Albumin and Ambulatory Status are Significant Predictors of 5-Year Mortality After Low-Energy Femoral Neck Fractures

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INTRODUCTION: Determining the optimal surgical management of displaced low-energy femoral neck fractures (FNF) in the elderly remains a debated topic. Studies have shown that total hip arthroplasty (THA) for FNF is not clinically superior to hemiarthroplasty (HA) for the first 12-24 months postoperatively and THA is a more costly surgery with potentially increased risks. Efforts have been made at determining objective measures for surgical decision-making, including pre-operative albumin, preoperative activity, use of ambulatory aids, comorbidities, and more. This study attempted to determine factors associated with 1- and 5-year mortality after FNF treated with HA or THA.

METHODS: A retrospective chart review from 2012 to 2023 at a single tertiary academic medical center of all patients over 65 years old who underwent THA or HA for low-energy FNF was undertaken. These charts were reviewed for preoperative (age, sex, preoperative ambulatory status, albumin, hemoglobin, American Society of Anesthesiologists (ASA) physical status score , BMI, and comorbidities), intraoperative, and postoperative (postoperative ambulatory status, mortality) factors. Fischer's exact test was used to look at the association of these factors with mortality at 1 and 5 years postoperatively. Variables were considered for final model if bivariate association of $p<0.1$. Multivariable logistic regression with backward selection was performed with retention criteria of $p<0.05$ to build the final model.

RESULTS: Of 496 total patients, 427 patients met inclusion criteria, with an average age of 80 years. 295 patients underwent HA while 132 underwent THA. 193 patients were deceased at 5 years, including 27 THA patients (20.5%) and 166 HA (56.6%) patients. Preoperative ambulatory status, age, preoperative hemoglobin, and preoperative albumin were all significantly associated with mortality at 1 year. Preoperative ambulatory status, age, ASA score, pre-operative albumin, and preoperative BMI were all significantly associated with mortality at 5 years. Specifically, patients who were not community ambulators before surgery had 4.3-fold increased odds of death <5 years compared to community ambulators ($p<0.001$). Preoperative albumin was associated with 58% increased odds of death at 5 years per each 1gm/dL decrease.

DISCUSSION AND CONCLUSION: We found that multiple preoperative risk factors are significantly associated with 1- and 5-year mortality after surgical intervention for FNF. The multivariate logistic regression generated from this retrospective cohort will be used to generate a decision guiding tool to assist in indicating THA versus HA moving forward, with the goal of improving patient outcomes, limiting post-operative complications, and being cost conscious.