Cementless Collard Metadiaphyseal-Filling Femoral Design versus Cemented Femoral Fixation for Total Hip Arthroplasty in Patients 65 Years and Older: An Analysis from the American Joint Replacement Registry

Mackenzie Kelly[1], Ryland Phillip Kagan[2], Adam Anton Sassoon, Vishal Hegde, Isabella Zaniletti, Harpal Singh Khanuja
[1]OHSU, [2]Oregon Health & Science University

INTRODUCTION:
Periprosthetic femur fracture (PPFx) is a known complication after total hip arthroplasty (THA). Among cementless femoral designs, collared metadiaphyseal-filling implants have a lower associated risk of PPFx. Yet it remains unclear how this subset of stems compares to cemented fixation, which has traditionally been thought to have the lowest PPFx rate. We examined the risk of PPFx after THA comparing collared metadiaphyseal-filling cementless stems versus cemented femoral implant designs.
METHODS:
We analyzed the American Joint Replacement Registry data from January 2012 to March 2020 with outcomes captured through December 2022 to allow for minimum 2-year follow-up. We identified primary THAs in patients ³65 with a diagnosis of osteoarthritis and linked to Centers for Medicare and Medicaid data, excluding those with missing or unreliable data elements. Patient demographics, procedure dates, and the primary outcome of revision for PPFx was recorded. Primary analyses compared 52,288 cementless collared metadiaphyeal-filling femoral components and 16,609 cemented femoral components. Cox proportional hazard regression analysis with competing risk of death was used to evaluate the association of fracture risk while adjusting for sex, age, body mass index (BMI), and Charlson Comorbidity Index (CCI).
RESULTS:
Cemented patients were older (mean age 79.3 vs.73.5, p<.001), more likely to be female (79.8% vs. 61.3%, p<.001), to have a severe CCI (34.2% vs. 18.9%, p<.001), and to have a BMI <35 (90.6% vs 86.2%, p<0.001). After controlling for age, sex, BMI, and CCI, cementless metadiaphyseal-filling collared stems showed a lower risk of revision for fracture (HR=0.38; 95% CI=0.25,0.59 p<.001).
DISCUSSION AND CONCLUSION:
If cementless femoral fixation is used for THA in patients ³65 years, surgeons should consider collared metadiaphyseal-filling stem designs for the potential benefits of cementless fixation without the associated risk of PPFx.