Anatomic Versus Reverse Total Shoulder Arthroplasty For Primary Osteoarthritis with an Intact Rotator Cuff in Patients with Minimal Glenoid Deformity

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INTRODUCTION: The optimal management of rotator cuff-intact glenohumeral osteoarthritis (RCI-GHOA) in patients who have not benefited from nonoperative management is now regularly debated, with many surgeons opting for reverse total shoulder given similar functional outcomes and potentially lower long term revision risk. Numerous studies have compared anatomic and reverse total shoulder arthroplasty (aTSA, rTSA) in patients with RCI-GHOA; however, glenoid deformity is not controlled for in these studies. Eccentric glenoid wear is a risk factor for failure after aTSA, potentially biasing previous studies. In order to better assess the differences between aTSA and rTSA in patients with GHOA, we sought to compare clinical outcomes in a cohort patients with no glenoid bone loss.

METHODS: A retrospective review of a multicenter shoulder arthroplasty database was performed between 2007 and 2020. All shoulders undergoing primary aTSA (n=444) or rTSA (n=236) for RCI-GHOA with a Walch A1 or B1 glenoid were identified. Matched cohorts were conceived based on age, sex, follow-up, Walch classification, history of prior surgery, preoperative shoulder arthroplasty smart (SAS) score, preoperative forward elevation, and preoperative abduction. Clinical outcomes including range of motion, outcome scores, and rates of complications and reoperations were compared.

RESULTS: At a mean 3.2 years postoperatively, aTSAs demonstrated more favorable abduction (146±27° vs. 133±26°, P<.001), internal rotation score (4.6±1.3 vs. 4.1±1.3, P=.004), external rotation (53±15° vs. 43±14°, P<.001), Constant score (73.6±10.5 vs. 70.5±12.8, P=.039), and SAS score (81.1±9.7 vs. 77.2±10.2, P=.002). However, when evaluating pre-to-post operative improvement, only abduction remained significantly greater in the aTSA group (60° vs 47°, p=0.024). Patients undergoing aTSA achieved substantial clinical benefit (SCB) at a higher rate for abduction (78% vs. 64%, P=.034) and external rotation (61% vs. 45%, P=.034). There was no difference in the incidence of complications (4.5% vs. 1.9%, P=.336) or revision surgery (3.2% vs. 0.6%, P=.214).

DISCUSSION AND CONCLUSION: When controlling for glenoid bone loss, aTSA and rTSA continue to offer similar clinical benefit for patients with RCI-GHOA. When indicating patients for surgery, surgeons should consider the patient's desired function and activities, as aTSA patients achieved the SCB at a higher rate for abduction and external rotation. However, aside from these small differences, clinical differences between aTSA and rTSA remain small even in patients with no glenoid bone loss.