Comparing One vs. Two Year Patient-Reported Outcomes After Reverse Shoulder Arthroplasty for Proximal Humerus Fractures

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INTRODUCTION: Reverse shoulder arthroplasty (RSA) has become an increasingly popular treatment option for complex proximal humerus fractures in elderly patients, with studies demonstrating favorable and predictable short-term clinical results. However, while significant improvements in patient-reported outcome measures (PROMs) have been reported following RSA, there is limited data comparing the clinical relevance of changes in PROMs between 1 and 2 years postoperatively. This study aimed to evaluate whether there are clinically significant differences in PROMs and clinically significant outcomes (CSOs) between 1 and 2 years after RSA for acute proximal humerus fractures.

METHODS: A retrospective analysis of prospectively collected data was conducted on 64 patients who underwent RSA for acute proximal humerus fractures. PROMs, including the Visual Analog Scale (VAS) for pain, Single Assessment Numeric Evaluation (SANE), and American Shoulder and Elbow Surgeons (ASES) score, as well as range of motion measurements for forward flexion and external rotation, were assessed at 1 and 2 years postoperatively. CSOs, such as the patient acceptable symptom state (PASS), were determined for each PROM and range of motion measurement. Linear regression analysis was performed to identify demographic and clinical factors associated with changes in PROMs between 1 and 2 years.

RESULTS: The mean VAS score improved from 1.4 ± 0.7 at 1 year to 1.3 ± 0.8 at 2 years, but this change was not statistically significant (p=0.672). The mean SANE score improved from 73.8 ± 9.1 at 1 year to 75.4 ± 8.6 at 2 years (p<0.001), and the mean ASES score improved from 74.3 ± 5.6 at 1 year to 75.7 ± 6.2 at 2 years (p=0.005). Forward flexion improved from $119.8\pm17.0^{\circ}$ at 1 year to $121.1\pm16.4^{\circ}$ at 2 years, but this change was not statistically significant (p=0.070). External rotation improved from $15.7\pm7.2^{\circ}$ at 1 year to $16.7\pm7.4^{\circ}$ at 2 years (p=0.019). The proportion of patients achieving PASS for VAS, SANE, ASES, forward flexion, and external rotation was 98.4%, 64.1%, 46.9%, 54.7%, and 39.1% at 1 year, respectively, and 95.3%, 68.8%, 56.3%, 59.4%, and 51.6% at 2 years, respectively. Regression analysis revealed that dominant side, NEER grade, and BMI were associated with changes in VAS scores between 1 and 2 years,

while the use of cement and anatomic healing were associated with changes in ASES scores and external rotation during this period.

DISCUSSION AND CONCLUSION: Although statistically significant improvements in SANE and ASES scores were observed between 1 and 2 years after RSA for acute proximal humerus fractures, the clinical relevance of these changes may be limited. The proportion of patients achieving PASS for each

PROM and range of motion measurement remained relatively stable or improved slightly between 1 and 2 years postoperatively. These findings suggest that 1-year postoperative PROMs may be sufficient for assessing outcomes after RSA for proximal humerus fractures in most patients. However, specific factors such as dominant side, NEER grade, BMI, use of cement, and anatomic healing may influence changes in certain PROMs and range of motion measurements between 1 and 2 years

postoperatively.

		Clinical Metrics Over Time	
	100		ASS VAS
	90		
	80		ASS SANE
cent	70	<u> </u>	ASS ASES
Per	60		
	50		ASS Flexion
	40		
	30	2	ASS External otation
		Months	

Age (Years)	Mean±SD	74.4±8.
Side	Right	25 (39%
	Left	39 (61%
Dominant Side	Yes	27 (42%
	No	47 (58%
NEER	1	26 (41%
	2	14 (229
	3	9 (149
	4	15 (239
BMI	Mean±SD	30.3±8
Sex	Female	42 (669
	Male	22 (349
Cemented	Yes	29 (459
	No	35 (559
Anatomic Healing	Yes	39 (619
Anatomic frequing	No	25 (39)
O	Vee	2 (60
Complications	No	61 (959
Revision	Yes	4 (69
	No	64 (949

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	VAS		SANE		ASES		Floxion		External Rotation		
Variable	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value	
Age Side	0.01	0.974	0.01	0.848	0.01	0.932	0.02	0.744	0.09	0.071	
Dominant NEER	0.70 0.26	0.002	-1.02 -0.28	0.253 0.439	0.31 0.10	0.748	2.47 0.40	0.103	-0.54 -0.12	0.499	
0.00	0.02	0.008	0.01	0.827	0.02	0.778	0.01	0.059	0.08	0.164	

NEER	0.26	0.003	-0.28	0.439	0.10	0.908	0.40	0.511	-0.12	0.712
BMI	0.03	0.028	-0.01	0.827	-0.02	0.776	0.01	0.928	-0.06	0.154
Sex	0.34	0.119	-0.61	0.505	-1.52	0.126	-0.82	0.593	-1.45	0.078
Comented	-0.05	0.800	-0.72	0.395	-2.75	0.004	-1.18	0.412	-2.12	0.007
Anatomic Healing	-0.15	0.477	0.82	0,349	-2.07	0.031	-1.88	0.206	-0.80	0.308