



**HOW TO DEAL WITH
PILON NONUNIONS
AND INFECTION**

John Ketz, MD
10/29/2018 1


**I don't have any fucking
problems with pilons. I
only take care of other
people's problems who don't
know how to operate!**
10/29/2018 2


**Hey, listen I'm too fucking
old to take trauma call. I
mean, goddamnit , that shits
for the young guys!**
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The trauma guys (Watson) steal all of my pilons!

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4

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AVOIDANCE IS THE BEST SOLUTION

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6

History of Treatment

Immediate ORIF External Fixators Staged Reconstruction

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**BAD SOFT
TISSUE INJURY**

WITH A FRACTURE

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**DON'T BURN
BRIDGES**

10/29/2018 9

Pilon Fractures

A WELL PLACED EXTERNAL FIXATOR LEAVES YOU OPTIONS



10/29/2018 10


Pilon Fractures

- Staged Fixation

Initial ex-fix +/- ORIF fibula

What Happens? ↓ Soft Tissue Improves Partial Healing

Definitive Fixation

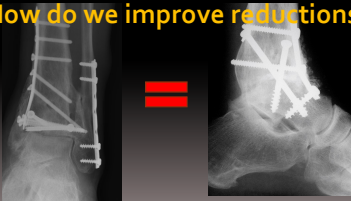


10/29/2018 11

Pilon Fractures

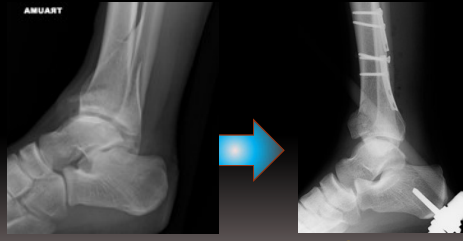
Good Reduction ? Good Results
Bad Reduction = Bad Results

How do we improve reductions?



10/29/2018 12

- More staged soft tissue friendly incisions
- Initial Ex-fix with limited ORIF




10/29/2018 13

TECHNICAL TRICK

Early Limited Internal Fixation of Diaphyseal Extensions in Select Pilon Fractures: Upgrading AO/OTA Type C Fractures to AO/OTA Type B

Robert P. Dunbar, MD,* David P. Barei, MD, FRCSC(J),* Erik N. Kubiak, MD,†
Sean E. Nork, MD,* and M. Bradford Henley, MD, MBA*




J. Orthop. Trauma
2008: V.22, pp. 426 - 9

10/29/2018 14

ORIGINAL ARTICLE

Staged Posterior Tibial Plating for the Treatment of Orthopaedic Trauma Association 43C2 and 43C3 Tibial Pilon Fractures

John Ketz, MD* and Roy Sanders, MD†




J. Orthop. Trauma
2012: V.26, pp. 341-6

10/29/2018 15

Pilon Fractures


- Posterolateral approach
 - Displaced posterior fragments
 - Prone
 - ORIF fibula through same approach



10/29/2018 16

Technique

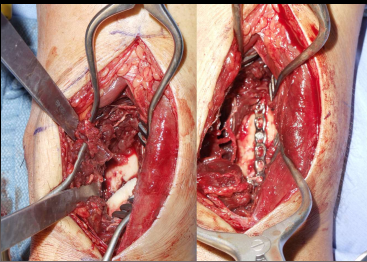
- Posterolateral incision



10/29/2018 17

Pilon Fractures

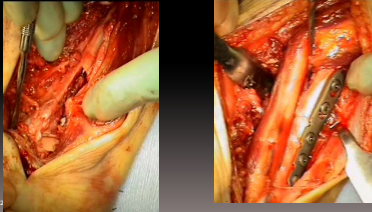
- Posterolateral approach
 - Interval between Peroneals and FHL




10/29/2018 18

Technique

- Posterolateral approach
 - Anatomic reduction of fibula
 - Stabilization of posterior malleolar fragment



10/29/18 19



10/29/2018 20



10/29/2018 21



Advantages

- Better visualization of fragments
- One incision at a time
- Limited tourniquet time
- Allows for revision

10/29/2018 23

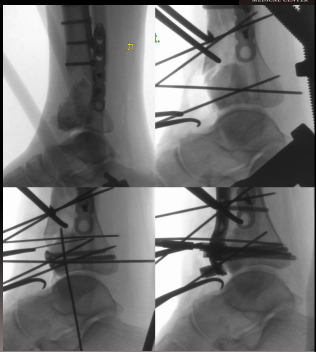
Disadvantages

- Increased nonunion risk
- Infection/Nonunion with posterior hardware

10/29/2018 24

Stage 2 Goals -Strategy

- Begin with Posterolateral Fragment
- Fix posteromedial to posterolateral
- Reduce central impaction
- Reduce Medial and Anterolateral fragments
- Provisional wire fixation
- Lag Screw Fixation
- Fix articular block to diaphysis

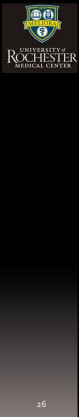


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Incisions

- Posteromedial
- Posterolateral
- Anterior
- Anterolateral
- Anteromedial
- Percutaneous




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What about the “7cm” Rule?

- Multiple smaller approaches
- Allows for fracture specific fixation



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Incision Placement

- 42 patients, 46 plafond fractures
- Two surgical approaches in 32 fractures
- Three Surgical approaches in 14 fractures
- Skin bridges:
 - 5.0 to 5.9 cm (25)
 - 6.0 to 6.9 cm (16)
- Soft tissue complications in 4 fractures (9%)

Howard et al. J Orthop Trauma. 22(5) 299-305.

10/29/2018 28

Percutaneous Techniques

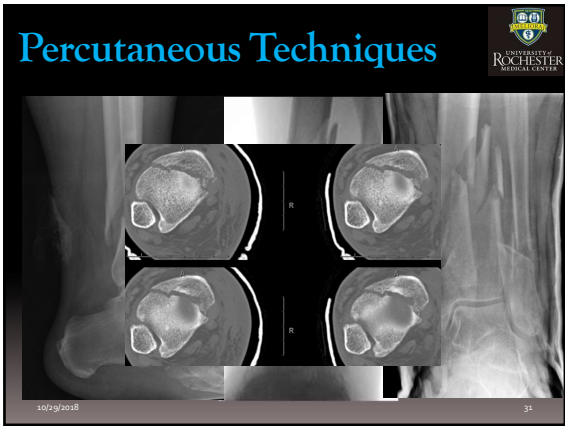


10/29/2018 29

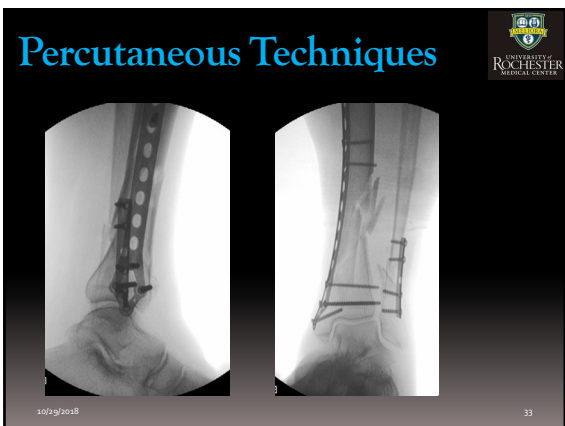
Percutaneous Techniques



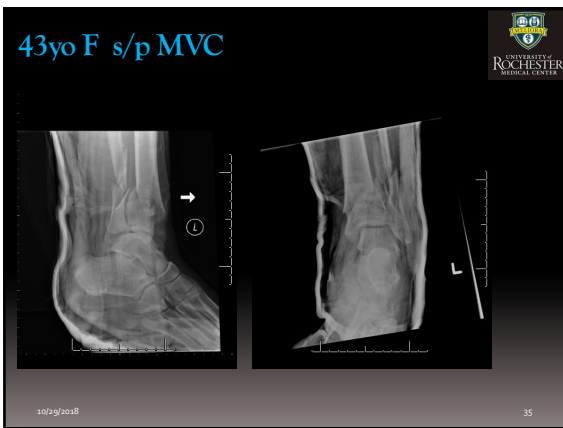
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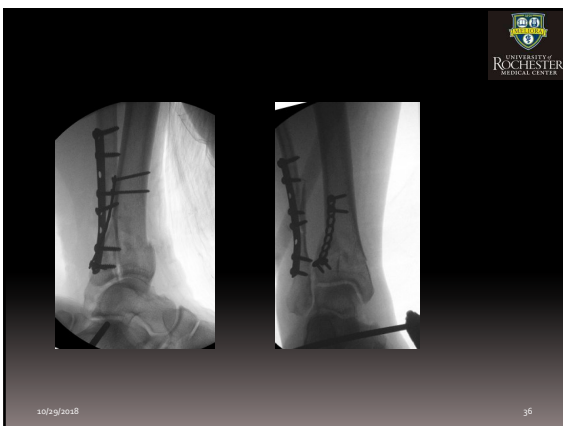

















ORIGINAL ARTICLE

Does a Staged Posterior Approach Have a Negative Effect on OTA 43C Fracture Outcomes?

Daniel S. Chan, MD, Paul M. Balthrop, MD, Brian White, MD, David Glassman, MD, and Roy W. Sanders, MD



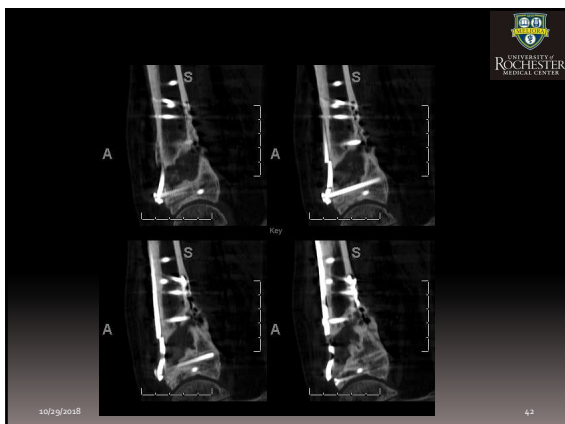
10/29/2018 39

Workup of Nonunion

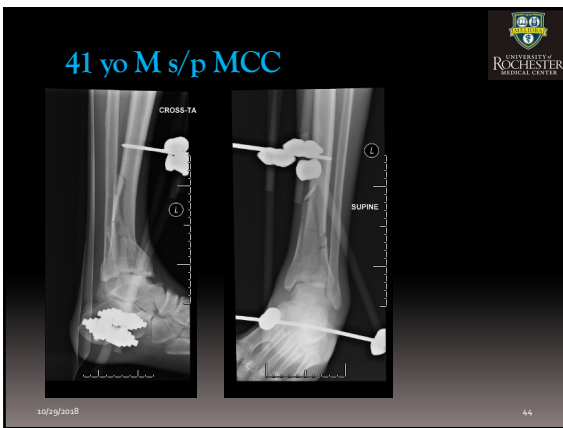
- Evaluate the patient
 - Smoking, malnutrition, immune compromise
- Evaluate the fracture
 - Comminution, open, soft tissue compromise
- Labs - CBC w/ diff, ESR, CRP
 - **BEST PREDICTORS OF INFECTION**

10/29/2018 40

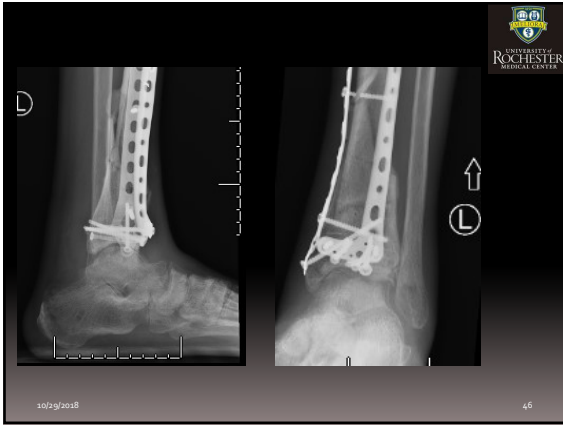
















Infection

- 20% had “surprise” infection
- 73% vs. 96% union rates

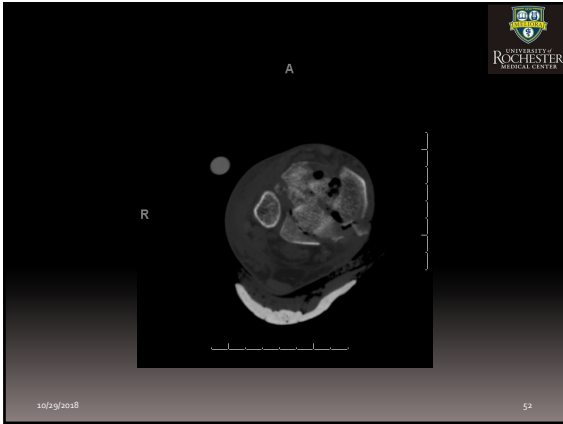
Olszewski et al. JOT 2016

10/29/2018 49

10/29/2018 50

37 yo male fell at work

10/29/2018 51



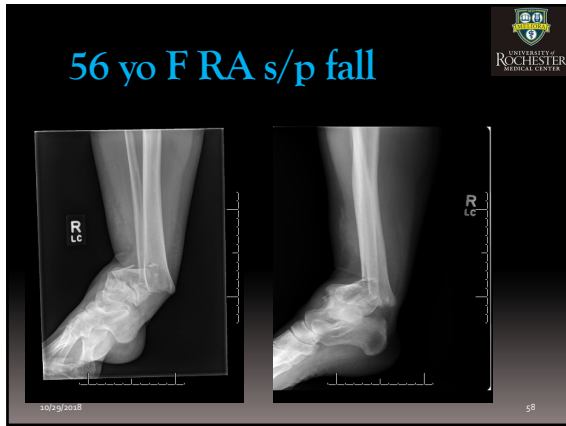


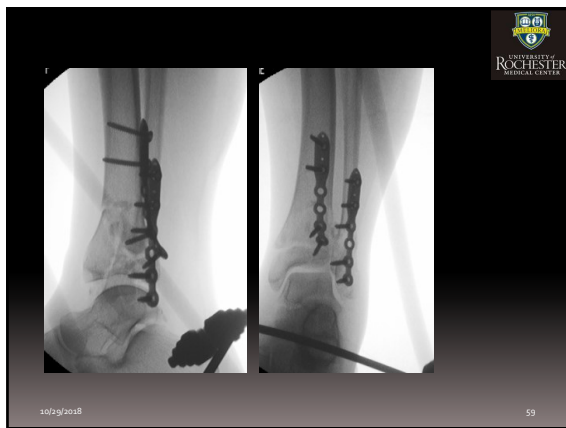






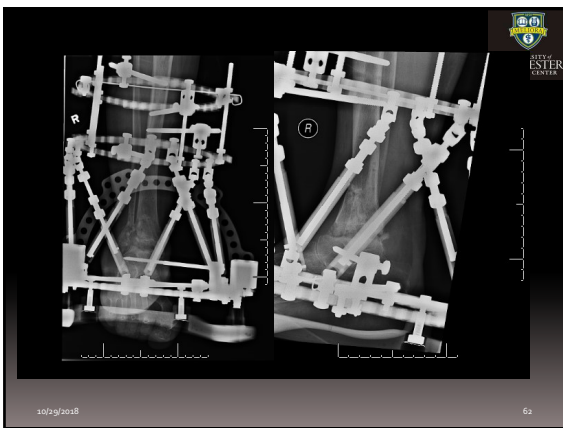















Summary

- If you treat pilon fractures you **WILL** get nonunions and infections
- Be humble and follow the principles
- Treatment depends on multiple factors

10/29/2018  64
