

Title: Proximal Humerus Fractures Treated with Open Reduction and Internal Fixation Demonstrates Worse Outcomes based on Social Determinants of Health than Reverse Total Shoulder Arthroplasty

Authors: Kai Zhu¹, Mary Hennekes¹, Chimdi Obinero¹, Christian Freitag¹, Frass Ahmed¹, Mahdi Mazeh¹, Jared Mahylis¹, Stephanie Muh¹

1.) Henry Ford Health

Introduction: Proximal humerus fractures (PHFs) account for 5-6% of all adult fractures. The optimal surgical management for PHFs remains under debate with two of the most common operations being open reduction and internal fixation (ORIF) and reverse total shoulder arthroplasty (rTSA). Social determinants of health (SDOH) has gained particular attention in many medical fields due to its relationship to health outcomes with the Social Vulnerability Index (SVI) as an example of an adopted measure of geographic disadvantage. The purpose of this study was to investigate the associations between SVI percentiles and insurance status to adverse postoperative outcomes following surgical treatment of PHFs using either ORIF or rTSA.

Material & Methods: This was a retrospective chart review of patients with PHFs who were treated surgically with either ORIF or rTSA between 2016 to 2023 at a large metropolitan healthcare system. Patient demographics were recorded, and SVI percentiles were determined using patient addresses. Demographic variables were descriptively analyzed based on type of surgery and SVI quartile group. Univariate and multivariate logistic regression analyses were conducted to investigate associations between SVI percentiles and insurance status to adverse postoperative outcomes.

Results: A total of 215 patients with PHFs were included in this study, with 118 in the ORIF group and 97 in the rTSA group. From the multivariate analysis in the ORIF group, there was an association with increasing SVI percentiles and higher odds of returning to the emergency department (ED) (OR = 1.023, p value = 0.002) and having a hospital readmission (OR = 1.028, p value = 0.001). Additionally, patients in the ORIF group with private insurance had shorter lengths of stay (LOS) (3.97 less days, p value = 0.023), lower odds of having a nonunion (OR = 0.056, p value = 0.033), returning to the ED (OR = 0.217, p value = 0.026), having a hospital readmission (OR = 0.077, p value = 0.001), and returning to the operating room (OR = 0.236, p value = 0.031) compared to patients who had Medicaid. Patients in the rTSA group did not have significant associations with adverse postoperative outcomes based on increasing SVI percentiles or insurance status.

Discussion: This study demonstrated that higher SVI percentiles and Medicaid status were associated with adverse postoperative outcomes in patients who underwent ORIF for treatment of their PHFs. Higher SVI percentiles and insurance status did not appear to be associated with adverse postoperative outcomes in the rTSA group. This study highlighted the importance of how SDOH and/or choice of surgery can play a factor in adverse postoperative outcomes in patients with PHFs.