

## Lateralized versus Traditional Grammont-style Reverse Shoulder Arthroplasty: Comparison of Outcomes and Range of Motion.

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**Aim:** The purpose of this study is to compare patient reported outcome measures and range of motion following reverse shoulder arthroplasty with either a lateralized or traditional Grammont-style glenoid implant.

**Background:** Reverse shoulder arthroplasty glenoid design has gone through many changes throughout its history but has recently developed two principal designs; a lateralized glenoid implant versus the traditional Grammont-style glenoid implant. While glenoid implant lateralization increases shear forces across the glenoid, it has been found to decrease glenoid notching and may possibly increase range of motion, specifically external rotation. The traditional Grammont-style glenoid designs have been found to decrease shear forces on the glenoid and decrease the force required by the deltoid for shoulder elevation and abduction.

**Methods:** This single center retrospective cohort study evaluated patients that underwent primary reverse shoulder arthroplasty from 2019-2021 for rotator cuff tear arthropathy or glenohumeral arthritis, by one of four fellowship trained shoulder and elbow surgeons. Patients either underwent a Lateralized glenoid with an inlay 135° humeral component or traditional Grammont-style glenoid with an inlay 150° humeral component at the discretion of the operating surgeon. Patients were included in the study if they had preoperative and 1-year postoperative range of motion and patient reported outcomes. Patient reported outcome scores included ASES, VR-12, PROMIS 10 Global, EQ5D, and SANE scores.

**Results:** A total of 86 patients (55.2% Female, age:  $71.62 \pm 7.58$ ) were included in the study with 50 patients in the traditional Grammont-style prosthesis group and 46 patients in the lateralized glenoid prosthesis group. No significant differences were found between the two groups with respect to age, gender, BMI, comorbidities, tobacco use, ASA, or preoperative diagnosis. There was a small but significant difference detected in the preoperative forward elevation, which was  $91.3^\circ \pm 52.1^\circ$  degrees in the group of patients undergoing a lateralized reverse prosthesis when compared to  $88.7^\circ \pm 39.5^\circ$  degrees in the traditional Grammont-style prosthesis group ( $p=0.03$ ). There was no significant difference in preoperative ASES, VR-12, PROMIS, EQ5D, or SANE scores. At 1 year postoperatively, overall ASES score, VR-12-physical score, EQ5D score, and SANE score significantly improved in both groups, and there were no significant difference in any patient reported outcome measure between the two groups. Similarly, overall Range of motion significantly improved compared to baseline in both groups in forward elevation, external rotation at the side, and external rotation in abduction. There were no significant differences in forward elevation or external rotation in abduction, however, there was a small but significantly difference in external rotation at the side in the lateralized glenoid prosthesis group ( $35.29^\circ \pm 8.25^\circ$  when compared to the traditional Grammont style glenoid prosthesis group ( $31.56^\circ \pm 5.69^\circ$ ;  $p=0.007$ ).

**Conclusion:** Consistent with numerous prior studies, reverse shoulder arthroplasty with either a lateralized or traditional Grammont-style glenoid design and inlay humeral component both significantly improve patient reported outcomes and range of motion at 1 year. In our retrospective study, patient reported outcomes and range of motion at 1 year postoperatively were not significantly different between the two groups with the exception of a small improvement in external rotation in the lateralized glenoid prosthesis group.