

How Patient-Specific Risk Factors Affect Functional Recovery After Reverse Shoulder Arthroplasty

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INTRODUCTION: Reverse shoulder arthroplasty (RSA) has become a reliable solution for complex shoulder conditions, with generally favorable outcomes. However, a notable proportion of patients fail to achieve meaningful functional improvement, as measured by standardized patient-reported outcome measures. While prior studies have evaluated individual risk factors, few have systematically identified which patient characteristics are most predictive of poor outcome. This study aimed to define predictors of failure to meet the minimal clinically important difference (MCID) for the American Shoulder and Elbow Surgeons (ASES) score as a benchmark following primary reverse shoulder arthroplasty.

METHODS:

A retrospective review was performed using a single-institution shoulder arthroplasty registry. Patients who underwent primary reverse shoulder arthroplasty by a single fellowship-trained orthopedic surgeon between 2007 and 2020 were included. Preoperative and postoperative ASES scores and range of motion data were collected. Preoperative and postoperative ASES scores and range of motion data were collected. Suboptimal outcome was defined as failure to achieve the anchor-based MCID for the ASES score, which was calculated to be 29.2 for this cohort. Univariate and multivariable logistic regression were performed to identify patient factors independently associated with failure to meet this threshold.

RESULTS: A total of 466 patients were included (mean age 72.8 ± 8.5 years; mean BMI 29.3 ± 5.9 kg/m²). Most patients were female (63.5%) and white/non-Hispanic (89.5%). Most underwent RSA for primary glenohumeral osteoarthritis (80.3%), and 15.7% had prior shoulder surgery. In univariate analysis, younger patients, females, and those with prior shoulder surgery were significantly less likely to achieve meaningful improvement based on the MCID for ASES. However, in multivariable analysis, only young age and higher baseline ASES score were independent predictors of achieving functional gains. Specifically, each additional year of age conferred a 3% increased likelihood of meeting MCID (OR = 0.97; $p = 0.046$), while patients with higher preoperative function were less likely to demonstrate improvement (OR = 1.05 per ASES point; $p < 0.001$). Female sex and prior surgery did not remain significant after adjustment. Other clinical factors, including BMI, smoking, hypertension, diabetes, and cardiac disease, were not predictive of outcome.

DISCUSSION AND CONCLUSION: Younger patients and those with higher preoperative function were significantly less likely to achieve clinically meaningful improvement in ASES scores following reverse shoulder arthroplasty, likely due to a ceiling effect in traditional outcome measures. In contrast, variables such as sex, BMI, and medical comorbidities did not independently impact functional recovery. These findings highlight the need for personalized preoperative counseling—particularly for younger, high-functioning patients—and reinforce the consistent reliability of reverse shoulder arthroplasty across a diverse and medically varied patient population.