



Pilon Fracture Tips

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Hughston Trauma at Ft Walton Beach

Objectives (Early)

- Establish Goals
 - Restore length
 - De-tension skin
 - Immobilize traumatized tissue
- Don't make a bad situation worse:
 - Avoid further tissue trauma
 - Don't impair future work
- Ex fix is your friend

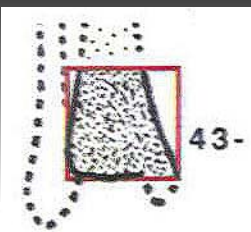
Objectives (Delayed)

- Stable articular axis/alignment
- Length correct
- Reduce articular surface
- Avoid soft tissue compromise
- Allow early restoration of motion



Pilon Fractures

- Definition: Pilon: (n) from French "Hammer"
- Mueller's rule of "squares"
- Intraarticular distal tibia (involving the plafond) (Plafond: (n) from French "Ceiling")
- AO/OTA 43: B, C



Problem

- High energy injury
- Severe soft tissue embarrassment
- Problematic:
 - Distorted soft tissue envelope
 - Interventions add further insult
 - High incidence of wound complications
 - (70%) Teeney and Wiss '87



Strategies

- Restore length and alignment:
 - Minimal additional injury
 - Joint-spanning external fixation
- Immobilization:
 - Include control of the hindfoot
- De-tension skin
- Allow access to soft tissue management



Technique: Traditional Ex Fix

- Proximal fixation points
 - Two pins in proximal tibia
- Distal fixation
 - Transverse cent. thread. Pin
- Additions:
 - Kickstand
 - Forefoot
- “Delta” bilateral struts
- Axial distraction corrects :
 - Shortening
 - Coronal plane deformity



Options: Traditional Ex Fix Frame

- Advantages:
 - Familiar to most surgeons
 - “Simple” (?)
- Disadvantages:
 - Limited control of hindfoot
 - Costly (12,000 \$ US)
 - Difficult to gain access to soft tissue



Options: Ziran Frame

- Advantages:
 - Simple
 - Built in Kickstand
 - Superior hindfoot control
 - Minimal effect on future surgeries
 - Inexpensive (3-4000 \$ US)
- Disadvantage:
 - Unfamiliar to most surgeons



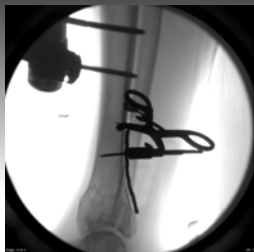
Technique Ziran Frame

- Proximal fixation points:
 - Two pins proximal tibia
- Distal fixation:
 - Two crossing pins in posterior calcaneus
- Single vs double side bars
- Anecdotal series: since 2010- all pilons at Upstate
 - Zero complications
 - Avg time to definitive fix: 6 days



Limited Early Fixation

- C to B procedure
- Supine patient
- Posteromedial incision
- Semitubular plate as buttress
- Convert “complete” articular fractures into “partial” articular fractures
- Buttress against posterior subluxation



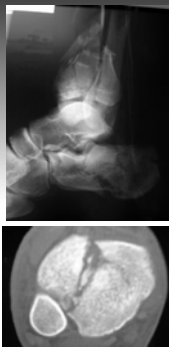
What NOT to Do

- Unstable construct
 - Less is NOT better
- Pins in the wound
- Pins near zone of injury
- Clamps next to the skin
 - “Stiffer” construct
- Clustered constructs
 - More is NOT better



Definitive Fix

- Post reduction CT
 - Interposed fragments
 - Size/geometry of fracture elements
- Preop Plan:
 - Surgical positioning
 - Incisions
 - Reduction strategy
 - Implants



Definitive Fixation

- Wait for the tissue
- “Pruning”
- Know your own limitations
 - How long will this take you?
 - How much time can the extremity tolerate?
 - Patient tissue factors:
 - Diabetes, smoker?



Incisions

- Choose wisely:
- Anteromedial incisions have significant hx of wound compromise
- Posteromedial
- Anterolateral
- Posterolateral



Indirect Reduction

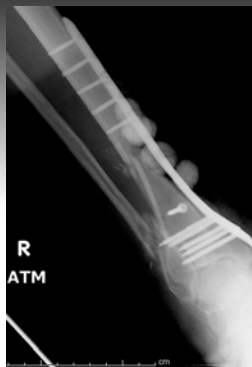
- Femoral distractor
- Ex Fix
- Push-pull through periarticular plate



Implants

Caution:

- Anatomic plates will NOT reduce the fracture
- Reduction still required
 - Usually, first



Conclusions

- Early indirect reduction
- Closed management
 - Ex fix
- Bulky soft compressive splint
- Ziran frame: simple, inexpensive, effective
- Posteromedial ORIF (C to B)
- Perc reduction/pinning if absolutely necessary
- Cautious planning and execution of definitive fixation



