

Long-Term Outcomes of Anatomic Total Shoulder Arthroplasty for B2 Glenoids Treated with Asymmetric Reaming compared to Type A Glenoids

Carl Cirino, David Eric Kantrowitz, Thomas Boucher, Akshar Patel, Evan L Flatow¹, Paul Joseph Cagle²

¹Mount Sinai West Hospital, ²Mount Sinai West Orthopaedics

INTRODUCTION: Walch B2 glenoids can present a technical challenge to shoulder arthroplasty surgeons. Short-term studies have demonstrated that corrective reaming in anatomic total shoulder arthroplasty (aTSA) can result in good outcomes, however there is little data reporting the long-term outcomes in this cohort. The glenoid component is the most common cause of late failure of aTSA regardless of Walch classification. B2 glenoids treated with high-side reaming present a theoretical risk of early failure as one may ream into the subchondral bone to achieve the desired correction. The goal of this study was to demonstrate that 1) B2 glenoids treated with corrective reaming have durable results and 2) offer similar results to Walch A1/2 in long-term follow up.

METHODS: Patients who underwent aTSA by a single surgeon (ELF) were identified from a shoulder arthroplasty registry. Inclusion criteria included Walch A1, A2 or B2 glenoid, a diagnosis of primary shoulder osteoarthritis, and a minimum radiographic and clinical follow up of 5 years. Forty-three patients with B2 glenoids were identified and compared to a cohort of 42 patients with A1 or A2 glenoids. Preoperative computed tomography (CT) and radiographs were utilized to assess deformity, glenoid version, and posterior subluxation of the humeral head. Postoperatively, patients were assessed with radiographs and patient-reported outcome measures including American Shoulder and Elbow Surgeon (ASES) score, Simple Shoulder Test (SST) score, and Visual Analog Scale (VAS).

RESULTS:

Eighty-five shoulders (82 patients, 43 B2 and 43 A1/A2 glenoids) with an average follow up of 9.4 years were included in the study. In the B2 cohort, the average retroversion was 21.1° and posterior subluxation was 69.4% compared with 10.6° ($p<0.001$) and 57.5% ($p<0.001$) in the A1 or A2 cohort, respectively. Demographics were similar between the cohorts with the exception of male sex (B2 69.8% vs. A1 or A2 37.2%, $p=0.008$). Preoperatively and postoperatively there was no difference between the cohorts in their improvement in ASES ($p=0.807$), SST ($p=0.586$), or VAS ($p=0.930$) scores. There was no difference in lateral humeral offset ($p=0.889$) or acromial humeral interval (0.468) between initial postoperative and final follow-up visits. The rate of survivorship for B2 glenoids was 97.6%, 94.1%, and 73.3% at 5, 10, and 15 years, respectively. This is compared to 97.6%, 91.9%, and 83.5% for the same timepoints in type A glenoids. All revisions were for aseptic loosening of the glenoid component and there was no difference in the number of revisions between the two cohorts ($p=0.432$). Lazarus score ($p=0.682$) and rates of humeral radiolucency ($p=0.366$) and humeral osteolysis ($p=0.194$) were similar between the two cohorts at final follow up.

DISCUSSION AND CONCLUSION:

Asymmetric reaming of patients with B2 glenoids is a viable method of glenoid preparation with excellent mid- to long-term clinical results, patient-reported outcomes, and a low revision rate. When compared to a cohort of A1 or A2 glenoids, similar results can be expected.