Pilon Fractures: Exfix as definitive treatment (DM?)

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Diabetes

- High risk of infection (10X)
- Development of Charcot joint
- 50% re-operation rates

Referred for management of complex pilon fracture?

Charcot
French neurologist
Known as “Napoleon of neurosis”
Outcomes of ankle fractures with DM

• McCormack et al: 47% complication rate (4 infection; 2 amps)

• Kristiansen et al: 60% infection; 10% charcot development.

Pilon Treatment Challenges

• Bony injury (probably can fix)

• Chondral injury (can’t fix)

• Soft tissue injury (can hurt you and patient)

Soft tissue injury

• Thin envelope

• Usually injured during initial trauma

• Poorly tolerant of surgical insult
Contoured plates are better?

Potential to produce severe complications of treatment

Pilon Fractures

Courtesy of J.L. Marsh M.D.
Pilon Fractures

Excellent results are only rarely achieved

2 yrs.

Tibial Plafond Fractures

Fair to good results are the norm

26 mos.

Pilon Fractures

Outcomes are impossible to predict

5 years - no pain
ankle score 95
Tibial Plafond Fractures
*Outcomes are impossible to predict*

6.5 yrs - miserable -
ankle score 45

Courtesy of J. L. Marsh M.D.

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Preoperative Planning

Soft tissue assessment
Abrasions
Fracture blisters
Contusions
Compartment syndrome
Vascular injury

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Ex-Fix Advantages

Spans Zone of Injury
One surgery
Minimally Invasive
Outcome are the same
Technique: talus pin helpful

Reduction and fixation most often percutaneous with fluoroscopic control

Reduction forceps based on anterolateral incision
Limited Ant-lat approach for articular reduction

Removal of exfix at six weeks
Is Routine Plating of the Fibula Necessary

Williams et al, 1998

- Reduction - no diff
- Ex Fx/Healing time - no diff
- Ankle score/Athritis - no diff
- Complications total - no diff
- Fibular plating: less angular malunion

Pin Infection

49 patients (Marsh et al JBJS 1995)

- 39 - no treatment required
- 2 - I.V. antibiotics
- 6 - oral antibiotics
- 1 - talar pin curetage
- 1 - calcaneal pin curetage
Poor Pin Placement

Locked Fixator

Two years after injury

Most have some pain
Most return to work
Detectable arthrosis - 50%
Arthrodesis rare
Outcome

• Marsh et al. 2003, JBJS
  • 35 Pilon in 31 patients at 5-12 years
  • Iowa ankle scores 78
  • 5 fusions
  • Patients continued to improve 2.4 years after injury
  • 14 patients had to change jobs

Wang, JFAS, 2015

• Meta-analysis of 498 fx (9 studies)
• Compared ORIF to Limited internal fixation and ExFix
• No difference in:
  • Non union or malunion
  • Superfical or deep infections
  • Post-traumatic OA

Galante et al, Injury, 2016

• 162 patients with hybrid ex fix
• No deep infections (30% superficial)
• One loss of reduction
• Overall functional score excellent; but worse with worse injuries(!)
Open Reduction vs External Fixation and Limited Internal Fixation for High Grade Pilon Fractures (OTA Types 43C)

Egol et al 2008
21/27 patients with EF
26/35 patients with Staged ORIF
Mean 18 month follow up.

No diff in Final ROM, arthritis grade, complications, AOFAS scores
ORIF worse on bother index of SMFA

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<th>Number of Fractures</th>
<th>21</th>
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<th>Treatment</th>
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| Summary/Conclusion    | Fixation Group          | Fixation Group          | P-Value |
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1986 - 24 yo male
Why External Fixation??

Graded approach to articular surface
Easiest of the available techniques
Safe
Results comparable to other techniques

Conclusions

• Surgical tactic should be well planned for and include the use of meticulous soft tissue techniques and indirect reduction methods
• With the proper attention to detail, long-term results will be maximized.
• Results with this technique comparable to other series.

Summary

• Respect for soft-tissue management is of paramount concern, as is attention to stable, rigid fixation with prolonged immobilization and prolonged restricted weight bearing, in trying to minimize problems and yield good functional results.

THANK YOU