Incidence of Bone Cement Implantation Syndrome Is Not Associated With Cement in a Modern Series of Patients Treated with Arthroplasty for Femoral Neck Fracture

Charles Engh III, MD, James Temple, BS, Wendy M. Novicoff, PhD, James A. Browne, MD

Introduction:

Bone cement implantation syndrome (BCIS) has been characterized by hypotension and/or hypoxia during cementation of a prosthesis; however, the casual link between cement and the pathophysiology of BCIS is unclear. This study aims to determine if there is an association between cement and the incidence of BCIS by comparing cemented versus non-cemented hip arthroplasties in a modern series of patients with a femoral neck fracture.

Methods:

A single institution multi-surgeon retrospective review of 428 patients who underwent either hemi-arthroplasty (HA) or total hip arthroplasty (THA) for acute femoral neck fracture between May 2017 and December 2024 was performed. Data including ASA, co-morbidities, type of anesthesia, operative time, and use of cement for fixation were recorded. Intraoperative anesthesia records were manually reviewed for hypoxia and hypotension, and the grade of BCIS was calculated where applicable. Data were then analyzed using multivariate logistic regression and chi-square analysis.

Results:

Of the 428 patients, 301 (70%) had a cemented arthroplasty (211 HA and 90 THA) whereas the remaining 127 (30%) had cementless implants (18 HA and 109 THA). Of patients who met BCIS criteria, 219 (51%) were grade I and 83 (19%) were Grade II. No patients were grade III (cardiovascular collapse requiring CPR). Of patients who met BCIS criteria, there was no statistical association with cemented versus press fit arthroplasty. In the multivariate analysis, only the type of anesthesia (spinal versus general) was significant ($p<0.001$) for BCIS grade I or II, and no other recorded variables reached significance.

Conclusion:

In this modern series of patients undergoing arthroplasty for femoral neck fracture, no association was found between intraoperative BCIS and the use of cemented components. Prior assumptions regarding BCIS my need to be reconsidered given contemporary surgical and anesthetic techniques.