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Nonmechanical Revision Indications Portend Certain Limb-Salvage Failure Following Total Femoral Replacement

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Abstract

Background: There is scant evidence to guide decision-making for patients considering total femoral replacement (TFR). We aimed to identify the indication, patient, disease, and surgical technique-related factors associated with failure. We hypothesized that failure occurs more frequently in the setting of revision surgical procedures, with infection as the predominant failure mode.

Methods: We performed a retrospective cohort study of patients receiving total femoral endoprostheses for oncological and revision arthroplasty indications; 166 patients met these criteria. Our primary independent variable of interest was TFR for a revision indication (arthroplasty or limb salvage); the primary outcome was failure. Analyses were performed for patient variables (age, sex, diagnosis group, indication), implant variables (model, decade, length, materials), and treatment variables. We analyzed TFR failures with respect to patient factors, operative technique, and time to failure. We conducted bivariate logistic regressions predicting failure and used a multivariate model containing variables showing bivariate associations with failure.

Results: Forty-four patients (27%) had treatment failure. Failure occurred in 24 (23%) of 105 primary TFRs and in 20 (33%) of 61 revision TFRs; the difference was not significant ($p = 0.134$) in bivariate analysis but was significant ($p = 0.044$) in multivariate analysis. The mean age at the time of TFR was 37 years in the primary group and 51 years in the revision group ($p = 0.0006$). Of the patients who had mechanical failure, none had reoccurrence of their original failure mode, whereas all 8 patients from the nonmechanical cohort had reoccurrence of the original failure mode; this difference was significant ($p = 0.0001$).

Conclusions: TFR has a high failure rate and a propensity for deep infection, especially in the setting of revision indications and prior infection. All TFRs performed for revision indications for infection or local recurrence failed by reoccurrence of the original failure mode and resulted in amputation.

Level of evidence: Therapeutic Level IV. See Instructions for Authors for a complete description of levels of evidence.