Does Prior Rotator Cuff Surgery Influence the Outcomes and Complications after Reverse Total Shoulder Arthroplasty?

Chul-Hyun Cho[1], Du Han Kim[2], Byung-Woo Min[3], Beom-Soo Kim, Byungchan Choi[4], Kyung-Jae Lee[1], Chul-Hyun Cho[1]
[1]Keimyung University Dongsan Hospital, [2]Keimyung University Hospital, [3]Keimyung University, [4]Department of Orthopedics, Keimyung University Dongsan Hospital

INTRODUCTION: The purpose of this study was to compare outcomes and complications in patients with and without a history of prior rotator cuff surgery who underwent reverse total shoulder arthroplasty (RTSA). This study was conducted to demonstrate the hypothesis that patients with prior rotator cuff surgery would have more complications and worse clinical outcomes.

METHODS:

Two-hundred-nine consecutive patients who underwent RTSA for cuff tear arthropathy or irreparable massive rotator cuff tear with a minimum 12-months follow-up period were reviewed. A total of 35 patients with a history of prior rotator cuff surgery were identified and formed the study (PS group). They were matched 1:3 with a control group of 105 patients without a history of prior surgery who underwent primary RTSA (NPS group). The mean follow-up period was 41.4 months. Visual analog scale (VAS) pain score, University of California Los Angeles (UCLA) score, American Shoulder and Elbow Surgeons (ASES) score, Subjective Shoulder Value (SSV), and active range of motion (ROM) were evaluated preoperatively and at the final follow-up examination. Intraoperative and postoperative complications were also evaluated.

RESULTS:

In the PS group, the mean VAS pain score, UCLA score, ASES score, and SSV showed a significant improvement from 6.3, 11.4, 32.9, and 31.1% to 1.9, 26.1, 78.3, and 75.1% after RTSA, respectively (all $p < .001$). In the NPS group, the mean VAS pain score, UCLA score, ASES score, and SSV showed a significant improvement from 6.5, 10.7, 31.6, and 29.2% to 1.2, 27.8, 82.5, and 78.9%, respectively (all $p < .001$). The PS group had significantly higher final VAS pain score than that in the NPS group ($p=0.020$). Although UCLA score, ASES score, SSV, and all ROMs in the PS group were lower than those in the NPS group, there were no significant differences between the two groups (all $p > .05$). The PS group had significantly higher incidence of acromial stress fracture than the NPS group (17.1% vs. 4.8%, $p=0.018$), but there were no significant differences between the two groups for overall complication rate (25.7% vs. 13.3%, $p=0.087$). The PS group had significantly higher reoperation rate than the NPS group (14.3% vs. 1.9%, $p=0.004$).

DISCUSSION AND CONCLUSION:

Our study revealed both groups had satisfactory clinical outcomes after RTSA in patients with cuff tear arthropathy or massive rotator cuff tear. However, a history of prior rotator cuff surgery is associated with high incidence of acromial stress fracture and reoperation after RTSA as well as high final VAS pain score. This information can be used to counsel the patients who scheduled RTSA.

Table I Demographics between two groups

Variable	Prior surgery	No prior surgery	*P* Value
Age (year)	70.6 ± 6.4	72.1 ± 5.6	0.199
Sex			0.625
Male	18 (51.4%)	49 (46.7%)	
Female	17 (48.6%)	56 (53.3%)	
Side			0.154
Right	26 (74.3%)	64 (61.0%)	
Left	9 (25.7%)	41 (39.0%)	
Diagnosis			0.919
CTA	23 (65.7%)	68 (64.8%)	
MRCT	12 (34.3%)	37 (35.2%)	
Duration of symptoms (month)	43.3 ± 42.9	29.1 ± 33.2	0.080
BMI	25.2 ± 2.9	24.4 ± 3.5	
BMD (T-score)	-1.9 ± 1.2	-2.2 ± 1.1	
Smoking			0.856
Yes	3 (8.6%)	8 (7.6%)	
No	32 (91.4%)	97 (92.4%)	
DM			0.724
Yes	7 (20.0%)	24 (22.9%)	
No	28 (80.0%)	81 (77.1%)	
Charlson Comorbidity Index			0.140
OP time (min)	81.6 ± 15.6	84.8 ± 18.2	0.352
Pre AHI	8.3 ± 4.1	8.5 ± 4.2	0.847
PO AHI	29.1 ± 6.9	28.9 ± 6.7	0.883
AHI difference	20.8 ± 5.5	20.4 ± 7.6	0.801
Rehabilitation (week)	1.2 ± 0.6	1.2 ± 0.6	0.352
F/U period (months)	45.0 ± 28.6	40.2 ± 28.7	0.394

Table II Clinical outcomes between two groups

Variable	Total case	Prior surgery	No prior surgery	*P* Value
VAS pain score				
Preoperative	6.5 ± 2.1	6.3 ± 1.6	6.5 ± 2.2	0.607
Postoperative	1.4 ± 1.6	1.9 ± 1.9	1.2 ± 1.5	0.020*
UCLA score				
Preoperative	10.9 ± 4.9	11.4 ± 5.6	10.8 ± 4.7	0.501
Postoperative	27.3 ± 5.6	26.1 ± 6.1	27.8 ± 5.4	0.132
ASES score				
Preoperative	31.9 ± 15.3	32.9 ± 15.3	31.6 ± 15.3	0.668
Postoperative	81.4 ± 16.4	78.3 ± 18.1	82.5 ± 15.7	0.192
SSV (%)				
Preoperative	29.7 ± 19.7	31.1 ± 18.4	29.2 ± 20.2	0.622
Postoperative	77.9 ± 17.2	75.1 ± 21.7	78.9 ± 15.4	0.269
Forward flexion (°)				
Preoperative	81.1 ± 57.2	90.1 ± 58.6	78.1 ± 56.7	0.284
Postoperative	137.1 ± 24.8	135.9 ± 31.6	137.5 ± 22.3	0.740
Abduction (°)				
Preoperative	76.4 ± 53.2	83.4 ± 52.1	74.0 ± 53.6	0.366
Postoperative	118.6 ± 26.1	117.4 ± 32.3	119.0 ± 23.9	0.759
External rotation (°)				
Preoperative	36.9 ± 27.6	34.3 ± 28.2	37.7 ± 27.5	0.527
Postoperative	50.9 ± 13.5	48.9 ± 17.5	51.6 ± 11.9	0.297
Internal rotation				
Preoperative	15.3 ± 2.9	15.3 ± 2.9	15.2 ± 2.9	0.868
Postoperative	14.6 ± 1.8	14.7 ± 1.9	14.5 ± 1.8	0.668

Table III Complications and reoperations between two groups

Variable	Total case (N=140)	Prior surgery (N=35)	No prior surgery (N=105)	*P* Value
Complications (no. of patient)	24 (23)	9 (9)	15 (14)	0.087
Acromial stress fracture	10	6	4	
IO PH medial cortex crack	5	0	5	
Brachial plexus injury	1	0	1	
Glenoid loosening	2	1	1	
Instability	2	0	2	
Periprosthetic fracture	0	0	0	
Glenosphere disassembly	1	1	0	
Infection	2	1	1	
CRPS	1	0	1	
Reoperation	7 (7)	5 (5)	2 (2)	0.004*
ORIF for acromial fracture	3	3	0	
Glenosphere reinsertion for disassembly	1	1	0	
Infection control surgery	1	1	0	
Revision RTSA for glenoid loosening	1	0	1	
Revision RTSA for instability	1	0	1	
Revision RTSA for periprosthetic fracture	0	0	0	
ORIF for periprosthetic fracture	0	0	0	