

Baseplate Version in Reverse Shoulder Arthroplasty: Is There a Functional Benefit to Neutral Version?

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INTRODUCTION:

Background: While bone grafting and augmented components can help restore reverse shoulder arthroplasty (RSA) baseplate version close to neutral, the indication for version correction in RSA is unclear. One of the proposed benefits of version correction is optimizing motion by maximizing impingement-free arcs of motion and remnant soft-tissue tensioning. The objectives of this study were to answer the following questions:

- 1) Does baseplate retroversion or anteversion influence functional outcomes?
- 2) Do extremes of baseplate version limit ability to perform functions involving rotation and cross-body adduction?

METHODS:

Methods: Patients who underwent RSA with minimum 2-year follow-up were identified from an institutional registry. Standardized post-operative radiographs were used to assess baseplate version. Overall function was assessed using the total Simple Shoulder Test (SST), American Shoulder and Elbow Surgeons Score (ASES). In addition, the frequency of difficulty with functions requiring internal rotation, external rotation and cross-body adduction were compared among four groups of baseplate version:

- Moderate to severe anteversion, $\geq 10^\circ$ (n=14)
- Neutral version, 10 to -10° (n=69)
- Moderate retroversion, -10° to -20° (n=25)
- Severe retroversion, $\leq -20^\circ$ (n=7)

RESULTS:

Results:

- Influence of baseplate version on total functional outcome scores: there were no differences in final SST, final ASES, or change in SST from pre- to post-operative across the four version groups. There was no linear correlation between baseplate version and final SST (**Figure 1**), nor the appearance of more outliers at the extremes of version. There were no differences in rates of complications and revisions across the four groups.
- Ability to perform functions involving rotation and cross-body adduction: there were no statistically significant differences in difficulty performing most tasks related to internal rotation, external rotation, and cross-body adduction among the four baseplate version groups; however, patients with moderate to severe anteversion had a greater frequency of difficulty putting on a coat (86%) compared to patients with neutral version (42%), moderate retroversion (45%) and severe retroversion (0%) ($p = 0.021$) (Table 1). Among patients with osteoarthritis and an intact rotator cuff, the final ASES score was higher in patients with residual retroversion (≤ -20 retroversion: 93 ± 8 ; ≤ -10 to -20 : 85 ± 16) than patients with more neutral version (5 to < -10 degrees: 81 ± 19).

DISCUSSION AND CONCLUSION:

Conclusion: This study did not find evidence that more extreme values of baseplate retroversion or anteversion were associated with inferior patient reported outcomes or most activities involving functional rotation after reverse total shoulder arthroplasty. However, glenoid component anteversion of more than 10° was associated with greater difficulty putting on a coat. The functional benefit of version correction in primary RSA remains unclear.

Table 1: Scatter plot of baseplate version and final SST

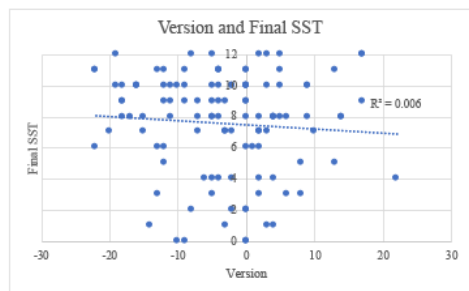


Table 2: Patients with difficulty performing functions or activities involving rotation based on degree of glenoid baseplate version.

	p	$\geq 10^\circ$ (moderate to severe anteversion)	10° to -10° (neutral)	$\leq -10^\circ$ to -20° (moderate retroversion)	$\leq -20^\circ$ (severe retroversion)
Functional internal rotation					
Reach small of back	0.807	43%	41%	32%	29%
Toileting	0.147	29%	8%	23%	0%
Wash back / fasten bra	0.587	86%	66%	68%	50%
Functional external rotation					
Place hand behind head	0.601	21%	17%	12%	0%
Comb hair	0.580	29%	24%	23%	0%
Functional cross-body adduction					
Wash back of opposite shoulder	0.971	50%	45%	50%	43%
Other motions involving rotation					
Put on a coat	0.021	86%	42%	45%	0%