

Proximal Humerus Absolute Reintervention to Arthrolysis, Arthroplasty, or Hemiarthroplasty: Survivorship and Long-Term Outcomes of the PHARAOH Study*Jason Strelzow, MD; Paul H. C. Stirling, MBBS; C. M. Robinson**Royal Infirmary of Edinburgh, Edinburgh, Scotland, UNITED KINGDOM*

Purpose: Proximal humerus fractures represent an important fragility fracture frequently managed by orthopaedic surgeons. Recent research has focused on the optimal treatment modalities for these injuries. Open reduction and internal fixation (ORIF) of proximal humerus fractures remains a topic of debate. This study evaluates the survivorship and functional outcomes after initial fixation of patients with proximal humerus fractures.

Methods: A single center prospective database review identified 579 patients treated surgically with proximal humeral ORIF between 1996 and 2015. Inclusion criteria were: acute proximal humerus fracture treated with ORIF, age over 14 years at the time of injury, and a minimum of 2 years follow-up. Patient demographics, patient-reported outcomes, complications, and the need for additional surgery were recorded. Study end points included: revision ORIF, conversion to arthroplasty, arthroplasty, and death. Kaplan-Meier survival analysis and Cox proportional-hazards regression were performed to assess for risk factors for failure.

Results: 337 patients met inclusion criteria. 27 patients were excluded and 238 patients had data available (77% response rate). 71 patients were deceased (30% mortality) and 3 institutionalized. Mean follow-up was 7.9 years. Average age at the time of operation was 58 years (SD 13). Fracture type by Neer classification included: 38% type 2, 28% type 3, and 34% type 4. 34 anterior fracture dislocations and 43 posterior fracture dislocations were included. Oxford Shoulder Score and QuickDASH (an abbreviated version of the Disabilities of the Arm, Shoulder and Hand [DASH]) scores were 32.2 and 16.9, respectively. 28% of patients underwent reintervention for any cause. Median survival time to reintervention was 76 months and 93 months for survival to arthroplasty. At a mean of 7 years post ORIF, 72% of patients remained reintervention-free. Renal disease was the only significant predictor of reintervention. 11% (19 patients) required conversion to arthroplasty. Overall patient-reported shoulder satisfaction was high; mean global shoulder score was 83% (SD 18.6) at 2 years post procedure.

Conclusion: Overall, our data suggest that ORIF for proximal humerus fractures does not result in early revision or arthroplasty and survival of the procedure is the norm. Additionally, failure requiring conversion to arthroplasty or revision generally occurs late (>7 years). Furthermore, we demonstrated that a subset of patients may be at higher risk of requiring additional reoperation or revision.