

Collared Cementless Stems Show Equivalent Rates of Periprosthetic Fractures Compared to Collarless Cemented Stems in an Exclusively Elderly Cohort of Patients

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INTRODUCTION:

The choice of femoral stem fixation for total hip arthroplasty (THA) is widely debated, especially for older patients due to their heightened risk of periprosthetic fractures in the setting of decreased bone density (PPFx). Previous studies in elderly patients have shown advantages of cemented fixation with patients requiring fewer revisions, reduced PPFx, and improved long-term implant survival. We hypothesize cementless stems with a collar would be just as protective against PPFx compared to cemented and uncemented collarless stems. This study represents the first analysis of stem design outcomes in an exclusively older cohort of patients traditionally recommended for cemented fixation.

METHODS:

We analyzed our institutional database to identify primary THAs performed at one academic institution for all women over 70 and men over 75 between January 1, 2013 and December 31, 2024. Type of complication (periprosthetic fractures, dislocations, prosthetic joint infection, and aseptic loosening), reason for reoperation, time from initial surgery to reoperations, and patient reported outcomes (PROs) were analyzed for the four categories: collarless/cementless (n=229), collarless/cemented (n=30), collared/cementless (n=306), and collared/cemented (n=40).

RESULTS:

Surgical time was shortest in the collared/cementless group. The most sustained and highest improvements in PROs were seen in the collared/cementless group ($p<0.05$). Of all complications, the most common was periprosthetic fracture (65%), with most occurring in collarless/cementless designs. Collared/cementless stems were less likely to have complications ($p<0.05$), revisions ($p<0.05$), and periprosthetic fractures ($p<0.05$) compared to collarless/cementless stems. In addition, collared/cementless stems were non-inferior at protecting from PPFx compared to collarless/cemented stems ($p>0.05$). Collared/cementless stems had equivocal revision and complication rates compared to all cemented stems ($p>0.05$).

DISCUSSION AND CONCLUSION:

The current study found that collared/cementless stems had lower PPFx and complication rate compared to collarless/cementless stems. In addition, collared/cementless stems were non-inferior to collarless/cemented stems at protecting from PPFx. Finally, collared/cementless stems were non-inferior to all cemented stems for complication and revision rates. A modern collared/cementless stem may be an alternative to cementing in osteoporotic population without the associated increased risk of PPFx and has lower risk for PPFx than a collarless/cementless stem.