

Effects of Bone Cement Pressurization on Mortality and Revision Following Hip Hemiarthroplasty for Neck of Femur Fracture Patients: A Comparative Cohort Study

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Purpose: Pressurization of bone cement in arthroplasty aims to improve the quality of the bone-cement interface and reduce the risk of aseptic loosening. This technique is performed by some surgeons during hip hemiarthroplasty for neck of femur fracture patients. However, some surgeons avoid this practice due to the theoretical increased risk of bone cement implantation syndrome, which can lead to cardiovascular collapse. This study aimed to compare 30-day mortality and revision for aseptic femoral component loosening and all causes following hip hemiarthroplasty performed with versus without pressurized bone cement in neck of femur fracture patients.

Methods: Hip fracture patients aged ≥ 60 years who underwent cemented hemiarthroplasty between 2007-2023 were identified using our hospital database. Patients were grouped by whether or not cement was pressurized using an interference plug sealing the proximal femoral canal opening. Cox proportional hazards were used adjusting for age, gender, American Society of Anesthesiologists (ASA) class, mobility, anesthesia, year of surgery, blood transfusion, COVID-19, and time to surgery.

Results: 406 and 722 procedures were performed with and without cement pressurization respectively. There were no differences in 30-day mortality (7.14% vs 8.17%; hazard ratio [HR] 0.89, 95% confidence interval [CI] 0.46-1.73, $P = 0.727$). At 10-year follow-up, there were no differences in all-cause revision (HR 1.04, 95% CI 0.27-4.04, $P = 0.953$) and no revisions were performed for aseptic loosening in either group. Patient survival was 16% at 10 years for both groups. Overall incidence of intraoperative periprosthetic fracture was 0.8%.

Conclusion: There were no differences in mortality rates observed between pressurized and unpressurized cementing techniques during hemiarthroplasty, and the pressurization of bone cement did not confer any advantages for revision outcomes. The latter could be due to these patients' low functional demands and high mortality rates. We believe that cementation of hemiarthroplasty procedures is safe and can be used routinely with minimal risk to patients. Surgeons' preferences towards uncemented hemiarthroplasty as a means of avoiding bone cement pressurization is unsupported.