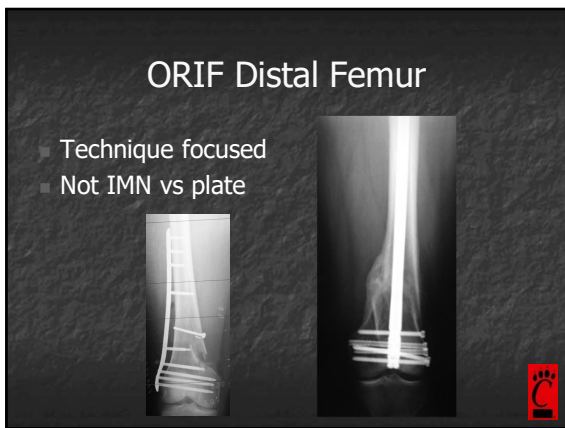




1



2




3

ORIF Distal Femur

Anatomy

- Main deforming forces
 - Pull of gastrocs and quads
 - Extension deformity
 - Rotation of condyles
- Alignment: 7-11° valgus
 - 95° implants

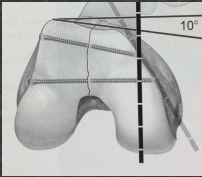


4

ORIF Distal Femur

Anatomy


- Main deforming forces
 - Pull of gastrocs and quads
 - Extension deformity
 - Rotation of condyles
- Alignment: 7-11° valgus
 - 95° implants
- Trapezoidal shape



5

Goals

- Avoid varus
 - Aiming for 5-10° anatomic valgus
- Anatomic reduction of joint
- Stable fixation to allow early ROM



6

Initial Treatment To Ex Fix or Not

- Allows for elective scheduling
- CT with reduction
- Mobilize while waiting
- Use as reduction aid in surgery
- Not necessary every case
 - Soft tissue more forgiving vs prox tibia



7

Evaluation

- CT in all DF fxs
- Preferably after ex fix



8

Position

- Supine on Jackson
 - Allows visualization of hip
 - Standard cases, joint exposure
 - Triangle
- Lateral
 - Periprosthetic
 - Pure SC
 - Nonunion



9

Approach

- Lateral
 - SC or simple split
 - Extend to Gerdy's for more exposure



10

Approach


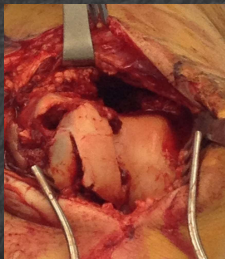
- Lateral parapatellar
 - More joint exposure
 - Hoffa fxs



11

Approach


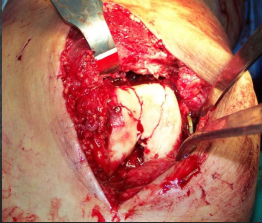
- Lateral parapatellar
 - More joint exposure
 - Hoffa fxs
- Can allow shortening to relax quads



12

Approach


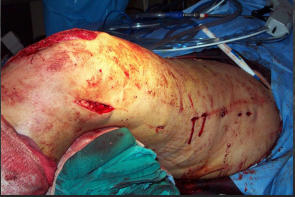
- Medial parapatellar option
- Lateral min invasive plate



13

Approach



- Medial parapatellar option
- Lateral min invasive plate



14

ORIF Distal Femur


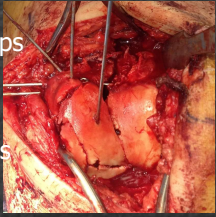
- Articular reduction first
- Pointed tenaculum clamps
- Hoffa first then IC fx
- K-wires
- 3.5mm or smaller screws
 - Lag and countersink



15

ORIF Distal Femur



- Articular reduction first
- Pointed tenaculum clamps
- Hoffa first then IC fx
- K-wires
- 3.5mm or smaller screws
 - Lag and countersink



16

ORIF Distal Femur


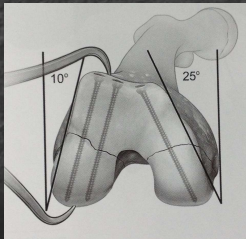
- Articular reduction first
- Pointed tenaculum clamps
- Hoffa first then IC fx
- K-wires
- 3.5mm or smaller screws
 - Lag and countersink



17

ORIF Distal Femur

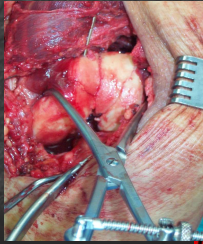
- Remember the shape of the femur



18

ORIF Distal Femur

- Clamp across IC fx at Blumensaats

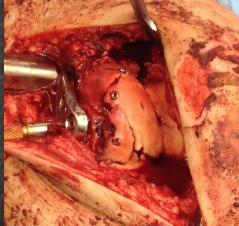
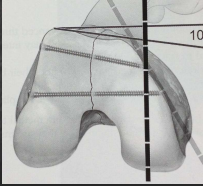


IC

19

ORIF Distal Femur

- IC screws anterior and distal to plate


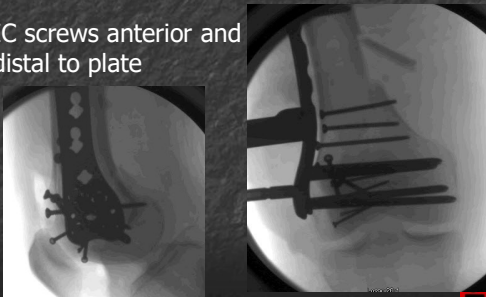


IC

20

ORIF Distal Femur

- IC screws anterior and distal to plate




IC

21

ORIF Distal Femur


- Condyles to the shaft
- Extension deformity
- Use ex fix to help, flex knee



22

ORIF Distal Femur

- Condyles to the shaft
- Extension deformity
- Use ex fix to help, flex knee
- Joysticks, Schantz pin



23

ORIF Distal Femur


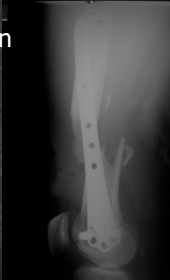
- Condyles to the shaft
- Extension deformity
- Use ex fix to help, flex knee
- Joysticks, Schantz pin



24

ORIF Distal Femur Sagittal Plane



- Simpler fx's direct reduction
- Lag or small plates
- Alignment and length
- Read off lateral cortex



25

ORIF Distal Femur Sagittal Plane



- Simpler fx's direct reduction
- Lag or small plates
- Alignment and length
- Read off lateral cortex
- Match plate and DF contour



26

ORIF Distal Femur Coronal Plane

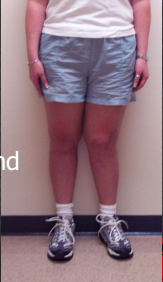
- Hardest for me to get correct
- C-arm limited view
- Implants with 95° alignment wire
- ? accuracy of C-arm image and position of wire
- Flex in wire, can help



27

ORIF Distal Femur Coronal Plane


- Hardest for me to get correct
- C-arm limited view
- Implants with 95° alignment wire
- ? accuracy of C-arm image and position of wire
- Flex in wire, can help



28

ORIF Distal Femur Coronal Plane


- Techniques to use
- Alignment wire



29

ORIF Distal Femur Coronal Plane



- Techniques to use
- Alignment wire
- Intraop plain xray
 - Metaphyseal comminution
- Check mech axis with bovie



30

ORIF Distal Femur Plate Application



- Locking plate, polyaxial
- Fix distal and prox with wires
- Cortical screws in shaft
 - Still allows adjustment of alignment of joint



31

ORIF Distal Femur Plate Application



- Locking plate, polyaxial
- Fix distal and prox with wires
- Cortical screws in shaft
 - Still allows adjustment of alignment of joint
 - Whirlybird
- Clamp plate to bone



32

ORIF Distal Femur Plate Application

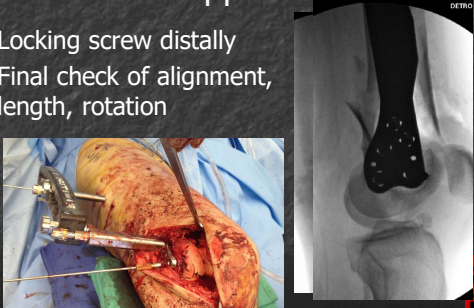
- Locking screw distally
- Final check of alignment, length, rotation



33

ORIF Distal Femur Plate Application

- Locking screw distally
- Final check of alignment, length, rotation




The slide contains two images. On the left is an intraoperative photograph showing a surgical team performing an ORIF on a distal femur. A locking distal femur plate is being applied to the bone. On the right is an AP radiograph of the knee joint, showing the distal femur with a locking plate and several locking screws. A red logo is visible in the bottom right corner of the radiograph.

34

ORIF Distal Femur Plate Application

- Check mechanical axis with bovie




The slide features a lateral radiograph of the distal femur. A locking distal femur plate is visible, secured with multiple locking screws. A bovie is used to check the mechanical axis of the femur. A red logo is present in the bottom right corner.

35

ORIF Distal Femur Plate Application

- Check mechanical axis with bovie



The slide displays three radiographic views of the distal femur after ORIF. From left to right: a medial view, a lateral view, and an AP view. Each view shows the locking distal femur plate and locking screws. A bovie is used to check the mechanical axis. A red logo is located in the bottom right corner.

36



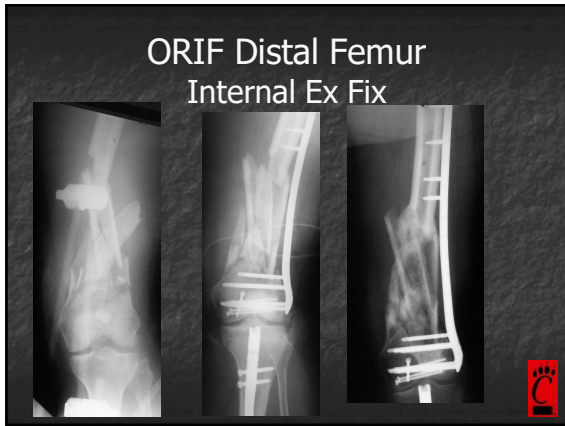
37



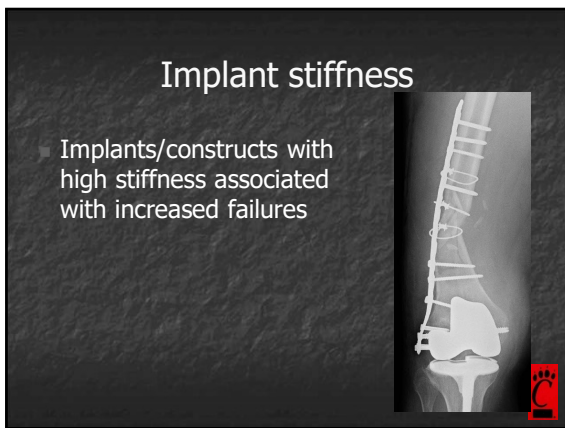
38



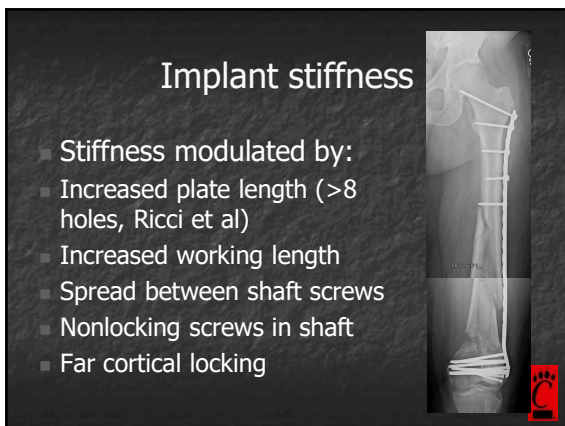
39



40




41



42



Summary

- Remember the trapezoidal shape
- Alignment, alignment, alignment
- Intraop xrays
- Simple fxs, direct reduction
- Comminuted fxs, indirect



43

Life is short, Have some fun



44


Lightning Tips Distal Femur

JW



45

- Trend for IMN fixation of DF fx, including articular fxs
- I wanted to review the selection of DF nails.
- Dr Beltran has done this already
- JOT 2015




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Management of Distal Femur Fractures With Modern Plates and Nails: State of the Art

Michael J. Beltran, MD, Joshua L. Gary, MD,† and Cory A. Collinge, MD‡*
JOT 2015;29:165-172

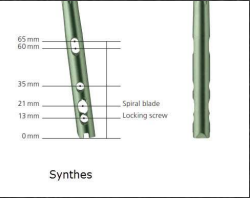
Nail System	Manufacturer	Distal Screw Options	Fixed Angle Screws?	Distance from Nail Tip to Prox Screw	Radius of Curvature	Driving End Diameter*
RAFN	Depuy-Synthes	3: All transverse may use spiral blade in distal hole.	Yes Distal only w/ end cap	65mm	1.5m	12mm
T2 Supracondylar Nail (SCN)	Stryker	4 Screws: 2 Transverse, 2 Oblique may use 2 condyle bolts/nuts	Yes Distal screw only w/ end cap	32mm	2.0m	12mm
Meta-Nail	Smith and Nephew	3 Screws: 1 Transverse and 2 Oblique	Yes Distal screw only w/ end cap	40mm	2.0m	11mm
Phoenix	Biomet	4: 2 Transverse, 2 Oblique	Yes all 4 screws w/o end cap	38mm	1.8m	12mm
Natural Nail	Zimmer	4: 2 Transverse, 2 Oblique	Yes Distal screw only w/ end cap	48mm	1.27m	13mm




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Depuy Synthes R/AFN

- 3 screws, all transverse
- Spiral blade option
- Distal screw fixed angle with end cap
- Most distal 13 mm from end
- Most proximal 60-65mm



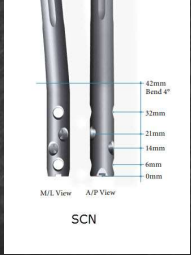
Synthes



48

Stryker SCN

- 4 screws, 2 transverse and 2 oblique
- Fixed angle: distal screw with end cap
- Most distal screw 6mm from end
- Proximal 32mm from end



M/L View A/P View
SCN

49

Stryker SCN

- 4 screws, 2 transverse and 2 oblique
- Fixed angle: distal screw with end cap
- Most distal screw 6mm from end
- Proximal 32mm from end



50

Smith & Nephew MetaNail

- 3 screws, 1 transverse, 2 oblique
- Fixed angle: all 3 with threaded internal bushing
- Most distal screw 15mm from end
- Proximal screw 40mm



Driving End of Nail
S&N MetaNail

51

Smith & Nephew MetaNail

- 3 screws, 1 transverse, 2 oblique
- Fixed angle: all 3 with threaded internal bushing
- Most distal screw 15mm from end
- Proximal screw 40mm



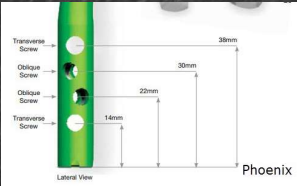
Top View of Nail
S&N MetaNail



52

Biomet Phoenix


- 4 screws, 2 transverse, 2 oblique
- All 4 fixed angle without end cap
- Most distal screw 16mm from end
- Proximal 38mm



Transverse Screw
Oblique Screw
Oblique Screw
Transverse Screw

38mm
30mm
22mm
14mm


Phoenix




53

Biomet Phoenix

- 4 screws, 2 transverse, 2 oblique
- All 4 fixed angle without end cap
- Most distal screw 16mm from end
- Proximal 38mm




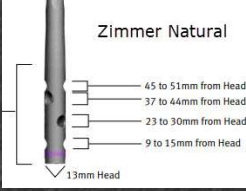
20°
20°



54

Zimmer Natural



- 4 screws, 2 transverse, 2 oblique
- Fixed angle: distal screw only with end cap
- Distal screw 12mm from end of nail
- Proximal 48mm



55

Zimmer Natural

- 4 screws, 2 transverse, 2 oblique
- Fixed angle: distal screw only with end cap
- Distal screw 12mm from end of nail
- Proximal 48mm
- Unique locking into post femoral condyles



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