Distal Femoral Replacement in Complex Primary and Revision TKAs: 10-Year Survivorship of 292 Cases

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INTRODUCTION:
Distal femoral replacements (DFRs) are a salvage option for complex total knee arthroplasties (TKAs). There is a paucity of data correlating methods of femoral component fixation to long-term implant survivorship. This study evaluated implant survivorship, femoral component fixation method, and radiographic results of TKAs with DFRs in the largest series to date with long term follow-up.
METHODS:
We identified 292 primary and revision TKAs performed with a DFR for non-oncologic indications from 2000 to 2022 at a single academic institution. The most common indication for DFR was reimplantation after periprosthetic joint infection (PJI; 27%). The mean number of prior arthroplasties was 3. The mean age was 72 years, mean BMI was 33 kg/m^2, and 63% of patients were female. The mean follow-up was 4 years.
RESULTS: The 10-year survivorships free of revision for aseptic femoral loosening, any femoral revision, any revision, and any reoperation were 87%, 79%, 60%, and 46%, respectively. Modular component exchange (53%) was the most common revision performed. An increase in ratio of femoral component length to femoral stem length ($p=0.03$), prior femoral canal instrumentation ($p=0.05$), and cementless femoral fixation ($p<0.01$) were associated with higher risk of any femoral revision. As our technique evolved, 16 patients had impaction grafting at the time of index DFR, and only one underwent subsequent femoral component revision. Femoral cones were not protective of revision surgery. Radiographic loosening was observed in 17 unrevised DFRs (6%).
DISCUSSION AND CONCLUSION:
DFRs are a salvage reconstructive option and had a high 10-year cumulative probability of reoperation (54%). However, the 10-year survivorship free from femoral revision for aseptic loosening was 87%, demonstrating failure modes other than aseptic loosening (most commonly PJI) are common in this population. Enhanced femoral fixation with an increase in ratio of femoral stem to component length was protective of femoral revision.