced avulsion fractures of the middle phalanx, PIP instability, and failed nonsurgical treatment.
- primary repair for open lacerations and suture anchor repair for avulsions and distal central slip injuries.
- Mini-fragment screws are considered for fixation of larger middle phalangeal base

Central slip reconstruction

- Snow's central slip turndown
- Aiche's central lateral band mobilization
- Ahmad and Pickford (2009) have described using a slip of flexor digitorum superficialis for central slip reconstruction
- Ahmad & Pickford 2009



Open zone 3 rehab

- similar to that of nonsurgical management, with static extension splinting for 4 to 6 weeks.
- Evans early active short arc motion protocol compared to static splinting.
- Pratt static 3 weeks; Capener coil 3 weeks

Zone 4

- Tendon strong enough : modified Kessler/ horizontal mattress
- Early active mobilisation (Norwich)

Zone 5

- Watch out for Bites: tendon of secondary importance

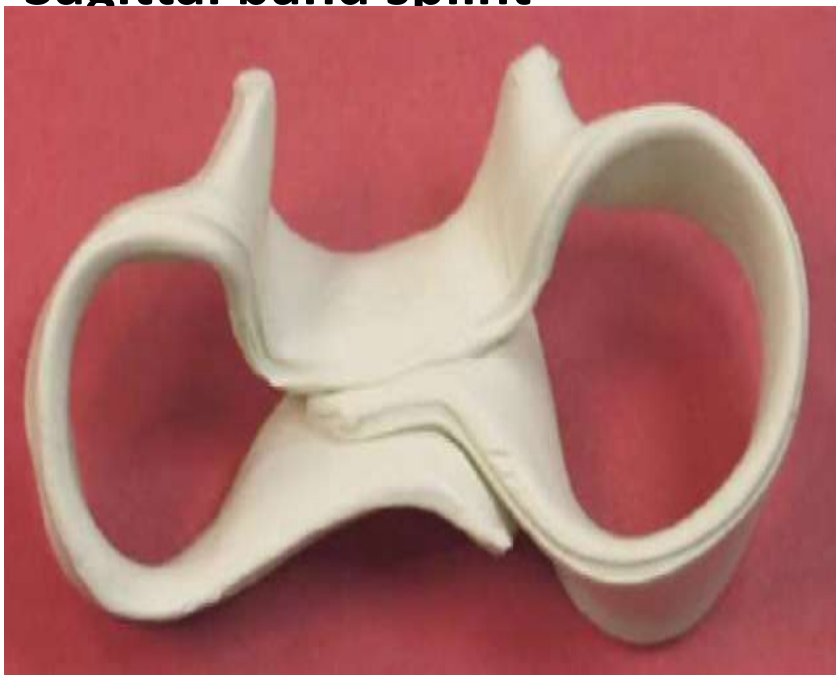
- Blunt trauma to the MCP joint can cause rupture of the sagittal bands, with subsequent extensor tendon subluxation.

Sagittal band rupture

Sagittal band ruture

- **Rayan and Murray Classification**
- **Type I injuries involve a contusion without a tear.**
- **Type II is associated with subluxation of the extensor, with its border extending past the midline but maintaining contact with the metacarpal head condyle.**
- **Type III involves a dislocation of the tendon between the metacarpal heads.**
- **Patients with type II and III injuries experience snapping of the tendon with flexion and extension, and patients with type III injuries might have difficulty in actively extending the digit from full flexion.**
- **Acute injuries can be treated with extension splinting of the MCP joint for 6 weeks. The splint is fabricated with the injured MCP joint immobilized for 8 weeks in 25° to 35° of hyperextension relative to the adjacent**

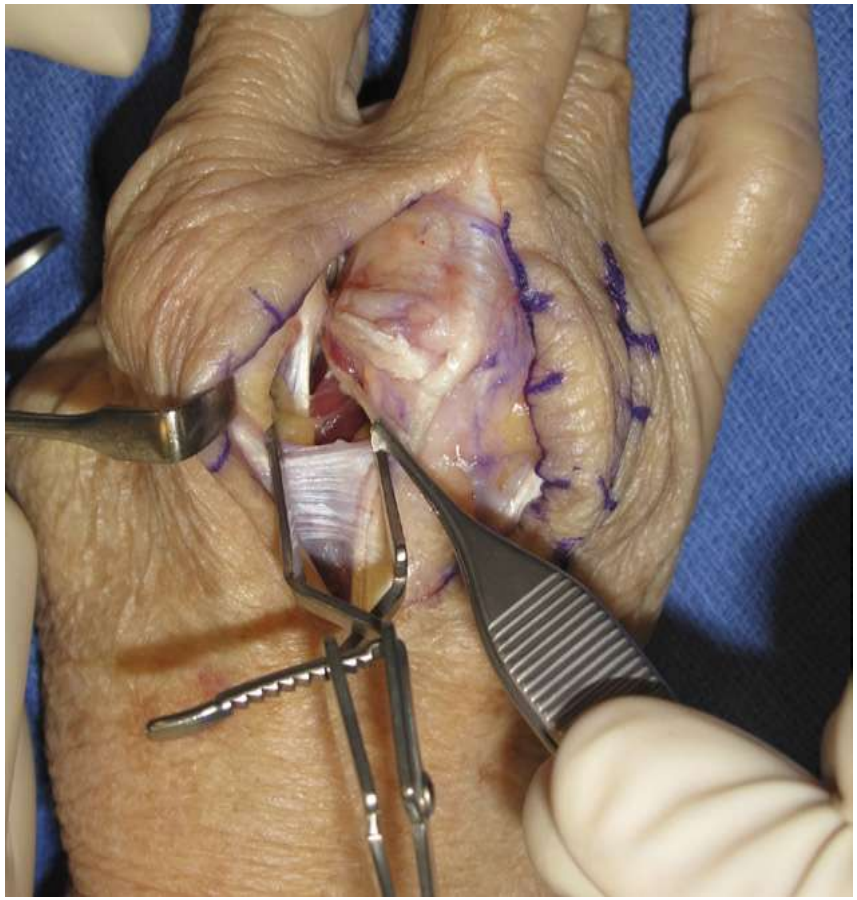
Sagittal band splint



Sagittal band reconstruction

- Distally based slip of the extensor tendon or juncturae

- New technique using a dynamic lumbrical muscle transfer that has the benefit of being extra-articular and, therefore, minimizing stiffness.



Zone 6

- Better outcome:fewer associated joint injuries, decreased adhesion formation,and less chance of tendon imbalances.
- Diagnosis: challenging because the patient might still be able to extend the MCP joint via the EIP, EDM, and/or junctura tendinum.
- It is critical to have a high index of suspicion

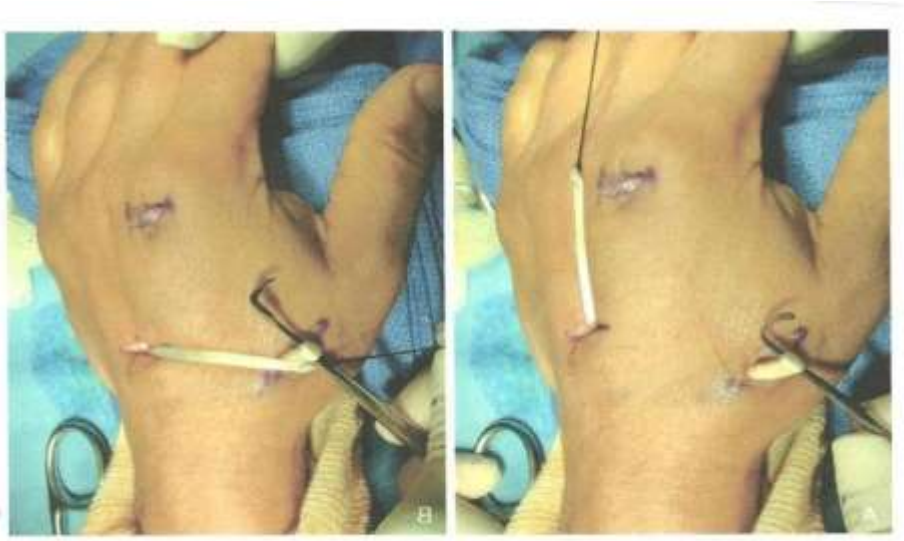
and to thoroughly evaluate for extension weakness

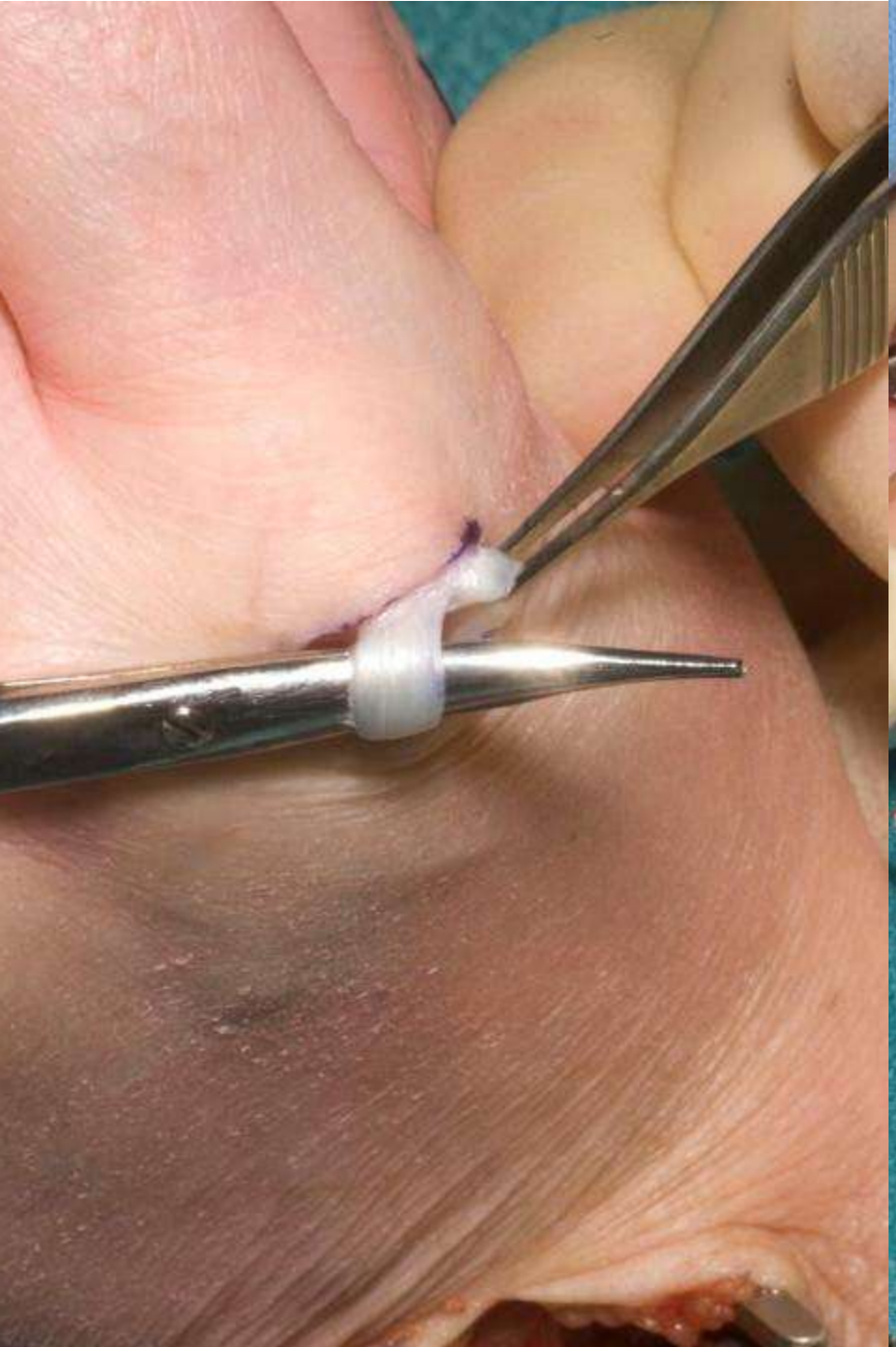
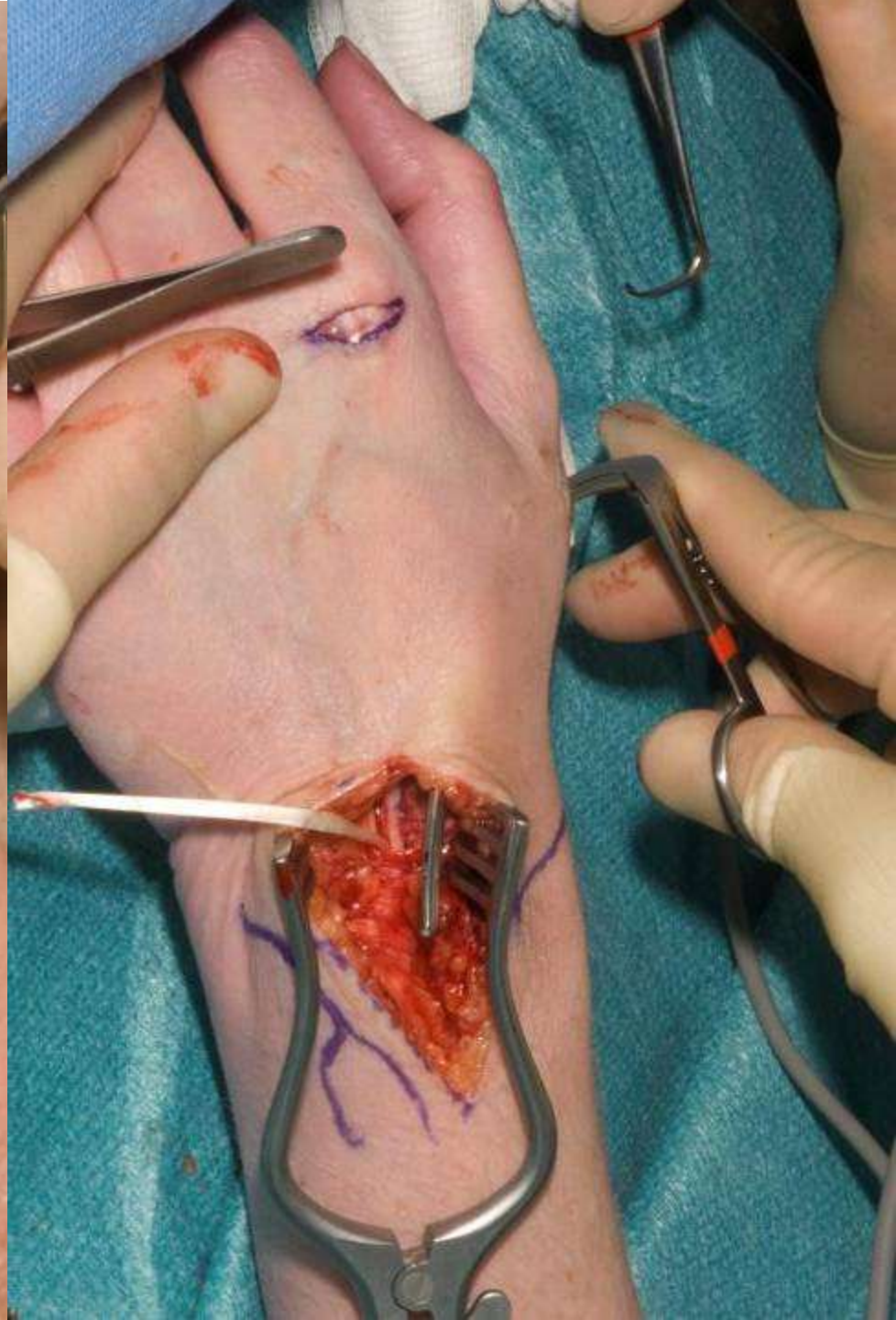
- Tendons big enough for core suture

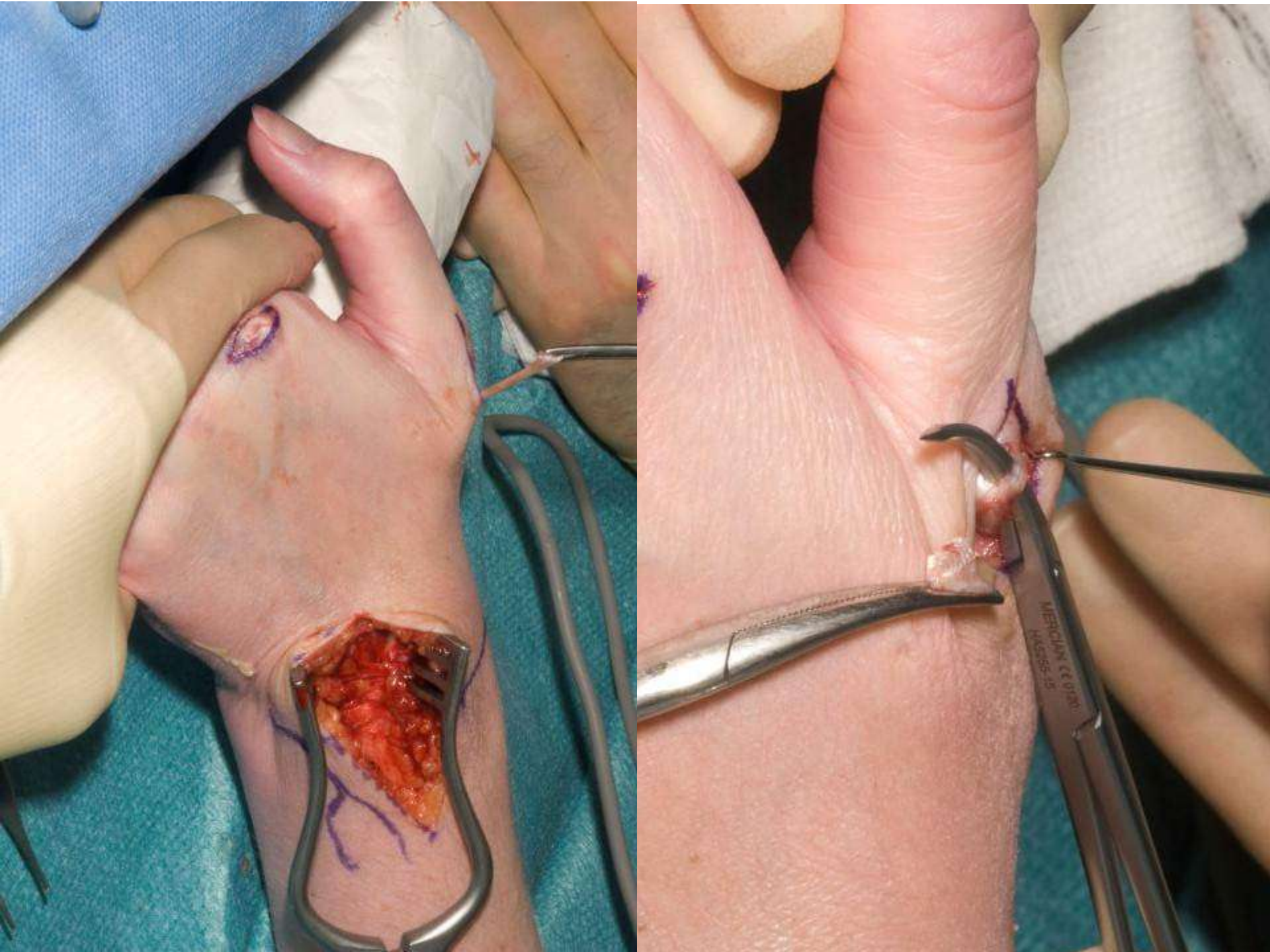
Zone 7 & EIP to EPL Transfer

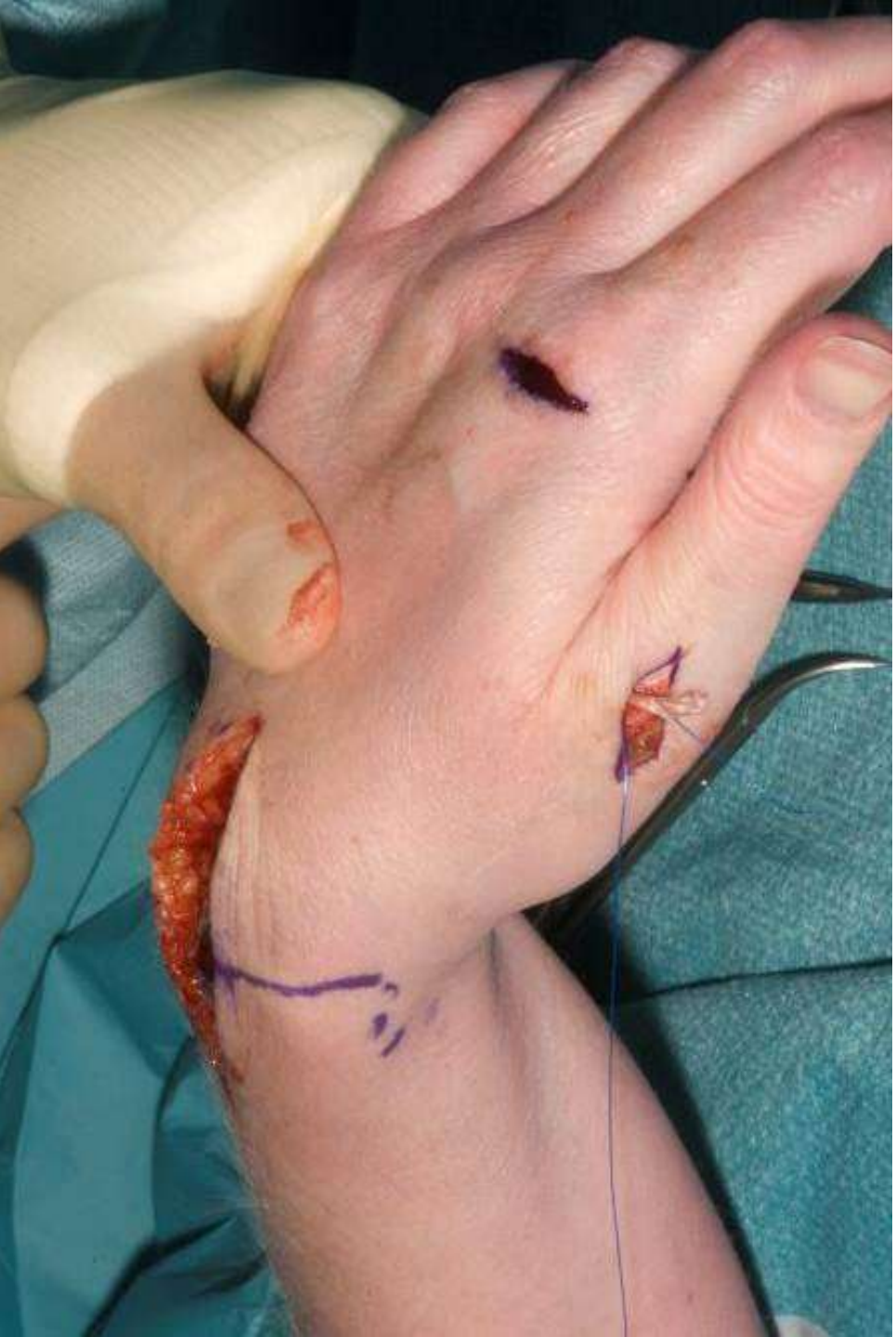
- Exposure ext retinaculum: step cut or zig-zag

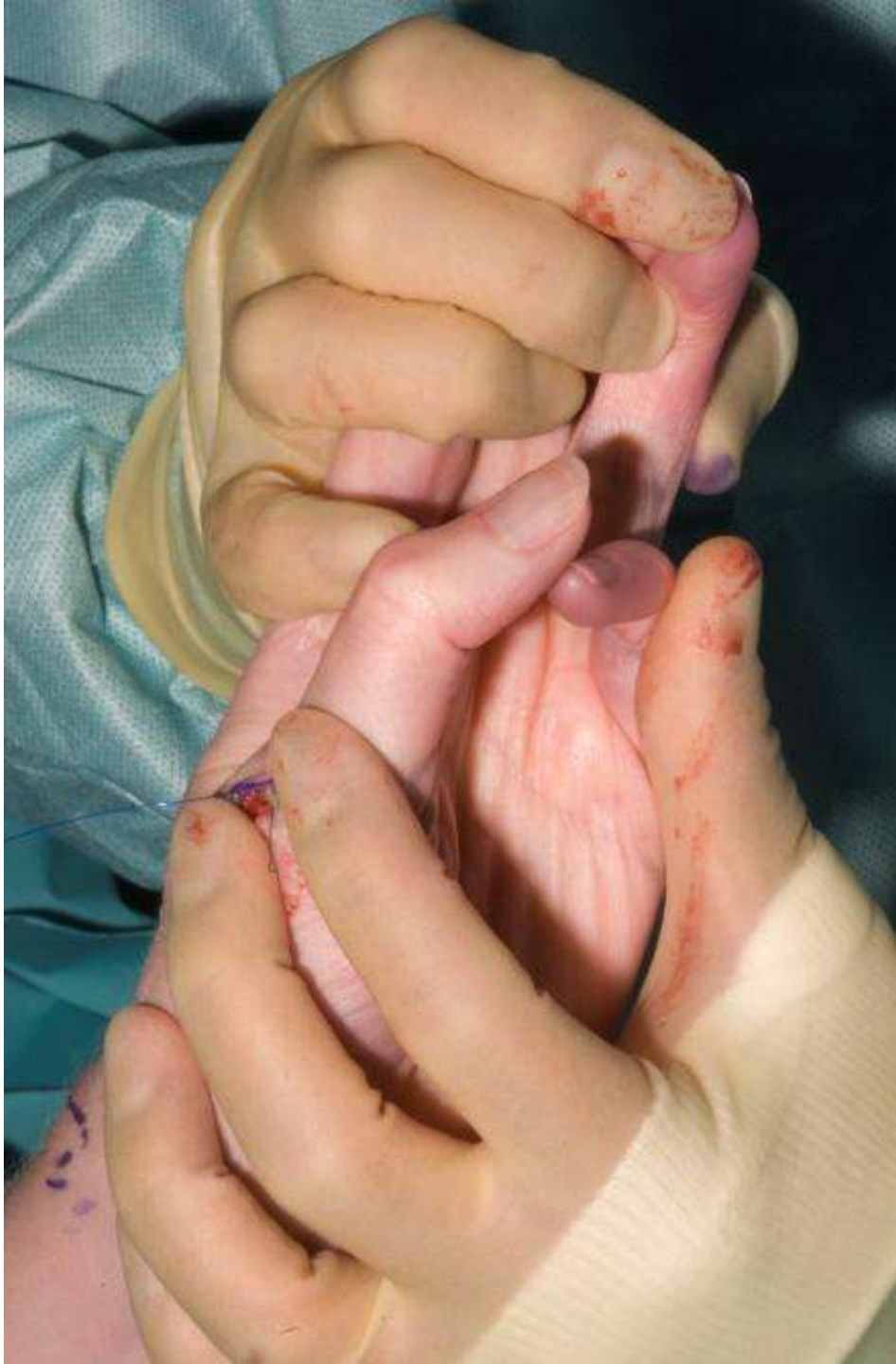
- Chronic Rupture : transfer
- EPL









ZONE 8 & 9

- SUTURE TENDON OR FASCIA
- MULTPLE MATTRESS OR FIG 8

Extensor tendon repair

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