Anatomic versus Reverse Shoulder Arthroplasty with Glenoid Retroversion of at Least 15 Degrees in Rotator Cuff Intact Patients: A Comparison of Mid-Term Results

Johnny Kasto, Jared M Mahylis[1], Richard J Friedman[2], Josie A Elwell, Christopher Roche, Stephanie J Muh
[1]Orthopaedic Surgery, Henry Ford Health, [2]Medical University of South Carolina

INTRODUCTION: Severe glenoid deformity has been associated with inferior outcomes and higher complication rates. In patients with intact rotator cuffs, there is no clear consensus as to whether anatomic total shoulder arthroplasty (aTSA) or reverse (rTSA) shoulder arthroplasty is the optimal implant to best address this issue. The purpose of this study was to compare outcomes of aTSA versus rTSA in glenoid deformities with greater than 15° retroversion.

METHODS: A retrospective review of a large multicenter database was conducted. All patients who underwent either aTSA or rTSA with an intact rotator cuff and glenoid retroversion 15° or greater with minimum 2-year follow up were included. Range of motion (ROM), revisions, and patient-reported outcomes (PROs) including Constant Score, Simple Shoulder test (SST), American Shoulder and Elbow score (ASES), UCLA score, Shoulder Pain and Disability Index (SPADI), Shoulder Arthroplasty Smart score (SAS) were collected for all patients pre- and post-surgery.

RESULTS: Overall, 336 patients were included with 187 receiving an aTSA and 149 rTSA. Reverse patients overall had more comorbidities (75.0% vs. 65.1% p=0.053) and were older (70.9 ± 7.0 years vs. 66.3 ± 7.7 years $p < 0.001$). Average follow up for the aTSA group was 62.0 ± 37.8 months versus 40.6 ± 22.9 months for rTSA ($p< 0.001$). Preoperative retroversion in the anatomic group averaged 20.7 ± 5.5 degrees vs. 24.2 ± 7.7 in reverse patients ($P < 0.001$). Both groups demonstrated significant improvements in all PROs and ROM from pre- to post-surgery ($p<0.05$). At latest follow up aTSA patients had significantly better internal rotation scores (4.9 ± 1.6 versus 4 ± 1.8, P=0.000), external rotation (50 ± 19 versus 38 ± 18 $p < 0.05$), and SAS scores (80.2 ± 13.5 versus 76.6 ± 11.3, P=0.017) but worse pain VAS (1.5 ± 2.3 vs. 0.9 ± 1.9 $p = 0.016$). There was no significant difference in abduction or forward elevation or PROs (Shoulder function, SST, Constant, ASES, UCLA, or SPADI). Overall revision rate (7% vs. 1% p =0.002) was higher in aTSA.

DISCUSSION AND CONCLUSION: ATSA and rTSA results in significant improvements patients with glenoid retroversion equal or greater than 15 degrees. Anatomic TSA patient have better postoperative internal rotation score, external rotation, and SAS score but demonstrated no other significant improvement in ROM or PRO. However, there was significantly higher rate of complications and revisions with short to mid-term follow up following aTSA.