Comparison of Functional Outcomes of Intraoperative Greater Tuberosity Fractures in Reverse Shoulder Arthroplasty: A Matched Cohort Study

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INTRODUCTION: Intraoperative greater tuberosity fractures (GTF) can occur during reverse total shoulder arthroplasty (rTSA) and can potentially affect the clinical results. The purpose of this study was to determine for both primary and revision rTSA the incidence, risk factors, and healing rate of intraoperative GTF, as well as clinical results with patient reported outcomes measures (PROMs) and physical examination.

METHODS: Our institutional shoulder database was retrospectively reviewed from 2004 to 2022 for patients who underwent a primary rTSA or a revision of an arthroplasty to a rTSA. Patients with an intraoperative GTF were matched in a 1:2 ratio to patients who underwent rTSA without fractures by age, sex, indication, and stage of surgery. American Shoulder and Elbow Surgeons (ASES) scores, Simple Shoulder Test (SST), Single Assessment Numeric Evaluation (SANE) scores, Western Ontario Osteoarthritis of the Shoulder Index (WOOS) scores, and range of motion were compared from before surgery to after surgery in both primary and revision groups. Postoperative radiographs were reviewed and greater tuberosity fragments were classified as healed, displaced, or resorbed at minimum one year post surgery.

RESULTS: The overall incidence of intraoperative GTF was 3.4% (47/1402). 39 patients had one year follow-up and thus were included in our analysis. Primary cases were less likely to experience GTF than revision (2.5% (29/1177) vs 8.0% (18/225)). In primary cases, GTF occurred most often during reduction or dislocation of the humeral tray and polyethylene component (48%, 11/23). In revision cases, GTF occurred most often during humeral component removal (75%, 12/16). At one year follow-up, 61% (22/36) of GTF had healed, 17% (6/36) were displaced, and 19% (7/36) had undergone osteolysis. Improvement in satisfaction, pain scores, and all PROMs between the GTF and control groups were not significantly different (p=0.5).

DISCUSSION AND CONCLUSION: While GTF are uncommon in primary cases of rTSA, the incidence is more than double when revising an arthroplasty to a rTSA. When treated with repair at the time of surgery, a majority will have clinical results similar to a comparison group of patients who have undergone rTSA.