Calcaneal Fractures: Do They Really Need ORIF?

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Objectives

• Review evidence for natural history of calcaneal fx
• Discuss recent trends
• Suggest an algorithm for management:
  – Displaced tongue type
  – Displaced central depression type

Case Presentation

• 59 y/o roofer
• Isolated Right heel injury
• Smoker
• Worker’s Compensation
• Bohler’s angle 10 degrees

Fix or don’t fix?
**Calcaneal Fractures**

A Brief History

- Malgaigne 1843
  - 1st classification system
- Conn 1935
  - Triple arthrodesis
- Essex Lopresti 1952
  - Classification/reduction
- Sanders 1993
  - CT Classification
- Benirschke/Sangeorzan 1994
  - Operative guidelines
- Norris 1839
  - mechanism of fx
- Cotton 1908
  - reports nonop protocol
- Bohler 1931
  - Describes ORIF
- Lindsay 1958
  - Nonop rx best

**Natural History Of Deformity**

- Buckley: poor outcomes if Bohler’s angle 0 or less
- Preponderance of Work Comp in poor results
- Complications higher in smokers, diabetics
  - Why, then, even bother?

**So Where Are We Now?**

- Don’t fix:
  - Uninsured
  - Work Comp (Buckley)
  - Bohler’s angle: 0 degrees
  - Diabetics
  - Rheumatoids/steroids
  - Smokers/COPD
  - Noncompliant risk:
    - Lost to follow up
- Fix:
  - Insured
  - Nonsmoker
  - Healthy
  - Athletic
  - If I have the time...
  - After three weeks
    - (if they come back after all that)
Sanders 2009:
• Displaced fractures do poorly
  – Salvage: subtalar fusion
• Operation carries significant risk (skin)
• Salvage subtalar fusion:
  – Complicated by altered anatomy
• Conclusion:
  – Advocates surgery to restore anatomy for future surgery

Change in Thinking
• Reduction is critical
• Restoration of anatomy:
  – Outcome of future subtalar fusion
• Subfibular incision
  – Tissue-friendly
  – Focus on joint and anterior process
• Long axial fixation:
  – Headless compression screws

Key Concepts
• Correction of deformity
  – Varus
  – Wide heel
  – Shortening
  – Loss of height
• Direct vs Indirect reduction
  – Direct:
    • Big incision, big complication
  – Indirect
    • Allows for smaller incision
**Distractor-Mediated Reduction**

- Schillhammer et al 2016
- Tibia, Lateral calcaneus
- “Essex-Lopresti” maneuver
- Correct all deformities
- Allows
  - Mini-open reduction and plating
  - Long axial screws

**Minimally Invasive Incision**

- Chevron incision
- Sinus tarsi exposure
- Direct visualization:
  - Anterior process
  - Posterior facet
  - Angle of Gissane
- Minifragment plates
- Long axial screws

**Syracuse Experience**

- 100 patients
- S2-S4
  - 34 Open
  - 66 Subfibular
- Corrected Bohler’s angle
- No wound complications
- 5 patients had progressed to subtalar fusion
Summary

- Fix:
  - All displaced calcaneus fractures
  - Restore height, length, width and joint congruity
  - Minimally displaced calcaneal fractures:
    - Allow early mobility and WB
  - Poor skin, smokers, diabetics

- Don’t fix:
  ......still thinking