

Distal Femur Fractures

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Disclosures: None contained within this talk

Objectives

- Understand critical elements during initial evaluation
- Understand distal femoral anatomy
- Understand concepts for reduction and fixation
- Recognize fixation options

Evaluation of Distal Femur Fractures

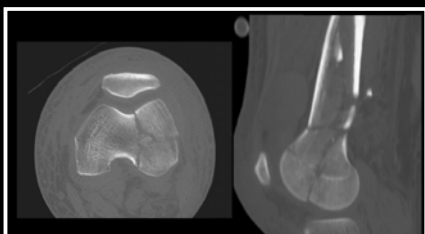
- Evaluate **THOROUGHLY**
 - ATLS
 - Thorough NV examination
 - ABI
- Temporization
 - Knee immobilizer
 - Ex-fix
 - Traction

Imaging Evaluation

- Plain radiographs
 - AP/lateral knee
 - AP/lateral femur
 - AP/lateral hip
- Contralateral radiographs for comparison
- Consider traction views
- CT

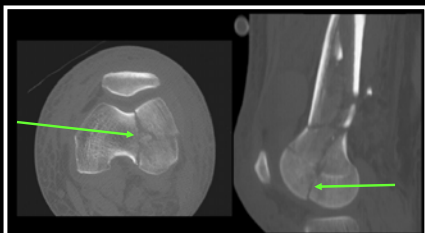
Imaging Evaluation: CT

- CT scan –
 - Articular evaluation (before or after ex-fix?)



Imaging Evaluation: CT

- Look for **Hoffa fragment**
 - 38% of supracondylar/intercondylar distal femur fractures have a coronal plane fracture
 - Need CT!



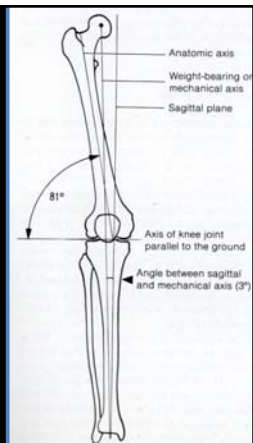
Distal Femoral Anatomy

- ANATOMY IS KEY FOR TREATMENT

- Articular block position and alignment
- Soft tissue attachments
- Shape of articular block

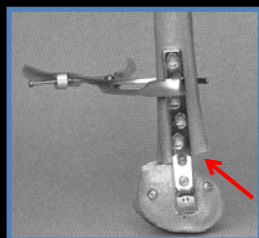
Distal Femoral Valgus

Articular surface is in approx. 9° valgus relative to the anatomical axis of the femur



Posterior Condylar Alignment with Shaft

Posterior condyles project **POSTERIORLY** with regard to femoral shaft



Deforming Forces

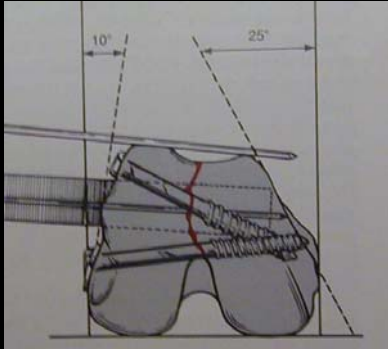
Recognition will help with effective **REDUCTION** **MANEUVERS**

Hamstrings Shorten

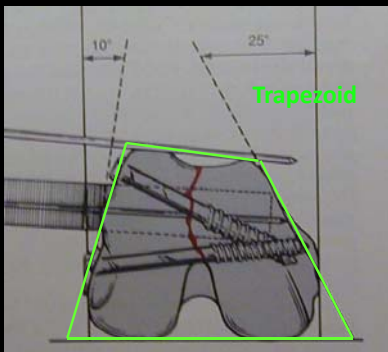


Gastrocnemius Extends

Distal Femur Anatomy



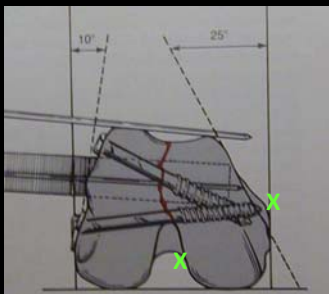
Distal Femur Anatomy



Distal Femoral Anatomy

CONSIDER SCREW TRAJECTORY!

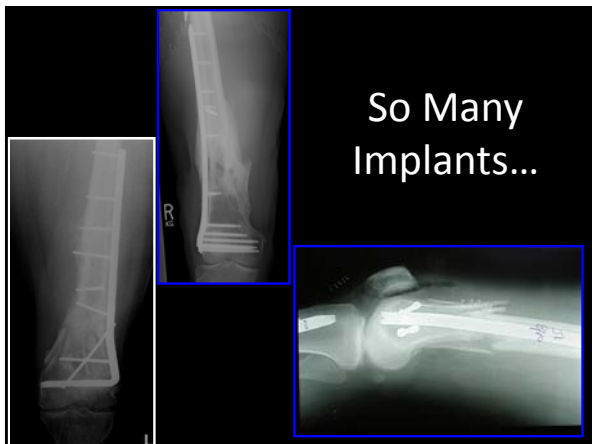
- Avoid notch
 - ACL, PCL
- Screw length
 - Irritation



Strategies for Operative Fixation

- Reduce and secure articular surfaces 1st
 - Direct reduction techniques
 - Interfragmentary screws
- Restore continuity of articular block with shaft
 - Many implants available
 - Indirect reduction techniques

So Many Implants...



Internal Fixation Options

- PLATING

Internal Fixation Options

- PLATING
 - Condylar buttress plates
 - Fixed-angle devices
 - Blade plate
 - Locked plates
 - Dynamic condylar screw

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All implants can work if utilized properly

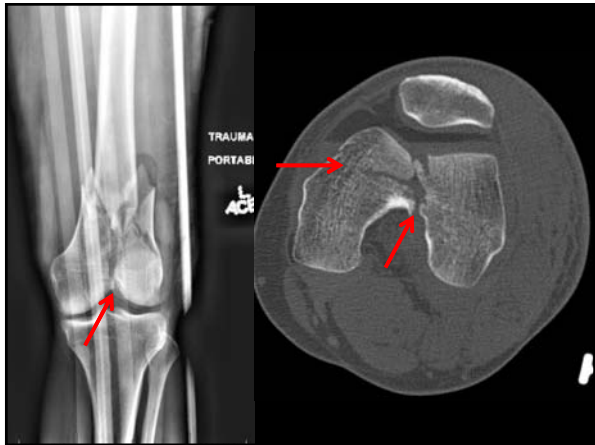
Regardless of Implant selection...

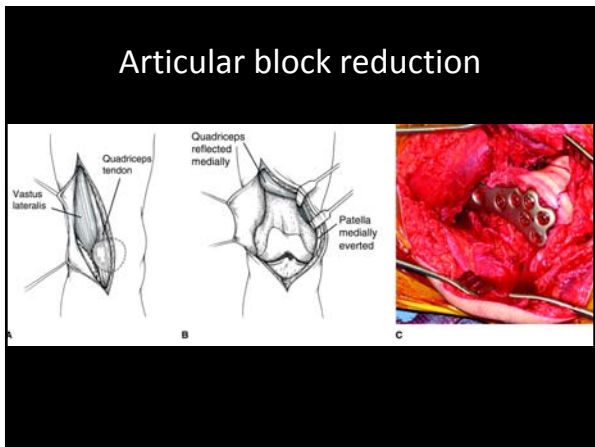
REDUCTION IS ESSENTIAL

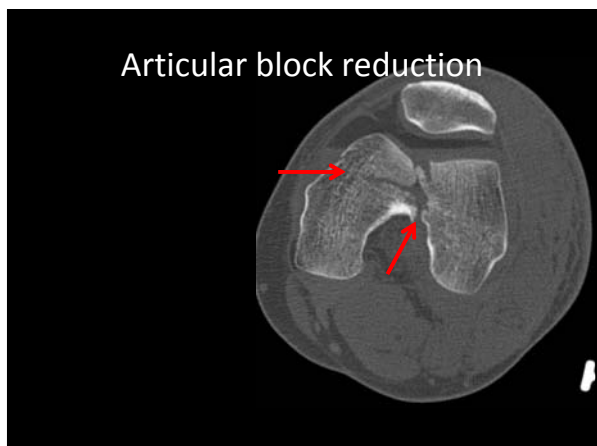
Steps that I use

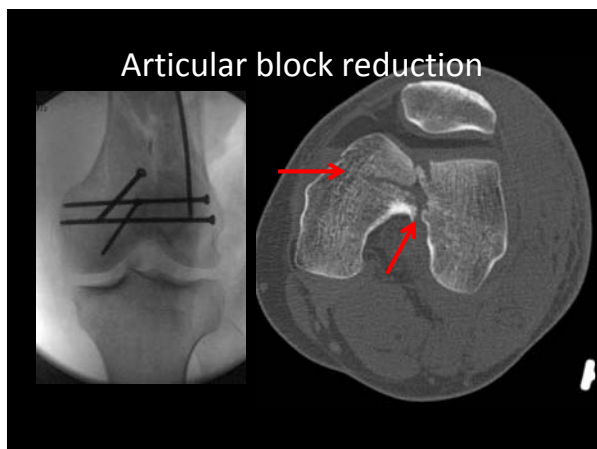
- Reduce articular surface (direct reduction)
- Reduce articular block to shaft (indirect reduction)
 - Length
 - Alignment
 - Rotation







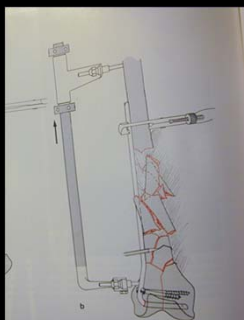




- Reduce articular block to shaft
- Get length first
 - Traction
 - Distractor
 - Ex-fix
 - Reduce rotation and alignment

Respect the Biology!

- Indirect reduction techniques:
 - External fixator
 - Femoral distractor
 - “Joysticks”
 - Percutaneous clamps
 - Bumps



Correct the deformity

Hamstrings Shorten



Gastrocnemius Extends

Correct the deformity

Hamstrings Shorten

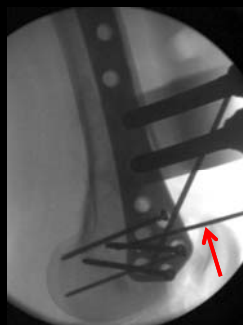


Gastrocnemius Extends



Correct the deformity

Hamstrings Shorten





Summary

- Importance of thorough evaluation
 - CT for the Hoffa fracture
- Remember distal femoral anatomy
 - Correct deforming forces
- Multiple fixation strategies
 - Absolute stability for joint
 - Relative stability for metadiaphyseal region
- Multiple implant options, but use wisely

Thank you