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QUANTIFYING SUCCESS AFTER REVISION REVERSE TOTAL SHOULDER ARTHROPLASTY: THE MINIMAL CLINICALLY IMPORTANT AND SUBSTANTIALLY CLINICALLY IMPORTANT PERCENTAGE OF MAXIMAL POSSIBLE IMPROVEMENT

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Background: While revision reverse total shoulder arthroplasty (RTSA) is increasingly commonplace, benchmarks of clinically-important improvement in this population have not been previously defined. In comparison to the minimum clinically important difference (MCID) and substantial clinical benefit (SCB), the percentage of maximal improvement (%MPI) assesses clinical improvement with regard to their "ceiling" possibly providing more equitable comparison. Our purpose was to define the minimal clinically important %MPI (MCI-%MPI) and substantial clinically important %MPI (SCI-%MPI) for outcome scores and range of motion (ROM) after revision reverse total shoulder arthroplasty (RTSA) and to quantify the proportion of patients achieving clinically-relevant success.

Methods: This retrospective cohort study used a prospectively-collected single-institution database of patients undergoing revision RTSA between August 2015 and December 2019. Patients with a diagnosis of infection were excluded. Outcomes scores included the ASES, Constant, SPADI, SST, and UCLA scores. ROM measures included abduction, forward elevation (FE), external rotation (ER), and internal rotation (IR). The MCI-%MPI was determined using an anchor-based method comparing patients describing their treatment as "better" compared to "worse" or "unchanged" and using a distribution method defined as 0.5 standard deviation. SCI-%MPI was determined using an anchor-based method comparing patients describing their treatment as "much better" compared to "worse" or "unchanged". The proportions of patients achieving each threshold were assessed.

Results: 108 revision RTSAs with minimum 2-year follow-up were evaluated. Mean age was 67 years, 59% were female, and average follow-up was 55 months. Revision RTSA was performed most commonly for failed anatomic TSA (n=53), followed by hemiarthroplasty (n=26), RTSA (n=18), and resurfacing (n=11). The indication for revision RTSA was most commonly glenoid loosening or rotator cuff failure (n=25 for both), followed by instability (n=21) and unexplained pain (n=11). The anchor-based MCI-%MPI values (% of patients achieving) were: ASES=33%(54%), Constant=22%(61%), UCLA=50%(52%), SST=28%(66%), and SPADI=31%(55%). The distribution-based MCI-%MPI values (% of patients achieving) were: ASES=25%(65%), Constant=13%(70%), UCLA=22%(77%), SST=23%(67%), and SPADI=34%(93%). The anchor-based SCI-%MPI values (% of patients achieving) were: ASES=57%(37%), Constant=42%(27%), UCLA=67%(36%), SST=75%(31%), SPADI=51%(35%).

Conclusions: This study established thresholds for the MCI-%MPI and SCI-%MPI at minimum 2-years after revision RTSA, providing physicians an evidence-based method to counsel patients and assess outcomes postoperatively while mitigating ceiling effects.