

Bladed femoral stem and risk of revision for periprosthetic fracture following cementless total hip arthroplasty

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INTRODUCTION:

Studies have found outcomes following total hip arthroplasty (THA) may differ based on femoral stem design. One concern with the use of blade type stems is there is a specific pattern of periprosthetic fracture (PPF) following THA. We sought to compare revision risk associated with the one specific bladed stem compared with other stem designs.

METHODS:

This was a cohort study using data from a US healthcare system's THA registry. Adult patients who underwent primary cementless THA for osteoarthritis with a highly crosslinked polyethylene liner and large diameter femoral head (>28mm) were included (2010-2022). The treatment groups were THA using a bladed stem compared to THA using other stems. Multivariable Cox proportional hazard regression was used to evaluate aseptic revision and revision due to PPF specifically with adjustment for age, gender, body mass index, race/ethnicity, smoking status, ASA classification, anesthetic technique, surgical approach, and operating surgeon. Risk within 90-days follow-up and at any point during follow-up was considered.

RESULTS:

The study included primary 76,909 THA, 9,425 bladed stems and 67,484 other stems. The crude cumulative aseptic revision incidence at 90-days follow-up was 1.3% for bladed stems and 0.6% for other stems (Figure); incidence of revision for PPF was 0.8% for bladed stems and 0.4% for other stems (Figure). In adjusted analysis, a higher risk of aseptic revision within 90-days was observed for bladed stems compared with other stems (HR=1.83, 95% CI=1.39-2.41). Similarly, a higher risk of revision for PPF for bladed stems was observed (HR=2.16, 95% CI=1.57-2.97).

DISCUSSION AND CONCLUSION:

Bladed stems were associated with a 2-times higher risk of revision for PPF when compared to non-bladed stems. These findings may guide surgeon stem selection in patients where PPF is a concern.

Figure. Cumulative probability of aseptic revision (top) and periprosthetic fracture revision (bottom) during 90-day follow-up for patients who underwent total hip arthroplasty. The shaded areas around the solid lines represent 95% CI.

