



Femoral Nailing: Starting Point Options

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Antegrade Nailing

- Predictable Healing
 - 99% union rate –
Winqvist 1984
- Familiar
- Gold standard
- Minimally invasive







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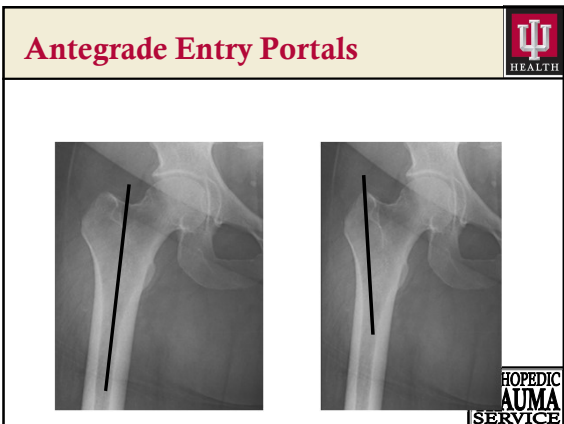
Antegrade Entry Portals

- Original Kuntcher nails used troch entry portal
- North American modification used piriformis entry portal because more in line with canal—less “hoop stress”
- Recent interest in troch entry for ease of surgeon, enabled by change in nail geometry

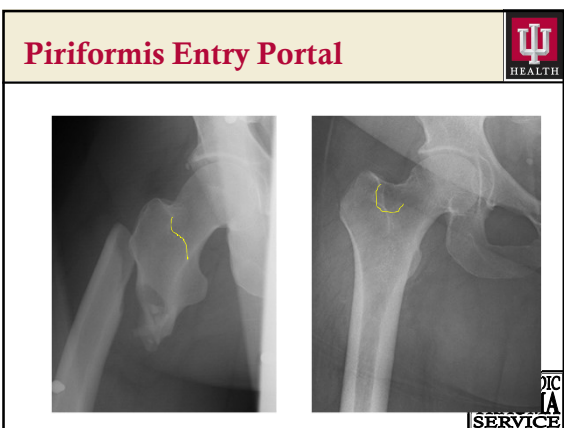




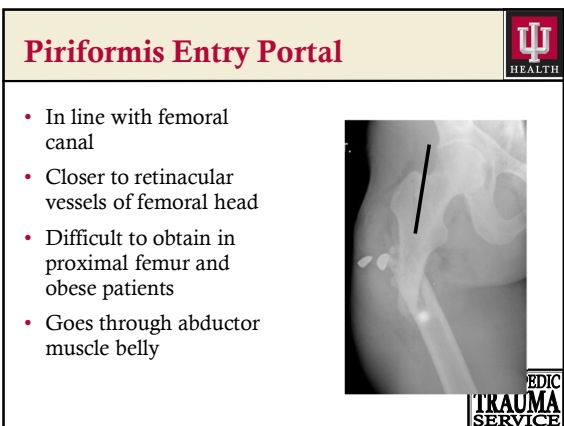
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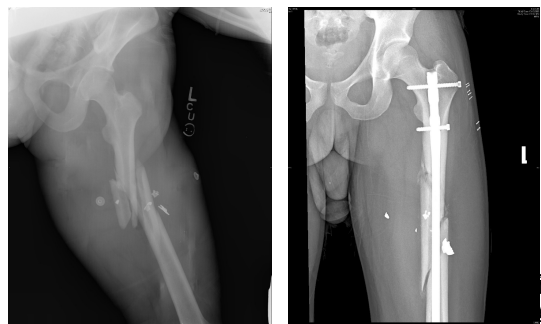
Piriformis Entry Portal

- Main Advantages:
 - Once starting point obtained, nail "reduces" the fracture
 - Avoids abductor tendon
 - Starting point does not migrate



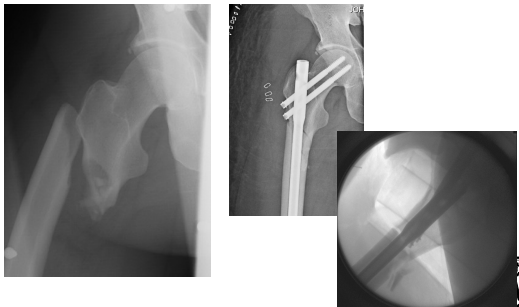
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Trochanteric Entry Portal

- Not in line with canal
- Damages up to 1/3 of abductor tendon-significance?
- Easier in proximal fractures and obese patients
- Can migrate lateral in soft bone




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Trochanteric Entry Portal

- Main advantages:
 - Easier to obtain in abduction proximal fragments
 - More familiar to many surgeons



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Nailing Errors

- Poor starting point
- Starting point obtained under "false" AP view, due to flexion and external rotation
- Reaming and locking done with fracture in varus and flexed alignment
- Malrotation at time of distal locking
- Not converting to open nailing with necessary

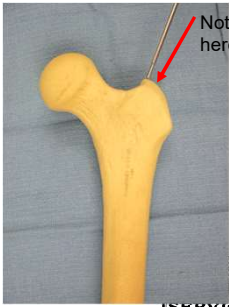


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Control the Entry Hole

- Proper starting point critical
- Not too anterior (extension deformity)
- Not too posterior (posterior ream out)
- Medial rather than lateral on greater troch

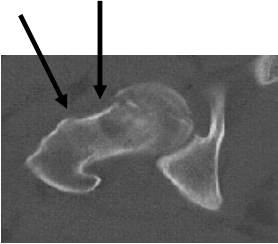


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Know What Your Looking At

- Need to understand true AP and lateral views to assess reduction and get starting point

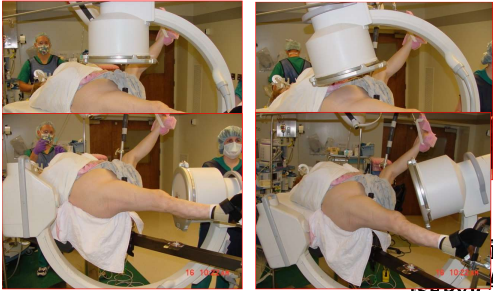


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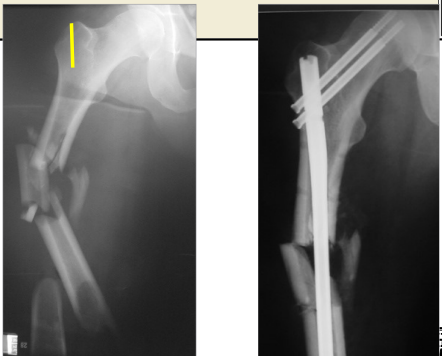
Technique Pearls

- Obtain “true” AP/Lat XR’s



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Control the Entry Hole

- Must prevent migration of entry hole during reaming
 - Soft tissue protector works well
 - Richardson retractor works well
- Ream enough for effortless insertion

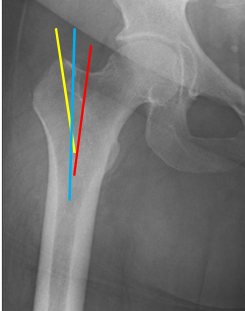


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“Trochiformis Start”

- Medial troch, lateral piriformis
- “best of both worlds”
- Avoids lateral migration
- Can induce slight valgus when using a troch entry nail
 - Avoid varus




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Trochanteric Entry Portal

- Technique modifications
 - Over ream 2mm
 - Internally rotate nail 90 degrees so anterior bow is curving lateral until nail past isthmus



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Nailing Tips and Tricks

- Obtain starting point with true AP and lateral views
- Must maintain sagittal and coronal plane reduction during reaming
- Ball spike/Schanz pin percutaneously onto anterior proximal fragment to push fragment out of extension and into valgus
- Be willing to convert to open nailing – reduction clamp
- Confirm rotation prior to

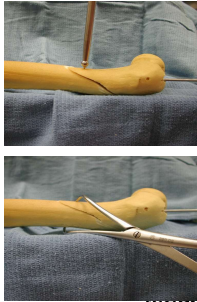


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IM Nail

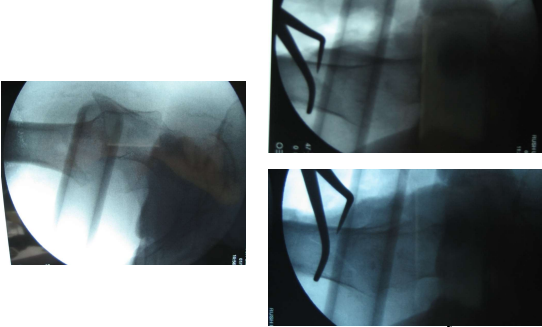
- Entry hole made in line with proximal fragment
- Obtain reduction and ream
- **Must maintain reduction in both planes throughout reaming**
- Length determined and nail inserted to level determined by proximal locking screws



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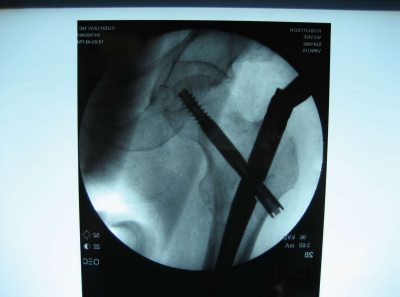
Open Nailing



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Open Nailing




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Literature 


- 91 patients, 38 GT, 53PF
- One nonunion in each group
- Surgery and flouro time decreased in GT group
 - Magnified in obese patients
- No malalignments or iatrogenic comminution
 - Ricci et al, JOT 2006




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Literature 


- 49 patients. PR trial GT vs PF
- Gait, outcome study
- No functional outcome difference
- PF group WORSE abduction moment
 - Archdeacon, et al. Presented at AAOS 2007



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Summary 

- Femoral nailing by both starting points do well
- Care must be taken in obtaining starting point, regardless of which is used
- Avoid lateral starting points in troch nails
- Internally rotate troch entry nails until tip past the isthmus
- Functional outcomes regarding abductor function are similar



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Thank You

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