

Impact of Glucagon-Like Peptide-1 Receptor Agonist Use on Postoperative Outcomes Following Rotator Cuff Repair in Type 2 Diabetes: A Retrospective Cohort Analysis

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INTRODUCTION: Glucagon-like peptide-1 receptor (GLP-1) agonists have demonstrated metabolic and anti-inflammatory benefits in patients with type II diabetes mellitus (T2DM), raising interest in their potential to reduce postoperative complications following orthopedic surgery. While prior studies suggest GLP-1 therapy may improve outcomes in total shoulder arthroplasty and arthroscopic rotator cuff repair, findings remain inconclusive. This study evaluates whether GLP-1 agonist use in patients with T2DM undergoing rotator cuff repair (RCR) is associated with reduced risk of postoperative complications and healthcare utilization.

METHODS: A retrospective cohort study was conducted using the TriNetX Research Network, identifying adult patients with T2DM who underwent RCR between January 2018 and December 2024. Patients were stratified by preoperative GLP-1 agonist use. Primary outcomes included 90-day medical complications, surgical complications, and readmissions or emergency department visits. Univariate logistic regression and inverse propensity score-weighted binary logistic regression were used to adjust for confounding factors. Institutional Review Board (IRB) exemption was obtained prior to study initiation.

RESULTS SECTION: A total of 5,876 (Male = 3,145, Female = 2,731) patients met inclusion criteria, including 233 (4.0%) GLP-1 users. GLP-1 users had higher baseline BMI, comorbidity burden, and insulin use compared to nonusers. Unadjusted analyses revealed significantly increased odds of postoperative respiratory complications (OR 1.97, 95% CI 1.32-2.86, P = 0.0006), urinary tract infection (OR 3.85, 95% CI 1.31-9.12, P = 0.0055), and postoperative stiffness (OR 2.20, 95% CI 1.31-3.49, P = 0.0016) among GLP-1 users. However, after inverse propensity score-weighted adjustment, no statistically significant differences in postoperative outcomes were observed.

DISCUSSION: In this large retrospective cohort study, preoperative GLP-1 agonist use in patients with T2DM undergoing RCR was not associated with a significant difference in postoperative complications, including respiratory complications, urinary tract infection, or postoperative stiffness, after adjustment using inverse propensity score-weighted analysis. While unadjusted analyses initially suggested greater odds of adverse outcomes among GLP-1 users, these differences did not persist following adjustment of relevant confounders. Our study was subject to several limitations, including: residual confounding due to unmeasured variables, reliance on administrative coding, and limited sample size of GLP-1 users prevented assessment of rare events. Our findings add to this evolving body of literature by demonstrating that GLP-1 agonist use was not independently associated with an increased or decreased risk of common postoperative complications following RCR. Further prospective randomized controlled trials are needed to clarify the agent-specific effects of GLP-1 therapy and its role in surgical recovery.

SIGNIFICANCE/CLINICAL RELEVANCE: Preoperative GLP-1 agonist use was not independently associated with reduced or increased risk of 90-day postoperative complications in T2DM patients undergoing RCR. These findings suggest that GLP-1 therapy may be safely continued in the perioperative setting, though further prospective studies are needed to assess agent-specific effects and optimize surgical outcomes.

REFERENCES: 1) Seddio AE, Moran J, Gouzoulis MJ, Garbis NG, Salazar DH, Grauer JN, et al. Lower Risk of Postoperative Complications and Rotator Cuff Retear Associated With Semaglutide Use in Patients with Type II Diabetes Mellitus Undergoing Arthroscopic Rotator Cuff Repair. *Arthroscopy* 2025;41(2):199-206. doi:10.1016/j.arthro.2024.09.057. 2) Elsabbagh Z, Haft M, Murali S, Best M, McFarland EG, Srikumaran U. Does use of glucagon-like peptide-1 agonists increase perioperative complications in patients undergoing shoulder arthroplasty? *J Shoulder Elbow Surg* 2025;34(4):997-1006. doi: 10.1016/j.jse.2024.07.045. 3) Choudhury A, Van Boxtel M, Hanley J. The impact of GLP-1 receptor agonists on postoperative outcomes following total shoulder arthroplasty. *Seminars in Arthroplasty: JSES* 2025;35(1):94-9. doi:https://doi.org/10.1053/j.sart.2024.10.001.

Table 1. Baseline demographic profiles of patients undergoing rotator cuff repair with or without the use of preoperative GLP-1 agonists.

	GLP-1 (n=233)	Non-GLP-1 (n=5643)	P value
Average Age	61.32 ± 7.99	61.63 ± 8.75	.5661
Race			.0261
White	65.24%	56.94%	
Black or African American	18.45%	18.45%	
Asian	3.00%	7.16%	
American Indian or Alaska Native	0.86%	0.62%	
Native Hawaiian or Other Pacific Islander	1.72%	1.93%	
Other Race	3.86%	2.85%	
Unknown	6.87%	12.05%	
Sex			.0251
Male	46.05%	53.83%	
Female	53.95%	46.17%	
Medical Comorbidities			
Metformin Use	42.49%	6.54%	<.0001
Insulin Use	34.33%	5.17%	<.0001
HHS	1.72%	1.54%	.7835
DKA	1.29%	0.69%	.2315
Diabetic Nephropathy	5.58%	3.42%	.0977
Diabetic Neuropathy	21.89%	7.18%	<.0001
Smoker	34.76%	22.08%	<.0001
Average BMI and Mod CCI			
Average BMI	35.66 ± 6.51	33.18 ± 6.47	<.0001
Average Mod CCI	3.56 ± 1.95	2.76 ± 1.73	<.0001

BMI, body mass index; DKA, diabetic ketoacidosis; GLP-1, glucagon-like-peptide-1 agonist; HHS, hyperosmolar hyperglycemic syndrome; Mod CCI, modified Charlson Comorbidity Index.

Figure 1. Full univariate logistic regression analysis demonstrating the effect of GLP-1 agonists on postoperative outcomes. Reference categories for all odds ratios was the “non-GLP-1” group.

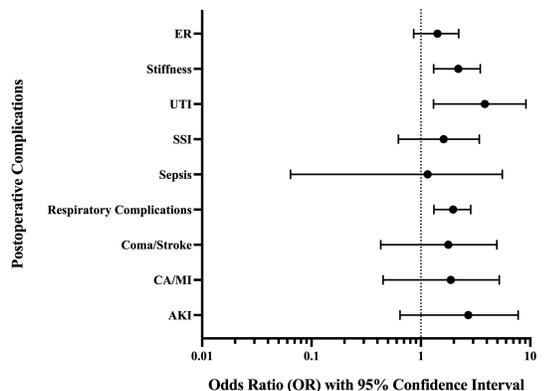


Figure 2. Full inverse propensity score-weighted binary logistic regression analysis demonstrating the effect of GLP-1 agonists on postoperative outcomes. Reference categories for all odds ratios was the “non-GLP-1” group.

