Calcaneal Fractures

Is the working man still doomed?
History

- 2% of all fractures
- Most frequently injured tarsal bone
- 60-75% are displaced intra-articular #’s
- 10% have assoc. #spine
- 20% have other extremity injuries
- 20% may be totally incapacitated for first 3 years
History

Conn:

“Serious disabling injuries in which the end results are incredibly bad”
Esex-Lopresti Classification

Classification

- Essex-Lopresti
- Tongue Type
Classification

- Essex-Lopresti.
- Joint Dep. Type.
Classification

- Sanders

- Intra-observer error significant
Classification

- Eastwood
- Type 1
Classification

- Eastwood
- Type 2
Classification

- Eastwood
- Type 3
Classification

- Eastwood

Whole lat facet
subluxed
Imaging:
Plain Films
Imaging:

- CT

3D Reconstruction
Management

- Non operative:
  - Elevation/ice/compression bandaging
  - Foot pumps/Cryocuff
  - POP
  - Early mobilisation
Management

- Operative:
  - ORIF Medial/Lateral approach
  - Plates Screws
  - K wires
  - Essex-Lopresti Procedure
Essex Lopresti Procedure
Management

McLauglin:

“Fixing calcaneal fractures is like nailing a custard pie to the wall”
Management

- Anon

- “The plate will flow out on a sea of pus”
Fix Them

- No
  - Pozo et al, JBJS-B 1984
    - 76 Type C #,s 21reviewed
    - Av follow up 14.6 years
Pozo et al

- 76% good results Min. limitations
- 81% back at work @ 6/12
- 2/3 max recovery @ 3 years
- No deterioration after 6 years
No patients required special shoes
76% had no restriction on walking
81% had subtalar OA but this had no correlation with the outcome
But 19% had significant pain during the day
No

- Parmar et al: JBJS-B Nov 1993
  - Randomised trial
    - No difference in operative and non operative treatment in their study.
    - BUT small numbers and their operative technique was relatively rudimentary
No

- Allmacher et al, Foot Ankle Int 2003

- 24 closed #’s 1970-85
- Assessed Av 12.8 years and 22 years
- 63% good to excellent at 12.8 yrs
- 47% good to excellent at 22 yrs
- CT ev of OA = poor result
Non operative management

- Increased lateral heel width
- Decreased heel height
- Flat foot
- Varus/valgus heel
- Lateral wall impingement
- Peroneal tendon subluxation
So should we fix them?

Yes

- Leung JBJS B1993
  - Retrospective review of fractures fixed
  - Significantly improved results with surgery, pain ROM return to work.
  - Lateral exposure/ H plate
Yes!

- Tennent Eastwood, Injury 32, 2001
  - 51 fractures all treated by ORIF
  - Reviewed at 2 years
  - 90% overall satisfaction rate
  - 94% back at work at 6 months
  - Op delay > 14/7 increased infection rate
Buckley JBJS 84A No 10 2002

- 471 fractures followed for a minimum of 2 years in 4 Canadian trauma centres.
- No difference in non operative and operative groups on SF 36 scores

BUT
Maybe

- When they looked closer:
  - Patients not receiving workers compensation did better
  - Accurate reduction of the posterior facet <2mm did better
  - Higher rate of arthrodesis in the non operative group
Maybe

- Best patients to treat non operatively:
  - Men > 50
  - Those receiving workers compensation
  - Heavy work loads
Yes

- Brauer and Buckley JBJS(A) 2005

- Operatively managed fractures lower rate of subtalar arthrodesis and shorter time off work

- Economically effective!
Operative Management

- Indications: Eastwood
  - Step/Gap > 5mm in posterior facet
  - Displacement >1 cm of fragment
  - Angulation >10 degrees of tuberosity frag. Relative to the wt. bearing axis of the ankle/subtalar joint
Operative Management

- **Contraindications:**
  - Skin
  - Swelling \{operate 7-10 days\}
  - Smokers !!
  - Age
  - Cooperation
  - Severe comminution of the sustentacular fragment
Calcaneal Plates
Operative technique
Incision
Operative technique: Flap development and retraction
Operative technique: Mobilising lateral fragment
Operative technique: Lateral wall rotation
Operative Technique:
Medial wall reduction
Operative Technique:
Medial Wall reduction
Operative technique: Reduction/fixation of post. facet
Operative technique: Lateral wall reconstruction
Operative technique:
Going home time!
Fracture Dislocations

- Lateral dislocation of virtually all of posterior facet and the body of the calcaneum
Tuberosity Fractures

- Avulsion fractures
Fixation of tuberosity fractures
Conclusions

- The working man is not doomed
- ORIF is not proven to be better
  - But in the right patient and in the right hands they will probably do better
  - What would you want?