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CLINICAL OUTCOMES OF ANATOMIC VERSUS REVERSE TOTAL SHOULDER ARTHROPLASTY FOR PRIMARY OSTEOARTHRITIS WITH AN INTACT ROTATOR CUFF AND PREOPERATIVE EXTERNAL ROTATION WEAKNESS

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Background: Anatomic and reverse total shoulder arthroplasty (aTSA and rTSA) are well-established modalities for patients with primary osteoarthritis and an intact cuff. However, it is unclear whether aTSA or rTSA provide superior outcomes in patients with preoperative external rotation (ER) weakness.

Methods: A retrospective review of a single-institution prospectively-collected shoulder arthroplasty database was performed between 2007-2020. Patients were excluded for preoperative diagnosis of nerve injury, infection, or fracture. Analysis included 403 aTSAs and 213 rTSAs performed for primary cuff-intact osteoarthritis with 2-year minimum follow-up. Defining preoperative ER weakness as strength less than 10 pounds, 3 cohorts were matched 1:1: (1) non-weak aTSAs (n=79) to weak aTSAs, (2) non-weak rTSAs (n=44) to weak rTSAs, and (3) weak rTSAs (n=95) to weak aTSAs. We compared ROM, outcome scores, strength, complications, and revision rates at latest follow-up.

Results: Weak aTSAs had significantly greater pre- to postoperative improvements in active internal rotation (IR) score and ER strength compared to non-weak aTSAs; no differences in postoperative outcomes nor complication and revision rates were found. Non-weak rTSAs had significantly better postoperative SPADI, SST, ASES, Constant, and ER strength compared to weak rTSAs. Pre- to postoperative improvement was significantly greater for weak rTSAs compared to non-weak rTSAs for SST, active forward elevation (FE), ER strength, and FE strength. There was no difference in complications or revision rates between non-weak and weak rTSAs. Weak rTSA had greater postoperative SPADI, ASES, UCLA, Constant, active ER, and active FE compared to weak aTSAs. Pre- to postoperative improvement was greater for weak rTSA for SPADI, ASES, UCLA, Constant, active FE, passive FE, active abduction, and FE strength. There was no difference in complications for weak rTSA and aTSA, but weak rTSA had a lower revision rate (1% vs. 9%, P=.015). Additionally, a greater proportion of weak rTSAs achieved minimal clinically important difference and substantial clinical benefit compared to weak aTSAs.

Conclusions: In preoperatively weak patients with primary osteoarthritis and an intact cuff, rTSA appears to lead to greater improvements in functional and clinical outcomes than aTSA.