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CLINICAL OUTCOMES OF ANATOMIC VERSUS REVERSE TOTAL SHOULDER ARTHROPLASTY IN STIFF SHOULDERS WITH PRIMARY OSTEOARTHRITIS: A CASE CONTROL STUDY

*K. Hao*¹, *A. Greene*², *J. Werthel*³, *J. Wright*⁴, *J. King*⁴, *T. Wright*⁴, *T. Vailopoulos*⁴, *B. Schoch*⁵

¹ College Of Medicine, University Of Florida, Gainesville, USA

² Exactech, Inc, Gainesville, USA

³ Hôpital Ambroise-paré, Paris, FRANCE

⁴ Department Of Orthopaedic Surgery & Sports Medicine, University Of Florida, Gainesville, USA

⁵ Department Of Orthopaedic Surgery, Mayo Clinic, Jacksonville, USA

Background: The popularization of reverse total shoulder arthroplasty (rTSA) has begun to challenge the place of anatomic total shoulder arthroplasty (aTSA) as a primary procedure for rotator cuff intact glenohumeral osteoarthritis (RCI-GHOA). One purported benefit of aTSA is improved postoperative range of motion (ROM) compared to rTSA especially in internal rotation; however, patients with preoperative stiffness may require extensive soft tissue release predisposing to instability and have poorer subscapularis function. We compared clinical outcomes of aTSA and rTSA performed in stiff versus non-stiff shoulders for RCI-GHOA.

Methods: A retrospective review of an international shoulder arthroplasty database identified 1,608 aTSAs and 600 rTSAs performed for RCI-GHOA with minimum 2-year follow-up. Preoperative stiffness was defined as $\leq 0^\circ$ of passive ER. Subsequently, three cohorts were matched: stiff aTSAs (n=257) were matched 1:3 to non-stiff aTSAs, stiff rTSAs (n=87) were matched 1:3 to non-stiff rTSAs, and stiff rTSAs (n=87) were matched 1:1 with stiff aTSAs. We compared ROM, outcome scores, and the rate of complications and revision surgery at latest follow-up.

Results: Compared to non-stiff aTSAs, despite stiff aTSAs having poorer preoperative ROM and functional outcome scores for all measures assessed, only poorer postoperative active abduction, active ER, and passive ER persisted postoperatively. Similarly, stiff rTSAs had poorer preoperative ROM and functional outcome scores for all measures assessed compared to non-stiff rTSAs, but only poorer active abduction, active ER, and passive ER persisted. When comparing stiff rTSAs to matched stiff aTSAs, no significant differences in preoperative ROM or functional outcome scores were found. However, stiff aTSAs had greater postoperative active IR score, active ER, and passive ER. Postoperative outcome scores were similar across all matched cohort comparisons despite motion differences. The rate of complications and need for revision surgery did not differ between any group comparisons.

Conclusions: Patients with RCI-GHOA and preoperative rotational stiffness have poorer postoperative ROM compared with non-stiff patients following both aTSA and rTSA. Notably, preoperative limitations in passive ER do not appear to be a limitation to utilizing aTSA. Indeed, patients with limited preoperative ER treated with aTSA had greater postoperative rotation compared to those treated with rTSA.