Effects of Gender and Fixation on the Outcomes of Total Hip Arthroplasty for Femoral Neck Fracture: Analysis of the American Joint Replacement Registry

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INTRODUCTION:
Despite strong recommendations from the American Academy of Orthopaedic Surgeons (AAOS) Clinical Practice Guideline for cementing femoral components during hip arthroplasty for femoral neck fracture (FNF), according to data from the American Joint Replacement Registry (AJRR), approximately 20% of all total hip arthroplasties (THA) done for femoral neck fracture (FNF) in the United States have cemented femoral fixation. The purpose of this study was to evaluate gender-fixation interaction effects on fracture THA outcomes. We hypothesized that compared to cementless THA, cemented THA would be associated with lower revision rates and mortality rates in females than in males.
METHODS: For this retrospective study, AJRR was queried to identify 19,194 patients over 65 years old undergoing THA for FNF from 2012-2023**.** Patient characteristics, fixation, early 90-day revision and mortality, and one-year revision and mortality were abstracted. Multivariable logistic regression models isolated gender-fixation interaction effects on each outcome. Of these patients, 12,922 were female (67%), average age was 77.5 years, and 3,825 (20%) were cemented.
RESULTS:
Of the 12,922 females, 21% underwent cemented femoral fixation (vs. 17% of males, $p<0.0001$). Compared to males, females with cemented THA had reduced odds of early revision for periprosthetic fracture (OR .78; 95% CI .07, 8.62), one-year revision for periprosthetic fracture (PPFx) (OR .79; 95% CI .07, 8.7); early mortality (OR .61 (95% CI .45, .82), and one-year mortality (OR .59 (95% CI .43, .83). They had increased odds of early all-cause revision (OR 1.24; 95% CI ..94, 1.63) and one-year all-cause revision (OR 1.15; 95% CI .58, 2.30). The gender-fixation effects were not significantly associated with cemented THA revision but were significantly associated with mortality.
DISCUSSION AND CONCLUSION:
These results support our hypothesis that compared to men, women benefit more from cemented THA fixation for FNF, evidenced by lower early and one-year rates of revision for PPFx, and lower mortality rates. Interestingly, despite having lower odds of revision for PPFx, female patients with cemented THA for FNF had increased odds of early and one-year all-cause revision. Future research should continue to investigate the increased all-cause revision rate among these patients.