Influence of Os Acromiale on Outcomes after Reverse Total Shoulder Arthroplasty

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INTRODUCTION:

The reverse total shoulder arthroplasty (rTSA) has been studied extensively, with current literature focusing on mitigating risk and improving patient outcomes. This includes understanding preoperative conditions that may predispose patients to risk or poor postoperative outcomes. Preoperative os acromiale is notable for patients undergoing rTSA given the increased deltoid tension after rTSA, which may lead to acromial displacement or tilting which may affect outcomes. There are a few studies with small sample sizes that have reported on the outcomes of rTSA patients with an os acromiale. The purpose of this study was to report the clinical outcomes in a large cohort of rTSA patients with a preexisting os acromiale.

METHODS: We conducted a retrospective review of a prospectively-collected shoulder arthroplasty database that included patients who underwent primary rTSA with a minimum 2-year clinical follow up. Preoperative imaging studies of included patients were assessed for an os acromiale. Patients with an os acromiale were identified and placed into their own sample group, with patients found not to have an os acromiale serving as a comparator. MRIs or CT scans were used when available to determine the presence of an os acromiale, with x-ray utilized if no advanced imaging was available. Clinical outcome scores (ASES score, Constant score, SPADI, SST, and UCLA score) and active range of motion (ROM) were assessed preoperatively and at latest follow up. Scores were compared between patients found to have an os acromiale and a matched control group without an os acromiale (matched 1:6 based on age (within 3 years), sex, preop ASES score (within 5 points), and primary preop diagnosis). A multivariable linear regression was conducted to assess the influence of an os acromiale on clinical outcomes following rTSA.

RESULTS: The mean age at surgery for the control group (n=210) was 69.9 ± 7.4 years, 48.6% were female, and mean follow up was 4.2 ± 2.9 years. The average age for the os acromiale group (n=35) was 69.4 ± 6.6, 48.6% were female. Mean follow up was 5.1 ± 2.8 years. Multivariable analysis showed there were no statistically significant differences between os acromiale vs. controls preoperative outcome scores or ROM (Table I). While postoperative scores showed os acromiale patients demonstrated better scores with statistical significance in the SST, UCL, Constant score, active forward extension and abduction, there were no scores that met MCID (Table I). For improvement in outcomes, the SPADI, SST, and UCLA scores were statistically better for os acromiale patients; however, they did not meet MCID (Table I). The presence of an os acromiale was not independently associated with poorer outcomes in patients following rTSA.

DISCUSSION AND CONCLUSION:

Our results demonstrate that an os acromiale alone does not independently influence clinical or ROM outcomes following rTSA, which is consistent with previous literature. Patients found to have an os acromiale on preoperative imaging may safely undergo rTSA and expect similar outcomes to patients without it.

Table I. Comparison of clinical outcomes between shoulders with vs. without os acromiale.

Outcome measure	Control (n=210)		Os Acromiale (n=35)		*P* value
Preoperative					
SPADI score	210	69.5 ± 13.8	35	71.8 ± 12.3	.325
SST score	209	3.5 ± 2.4	35	3.3 ± 2.3	.630
ASES score	210	34.7 ± 14.2	35	32.9 ± 13.2	.476
UCLA score	191	13.4 ± 3.8	31	12.9 ± 3.9	.511
Constant score	202	38.1 ± 15.1	34	36.3 ± 13.9	.496
Active ER (°)	209	18 ± 21	34	18 ± 20	.978
Active FE (°)	208	83 ± 33	34	81 ± 33	.824
Active IR score	207	3 ± 2	33	4 ± 2	.541
Active Abduction (°)	207	78 ± 33	34	80 ± 34	.759
Postoperative					
SPADI score	205	24.7 ± 22.8	35	18.7 ± 18.0	.086
SST score	205	9.2 ± 3.1	35	10.3 ± 2.2	**.009**
ASES score	205	76.3 ± 21.7	35	82.3 ± 17.0	.069
UCLA score	147	28.8 ± 5.5	26	31.3 ± 2.9	**.001**
Constant score	147	73.1 ± 17.1	26	78.0 ± 9.4	**.037**
Active ER (°)	154	32 ± 19	27	31 ± 17	.614
Active FE (°)	154	126 ± 26	27	134 ± 14	**.016**
Active IR score	149	4 ± 2	27	5 ± 2	.263
Active Abduction (°)	153	116 ± 29	27	128 ± 21	**.009**
Improvement					
SPADI score	205	-44.5 ± 26.4	35	-53.1 ± 22.7	**.049**
SST score	204	5.6 ± 3.9	35	7.0 ± 3.7	**.047**
ASES score	205	41.2 ± 26.7	35	49.4 ± 23.5	.068
UCLA score	134	15.1 ± 7.3	24	17.8 ± 4.9	**.030**
Constant score	142	34.4 ± 23.4	25	41.6 ± 17.8	.087
Active ER (°)	154	14 ± 28	26	14 ± 18	.947
Active FE (°)	153	44 ± 41	26	50 ± 42	.494
Active IR score	148	1 ± 3	25	1 ± 2	.720
Active Abduction (°)	151	38 ± 41	26	45 ± 46	.465

ACJ, acromioclavicular joint; 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.