

**Outcomes of Geriatric Periprosthetic Distal Femur Fractures:
Comparison of Fixation Versus Reconstruction**

*Noah Joseph, MD; William A. Zuke, MD; Megan Sharpe, BS, MA;
Abigail Bacharach, BS; Nihal Anil Punjabi, BS; Ahmed Emarar, MD;
Nicolas Santiago Piuzzi, MD; Kirsten Boes, MPH; George Ochenjele, MD;
Brendan M. Patterson, MD; Heather A. Vallier, MD*

*Case Western Reserve University School of Medicine, Department of Orthopaedic Surgery,
Cleveland, Ohio, UNITED STATES*

Purpose: Management of distal femur fractures adjacent to total knee arthroplasty remains challenging and controversial. Morbidity is related to prolonged immobility, high nonunion rates, and the physiologic burden of injury. Distal femoral replacement (DFR) traditionally had been reserved for fractures with loose components or insufficient bone stock. In some centers the indications for DFR have expanded. While arthroplasty offers the benefit of immediate postoperative weightbearing, outcomes are variable with wide ranges of complications and reoperation rates reported. We aim to compare the complications, ambulatory status, and mortality in periprosthetic distal femur fractures treated with open reduction and internal fixation (ORIF) with plating, versus DFR.

Methods: A retrospective review of 370 periprosthetic distal femur fractures treated at 3 institutions in the same metropolitan area over a 5-year period was performed. 65 with ORIF, and 53 with DFR (n = 118) with mean 16-month follow-up met inclusion criteria. Patients less than 65 years old, polytrauma patients, those with fractures around prior ORIF, managed closed, or those with incomplete documentation were excluded. Demographic, medical, and injury-related characteristics were collected, including injury mechanism, body mass index (BMI), and Charlson Comorbidity Index (CCI). Rehospitalization, reoperation, infection, and medical complications were noted. Ambulatory status and mortality at 1 year were also recorded.

Results: The cohort comprised primarily women (82.2%), mean age 77 years old (range, 65-98). Half were ambulatory without assistive device preinjury (53.3%). No differences were noted in age (P = 0.23), sex (P = 0.24), BMI (P = 0.91), or CCI (5.6 ORIF vs 6.4 DFR, P = 0.18) between those who underwent ORIF versus DFR. Deep infection rate was similar between groups (4/65 ORIF vs 7/53 DFR, P = 0.19). While 90-day hospital readmissions were higher in the DFR group (32.1% vs 12.3%, P = 0.009), no difference was noted in reoperations (20.8% DFR vs 10.8% ORIF, P = 0.13), as many were hospitalized for medical complications including pneumonia and urosepsis. Mortality 1 year after injury was higher in the DFR group (24.5% vs 6.6%, P = 0.007). Lastly, more patients who underwent DFR were nonambulatory or required ambulatory aid 1 year postoperatively (89.7% vs 61.5, P = 0.001).

Conclusion: While DFR may be indicated for patients with loose components or insufficient bone, more complications, readmissions, and mortality were associated with DFR in the treatment of periprosthetic distal femur fractures when compared to ORIF. Further study is warranted to elucidate functional outcomes and long-term sequelae related to this treatment option, to better inform surgeons and patients in treatment planning.