Cemented Femoral Stem Design Is Not Associated with Risk of Revision After Total Hip Arthroplasty in Patients 65 Years and Older: An Analysis of the American Joint Replacement Registry

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INTRODUCTION:

Cemented femoral fixation for total hip arthroplasty (THA) in those 65 years and older has potential benefits. However, few resources exist to assist in selecting cemented femoral implant designs. We examined the associated risk for all-cause revision, risk of periprosthetic femur fracture, and aseptic loosening based on a modern classification of cemented femoral stem designs.

METHODS: An analysis of primary THA cases in patients aged ³65 years was performed with American Joint Replacement Registry (AJRR) data linked to Centers for Medicare and Medicaid Services data from 2012-2023. Patient demographics, revision or open reduction and internal fixation (ORIF) for periprosthetic femur fracture, and revision for aseptic loosening were recorded. We identified 20,484 primary THAs with cemented stems that were classified via a modern classification. There were 5,437 (26.5%) type I (taper-slip) and 14,796 (72.2%) type II (composite beam) stem designs. Cause-specific Cox proportional hazard models with competing risk of death was used to evaluate the association of cemented stem design with all-cause revision, revision or ORIF due to periprosthetic femur fracture, and revision for aseptic loosening while adjusting for potential confounders.

RESULTS:

Compared to those who had type I (taper-slip) designs those with type II (composite beam) designs were not associated with increased risk of all-cause revision HR = 1.28 (95% CI: 0.99 to 1.65, P = 0.06), revision or ORIF for periprosthetic femur fracture HR = 0.83 (95% CI: 0.40 to 1.70, P = 0.61), and revision for aseptic loosening HR = 1.59 (95% CI: 0.75 to 3.39, P = 0.23).

DISCUSSION AND CONCLUSION:

Cemented stem designs were not associated with risk of all-cause revision, revision/ORIF for periprosthetic femur fracture, or revision for aseptic loosening in patients ≥65 years. As such, orthopedic surgeons should be aware that selection of specific cemented stem designs may not necessarily reduce risk of revision.