

Supracondylar Femur Fractures- IM Nails

George V. Russell, MD, MBA
University of Mississippi

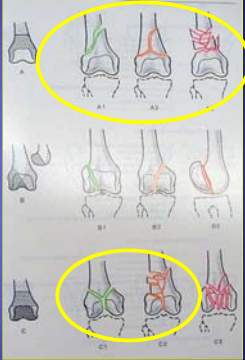
Disclosures

- Minor stockholder
- Consulting Fees
- Institutional Grants

Retrograde Intramedullary Rodding:

- Reduction
- Starting Point
- Entrance Angles
- Ending Point

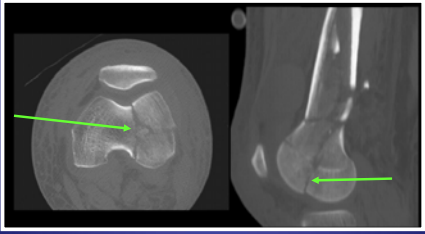
- AO/OTA classification
 - Type 3X-XX: femur
 - Type 33-XX: distal femur
- AO/OTA Type 33
 - 33-AX Supracondylar
 - 33-BX Unicondylar
 - 33-CX Bicondylar
- See figure for further subclassification



The figure shows AO/OTA classification diagrams for distal femur fractures. It is organized into three rows (A, B, C) and three columns (A1, B1, C1; A2, B2, C2; A3, B3, C3). Row A shows supracondylar fractures (A1, A2, A3). Row B shows unicondylar fractures (B1, B2, B3). Row C shows bicondylar fractures (C1, C2, C3). The diagrams are color-coded: A1 and C1 are green, A2 and C2 are orange, and A3, B3, and C3 are red. Yellow circles highlight the A1, A2, A3, and C1, C2, C3 diagrams.

Evaluation of Distal Femur Fractures

- Don't forget the Hoffa fragment!
 - 38% of supracondylar/intercondylar distal femur fractures have a coronal plane fracture (Norki et al, *J Orthop Trauma*, 87-564, 2005)
 - Most precisely diagnosed via CT scanning



The image shows two CT scans of a distal femur. The left scan is an axial view showing a fracture of the distal femur with a green arrow pointing to a small fragment (the Hoffa fragment) located anteriorly. The right scan is a coronal view showing the same fracture with a green arrow pointing to the Hoffa fragment.

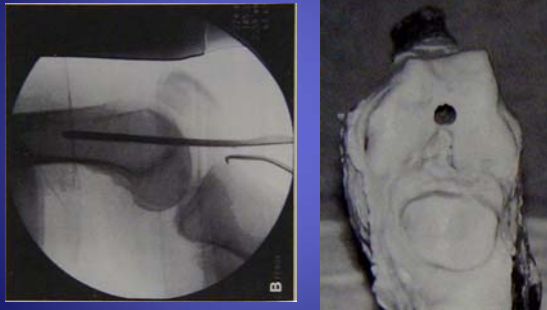
Table Selection-Supine Position

■ Flat top (+) <ul style="list-style-type: none">■ Patient positioning■ Multiple injuries■ Easy	■ Flat top (-) <ul style="list-style-type: none">■ Fracture reduction■ Maintaining fracture reduction■ Assistants■ Lateral images-proximally
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Why Retrograde Medullary Nail?

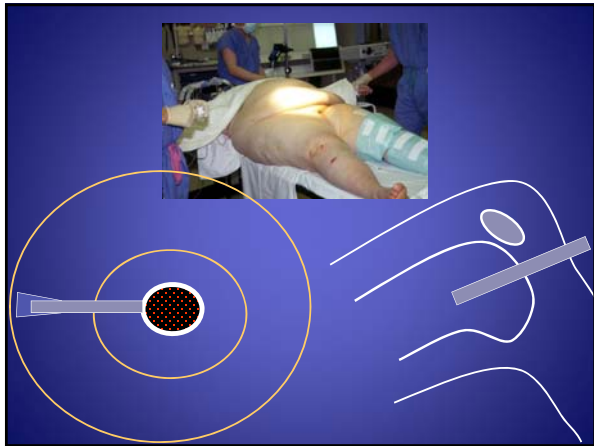
- "Advantages"
 - Smaller incision
 - "Percutaneous" joint fixation
 - Limited exposure
 - Decreased blood loss (?)
 - Load-sharing device, longer lever arm (if long nail utilized)
 - Soft tissues intact
- "Disadvantages"
 - Arthrotomy required
 - "Percutaneous" joint fixation
 - Lack of alignment control ("windshield wiper" of implant)
 - Insertion thru reconstructed cartilage
 - Difficulty of insertion with total knee arthroplasty component in place

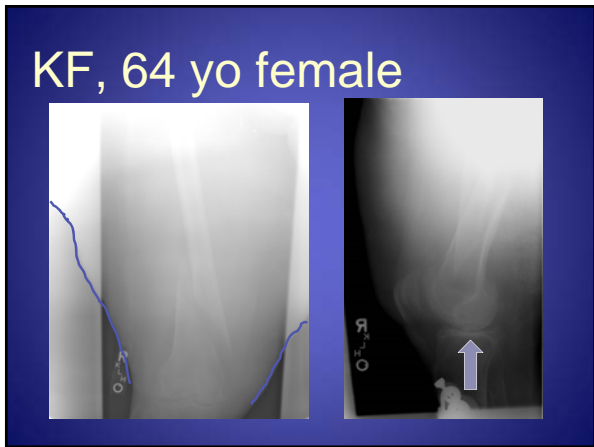
Retrograde Femoral Nailing

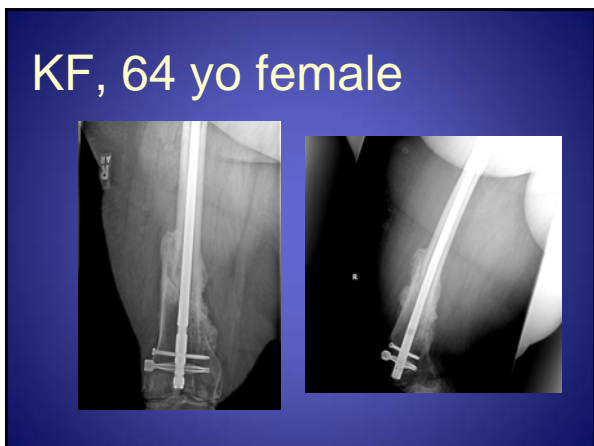


When to Retrograde Nail?

- Floating knee
- One surgical positioning
- Preexisting arthritis
- Ipsilateral femoral fractures
- Appropriate fracture pattern

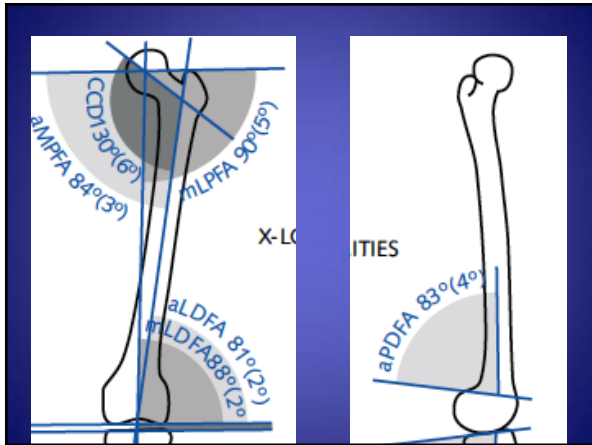






Preferred Steps

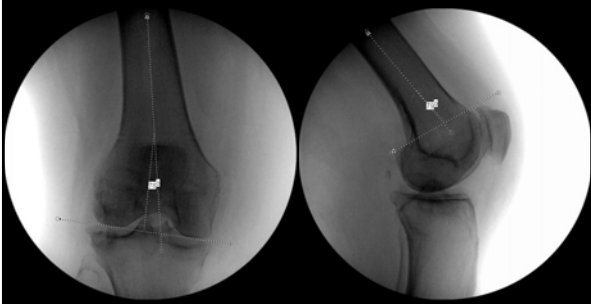
1. Get fluoroscopic images of contralateral side
2. Restore the joint surface
3. Obtain length/alignment
 1. Sagittal plane alignment!
4. SEE



Final films



Measure the contralateral side



Planning Definitive Reconstruction – Deforming Forces

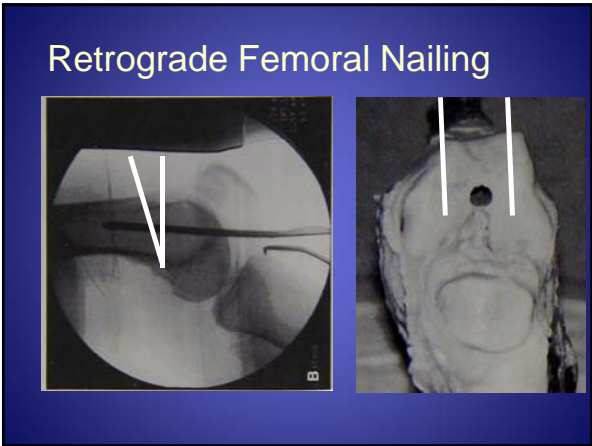
- Recognition of muscular deforming forces allows for reduction techniques designed to overcome these forces, thereby achieving anatomical reduction.

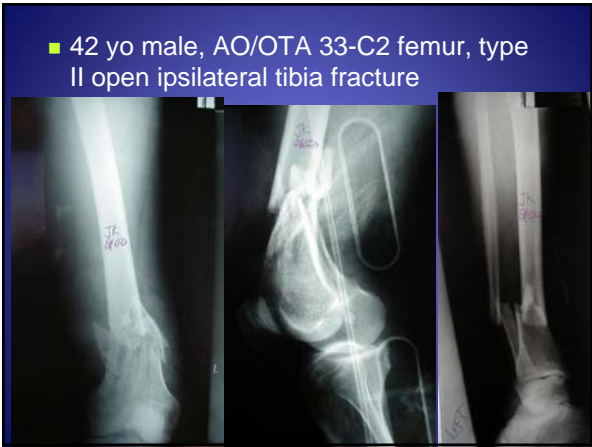
Hamstrings Shorten



Gastrocnemius Extends



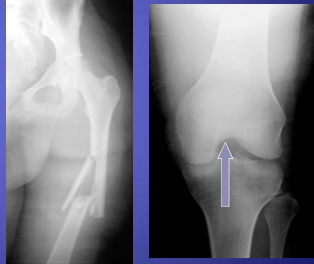






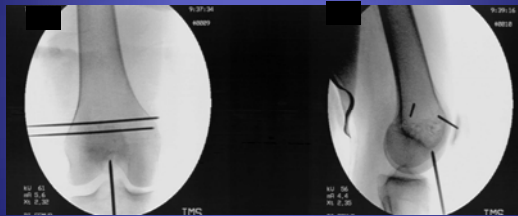
Case Presentation

- 23 yo female
- MVC
- B SIJD
- L acetab fx
- R femoral shaft fx
- L femoral shaft fx
 - Assoc IC fx



SB

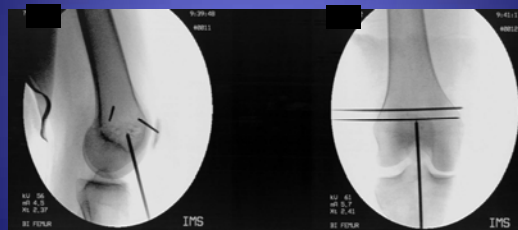
Entry Portal



STARTING POINT

SB

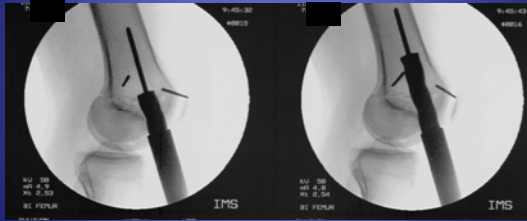
Confirmation



ENTRANCE ANGLE

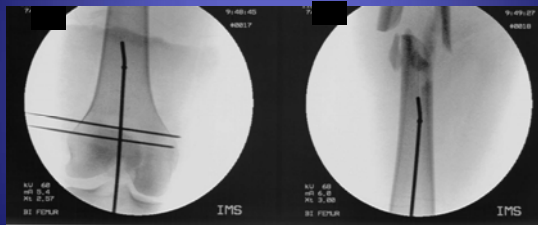
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Starting Reamer



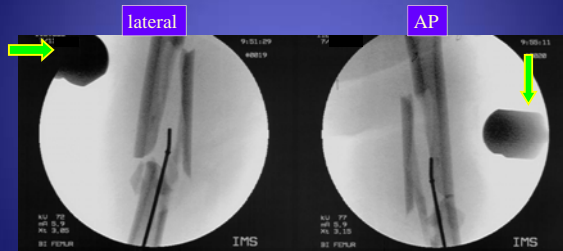
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Guidewire Insertion



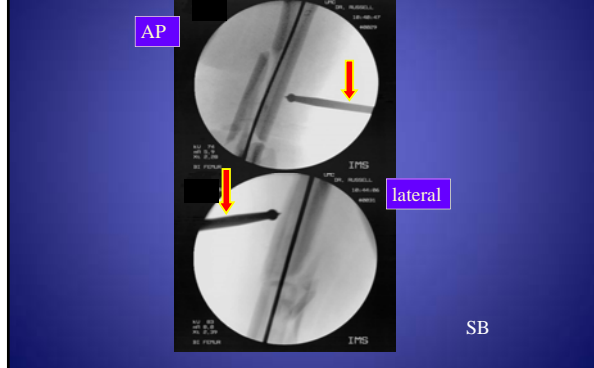
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Initial Reduction

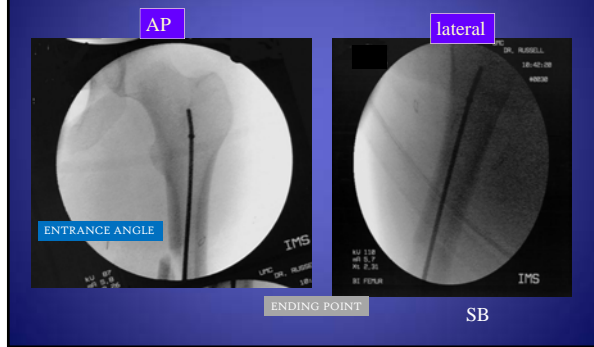


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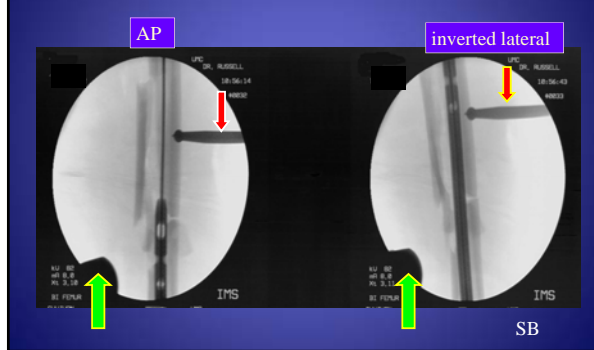
Guidewire Across



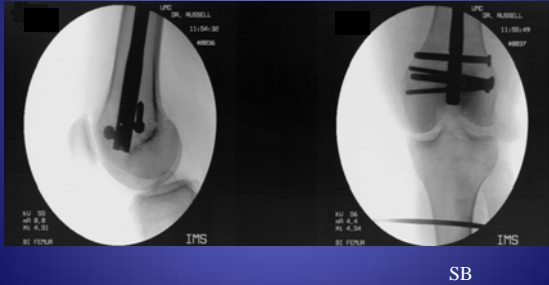
Final Guidewire Position



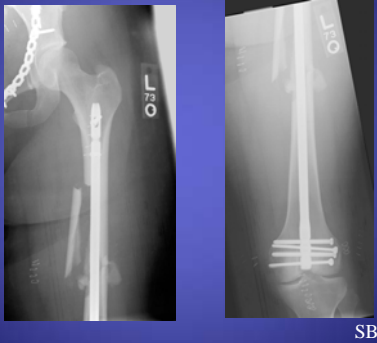
Nail Insertion



Final Fluoro



Postoperative Radiographs



Key Points

- Get contralateral fluoro images before beginning the operation
- Reduce/fix articular fracture
- Correct extension deformity
- SEE



Thank You



Retrograde Medullary Nail

- Don't forget to reduce the fracture first!
 - Nail will not assist with this as you are not achieving an isthmic fit as can be achieved with diaphyseal femoral shaft fractures
 - Nail will happily "lock" a fracture in a malreduced position as easily as it will "lock" a fracture reduced