Finger tip injuries

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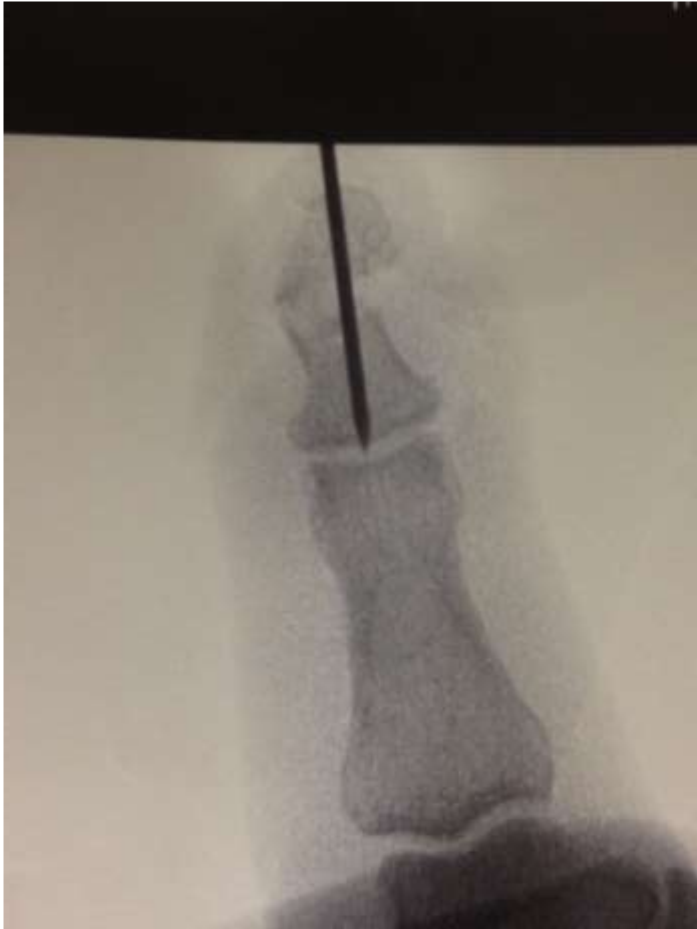
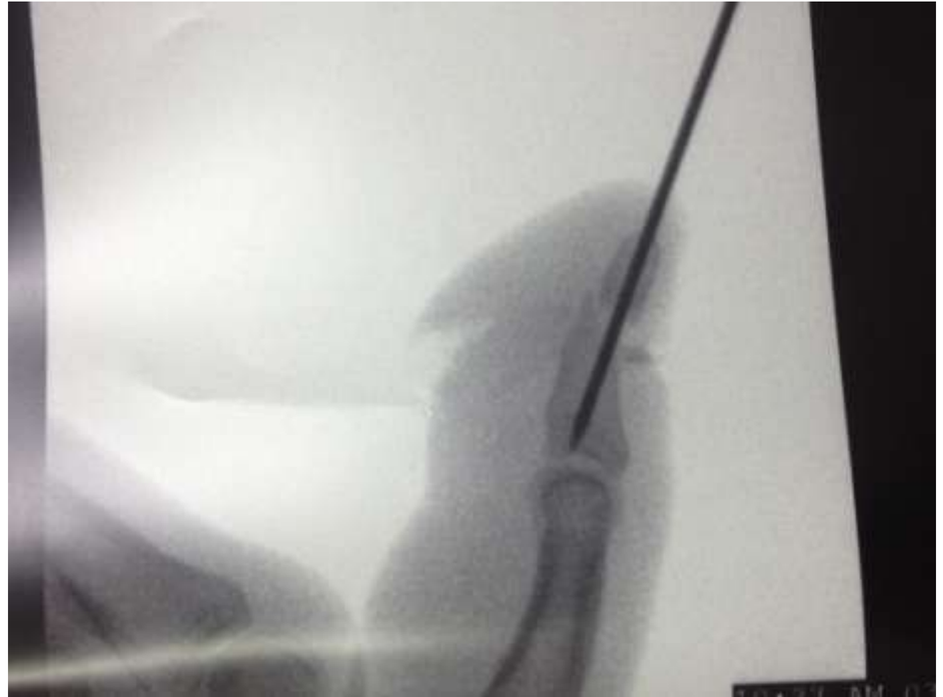
Introduction

- Most common hand injuries seen in emergency departments.
- Broadly classified as those with or without soft tissue loss.
- Crush injuries without extensive soft tissue loss may result in nail plate avulsions, nail matrix lacerations, and distal phalanx (tuft) fractures.
- Distal phalanx fractures are typically reduced when the nail bed is repaired, but large, displaced fragments may require percutaneous pinning.





Nail structure

- Nail plate is composed of keratin and originates from germinal matrix proximal to nail fold.
- Sterile matrix lies directly beneath nail plate and contributes keratin to increase plate thickness.
- Crescent-shaped white lunula is seen through proximal nail plate at junction of sterile and germinal matrices.

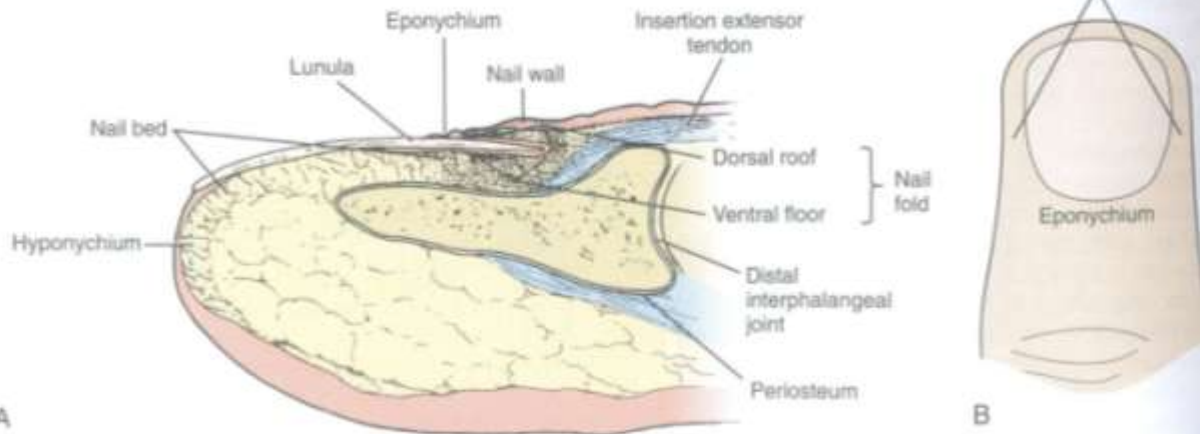


Figure 7-34 A, The anatomy of the nail bed is shown in sagittal section. B, The perionychium includes the paronychium, eponychium, hyponychium, and nail matrix. (From Green DP, et al, editors: Green's operative hand surgery, ed 5, Philadelphia, 2005, Churchill Livingstone.)

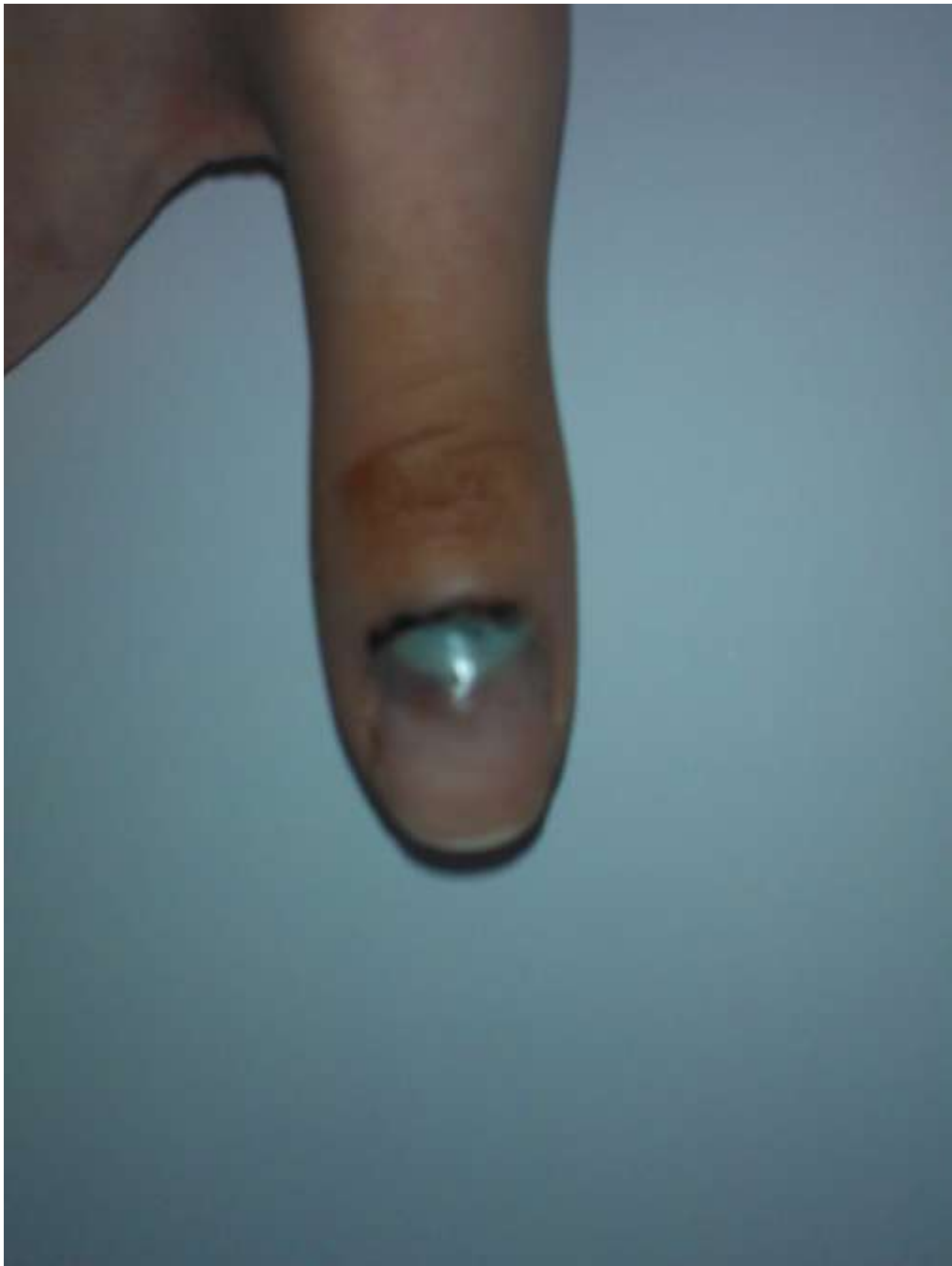
- Hyponychium lies between distal nail bed and skin of fingertip, serving as a barrier to microorganisms.
- The eponychium, also called the cuticle, is at distal margin of proximal fold.
- The paronychium forms the lateral margins.

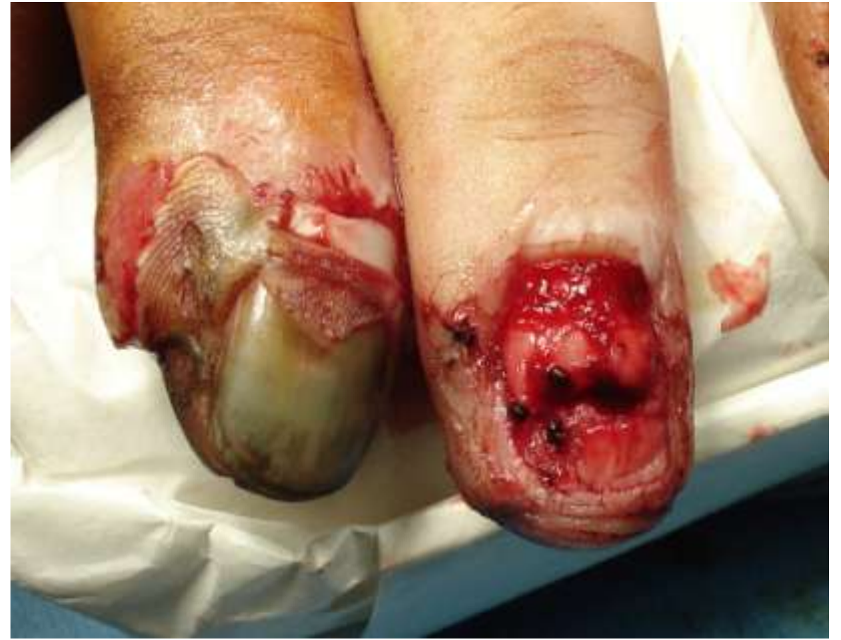
Nail bed injury

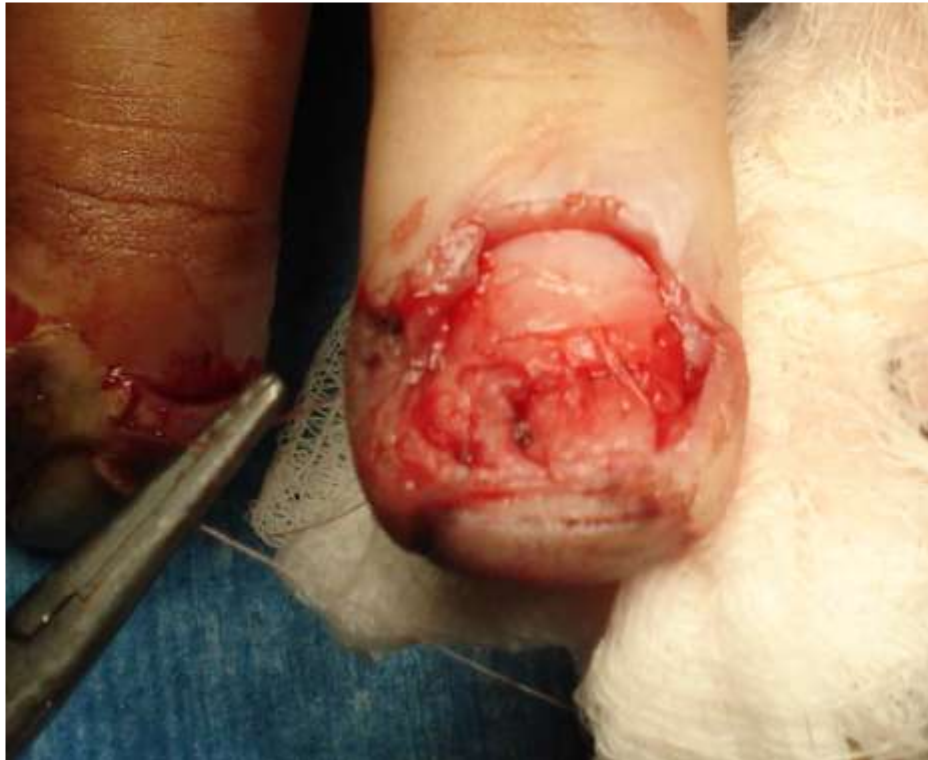
- A small subungual hematoma constituting less than 50% of nail area may be treated without nail plate removal. Nail plate should be perforated with sterile needle. Potentially controversial as if associated fracture then you have created an open #

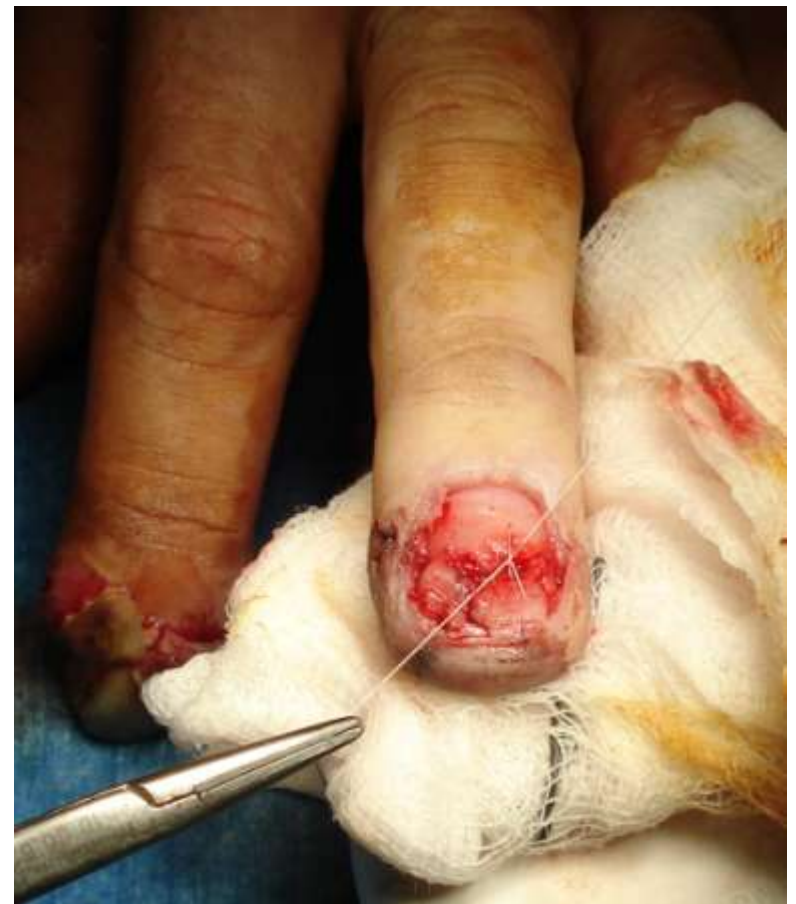
- >50% require nail plate removal for repair of underlying nail matrix lacerations.

- Wound debrided and thoroughly irrigated.
- Sterile and/or germinal matrix repaired with 6-0 vicryl rapide or smaller absorbable suture under loupe magnification.
- Eponychial fold splinted open with nail plate.
- Figure of 8 suture using 4-0 vicryl.









ETHICON
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6-0
(0.7 Ph. Eur.)
Coated
VICRYL*rapide
Polyglactin 910
undyed braided absorbable suture
incoloro trenzado sutura absorbible
incolore tressé suture résorbable
sutura absorvível incolor entrançada
P-1
11mm 3/8c
REVERSE CUTTING
PRIME*
45cm
* Trademark
XK2CWMM0
2011-12
STERILE R
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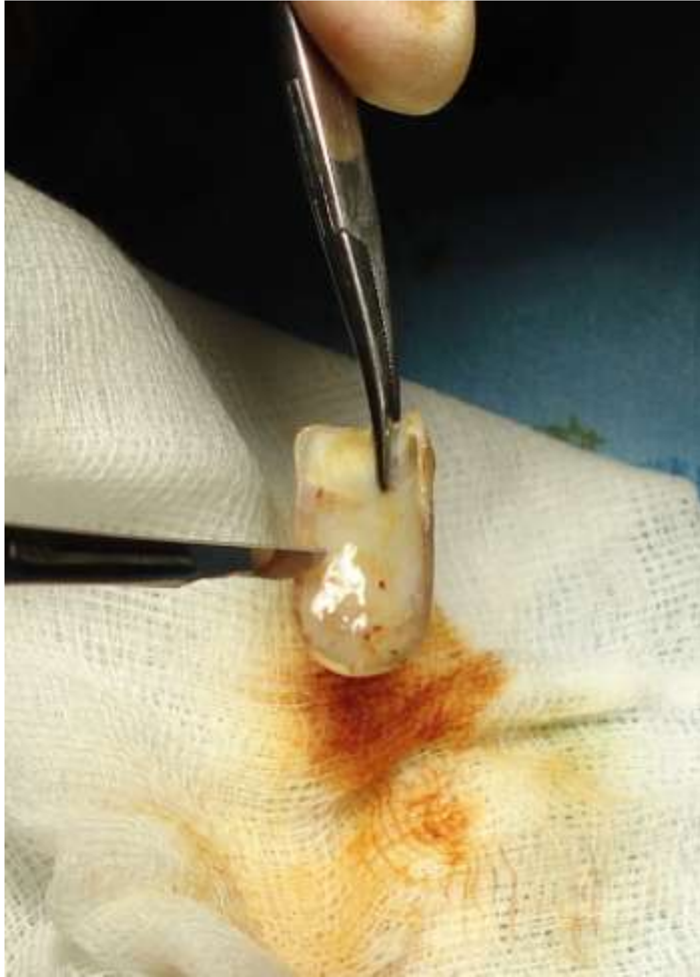
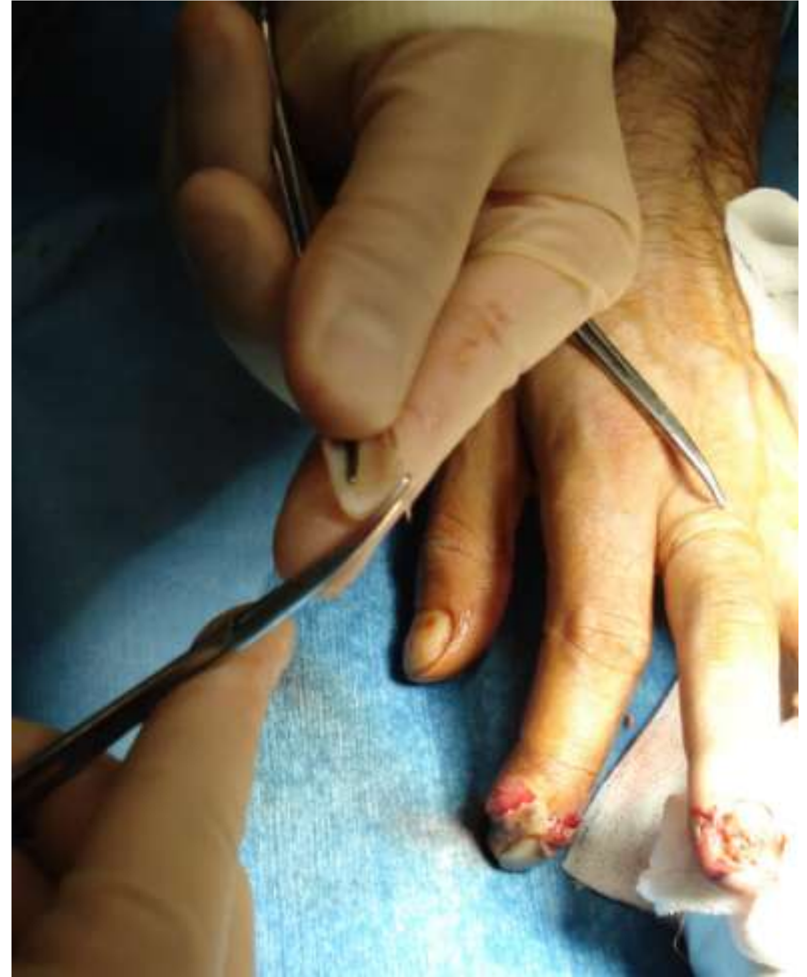
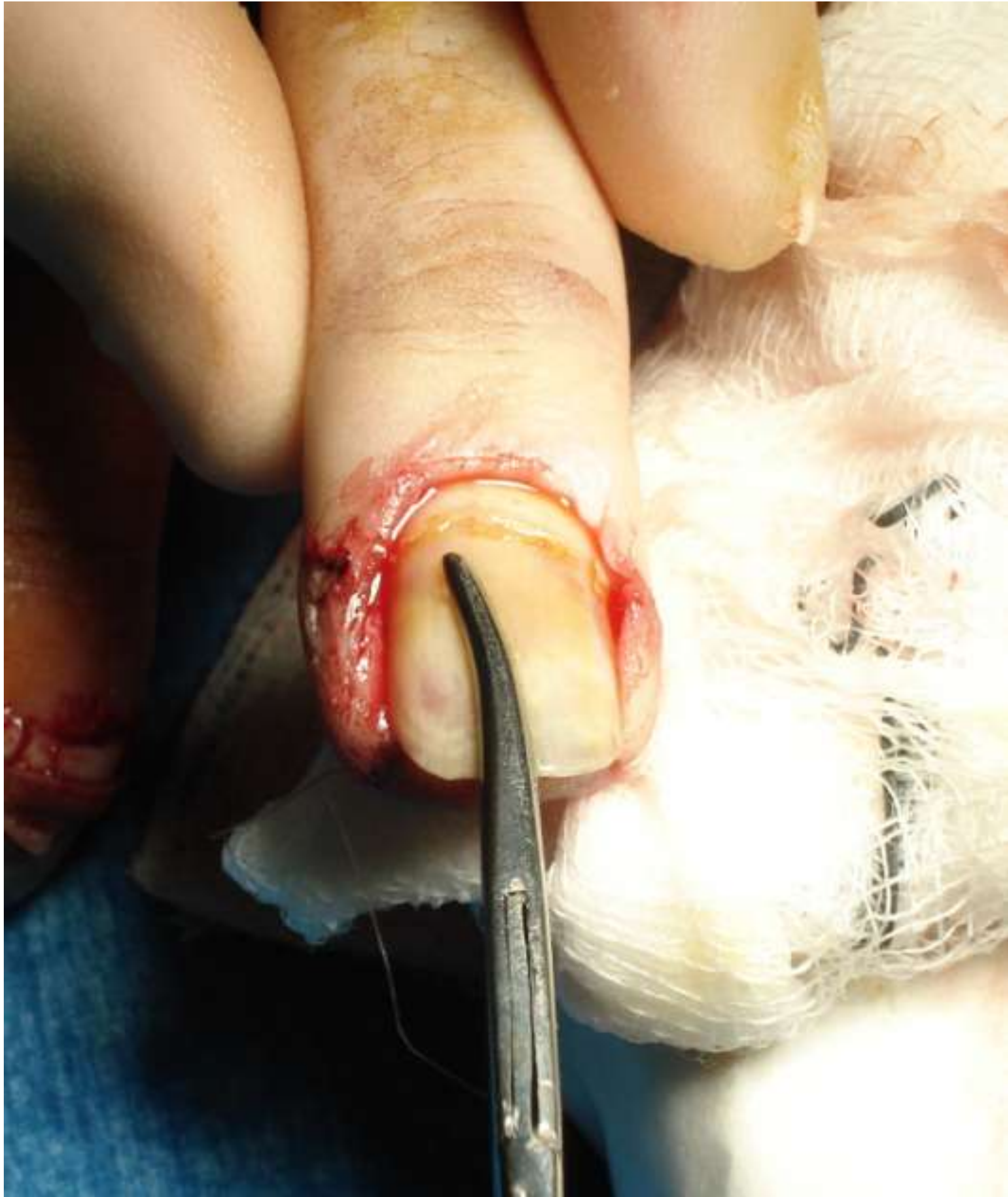
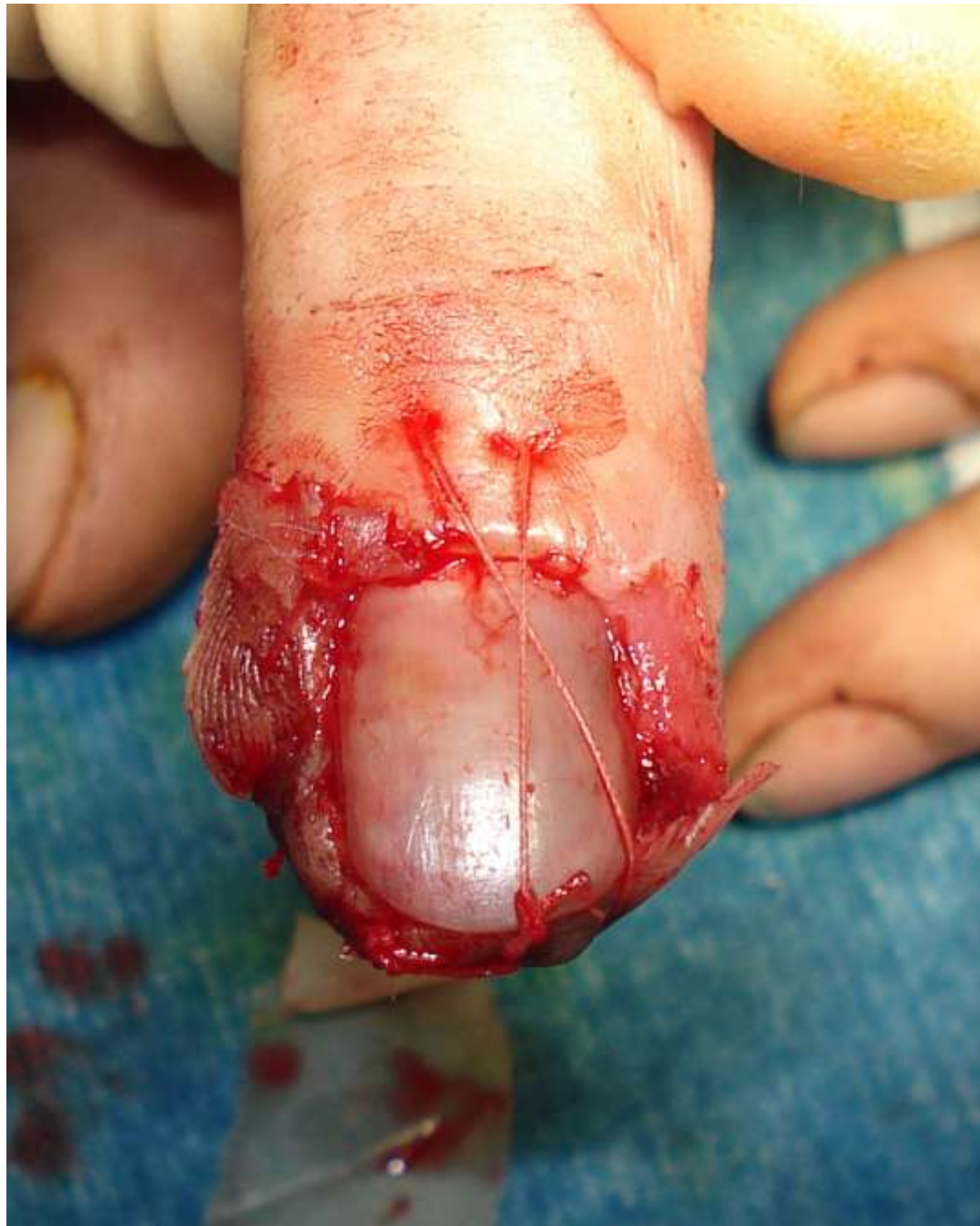
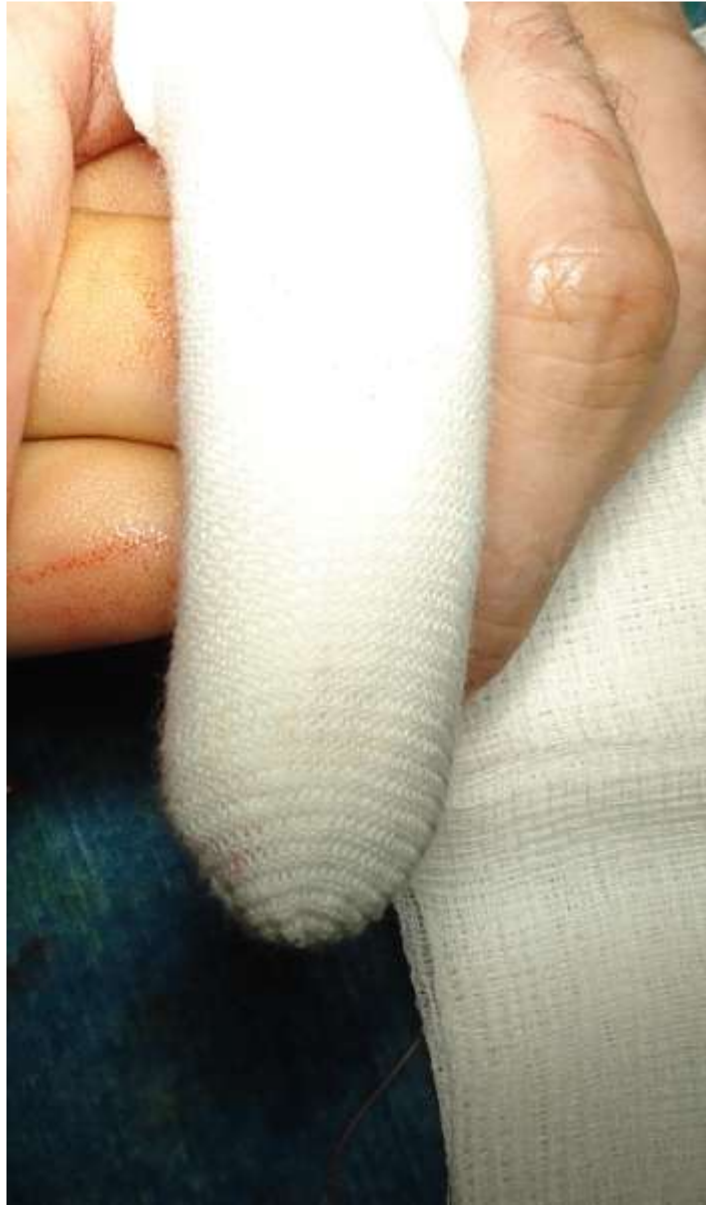
Manufacturer











- If significant nail matrix has been lost, options include a split-thickness matrix graft from an adjacent uninjured finger or transfer of the nail matrix from second toe. Reported to give good cosmetic and functional results. Complications include split and hook nail deformity (1).

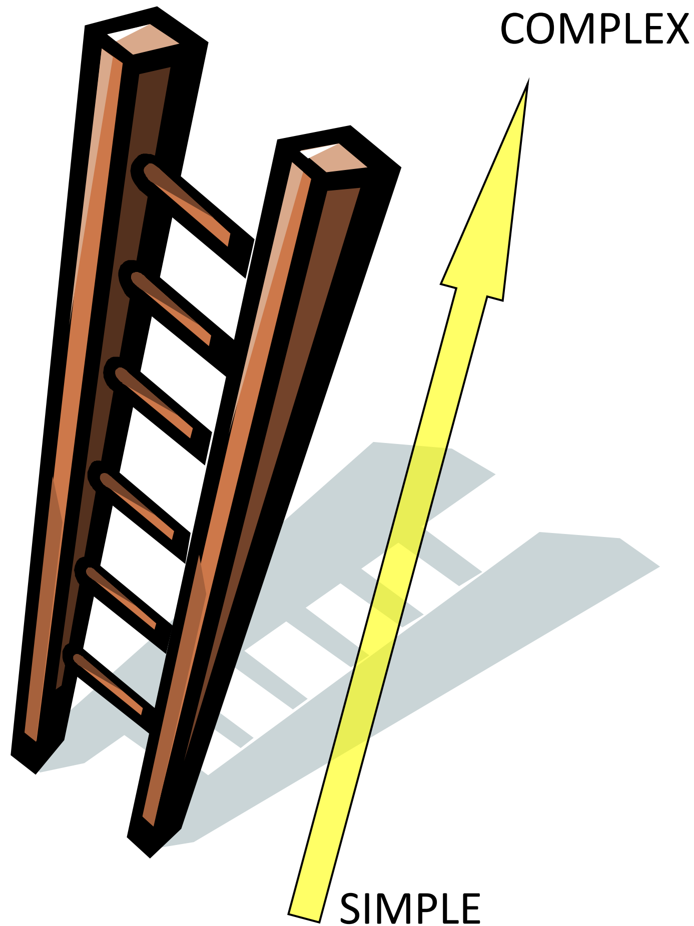
- Full-thickness nail-bed graft is necessary, however, when replacing lost germinal matrix
- Have the disadvantage of causing deformity of the donor site

- Complete growth of a new nail plate takes 3 to 6 months depending on the age of the patient.

Reconstructive ladder

- Goals of soft tissue reconstruction in the upper extremity are:
- To provide coverage of deep structures (e.g., bone, cartilage, tendons, nerves, blood vessels).
- Create a barrier to microorganisms
- Restore dynamic function of the limb
- Prevent joint contractures

Reconstructive Ladder



- Free flap
- Distant flap
- Regional flap
- Local flap
- Skin graft
- Primary closure
- Secondary intention healing

Fingertip injuries with tissue loss

- General principles repair and rehabilitate

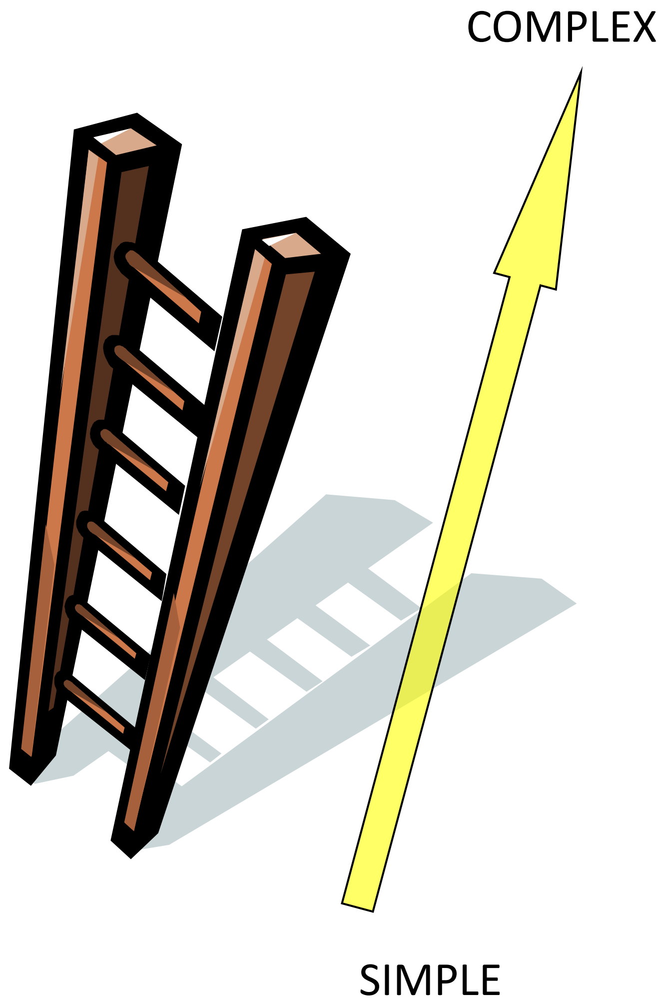
Goals of repair

- Preservation of digit length.
- Maintenance of sensate finger tip pulp.
- Prevention of joint contracture.

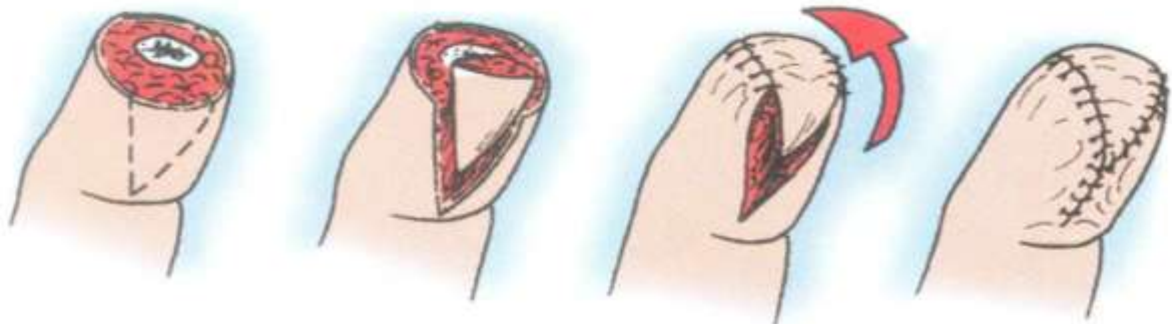
Goals of rehab

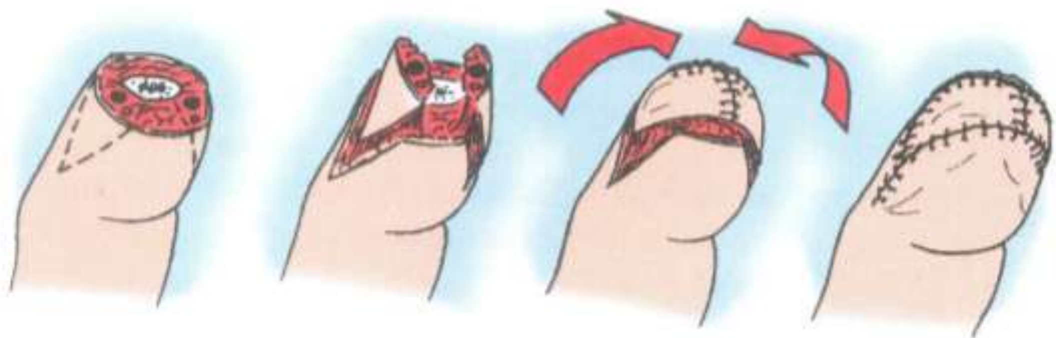
- Eventual pain-free use of digit.
- Prevention of joint contracture.

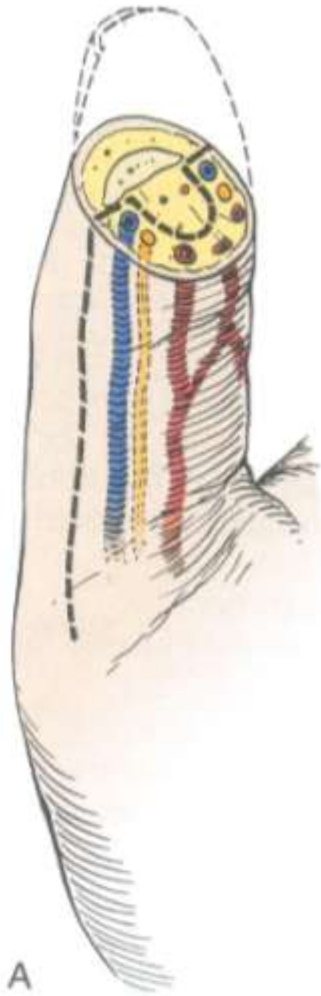
Reconstructive Ladder

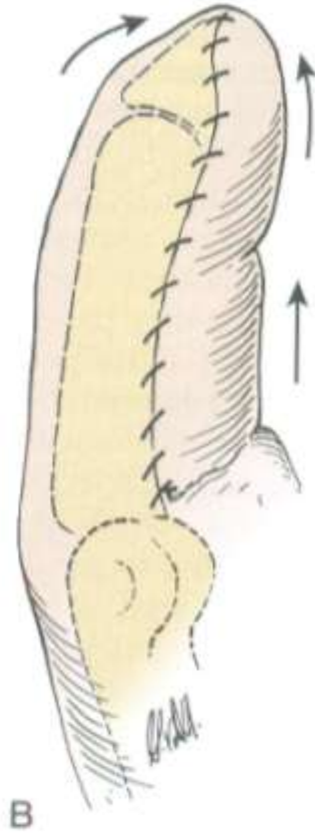


- **DISTANT FLAP** = Chest or groin flap. Rarely used
- **REGIONAL FLAP** = Thenar flap – indications: best reserved for volar index or long digit injuries. Risks: Donor site tenderness and PIP contracture.
- **REGIONAL FLAP** = Cross finger flap – indications: treatment of choice for a volar oblique injury. Disadvantages: full thickness skin graft required for donor site.
- **LOCAL FLAP** = Moberg advancement flap – indications: best used for transverse or volar oblique thumb injuries. Risk: Flap necrosis and thumb flexion contracture.
- **LOCAL FLAP** = V-Y advancement flap and Kutler flap – indications: transverse or dorsal oblique injury.
- **SKIN GRAFT**– generally why not to be used.
- **PRIMARY CLOSURE** = Terminalisation
- **SECONDARY INTENTION** healing






A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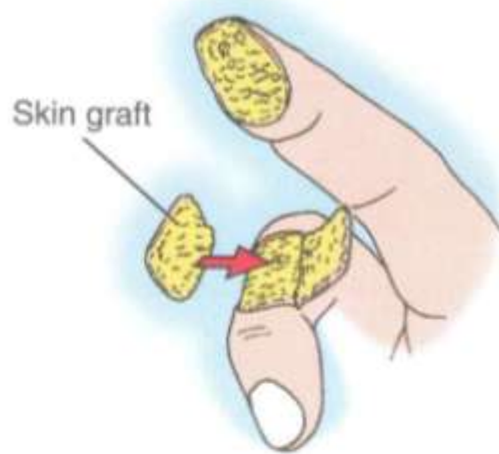
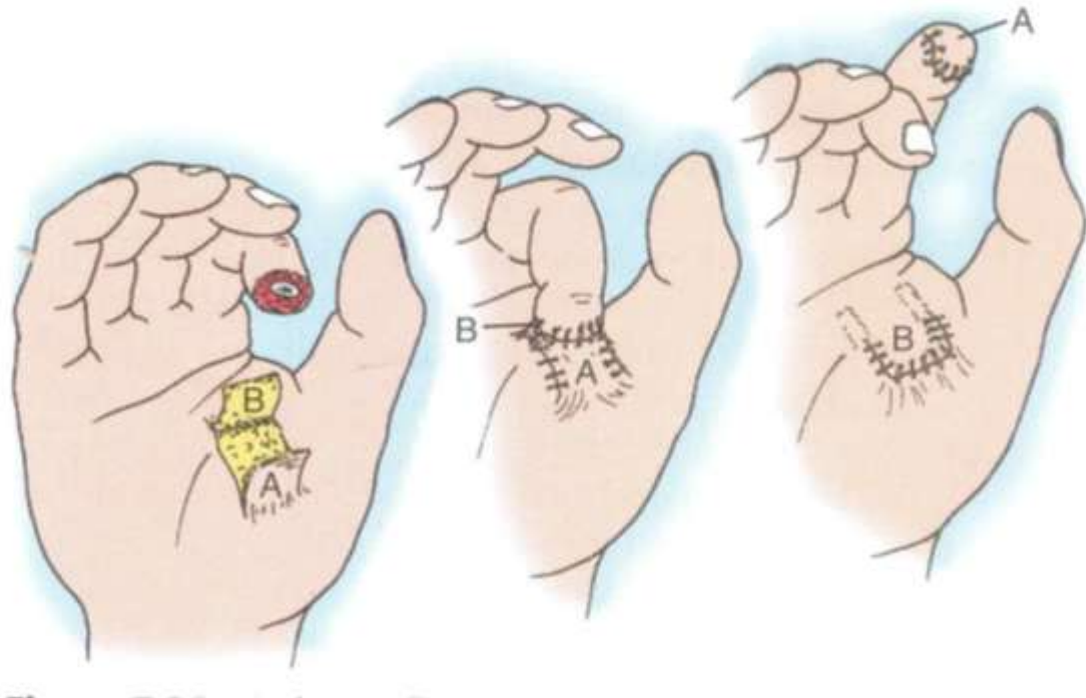
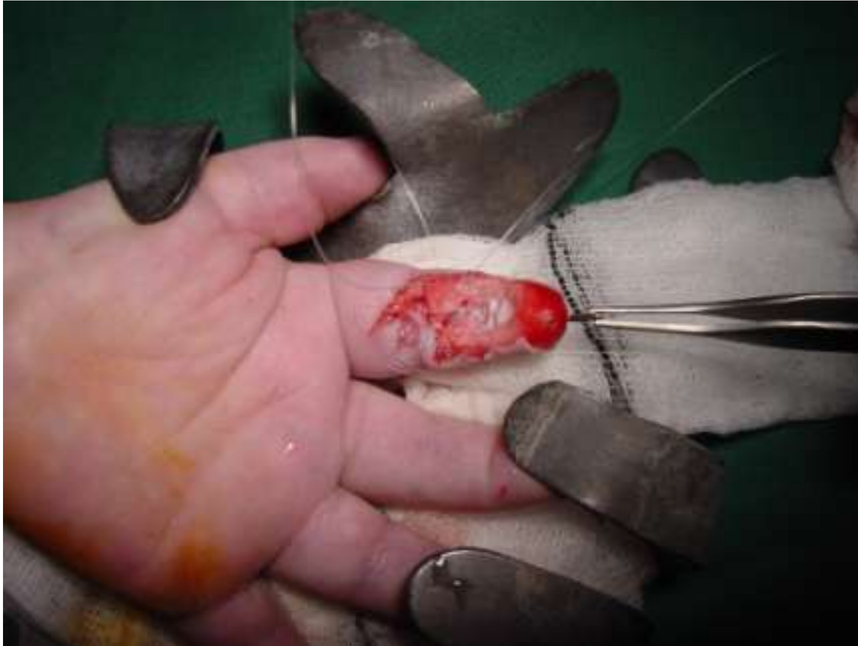
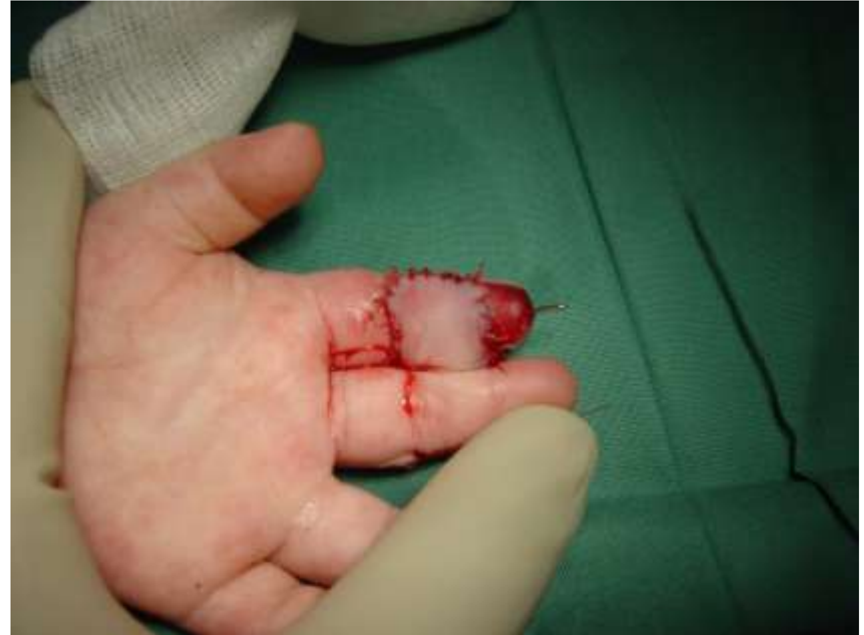

Skin graft

Skin graft slotted

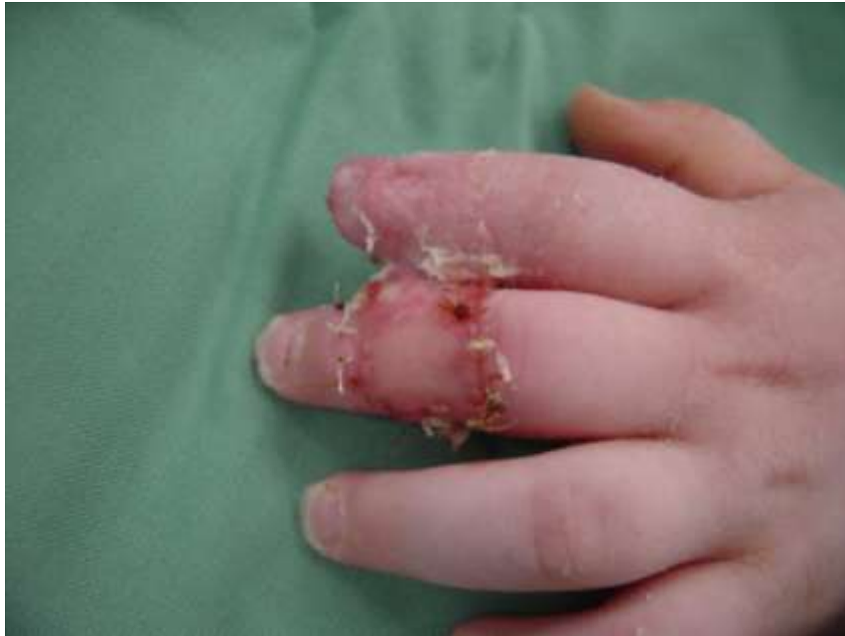

B
A
B
A
A
B

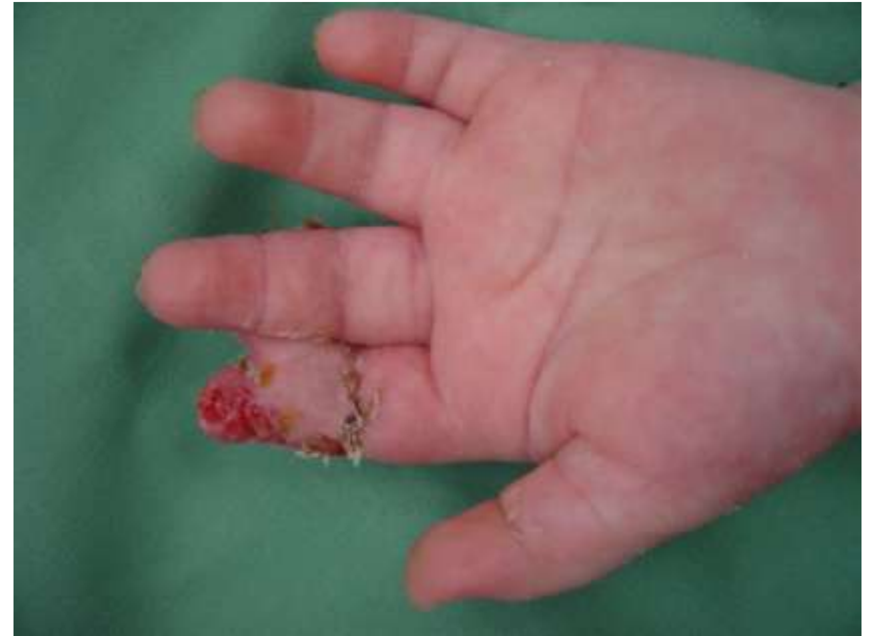
Cross-finger flap





3 year old boy crush injury to finger in window.





3 year old boy crush injury to finger in window. Three weeks post-op cross-finger flap.

Distant Flap