Os Acromiale Displacement Does Not Affect Outcomes in Reverse Total Shoulder Arthroplasty

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INTRODUCTION: The clinical significance of os acromiale on outcomes after reverse total shoulder arthroplasty (rTSA) is poorly elucidated in the literature. One possible complication of rTSA in shoulders with an os acromiale is displacement of the os acromiale. The purpose of this study was to compare the clinical outcomes in shoulders with an os acromiale with imaging evidence of postoperative displacement to those that did not displace.

METHODS: This study is a retrospective review of a prospectively-collected shoulder arthroplasty database for patients who underwent primary rTSA with a minimum 2-year clinical follow-up. Imaging studies (pre- and post-operative) taken within 6 months of surgery were assessed for an os acromiale and displacement of the free fragment postoperatively. Imaging was reviewed by two independent reviewers. Identification and measurement of displacement was done utilizing the established Critical Shoulder Angle and a new measurement termed the Os Displacement Angle (ODA). The ODA is represented by the angle of the free os acromiale fragment in reference to the superior border of the scapula (**Figure I**). The ODA was assessed for inter-rater reliability. Any change in angle greater than 5° from pre-operative to postoperative imaging was considered a displacement. The outcomes of displaced shoulders were compared to those of non-displaced acromiale shoulders including active range of motion and clinical outcome scores (SPADI, SST, ASES, UCLA, and Constant score).

RESULTS:

The incidence of os acromiale was 9.8% (64/663) in our institution. 20% demonstrated displacement postoperatively (n=13). The mean age at surgery for the non-displaced group (n=51) was 69.2 ± 6.9 years, 49.0% were female, and mean follow-up was 5.2 ± 3.0 years. The average age for the displaced group (n=13) was 70.3 ± 7.3, 53.8% were female, and the mean follow up was 5.2 ± 3.9 years. Inter-rater reliability (Intraclass Correlation Coefficient) of the ODA is 0.97 [0.93-0.98]. The mean change in ODA angle was 14.7° ± 9.5°, and the range of angle change was -7.5° to 27.7°. Analysis identified no statistically significant differences in outcomes between the two groups (**Table I**).

DISCUSSION AND CONCLUSION: Our results demonstrate that the displacement of the os acromiale free fragment following rTSA does not have a negative impact on outcomes.

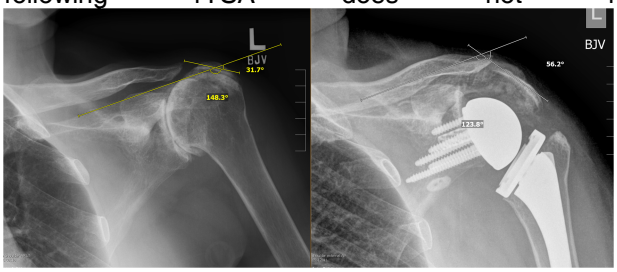

Table I. Comparison of clinical outcomes between patients with displaced versus nonintained os acromiale.

Outcome measure	Displaced (n=12)	Maintained (n=52)	*P* (raw)	*P* (adj)*
Preoperative				
SPADI score	70.7 ± 14.4	69.3 ± 13.8	.772	.947
SST score	3.4 ± 2.4	3.9 ± 2.3	.509	.934
ASES score	39.6 ± 12.9	36.4 ± 14.6	.465	.934
UCLA score	12.4 ± 3.5	13.9 ± 4.0	.224	.934
Constant score	37.6 ± 17.8	38.1 ± 13.4	.923	.947
Active ER (°)	26 ± 16	21 ± 23	.396	.934
Active FE (°)	74 ± 31	81 ± 36	.500	.934
Active IR score	3.5 ± 1.8	3.9 ± 1.8	.435	.934
Active Abduction (°)	73 ± 37	77 ± 32	.702	.947
ER strength (lbs.)	7 ± 3	7 ± 4	.881	.947
FE strength (lbs.)	5 ± 2	5 ± 4	.947	.947
Postoperative				
SPADI score	26.5 ± 25.5	28.1 ± 25.8	.852	.980
SST score	8.5 ± 3.3	8.9 ± 3.3	.742	.980
ASES score	73.8 ± 23.9	73.1 ± 25.3	.931	.980
UCLA score	30.3 ± 2.3	28.7 ± 6.3	.252	.759
Constant score	60.0 ± 23.3	71.0 ± 18.9	.276	.759
Active ER (°)	34 ± 19	29 ± 20	.534	.838
Active FE (°)	112 ± 37	123 ± 25	.464	.838
Active IR score	4.7 ± 2.3	4.7 ± 1.9	.980	.980
Active Abduction (°)	96 ± 40	117 ± 30	.221	.759
ER strength (lbs.)	8 ± 5	10 ± 6	.438	.838
FE strength (lbs.)	6 ± 4	10 ± 7	.063	.694
Improvement				
SPADI score	-44.1 ± 22.0	-44.7 ± 24.8	.939	.939
SST score	5.1 ± 3.3	5.3 ± 3.4	.825	.907
ASES score	34.2 ± 23.4	40.5 ± 25.8	.430	.788
UCLA score	19.2 ± 5.6	16.8 ± 6.4	.380	.788
Constant score	25.4 ± 30.3	35.6 ± 19.0	.422	.788
Active ER (°)	14 ± 21	10 ± 24	.665	.907
Active FE (°)	36 ± 58	42 ± 41	.799	.907
Active IR score	1.7 ± 2.0	0.9 ± 2.2	.409	.788
Active Abduction (°)	22 ± 64	40 ± 38	.509	.799
ER strength (lbs.)	1 ± 3	3 ± 4	.151	.788
FE strength (lbs.)	1 ± 4	6 ± 6	**.032**	.350

ASES, American shoulder and elbow surgeons; ER, external rotation; FE, forward elevation; IR, internal rotation; SPADI, shoulder pain and disability index; SST, simple shoulder test; UCLA, University of California, Los Angeles.
Values represent mean ± standard deviation unless otherwise noted. Bold indicates statistical significance.
*P values are adjusted for multiple comparisons using the Benjamini and Hochberg False Discovery Rate.