Effect of primary diagnosis on return to sport after reverse total shoulder arthroplasty

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INTRODUCTION: Historically, reverse total shoulder arthroplasty (RSA) has been performed for revision cases, fractures or rotator cuff arthropathy (RTCA); however, indications are broadening to include primary osteoarthritis (OA). Recent evidence suggests that RSA performed for OA results in superior clinical outcomes as compared to RSA for RTCA. Despite this, there is a reduced return to sport and activity rate in patients that undergo RSA. The purpose of this investigation was to evaluate the effect of primary diagnosis on return to sport after RSA.

METHODS: A retrospective study was performed using a large institutional database to identify patients who received RSA for OA, RTCA, or massive cuff tear without arthritis (MCT) between September 2015 and October 2019 with minimum two-year clinical follow-up. All patients were called over the phone to answer a seven-question survey regarding which sports they played within three years before surgery and the level to which they were able to return to their sports after surgery. Sports were categorized into level of intensity, High/moderate demand (singles tennis, martial arts, squash, weightlifting, etc.) and low demand (golf, cycling, running, swimming, etc). Patient demographics, as well as pre and postoperative patient reported outcomes (PROs) and range of motion (ROM) were recorded from the database. PROs included Visual Analog Scale (VAS) for pain, American Shoulder and Elbow Surgeon's (ASES) score, and Single Assessment Numeric Evaluation (SANE) score. Descriptive statistics and univariate analysis were performed to assess for differences between patients who did not return to sport or did so at lower level after surgery and those that did return at same or higher level. Multivariate logistic regression was performed to assess predictors of returning to sports after RSA.

RESULTS: 106 patients who played sports within three years of their shoulder surgery were identified. Of these patients, 10 (9.4%) did not return to playing sports, 12 (20.7%) returned at a lower level, and 84 (79.2%) returned at the same or higher level. 18 patients (17.0%) played a high/moderate demand sport while 88 (83.0%) played a low demand sport. 68 (64.2%) patients had a preoperative diagnosis of OA and 38 (35.2%) had a diagnosis of RCTA or MCT. History of prior surgery was different between the OA and RTCA/MCT groups (14 vs 23, p<0.001) however, Age, BMI, Gender, and ASA score were similar between groups (Table I). As compared to patients returning at the same or higher level of athletic activity, patients who did not return to sports or did so at a lower level had higher preoperative pain (P = 0.007), lower preoperative and post operative ASES scores (p= 0.004 and p= 0.016, respectively), less preoperative and postoperative forward elevation (p = 0.004 and p= 0.019, respectively) and lower postoperative external rotation (p=0.004) (Table II). More patients with an OA diagnosis returned to sport as compared to RTCA (p=.003) (Table I). Logistic regression showed that a diagnosis of OA is a significant predictor of returning to sports while controlling for the intensity of the sport (OR = 6.3; P = 0.018).

DISCUSSION AND CONCLUSION: This study demonstrated preoperative pain and function as well as a primary diagnosis of OA were significant for patients returning to the same or higher level of sport participation after RSA as compared to rotator cuff disease. These results are useful for establishing expectations with patients in regards to their activity level after RSA.

Table I: Demographics by diagnosis after RSA

	OA n = 68	Cuff n = 38	P-Value
High Intensity Sport Pre-op	13 (19.1%)	5 (13.2%)	0.607
Returned to Sports	65 (95.6%)	31 (81.6%)	0.033*
Returned at a same or higher level	56 (82.4%)	28 (73.7%)	0.420
Age	71.8 ± 5.2	73.7 ± 7.2	0.167
BMI	30.4 ± 6.3	28.3 ± 4.9	0.059
Female Sex	37 (54.4%)	20 (52.6%)	1.000
ASA			
1	3 (4.4%)	0	
2	48 (70.6%)	30 (78.9%)	0.470
3	17 (25.0%)	8 (21.1%)	
History of Prior Shoulder Surgery	14 (20.6%)	23 (60.5%)	<0.001*

Table II: Clinical Outcomes by Return to Sports Status after RSA

Parameter	Return to sports status: Same or Higher Level n = 84	Lower Level or Not at All n = 22	P-Value
Pain			
Pre	5.0 ± 2.3	6.7 ± 2.6	0.007*
Post	0.5 ± 1.0	1.1 ± 1.6	0.180
Change	-4.5 ± 2.5	-5.7 ± 3.3	0.031*
SANE			
Pre	32.1 ± 19.7	26.3 ± 24.0	0.309
Post	88.2 ± 16.5	82.1 ± 14.6	0.027*
Change	56.1 ± 23.5	55.8 ± 25.3	0.957
ASES			
Pre	43.0 ± 16.6	29.5 ± 18.7	0.004*
Post	87.1 ± 12.3	79.9 ± 14.4	0.016*
Change	44.2 ± 20.1	50.3 ± 23.1	0.261
Forward Elevation			
Pre	94 ± 26	79 ± 31	0.037*
Post	142 ± 17	129 ± 21	0.019*
Change	47 ± 26	51 ± 31	0.613
External Rotation			
Pre	28 ± 15	25 ± 15	0.456
Post	55 ± 22	41 ± 17	0.004*
Change	27 ± 25	17 ± 17	0.027*
Internal Rotation			
Pre	1.3 ± 1.8	0.5 ± 0.9	0.027*
Post	3.8 ± 2.4	2.9 ± 2.0	0.085
Change	2.5 ± 2.5	2.5 ± 1.9	0.984