

## **Very Distal Femoral Periprosthetic Fractures: Replacement Versus Fixation, a Systematic Review**

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**Purpose:** Very distal femur periprosthetic fractures (vDFPFs) around total knee arthroplasties (TKAs) are a growing and potentially devastating problem. Fixation of these fractures can be done using a lateral distal femoral locking plate (DFLP); however, this comes with a period of restricted mobility, which may be associated with increased morbidity and mortality in a geriatric population. Alternatively, surgeons can revise the TKA to a distal femoral replacement (DFR), allowing for earlier mobility. However, this prosthesis comes with additional upfront surgical costs, and may be associated with its own unique set of complications.

**Methods:** We conducted a systematic review of the clinical, functional, and quality of life outcomes following the treatment of displaced distal femur periprosthetic fractures with either open reduction and internal fixation (ORIF) using a DFLP, or with a DFR. This systematic review adhered to recommendations outlined in both PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) and Cochrane Collaboration guidelines. Three reviewers systematically screened studies and extracted data independently in duplicate. The Methodological Index for Non-Randomized Studies was used to assess study quality. Additionally, treatment groups were pooled into DFLP or DFR for comparison of pooled means.

**Results:** A literature search identified 25 studies with 645 patients (649 vDFPFs) included for analysis. There were 440 knees in the DFLP group with a mean age of 74.3 years (range, 65.9 to 88.3 years), and 209 knees in the DFR group with a mean age of 77.7 years (range, 71.0 to 84.8). All-cause revision surgery rates were 22.6% in the DFLP group and 12.0% in the DFR group. On average, 1.19 operations were required to resolve a complication requiring surgery in the DFLP group, compared to 1 operation in the DFR group. Time to full weight-bearing in DFLP patients averaged 132.3 days, with a mean time to union of 19.9 weeks. In contrast, time to full weight-bearing in DFR patients averaged 1.85 days.

**Conclusion:** vDFPFs pose a challenging problem for patients and orthopaedic surgeons due to a high rate of all-cause revision surgery. DFR may offer benefit over ORIF with DFLPs by reducing time to weight-bearing and revision surgery rates. Future research should include cost-effectiveness evaluations before DFR is adopted for widespread implementation for vDFPFs to ensure that the increased upfront surgical costs are balanced by the potential clinical benefits.