2017 ANKLE TENDON REPAIR

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DISCLOSURE

- **Stock Holder: AlterG™**
- **Research Funding/Speaker: Storz Med AG/Curamedix**

PERCUTANEOUS ACHILLES TENDON RUPTURE REPAIR

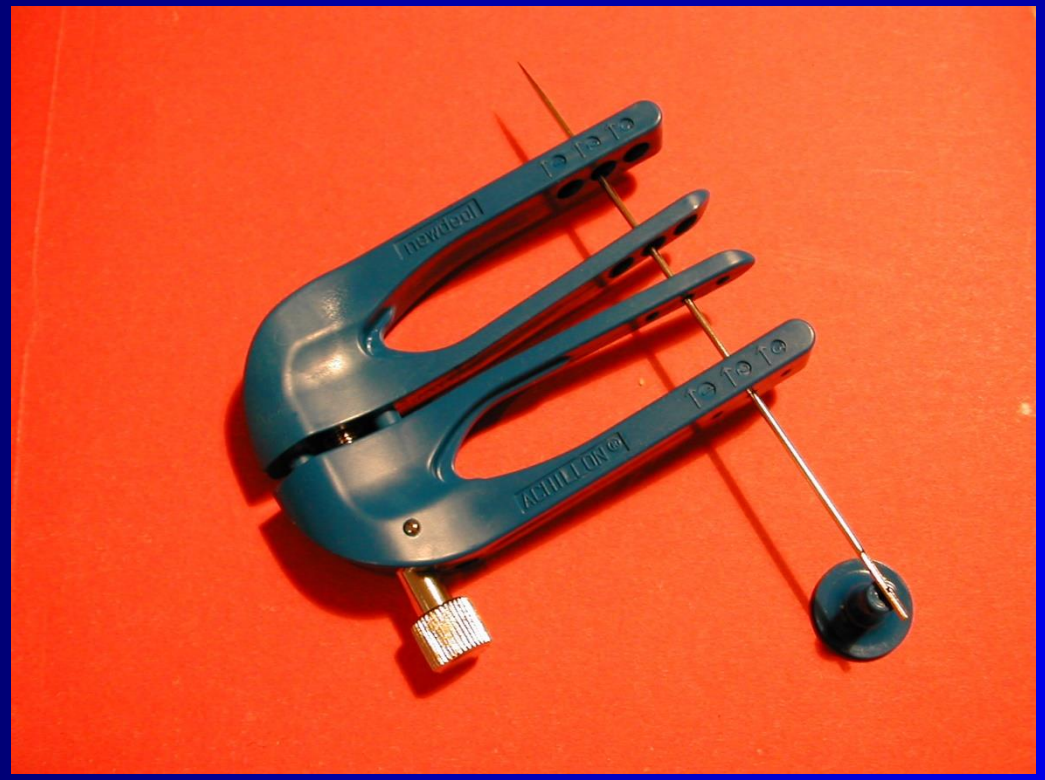
- Prof. Nicola Maffulli, MD, PhD
- University of Salerno, Salerno, Italy
- Queen Mary University of London, London, England
- London Independent Hospital , London, England

Mini-open Techniques

- Reduce wound problems of open operations
- Reduce sural nerve problems of percutaneus operations (???)
- Direct visualisation of tendon ends

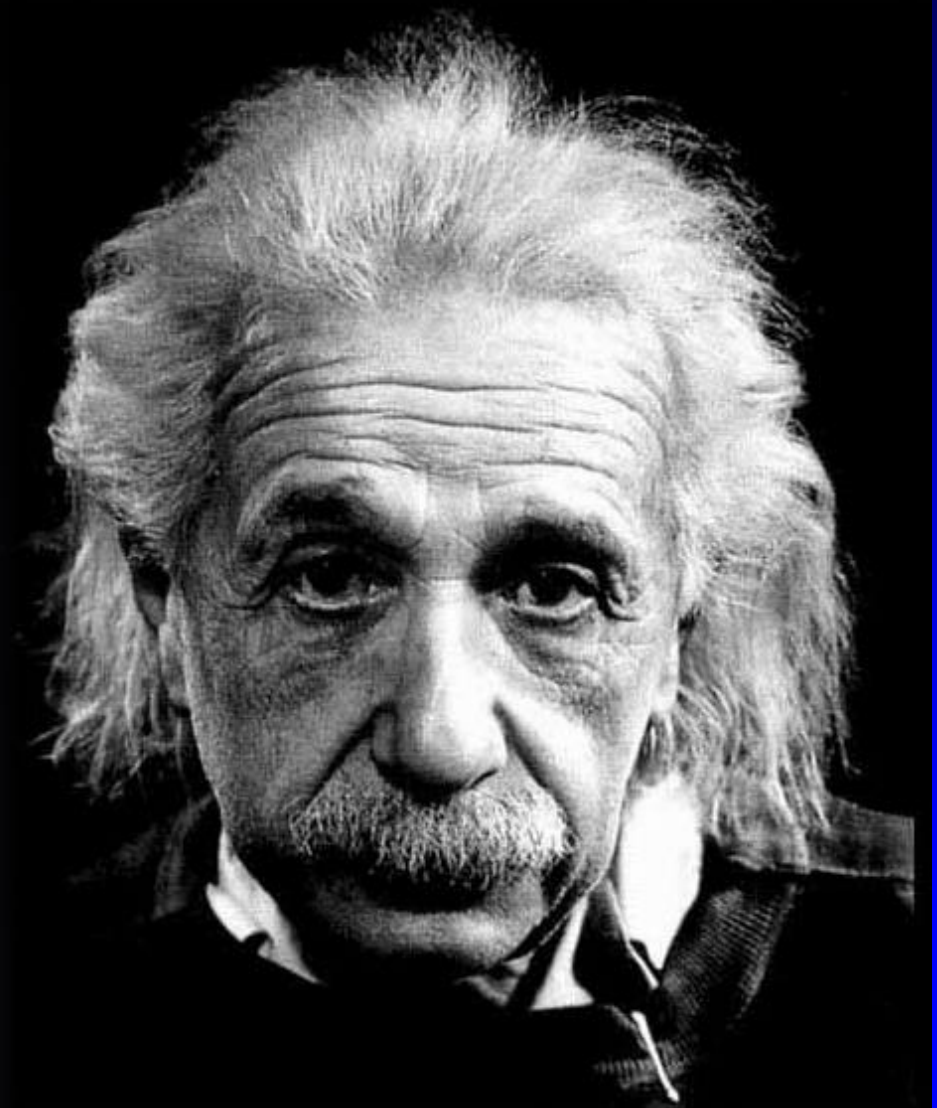
Mini-open technique

- Achillon® Mini-open technique
- PARS: Bob Anderson



“Everything should be made as simple as possible, but not simpler.”

Albert Einstein



A biomechanical comparison of the primary stability of two minimally invasive techniques for repair of ruptured Achilles tendon

Umile Giuseppe Longo, Francisco Forriol, Stefano Campi, Nicola Maffulli & Vincenzo Denaro

Knee Surgery, Sports Traumatology, Arthroscopy

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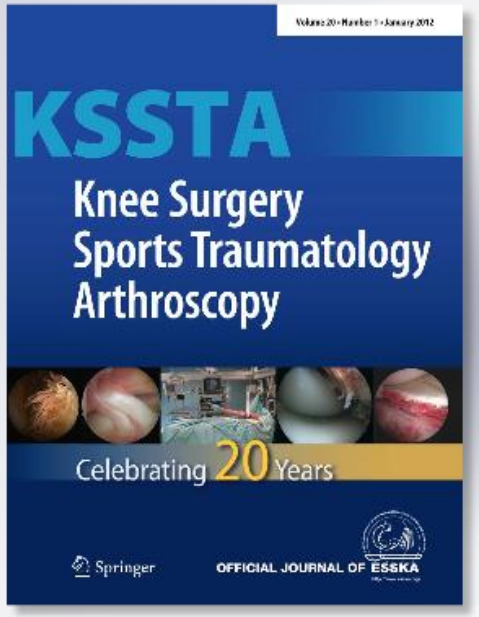

Springer

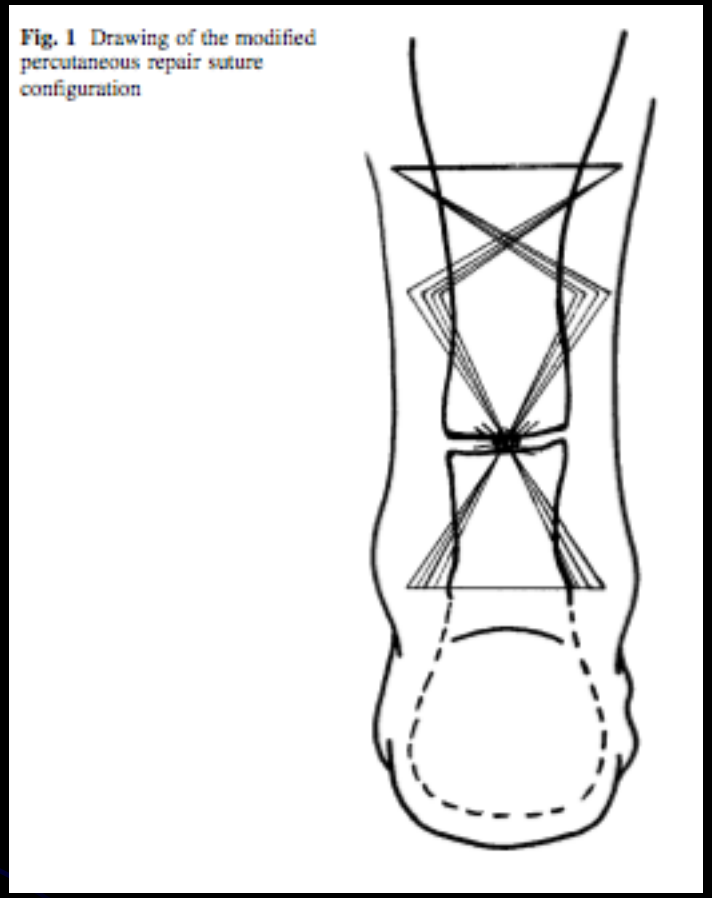

Fig. 1 Drawing of the modified percutaneous repair suture configuration

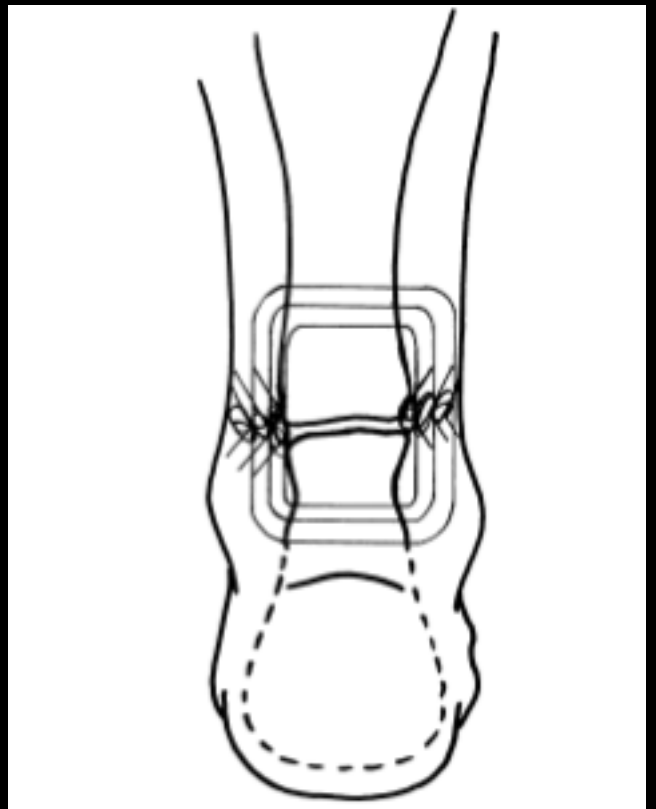

Fig. 2 Drawing of the Achillon device suture configuration

- The two suture configurations provide similar primary stability
- No advantages in using an Achillon-like configuration to repair a ruptured AT

How I do it now: Acute Rupture

- Percutaneous “Maffulli” technique w #2 absorbable mono-filament if < 2wks (Still do open for certain cases, w braided absorbable)
- 7-9 incisions: inferior transverse
- NWB 2 wks in BK EQUINUS CAST, 6 more wks in BK Boot w heel wedge. NWB > 3wks for rupture has NO Benefit-may actually promote atrophy & re-rupture!
- RTA 20 wks
- 1.5% re-rupture, 3% suture rxn still!

Bias proximal incisions medial: total 7-9 incisions

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Post-op Left Perc Achilles

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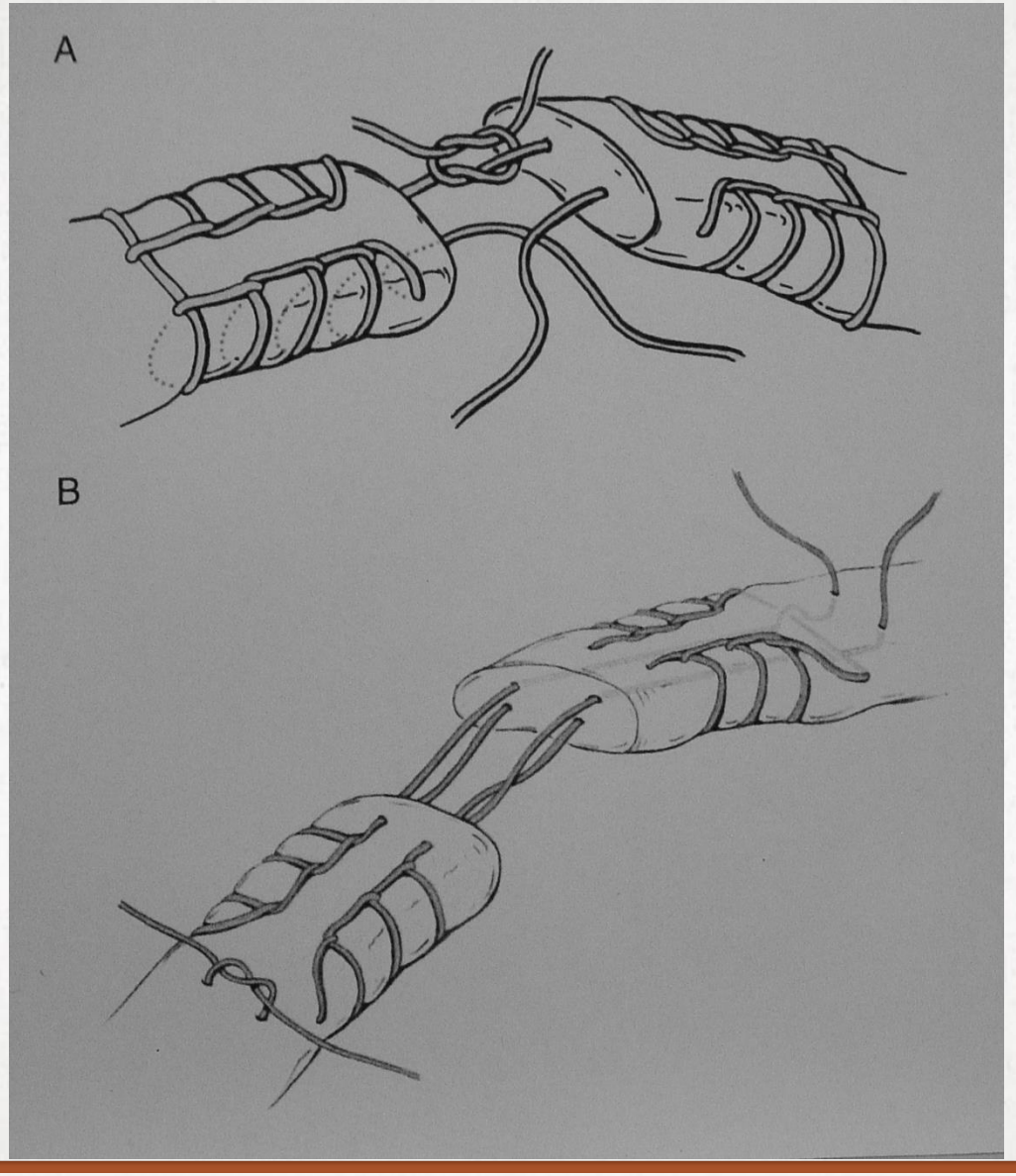
OPEN ACHILLLES TENDON REPAIR

CURRENT PRACTICE

- “MAC”/Local anesthesia
- No tourniquet
- Prone
- Medial incision for tendon
- Absorbable suture & anchors when possible

TENDON REPAIR TECHNIQUE

- BUNNELL
- KESSLER
- MASON-ALLEN
- KRACKOW
- GIFT-BOX


A
B

PROCEDURE DESCRIPTION

INCISION

DEEP FASCIA/PARATENON

ASSESS RUPTURE

APPRECIATE MUSCLE CONTRACTURE

RESECT MOP-ENDS

REESTABLISH TENDON STUMP IN EQUINUS!

KRACKOW?

COMPLICATIONS

- INFECTION
- SURAL NERVE INJURY
- WOUND DEHISCENCE
- RE-RUPTURE
- ATTENUATION
- CALF ATROPHY

MIDLINE ACHILLES REPAIR: KELOID: AVOID!!! NOT PREDICTABLE

ACHILLES TENDINOSIS/PERITENDINOSIS

LONG-TERM EVAL ON PERITENOLYSIS & DÉBRIDEMENT: SAXENA ET AL (SUBMITTED)

- 107 procedures
- Ave f/u 106 mos!
- 97% RTA to desired activity level
- Ave RTA for Peritenolysis 7 wks & Débridement 14 wks

POST-OP REHAB IS ALSO CRITICAL

- **Avoid eccentrics** (this is only for tendinopathy, not for tendon rupture/repair)
- **Concentric** exercise most critical to RTA (Silbernagel et al)
- **5x25 single leg heel raises, ROM within 5° & calf girth within 5 mm needed to RTA**

(Saxena et al 2011 J Foot Ankle Surg)

MY SUGGESTED ACHILLES SURGERY REFERENCES

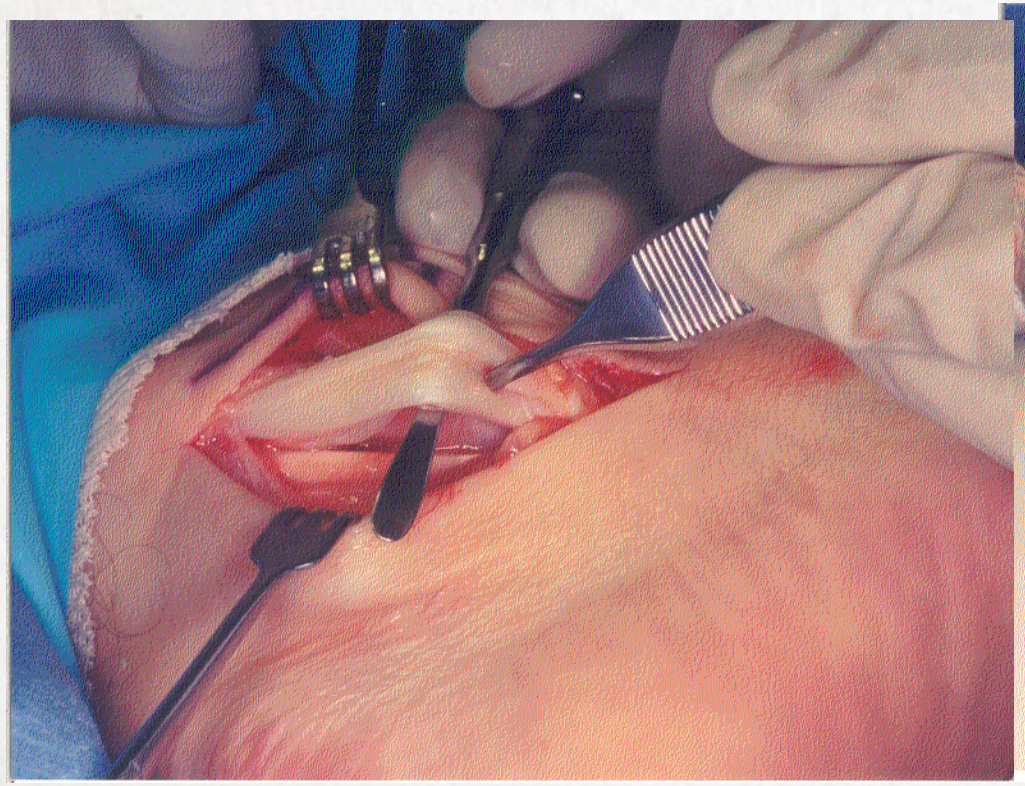
- Rehabilitation of the operated Achilles tendon: parameters for success. Saxena et al J Foot Ankle Surg 50(1):37-40, 2011
- Wound Complications with Achilles tendon surgery: report on 219 cases. Saxena et al J Am Podiatr Med Assoc 2008
- Use of a novel treadmill for rehabilitation for the Achilles tendon: a pilot study (Saxena & Granot J Foot Ankle Surg 2011)
- Results of Achilles Tendon Surgery in Elite and Sub-elite Track Athletes. Saxena Foot & Ankle Int'l 2003
- Retrospective review of 91 surgeries for chronic Achilles pathology. J Am Pod Med Assoc 2003
- Anything by Maffulli & Silbernagel!

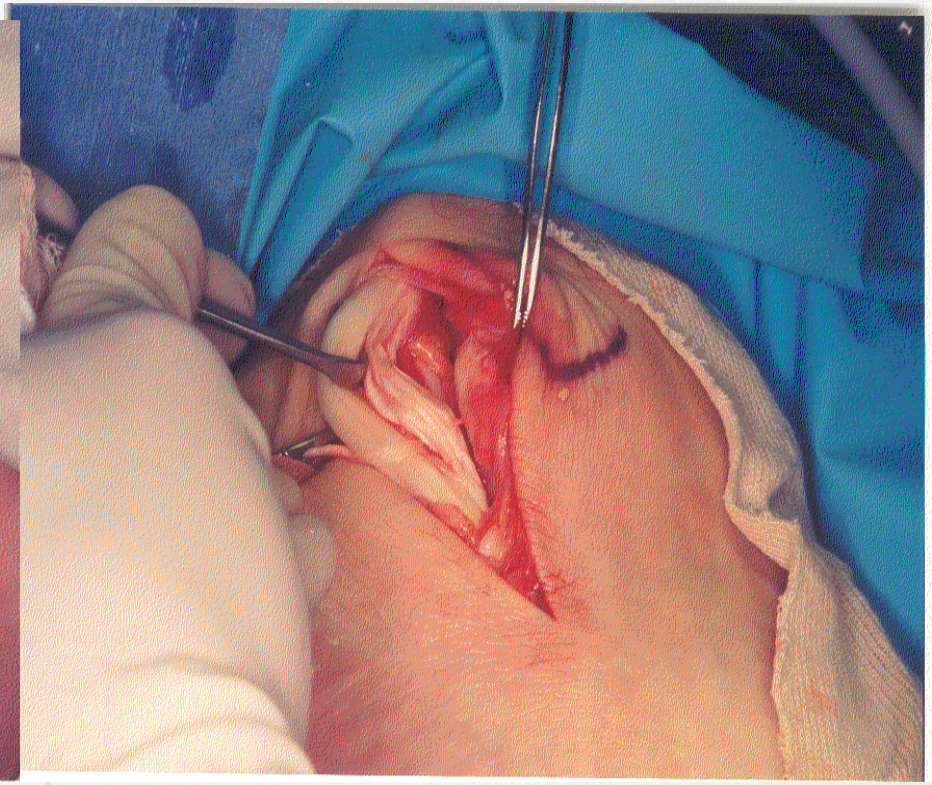
PERONEAL TENDON TEARS: POSTERO-LATERAL APPROACH

DON”T TRY THIS AT HOME: THINGS YOU SHOULD KNOW BEFORE CONSIDERING PERONEAL REPAIR

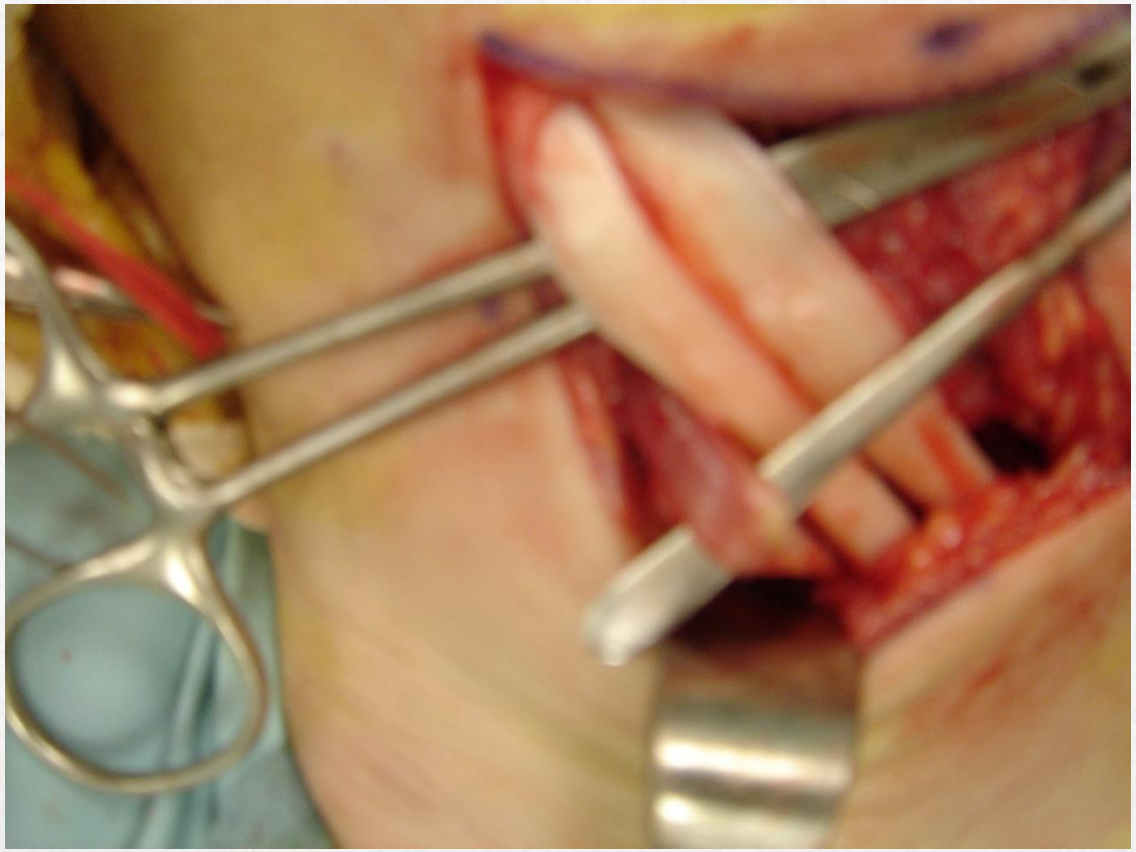
- 30% of asymptomatic patients will have a “torn” peroneal or ATFL on MRI (Saxena et al 2011 J Foot Ankle Surg)
- ONLY Operate is weakness, pain, swelling & if in doubt, diagnostic injection with local anesthetic in sheath above the superior peroneal retinaculum
- Remember to assess rearfoot varus, (“Coleman Block Test”), ankle & STJ instability
- Longer symptoms of subluxation > chance of peroneal tear (Saxena et al 2009 JFAS)

P BREVIS RUPTURE





PERONEUS QUARTUS: MIS-READ AS RUPTURE?

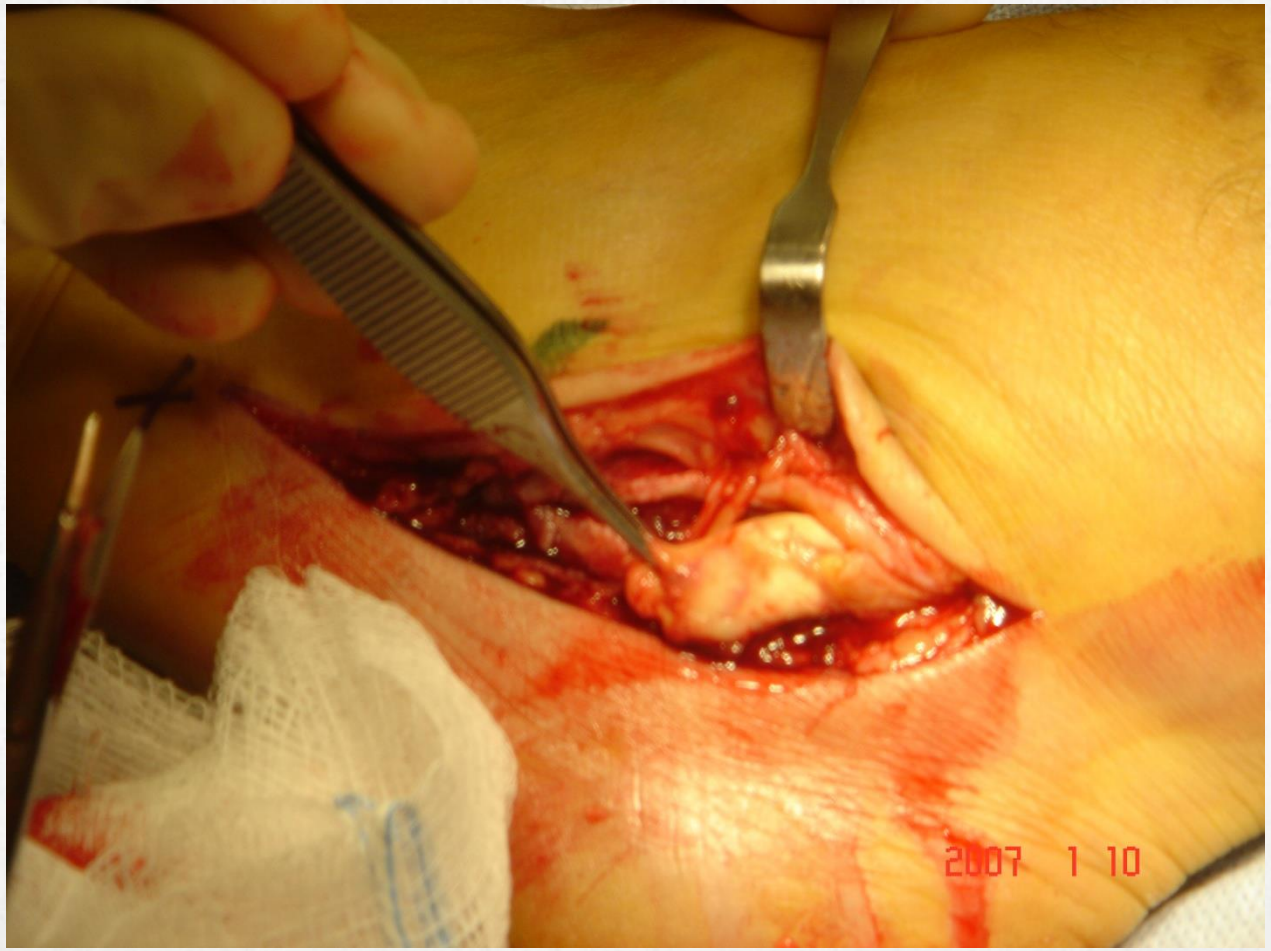


REPAIR TENDON & RETINACULUM

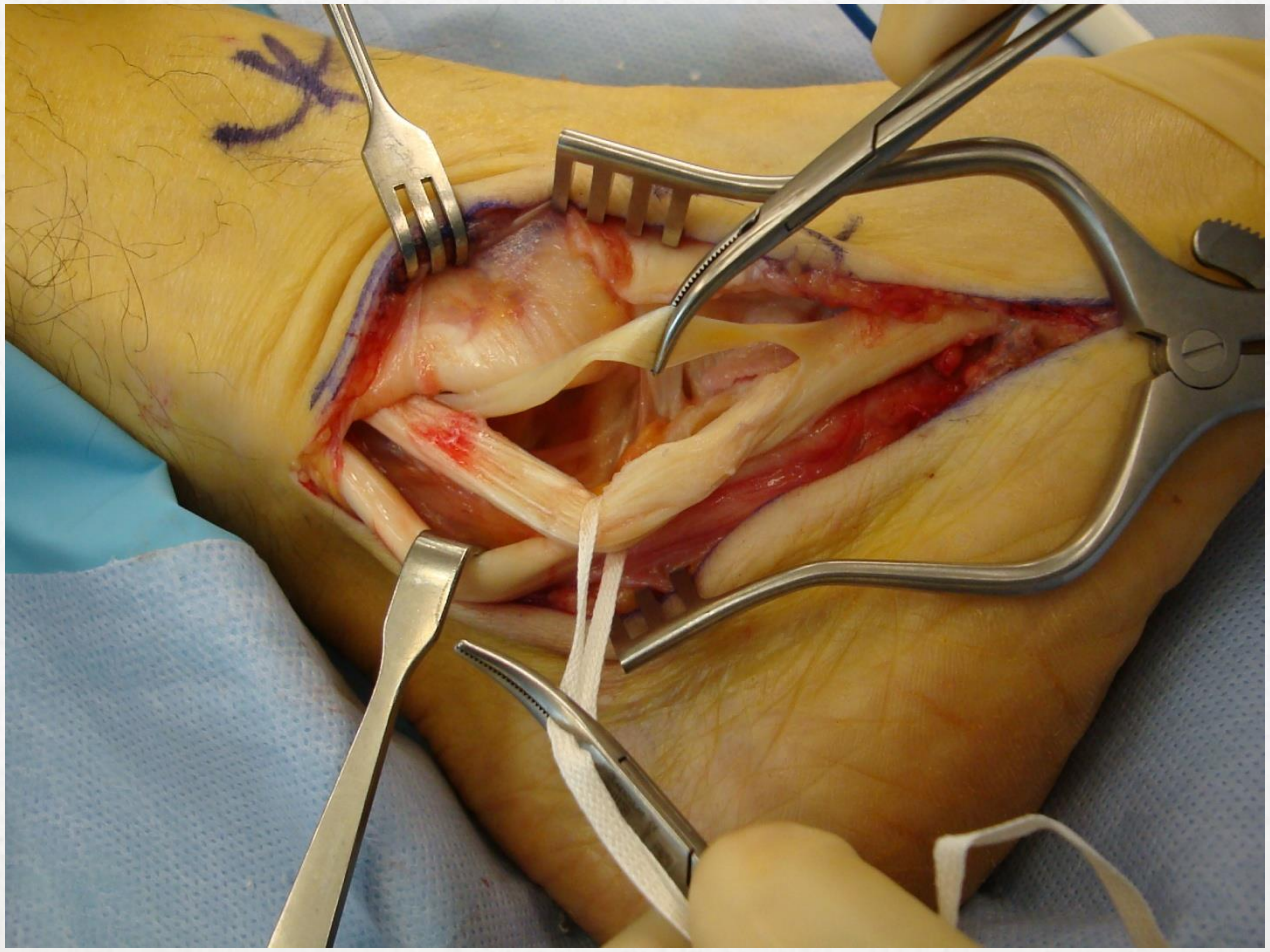
TENODESIS?

- > 50% of width deficient (Kraus & Brodsky)
- > 2.5 cm tear
- Absent Longus or Brevis
- Removal of Os Peroneum
- **2-0 or 3-0 Nylon** horizontal repair
- Tendon transfer or Transplant?

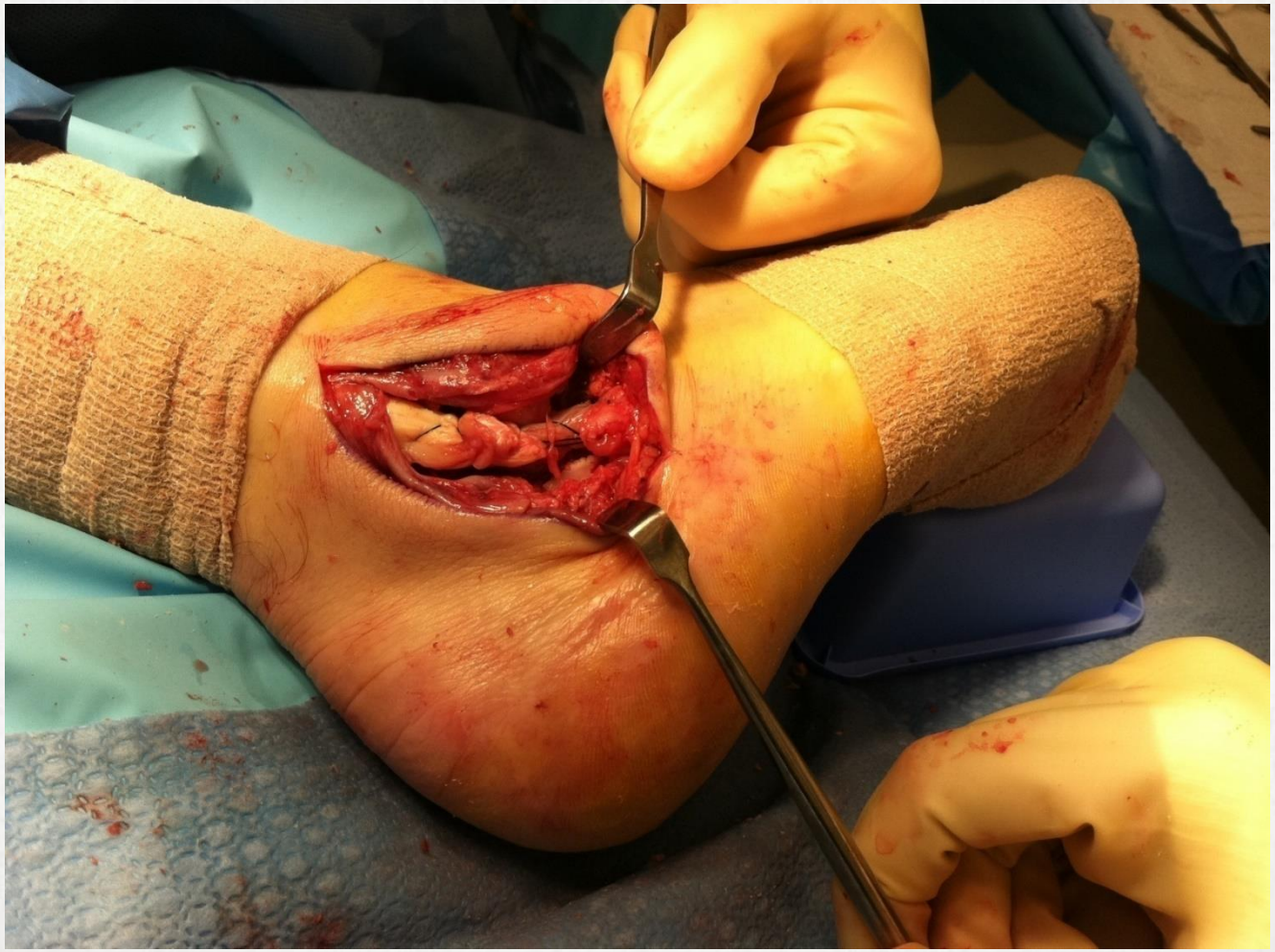
TENODESIS



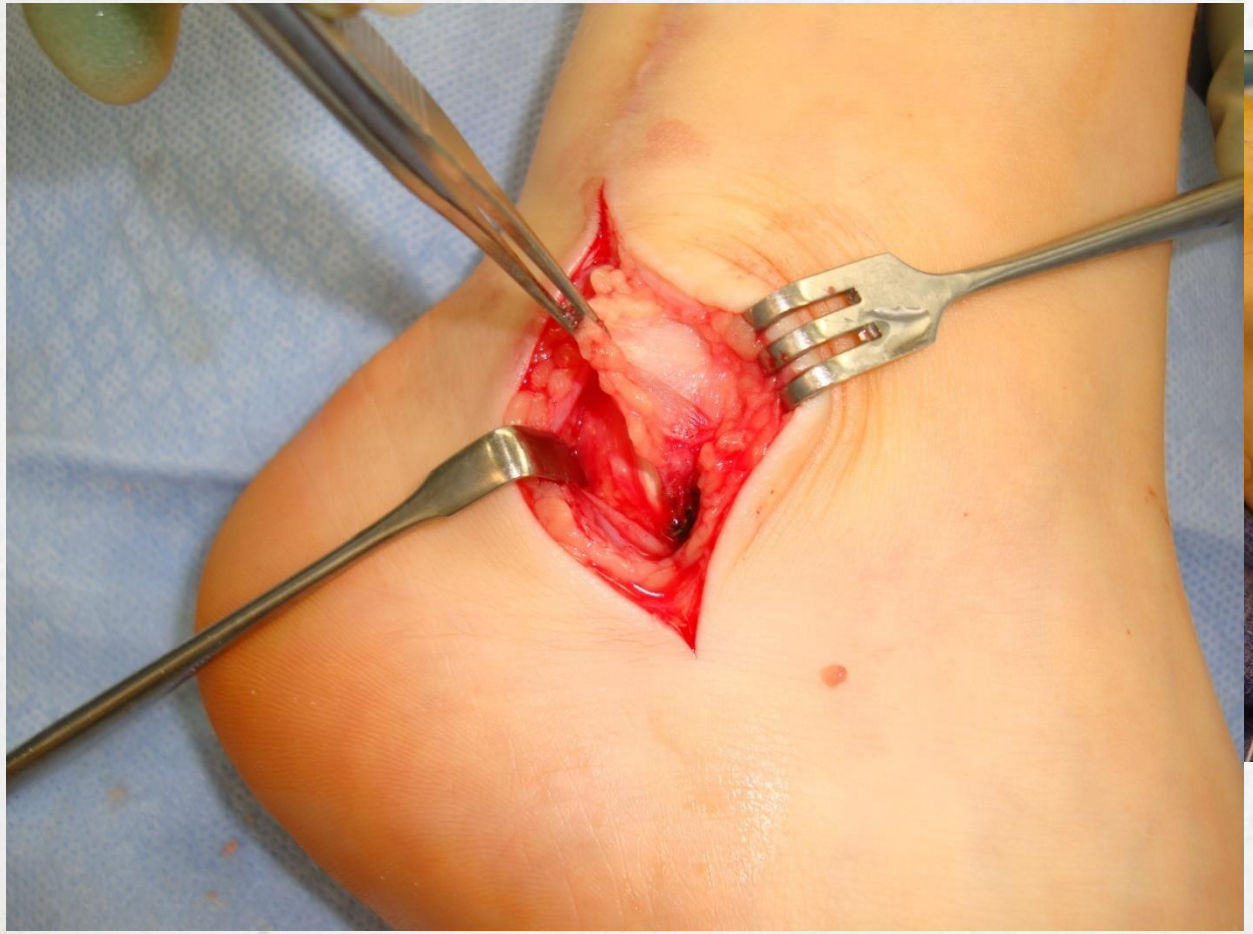
TENODESIS

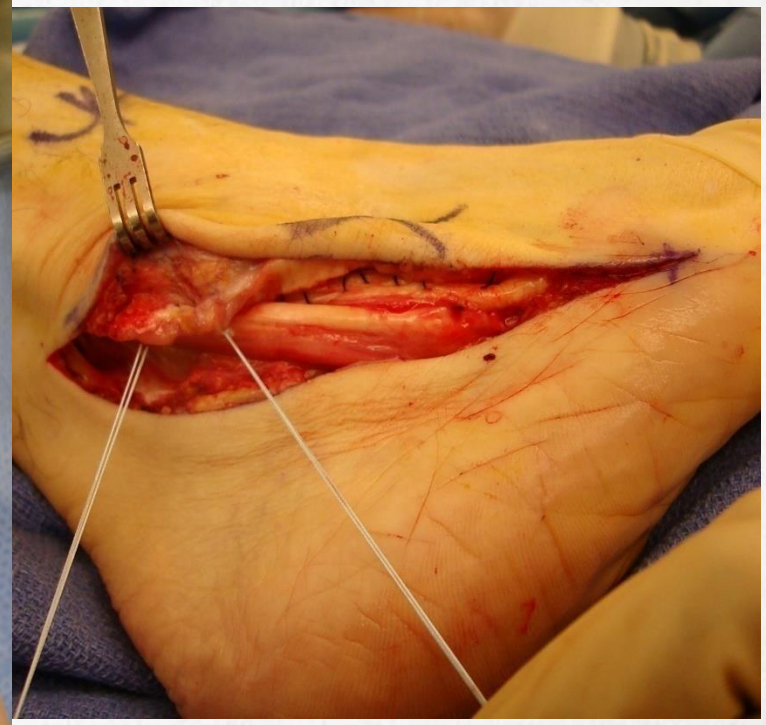


P BREVIS TO LONGUS



PERONEAL RETINACULUM REPAIR AS NEEDED





KIDNER PROCEDURE (MODIFIED)

PROCEDURE TECHNIQUE

- Curvilinear incision along course of PTT, swing superior above navic tub
- Dissection down to PTT insertion
- Longitudinal “open-book” incision
- Dissection of PTT insertion
- Identify “cleavage line”
- Shell out accessory bone

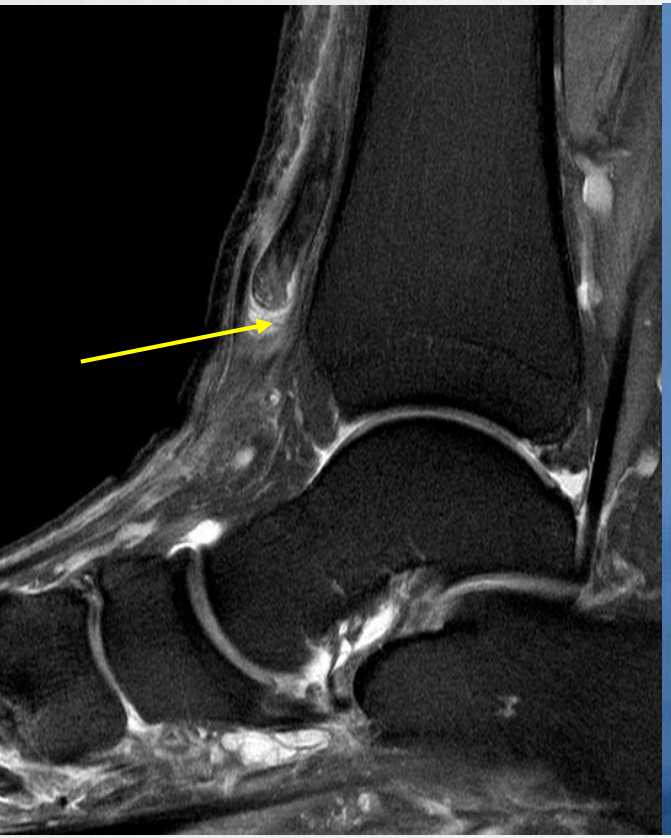
TECHNIQUE (CONT.)

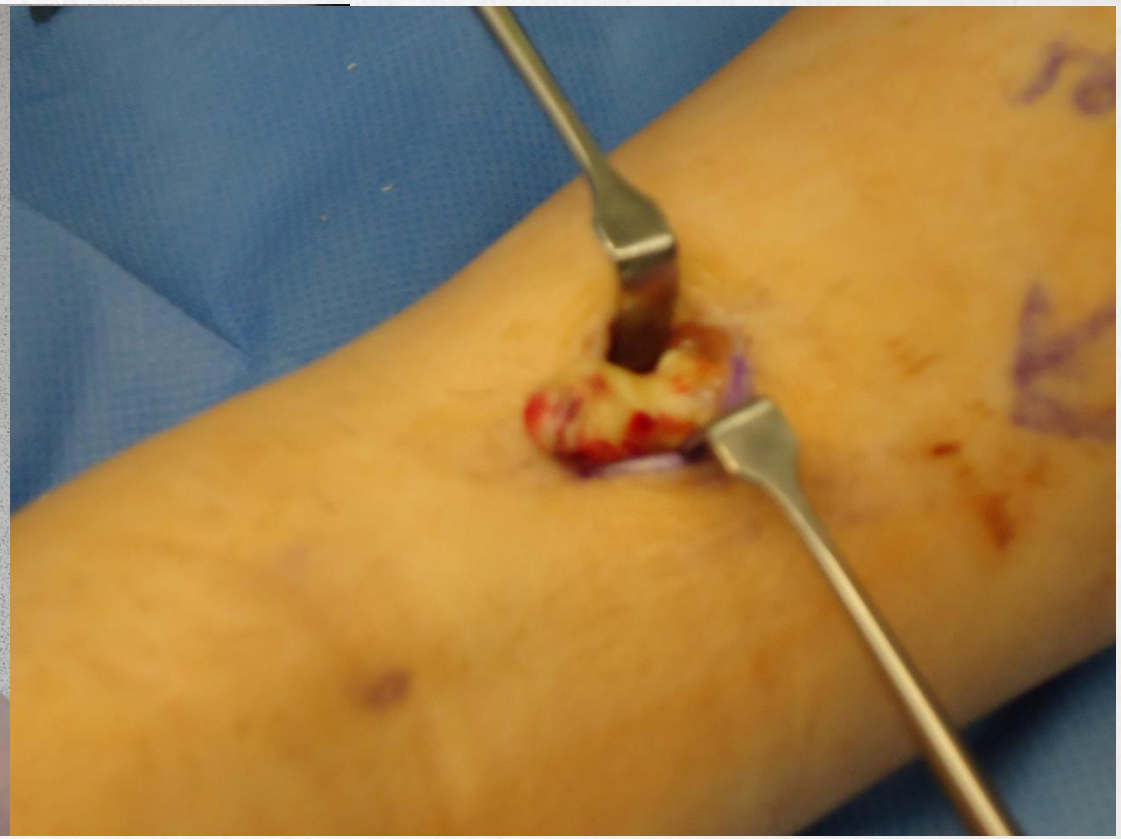
- Remodel navicular tuberosity & check spring ligament
- Confirm resection, remodeling & anchor placement w/ intraoperative fluroscopy
- Insert bone anchor plantar medially & secure PTT to medial navicular
- Use combo suture with absorbable component
- POST-OP: NWB 3 wks w foot supinated, 3 additional wks w arch support in BK boot, WB, progress to ankle brace & rehab

Weight Bearing
R
SL

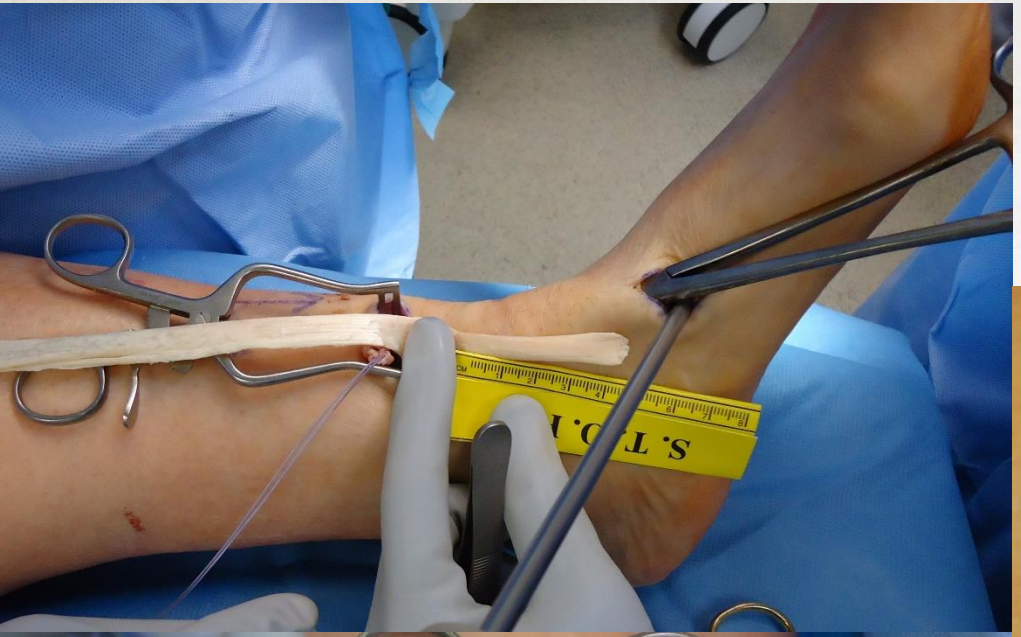
R

TIBIALIS ANTERIOR REPAIR WITH ALLOGRAFT (5CM DEFICIT)





RECONSTRUCTION W ALLOGRAFT & INTERFERENCE SCREW/ANCHOR



IMPORTANT ASPECTS OF TENDON REPAIR

- Start moving sooner than you think!
- Usually at 3 wks with active ROM
- Complete tendon healing can take 6 mos but rehab up to a year!
- **Avoid braided non-absorbable as much as possible (use the least reactive & absorbable if possible)**
- Don’t stretch until concentric strength achieved
- Avoid eccentric loading in early portion of rehab phase

COME TO A FUN COURSE SOMETIME!