Indications for Revision Shoulder Arthroplasty: Are They Changing?

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INTRODUCTION: Shoulder arthroplasty is a reliable treatment option for the management of degenerative and traumatic shoulder conditions with high rates of patient satisfaction. The demand for shoulder arthroplasties is projected to increase significantly over the next decade and more shoulder arthroplasties are being performed in younger patients. It would be expected that as the number of primary shoulder arthroplasties increases and performing them in younger patients the number of revision procedures would increase as well. As surgical techniques change and implants evolve, it is imperative to determine how implants are failing to avoid complications in the future. The purpose of this study was to investigate the indications for revision TSA and RSA over a ten year time period at a single institution and determine any variations in the indications for revision surgery.

METHODS:

This was a retrospective review of all patients who underwent a revision shoulder arthroplasty procedure at a single institution from 2010 to 2020. Inclusion criteria were those who underwent a revision shoulder arthroplasty after a primary shoulder arthroplasty with an available operative report listing the indications for the revision procedure. Exclusion criteria were those who underwent primary shoulder arthroplasty, patients who previously had a revision shoulder arthroplasty, or those without an available operative report listing the indications for the revision procedure. Patient characteristics and demographic data collected included: age, sex, body mass index(BMI), Charlson Comorbidity Index(CCI), and American Society of Anesthesiologists Physical Status Classification Score (ASA). Surgical data collected included the type of index shoulder arthroplasty, the dates of the index and revision surgeries, and the indications for revision arthroplasty. The indications for revision arthroplasty included: pain, periprosthetic joint infection, glenoid loosening, humeral loosening, rotator cuff tear, periprosthetic fracture, instability, or other. Patients were noted to have more than one indication if multiple indications were listed in the operative report.

Multiple regression models were then developed to determine any trends in these indications for the 10 years collected in this study. Two sets of logistic regression models were analyzed, one for TSAs and one for RSAs. Dependent outcomes in each set of regression models included all the indications for revision shoulder arthroplasty previously listed.

RESULTS:

Overall, there were 584 revision shoulder arthroplasty procedures performed during the study period. Of these, 344 met our inclusion criteria of having a revision after a primary arthroplasty of which 196 underwent revision after primary TSA and 148 underwent revision after primary RSA. Patients who underwent revision shoulder arthroplasty after primary RSA were older (p=0.025) and had higher CCI scores (p=0.013) and ASA scores (p=0.006) compared to patients who underwent revision shoulder arthroplasty after primary TSA, respectively. There was a significant difference in time from index surgery to revision surgery (p=0.003) between the RSA and TSA cohorts.

Multiple regression models demonstrated that there was a significant increase in the number of revisions of primary TSAs for pain (p=0.006) and rotator cuff failure (p=0.003) with a significant decrease in the number of revisions for PJI (p=0.035) over the 10-year study period. There was no significant difference in the number of revisions of primary TSAs for glenoid component loosening (p=0.396), humeral component loosening (p=0.885), periprosthetic fracture (p=0.867), or instability (p=0.254) over the study period.

Multiple regression models demonstrated that there were no significant differences in the number of revisions of primary RSAs for pain (p=0.094), PJI (p=0.068), glenosphere or baseplate failure (p=0.513), humeral component loosening (p=0.161), periprosthetic fracture (p=0.503), or instability (p=0.795) over the study period.

DISCUSSION AND CONCLUSION: The significant increase in revisions of anatomic shoulder arthroplasties for pain and rotator cuff failure suggests that the current glenoid components are lasting longer than previous generations and rotator cuff failure may now be the most common indication for revision anatomic shoulder arthroplasty. Surgeons may elect to perform reverse shoulder arthroplasty in the setting of glenohumeral arthritis to avoid this complication in the future.