small incision calcaneus fractures

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objectives

• how to reduce a fracture
• Overview of my sinus tarsi technique
• Outcomes- does it work?

my current technique....

• small incision or sinus tarsi approach

• all cases since 2008

• over 150 cases

• all types including open fractures
Understand....

- this is not a compromise on reduction
  - reduction is the same
- articular reduction is directly visualized with headlight
- still trying to reestablish bony morphology to ENTIRE CALCANEUS

Pathoanatomy

- Primary fracture line
- "Constant" fragment

Pathoanatomy

- Secondary fracture line
- Extends posteriorly through tuberosity
- Creates 3 parts
fracture

fixation strategy

• fixation is used to connect two blocks together... minimum of 2 points of fixation at all times once reduced
• goal is solid fixation triangle

fracture - how to...
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1. Insert Schantz pin
2. Insert 2 wires in tuber just inside medial wall
3. Insert elevator to reduce medial wall/restore height
after reduced advance k wires to hold reduction of tuberosity

final reduction of articular surface- provisional k wires

reduce anterior process and critical angle- more k wires!!
insert plate to maintain articular reduction, lag thru plate- leave k wires in until fixation complete

final fixation

insert plate to maintain articular reduction, lag thru plate- leave k wires in..
plate does not provide fixation in tuberosity

need supplemental screws

insert screws for tuberosity medial wall- 2 points of fixation
remove k wire to make room for 2nd screw. 2 points fixation

insert second screw

may remove last tuberosity k wire
raft joint

insert screw from central tuberosity to anterior process - remove wires

screw pattern for tongue fractures
final fixation


cannot tell difference between reduction steps/provisional fixation between lateral extensile and small incision approaches

reduction steps are the same
quality of reduction is identical

Results from case studies are not predictive of results in other cases. Results in other cases may vary.

case example

- 72 year old farmer
- fell off loft
- open wound medially

ED
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Incision starts 1cm below fibula and 1cm anterior and runs 2-3cm.

K wires along medial wall from tuberosity then use elevator to lift while manipulating tuber with Schantz pin.
after medial wall reduction
advance k wires

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initial k wires placed for articular reduction

reduce posterior facet-looking directly into joint

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reduce anterior process and advance k wires

previously used 2.4 plate with 2.7 lag screws

provisional fixation complete

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- **Plate in - fixation of articular surface complete**
- **Supplemental 4.0 screws inserted from tuberosity**
- **4.0 screws inserted to stabilize medial wall/tuberosity reduction**
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24 year old MVA

Pre op
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59 yo male fell off top of truck
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tissue friendly-final closure

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bilateral

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easier fracture patterns require less fixation
more difficult patterns require more fixation
Outcomes

• No difference in functional outcome between Extensile lateral and small incision approaches
• Lower reoperation rate – 19.2 vs. 50%
• Shorter time to FWB- 12 vs. 15 wks
• Longer fu in extensile group
• Further eval in progress…

summary

• hard fractures
• small incisional is possible for most fractures- WITH EXPERIENCE
• should not be a compromise on reduction

Thank You