Anatomic versus Reverse Total Shoulder Arthroplasty: A Comparison in Patients with a Single Assessment Numeric Evaluation of 95 and over

Casey Michelle Beleckas [1], Daniel F Schodlbauer, Albert Mousad, Jonathan Chad Levy[2]
[1]Levy Shoulder To Hand Center At the Paley Orthoped, [2]Levy Shoulder to Hand Center at the Paley Orthopedic & Spine Institute

INTRODUCTION:

Reports of equivalent patient reported outcomes between anatomic shoulder arthroplasty (TSA) and reverse shoulder arthroplasty (RSA) have contributed to a growing preference for RSA. While many surgeons believe the best TSA outcome can outperform the best RSA outcome, this has not yet been demonstrated in the literature. The purpose of this study is to investigate the outcome characteristics of TSA and RSA patients who perceive their shoulder is close to normal, with the hypothesis that TSA patients will outperform RSA patients.

METHODS:

A retrospective query of our institution's data repository from 2006 to 2021 identified primary anatomic and reverse total shoulder arthroplasty patients with minimum 2-year follow-up and a most recent Subjective Assessment of Normal Evaluation (SANE) score ≥ 95. Anatomic and reverse shoulder arthroplasty patients were compared based on patient-reported outcome measures (PROM), range of motion (ROM), and satisfaction. Specific PROM questions representative of higher functional demands were analyzed and a subset analysis of patients treated for osteoarthritis with an intact rotator cuff was performed.

RESULTS:

The query identified 849 TSA and 745 RSA patients with minimum 2-year follow-up. Of these, 40% (337) of TSA and 26% (193) of RSA patients reached a SANE score ≥ 95 at most recent follow-up. TSA significantly outperformed RSA in American Shoulder and Elbow Surgeons (ASES) total score, ability to reach a high shelf, lift 10lbs, perform usual work and perform usual sport (p<.001), Simple Shoulder Test (SST) total score, ability to lift 8lbs and carry 20lbs (p<.001), Visual Analog Score (VAS) pain (p=.048), ROM including clinician measured and patient reported elevation, abduction, external rotation, and internal rotation (p<.001), external rotation strength (p<.001), and patient satisfaction (p=.028). A sub-analysis among patients treated for osteoarthritis with an intact rotator cuff produced similar results, with TSA patients outperforming RSA patients in nearly every higher demand function.

DISCUSSION AND CONCLUSION:

The results of this study demonstrate that among TSA and RSA patients who perceive a near normal shoulder, TSA patients outperform RSA patients at higher demand activities.

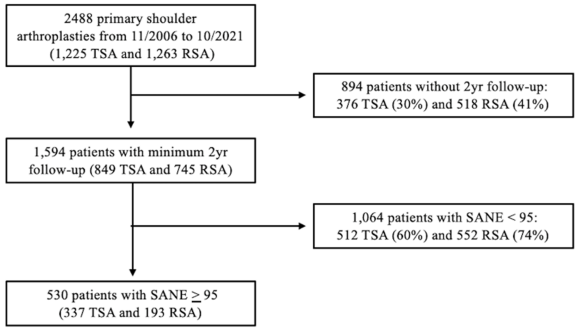

Figure 1. A Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) flow diagram displaying number of and reason why patients were excluded. TSA, Total Shoulder Arthroplasty; RSA, Reverse Shoulder Arthroplasty; SANE, Single Assessment Numeric Evaluation.

Table I. TSA versus RSA Outcomes in Patients with a SANE Score ≥ 95

	TSA (n=337)		RSA (n=193)		P
	n	Median (IQR), Mean ± SD or N (%)	n	Median (IQR), Mean ± SD or N (%)	
SANE					
Preoperative	228	43 (21-67)	145	35 (11-60)	**.011**
Most Recent	337	99 (97-100	193	98 (97-100)	.135
ASES	319	98 (92-100)	175	93 (87-98)	**<.001**
Reach shelf[†]		281 (88.1)		112 (64.0)	**<.001**
Lift 10lbs above shoulder[†]		230 (72.1)		71 (40.6)	**<.001**
Perform usual work[†]		296 (92.8)		116 (66.3)	**<.001**
Perform usual sport[†]		255 (79.9)		95 (54.3	**<.001**
SST	331	12 (10-12)	190	10 (8-12)	**<.001**
Lift 8lbs to shoulder level[‡]		280 (84.6)		114 (60.0)	**<.001**
Carry 20lbs at side[‡]		280 (84.6)		120 (63.2)	**<.001**
VAS Function	337	10 (9-10)	193	10 (9-10)	.253
VAS Pain	329	0.2 ± 0.8	192	0.7 ± 2.2	**.048**
CM-ROM					
Elevation	300	150 (140-160)	186	140 (130-150)	**<.001**
Elevation ≥120°		289 (96.3)		173 (93.0)	.100
Abduction	299	100 (90-120)	186	95 (90-100)	**<.001**
External Rotation	299	60 (45-60)	186	40 (30-50)	**<.001**
Internal Rotation*	296	8 (6-8)	176	6 (4-8)	**<.001**
PR-ROM			193		
Elevation	327	170 (170-170)		170 (145-170)	.060
Elevation ≥120°		323 (98.8)		187 (96.9)	.130
Abduction	326	161.1 ± 20.9		152.4 ± 30.5	**<.001**
Internal Rotation*	327	8 (8-10)		6 (6-8)	**<.001**
Strength (=5/5)	298		184		
Deltoid		296 (99.3)		183 (99.5)	.859
Supraspinatus		285 (95.6)		168 (91.3)	.052
External Rotation		295 (99.0)		165 (89.7)	**<.001**
Internal Rotation		292 (98.0)		183 (99.5)	.189
Satisfaction	337		192		**.028**
Excellent		323 (95.8)		177 (92.2)	
Good		9 (2.7)		14 (7.3)	
Satisfactory		5 (1.5)		1 (0.5)	
Unsatisfactory		0		0	
Same procedure again? (yes)	337	321 (95.3)	192	179 (93.2)	.326

[†]Patients that reported 3 (no difficulty). [‡]Patients that reported "Yes" (able to do). *Internal rotation was scored on a 10-point scale using the following conversions: buttock/greater trochanter=2, sacrum–L4=4, L1–L3=6, T8–T12=8, T1–T7=10. TSA, Total Shoulder Arthroplasty; RSA, Reverse Shoulder Arthroplasty; SANE, Single Assessment Numeric Evaluation; IQR, Interquartile Range; SD, Standard Deviation; ASES, American Shoulder and Elbow Surgeons; SST, Simple Shoulder Test; VAS, Visual Analog Scale; CM, Clinician-Measured; PR, Patient-Reported; ROM, Range of Motion