Increased Risk of Postoperative Periprosthetic Femur Fracture with Cementless Versus Cemented Hemiarthroplasty: A Nationwide Database Study of 24,468 Femoral Neck Fractures

Frank Rodgers, Zachary Mark Working, Darin M Friess[1], Jung U Yoo[2], Ryland Phillip Kagan[3]
[1]Oregon Hlth & Sci Univ, [2]OHSU, [3]Oregon Health & Science University

INTRODUCTION:
Femoral component fixation in hemiarthroplasty (HA) is achieved with cemented or cementless fixation. Previous investigations have suggested cementless fixation as a risk for postoperative periprosthetic femur fracture (PPFx) but were limited in their generalizability. We aimed to evaluate the risk of PPFx after hemiarthroplasty for treatment of femoral neck fracture based on stem fixation with review of a robust national administrative claims database.
METHODS:
A retrospective review using the Medicare Standard Analytical Files from a large national insurance database was performed for patients with hemiarthroplasty for the treatment of femoral neck fracture. We identified PPFx as our primary outcome and stratified femoral fixation as cemented or cementless. Demographic data were collected; age, sex, obesity, and Charlson Comorbidity Index (CCI). A propensity-matched analysis was performed with odds ratios (OR) to evaluate association of femoral fixation and risk of PPFx. Multivariate analysis evaluated the association of PPFx after adjusting for demographic characteristics and comorbidity.
RESULTS:
We identified 24,468 patients with HA as treatment of femoral neck fractures from 2015-2020. The mean age of our population was 77 ($\pm$6.14) years, 66.9% were female, mean CCI was 3.54 ($\pm$3.17), and 16% carried a diagnosis of obesity. In total, 12,777 (52.2%) received cemented femoral fixation and 11,691 (47.8%) cementless. PPFx was identified in 660 (2.7%) of cases. Cementless fixation was associated with an increased risk of PPFx (OR 3.32 [95% CI, 2.75-4.00]; $p<0.001$). This risk was elevated further for females with cementless fixation (OR 3.70 [95% CI, 2.94-4.76]; $p<0.001$).
DISCUSSION AND CONCLUSION:
We noted an increased risk of PPFx with cementless versus cemented hemiarthroplasty for treatment of femoral neck fractures. This risk was amplified in females with cementless fixation. The risk of PPFx should be considered as surgeons choose femoral fixation for hemiarthroplasty in the treatment of femoral neck fractures.