

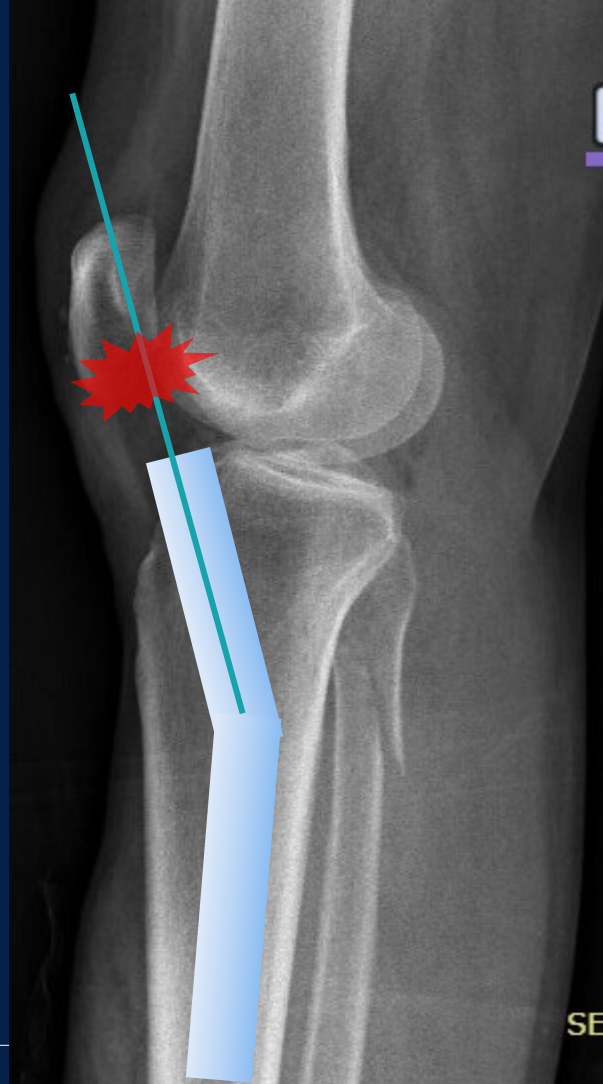


Infrapatellar Nailing: Has it been replaced?

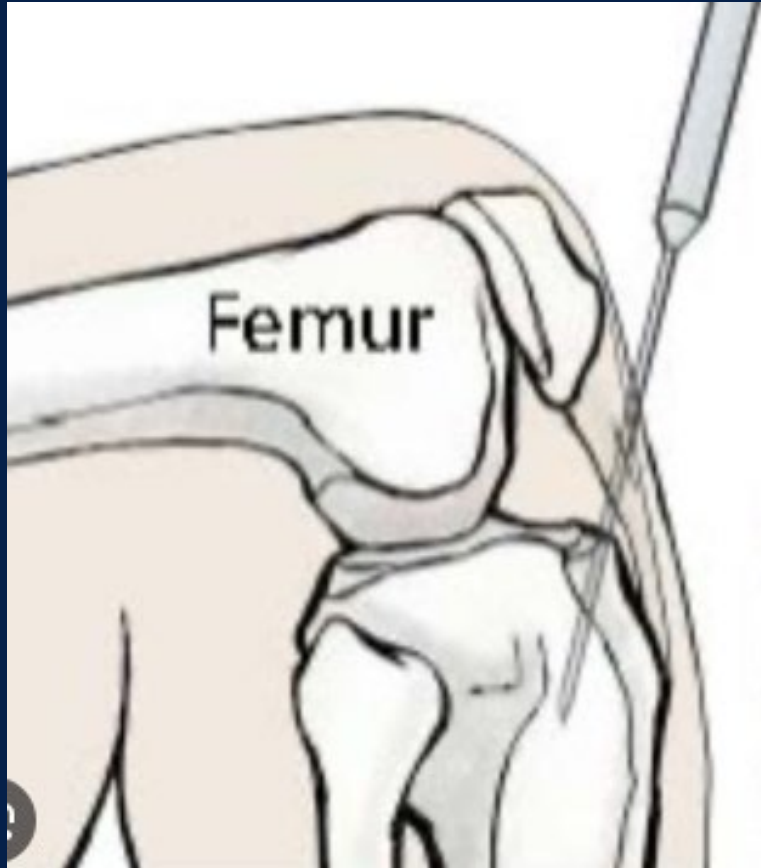
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It is about managing the patella...



Infrapatellar Approach



Knee hyper-flexed

Suprapatellar Approach



Knee Semi-Extended

Infrapatellar Approach



Knee hyper-flexed

Suprapatellar Approach



Knee Semi-Extended



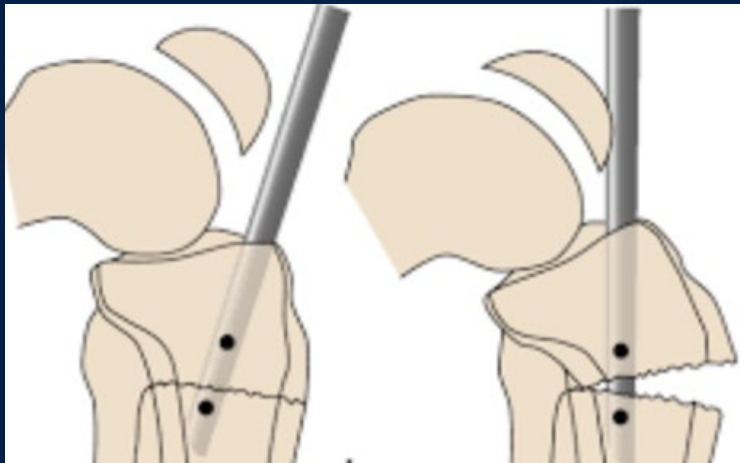
Knee Flexion

- Generally, more difficult to get AP and lateral imaging
- Have to manipulate the leg position more often during the case
- More difficult to maintain reduction for proximal tibial fractures



Knee Semi-Extended

- Generally easier to get AP and Lateral Imaging
- Have to manipulate the leg position less often during the case





Knee Flexion

- Generally, more difficult to get AP and lateral imaging
- Have to manipulate the leg position more often during the case
- Easier to impact to get fracture compression across simple fractures with foot planted against bed



Knee Semi-Extended

- Generally easier to get AP and Lateral Imaging
- Have to manipulate the leg position less often during the case
- Concern regarding intraarticular injury to cartilage
- Attention must constantly be given that cannula hasn't moved
 - May involve additional pinning to the femur
- More difficult to remove nail through this approach

Meta-Analyses

□ A **Suprapatellar** approach, when compared to an **Infrapatellar** approach, yields less Anterior Knee Pain and better patellofemoral joint Function, for intramedullary nailing of diaphyseal tibial fractures. Results of a Randomised Controlled Trial.

Suprapatellar tibial fracture nailing is associated with lower rate for acute compartment syndrome and the need for fasciotomy compared with the infrapatellar approach^h

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Suprapatellar versus infrapatellar approach for intramedullary nail fixation of tibial shaft fractures: a review of the literature

Jonathan D. Ringenber, MD^{*}, Jonathan L. Tobey, MD, Jeffrey L. Horinek, MD, David C. Teague, MD

Yang et al.
Journal of Orthopaedics and Traumatology (2023) 24:14
<https://doi.org/10.1186/s10195-023-00694-7>

Journal of Orthopaedics
and Traumatology

SYSTEMATIC REVIEW

Open Access

Suprapatellar vs infrapatellar approaches for intramedullary nailing of distal tibial fractures: a systematic review and meta-analysis

Chen-Yuan Yang^{1,2}, Soon-Tzeh Tay³ and Liang-Tseng Kuo^{3,4*}

European Journal of Trauma and Emergency Surgery
<https://doi.org/10.1007/s00068-023-02384-9>

REVIEW ARTICLE

A systematic review and meta-analysis comparing suprapatellar versus infrapatellar approach intramedullary nailing for tibial shaft fractures

Zhongqing Wang¹ · Xianmei Xiong¹ · Zesheng Lu¹ · Yijia Gao²

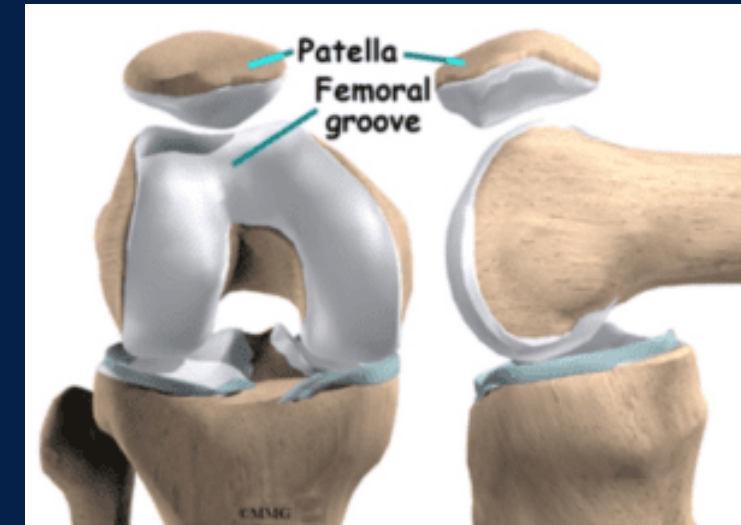
- Looking at all comers:
 - Suprapatellar nailing associated with:
 - Decreased fluoroscopy time
 - Improved reduction (especially sagittal plane alignment)
 - Decreased operative time
 - Decreased anterior knee pain
- Little difference in long term knee function

What about the cartilage?

- Serbest et al JOT 2019
 - 21 patients
 - Examination of intra-articular damage was performed using intraoperative patellofemoral arthroscopy before and after nail insertion
 - 17 of 21 patients (80.95%) had normal (grade 0) patellar and femoral articular pre-nail and post-nail.
 - 4 patients starting with grade 0 chondromalacia,
 - 2 patients had grade 1
 - 2 patients had grade 2 chondral damage post-nail
 - Not associated with either anterior knee pain or functional limitations of the knee
- Sanders et al JOT 2014
 - 13% patients grade 2 chondromalacia limited to the trochlear groove
 - Patients with grade 2 cartilage changes on arthroscopic images had MRI findings at 1 year which were read as normal
 - No correlation between the arthroscopic images, MRI findings, or patient outcomes.

What about the cartilage?

- Gelbke et al JOT 2010
 - Cadaveric study evaluating the contact pressures of SP and IP
 - SP pressures (3.83MPa) were >3 times higher than IP pressures (1.26MPa)
 - Below minimum of 4.5MPa is needed to induce chondrocyte death in prior studies
 - Peak contact pressure with knee flexion alone can reach pressures as high as 4 to 5MPa
 - Conclusion: SP approach doesn't post any significant risk to the viability or structural integrity of the articular cartilage



Suprapatellar nail ...

- Favorable position during procedure
- Easier to maintain reduction especially if reduction tenuous
 - Proximal metaphyseal fractures
 - Distal tibial fractures
- Cartilage injury occurs but not correlated to worsened outcomes
- Meta-analysis point to improved reduction, operative time, radiation



Why Consider Infrapatellar Nailing ...

Identifying the Critical Portions of the Case ...

- Obtaining the start point
 - Getting posterior enough on lateral is more difficult with SP
 - Arthritic knee with limited patellar mobility more difficult to manage with SP
- Obtaining a reduction
- Maintaining a reduction



Identifying the Critical Portions of the Case ...

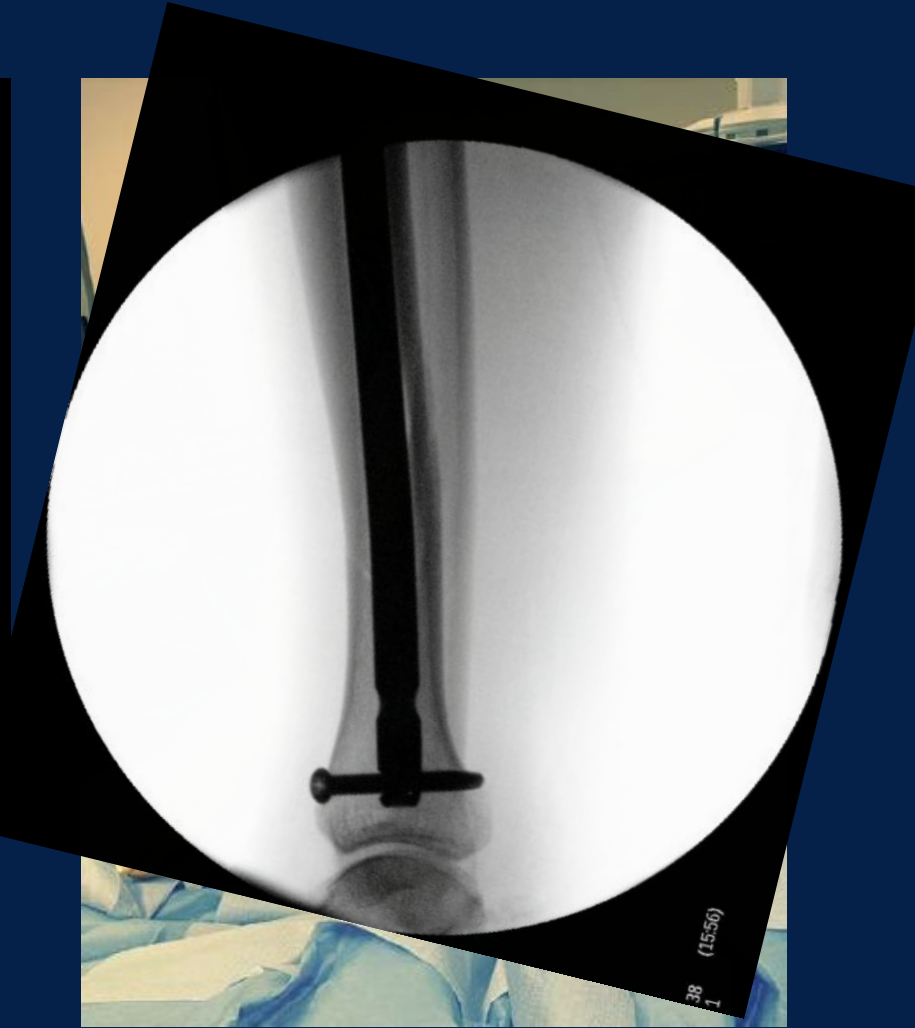
- Obtaining the start point

- Obtaining a reduction
- Maintaining a reduction



Clear advantage of semi-extended approach for proximal and distal metaphyseal injuries

Identifying the Critical Portions of the Case ...



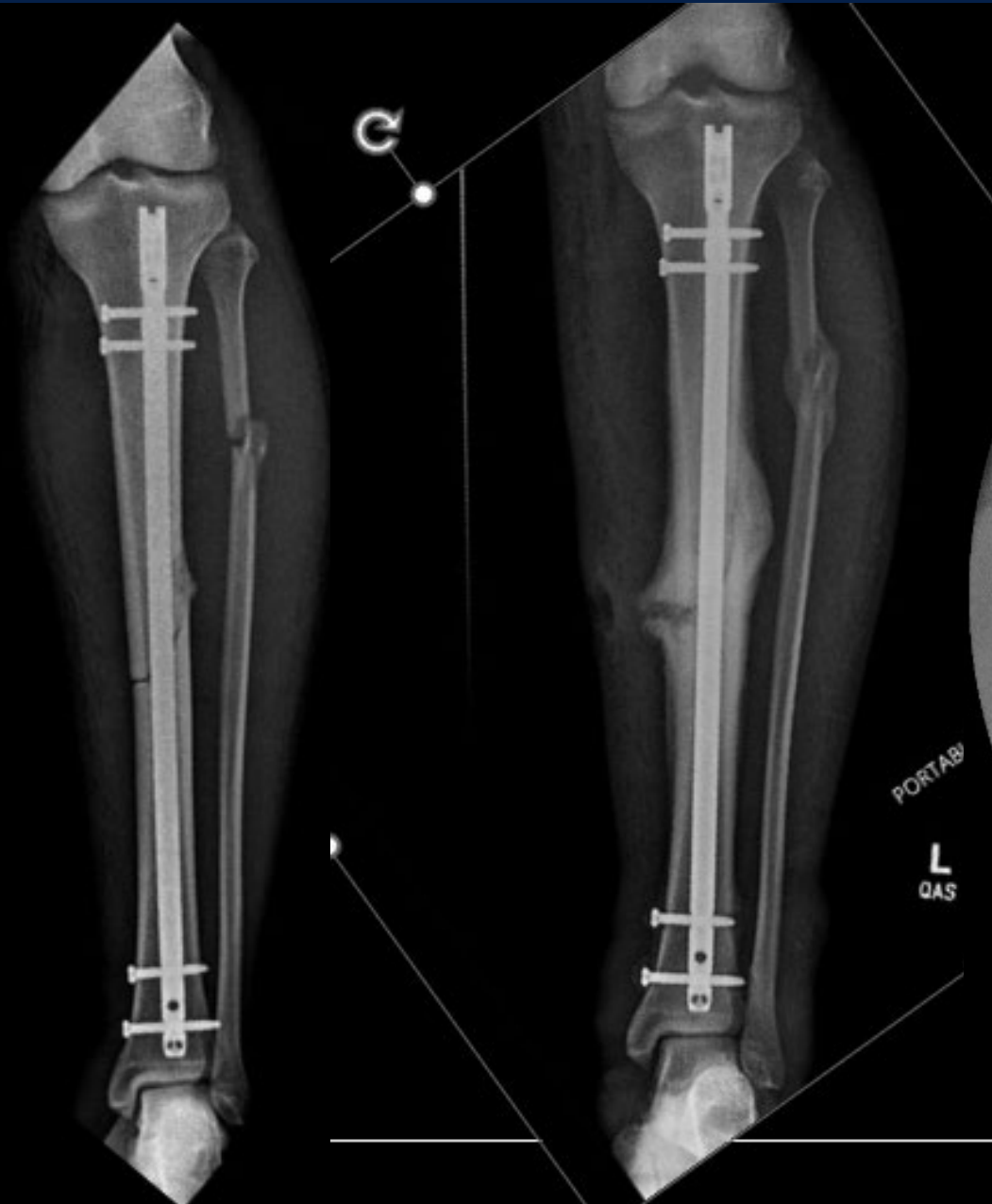
Why Still Infrapatellar Nail?

- Obtaining the start point
 - Getting posterior enough on lateral is easier with IP
 - Arthritic knee
 - Obtaining a reduction
 - Maintaining a reduction
- Not an issue for simple diaphyseal injuries
 - Nail will obtain a reduction

Identifying the Critical Portions of the Case ...



Nail Removal



Summary

- Certainly advantages to **suprapatellar approach** when looking at all comers
- Advantages are greatest for **metaphyseal and meta diaphyseal injuries**
- **Infrapatellar approach**
 - Still my approach of choice given efficiency for **simple diaphyseal fractures**
 - **Any revision/ nail removal regardless of the initial approach**

Thank You

