Total Shoulder Arthroplasty for Fracture Versus Osteoarthritis: A Propensity Matched Comparison

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Purpose: Total shoulder arthroplasty (TSA) is a common treatment that may be considered for end-stage shoulder osteoarthritis (OA) or proximal humerus fractures (OTA 11A1-3, 11B1, 11C1,3). As reimbursement is bundled to procedural codes, it is important to understand how the perioperative course, time, and care may differ for the same treatment applied to different indications. The present study uses a large national surgical database to study the difference in outcomes between 2 common indications for TSA.

Methods: The 2006-2017 National Surgical Quality Improvement Program database was queried for all cases of proximal humerus fractures (ICD-9 812.XX and ICD-10 S42.XXXX) and shoulder OA (ICD-9 715.X1, 716.91 and ICD-10 M91.01X) treated with a primary TSA (reverse or anatomic, CPT 23472). Primary diagnoses of cancer or infection were excluded. Propensity matching was applied to adjust for differences in age, gender, ASA (American Society of Anesthesiologists) class, obesity, medical comorbidities, and functional status. Logistic regressions were used to derive odds ratios (ORs) comparing 30-day postoperative adverse events between the OA and fracture groups. Significance was set at $P \leq 0.003$ to correct for multiple comparisons.

Results: From an unmatched population of 7812 patients, a matched sample of 995 OA and 995 fracture patients was obtained. The fracture cohort had significantly increased odds of any adverse event (OR = 2.31, $P < 0.001$), serious adverse events (OR = 2.00, $P = 0.003$), minor adverse event (OR = 2.43, $P < 0.001$), transfusion events (OR = 2.82, $P < 0.001$), prolonged operative time (mean + 1 SD [standard deviation], 175 minutes, OR = 2.16, $P < 0.001$), and readmission within 30 days of surgery (OR = 2.49, $P < 0.001$) (Fig. 1).

Conclusion: Compared to TSA performed for OA, TSA performed for fracture is associated with higher rates of perioperative complications even after controlling for baseline differences between patient populations. This is important for patient counseling, care pathway development, and cost predictions.