Outcomes Following Distal Femur Replacement for Fracture: A Multi-Institutional Retrospective Review

David C. Landy, MD, PhD; Wyatt GS Southall, BS; Stephen T. Duncan, MD; Michael T. Archdeacon, MD, FIOTA; William T. Obremskey, MD, MPH, FIOTA; Joshua M. Lawrenz, MD; Christopher Lee, MD; Michael S. Sridhar, MD; ***Jeffrey A. Foster, MD****; Arun Aneja, MD, PhD; DFR Research Group*

Purpose: Distal femur replacement (DFR) is increasingly used to treat distal femur fracture (DFF), especially for patients with limited bone stock, poor bone quality, and advanced age. Although DFR does not rely on bony healing and allows early weightbearing, complications can be devastating, especially periprosthetic joint infection (PJI). Meta-analytic studies have reported lower than expected complication rates, but may be limited by publication bias. The objective of this study was to estimate representative outcomes of patients who underwent DFR for DFF.

Methods: A retrospective cohort study was conducted at 12 academic trauma centers. Adult patients who underwent DFR for native or periprosthetic DFF from 2010 to 2022 were identified; infectious, oncologic, and any other indications were excluded. The primary outcome was PJI. Secondary outcomes included reoperation, mortality, and function. Outcomes were estimated using proportions and Kaplan-Meier curves with 95% confidence intervals (CI) and stratified by periprosthetic fracture with Fisher's exact testing.

Results: In total, 173 patients were included with 130 (75%) having a periprosthetic DFF. Patients were older (median age 77 years, interquartile range 70-84), women (84%), and had more severe medical comorbidities (63% ASA class III and 24% ASA class IV). The rate of PJI was 5.8% (95% CI, 3.1-10.5%); this was lower for native compared to periprosthetic DFF although not statistically significant (2.3% vs 6.9%, P = 0.45). The reoperation rate was 16.6% (95% CI, 11.7-23.0%) and the one-year mortality rate was 27.0% (95% CI, 20-35%). Slightly more than one half of patients returned to their baseline function at 54.6% (95% CI, 46.9-62.1%).

Conclusion: DFR for DFF was associated with a PJI rate of 5.8%. The one-year mortality rate was 27.0% and reoperation rate was 16.6%. Slightly more than one half of patients returned to their baseline function at 54.6%. DFR can be considered as a salvage option in cases of complex native and periprosthetic DFF, although surgeons should continue to counsel patients on the considerable risks, particularly mortality, associated with DFR when assessing treatment options for DFF.