Paper - Annual Meeting

Paper Session: Geriatrics

Association Between Femoral Stem Type and the Risk of Aseptic Revision Following Hemiarthroplasty

Kanu M Okike MD*; Priscilla Hannah Chan MS; Nithin C Reddy MD; Robert Alan Burri MD; Liz Paxton MA; Heather Ann Prentice PhD*
Kaiser Permanente, San Diego, CA, United States

Purpose: Prior research has found uncemented hemiarthroplasty to be associated with a higher risk of aseptic revision than cemented hemiarthroplasty in the treatment of displaced femoral neck fractures in the elderly. However, it remains uncertain whether this elevated risk of aseptic revision applies to all uncemented stem designs, or only a subset. The purpose of this study was to assess the risk of aseptic revision associated with 3 types of uncemented hemiarthroplasty stem design (single wedge without collar, fit and fill without collar, and fit and fill with collar) as compared with cemented fixation in the hemiarthroplasty treatment of displaced femoral neck fractures in the elderly.

Methods: This was a retrospective cohort study of 12,071 patients aged 60 years and over who sustained a hip fracture and underwent hemiarthroplasty between 2009 and 2018 at one of 35 hospitals owned by a large U.S. health maintenance organization. Hemiarthroplasty fixation was categorized as cemented or uncemented, with the uncemented stems further classified as single wedge without collar, fit and fill without collar, or fit and fill with collar. The primary outcome was aseptic revision, which was analyzed using mixed effects Cox regression with mortality considered as a competing event. This analysis was performed comparing the 3 uncemented stem types to cemented fixation, and also to one another. All models were adjusted for potential confounders including age, sex, American Society of Anesthesiologists (ASA) score, body mass index (BMI), chronic kidney disease, diabetes, neurologic disorders, chronic pulmonary disease, psychoses, alcohol abuse, liver disease, anesthesia type, and operating surgeon. The median follow-up time was 4.8 years.

Results: Of 12,071 patients who underwent hemiarthroplasty during the study period (median age 83 years, 67.9% female), 55.4% underwent cemented fixation and 44.6% underwent uncemented fixation (6.7% single wedge without collar, 17.6% fit and fill without collar, and 20.3% fit and fill with collar). Compared to cemented fixation, all uncemented hemiarthroplasty stem designs were associated with a significantly higher risk of aseptic revision including single wedge without collar (hazard ratio [HR] 2.00, 95% confidence interval [CI] 1.38-2.89, P <0.001), fit and fill without collar (HR 1.52, 95% CI 1.14-2.04, P = 0.005), and fit and fill with collar (HR 2.11, 95% CI 1.63-2.72, P <0.001). There were no significant differences in aseptic revision observed between the single wedge and fit and fill designs (adjusted risk 1.09, 95% CI 0.75-1.57, P = 0.66), or between the collared and collarless designs (adjusted risk 1.26, 95% CI 0.98-1.64, P = 0.08).

Conclusion: In the hemiarthroplasty treatment of elderly patients with hip fracture, all routinely utilized uncemented stem designs (single wedge without collar, fit and fill without collar, and fit and fill with collar) were associated with a higher risk of aseptic revision as compared to cemented fixation.