Calcaneal Fracture Management The Evolution From Extensile Lateral to "Percutaneus" Techniques

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Disclosure

- I am a consultant and designer for Smith and Nephew (VLP Foot System)

Percutaneus Fixation

- A modification of standard fixation techniques
- Smaller incisions
- Submuscular / Subcutaneous but supraperiosteal placement of plates
- Joint surfaces must be visualized through adequate incisions
- **The concept = Less damage to the soft tissues**
- Biologic fixation principles

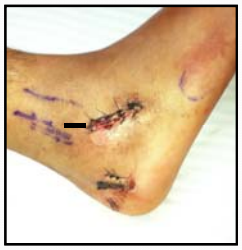
Sinus Tarsi Approach

- Kikuchi C, et. Al. FAI 2013
- Nosewicz T, et. Al. FAI 2012
- Kline AJ, et. Al. FAI 2013
- Schepers T Int Orthop, 2011

- Successful restoration of anatomy
- Clinical outcomes:
  - Good to excellent
  - Likely similar to extensile lateral approach
- Fewer:
  - Infections
  - Wound healing problems

Modification of the sinus tarsi approach

- Femino JE, et. Al. Iowa Orthop J. 2010
- **Extended** sinus tarsi approach with plate
- **No wound complications occurred in smokers.**
- Avoid dissection through the deep portion of the SPR, (lateral calcaneal artery protected)

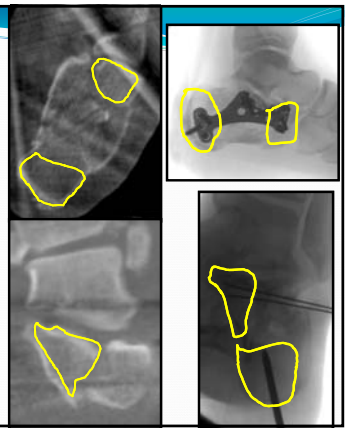


Mini-incision Treatment for calcaneal fractures

- Workup - same
- Radiographs and CT – same
- Timing – different
  - Extensile lateral incision – Once swelling goes down (usually within 3 weeks)
  - **Mini-incision techniques - 1 – 14 days (The earlier the better, soft tissues permitting)**
- Preop –
  - RICE
  - Jones dressing

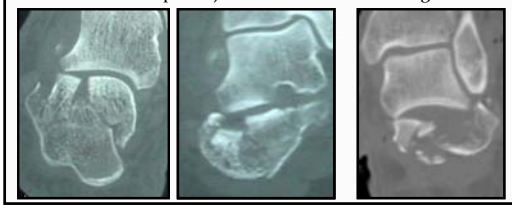
Indications

- You must have good bone in 3 locations:
  - Anterior, Posterior tuberosity, Constant fragment
  - These are the areas for needed screw fixation
  - Specific percutaneus plate - fracture lines extending to these regions – locking screws help



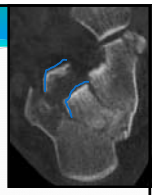
Indications

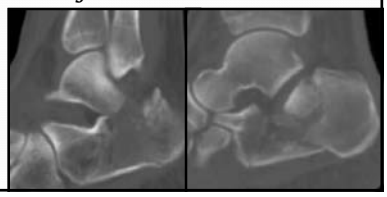
- Specific Fracture Patterns:
  - Sander's 2 part (Easiest)
  - Sander's 3 Part with an anterior central part (Difficult)
  - Sander's 4 part (Fairly Straight forward) (If Fusing)
    - Need to reestablish articular anatomy grossly and then fuse
  - Excellent for open injuries in the correct setting



Contraindications

- Sander's 3 part (posterior fragments)
  - You cannot get to them
- Fractures where you do not think that you can achieve an anatomic reduction
- ***Remember – Small Incisions with a poor reduction achieve nothing!!!***

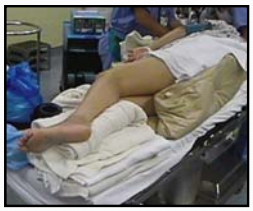




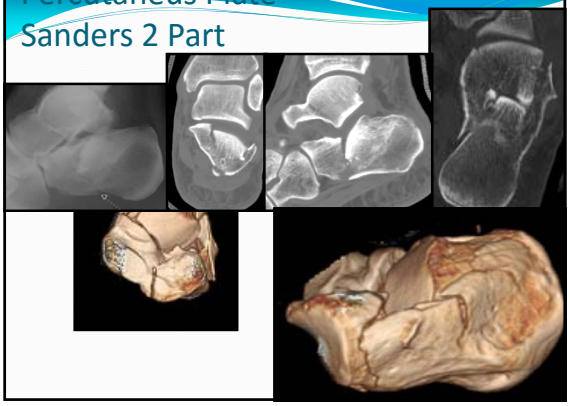
Positioning

Supine for unilateral or bilateral

Lateral decubitus



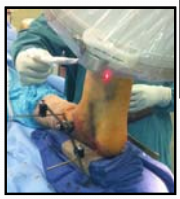
Percutaneus Plate Sanders 2 Part

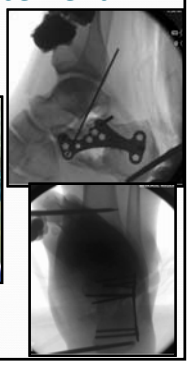


Step 1 -Medial Ex-Fix Placement

Placement of medial ex- fix:

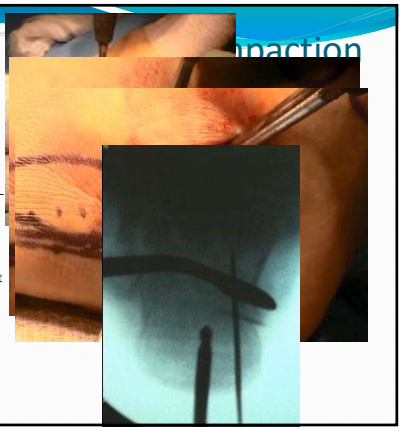
- "Pull" the posterior tuberosity out of the way.
- This allows for:
  - Easier reconstruction of the posterior facet
  - Easier correction of height and varus
  - No need for a medial screw





Steps 2 - [illegible]naction

- ❑ Sinus tarsi incision – Dorsal to the peroneals
- ❑Keep the peroneals in their sheath
- ❑Compress Lateral wall "blow-out"
- ❑Make path for the plate – *stay on the outside of the posterior tuberosity*
- ❑Disimpact medial wall – Curved elevator
- ❑Correct varus and height

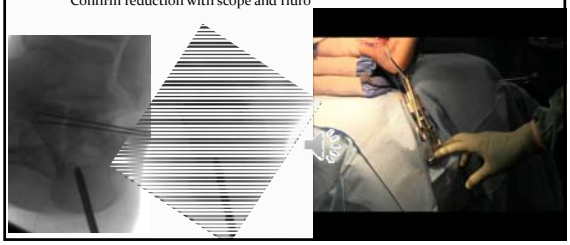


Step 3 -Reduction and stabilization of posterior facet

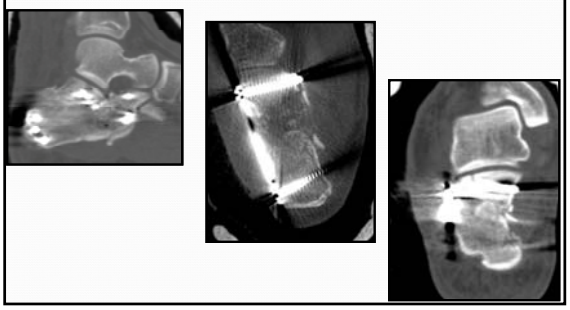
Pulling the posterior tuberosity out of the way makes the posterior facet reduction possible

Lag the posterior facet with 2.0 to 3.0mm screws as needed (canulated vs. solid)

- Aim towards sustentaculum as much as possible
- Confirm reduction with scope and fluro

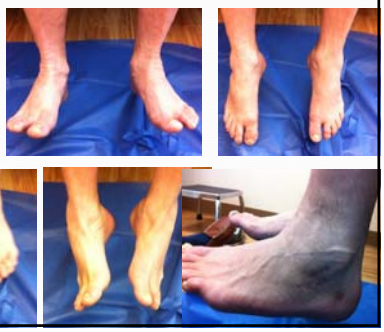


Get postop CT to learn and get better!!!



Post-op Protocol

- Start motion when the wound is ready



Summary - Pearls

- Choose simple fractures at first (Sander's 2 part)
- Preop plan based on CT
- Operate before 14 days (compression wraps)
- Medial Ex fix to "get the tuberosity out of the way"
- Incision 1 cm onto fibula
- 2 kwires in the talar neck for soft tissue retraction
- Arthroscope to confirm reduction
- Malleable retractors to protect peroneals
- Protect sural nerve branches

Thank You