



Distal Femoral Replacement for Distal Femur Fractures When is it the Best Choice

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Difficult Hosts

- Distal femur fractures common
- Distal periprosthetic fractures common
- Bone quality can be poor
- Elderly patients
- Compromised ability to protect WBing



Treatment Options

- ORIF
 - Distal femoral locking plate
- Retrograde IM nail
 - Specialized distal femoral nail
- TKA
 - Distal femoral replacement

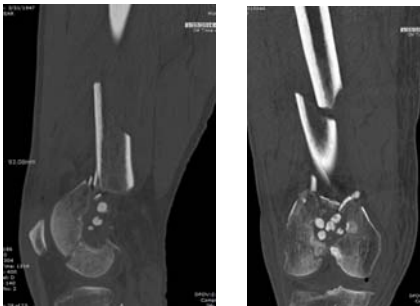
ORIF



- Advantages
 - Versatile
 - Min invasive options
 - Good distal fixation
- Disadvantages
 - Less fixation with very distal fractures
 - Stability can be compromised in comminuted patterns
 - ? Stability for WBing



70 yo female, open fracture



70 yo female, open fracture



70 yo female, open fracture



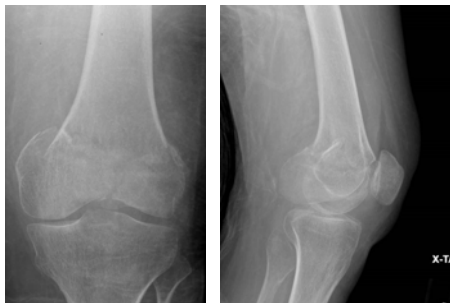
IM Nail



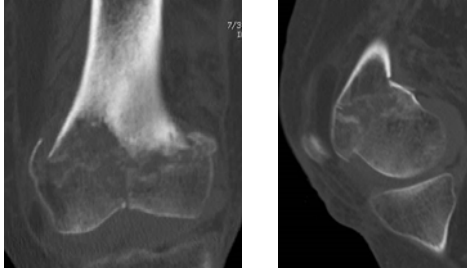
- Advantages
 - Can get more distal than plates
 - Min invasive insertion
 - Good distal fixation with modern nails
 - Rarely limited by TKA
- Disadvantages
 - Less stability without all screws
 - Stability for WBing



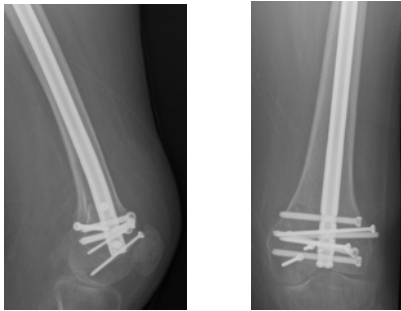
60 yo female with MS



60 yo female with MS



60 yo female with MS



72 yo female



72 yo female



72 yo female



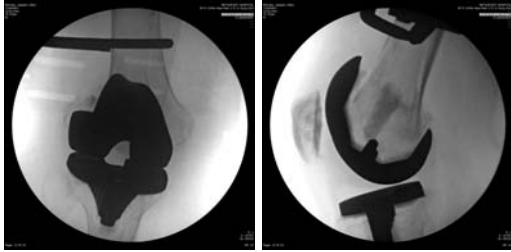
DFR



- Advantages
 - Immediate full WBing
 - No fracture healing required
 - Usually easier than fixing
- Disadvantages
 - Cement compromises femoral canal
 - Major arthroplasty in unoptimized patient
 - Infection is devastating
 - AKA
 - Cost



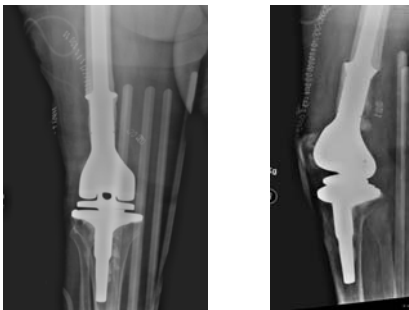
76 yo male



76 yo male



76 yo male



Literature Review



- Equivalent mortality and complication rates following periprosthetic distal femur fractures managed with either lateral locked plating or a distal femoral replacement
 - Hoellwarth, et al, Injury 2018
- Over 55
- DFR mostly used for fx below flange
- 87 LLP, 53 DFR
- 90 day mortality- 9% vs 4%
- 1 yr mortality- 22% vs 10%
- Additional surgery- 9% vs 3%
- Maintaining ambulation- 77% vs 81%
- NO statistical difference
- Revision knee arthroplasty using a distal femoral replacement prosthesis for periprosthetic fractures in elderly patients
 - Girgis et al, Eur J Orthop Surg Traumatol., 2018
- 14 patients over 70
- 64% returned to baseline function
- 1 died early post op and 2 surgical complications (21% overall complication rate)

Literature Review



- Predictors of Functional Recovery Following Periprosthetic Distal Femur Fractures
 - Ruder et al., J Arthroplasty, 2016
- 58 patients over 60
- DFR patients older than ORIF patients (83 vs 78)
- No difference between mortality, complications, discharge disposition, or ambulatory status at 1 year
- Older patients more likely to lose amb ability
- Overall mortality 21%
- Age and not treatment is major predictor of functional recovery
- Distal Femoral Replacement for Selective Periprosthetic Fractures above a Total Knee Arthroplasty
 - Rao et al., Eur J Trauma Emerg Surg, 2013
- 12 patients over 68 (mean 78)
- No major complications
- All mobilizing WBAT by day 3
- All returned to pre op living location

Literature Review



- Open Reduction vs Distal Femoral Replacement Arthroplasty for Comminuted Distal Femur Fractures in Patients 70 years and Older
 - Hart et al, J Arthroplasty, 2016
- 38 intraarticular fractures (10 DFR, 28 ORIF)
- Reoperation 11% in ORIF, 10% in DFR
- Nonunion 18% in ORIF group
- 23% WC dependent in ORIF group, none in DFR group (not significant)
- Distal Femoral Arthroplasty for Management of Periprosthetic Supracondylar Fractures of the Femur
 - Rahman et al, J Arthroplasty, 2016
- 17 patients
- Overall good patient reported outcomes and knee scores
- 4 complications (prosthesis retained), 2 failure (prosthesis revised)

Literature Review



- Primary Versus Secondary Distal Femoral Arthroplasty for Treatment of Total Knee Arthroplasty Periprosthetic Femur Fractures
 - Chen et al., J Arthroplasty, 2013
 - 13 patients (9%) failed ORIF had DFR
 - 36 primary DFR
 - Failed ORIF group had more surgeries than primary DFR group (2.4 vs 1.4)
 - 5/13 (38%) secondary DFR had complications
 - 6/36 (17%) primary DFR had
- Primary Total Knee Arthroplasty for Complex Distal Femur Fractures in Elderly Patients
 - Rosen and Strauss, CORR 2004
 - 24 patients
 - 71% resumed pre op activity level
 - No significant complications

IU Data



- Periprosthetics
 - 115 periprosthetic distal femur fractures 2013-2017
 - 1 primary DFR
 - With > 6 mos fu
 - 82 patients
 - 57 nails, 25 plates
 - No difference in nonunion (16% vs 11%), malunion (20%) reoperation (28% vs 18%)
 - ORIF group had higher infection rate (16% vs 2%, and surgery time (128 mins vs 80 mins)
 - No difference in functional outcomes
 - IMN group more likely to WBAT

IU Data



- 64 intraarticular fractures over 60
- 26 C3- multifragment articular surface
- 14 >6 mos fu
- 5 reoperations (36%)
 - 3 nonunion, 1 infection, 1 hematoma

Patient Considerations



- Age- likelihood for revision
- Bone quality- likelihood for fixation failure
- Fracture location- joint involvement
- Pre-existing OA
- Functional status
- Open fracture
- Prior infection
- Stability of TKA-
- Nonunion w/w/o TKA
- BMI- ability to partial WB
- Living situation- need for WBAT

65 yo male, Infected Nonunion



65 yo male, Infected Nonunion



65 yo male, Infected Nonunion



60 female, morbidly obese, open fx



60 female, morbidly obese, open fx



60 female, morbidly obese, open fx



70 yo female with Hx of Breast CA



62 yo female, open fracture



62 yo female, open fracture



62 yo female, open fracture



62 yo female, open fracture



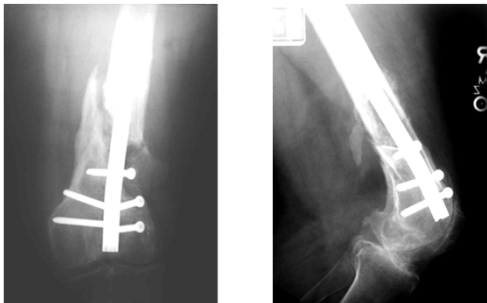
62 yo female, open fracture



62 yo female, open fracture



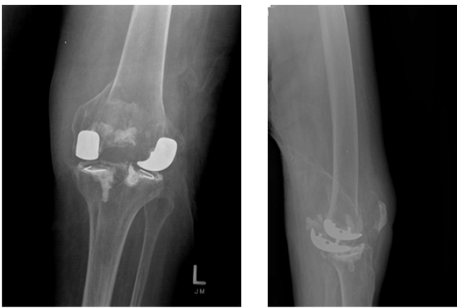
58 yo with preexisting OA



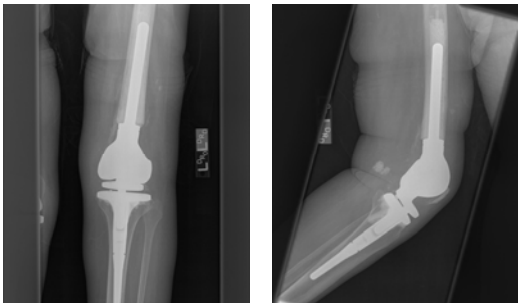
58 yo with preexisting OA



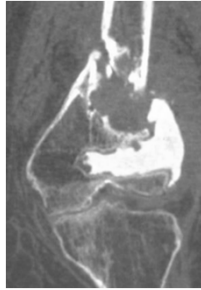
82 yo Female with RA



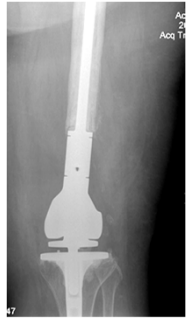
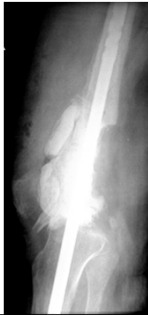
82 yo Female with RA



45 yo Female with DM and Infection



45 yo Female with DM and Infection



PHI_ACC
Dr. [Name]
Knee AP post
Site: 12
In: 11
KNEE
BU
W4055 L2042

Right Proximal Tibial Lock
SARGENT MARLENE
P. 526058
Age: 279456
2009 May 18
Age Tr: 117721





Indiana University Health

Thank You

