

Anatomic versus Reverse Total Shoulder Arthroplasty for Primary Osteoarthritis with an Intact Rotator Cuff: A Mid-Term Comparison of Initial Top Performers

Kevin A Hao, William Reuben Aibinder, Jonathan O Wright¹, Thomas W Wright², Joseph John King³, Bradley S Schoch⁴
¹University of Florida, ²UF Orthopaedics, ³UF Orthopaedics & Sports Medicine Institute, ⁴Mayo Clinic

INTRODUCTION: The optimal management of rotator cuff-intact glenohumeral osteoarthritis (RCI-GHOA) in patients who have not benefited from nonsurgical management is often debated. Many surgeons state that their best anatomic total shoulder arthroplasty (aTSA) outperforms their best reverse total shoulder arthroplasty (rTSA). While recent studies have demonstrated similar outcomes after aTSA and rTSA at short-term (2-year) follow up, whether these outcomes are durable at later follow up is unclear. The purpose of this study is to identify the top performing aTSAs and rTSAs at 2-year follow up and compare their clinical and radiographic outcomes at minimum 5-year follow up.

METHODS: A retrospective review of a multicenter commercially-maintained shoulder arthroplasty database was performed between 2007 and 2020. All shoulders undergoing primary aTSA and rTSA for RCI-GHOA were reviewed. Shoulders with postoperative infection, nerve injury, or periprosthetic fracture were eliminated. Shoulders with a follow-up timepoint between 2-3 years and one visit of at least 5 years were included. The top 20% of patients (114 aTSA, 21 rTSA), as assessed by the Shoulder Arthroplasty Score (SAS), were identified at early (2-3 year) follow up for inclusion. Groups were compared at a minimum 5-year follow up for range of motion (abduction, forward elevation, external rotation, internal rotation), patient-reported outcomes (ASES, SST, SPADI), and combined physician-input and patient-reported outcomes (Constant, SAS). In patients with multiple minimum 5-year follow-up visits, the earliest visit was used to ensure an equal comparison.

RESULTS: The top performing cohort of aTSA were younger than the top performing rTSA shoulders (66 vs. 71, $p=0.003$). Sex, body mass index, and follow up at early and midterm follow up were similar between groups. aTSA shoulders were also more commonly treated with steroid injections prior to surgery (52% vs. 19%, $p=0.008$). At minimum 5-year follow up (**Table I**), aTSA demonstrated greater abduction (141° vs. 125° , $p=0.012$), external rotation (60° vs. 43° , $p=0.002$), and SAS score (88 vs. 84, $p=0.014$). When comparing improvements from preoperatively, aTSA again demonstrated greater ER, ASES, SPADI, and SAS scores. No patient in either of the top performing cohorts sustained a complication or underwent revision surgery between early (2-3 year) and mid-term (5-year) follow up.

DISCUSSION AND CONCLUSION:

In a cohort of top performing shoulder arthroplasties at early follow up, aTSAs maintained advantages in abduction and external rotation to mid-term follow up. However, similar to prior studies, PROMs remained similar.