

Clinical Outcome of Primary Reverse Total Shoulder Arthroplasty Performed for Proximal Humerus Fracture: A Comparison of Outcomes According to Age

Derek S Stenquist MD; James Barger MD; Amin Mohamadi MD; Michael John Weaver MD; Nishant Suneja MD; George S.M. Dyer MD; Arvind Gabriel Von Keudell MD
Brigham and Women's Hospital, Boston, MA, United States

Purpose: The optimal management of displaced, unstable 3- and 4-part proximal humerus fractures (PHFs) continues to be debated. Options include open reduction and internal fixation (ORIF), hemiarthroplasty (HA), and reverse total shoulder arthroplasty (RSA). ORIF has traditionally been preferred for patients under the age of 70 years, but young patients may require RSA due to unreconstructible fracture patterns. The use of RSA recently surpassed that of HA for the treatment of PHFs, and surgeons may be lowering their “age limit” for RSA after fracture due to unpredictable results with HA. Studies reporting clinical outcomes after RSA for fracture in young patients are sparse. We compared outcomes for patients younger than 70 years versus patients older than 70 treated with RSA for a PHF.

Methods: All patients who underwent RSA as the primary management of a PHF at 2 Level-I trauma centers and 1 academic community hospital between 2004 and 2016 were identified. A retrospective comparative cohort study was performed to compare complications and functional outcomes for patients younger than 70 years versus patients older than 70 at the time of surgery. Bivariate analysis and multivariate analysis were performed to evaluate for differences and predictors of complications and functional outcomes.

Results: There were 40 patients younger than 70 years (mean 62.4 years, standard deviation [SD] 11.1) and 75 patients older than 70 (mean 78.5 years, SD 6.1) eligible for inclusion. Minimum 6-month clinical follow-up was available for 82 patients (71.3%), and minimum 1-year clinical follow-up was available for 58 patients (50.4%). A total of 19 patients under 70 and 19 patients over 70 years of age returned functional outcomes surveys (44.7% of eligible patients) at an average of 5.46 years (range, 2.96-10.9; SD 2.19). There were no significant differences in complications, reoperation rates, range of motion (active flexion, active external rotation), Disabilities of the Arm, Shoulder and Hand (27.4 vs 24.5, $P = 0.61$), Patient-Reported Outcomes Measurement Information System (PROMIS) (43.7 vs 43.1, $P = 0.86$), or EuroQol 5 Dimensions (0.75 vs 0.79, $P = 0.38$) scores between patients in the 2 age cohorts.

Conclusion: Younger patients with an average age of 62 years at the time of surgery did at least as well as their older counterparts after RSA for PHF at an average of 5 years postoperatively, with no difference in complication or reoperation rates. These results support RSA as a primary option for the treatment of PHFs in relatively young patients based on fracture morphology, patient factors, or surgeon judgment. They also provide preliminary information about patient satisfaction and function after this procedure that can be used to counsel younger patients undergoing RSA for PHF to help set reasonable expectations for function. Further studies and longer-term follow up are needed to determine optimal surgical treatment and revision rates after RSA for PHF specifically in younger patients.