Calcaneal Fractures: Lateral Extensile Incision

AS Flemister JR, MD
University of Rochester

Disclosures

- I have no financial disclosures

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

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

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

Evaluating the Patient

Physical Examination
- Skin
- Pulses
- Skin wrinkles

Timing of Surgery

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

- Lateral decubitus
- Bean Bag
- Tourniquet

- Bilateral
  - prone

Setup

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

Operative Technique

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

K wire retractors
Operative Technique

Reconstruct Posterior Facet on back table
Operative Technique

Medial Wall Reduction
- Osteotome to free medial scarring/healing
- Lamina Spreader

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

Operative Technique

Minimum 2 points of fixation
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!

Operative Technique

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

Postoperative protocol

- Wound VAC?
- Wound will dictate advance of motion
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

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 shoe wear/activities

Complications
- Subtalar arthrosis
  - Increased with nonoperative treatment
- Subtalar stiffness
- Compartment syndrome (10%)
- Wound healing (2-10%)
  - Smokers
  - Diabetes
  - Open fractures
  - Delay in treatment
  - Recommend immobilize until wound heals
Why Extensile Lateral Approach?

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

Thank You