ACHILLES TENDON REPAIRS

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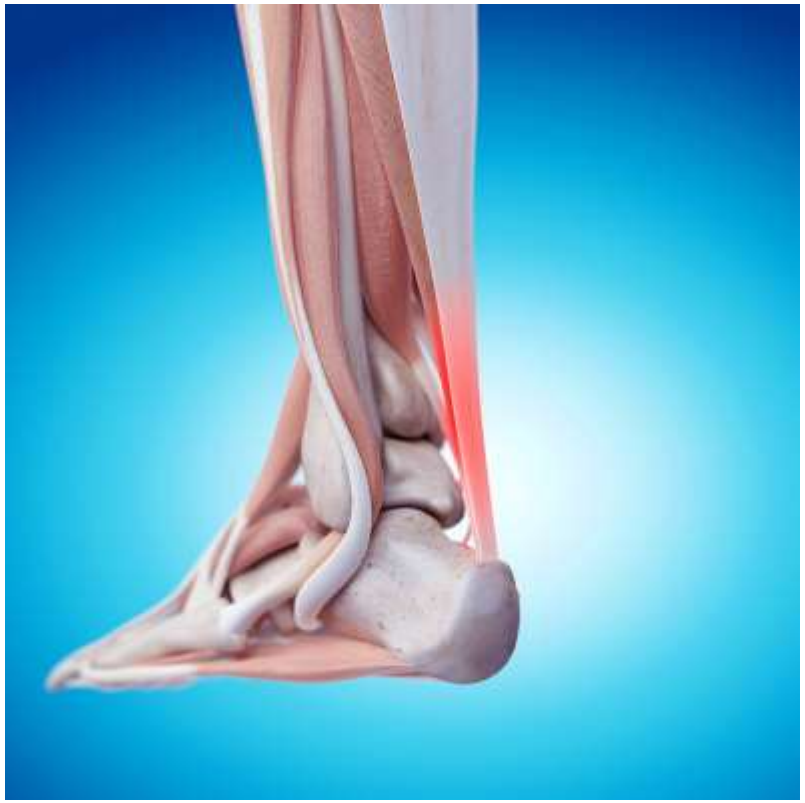
DISCLOSURES

NO CONFLICTS OF INTEREST

ANATOMY

- 10-12 cm long
- 0.5-1.0 cm diameter
- Avascular zone 2-6 cm proximal to insertion
- Fibers rotate 90 degrees at insertion



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HISTORY

- Acute pain in the back of the ankle with contraction
- Average age 35
- “Weekend warrior”
- Steroids, fluorquinolones, and chronic overuse may predispose to rupture
- Blood supply decreases with age

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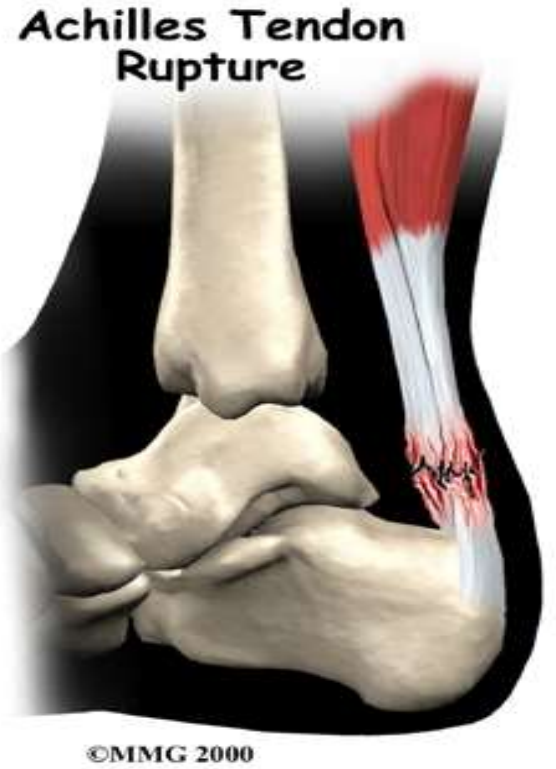
PATHOLOGY

- Rupture occurs 2 – 6 cm above the Achilles insertion in a watershed area



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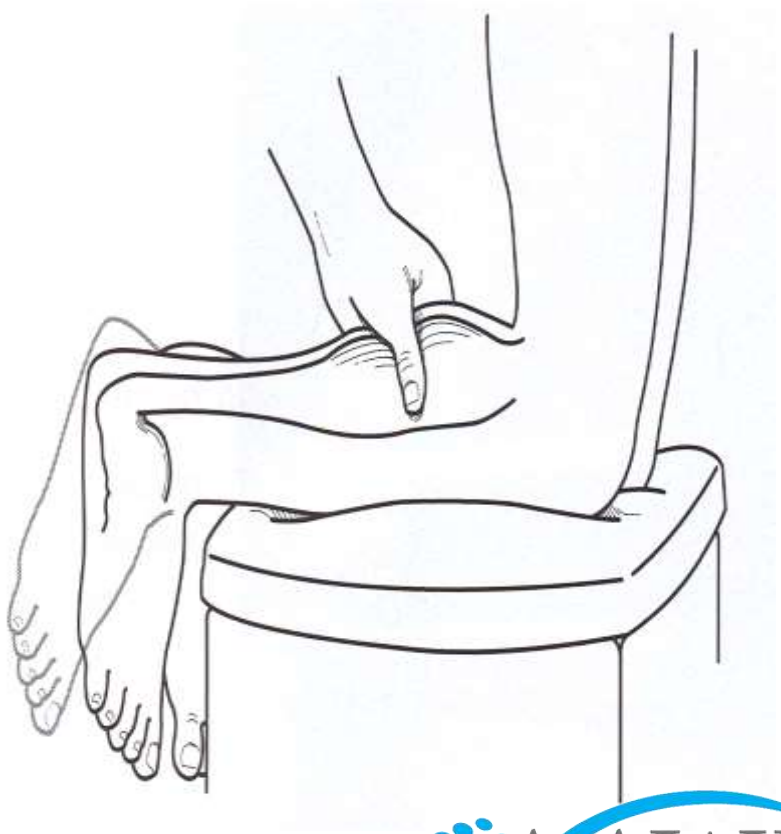
PHYSICAL EXAM

- Tenderness over achilles tendon
- Palpable defect
- Positive Thompson's test



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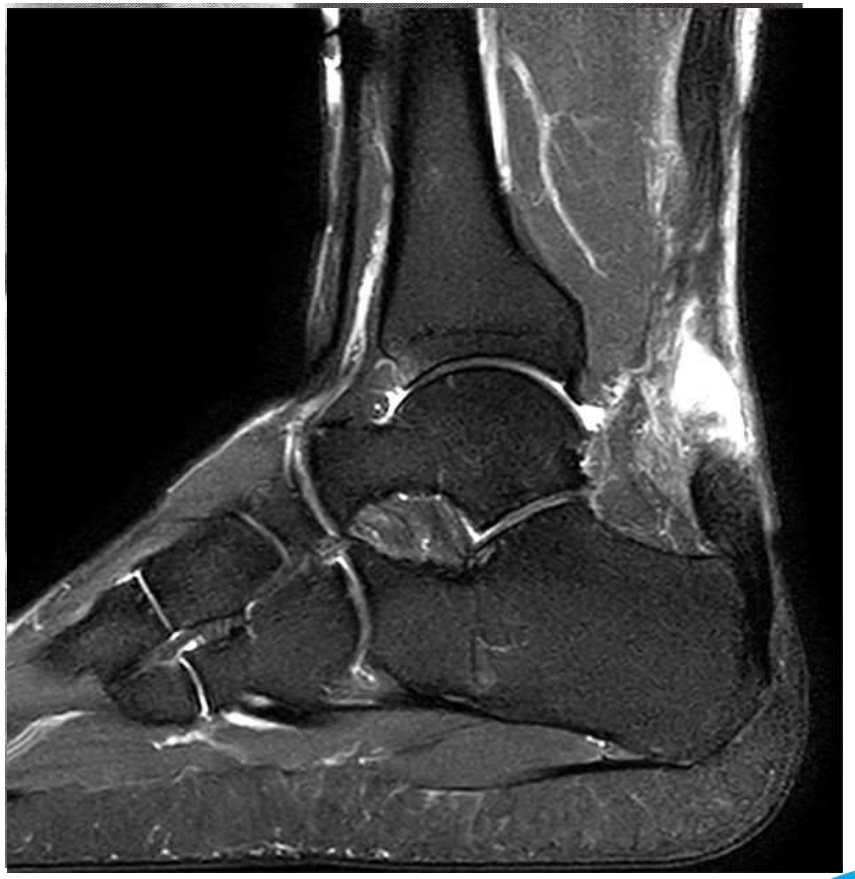
IMAGING

- X-ray
  - Lateral ankle X-ray to exclude avulsion from the calcaneus
- MRI
  - May be useful to diagnose partial\complete rupture
  - Surgical planning



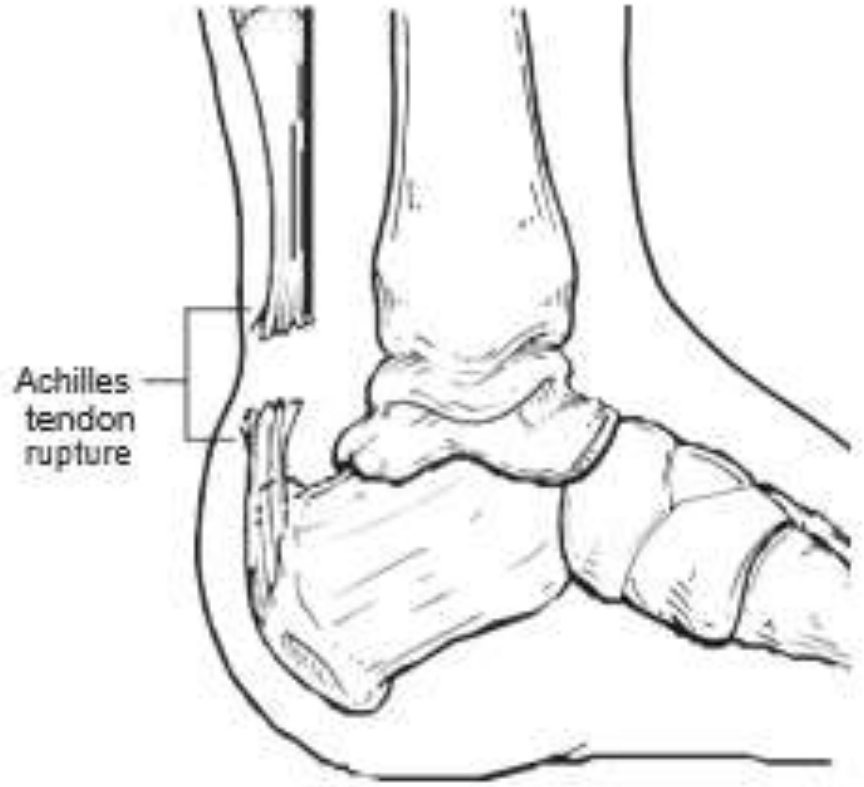
KUWADA CLASSIFICATION

Type I: partial rupture of tendon

Type II: complete rupture of tendon, < 3.0 cm gap

Type III: complete rupture, 3.0- 6.0 cm gap

Type IV: complete rupture, > 6.0 cm gap



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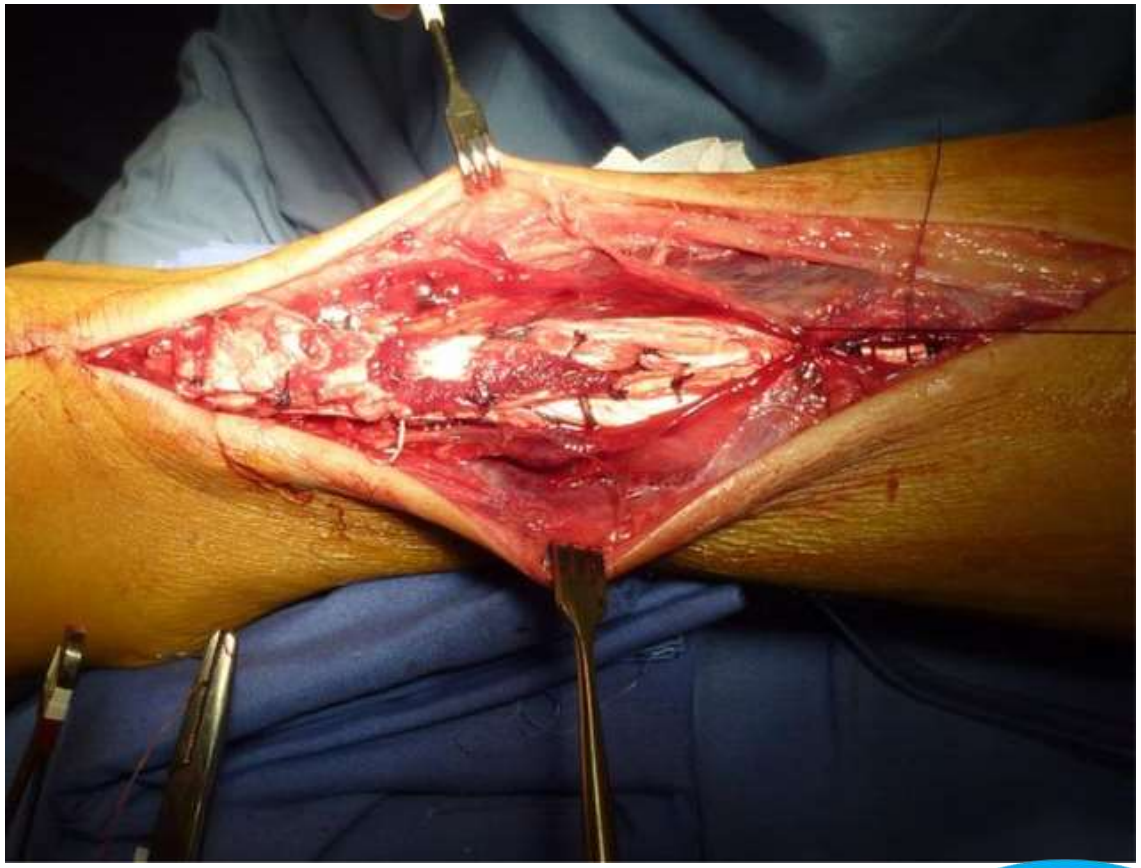
SURGICAL REPAIR

- Superior tendon strength
- Lower risk rerupture (1-3%)
- Quicker return to sport
- Surgical morbidity
  - Infection
  - Dehiscence
  - Superficial nerve injury
- Increased cost



GOALS FOR SURGICAL REPAIR

- Return to pre-injury activity level
- Calf circumference
- Normal strength & power
- Ankle dorsiflexion
- Restoration of appropriate length and tension

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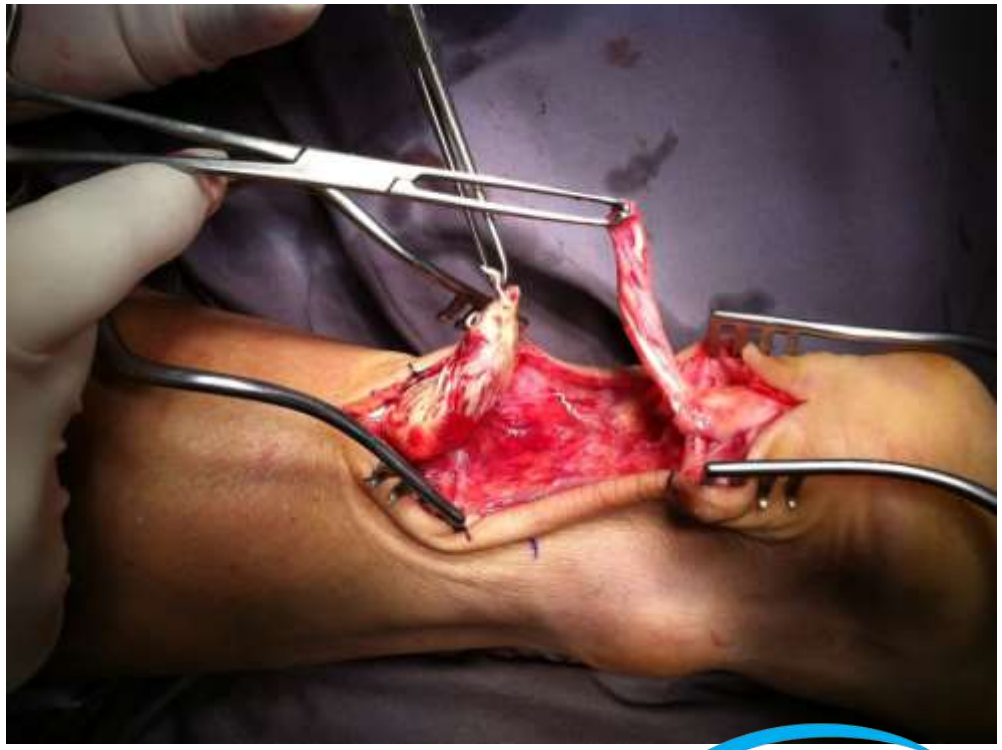
SURGICAL TREATMENT

- Preferred for athletes, younger patients
- Medial incision avoids the sural nerve
- Percutaneous vs. Open treatments described
- Isolate the paratenon as a separate layer



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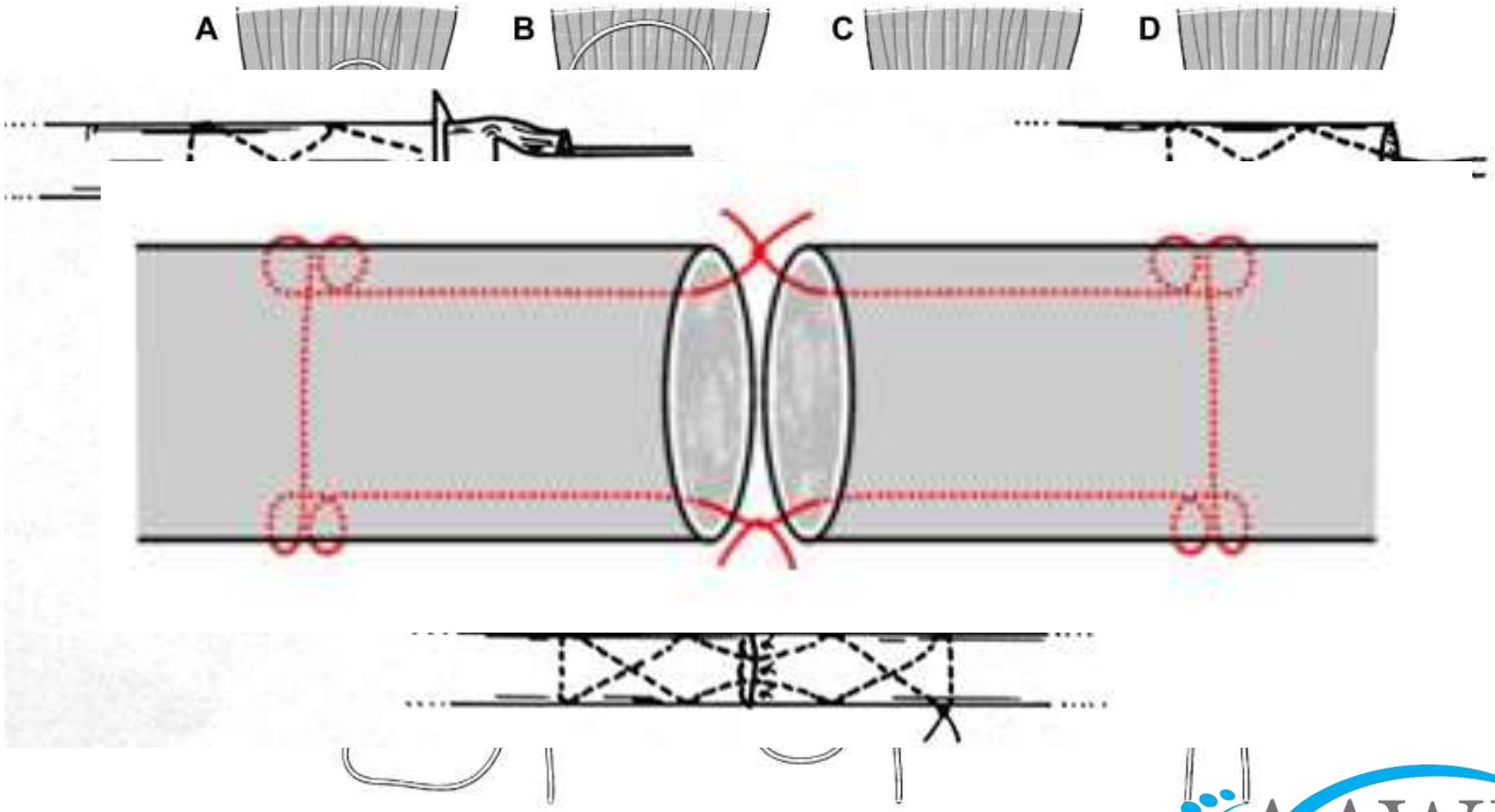
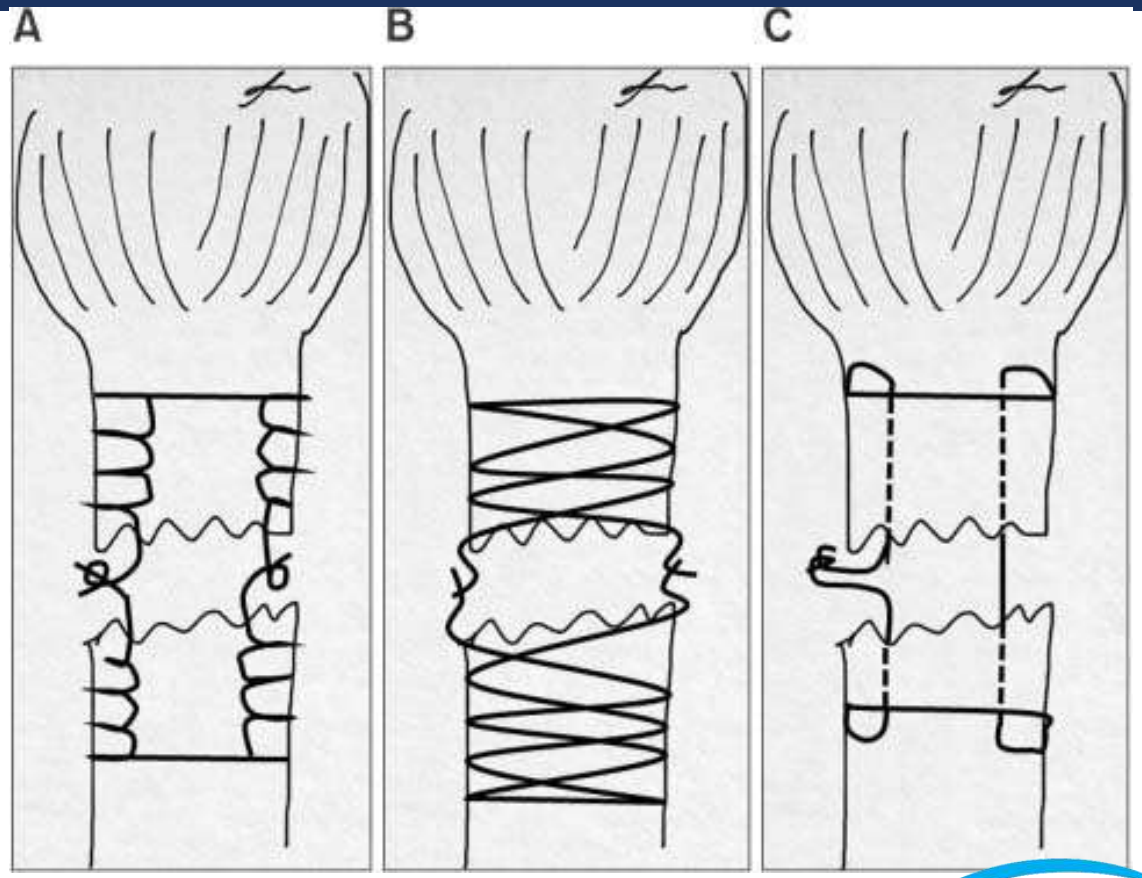
OPEN TREATMENT

- End to End Repair
  - Krackow
  - Bunnell
  - Kessler



OPEN REPAIR

- McCoy and Haddad, FAI, 2010
  - Double Krackow, double Bunnell and double Kessler
  - **No difference in strength**



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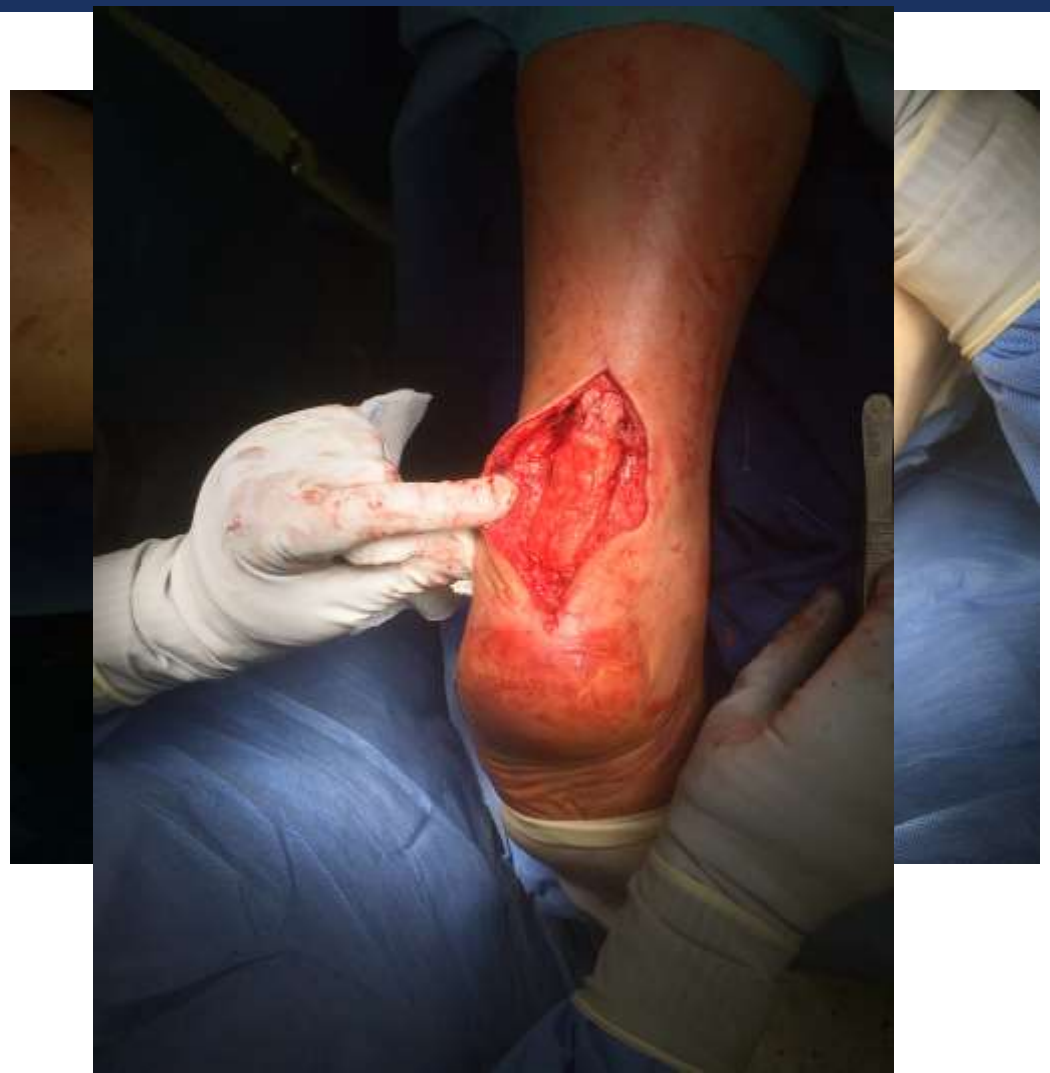
BIOLOGIC AUGMENTATION



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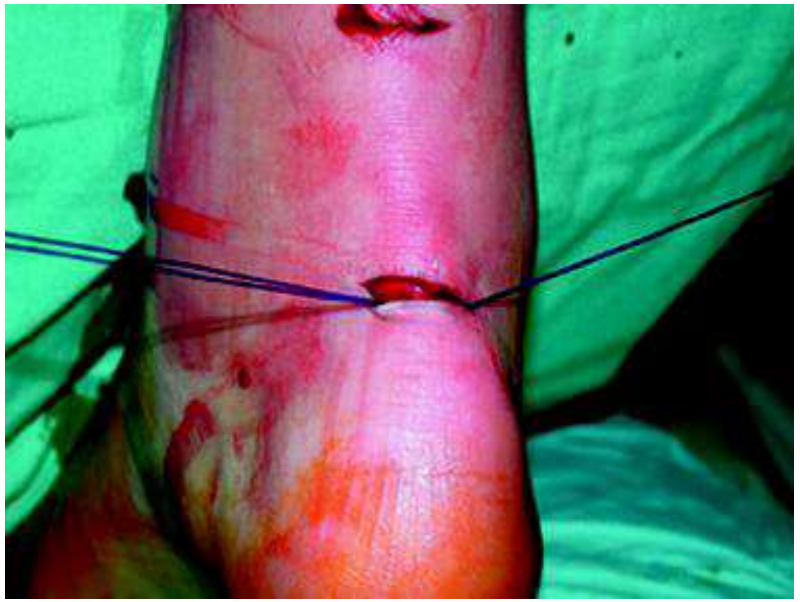
PERCUTANEOUS REPAIR

- Benefits
  - Less wound complications
  - Less tendon dissection
  - Less paratenon disruption
  - Less vascular disruption
  - Less scarring



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PERCUTANEOUS REPAIR

Treatment of Acute Achilles Tendon Ruptures: A Meta-Analysis of Randomized, Controlled Trials

Riaz Khan, Dan Fick, Angus Keogh, John Crawford, Tim Brammar, Martyn Parker, MD
Perth Orthopaedic Institute, Department of Surgery and Pathology, University of Western Australia, Perth, Australia
2005, Journal of Bone and Joint Surgery

- 800 Adult patients with acute rupture
- Lower complication rate
- Risk of rerupture is equal to or less than open repair

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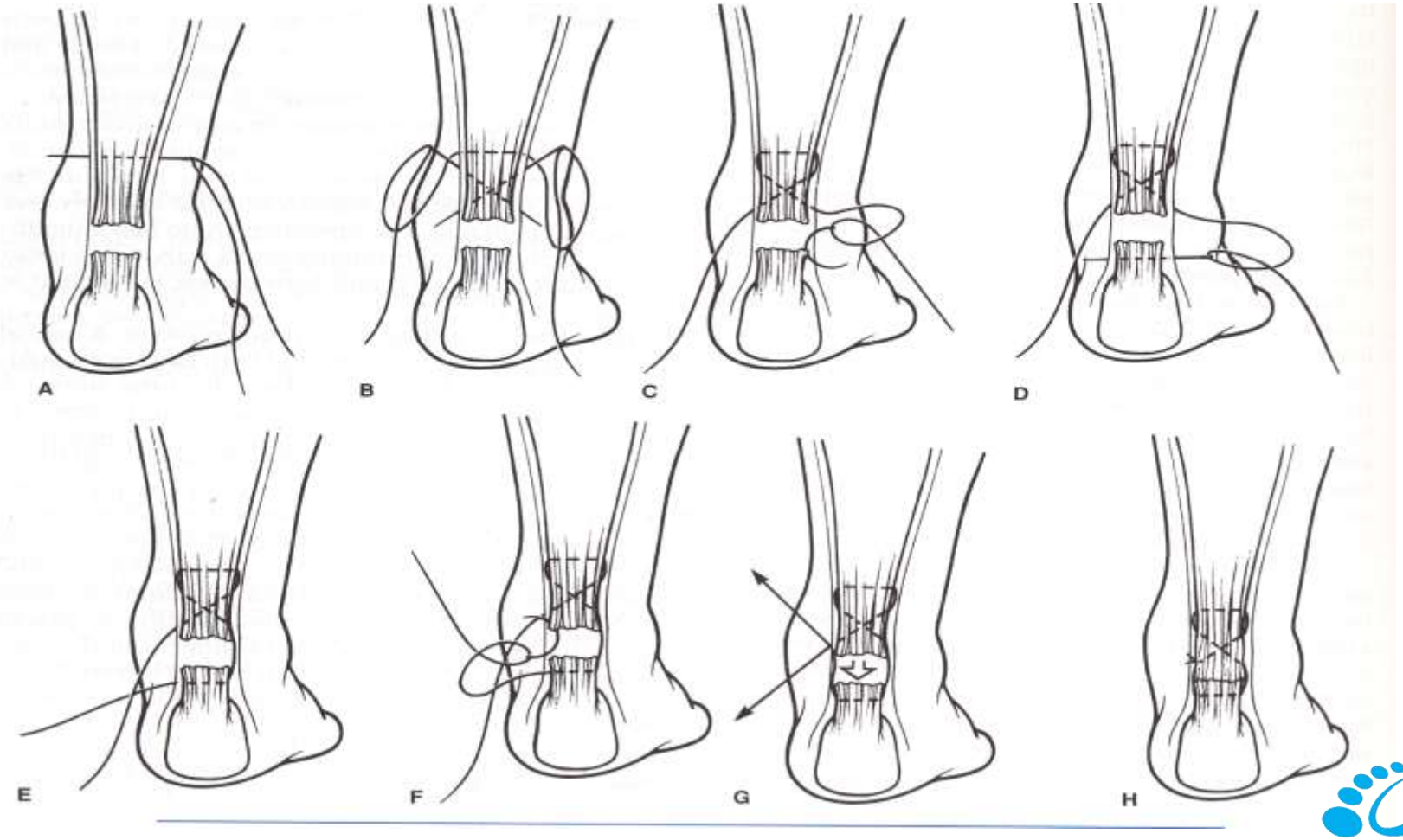
PERCUTANEOUS REPAIR



PERCUTANEOUS REPAIR

- Several different systems

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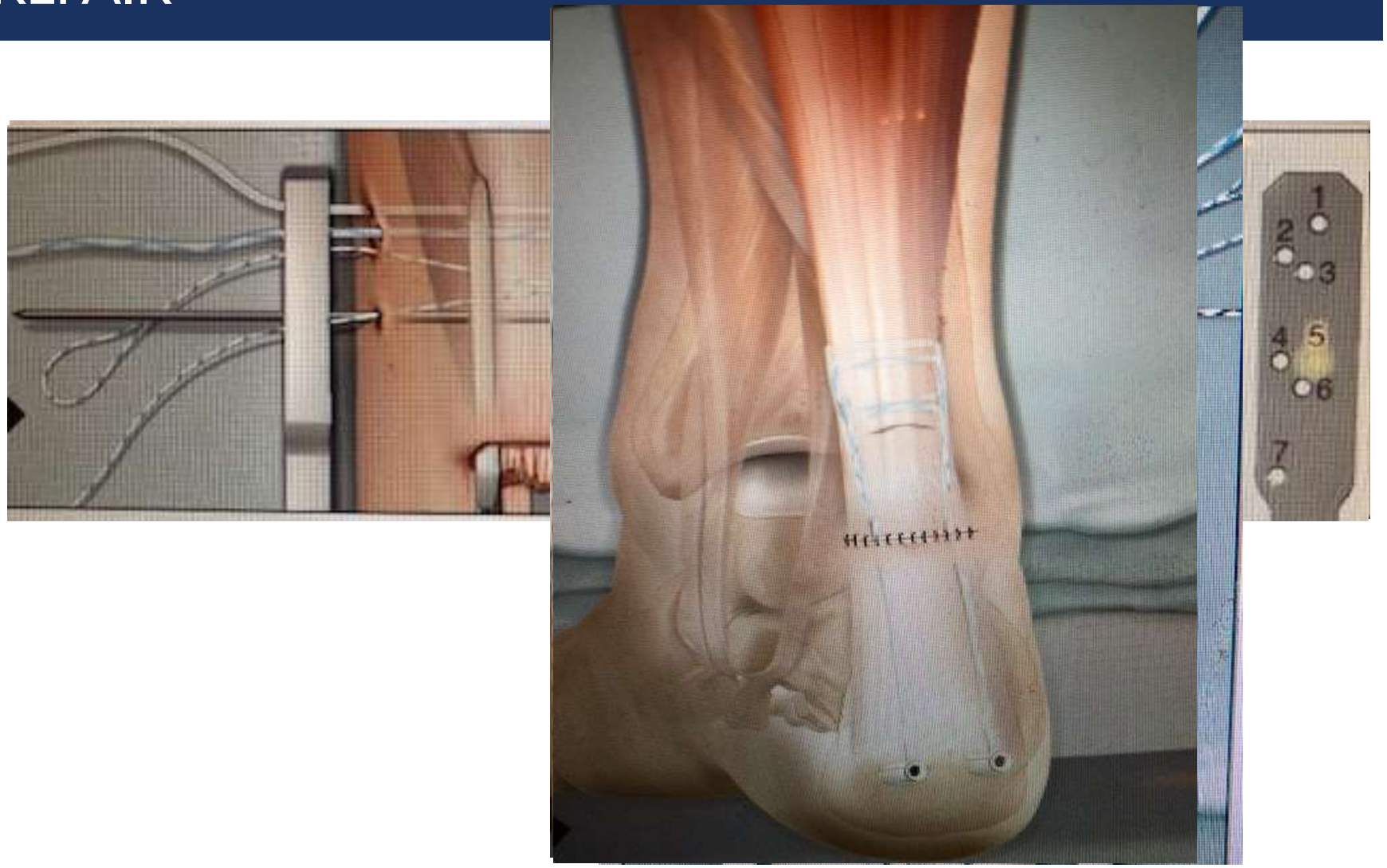
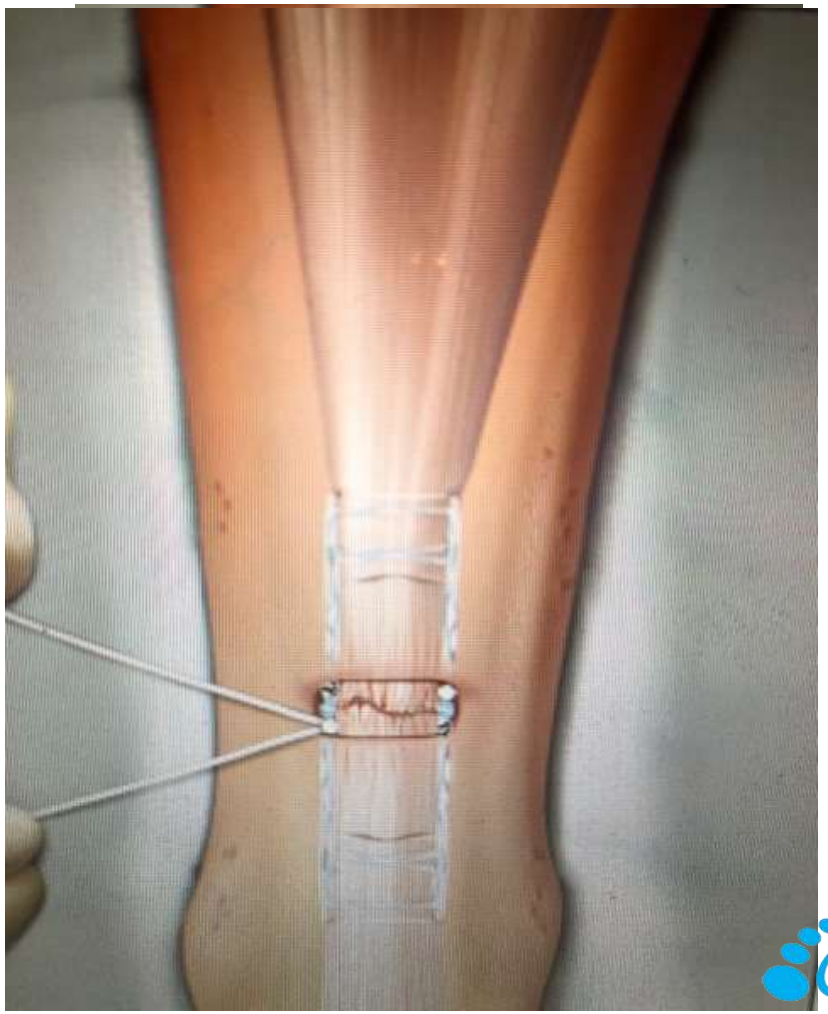
PERCUTANEOUS REPAIR

- Percutaneous technique I



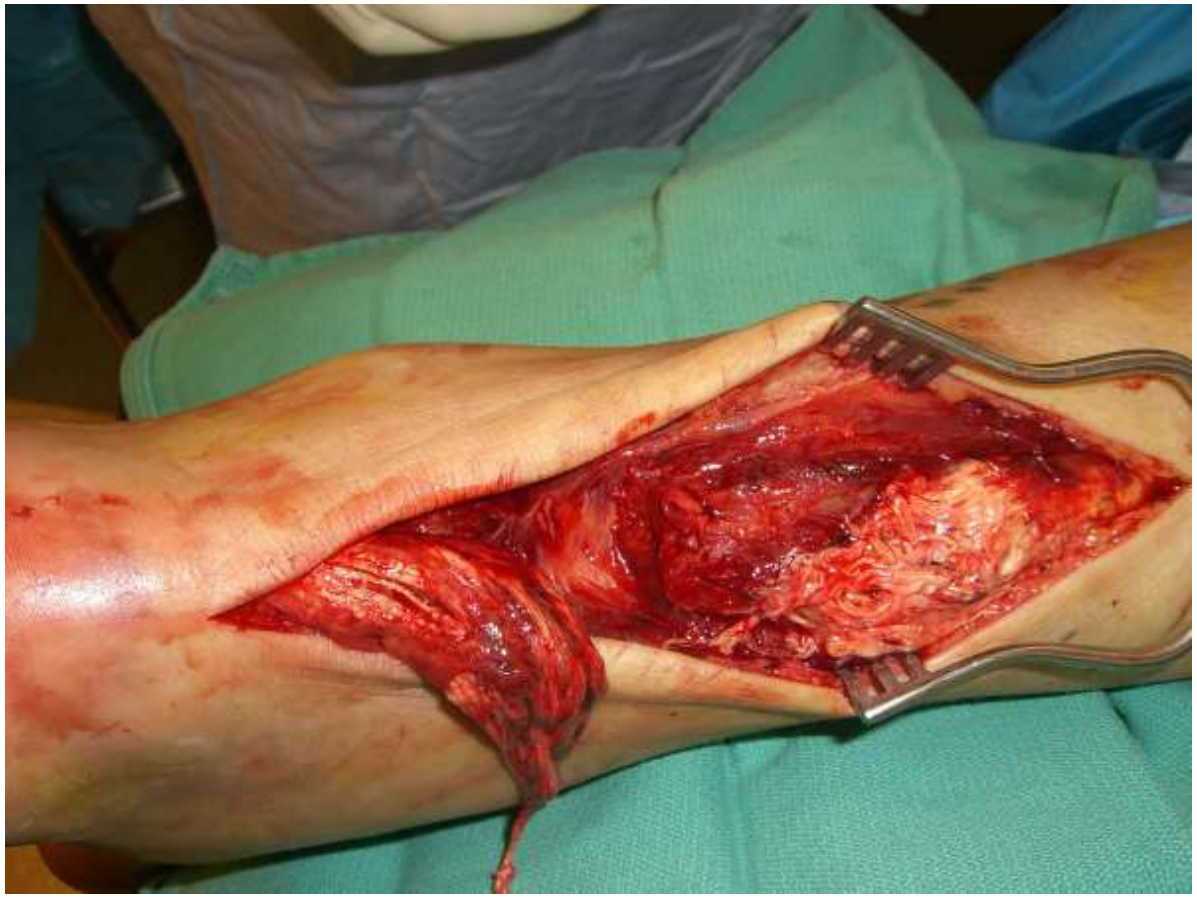
PERCUTANEOUS REPAIR

- Percutaneous technique 2



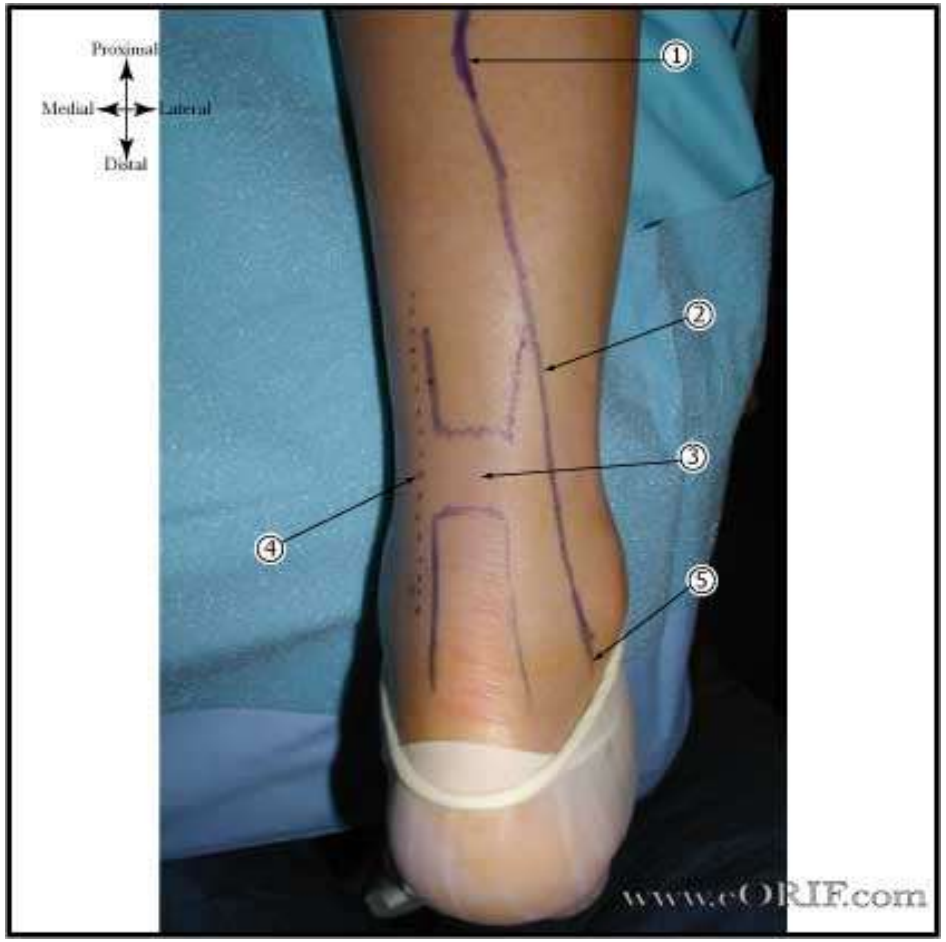
FHL AUGMENTED REPAIR

- Indications
  - Used when there is a delayed dx/presentation of AT rupture
  - Kuwada Stage 4
  - Tendon is unhealthy with fibrofatty heterogeneity



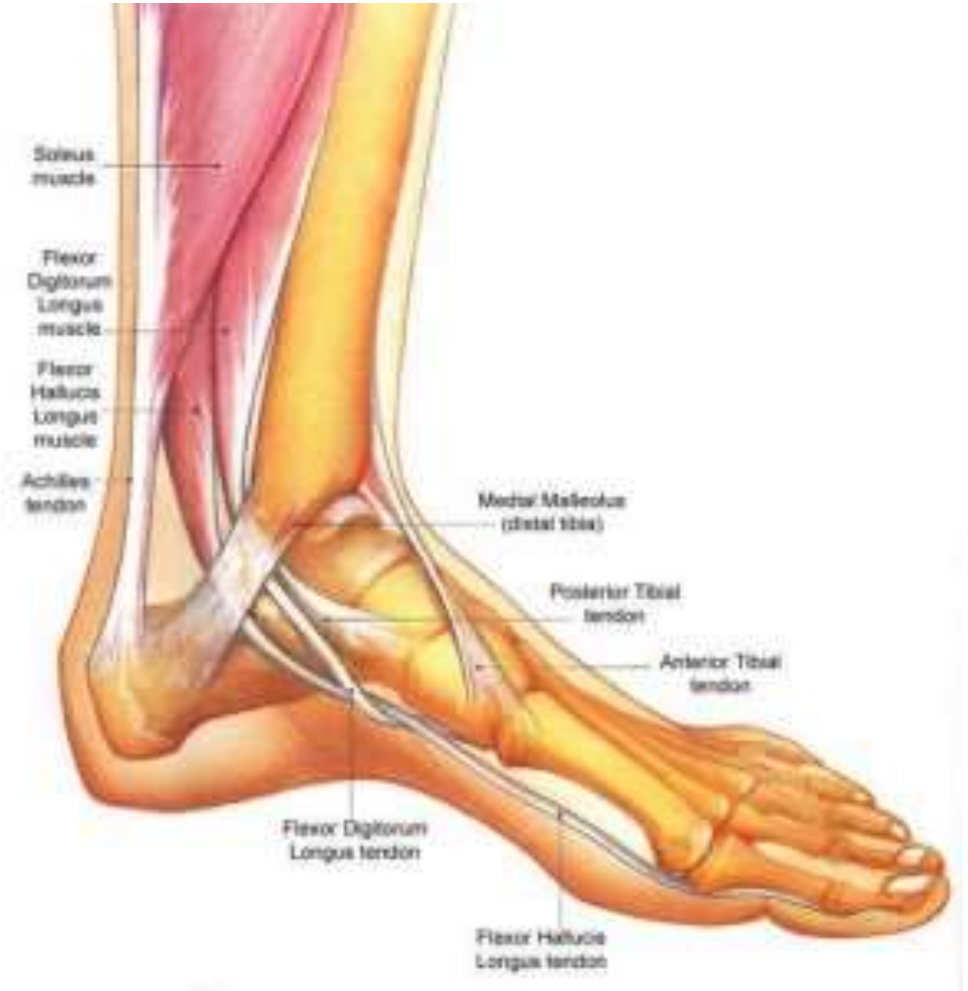
FHL AUGMENTED REPAIR

- Technique
  - Posterior linear incision medial to midline
  - Careful dissection
  - FHL harvest is done before repairing the AT



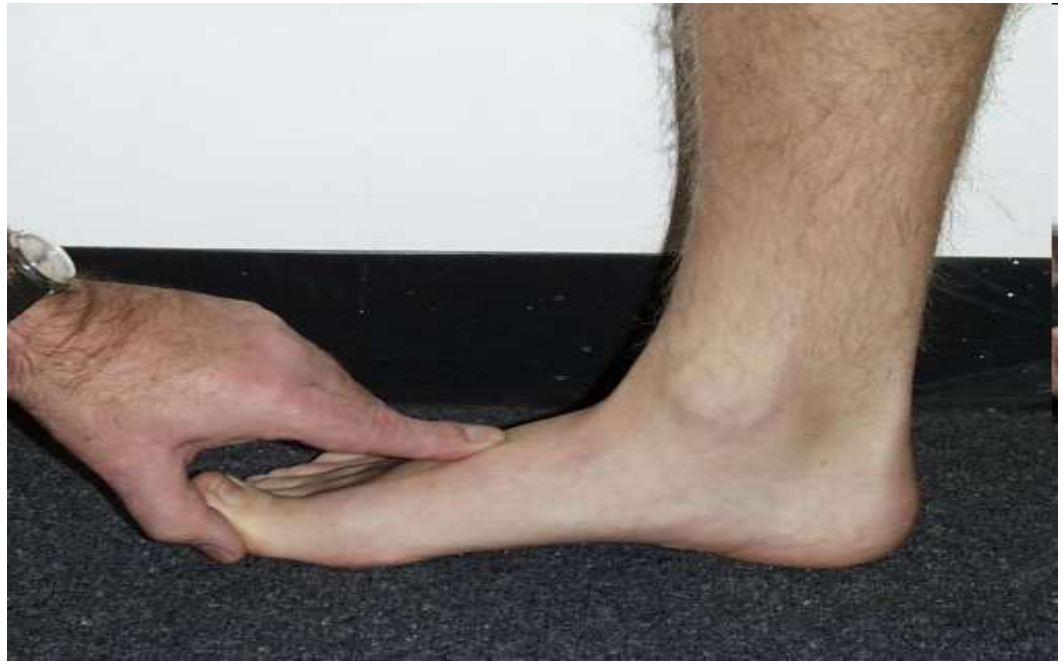
FHL AUGMENTED REPAIR

- Benefits
  - FHL is very close to AT
  - FHL is a strong PF
  - FHL fires in same phase as AT
  - Transferring FHL has the least impact in biomechanics



FHL AUGMENTED REPAIR

- Technique
  - Confirm the correct tendon (FHL) clinically!
  - Caution with tibial artery and nerve
  - Obtain 3 to 4 cm of FHL by cutting it as distal as possible
  - Krakow stitch is done at the distal tip of FHL with non-absorbable suture



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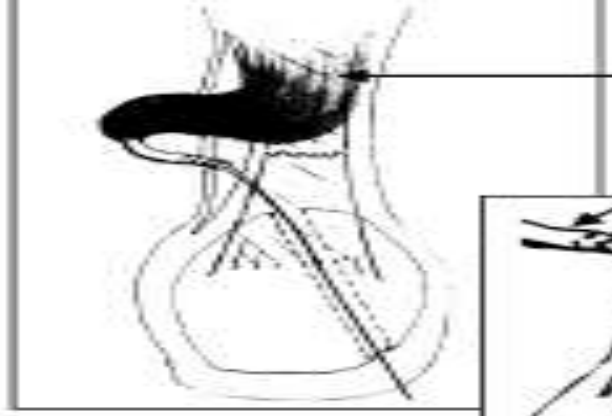
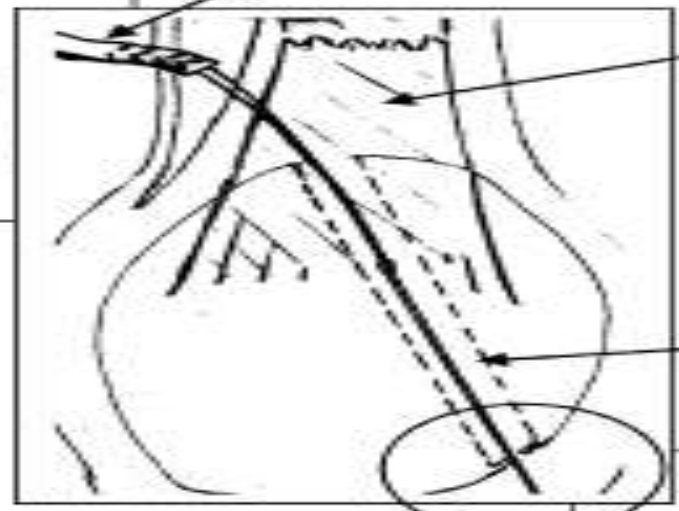
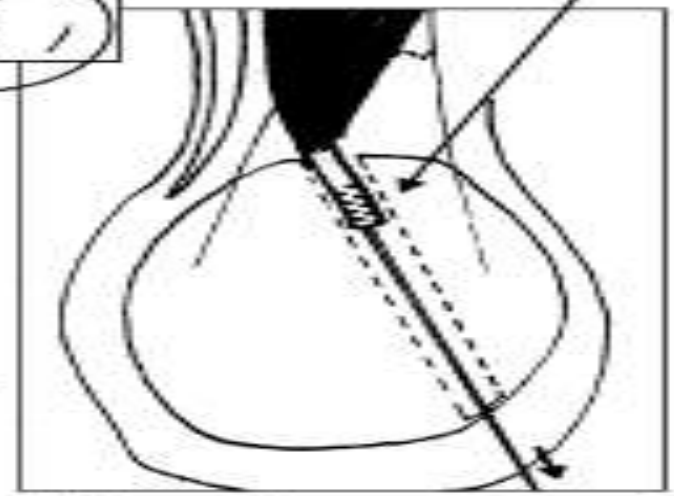


FHL



Achilles tendon

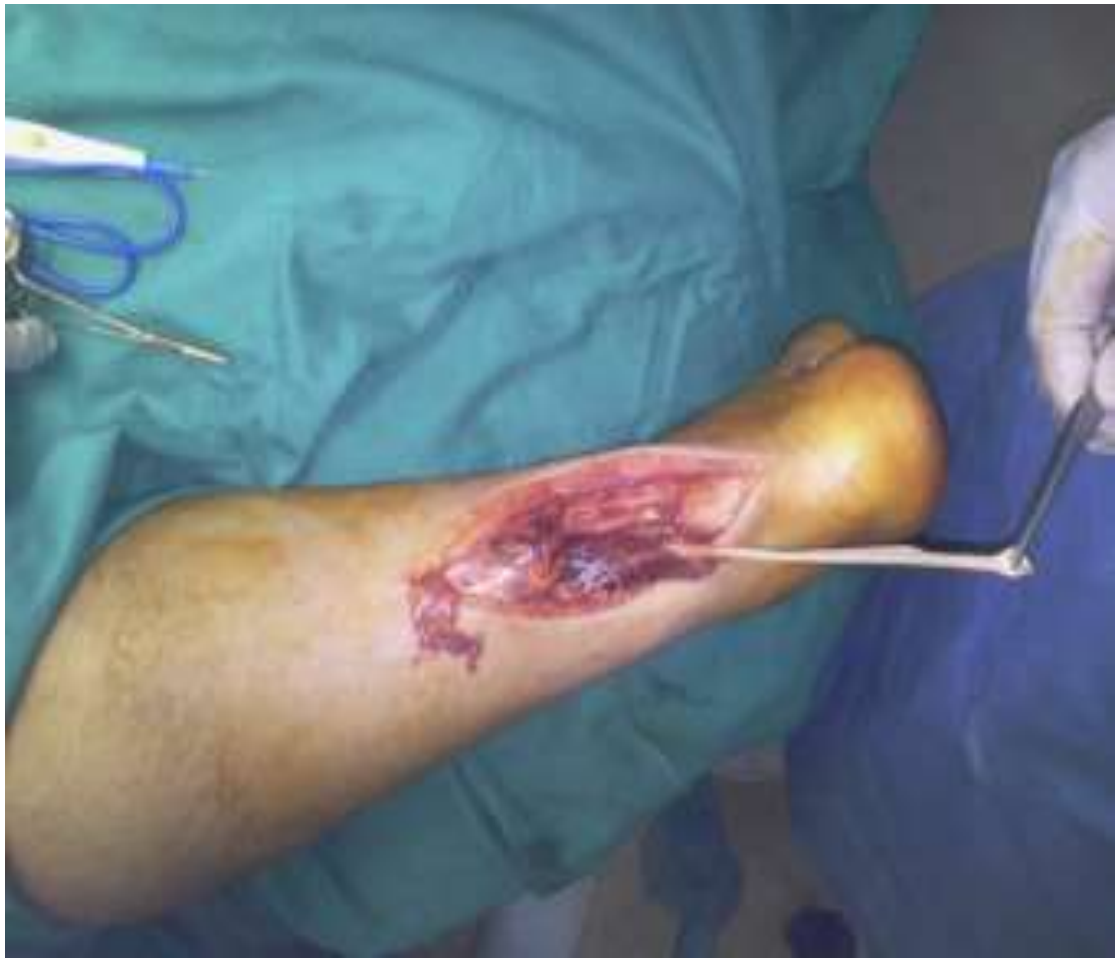
Drill hole in calcaneum into which FHL is passed

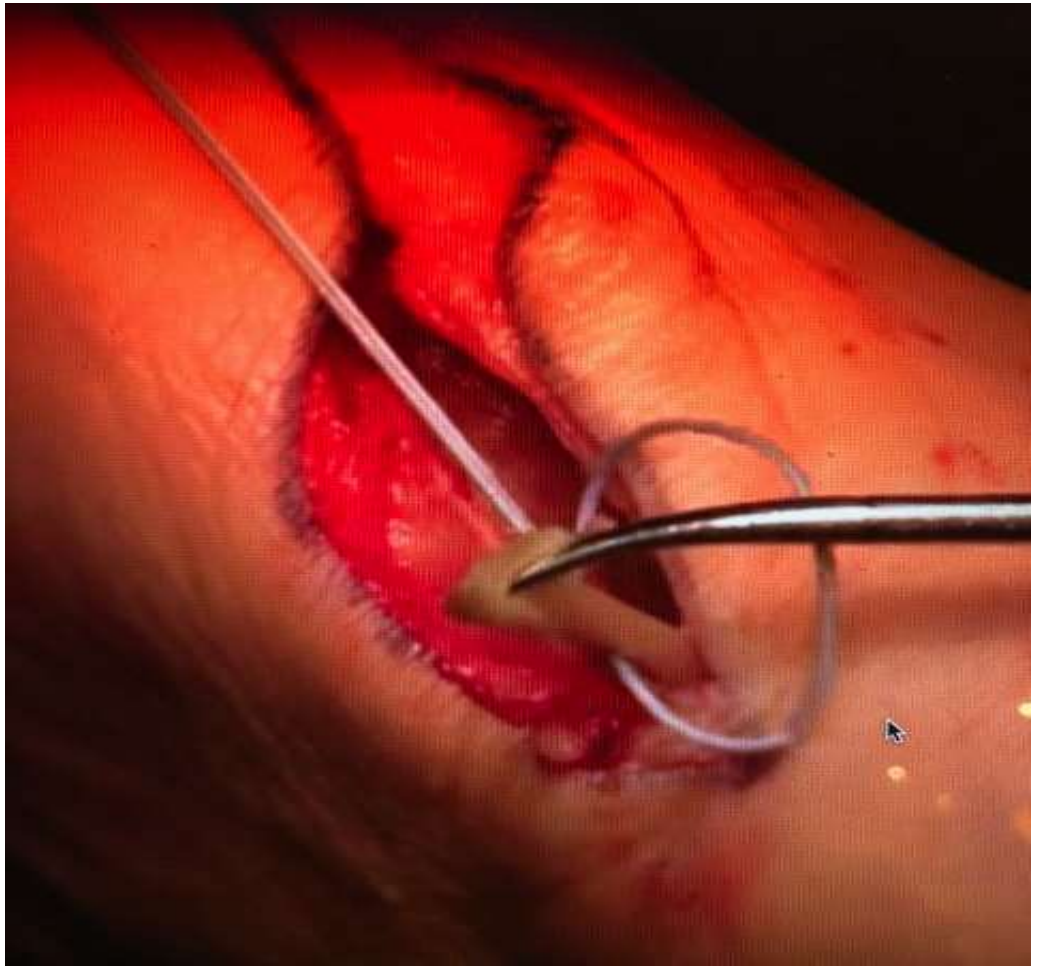


Only guide-wire passes through plantar cortex of calcaneum, which allows subsequent passage of tendon passer and suture

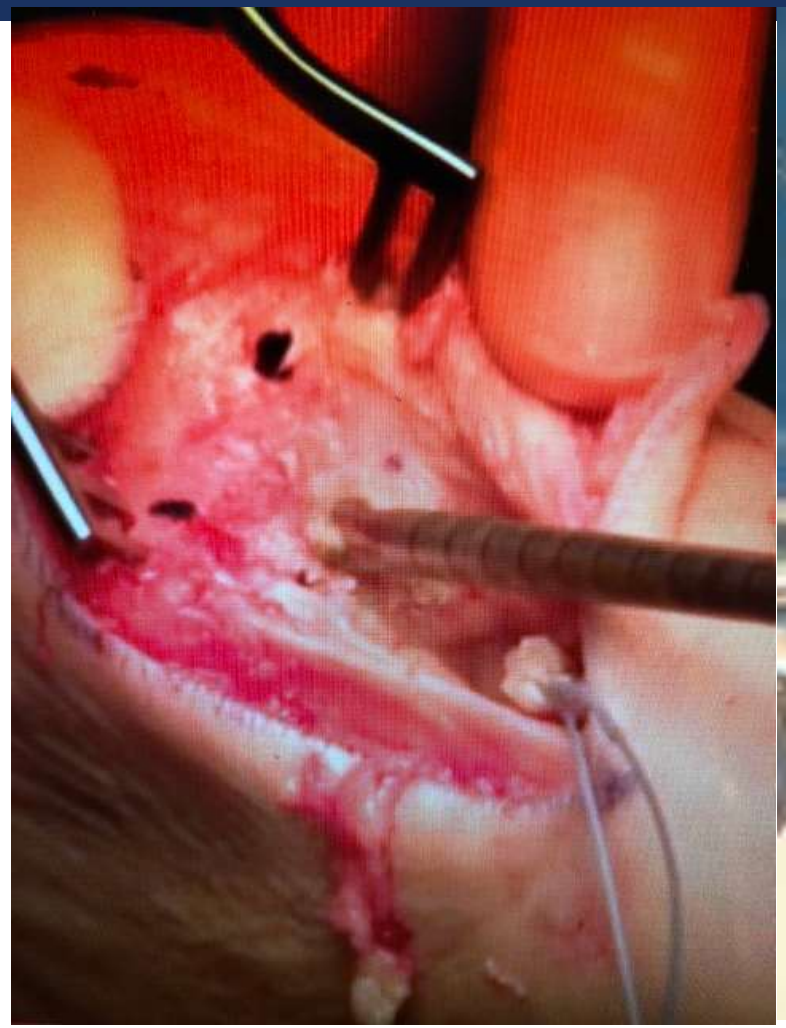
Interference screw inserted to fix FHL in tunnel at desired tension

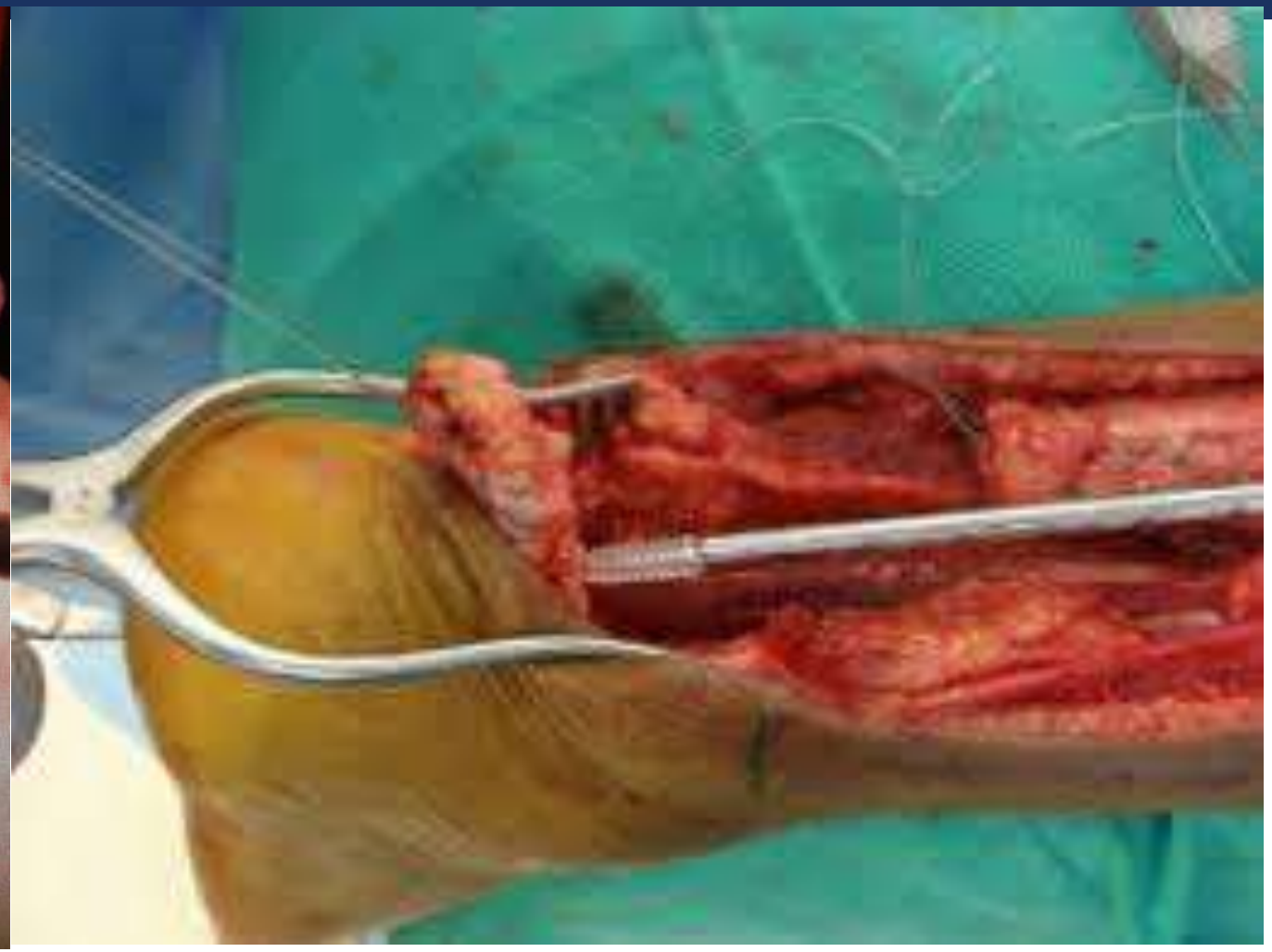
FHL AUGMENTED REPAIR



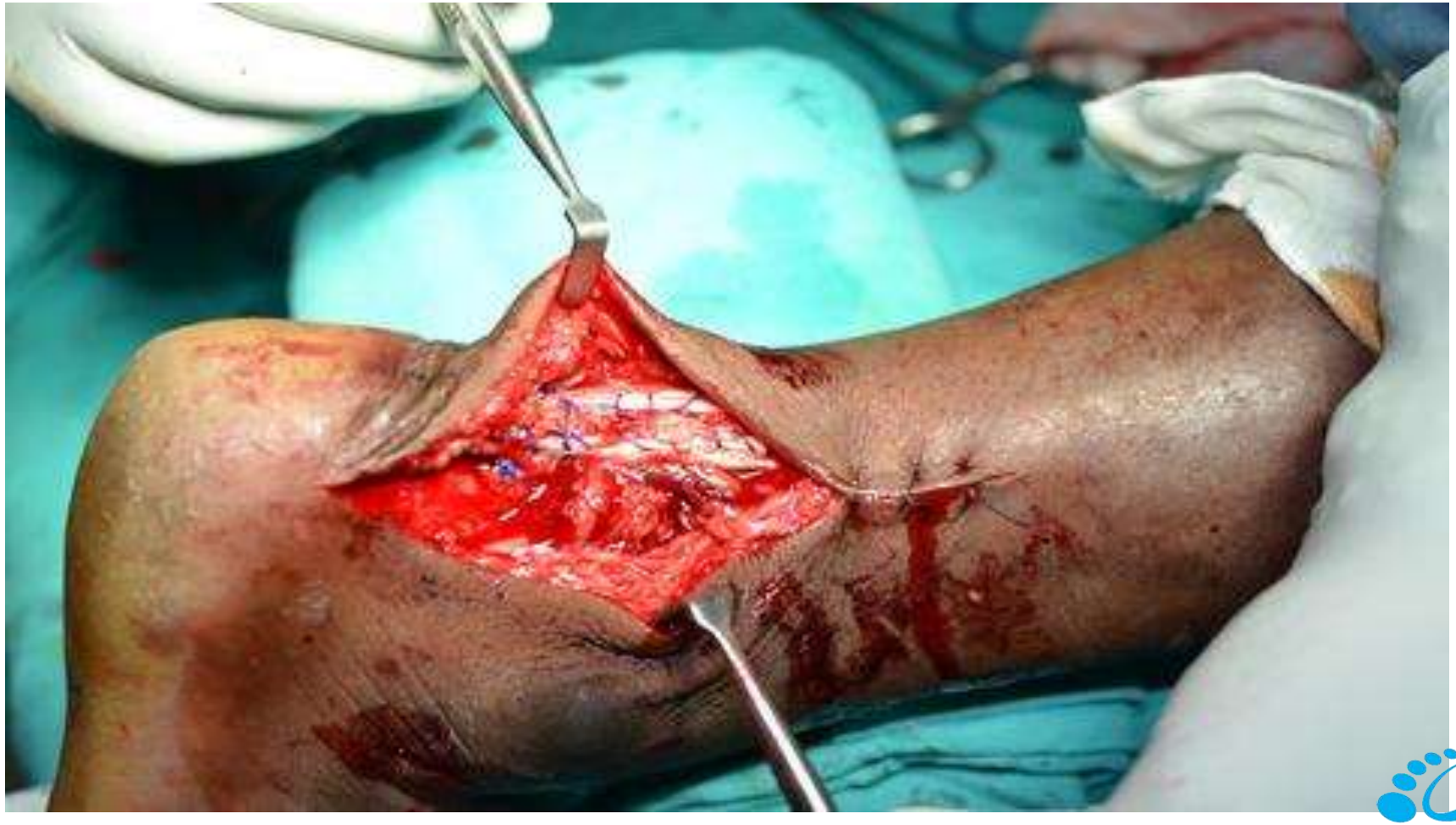


FHL AUGMENTED REPAIR





FHL AUGMENTED REPAIR



FHL AUGMENTED REPAIR

- Two main benefits:
  - Provides maximal strength to the remaining AT
  - AT receives blood supply from FHL

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FHL AUGMENTED REPAIR

- Newer technique to improve surgical treatment of chronic AT rupture of Kuwada stage 4
- Reduces surgical time
- Reduces amount of incisions
- Decreases amount of dissection needed
- Increases initial repair strength
- During screw resorption there is increase of physiological tensile loading at bone-tendon interface so it may increase the strength of transfer over time

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FHL AUGMENTED REPAIR

Modified Flexor Hallucis Longus Transfer for Achilles Insertional Rupture in Elderly Patients

Margaret Wan Nar Wong, MB, BS; and Vincent Wan Sing Ng, MSc.* CLINICAL ORTHOPAEDICS AND RELATED RESEARCH Number 431, pp. 201–206

- 5 patients with ruptures of achilles tendon
- Can complete single heel raise
- AOFAS hindfoot score of 94.4 post operatively
- No surgical complications
- No reruptures

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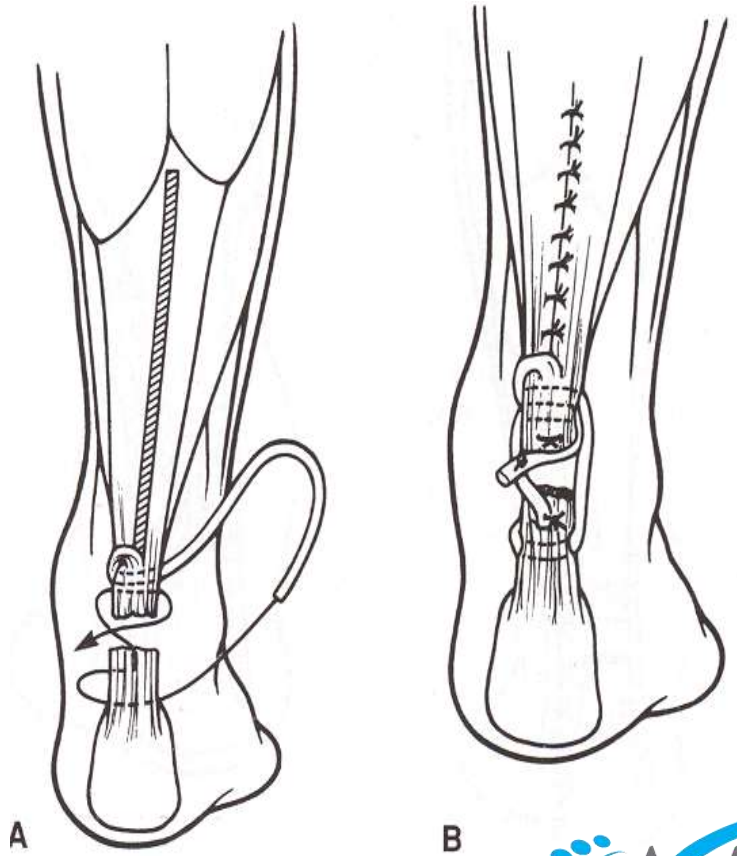
CHRONIC ACHILLES RUPTURES

- Chronic rupture may be reconstructed with FHL, FDL, or slip from gastrocnemius



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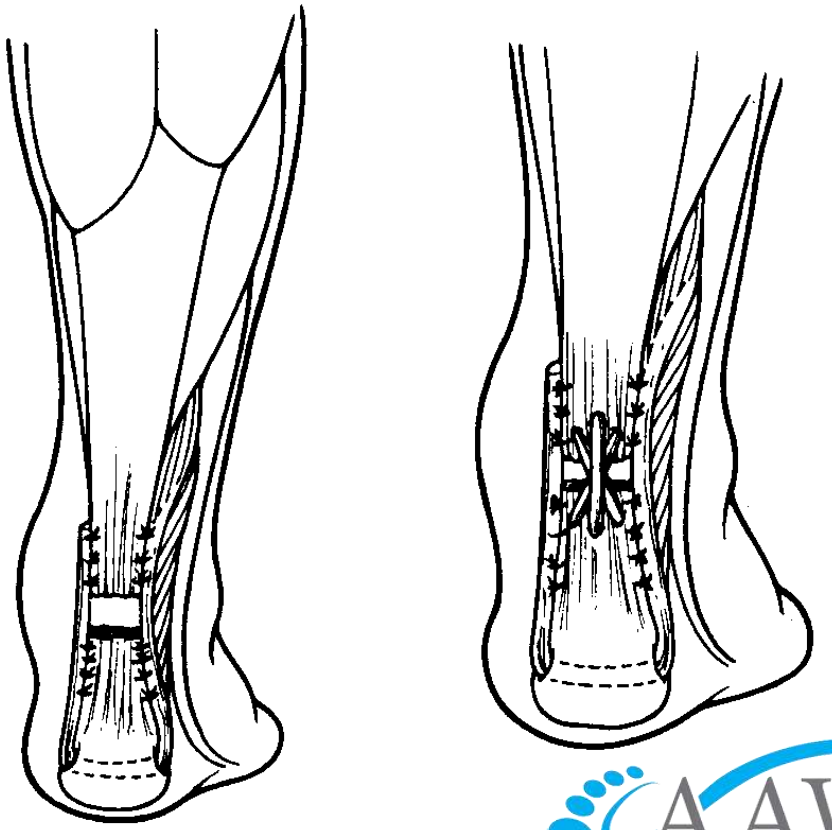
CHRONIC ACHILLES RUPTURES

- Reconstruction of neglected rupture with peroneus longus and plantaris weave



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CONCLUSIONS

- Increasing evidence for minimally invasive techniques
- Younger athletic population still favor operative repair
- Chronic injury or higher stage acute ruptures do well with augmented repair
- **Do what works best for your patient and in your hands**

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Thank You!

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