Fracture-Dislocation of the Proximal Humerus: A Marker of Poor Outcome

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Purpose: This study aims to evaluate the effect that associated dislocations have on outcomes following surgical treatment of proximal humerus fractures.

Methods: This IRB-approved study reports on 354 patients, who underwent operative treatment for proximal humerus fractures at an academic medical center from January 2004 to January 2023. Fractures were classified according to the Neer system. Patients were separated into 2 cohorts based on whether a glenohumeral dislocation was present at the time of initial injury. Outcomes measured included the Disabilities of the Arm, Shoulder and Hand (DASH) score, range of motion (forward elevation, external rotation, adduction, abduction), readmission rates, complications, removal of hardware, and revision surgery. Independent samples t-tests and $\chi 2$ analysis were used for continuous and categorical variables, respectively. A binary logistic regression was performed to analyze the influence of these factors on complication rate.

Results: 277 patients sustained an isolated fracture (IF) and 77 sustained a fracture-dislocation (FD). No differences were found between demographics and fracture class. Significant differences were observed between the FD and IF groups in all measured outcomes. The FD group had a poorer DASH score ($P<0.001$) and reduced range of shoulder motion in forward elevation ($P<0.001$), external rotation ($P<0.001$), adduction ($P<0.001$), and abduction ($P<0.001$). Readmission rates were higher in the FD group ($P<0.001$). The FD cohort also had a significantly higher rate of complications ($P<0.001$) and need for removal of hardware ($P<0.001$), but not overall revision surgery ($P<0.001$). No significant difference was observed regarding rates of fracture healing, osteonecrosis, and recurrent dislocation. Multivariate analysis in the form of binary logistic regression indicated that fracture-dislocation significantly increased the risk of complications (odds ratio = 3.310, 95% confidence interval = 1.42-7.70, $P = 0.005$).

Conclusion: Proximal humerus fractures with associated dislocations were associated with worse functional outcomes and higher complication rates compared to those without dislocations. These findings highlight the potential need for specialized treatment strategies to mitigate the impact of dislocation on recovery.