Polytrauma Case Presentation with a Focus on Tibia Pilon Fractures and Soft Tissue Management

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CASE OVERVIEW

32 y.o female ejected in MVA
- Dislocation of R glenohumeral joint
- Multiple tibial fractures
- Sacroiliac joint and obturator ring fractures
- R rib fracture w/ pneumothorax
- Hepatic lobe laceration
Background

• Mechanism of injury: Axial load (high energy) or rotational (low energy) and major soft tissue damage

• Frequency: <10% of lower limb injuries; increasing with survival rate in MVA; Related Conditions: 75% associated with fibula fractures

• Poor clinical outcomes → males, co-morbidities, lower levels of income etc...

Anatomy

Fragments

Anterolateral (Chaput)

Medial Malleolar

Posterolateral (Volkmann)
**Imaging**
- Xray
- CT
- 3D Reconstruction

**Classification**
- Tserne → Grades O1-O4 and C0-C3
- AO/OTA → 43-A, B and C
- Ruedi and Allgower → Type I, II and III
PILON FRACTURES

Treatment/Management

Surgical Option

1. Fibular length restoration
2. Reduction of the articular surface of the distal tibia
3. Filling of metaphyseal bone defects with cancellous autograft
4. Stabilization of the distal tibia

Non-Surgical Option

1. Long leg cast → 6 weeks
2. ROM exercises
**PILON FRACTURES**

**Treatment/Management Fixation**

Joint Spanning External Fixation

- Can be used as definitive treatment
- Removed at 10th - 21st day mark followed by ORIF and/or IM Nail
- Ilizarov ➔ C2 or C3 fractures
PILON FRACTURES

Treatment/Management Fixation

Ilizarov variants
Fibular Length Restoration

- Reduction can be more accurate
- Important for syndesmotic injury
- When?
- Lowers the rate of malunion when fixed with plating
- No restoration → improvement of metaphyseal contact for the tibia

“To fix or not to fix: that is the question”
Complications
• Wound breakdown
• Non-union
• Posttraumatic arthritis
• Chondrolysis
• Malunion
• Stiffness
• Pin site infections

Outcomes
• Lower SF-36 scores compared to pelvic fracture, HIV and coronary disease at 2 year follow up
• Full recovery → <38%
PILON FRACTURES

TIBIAL PILON (AO Type 43)

TEMPORARY EX-FIX
+/- LIMITED INTERNAL FIXATION

RESTORATION OF ARTICULAR SURFACE

OPEN FRACTURE?

YES

DEBRIDEMENT AND APPLICATION OF NEGATIVE PRESSURE DRESSING

NO

TYPE OF FRACTURE

TYPE A AND B

ORIF WITH LOCKING PLATE USING MINIMALLY INVASIVE TECHNIQUE

TYPE C1

ORIF WITH LOCKING PLATE USING MINIMALLY INVASIVE TECHNIQUE

TYPE C2/C3

APPLICATION OF RING FIXATOR

DEFINITIVE FIXATION AND SOFT TISSUE COVERAGE WITHIN 5 DAYS OF INJURY
My Experience!

Zyrconium!!!

1. Femoral implant
2. Articular insert
3. Tibial baseplate

HIT ME UP

ON MY BEEPER

1. you're so great
2. oh, heh, thanks!
3. we should be together!
4. we... we see each other every day!

1. you would never leave me, right?
2. ow, you're hurting me!
3. I just had to be sure!
4. help me!

1. theAwkwardYeti.com
Thank you!

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References

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6220009/
https://www.orthobullets.com/trauma/1046/tibial-plafond-fractures
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4666229/#CR10
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5213932/
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4666229/