

ALL HANDS ON DECK: Management of Acute Hand Pathology

Jacob Watson, MD, Capt, USAF, MC
UT Health San Antonio
Emergency Medicine Residency - PGY3

Learning Objectives

- Identify common presentations, pathophysiology and management of hand fractures and dislocations
- Recognize and manage various hand infections
- Review management techniques for nailbed injuries
- Review bedside surgical and splinting techniques related to hand injuries in the ED

Can't I just transfer the patient?

Main reasons to transfer the hand patient:

- **They need emergent operative intervention/ "it's really bad"**



Can't I just transfer the patient?

Main reasons to transfer the hand patient:

- They need follow-up (rural areas or poor social situation)



OVERVIEW

**Fractures/
dislocations**

**Lacerations/
wounds**

Infections

Majority of images and materials sourced from OrthoBullets, RadioPaedia or Roberts and Hedge's Clinical Procedures in Emergency Medicine

OVERVIEW

**Fractures/
dislocations**

Lacerations/
wounds

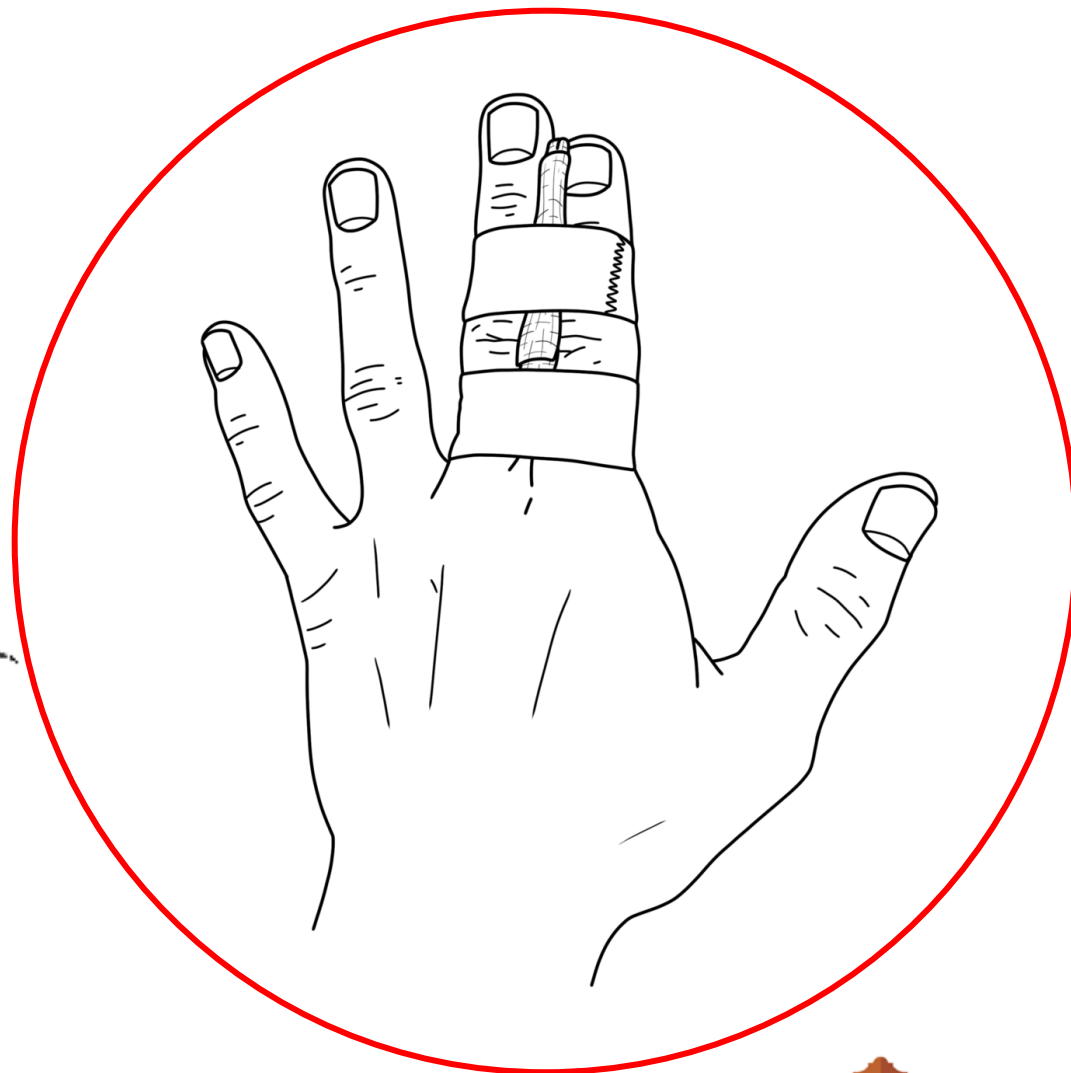
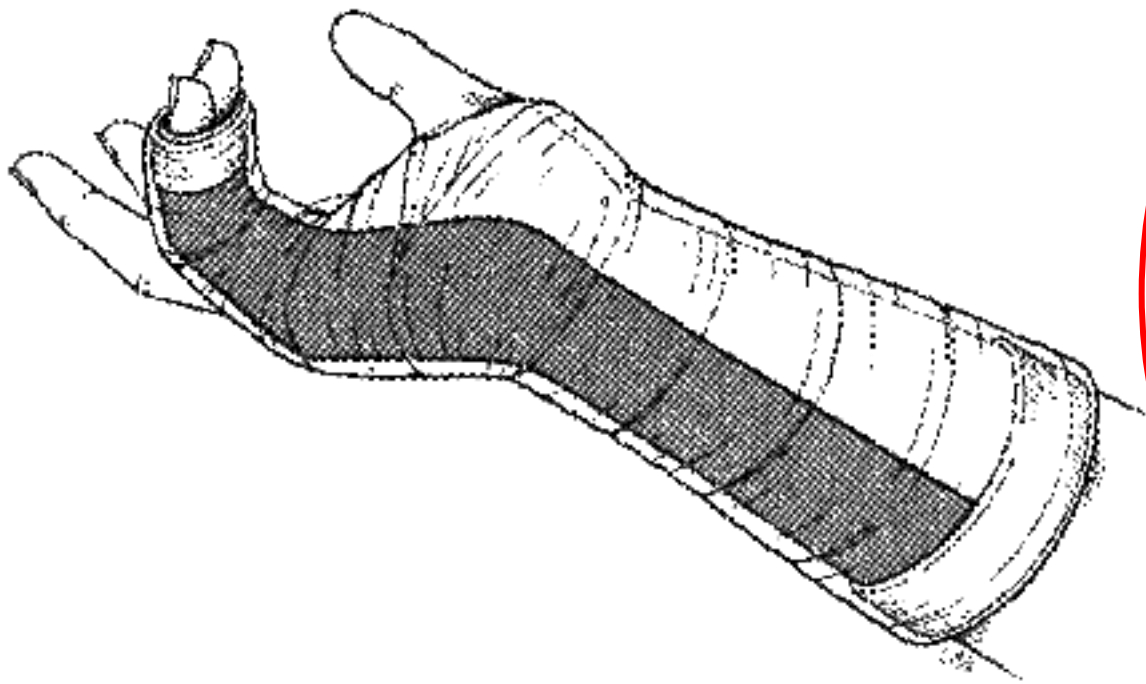
Infections

Finger	Shaft Angulation (degrees)	Shaft Shortening (mm)	Neck Angulation (degrees)	Rotational Deformity
Index & Long Finger	10-20	2-5	10-15	None
Ring Finger	30	2-5	30-40	None
Little Finger	40	2-5	50-60	None

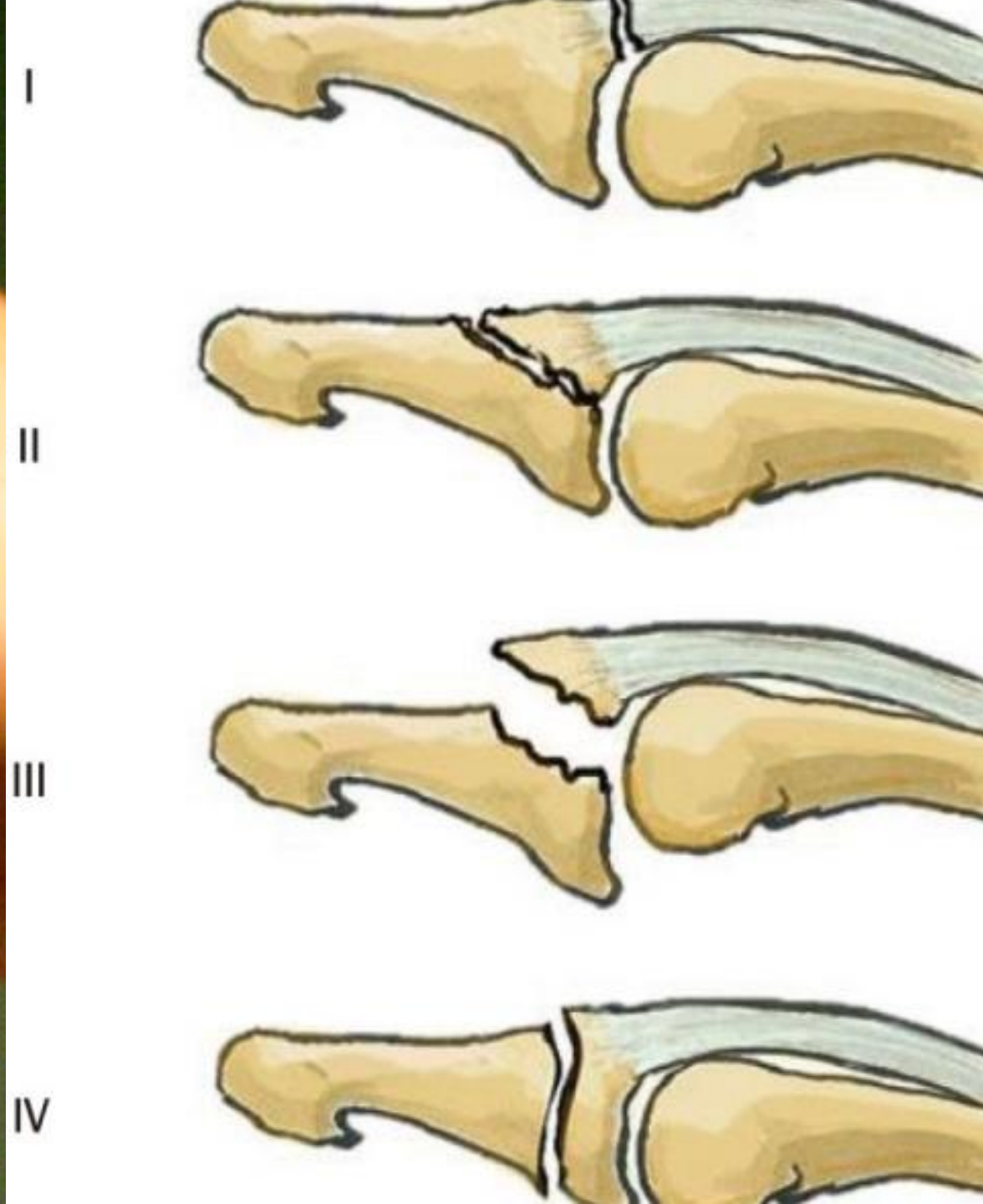




Pictures Courtesy of: EMDocs.net



Pictures Courtesy of: WikEM



Pictures Courtesy of: Roberts and Hedges'



Full extension

x6 weeks

Picture Courtesy of: Amazon





**Finger splint with
partial DIP Flexion**

Surgery 7-10 days

Picture Courtesy of: Amazon



Pictures Courtesy of: RadioPaedia



Typically non-operative

Treat underlying wound, splint

Picture Courtesy of: Amazon



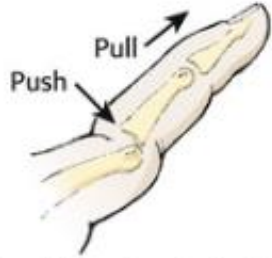
Pictures Courtesy of: RadioPaedia

Phalangeal Joint Dislocation Reduction

A. Traction Method



Dorsal PIP dislocation



Apply axial traction to the finger, and then push anteriorly on the base of the dislocated phalanx.



Flex the finger while continuing to apply traction and anterior pressure.



After reduction, test for range of motion and stability. Obtain a postreduction x-ray and apply a splint.

B. Exaggeration Method



Dorsal PIP dislocation



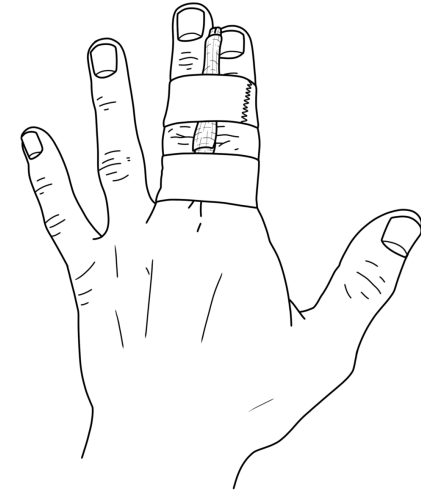
Exaggerate the dislocation to distract the phalanges, and then apply pressure to the base of the dislocated phalanx.

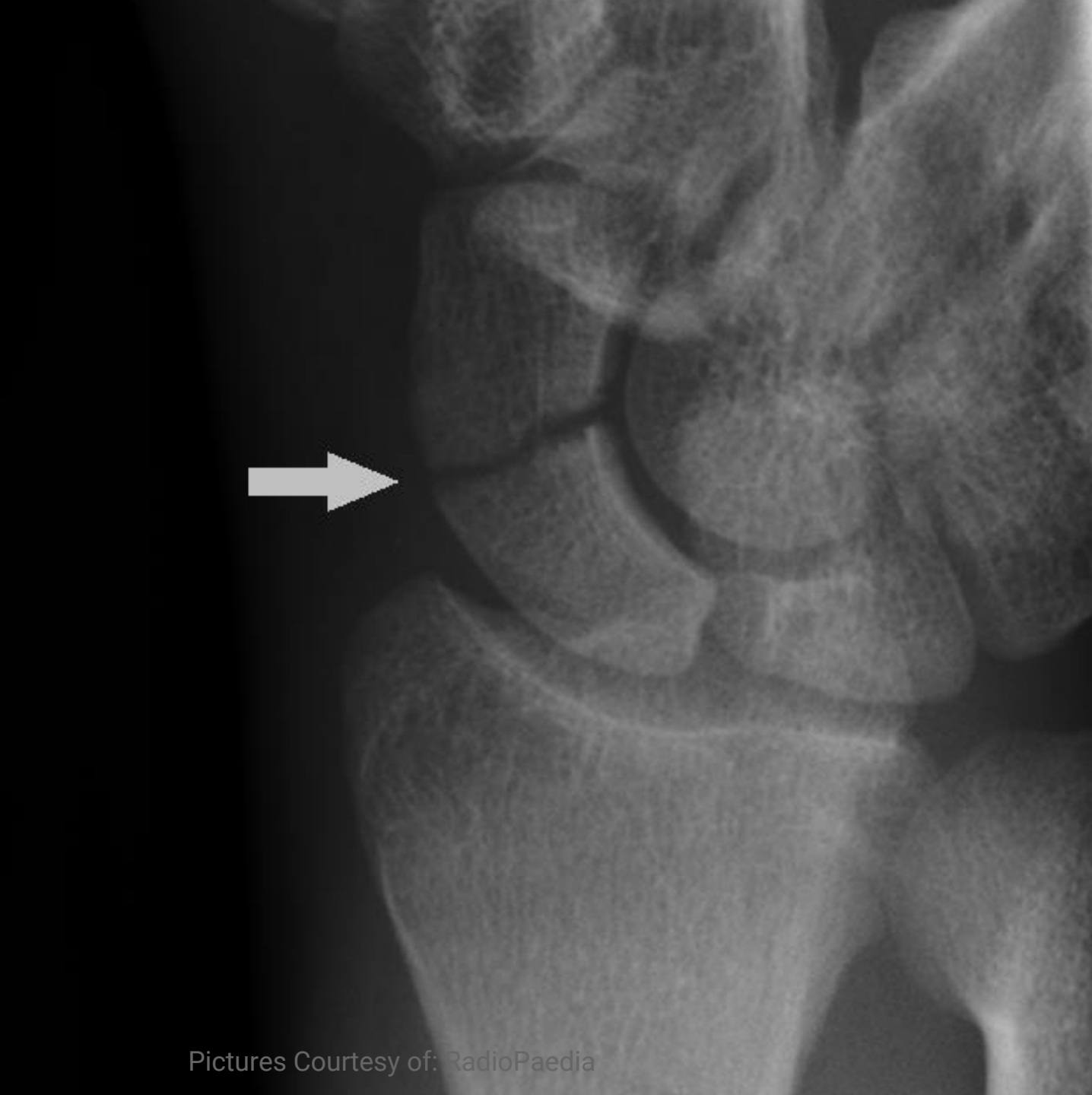


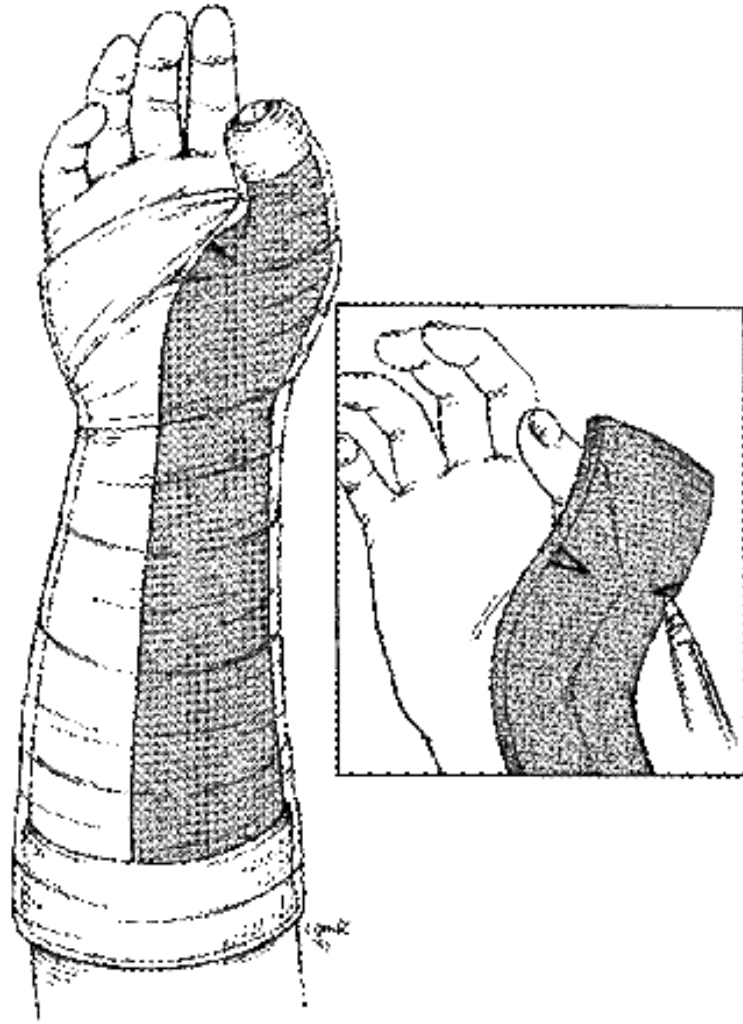
Flex the finger while continuing to apply traction and anterior pressure.



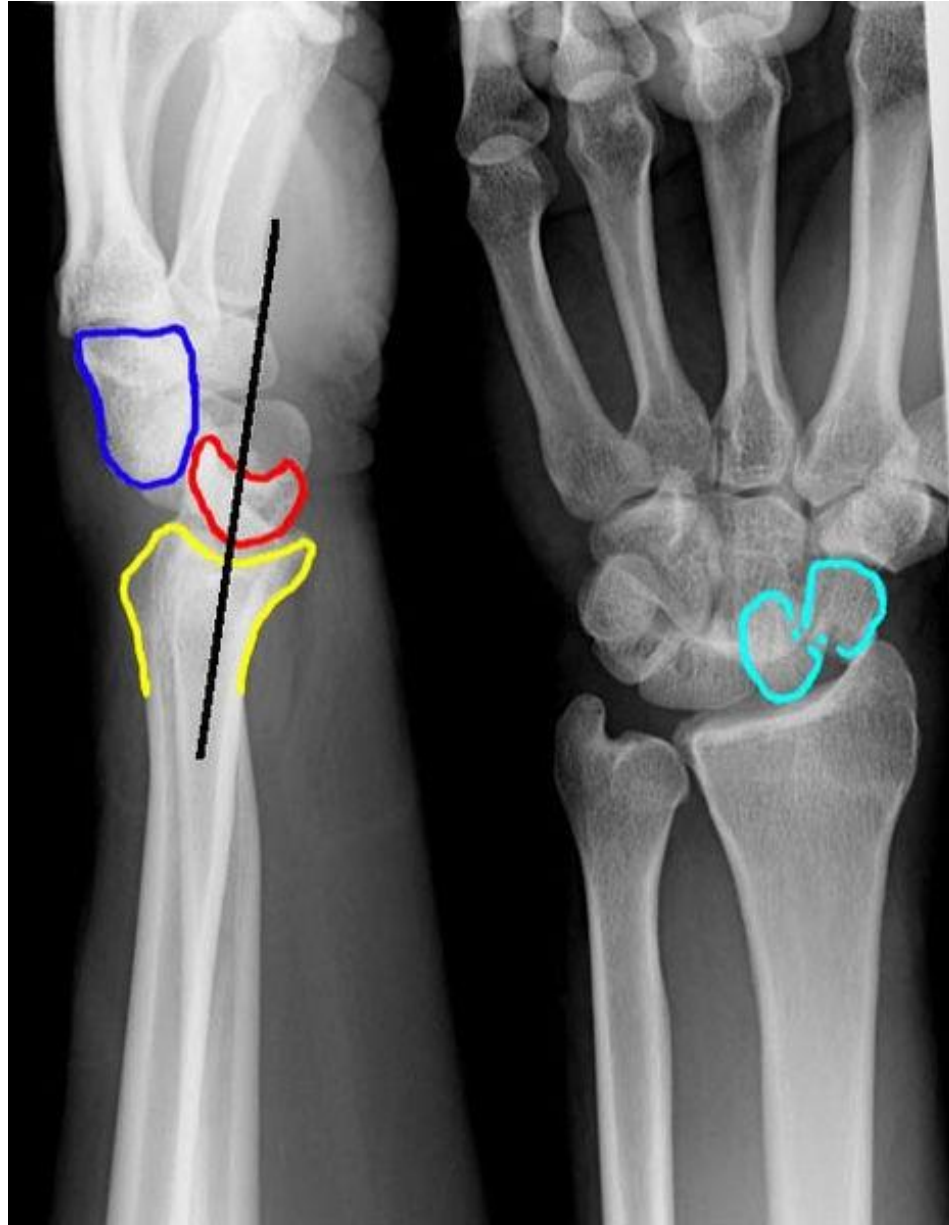
After reduction, test for range of motion and stability. Obtain a postreduction x-ray and apply a splint.







Picture Courtesy of: WikEM



Pictures Courtesy of: RadioPaedia



Mayfield Classification	Level of carpal instability
Stage I: scapholunate dissociation	Disruption of scapholunate ligament with +Terry Thomas sign; exacerbated in clenched fist view
Stage II: perilunate dislocation	+Disruption of capitulunate joint; high association with scaphoid fractures
Stage III: midcarpal dislocation	+Disruption of triquetrolunate joint; neither capitate or lunate is aligned with distal radius
Stage IV: lunate dislocation	+Disruption of radiolunate joint

Pictures Courtesy of: RadioPaedia, OrthoBullets



Finger traps

**Reduction:
extension, flexion
with axial traction**

Operative (urgently)

OVERVIEW

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Infections

General Principles

Nerve blocks

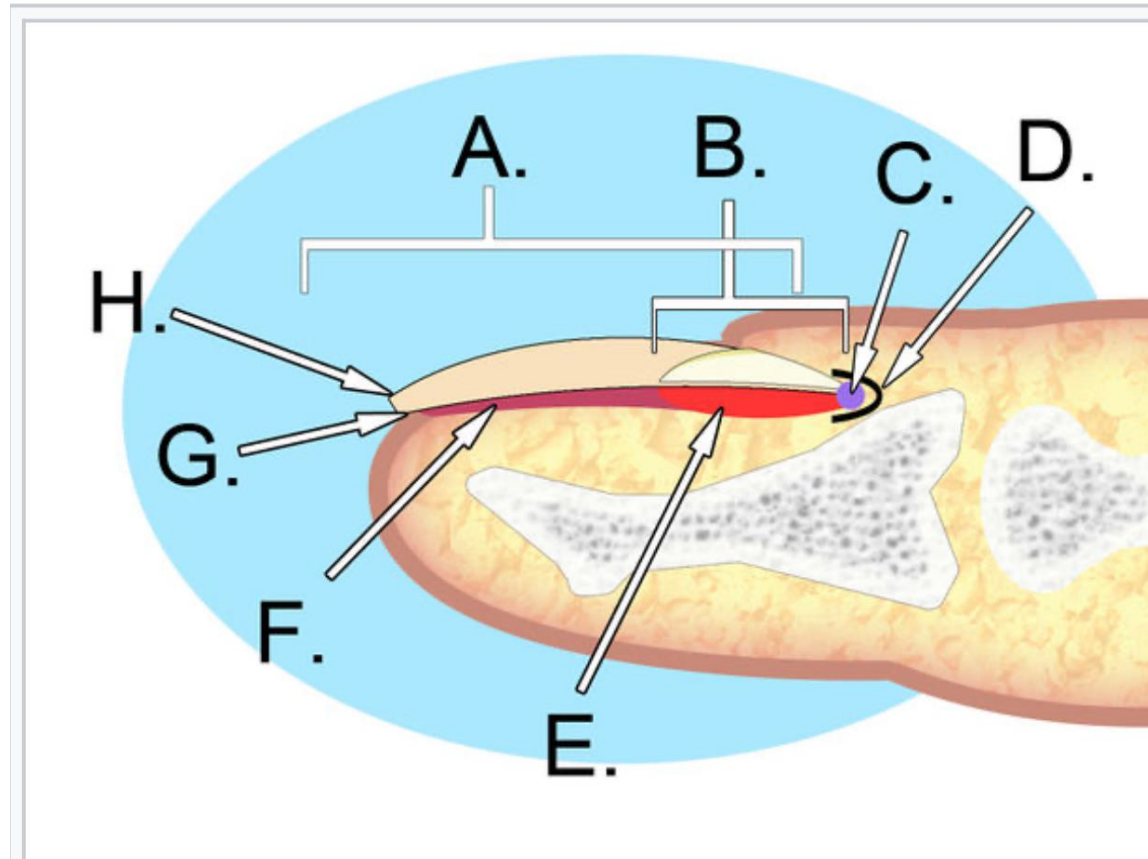
Sutures: less is more

**Consider splint for soft
tissue rest**

Antibiotic prophylaxis?



Nailbed Anatomy



A. Nail plate; B. lunula; C. root; D. sinus; E. matrix; F. nail bed; G. hyponychium; H. free margin.

Picture Courtesy of: Robert's and Hedges'



Pictures Courtesy of: WikEM, Roberts and Hedges'

Acute treatment (24-48hrs)



Pictures Courtesy of: WikEM



Pictures Courtesy of: OrthoBullets, The Bone School



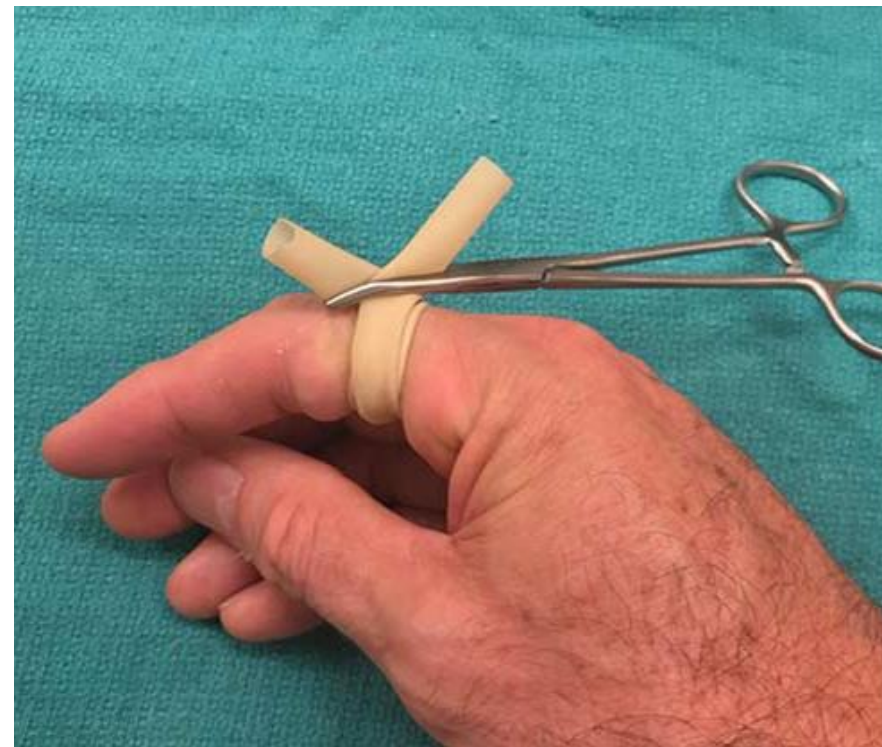
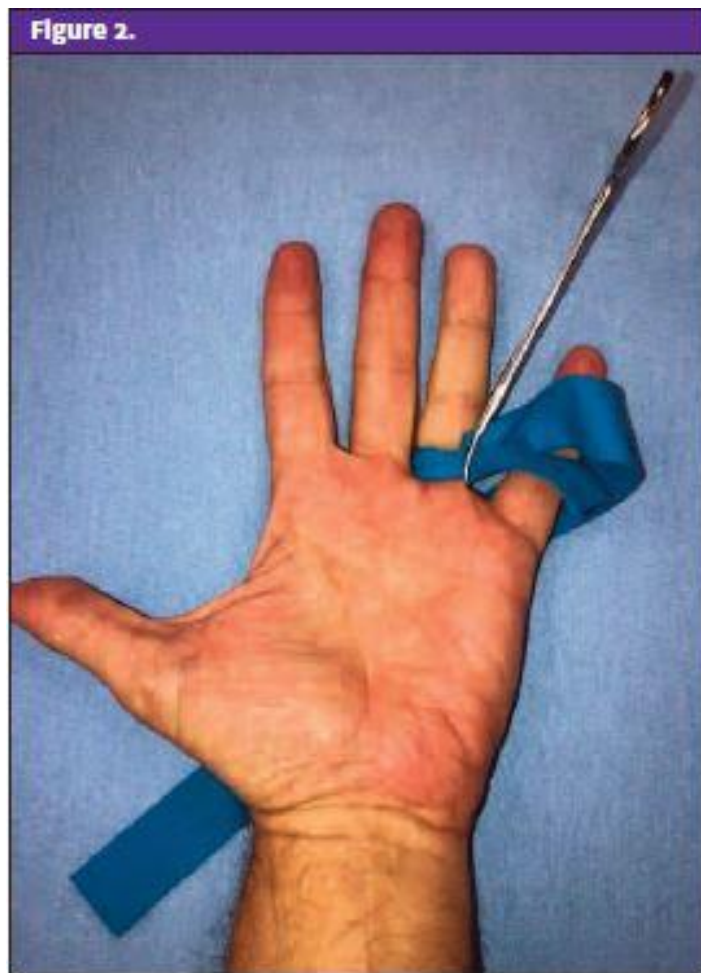
Remove Nail

Picture Courtesy of: OrthoBullets



Bloodless field

Picture Courtesy of: OrthoBullets



Pictures Courtesy of: Roberts and Hedges'



6-0 absorbable suture

Consider dermabond

Picture Courtesy of: Roberts and Hedges'



Eponychial fold stent:

Native nail (betadine soak)

Foil from suture packet

Picture Courtesy of: OrthoBullets



**Can suture through
existing nail**

**Do not need to
remove**

Picture Courtesy of: Medical News Today



Pictures Courtesy of: Lowes



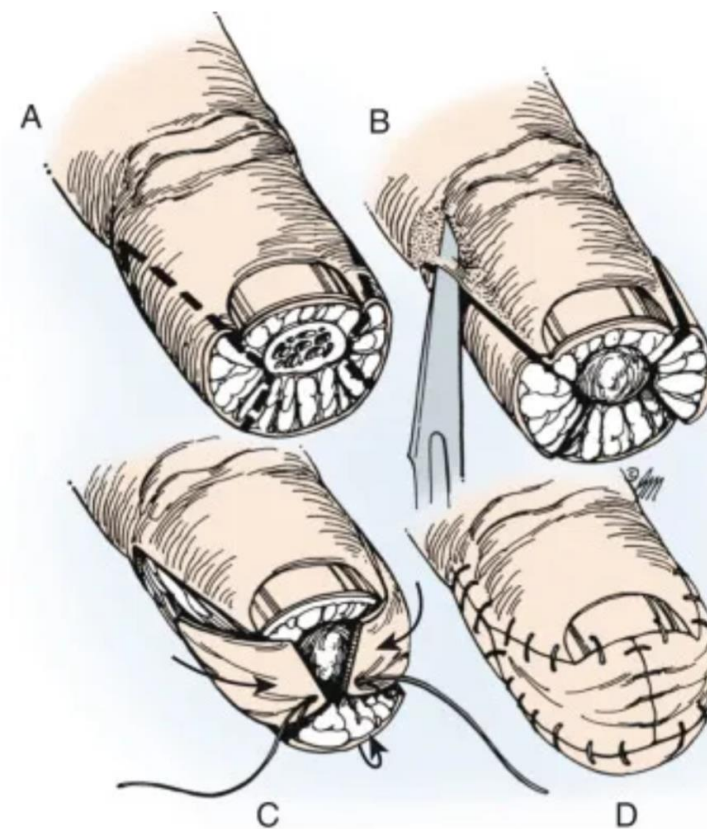


**Assess distal perfusion,
underlying injury**

4-0 non-absorbable suture



Must have soft tissue coverage of bone



Pictures Courtesy of: EM:RAP, Roberts and Hedges'

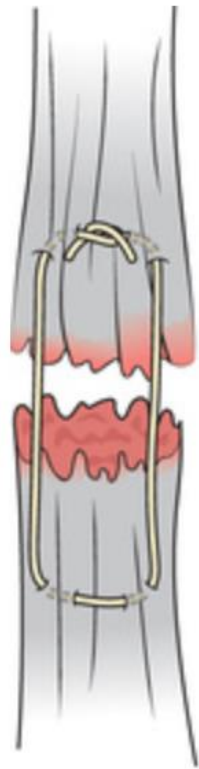


Goal is soft tissue coverage

Zones of Extensor Tendon Injuries		
Zone I	Disruption of terminal extensor tendon distal to or at the DIP joint of the fingers and IP joint of the thumb (EPL) ▶ Mallet Finger ▶	📷
Zone II	Disruption of tendon over middle phalanx or proximal phalanx of thumb (EPL)	
Zone III	Disruption over the PIP joint of digit (central slip) or MCP joint of thumb (EPL and EPB) ▶ Boutonniere deformity ▶	📷
Zone IV	Disruption over the proximal phalanx of digit or metacarpal of thumb (EPL and EPB)	
Zone V	Disruption over MCP joint of digit or CMC joint of thumb (EPL and EPB) ▶ "Fight bite" common ▶ Sagittal band rupture ▶	📷
Zone VI	Disruption over the metacarpal Nerve and vessel injury likely	
Zone VII	Disruption at the wrist joint Must repair retinaculum to prevent bowstringing Tendon repair followed by immobilization with wrist in 40° extension and MCP joint in 20° flexion for 3-4 weeks	
Zone VIII	Disruption at the distal forearm Extensor muscle belly Usually from penetrating trauma Often have associated neurologic injury Tendon repair followed by immobilization with elbow in flexion and wrist in extension	📷



Consider ED repair



Mattress

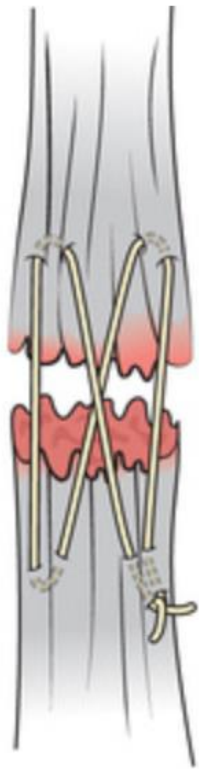
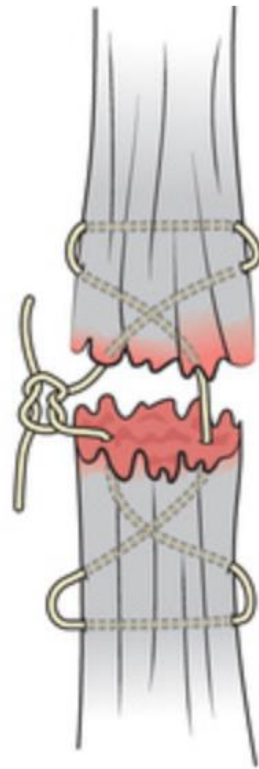
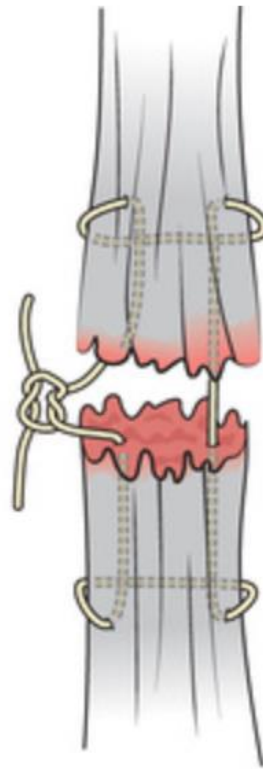


Figure 8



Modified
Bunnell

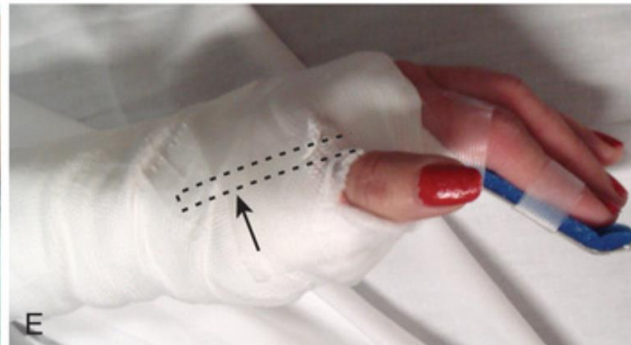


Modified
Kessler

**3-0 or 4-0
nonabsorbable
suture**

Picture Courtesy of: Roberts and Hedges'

Flexor tendon injuries



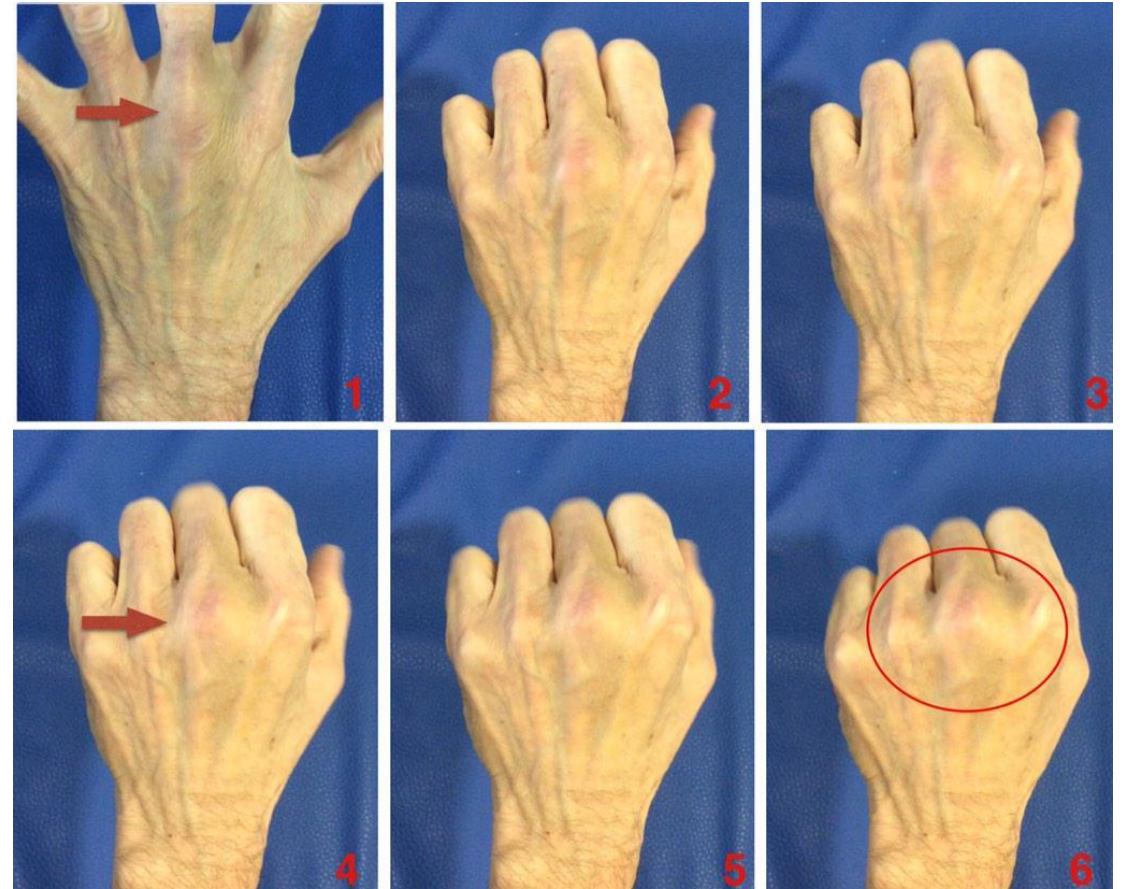
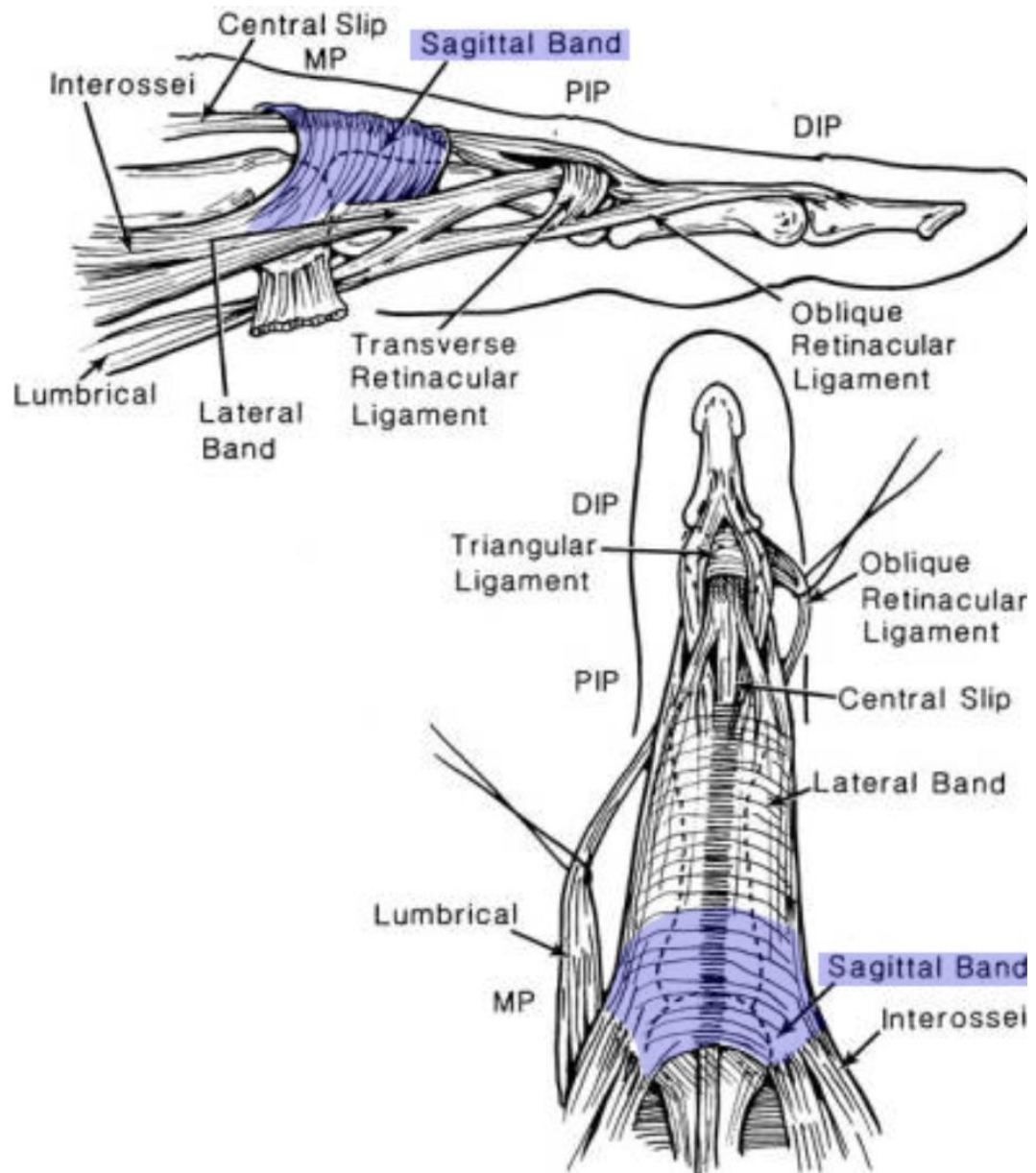


Close wound in ED

**Will require
operative repair**



Pictures Courtesy of: Roberts and Hedges'



Pictures Courtesy of: Roberts and Hedges', OrthoBullets

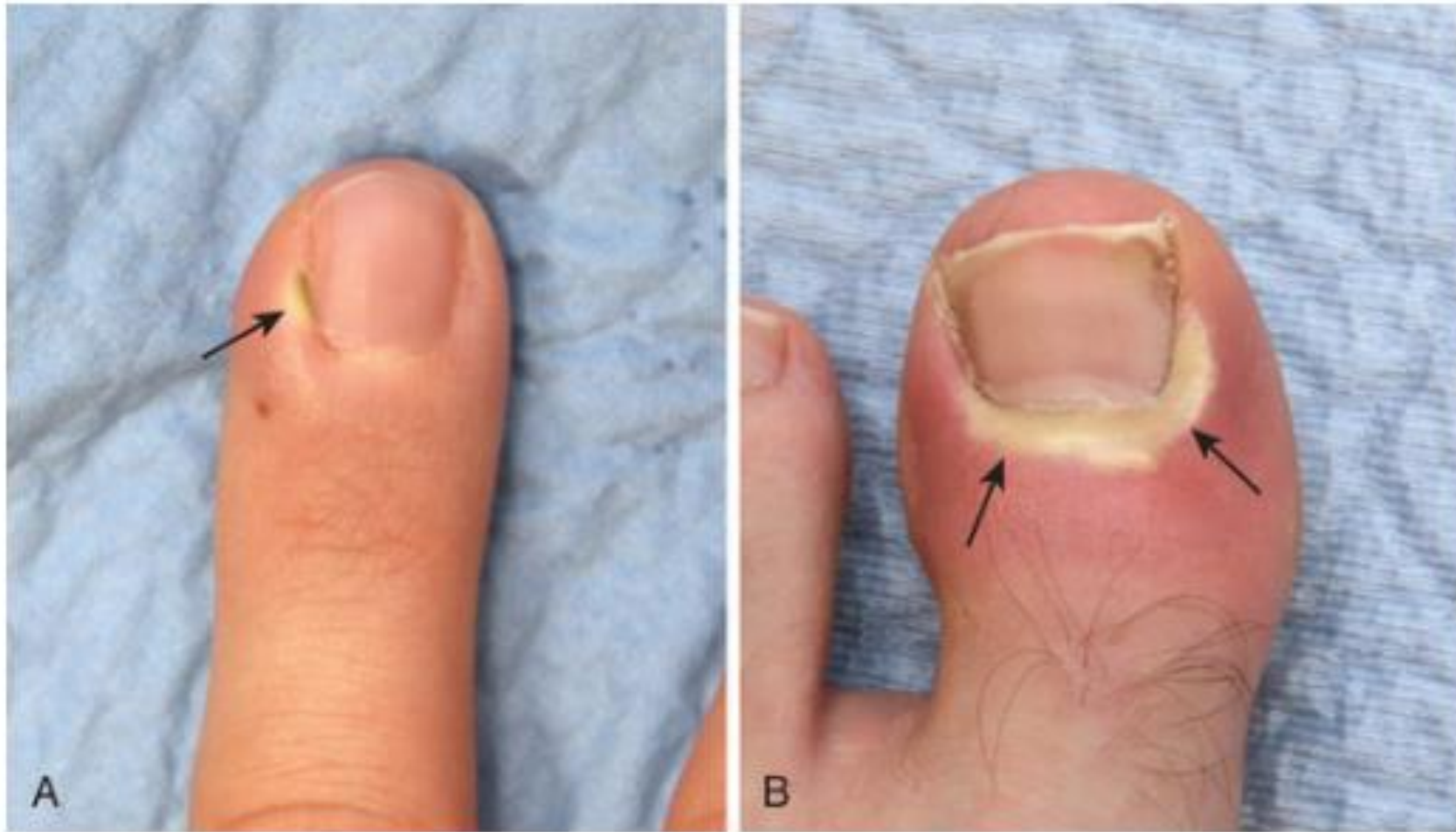


OVERVIEW

Fractures/
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Lacerations/
wounds

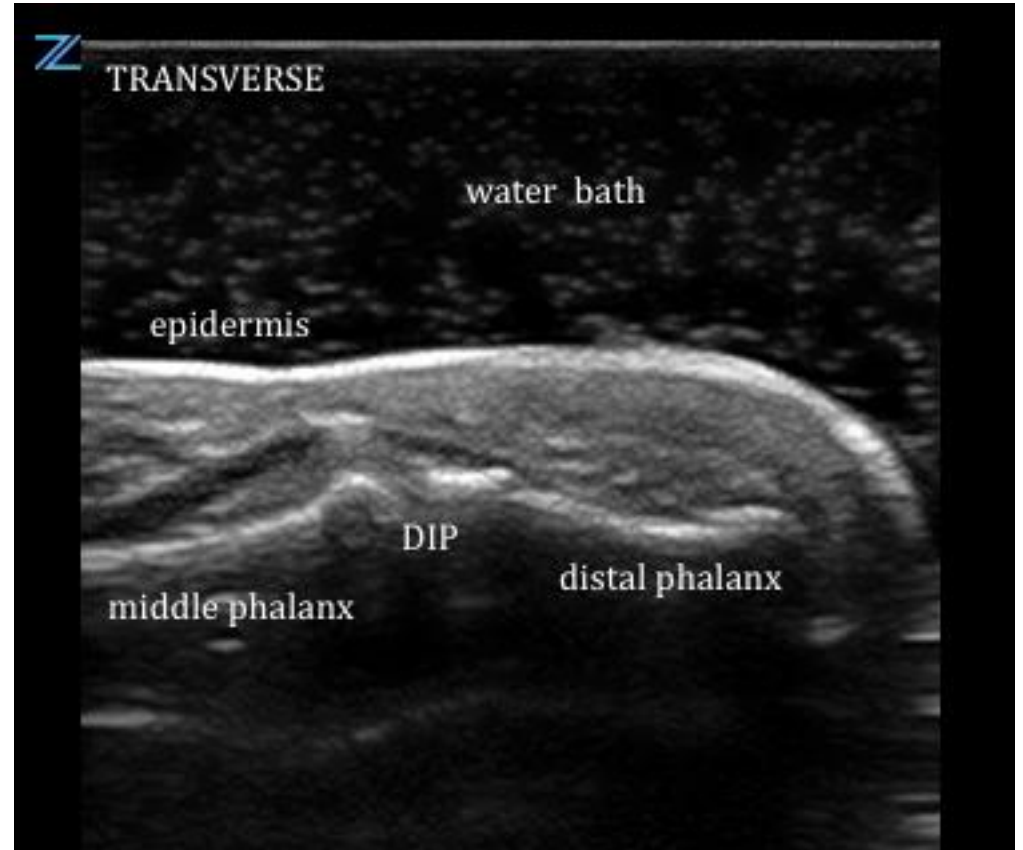
Infections







Pictures Courtesy of: Roberts and Hedges'



Pictures Courtesy of: EMDocs.net

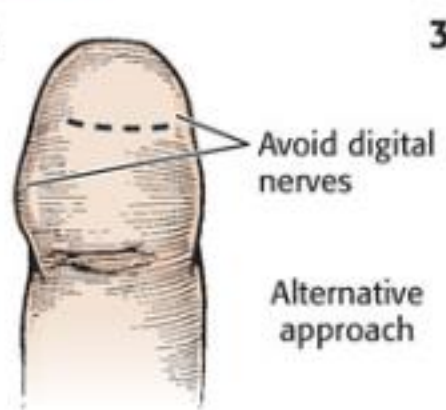
Felon Drainage

1

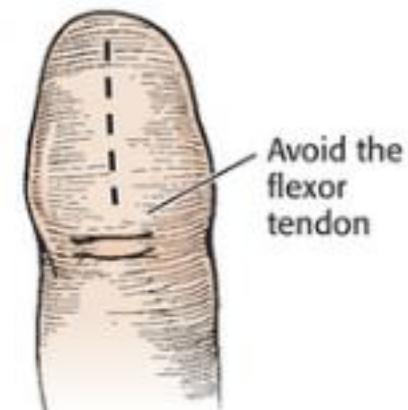


The preferred initial incision for draining a felon is made directly into the area of most fluctuance (1). More aggressive incisions should be reserved for complicated cases because they have greater morbidity and require more complicated wound care. The unilateral longitudinal approach is a good first choice. Some prefer a similarly located through-and-through incision (see below).

2



3

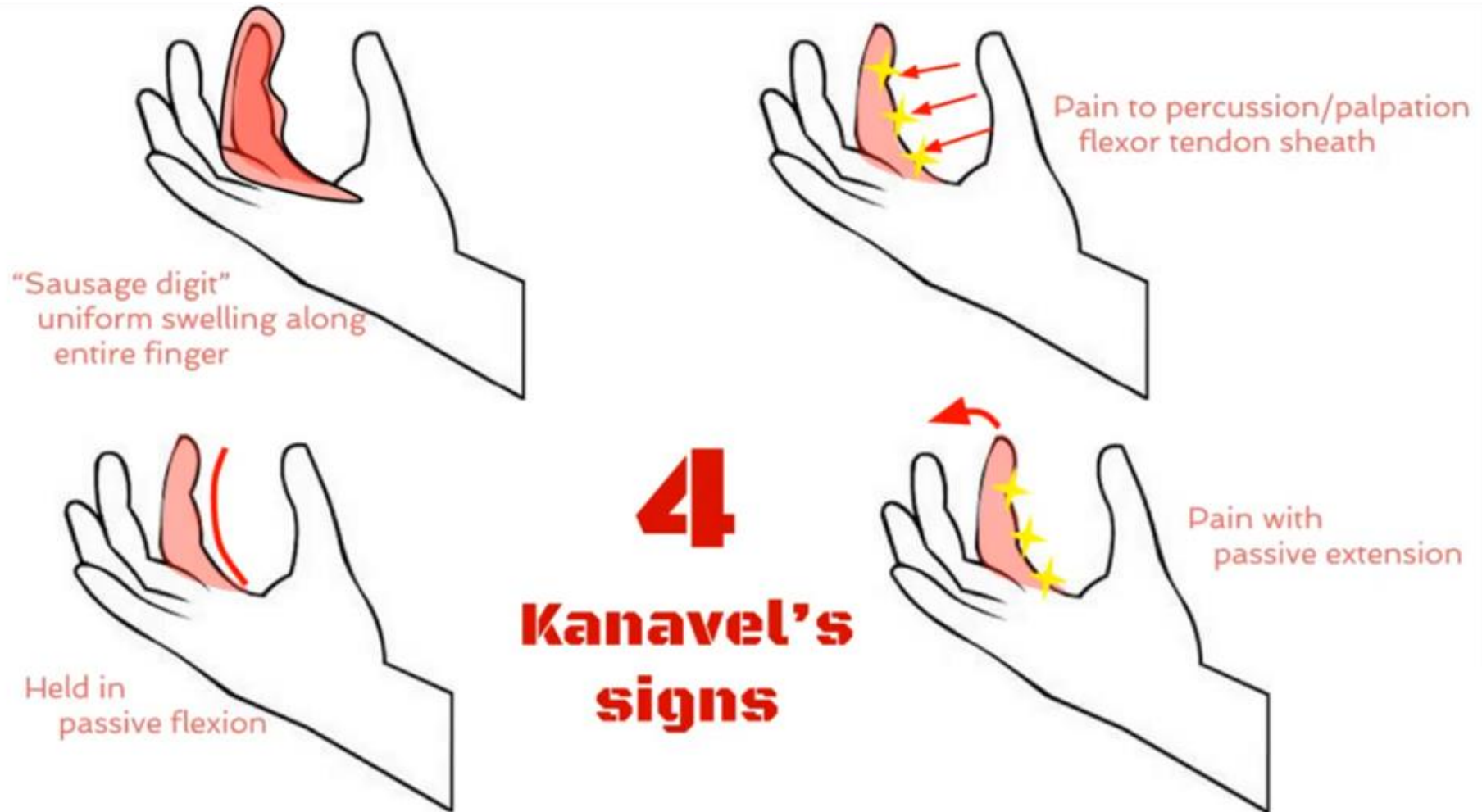


A fat pad incision is generally avoided but can be acceptable for localized infections. They may be associated with a painful scar in an area that is often traumatized. The transverse fat pad incision should avoid the digital nerves (2), and the longitudinal fat pad incision should avoid the flexor tendon (3).

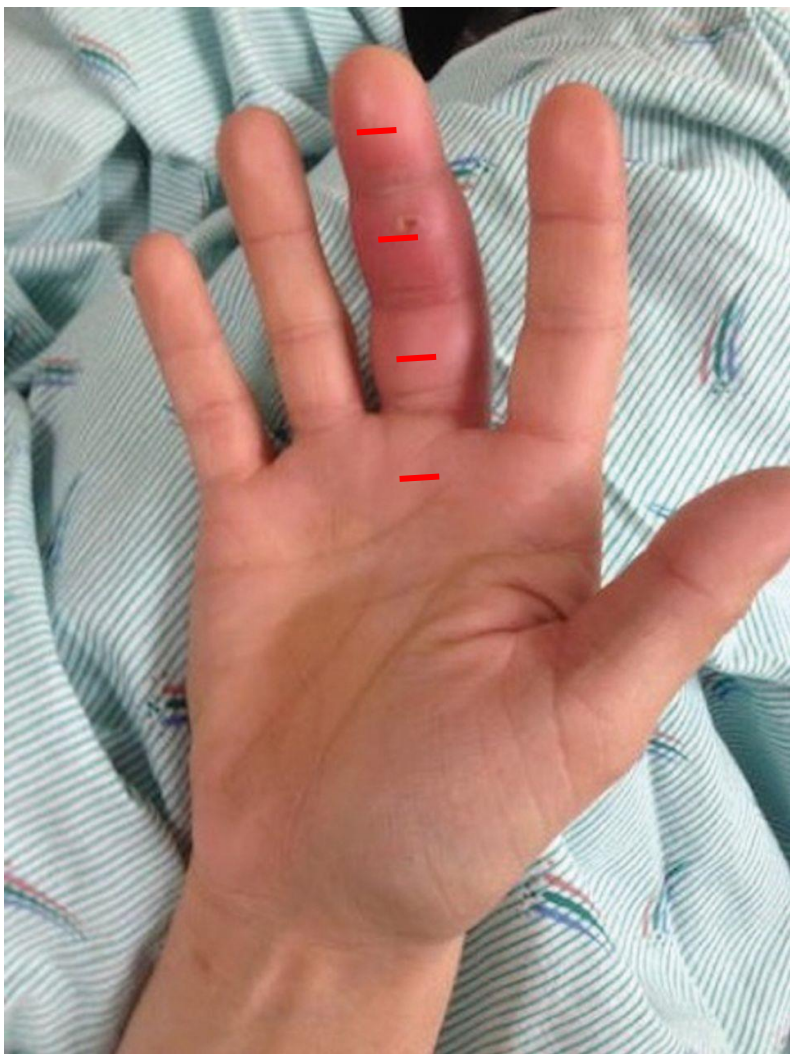




Pictures Courtesy of: Roberts and Hedges'



Picture Courtesy of: Northwestern University Emergency Medicine



Pictures Courtesy of: Roberts and Hedges'



Pictures Courtesy of: Adobe, FCC Medical Group



Pictures Courtesy of: RadioPaedia



Pictures Courtesy of: OrthoBullets, Lowes



Pictures Courtesy of: RadioPaedia, OrthoBullets



Pictures Courtesy of: OrthoBullets, Life in the Fast Lane

OVERVIEW

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Infections

Surgical Loupes



Surgical Loupes Neitz W/Headlight
X80 Frame Silver Blue NTZ-BLS-3
(2.5X - 3.0X) | USO Medical

\$3,080.00

USO USO Medical
Small business



**Amazon:
\$60**

Pictures Courtesy of: USO Medical, Amazon

References

- Roberts and Hedges' Clinical Procedures in Emergency Medicine and Acute Care. 7th Edition, Elsevier, Amsterdam.
- The Hand: Primary Care of Common Problems. 2nd Edition, American Society for Surgery of the Hand.
- Orthopedic Emergencies: Expert Management for the Emergency Physician. 1st Edition, Cambridge University Press.

Thank you!