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# RELATIONSHIP BETWEEN THE PROSTHESIS SCAPULAR NECK ANGLE AND CLINICAL OUTCOMES IN REVERSE SHOULDER ARTHROPLASTY

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**Background:** Optimal glenosphere positioning in reverse shoulder arthroplasty (RSA) remains highly debated. We aimed to characterize the association between the prosthesis scapular neck angle (PSNA) and postoperative clinical outcomes including range of motion (ROM), functional scores, and complications.

**Methods:** A retrospective review of 284 RSAs using a single medialized glenoid lateralized humeral component design with minimum 2-year follow-up was performed. Glenosphere tilt was measured postoperatively using the PSNA- the angle between the intersection of vertical axis of glenosphere and the straight line along the inferior scapular neck. ROM and functional outcome scores were assessed preoperatively and at latest follow-up. The PSNA was dichotomized to inferior or superior groups (greater than 90° vs. less than or equal to 90°, respectively) and stratified into quartiles; ROM and outcome score measures were compared between groups controlling for inferior glenosphere overhang.

**Results:** PSNA between inferiorly inclined and neutral or superiorly inclined inferior glenosphere tilt was significantly different between groups ( $95.6 \pm 4.5^\circ$  vs.  $85.8 \pm 3.6^\circ$ , respectively,  $P < .001$ ). Inferiorly inclined glenosphere tilt demonstrated more external rotation postoperatively when compared to superiorly inclined glenosphere tilt ( $31 \pm 18^\circ$  vs.  $26 \pm 19^\circ$ ,  $P = .047$ ). No range of PSNA was consistently associated with clinically important differences in ROM, clinical outcome scores, or rates of complications including scapular notching. Superiorly inclined glenosphere tilt did demonstrate more preoperative to postoperative improvement in active forward elevation (FE) when compared to inferiorly inclined glenosphere tilt ( $53 \pm 35^\circ$  vs.  $37 \pm 33^\circ$ ,  $P = .005$ ), and glenospheres with PSNA in the first quartile ( $85.1 \pm 3.5^\circ$ ) had the greatest improvement in active FE ( $57 \pm 35^\circ$ ,  $P = .004$ ) compared to the rest of the quartiles. However, these findings can likely be attributed to significantly worse preoperative active FE scores in this cohort, as active FE at final follow-up did not differ between inferiorly inclined or superiorly inclined glenosphere tilt groups ( $125 \pm 23^\circ$  vs.  $125 \pm 26^\circ$ , respectively,  $P = .824$ ).

**Conclusions:** Though small differences in ROM were found between superior and inferior PSNA, a lack of significant differences between clinical outcome scores suggests negligible clinical significance as long as glenosphere tilt falls within the distribution studied herein ( $92.6^\circ \pm 6.2^\circ$ ). These findings suggest that the PSNA is likely a minor contributor to differential short-term outcomes; however, longer follow-up is needed to ascertain the impact on long-term outcomes and complications.