

# Unipolar Hemiarthroplasty, Bipolar Hemiarthroplasty, and Total Hip Arthroplasty Survivorship in a US Healthcare System's Geriatric Hip Fracture Registry

Foster Chen<sup>1</sup>, Heather Ann Prentice<sup>2</sup>, Priscilla Hannah Chan<sup>3</sup>, Brian H Fasig<sup>4</sup>, Liz Paxton<sup>2</sup>, Joseph Bernstein, Jaimo Ahn<sup>5</sup>, Kanu M Okike

<sup>1</sup>Orthopaedic Surgery, Kaiser Permanente Washington, <sup>2</sup>Kaiser Permanente, <sup>3</sup>Kaiser, <sup>4</sup>Kaiser Permanente National Implant Registries, <sup>5</sup>Univ of Michigan Orthopaedic Surgery

**INTRODUCTION:** Practice patterns vary regarding the usage of unipolar hemiarthroplasty, bipolar hemiarthroplasty, and total hip arthroplasty (THA) for geriatric femoral neck fracture, but data supporting the circumstances for which each arthroplasty is preferred is limited. The purpose of this study is to examine patient scenarios for which a particular treatment may have advantages in revision rates.

**METHODS:** A US healthcare system's hip fracture registry was used to identify patients  $\geq 60$  years who underwent arthroplasty treatment for hip fracture (2009-2021). Unipolar hemiarthroplasty and bipolar hemiarthroplasty were compared to THA within patient subgroups defined by age (60-79 vs.  $\geq 80$  years) and ASA classification (1-2 vs. 3). Multivariable Cox Proportional Hazard Regression was used to evaluate all-cause revision rate, with adjustment for confounders, and mortality considered as a competing risk.

## RESULTS:

A total of 14,277 patients were included in the final sample (median age 82, 70% female, 69% ASA 3, median follow-up 2.5 years), including 7,587 unipolar hemiarthroplasty, 5,479 bipolar hemiarthroplasty, and 1,211 THA. In the multivariable analysis among all patients, unipolar hemiarthroplasty (HR=2.15, 95%CI=1.48-3.12,  $p < 0.001$ ) and bipolar hemiarthroplasty (HR=1.92, 95%CI=1.31-2.80,  $p < 0.001$ ) had higher revision rates compared to THA. In age-stratified multivariable analysis among patients aged 60-79 years, unipolar hemiarthroplasty (HR=2.17, 95%CI 1.42-3.34,  $p = 0.004$ ) and bipolar hemiarthroplasty (HR=1.69, 95%CI=1.08-2.65,  $p = 0.022$ ) had higher revision rates compared to THA. In the ASA-stratified multivariable analysis among patients with ASA 1-2, unipolar hemiarthroplasty (HR=3.52, 95%CI=1.87-6.64,  $p < 0.001$ ) and bipolar hemiarthroplasty (HR=2.31, 95%CI=1.19-4.49,  $p = 0.013$ ) had higher revision rates compared to THA. No differences in revision by treatment type were observed among patients aged  $\geq 80$  or ASA 3.

## DISCUSSION AND CONCLUSION:

In this study of elderly hip fracture patients in a large healthcare system's hip fracture registry, we found THA to have benefits over hemiarthroplasty for patients aged 60-79 or ASA 1-2 and was most pronounced for unipolar hemiarthroplasty. In contrast, we did not observe any benefits between arthroplasty types for patients 80 years or above, or who had an ASA classification of 3. While the final choice of treatment should be individualized, our study suggests some criteria that can help in deciding arthroplasty treatment for geriatric femoral neck fractures.

