Semaglutide and SGLT-2 Inhibitor Use Does Not Increase Risk of Prosthetic Joint Infection or Thromboembolic Events Following Total Shoulder Arthroplasty in Diabetic Patients

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INTRODUCTION:
Prosthetic joint infection (PJI) and venous thromboembolism (VTE) are rare but serious complications following total shoulder arthroplasty (TSA), particularly in patients with diabetes mellitus. Semaglutide, a GLP-1 receptor agonist, and SGLT-2 inhibitors have become increasingly prescribed to improve glycemic control and may reduce systemic inflammation. In June 2023, the American Society of Anesthesiologists (ASA) recommended holding GLP-1 receptor agonists prior to elective surgery due to concerns about delayed gastric emptying. However, their impact on postoperative complications in TSA remains unclear. This study evaluated whether preoperative use of semaglutide or SGLT-2 inhibitors is associated with an altered risk of PJI or VTE in diabetic patients undergoing TSA during early postoperative follow-up.
METHODS: A retrospective review was conducted on 1065 diabetic patients who underwent primary TSA within a large health system between June 2023 and June 2024. Patients were stratified based on documented use of semaglutide, SGLT-2 inhibitors, or neither medication at the time of surgery. The primary outcome was PJI, defined by intraoperative culture-confirmed infection or documentation of treatment for a presumed culture-negative infection. The secondary outcome was VTE, defined as a confirmed diagnosis of pulmonary embolism or deep vein thrombosis. Multivariate logistic regression was used to assess the association between medication use and complications, controlling for gender and body mass index (BMI). A subgroup analysis was performed in patients with known hemoglobin A1c values using a binary threshold of ≥8.0%.
RESULTS:
PJI occurred in 2.3% (24/1065) of the overall cohort, including 0.8% (1/119) of semaglutide users, 4.2% (7/168) of SGLT-2 users, and 2.1% (16/778) of patients on neither medication. On multivariate regression (Table 1), semaglutide use was not significantly associated with PJI (OR 0.38; 95% CI 0.05–2.94; p = 0.354), neither was SGLT-2 use (OR 1.80; 95% CI 0.72–4.47; p = 0.207). VTE occurred in 1.3% (14/1065) of patients, including 0.8% (1/119) of semaglutide users, 0.6% (1/168) of SGLT-2 users, and 1.5% (12/778) of patients on neither drug. Neither semaglutide (OR 0.51; 95% CI 0.06–4.08; p = 0.526) or SGLT-2 use (OR 0.42; 95% CI 0.05–3.26; p = 0.405) was associated with VTE risk. Male gender was associated with decreased VTE risk (OR 0.19; p = 0.031), while BMI was not independently associated with either complication (OR 0.99; p = 0.716).
In a subgroup of 765 patients with available A1c data, the mean A1c was 6.82 ±1.39%. An A1c ≥ 8.0% was not associated with increased PJI risk (OR 1.30; 95% CI 0.43–3.91; p = 0.640). Within this subgroup, semaglutide (OR 0.28; p = 0.238) and SGLT-2 use (OR 1.69; p = 0.345) were also not independently associated with increased PJI risk.

DISCUSSION AND CONCLUSION: In diabetic patients undergoing TSA, neither semaglutide nor SGLT-2 inhibitor use was associated with an increased risk of PJI or VTE. Elevated hemoglobin A1c and BMI were also not predictive of complications. These findings support the continued perioperative use of semaglutide and SGLT-2 inhibitors in diabetic TSA patients. Given the current ASA recommendation to hold GLP-1 receptor agonists prior to elective surgery, further prospective studies with long-term follow-up are warranted to clarify the perioperative safety of these medications and to evaluate the effects of holding them on TSA complications.

	Odds Ratio (OR)	95% Confidence Interval	p-value
Semaglutide	0.38	0.05 – 2.94	0.354
SGLT-2 Inhibitor	1.80	0.72 – 4.47	0.207
Male Gender	1.82	0.78 – 4.24	0.164
BMI	1.00	0.94 – 1.07	0.976

Table: Multivariate Logistic Regression Analysis for PJI Risk in TSA