Revision Total Hip Arthroplasty Survivorship by Femoral Implant Type and Bone Loss

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INTRODUCTION:

Periprosthetic bone loss is often challenging in revision total hip arthroplasty (THA). This study aimed to compare survivorship of non-modular, modular, and proximal femoral replacements (PFR) in cases with various stages of femoral bone loss.

METHODS:

This was a retrospective cohort study of 350 patients who underwent revision THA at a single institution. Patients either received a non-modular stem (n=108, 30.9%), modular stem (n=198, 56.6%), or PFR (n=44, 12.6%) at the time of revision. Pre-revision radiographs were reviewed to determine Paprosky classification of femoral bone loss (Grade I, II, IIIA, IIIB, or IV). The primary outcome included implant survivorship free of re-revision between stem types in those with greater stages of femoral bone loss.

RESULTS:

There were 115, 162, and 73 cases classified as Paprosky I, II, and III+ (including grades IIIA, IIIB, and IV), respectively. Of all cases, 55 (15.7%) required re-revision and 15 (4.29%) required reoperation. The most common indication for re-revision was periprosthetic joint infection. Non-modular and modular stems classified as Grades I or II showed comparable 4-year survivorship free of re-revision to those classified as Grades III+ (87.4% [95% CI 83.5 to 91.5] versus 83.3% [95% CI 72.0 to 96.4]; p=0.54). When comparing implants above Grade II femoral bone loss (n=235), PFRs demonstrated significantly lower 4-year survivorship (69.8% [95% CI 57.3 to 84.9]) compared to non-modular (84.5% [95% CI 75.7 to 94.3]) and modular stems (85.8% [95% CI 80.1 to 91.9]; p=0.03).

DISCUSSION AND CONCLUSION:

Non-modular and modular stems demonstrated comparable mid-term survivorship across varying degrees of bone loss, including severe defects of Paprosky III+. PFRs had lower survivorship than non-PFR stems above Grade II. In select cases with advanced femoral bone loss, modular and non-modular stems can be a viable alternative to PFR in revision THA.

Figure 1. Kaplan-Meier survivorship curve of non-modular and modular femoral stems, stratified by Paprosky I or II versus Paprosky 3+.

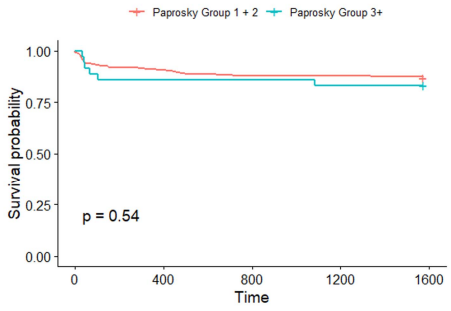

Figure 2. Kaplan-Meier survivorship curve of revision total hip arthroplasty patients with Paprosky Grade II or higher, stratified by stem type.