

Calcaneal Fractures: Lateral Extensile Incision

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Disclosures



- I have no financial disclosures

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Mechanism

Axial Loading

- Fall From Height
- MVA

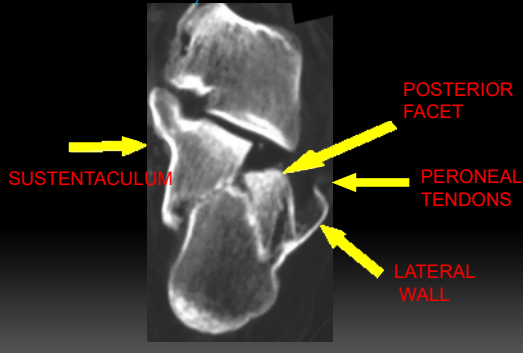


**BAD SOFT
TISSUE INJURY**

Mechanism



Pathoanatomy



Deformities

- Talar Collapse/Dorsiflexed talus
- Hindfoot Angulation(Varus)
- Lateral wall “blow out”
 - Peroneal dislocation
- Shortening

ALL HAVE TO BE ADDRESSED

Surgical Treatment

- Traditional Extensile Lateral Approach
- Sinus Tarsi Approach
- Percutaneous Techniques
- External Fixation

Question



- What method of calcaneal treatment do you most commonly use?
1. ORIF through lateral extensile incision
 2. ORIF through sinus tarsi incision
 3. Percutaneous techniques
 4. Nonoperative treatment

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Case 1

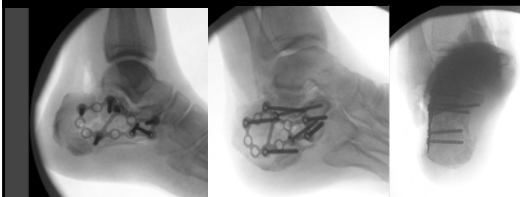
- 38 yo fireman who fell off of a ladder. Isolated injury to his R foot 17 days ago



Question

- What is the ideal surgical approach for this patient?
1. ORIF through lateral extensile incision
 2. ORIF through sinus tarsi incision
 3. Percutaneous techniques
 4. Nonoperative treatment

Case 1- ORIF Extensile approach



WHY?

- 38 yo fireman who fell off of a ladder. Isolated injury to his R foot 17 days ago



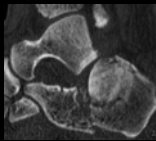
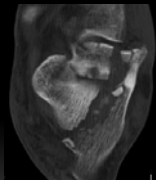
Operative Goals



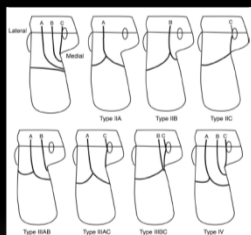
- Restore anatomy
- Restore function
- Avoid complications

Understanding the Fracture

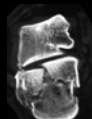
Imaging
XRAYs
CT



Understanding the Fracture



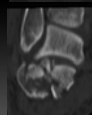
Type IIB



Type IIIAC



Type IV



Surgical Treatment

- Traditional Extensile Lateral Approach
- Sinus Tarsi Approach
- Percutaneous Techniques
- External Fixation

Lateral Approach

Advantages

- Allows for direct visualization
 - Anterior and Posterior
- Easy to reduce lateral wall
- Calcaneocuboid
- Peroneal tendon repair

Extensile Lateral Approach


Disadvantages

- Have to wait for the soft tissues
- Not soft tissue friendly
- Requires indirect medial reduction
- Sural nerve issues
- Scarring/Stiffness

Evaluating the Patient

History

- Get to know them
- Know their risk factors
 - Smoking
 - Diabetes
 - Vascular disease
- Beware of pain
 - Both extremes



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Evaluating the Patient

Physical Examination

- Skin
- Pulses
- Skin wrinkles



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Timing of Surgery

Delicate Balance

- Ideal 7-21 days
- >4 wks difficult
 - Best to have plan beforehand

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Positioning

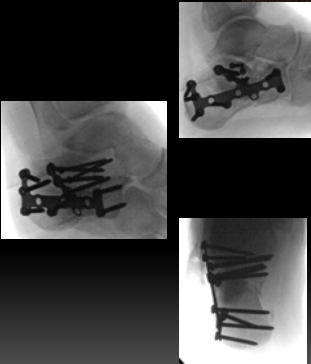
- Lateral decubitus
- Bean Bag
- Tourniquet
- Bilateral
 - prone



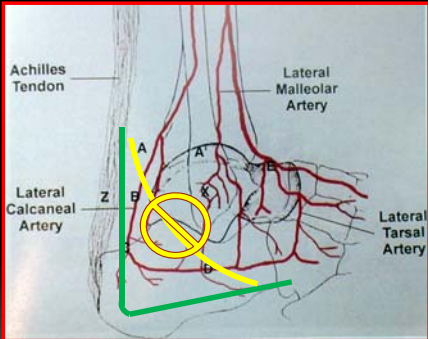
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Setup

- Radiolucent table
- Fluoroscopy
 - Lateral
 - Broden
 - Harris view (Axial)
 - Contralateral



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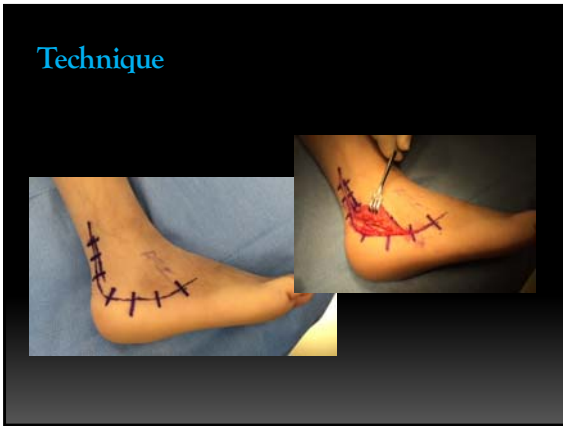


Achilles Tendon

Lateral Malleolar Artery


Lateral Calcaneal Artery

Lateral Tarsal Artery



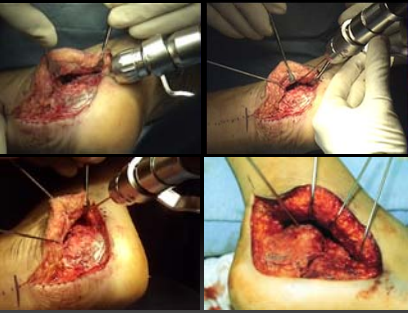
Operative Technique

- Incision
 - Full thickness soft tissue flap centrally
 - Beware of sural nerve proximally/distally
 - Protect peroneal tendons
- Exposure
 - Hands-free retraction



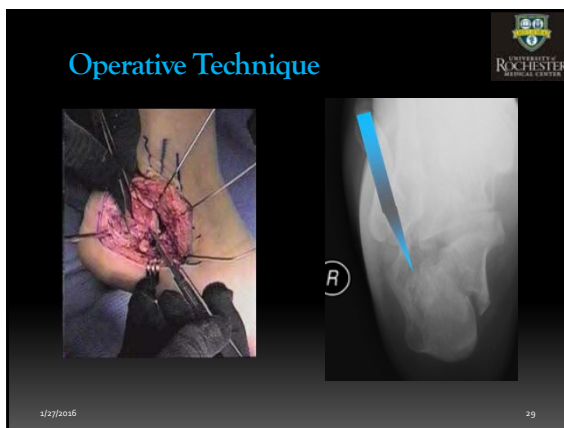
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K wire retractors



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Operative Technique

Medial Wall Reduction

- Osteotome to free medial scarring/healing
- Lamina Spreader



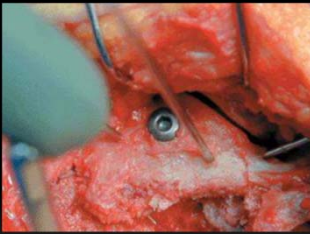
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Reduction Sequence

- Reduce the joint
- Reduce the angle of Gissane
- Reduce the Anterior process/CC joint
- Reduce Hindfoot Varus

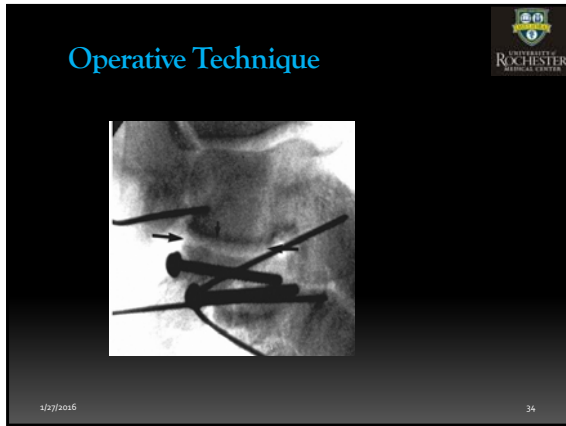
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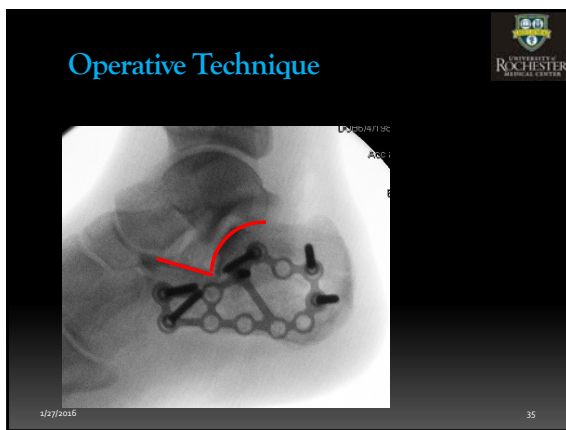
Operative Technique

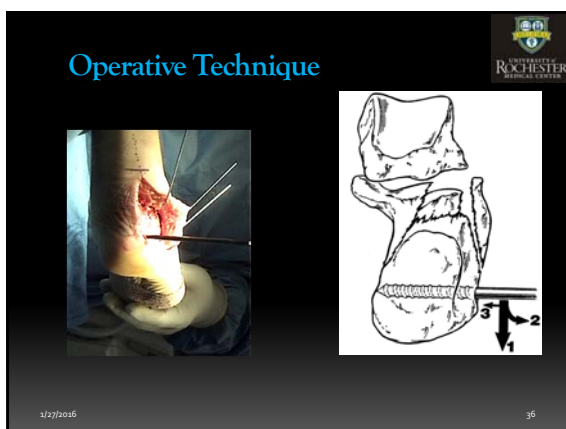


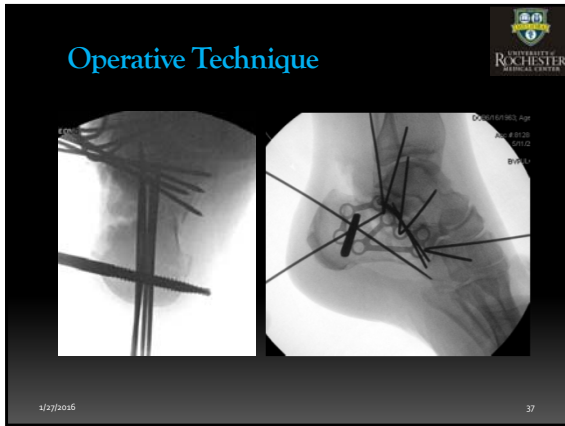
**Minimum
2 points of
fixation**

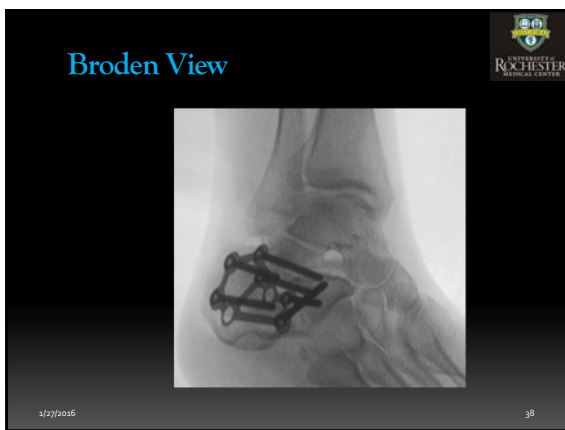
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ALTHOUGH AN ANATOMIC REDUCTION IS NEEDED FOR A GOOD OUTCOME IT WILL NOT GUARANTEE IT




Indications

- ORIF in displaced Type II and III fractures
- Relatively healthy patients
- Do not have a hard and fast age cutoff

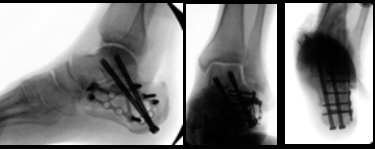


What about Type IV Fractures



Operative Technique

UNRECONSTRUCTABLE?

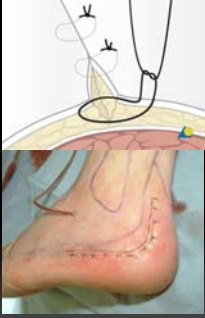


FUSION!

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Operative Technique

- Meticulous layered closure
- Drain
- Soft tissue friendly suture technique



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Postoperative protocol

- Wound VAC?
- **Wound will dictate advance of motion**



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Postoperative protocol

ORIF

- Immobilize in splint and elevate
- Week 2 - Ankle ROM in fracture boot
- Week 4 - Subtalar ROM exercises
- Week 10 - Weight bear in boot with gradual return to shoes activities

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Postoperative protocol

FUSION

- Immobilize in splint and elevate
- Week 2-8 - NWB cast
- Week 8 - NWB with ankle ROM in boot
- Week 12 - Progressive WBAT return to footwear/activities

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Complications

- Subtalar arthrosis
 - Increased with nonoperative treatment
- Subtalar stiffness
- Compartment syndrome (10%)
- Wound healing (2-10%)
 - Smokers
 - Diabetics
 - Open fractures
 - Delay in treatment
 - Recommend immobilize until wound heals




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Why Extensile Lateral Approach?

- Late Presentation
- Large Deformity
- Posterior articular comminution/stepoff
- Primary Fusion

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Thank You



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