

A Propensity Score-Matched Analysis on the 2-year Outcomes of Anatomic and Reverse Shoulder Arthroplasty for Glenohumeral Osteoarthritis

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INTRODUCTION:

Reverse shoulder arthroplasty (RSA) is increasingly being utilized for the treatment of primary osteoarthritis. However, limited data are available regarding the outcomes of RSA as compared with anatomic total shoulder arthroplasty (TSA) in the setting of osteoarthritis.

METHODS:

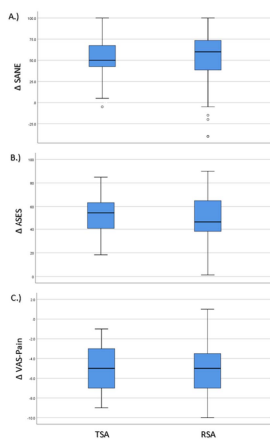
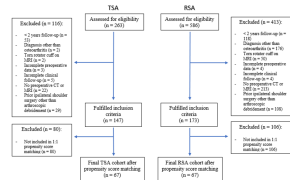
We performed a retrospective matched-cohort study of patients who had undergone TSA and RSA for the treatment of primary osteoarthritis and who had a minimum of 2 years of follow-up. Patients were propensity score-matched by age, sex, body mass index (BMI), preoperative American Shoulder and Elbow Surgeons (ASES) score, preoperative active forward elevation, and Walch glenoid morphology. Baseline patient demographics and clinical outcomes, including active range of motion, ASES score, Single Assessment Numerical Evaluation (SANE), and visual analog scale (VAS) for pain, were collected. Clinical and radiographic complications were evaluated.

RESULTS:

One hundred and thirty-four patients (67 patients per group) were included; the mean duration of follow-up (and standard deviation) was 30 ± 10.7 months. No significant differences were found between the TSA and RSA groups in terms of the baseline or final VAS pain score (p = 0.99 and p = 0.99, respectively), ASES scores (p = 0.99 and p = 0.49, respectively), or SANE scores (p = 0.22 and p = 0.73, respectively). TSA was associated with significantly better postoperative active forward elevation (149° ± 13° versus 142° ± 15°; p = 0.003), external rotation (63° ± 14° versus 57° ± 18°; p = 0.02), and internal rotation (≥L3) (68.7% versus 37.3%; p < 0.001); however, there were only significant baseline-to-postoperative improvements in internal rotation (gain of ≥4 levels in 53.7% versus 31.3%; p = 0.009). The overall complication rate was 4.5% (6 of 134), with no significant difference between TSA and RSA (p = 0.99). Radiolucent lines were observed in association with 14.9% of TSAs, with no gross glenoid loosening. One TSA (1.5%) was revised to RSA for the treatment of a rotator cuff tear. No loosening or revision was encountered in the RSA group.

DISCUSSION AND CONCLUSION:

When performed for the treatment of osteoarthritis, TSA and RSA resulted in similar short-term patient-reported outcomes, with better postoperative range of motion after TSA. Longer follow-up is needed to determine the ultimate value of



	Arthroplasty Type		P-Value
	TSA (n = 67)	RSA (n = 67)	
Mean Clinical Follow-Up (mo)**	32.8 ± 13.4	37.2 ± 6.8	<0.001*
Age (yr)**	67.4 ± 7.7	67.3 ± 5.5	0.98
Sex (Female)§	39 (58.2%)	41 (61.2%)	0.73
BMI (kg/m ²)**	30.6 ± 6.6	32.5 ± 6.9	0.12
ASA Physical Status Score***	2.1 ± 0.5	2.2 ± 0.5	0.55
Prior Ipsilateral Shoulder Surgery§	7 (10.4%)	11 (16.4%)	0.45
Walch Classification§			
A1	25 (37.3%)	17 (25.4%)	0.14
A2	1 (1.5%)	7 (10.4%)	0.06
B1	3 (4.5%)	4 (6.0%)	0.99
B2	24 (35.8%)	19 (28.4%)	0.12
B3	10 (14.9%)	15 (22.4%)	0.27
C	3 (4.5%)	3 (4.5%)	0.99
D	1 (1.5%)	2 (3.0%)	0.99

*ASA = American Society of Anesthesiologists.
 **Significant values with alpha risk set at 0.05.
 ***The values are expressed as mean ± standard deviation.
 §The values are expressed as the number of patients, with the percentage in parentheses.

Outcome	TSA (N = 67)	RSA (N = 67)	P-Value
VAS pain score§			
Preoperative	6 (3)	5 (6)	0.99
Postoperative	9 (0)	0 (0)	0.99
Change	-5 (6)	-5 (6)	0.86
SANE score§			
Preoperative	48 (23)	50 (30)	0.22
Postoperative	95 (10)	95 (10)	0.73
Change	50 (30)	60 (37)	0.08
ASES score			
Preoperative†	38.3 (22)	38 (27)	0.99
Postoperative†	95 (11.7)	93.3 (33.3)	0.49
Change†	54.7 (23.3)	47 (27)	0.17
Achieved MCEB (no. of patients) §	67 (100%)	65 (97%)	0.5
Achieved SCB (no. of patients) §	64 (95.5%)	62 (92.5%)	0.72
Forward elevation (deg)**			
Preop.	98.1 ± 25	99.4 ± 26	0.77
Postop.	148.9 ± 13	141.7 ± 15	0.003†
Change	50.8 ± 27	42 ± 28	0.08
External rotation (deg)**			
Preop.	29.1 ± 10	25 ± 13	0.64†
Postop.	63 ± 14	56.9 ± 18	0.02†
Change	34.2 ± 13	31.9 ± 20	0.43
Internal rotation (no. of patients) §			
Preop.			
Hip-L4	60 (89.6%)	63 (94%)	0.89
L3-T12	7 (10.4%)	4 (6%)	
Postop.			
Hip-L4	21 (31.3%)	42 (62.7%)	<0.001†
L3-T12	44 (65.7%)	22 (32.8%)	<0.001†
T11-T9	2 (3%)	3 (4.5%)	0.99
Change			
Loss or no change	11 (16.4%)	11 (17.9%)	0.82
Gain of 1-3 levels	20 (29.9%)	34 (50.7%)	0.01†
Gain of 4-6 levels	28 (41.8%)	17 (25.4%)	0.04†
Gain of ≥7 levels	8 (11.9%)	4 (6%)	0.22

*ASES = American Shoulder and Elbow Surgeons; VAS = Visual Analog Scale.
 †SANE = Single Assessment Numeric Evaluation.
 ‡Significant values with alpha risk set at 0.05.
 §The values are expressed as the median, with the width of the interquartile range in parentheses.
 **The values are expressed as mean ± standard deviation.
 ††The values are expressed as the number of patients, with the percentage in parentheses.