

# Low Success Rate of Closed Reductions when Treating Dislocations after Reverse Shoulder Arthroplasty: A Study by the ASES Complications of Reverse Shoulder Arthroplasty Multicenter Research Group

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## INTRODUCTION:

Instability is a known complication following reverse shoulder arthroplasty (RSA), but treatment patterns and outcomes remain unclear. The purpose of this study was to retrospectively identify treatment patterns, rate of successful closed reductions, and factors associated with successful closed reductions for dislocations after RSA.

## METHODS:

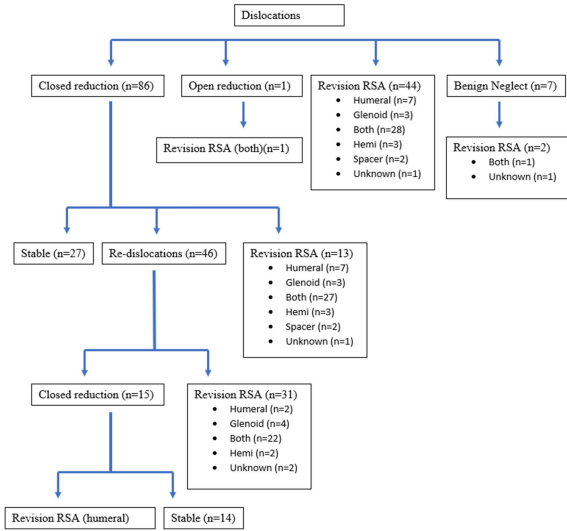
A multicenter retrospective review was performed for patients receiving primary or revision RSA from June 2013 to May 2019 across fifteen institutions in the United States, comprising 21 ASES members. Patients that sustained a postoperative shoulder dislocation with a minimum of 3-month follow up were included. The time from surgery to dislocation, nature of the dislocation, presence of a periprosthetic fracture, complications directly associated with the dislocation, initial treatment, success of closed reduction, and subsequent treatments including revision procedures were recorded. A univariate analysis was performed to identify patient factors associated with failure of an initial closed reduction attempt.

## RESULTS:

A cumulative postoperative dislocation incidence of 2.1% (n=138) was observed out of 6,621 patients undergoing RSA. The median time to dislocation was 7 weeks (interquartile range = 33 weeks), 61.6% (n=85) occurring within the first 90 days after surgery. Initial treatment consisted of closed reduction (n=86, 62.3%), open reduction (n=1, 0.7%), revision arthroplasty (n=43, 31.2%), or benign neglect (n=7, 5.1%) (Figure 1). Patients treated without an initial closed reduction had a significantly higher incidence of complications associated with the dislocation event (44.2% vs. 15.1%, P<0.001; 21.1% [n=11] implant dissociations, 7.6% [n=4] implant loosening, 17.3% [n=9] periprosthetic fractures, and 1.9% [n=1] infection). Among the patients initially treated with a closed reduction, 31.4% (n=27) were successful and required no further interventions, 53.5% (n=46) sustained an additional dislocation, 17.4% (n=15) were treated with additional closed reductions, and 52.3% (n=45) required a subsequent revision procedure. The only patient factor associated with an unsuccessful closed reduction was increased BMI (31.8±6 vs. 28.9±5.2, P=0.02) (Table 1). In total, 92 patients (66.7%) required a revision arthroplasty procedure during the study period; 15 isolated humeral component revisions, 8 isolated glenoid component revisions, 58 both component revisions, 5 conversions to hemiarthroplasty, 2 explants with placement of spacers, and 4 unknown.

## DISCUSSION AND CONCLUSION:

In this large multicenter series of postoperative dislocations following RSA, a closed reduction was initially attempted in the majority of patients (65.9%), but only one-third were successful and required no further intervention. Unsuccessful closed reductions were associated with higher patient BMIs. Approximately two-thirds of patients ultimately required a revision arthroplasty procedure.



**Table 1. Univariate analysis comparing patients with successful and unsuccessful closed reductions at initial treatment following dislocation**

Parameter	Successful Closed Reduction N = 27	Unsuccessful Closed Reduction N = 59	P-Value
Revision Arthroplasty	4 (14.8%)	15 (25.4%)	0.27
Age	70.6 ± 7.1	68.4 ± 7.4	0.22
Male:Sex	16 (59.3%)	34 (57.6%)	0.89
BMI	28.6 ± 5.0	31.8 ± 6.1	<b>0.02*</b>
ASA			
1	2 (7.7%)	1 (1.8%)	
2	12 (46.2%)	26 (46.4%)	0.41
3	12 (46.2%)	29 (51.8%)	
Subluxated before dislocation	3 (11.1%)	18 (31%)	0.06
No subcap repair	11 (40.7%)	23 (39%)	0.22
Early dislocation (within 90 days)	19 (70.4%)	37 (62.7%)	0.49
Nature of Dislocation			
Traumatic	6 (22.2%)	14 (23.7%)	
Altraumatic	17 (63%)	43 (72.9%)	0.89
Primary Dx			
GHDA	2 (7.4%)	5 (8.5%)	
CTA	19 (70.4%)	34 (57.6%)	0.16
Fracture scapulae	0	7 (11.9%)	
Prior Surgery	9 (33.3%)	26 (44.1%)	0.35
Osteoporosis	4 (14.8%)	9 (15.3%)	0.96
RA	2 (7.4%)	11 (18.6%)	0.21
Has DM	3 (11.5%)	9 (15.8%)	0.75
Smoking Status			
Never	13 (54.2%)	28 (52.8%)	
Previous	10 (41.7%)	22 (41.5%)	0.96
Current	1 (4.2%)	3 (5.7%)	
Only humeral design	9 (34.6%)	17 (29.8%)	0.66
Constrained polyethylene liner	2 (7.4%)	11 (19%)	0.21
Augmented glenoid baseplate	3 (11.5%)	6 (10.2%)	0.63
Glenosphere size >36	9 (34.6%)	25 (43.1%)	0.46
Lateralized glenosphere	18 (69.2%)	40 (67.8%)	0.90
Glenoid component lateral offset >5	12 (46.2%)	30 (50.8%)	0.69
Combined lateral offset (mm)	9.6 ± 7.2	9.7 ± 6.5	0.94

\* denotes statistical significance with alpha risk at 0.05; x ± s represents mean and standard deviation; n (%) represents number of patients and frequency within the cohort; BMI - Body Mass Index; ASA - American Society of Anesthesiologists score; GHDA - Glenohumeral Osteoarthritis; CTA - cuff tear arthropathy; includes massive rotator cuff tear; RA - Presence of Rheumatoid Arthritis; DM - Diabetes Mellitus