Outcomes of RSA Patients Undergoing GLP-1 Agonist Therapy

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INTRODUCTION: Glucagon-like peptide-1 (GLP-1) receptor agonists may have broader effects on general health, including potential impacts on healing after surgery. The purpose of this study was to evaluate the impact of prolonged GLP-1 usage on primary reverse total shoulder arthroplasty (RSA).

METHODS:

This single institution study evaluated 38 patients on long-term GLP-1 therapy (pre-treatment BMI: 34.71 ± 5.05 kg/m2) who underwent primary RSA. These GLP-1 patients were 3:1 matched to three cohorts of patients with varying BMI not on GLP-1 therapy: normal BMI patients (BMI of 18.5 – 24.9 kg/m2, n=32), overweight BMI patients (BMI of 25.0 – 29.9 kg/m2, n=43), and obese patients (BMI ≥ 30.0 kg/m2, n=33). Matching criteria included age, surgery indications, and comorbidities using the Charlson Comorbidity Index.

Clinical outcomes assessed included superficial and periprosthetic infection, loosening, periprosthetic fracture, dislocation, nerve injury, need for revision surgery, and forward flexion/external rotation range of motion (ROM) taken at most recent follow-up (≥ 6 months). Univariate analyses were conducted to compare outcomes between BMI groups.

RESULTS:

A total of 152 patients undergoing primary reverse total shoulder arthroplasty (RSA) were included in the analysis, comprising 38 GLP-1 agonist users and three matched control cohorts: 38 normal BMI patients (mean BMI 22.9 ± 1.8 kg/m²), 38 overweight patients (mean BMI 27.3 ± 1.2 kg/m²), and 38 obese patients (mean BMI 33.8 ± 3.6 kg/m²). GLP-1 users had a mean BMI of 34.3 ± 5.9 kg/m² at the time of surgery and a mean pre-treatment BMI of 34.7 ± 5.1 kg/m². Duration of GLP-1 therapy prior to surgery averaged 1.8 ± 1.4 years. The mean Charlson Comorbidity Index was similar across groups (GLP-1: 1.63 ± 1.71; normal BMI: 1.12 ± 1.41; overweight: 1.54 ± 1.29; obese: 1.37 ± 1.33; p=0.43).

The distribution of surgical indications was identical across all cohorts: primary glenohumeral arthritis in 44.7% (17/38), cuff tear arthropathy in 50.0% (19/38), and proximal humerus fracture in 5.3% (2/38) of patients.

Superficial infection occurred in 2.6% (1/38) of patients in the normal BMI and obese groups, with no cases in the GLP-1 or overweight groups (p=0.57). No patients in any group experienced periprosthetic infection. Loosening or component failure was seen in 2.6% (1/38) of GLP-1, normal BMI, and overweight patients, and in 0% of obese patients (p=0.80). Dislocation occurred only in one GLP-1 user (2.6%), with no dislocations in other groups (p=0.39). Rotator cuff tears were noted in 2/38 patients (5.3%) in both the normal and overweight groups, but not in GLP-1 or obese groups (p=0.25).

Periprosthetic fractures were more common in the normal BMI group (13.2%, 5/38) than in the obese (2.6%, 1/38), with no cases in the GLP-1 or overweight groups (p=0.08). Nerve injury occurred in 5.3% (2/38) of GLP-1 patients and 0% in all others (p=0.10). Revision surgery was performed in 1 GLP-1 patient (2.6%), 4 normal BMI patients (10.5%), 2 overweight patients (5.3%), and 2 obese patients (5.3%) (p=0.52).

At a mean follow-up of 1.4 years, forward flexion was similar across groups: GLP-1 users (131.5 ± 27.5°), normal BMI (132.8 ± 36.1°), overweight (136.4 ± 26.9°), and obese (130.4 ± 31.8°) (p=0.82). External rotation was also comparable: GLP-1 (41.4 ± 9.1°), normal BMI (41.9 ± 14.4°), overweight (44.0 ± 13.9°), and obese (41.0 ± 12.8°) (p=0.46). No statistically significant differences were observed in any measured clinical or functional outcomes between GLP-1 users and control groups.

DISCUSSION AND CONCLUSION:

Prolonged GLP-1 agonist therapy did not negatively impact or improve post-operative outcomes following RSA across BMI strata. These findings suggest GLP-1 therapy may be safely continued perioperatively, though further research and longer follow-up are needed.