

Predictors of Cement-Related Perioperative Death in Patients Undergoing Hip Hemiarthroplasty Surgery

Ali Shah, MRCS; Fahad S. Hossain, MRCS; Frank Howell, FRCS;

Department of Trauma and Orthopaedics, North East Lincolnshire and Goole Hospitals, NHS Foundation Trust, United Kingdom

Background/Purpose: Cemented hemiarthroplasty for hip fractures of the elderly is widely accepted as the preferred method of fixation compared to uncemented prostheses due to optimal functional outcomes and lower complications. However, bone cement implantation syndrome (BCIS) remains an important cause of perioperative mortality in patients with underlying comorbidities. The aim of this study was to assess the rates, causes, and potential preoperative risk factors for perioperative mortality within 48 hours of cemented hip hemiarthroplasty surgery.

Methods: Retrospective review of data obtained from a nationally linked institutional database on a cohort of 546 consecutive intracapsular hip fracture patients treated with a hemiarthroplasty (cemented = 320; uncemented = 226) was undertaken. Details including age, sex, comorbidities, American Society of Anesthesiologists (ASA) grade, admission source, time to surgery, surgeon grade, and preoperative blood parameters were recorded for all patients. Causes for intraoperative and perioperative mortality within 48 hours was examined. Cox regression analysis was undertaken to identify preoperative risk factors for 48-hour perioperative mortality.

Results: 13 (4.06%) and 2 (0.8%) patients died within 48 hours of their surgery in the cemented and uncemented groups, respectively. An intraoperative cardiac event (53.8%) was the predominant cause of death in our cohort. There was a statistically significant difference in the incidence of active cardiac disease ($P < 0.001$), chronic respiratory disease ($P = 0.049$), preoperative white cell count ($P = 0.019$), and the number of individual comorbidities ($P = 0.012$) between the two cohorts on univariate analysis. However a multivariate Cox model showed female gender (hazard ratio [HR] 8.8, $P = 0.037$), active cardiac disease (HR 31.4, $P = 0.001$), and a history of multiple comorbidities (HR 4.6, $P = 0.047$) to be the strongest preoperative predictors of increased risk of perioperative death associated with a cemented hemiarthroplasty.

Conclusion: Elderly female hip fracture patients with multiple comorbidities including that of active cardiac disease may be at increased risk of perioperative mortality during cemented hip hemiarthroplasty surgery. Such patients should be identified preoperatively with a view to careful medical optimisation or alternative uncemented options.

- The FDA has not cleared this drug and/or medical device for the use described in this presentation (i.e., the drug or medical device is being discussed for an "off label" use). For full information, refer to page 600.