

## **Utility of Superior Augments in Reverse Shoulder Arthroplasty without Significant Glenoid Coronal Plane Deformity**

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### **INTRODUCTION:**

Superior tilt of the glenoid baseplate in reverse shoulder arthroplasty (RSA) results in increased tensile forces at the baseplate and may result in early loosening, therefore superior tilt should be avoided. Glenoid baseplate augments have increasingly been used to manage superior erosion in order to minimize bone loss from reaming while achieving sufficient backside contact and avoiding superior tilt of the baseplate. However, superior augment use in cases with less deformity may help avoid superior tilt while minimizing removal of inferior glenoid bone. Therefore, our goal is to compare superior augments versus no augment baseplates in RSA for patients with rotator cuff dysfunction and no significant superior glenoid erosion.

### **METHODS:**

This is a multicenter retrospective analysis of 145 patients who underwent RSA with intraoperative navigation and mean 32-month follow up who had preoperative superior inclination less than 10 degrees and retroversion less than 15 degrees. Patient demographics, radiographic measurements, surgical characteristics, patient-reported outcomes at preoperative and postoperative visit closest to three years, and adverse events at final follow up were obtained. Operative time, planned inclination, and planned version of the baseplate were obtained. Chi-square test was used to compare categorical variables and student t-test was used to compare augment and no augment cohorts.

### **RESULTS:**

The study population consisted of 91 no augment patients and 54 superior augment patients. The augment cohort had lower BMI (27.2 vs. 29.4,  $p=0.023$ ), higher native superior inclination (5.9 vs. 1.4 degrees,  $p<0.001$ ). No difference between the augment and no augment cohorts was found regarding age ( $p=0.643$ ), gender ( $p=0.314$ ), medical comorbidities ( $p>0.05$ ), surgical indication ( $p=0.082$ ), and native glenoid version ( $p=0.564$ ). The augment cohort had higher internal rotation score (4.6 vs. 3.9,  $p=0.023$ ), all remaining ROM and PROs preoperatively were not significantly different. At final follow up, active ROM in all planes was no different between the cohorts. Regarding PROs, the postoperative SAS score was significantly higher (78.0 vs. 73.6,  $p=0.042$ ), and ASES score trended toward higher (83.6 vs. 77.5,  $p=0.063$ ) in the augment cohort. The augment cohort had significantly lower proportion of patients planned to have superior baseplate tilt (1.9% vs. 14.3%,  $p=0.012$ ), and had greater mean inclination correction (6.3 vs. 1.3 degrees,  $p<0.001$ ), compared to no augment cohort. Operative time trended toward shorter in the augment cohort (84.9 vs. 94.6,  $p=0.091$ ). Adverse events were rare, and there was no significant difference found between the augment and no augment cohorts (5.6% vs. 3.3%,  $p=0.509$ ), with no glenoid loosening in either cohort.

### **DISCUSSION AND CONCLUSION:**

Superior augmented baseplate in RSA with no significant superior glenoid erosion is associated with similar ROM and adverse events with somewhat improved postoperative PROs compared to standard baseplates at 3-year follow up. Additionally, superior augments resulted in a greater proportion of baseplates planned to avoid superior tilt, and trended toward shorter operative times compared to standard baseplates. Further investigation of long-term glenoid baseplate loosening is imperative to fully understand the cost-effectiveness of superior augments in the setting of minimal glenoid deformity.