

Distal tibial nailing panel case

Arvind von Keudell



Treatment: ORIF

- Fracture pattern often dictates fixation mode
 - Simple fx = direct reduction + absolute stability (A)
 - Comminuted fx = bridge plating + relative stability with secondary bone healing (B)



Treatment: Intramedullary Nailing

- 2 approaches:
 - Infrapatellar (A)
 - Suprapatellar (B)

A



B



Boulton CL, Rockwood and Green's 2019

Treatment: Intramedullary Nailing

- Infrapatellar approach
 - Traditional approach
 - Knee in hyperflexion to access start point
 - Knee hyperflexion can increase deforming forces in proximal third tibia fractures
 - XR can be difficult



Treatment: Intramedullary Nailing

- Suprapatellar approach
 - Semi-extended position
 - Start point accessed through knee
 - Reduces deforming forces, especially in proximal 1/3 tibia fxs
 - Need special instrumentation to protect knee



Boulton CL, Rockwood and Green's 2019

Treatment: Intramedullary Nailing

> J Orthop Trauma. 2020 Jul 8. doi: 10.1097/BOT.0000000000001897. Online ahead of print.

Comparison of Infrapatellar and Suprapatellar Approaches for Intramedullary Nail Fixation of Tibia Fractures

Kathryn B Metcalf ¹, Jerry Y Du ², Isaac O Lapite ³, Robert J Wetzel ⁴, John K Sontich ⁵, Elizabeth R Dachenhaus ⁶, Jessica L Janes ⁷, George Ochenjele ⁸

Affiliations + expand

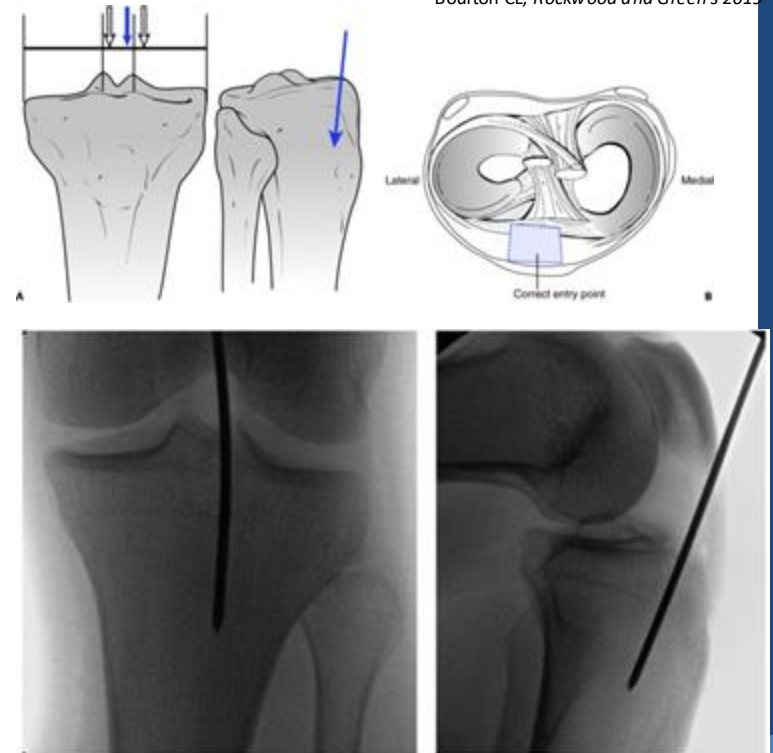
PMID: 32658019 DOI: 10.1097/BOT.0000000000001897

- Retrospective study comparing outcomes between infrapatellar and suprapatellar tibial IMN
- Suprapatellar nailing had decreased risk of malunion and decreased risk of post-operative knee pain
- No difference in rate of nonunion or PROMIS physical function or pain interference
- Consistent with other studies

Treatment: Intramedullary Nailing

Boulton CL, Rockwood and Green's 2019

- Start point vitally important for alignment
- Ideal guide wire placement for average tibia:
 - Just medial to the lateral tibial spine on true AP knee XR
 - Just anterior to the articular surface and parallel the anterior tibia cortex on lateral knee XR



Treatment: Intramedullary Nailing

- End point for nail also key to optimal alignment Triantafillou
K. J Orthop Trauma. 2017
 - Especially important for distal metaphyseal fxs
- End point should be at the center of the talus
 - This is very lateral within the distal tibial metaphysis
- The wire should be centered on the lateral view



Plate vs. Nail

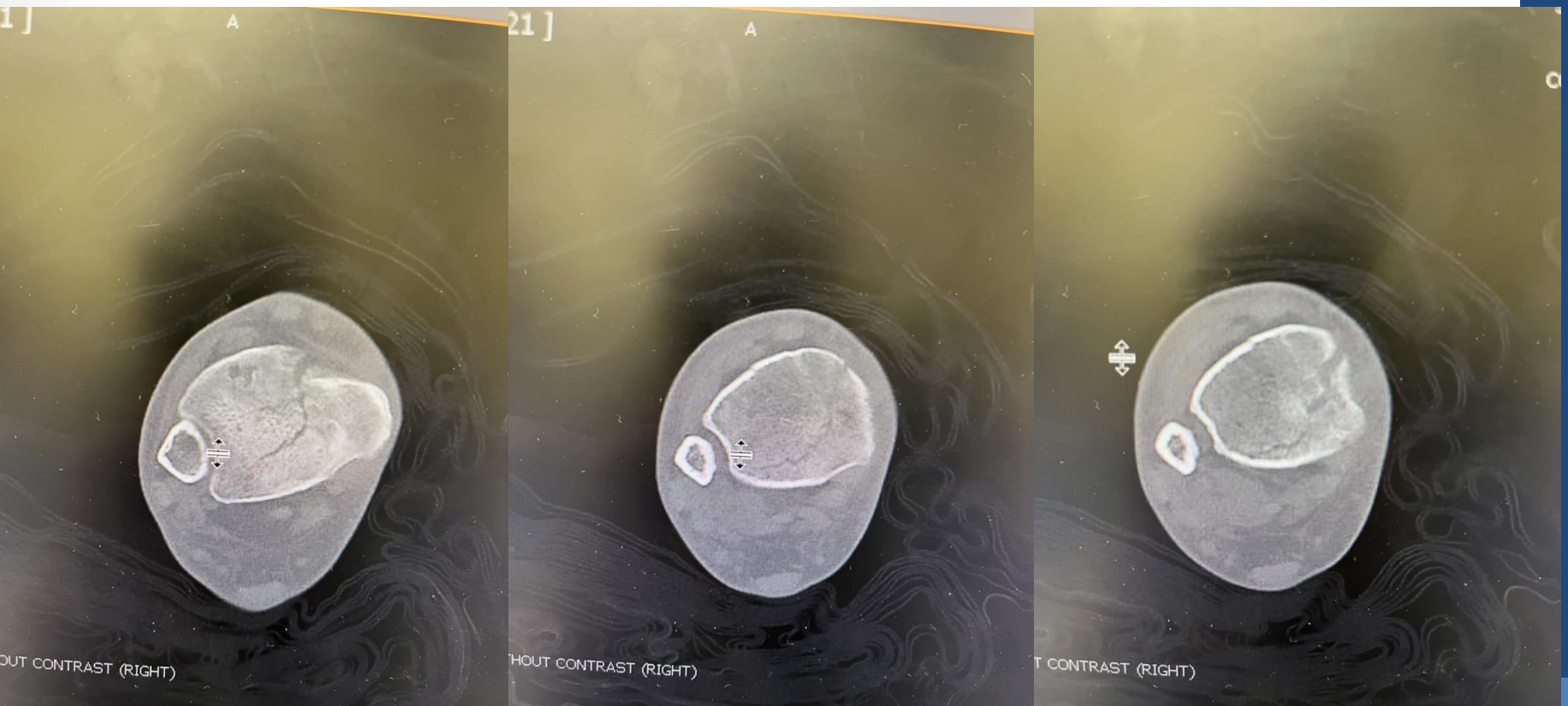
- Existing literature indicates less angular malalignment with ORIF when compared to infrapatellar nailing, especially in metaphyseal fxs Coles CP. *Can J Surg*. 2000.
- Studies show improved alignment in metaphyseal fx nailing with suprapatellar approach + external fixation assistance and/or blocking screws Nork SE. *J Orthop Trauma*. 2006.
 - Alignment may not be different between plates and nails with modern nailing methods
- Nails allow earlier return to WBAT and in some studies improved functional outcomes

Case- 66M no PMH, soft tissues healthy





Axial



Coronal

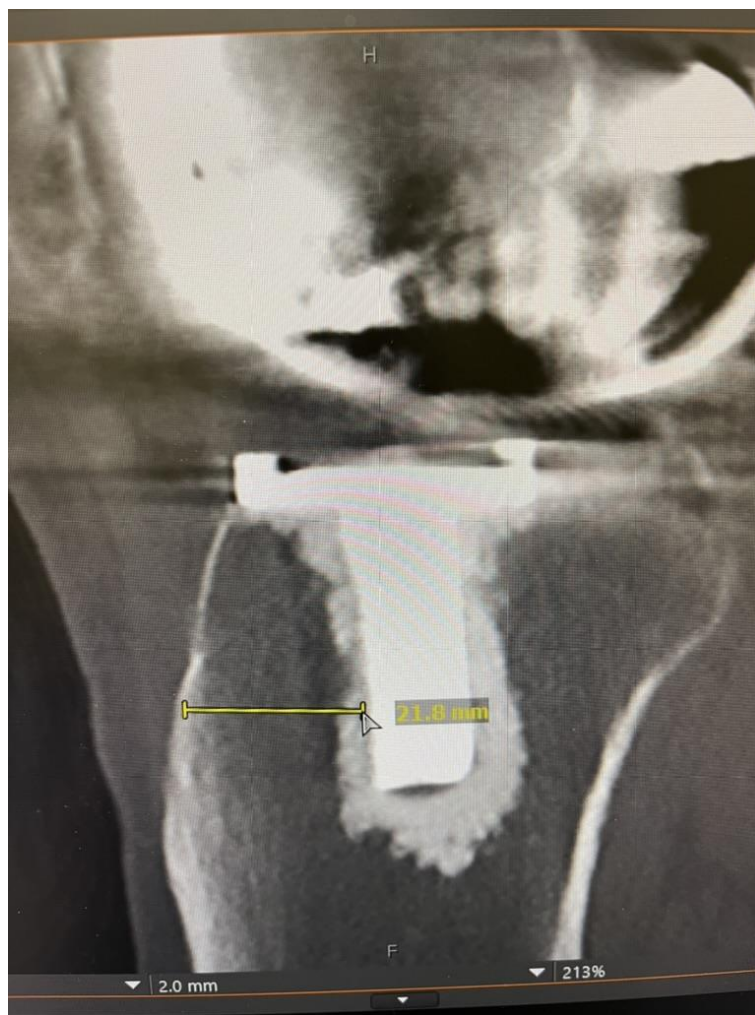


Sagittal



Options

- Nail versus Ring versus Plate?
- If you choose nail-
 - Will it reduce on its own with a nail?
 - What reduction tools can you use?
 - Anything you might want to obtain prior to nailing (if)?
 - What approach for nailing- supra, infra, para? Pros/Cons?



Intraop



Fix the joint



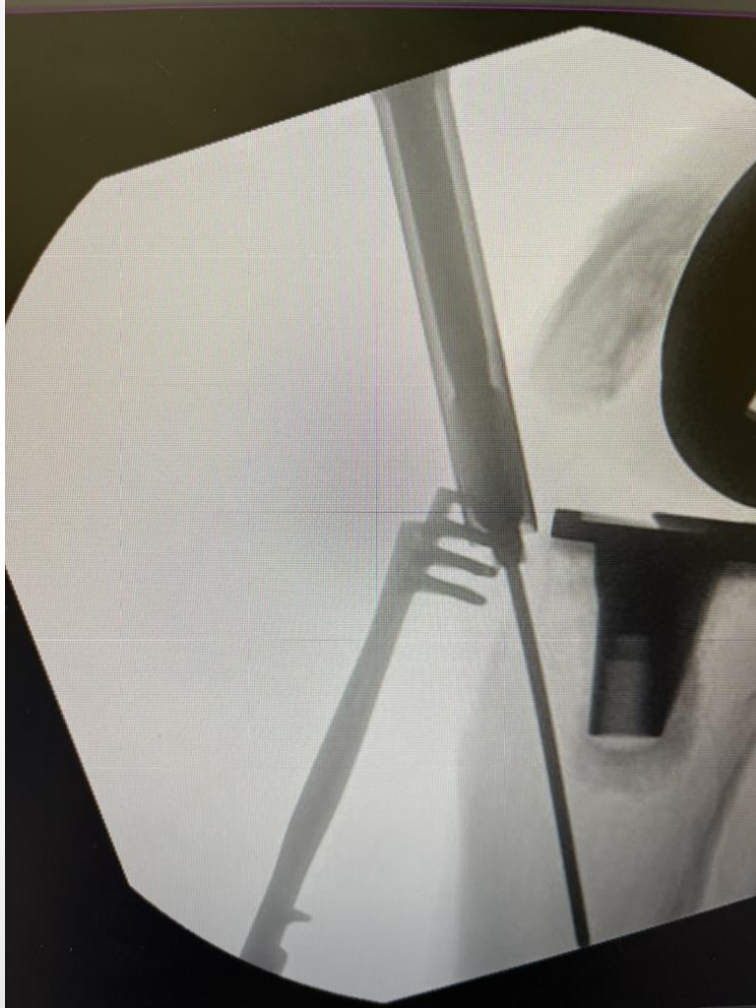
Entry point



Entry point



Opening reamer



Guide wire with a bent



Guide wire- Straight



Nail placement/Locking







Take home

- For Extreme nailing
- Plan your positioning and X-ray properly- infra vs supra
- Plan for reduction tools: Traveling traction, Pointed reduction- can use also pelvic reduction
- Try to understand torsional injury of the tibia in 3D for proper placement of Reduction clamps
- Beware of proper entry and exit point

