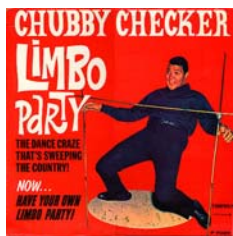




Distal Tibia Nailing: When and How (How low can I go!)

TRAUMA 101 2018 – FRACTURE CARE FOR THE COMMUNITY ORTHOPEDIST

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DISCLOSURES

- Independent Device Design contract related to SI joint fusion with Mayo Clinic Ventures and CoorsTek Medical
- None related to this talk



What are we talking about?

- 43 yo Male
- Fell from ladder
- 1.5 cm open wound anteromedially
- Neurovascular exam normal



Learning Objectives

1. Identify fracture patterns that are amenable to medullary nailing
2. Review the tips and tricks to optimize medullary nailing of the distal tibia

Potential Benefits of Medullary Nailing

- Incisions remote from area of injury
 - Less stripping
 - Maintain fx hematoma
- Full length fixation
- Large, strong implants
- Favors callus formation
- Lower moment arm

Bone Joint J. 2018 May 1;100-B(5):624-633. doi: 10.1302/0301-420X.100B5JJA2017-1329.R2.

A comparison of the cost-effectiveness of intramedullary nail fixation and locking plate fixation in the treatment of adult patients with an extra-articular fracture of the distal tibia.

Marecchia M¹, Patouros S², Orbanai M³, Actis O⁴, Griffin J⁵, Lamb S⁶, Parsons NR⁷, Costa M⁸.

- Economic analysis of trial in UK: Plate vs. nail
- Cost-effectiveness was reported in terms of incremental cost per QALY gained, and net monetary benefit
- Costs were collected prospectively over the 12-month follow-up period using trial case report forms and participant-completed questionnaires
- "Nail fixation is a cost-effective alternative to locking plate fixation."

Bone Joint J 2018;100-B:624-33.

Common Fallacy:

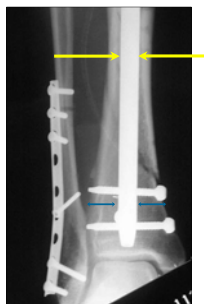
The Nail will Reduce the Fracture

The Solution

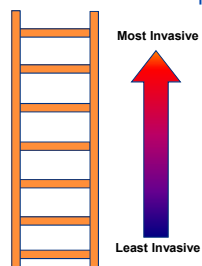
1. Surgeon Reduces Fracture
2. Surgeon Maintains Reduction
3. Surgeon Places Nail across Reduced Fracture
4. Surgeon Locks Nail Distally while Fracture Reduced

What's Different about Distal Fractures?

- Voluminous anatomy of distal segment
- Nail small relative to distal tibia
- Ankle joint proximity may amplify bending moment



Technical tips and Reduction tools

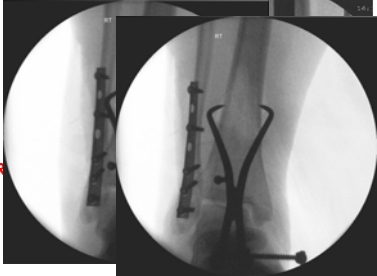



Start here...

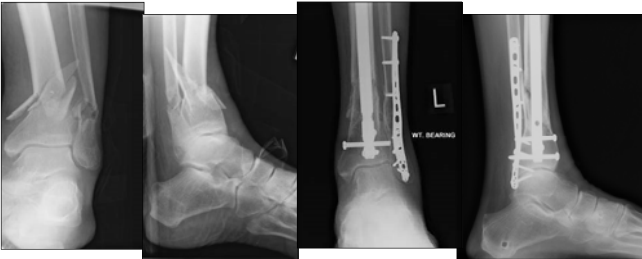

1. Holding (white knuckles)
2. Towel bumps
3. AO universal distractor
4. Percutaneous clamps
5. Schanz pins
6. Blocking screws
7. Mini-open clamping
8. Open provisional plating

Some tips

- Percutaneous clamps
- Femoral distractor
- Address joint injury BEFORE nailing
- Seriously consider fixing fibula

Case: Extraarticular distal tibia fracture





Injury. 2016 Apr;49(4):571-576. doi: 10.1016/j.injury.2016.02.024. Epub 2016 Mar 2.

High incidence of screw penetration in the proximal and distal tibiotalar joints after intramedullary nailing of tibial fractures-A prospective cohort and mapping study.

Scan MP1, Doornberg JH, Gull B, Cramer J, Jansen BA, Jazay B.

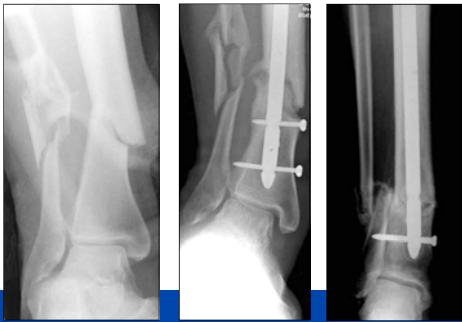
- 165 tibial shaft fractures
- AO/OTA classification
 - 69% were simple
 - 16% wedge
 - 15% complex fractures
- 42% had intra-articular screw penetration of their PTFJ
- 39% had penetration of their DTFJ
- 66% of patients had penetration of either one- or both of their TFJs.



Case: 71 y.o. female, highly contused soft tissue envelope



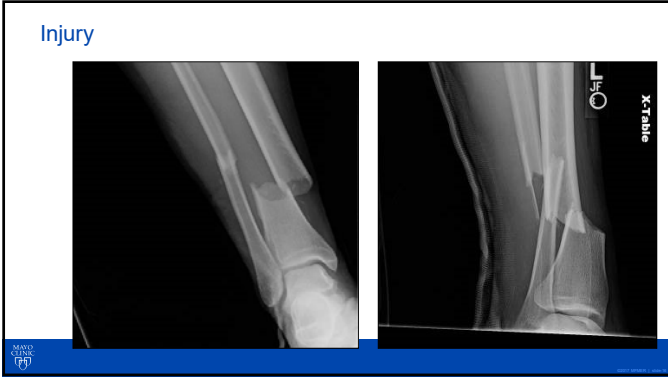
Strongly consider fixing the fibula

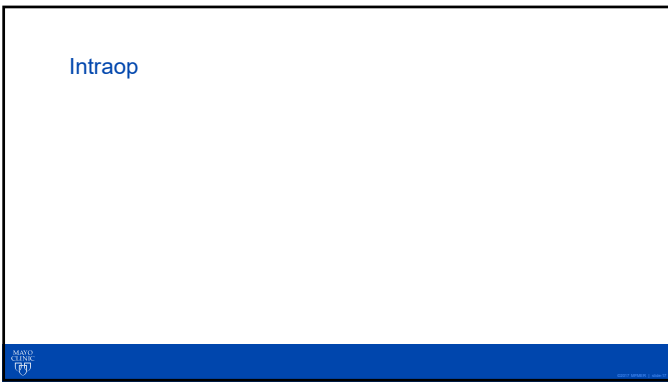


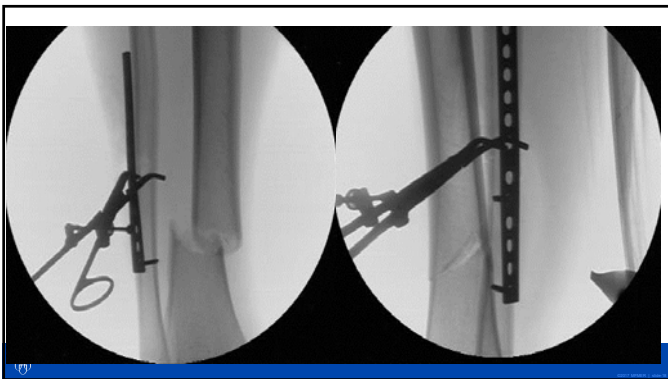
Case

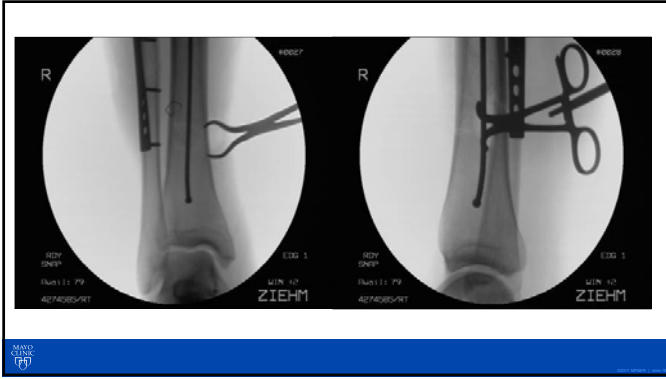
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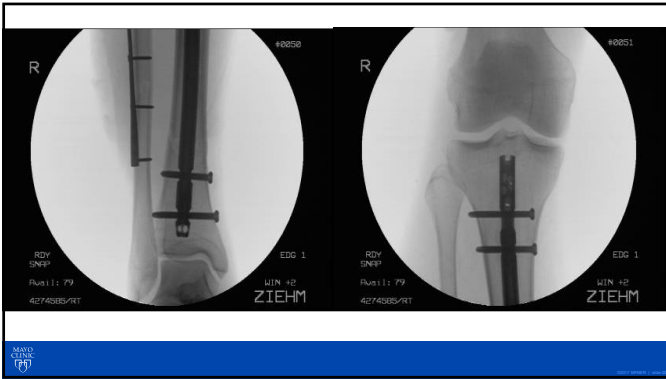


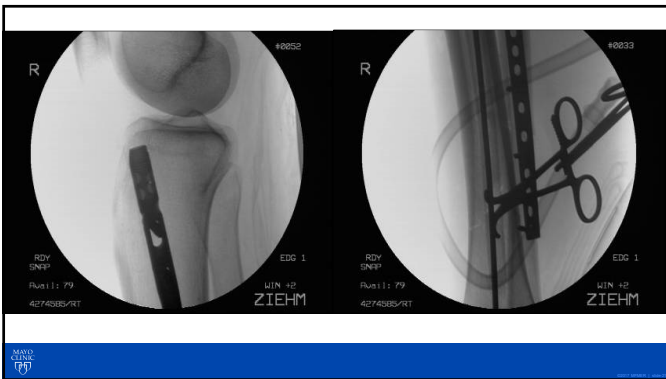


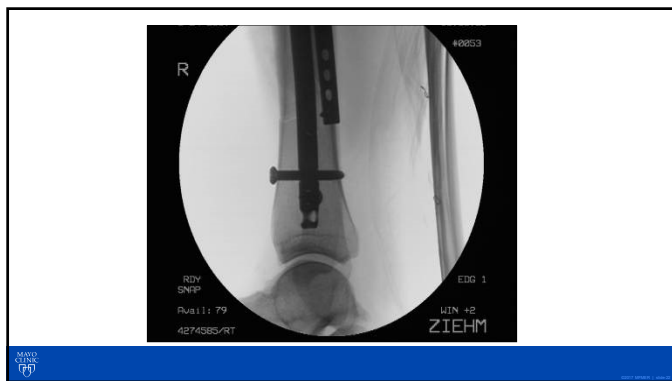


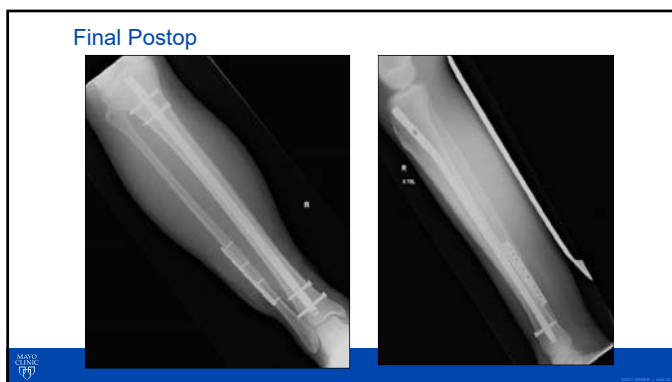


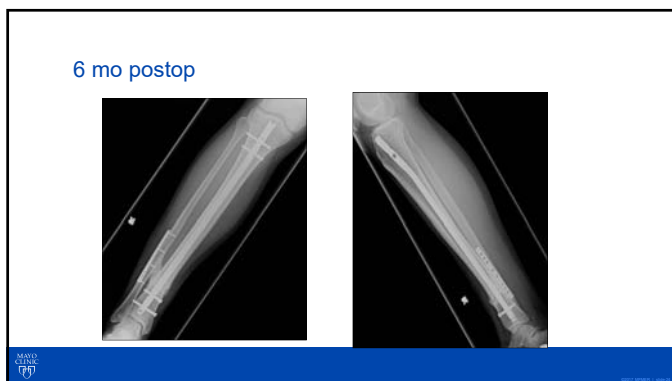






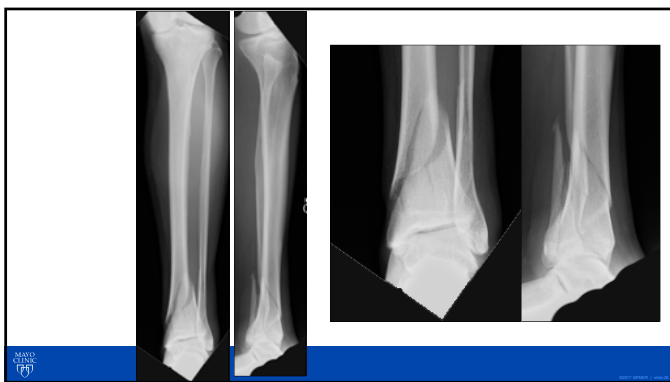




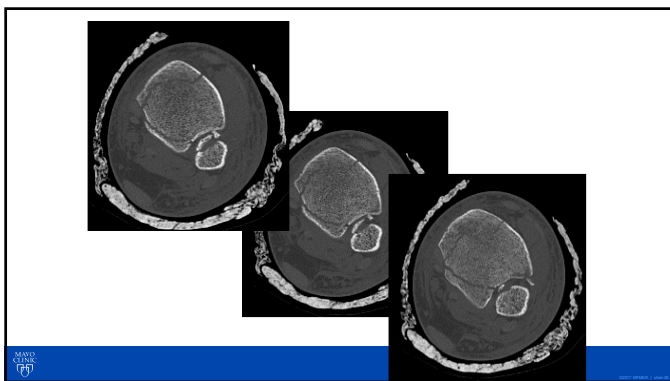


Case

- 62 y/o M slipped on ice
- Seen at OSH and transferred.
- PMH: Hep C, HTN, DM2, Bipolar
- Exam: Closed injury, no significant soft-tissue injury



More info needed?



Treatment plan?

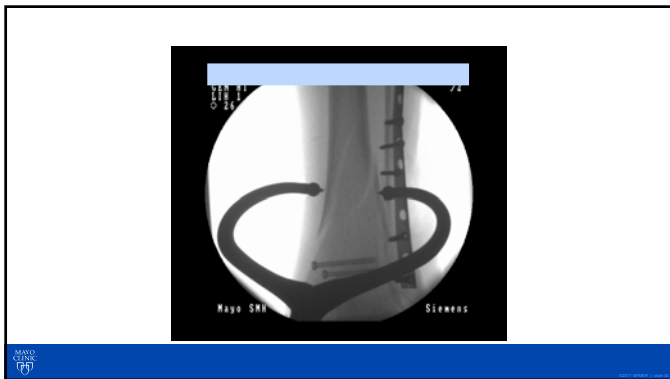
- Options?
- Pros/cons



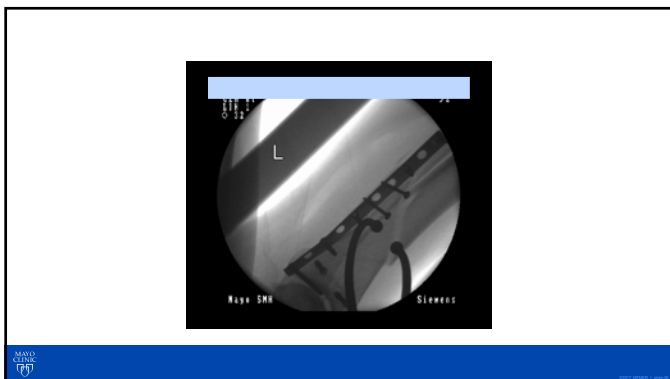


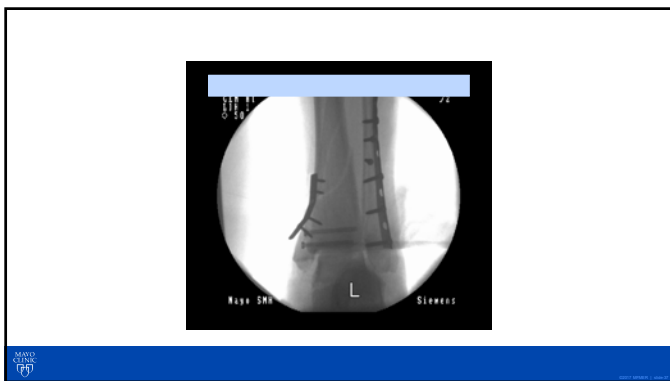


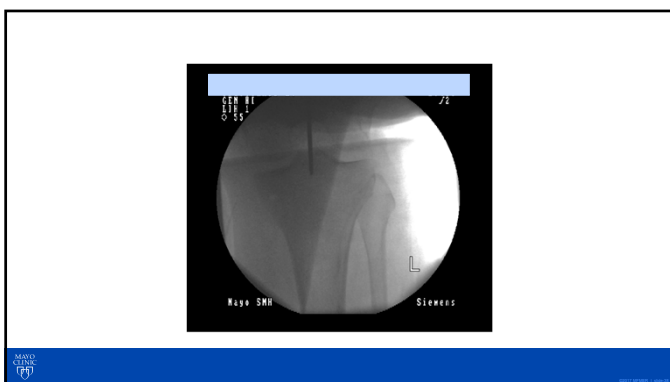


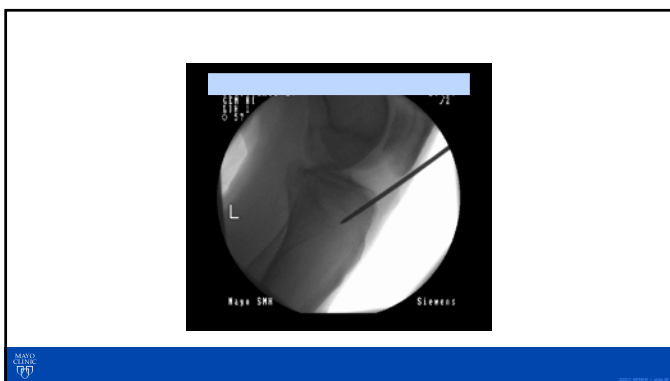








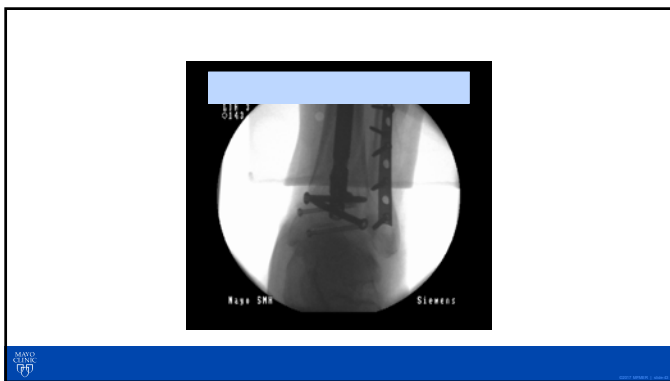




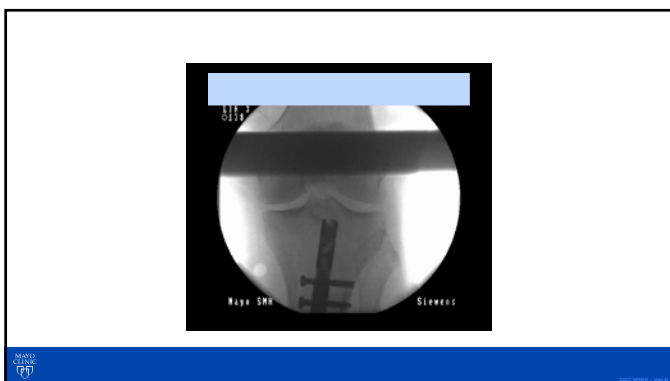


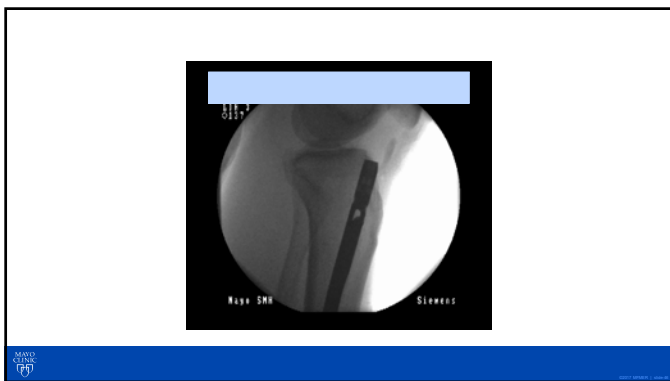


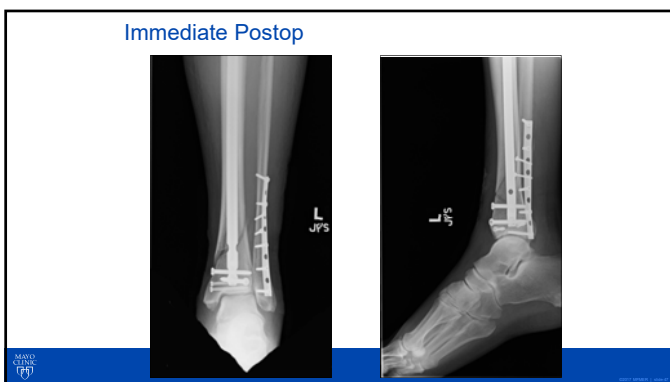
















Case

- 49 y/o M s/p MCC
- Isolated Left Tibia/Fibula fracture
- PMH: Chronic back pain, tobacco use
- Exam: NVI, mild soft-tissue trauma

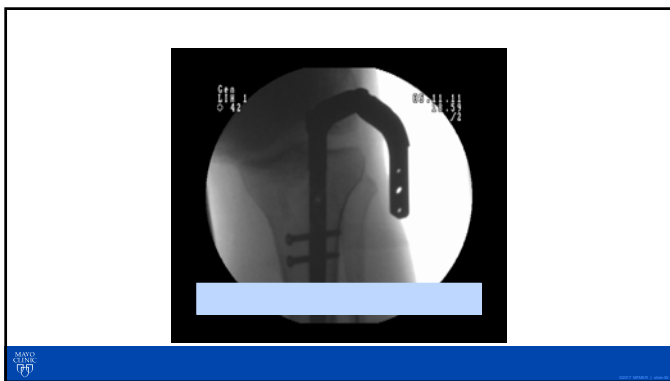


Treatment plan

- Options
- Pros/cons

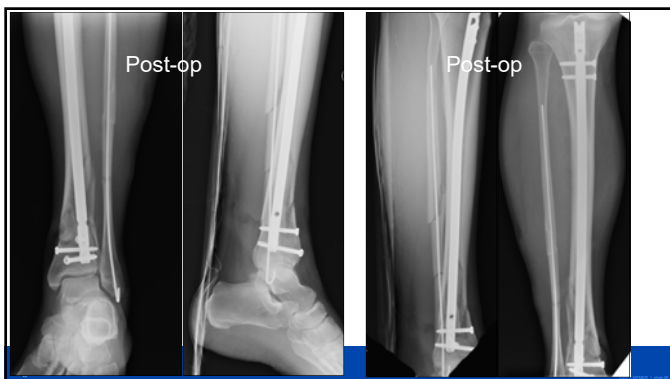














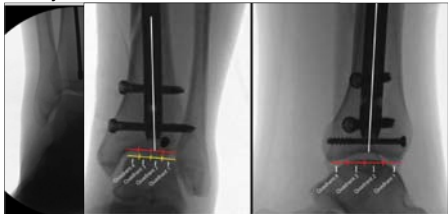
Nailing Distal Tibia Caveats

- Weight-bearing
 - Consider protecting if tenuous fixation
- Know your nail system
 - Distal nail morphology
 - # screws distal, distance
- Semi-extended positioning beneficial
- Get optimal distal positioning

Proper Distal Placement of Tibial Nail Improves Rate of Malalignment for Distal Tibia Fractures

Konstantinos Triantafyllou, MD, Eric Barcuk, DO,† Arturo Villarreal, MD,‡ Cory Collinge, MD,‡ and Edward Perez, MD§*

- Place nail just LATERAL to the CENTER of TALUS



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My Tips and Tricks

Semi-extended nailing

Consider, strongly consider, OPENING

Utilize nail with multiple distal interlocks

Almost ALWAYS fix the fibula

Know, and work, the reduction ladder
