Other than Delay, What Else Increases Risk of Mortality following Hip Fracture Surgery? Are We Missing Something?

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INTRODUCTION:
Hip fractures in the elderly are common and account for a significant burden on the healthcare system. Despite remarkable advances in orthopaedic implants and understanding of these fractures, mortality rate following hip fracture surgery still remains unsatisfactorily high. The purpose of this study was to identify and report additional perioperative and patient-specific risk factors that may be associated with increased mortality following hip fracture surgery.
METHODS:
A retrospective review was conducted at a single academic medical center identifying a consecutive cohort of hip fracture patients over a two-year study period (2017-2019). Patient demographics, comorbidities, ambulatory status, perioperative data, inpatient complications, and mortality data up to 1-year were collected and analyzed. A univariate cox regression analysis was used to identify risk factors associated with mortality. A p-value ≤0.05 was deemed statistically significant.
RESULTS:
Two-hundred-ninety-seven patients were included for analysis over a two-year study period. Majority were female (63.2%) with a mean age of 79 years. Operative fractures analyzed included 121 femoral neck, 143 intertrochanteric, and 33 subtrochanteric femur fractures. Increased time to surgery (>50hrs) was associated with significantly increased mortality at 90-days (p=0.01) and 1-year (p=0.004). Other factors found to significantly increase mortality at 30- and 90-days and 1-year were patient age over 85, body mass index (BMI) ≥35 kg/m2 (only at 30-days), male sex (only at 1-year), pre-existing history of pulmonary or liver disease, cancer, and dementia, chronic anticoagulation (only at 1-year), increased postoperative transfusions (only at 1-year), and hospital length of stay (LOS) (at 90-days and 1-year), and discharge disposition to rehabilitation/skilled nursing facility (SNF) (at 90-days and 1-year). More importantly, having experienced a postoperative complication significantly increased mortality risk while inpatient at 30- and 90-days and 1-year postoperatively (p<0.0001). The majority of complications were due to cardiac arrhythmia (15.1%) followed by cardiac arrest (9.4%), respiratory failure (9.4%), acute kidney injury (5.7%), and encephalopathy (5.7%). Increased preoperative hemoglobin status was associated with decreased mortality at 90-days and 1-year, along with tranexamic acid (TXA) use (at 1-year) and venous thromboembolism (VTE) chemoprophylaxis using aspirin (at 30-days) or a direct-acting anticoagulant (DOAC) such as apixaban or enoxaparin (at 30-days and 90-days). Factors found to have no significant impact on patient mortality were race, ambulatory status, fracture pattern or location, American Society of Anesthesiologists classification, anesthesia type, fixation by fellowship-trained trauma surgeon, fixation construct [i.e., short intramedullary nail (IMN), long IMN, hemiarthroplasty, total hip arthroplasty], or duration of surgery.
DISCUSSION AND CONCLUSION:
This study confirms the association between delay to surgery for hip fracture fixation and increased risk of 90-day and 1-year mortality, underscoring the importance of early operative fixation and mobilization. Other factors significantly associated with increased risk of mortality are patient age≥85years, BMI≥35, male sex, pre-existing comorbidities, chronic anti-coagulation, postoperative transfusions, increased LOS, discharge disposition to rehabilitation/SNF, and inpatient complications. Some factors that were found to be protective of mortality were increased preoperative hemoglobin status, TXA use, and the use of aspirin or DOACs for VTE prophylaxis.