# Restriction-Free Rehabilitation after Reverse Shoulder Arthroplasty with Lateralized Components and No Subscapularis Repair is a Safe Management Strategy with a Low Complication Rate

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INTRODUCTION:
Recovery after reverse shoulder arthroplasty (RSA) has been reported to take up to 1 year. With the advent of lateralized components and a de-emphasis on subscapularis repair, earlier return to full activity may be possible, but concerns persist regarding complications with early mobilization. The purpose of this study was to assess the complication rate and patient-reported outcomes (PROs) after RSA with lateralized components, no subscapularis repair, and restriction free rehabilitation.
METHODS:
A retrospective review from 2019 - 2022 of RSAs performed by a single surgeon was conducted. Inclusion criteria were primary RSA for glenohumeral osteoarthritis (GHOA), irreparable rotator cuff tear (RCT), or rotator cuff arthropathy (RCA). Exclusion criteria were RSA for fracture, revision, intra-operative findings that required a non-accelerated rehabilitation protocol, refusal, or less than 1 year follow-up. The surgical technique included a metal glenoid augment and lateralized components without subscapularis repair. The rehabilitation protocol included unlimited range of motion and activity and sling discontinuation after the anesthetic block wore off. Patient demographics, PROs including the SANE, PROMIS Pain Interference, Physical Function and Upper Extremity, ASES, and complications were collected. Major and minor complications were documented, and PROs were collected and compared using paired t-tests.
RESULTS:
One hundred and nine patients were included (65% male, 42% left shoulders). The mean age was 74 ± 7.1 years, and the mean follow-up was 22.3 ± 9.1 months. The most common indications were RCA (52%), GHOA (37%), and RCT (10%). The major complication rate was 5.5% (6/109), which consisted of 1 case of instability and 5 cases of acromial stress fracture. Four of the 5 acromial stress fractures were incomplete or non-displaced, none required re-operation, and patients with an acromial stress fracture did not report decreased PROs compared to patients without an acromial stress fracture. The minor complication rate was 3.7% (4/109), of which 2 were hematoma, 1 was incidental, asymptomatic HO, and 1 was incidental, asymptomatic radiographic scapular notching. The reoperation rate was 0.9% (1/109) and consisted of a liner exchange for instability. All PROs significantly improved at the 3 month and 1-year timepoints compared to preoperative values. The final mean SANE score was 85.8 ± 11.5, and on average, patients achieved 87% of their final SANE score by 6 weeks postoperatively. Similarly, patients achieved 91% of their final SANE by 3 months postoperatively. When cases without a complication were considered alone, the mean difference between the 3-month and 1-year SANE score was 4.9 ($P$ = 0.04, CI: 0.2, 9.5) and did not meet the previously established minimally clinically important difference of 28.8.
DISCUSSION AND CONCLUSION:
RSA performed with lateralized augmented components, no subscapularis repair, and restriction-free rehabilitation resulted in a low complication rate, rapid improvement in PROs, and similar PROs to the traditional RSA and rehabilitation protocol at 1 year postoperatively.

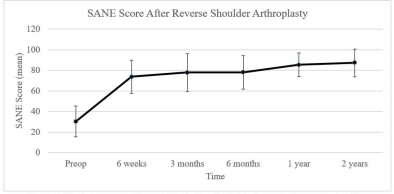


**Figure 1**. Single Assessment Numeric Evaluation (SANE) before and after reverse shoulder arthroplasty.

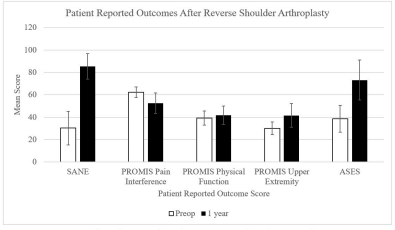


**Figure 2.** Comparison of pre-operative and 1-year post-operative patient reported outcome scores after reverse shoulder arthroplasty.

SANE, single assessment numeric evaluation; PROMIS, patient reported outcomes measurement information system; ASES, American Shoulder and Elbow Surgeons; Preop, pre-operative.

| Variable | Total (%) |
|---|---|
| Male sex | 71 (65) |
| Age (± SD) | 74 ± 7.1 |
| Side | 46 (42) |
| Indication | |
| - Glenohumeral Osteoarthritis | 40 (37) |
| - Irreparable Rotator Cuff Tear | 11 (10) |
| - Rotator Cuff Arthropathy | 57 (52) |
| - Other | 1 (0.9) |
| Major Complication | |
| - Fracture | 5 (4.6) |
| o Acromial stress fracture | 5 (4.6) |
| o Glenoid fracture | 0 (0) |
| o Humeral fracture | 0 (0) |
| - Instability | 1 (0.9) |
| - Infection | 0 (0) |
| - Nerve injury | 0 (0) |
| - Aseptic loosening | 0 (0) |
| - Polyethylene dissociation | 0 (0) |
| - Glenoid screw problem | 0 (0) |
| Minor Complication | |
| - Radiographic scapular notching | 1 (0.9) |
| - Radiographic glenoid lucent lines | 0 (0) |
| - Hematoma | 2 (1.8) |
| - Heterotopic Ossification | 1 (0.9) |
| - Algodystrophy | 0 (0) |
| - Phlebitis | 0 (0) |
| - Intraoperative dislocation | 0 (0) |
| - Intraoperative cement extravasation | 0 (0) |

**Table 1**: Patient demographics and complications. SD, standard deviation.