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# CLINICAL OUTCOMES OF ANATOMIC VERSUS REVERSE TOTAL SHOULDER ARTHROPLASTY FOR PRIMARY OSTEOARTHRITIS WITH PREOPERATIVE FORWARD FLEXION STIFFNESS AND AN INTACT ROTATOR CUFF

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**Background:** Both anatomic and reverse total shoulder arthroplasty (aTSA and rTSA) provide functional and clinical improvements for patients with primary osteoarthritis. One purported benefit of aTSA over rTSA is comparatively better postoperative ROM; however, it is unclear whether aTSA provides superior ROM compared to rTSA in patients with preoperative stiffness.

**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 344 aTSAs and 163 rTSAs performed for primary cuff-intact osteoarthritis with 2-year minimum follow-up. Defining preoperative stiffness as passive FE <=105°, three cohorts were matched 1:1: (1) stiff aTSAs (n=85) to non-stiff aTSAs, (2) stiff rTSAs (n=74) to non-stiff rTSAs, and (3) stiff rTSAs (n=64) to stiff aTSAs. We compared ROM, outcome scores, and complication and revision surgery rates at latest follow-up.

**Results:** Compared to non-stiff aTSAs, stiff aTSAs continued to have poorer postoperative active ER and passive FE postoperatively. While stiff rTSAs had poorer preoperative ROM and functional scores for all measures compared to non-stiff rTSAs, there were no differences between groups postoperatively. When comparing stiff aTSAs to stiff rTSAs, no significant differences in preoperative ROM or functional outcome scores were identified. However, stiff rTSAs had greater postoperative active FE (135+/-19 vs. 119+/-29,p=.001), passive FE (148+/-18 vs. 135+/-27,p=.004), and active abduction (127+/-23 vs. 109+/-29,p=.001) than stiff aTSAs. Postoperative outcome scores were more favorable in the stiff rTSA cohort for the SPADI, SST, ASES, UCLA, and Constant scores. When comparing the proportion of stiff aTSAs vs. stiff rTSAs that exceeded MCID and SCB for aTSA, stiff rTSAs demonstrated greater proportions in all measures except ER. The rate of complications did not significantly differ between stiff aTSA and stiff rTSA, but there was a higher rate of revision surgery in stiff aTSAs.

**Conclusions:** Preoperative FE stiffness leads to poorer postoperative ROM compared with non-stiff patients for aTSA, but not rTSA; however, functional score improvements are similar. Postoperative ROM and outcome scores favor rTSA when comparing stiff aTSA and stiff rTSA, indicating rTSA may have a role for patients with cuff-intact osteoarthritis and preoperative FE stiffness.