

**Patient Obesity Only Affects Severity of Proximal Humerus Fractures, Not Outcomes***Rebekah Belayneh, MD; Jack Haglin, BS; Ariana Lott, MD; Kenneth A. Egol, MD**NYU Langone Orthopedic Hospital, New York, NY, United States*

**Purpose:** The prevalence of obesity in adults has increased significantly in the United States and worldwide. It has been extensively reported in the literature to cause not only medical problems, but musculoskeletal issues as well. In addition to being associated with high rates of osteoarthritis as compared to normal weight populations, obese patients have a greater risk of trauma, including minor injuries and fractures. The purpose of this study is to evaluate the effect of the non-modifiable factor of obesity on the outcome of operatively treated proximal humerus fractures.

**Methods:** Proximal humerus fractures requiring surgery were prospectively followed. Fractures were classified according to the international AO/OTA and Neer classifications to determine their severity. Patients' body mass indexes (BMIs) were calculated and used to identify two groups: BMI  $\geq 30$  kg/cm<sup>2</sup> (obese) and  $< 30$  kg/cm<sup>2</sup> (non-obese). Variables such as age, gender, height, weight, Charlson Comorbidity Index (CCI), number of complications, latest follow-up shoulder range of motion (ROM), and latest follow-up Disabilities of the Arm, Shoulder and Hand (DASH) survey scores were also recorded. Independent t tests were used for statistical analysis of continuous variables and  $\chi^2$  tests for categorical variables. Regression analysis was performed to determine if BMI was a predictor of severity of fracture pattern as determined by the AO classification. Statistical significance was considered as  $P \leq 0.05$ .

**Results:** Overall, 198 patients who sustained 200 proximal humerus fractures were analyzed. Patient age at time of injury was  $60.0 \pm 13.6$  years. There were 61 OTA 11-A, 69 OTA 11-B, and 70 OTA 11-C fracture types. 62 patients (31.3%) were obese, while 136 patients (68.7%) were non-obese. No significant differences were seen between groups in regards to age, gender, height, CCI, complication rates, Neer classification, or functional and clinical outcomes as determined by follow-up DASH scores and shoulder ROM, respectively. Statistical analysis also demonstrated that obese patients had greater fracture severity per the AO/OTA classification ( $P = 0.021$ ).

**Conclusion:** Based on the results of this study, obesity is associated with more severe fracture pattern of the proximal humerus as determined by the AO/OTA classification. However, there are no differences in outcomes or complication rates between obese patients and non-obese patients. With increasing rates of obesity, this relationship may have important epidemiological implications in the future, including predicting proximal humerus fracture burden and severity in society. Additionally, orthopaedic surgeons should be reassured that performing proximal humerus fixation in obese patients yields similar outcomes and complication rates to non-obese patients.