

Correcting Coronal Glenoid Deformity during Reverse Shoulder Arthroplasty and its Impact on Clinical Outcomes

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INTRODUCTION:

Preoperative assessment of glenoid morphology is crucial for Reverse Shoulder Arthroplasty (RSA), and the reverse shoulder angle identified by Boileau et al. allows for an assessment of glenoid inclination specific to RSA. There is minimal data evaluating how a patient's postoperative RSA angle may impact clinical outcomes, and the purpose of this study is to assess how a patient's postoperative RSA angle may impact overall outcomes and complication rates.

METHODS:

This is a retrospective review of 106 adult patients who underwent RSA by a single surgeon between 2005 and 2020 to treat a diagnosis of rotator cuff arthropathy (RCA). The RSA angle was measured pre- and postoperatively using anterior-posterior glenoid "Grashey" view radiographs, and the angle was evaluated alongside a patient's range of motion (ROM), Visual Analog Scale (VAS) scores, American Shoulder and Elbow Surgeon (ASES) scores, Constant Murley scores, and Simple Shoulder Test (SST) scores to determine how a patient's RSA angle may affect overall outcomes. This was done using univariate quadratic modeling of outcomes using the RSA angle as the predictor variable.

RESULTS:

Using quadratic modeling, a patient's postoperative RSA angle was found to be a significant predictor of postoperative forward flexion ($p < 0.001$), external rotation at 90 degrees of abduction ($p = 0.016$), and abduction ($p < 0.001$). The best ranges of motion were found at postoperative RSA angles between 0 and 20 degrees. A patient's postoperative RSA angle was not found to be a significant predictor of patient-reported outcome measure scores, including VAS, ASES, SST, or Constant Murley scores. There was no statistical difference between RSA angles in patients without notching compared to those with grade 1 ($p = 0.22$), 2 ($p = 0.19$), 3 ($p = 0.84$), or 4 ($p = 0.41$) notching.

DISCUSSION AND CONCLUSION:

A patient's postoperative RSA angle is a significant predictor of range of motion, affecting forward elevation, external rotation at 90 degrees of abduction, and abduction. Patients with an RSA angle of 0 to 20 degrees have the best postoperative range of motion outcomes, and surgical planning to achieve this postoperative RSA angle can help yield optimal postoperative outcomes.