

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?

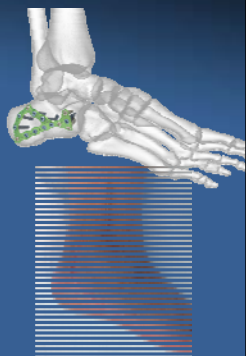


So Where Are We Now?

- 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



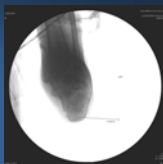
Change in Thinking

- 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



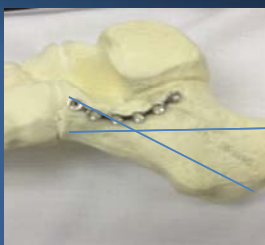
Distractor-Mediated Reduction

- 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
