

**Comparison of Complications Between Reverse Shoulder Arthroplasty and Open Reduction and Internal Fixation for the Treatment of Proximal Humerus Fractures**

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**Purpose:** While the use of open reduction and internal fixation (ORIF) for the treatment of proximal humerus fractures (PHFs) has remained consistent over the last decade, there has been a significant increase in the use of reverse total shoulder arthroplasty (RTSA). There are numerous considerations when deciding between these treatment options, including potential complications. This study sought to compare the 30-day complication profiles of RTSA to ORIF in a large, validated, retrospective cohort in order to guide surgeons in optimizing their patients prior to surgery.

**Methods:** Patients who underwent surgical treatment for PHFs (OTA / AO classification 11-A1/2/3, 11-B1/2/3 or 11-C1/2/3) with RTSA or ORIF were identified in a national database (National Surgical Quality Improvement Program) using CPT and ICD codes. Demographics and comorbidities were identified for each cohort of patients. 30-day complications were analyzed with univariate and multivariate analyses using  $\chi^2$ , Fisher's exact, and analysis of variance testing.

**Results:** The total number of patients included in this study was 2157, 522 (24.2%) of whom underwent RTSA and 1635 (75.8%) of whom underwent ORIF. Patients undergoing RTSA were older with an average age of 73.52 years compared with 63.84 years in those undergoing ORIF ( $P < 0.001$ ). Patients with RTSA were more likely to experience any 30-day complications (15.1% vs 7.3%,  $P < 0.001$ ), pulmonary complications (1.7% vs 0.7%,  $P = 0.029$ ), extended length of stay  $> 3$  days (25.5% vs 15.0%,  $P < 0.001$ ), and perioperative transfusion requirement (11.7% vs 4.8%,  $P < 0.001$ ) after univariate analysis. After controlling for differences in demographics, perioperative transfusion requirement was found to be significantly more common in the RTSA cohort (odds ratio 1.383, 95% confidence interval 1.080-2.345).

**Conclusion:** Patients undergoing RTSA were older and at increased risk for any 30-day complication, pulmonary complications, extended length of stay, and perioperative transfusion requirement after univariate analysis. After controlling for demographic variables and comorbidities, RTSA placed patients at increased risk for perioperative blood transfusion. Patients undergoing RTSA should be counseled prior to surgery regarding the risk for transfusion and medically optimized through multidisciplinary care if the surgeon elects to proceed with RTSA versus ORIF for the treatment of PHFs.