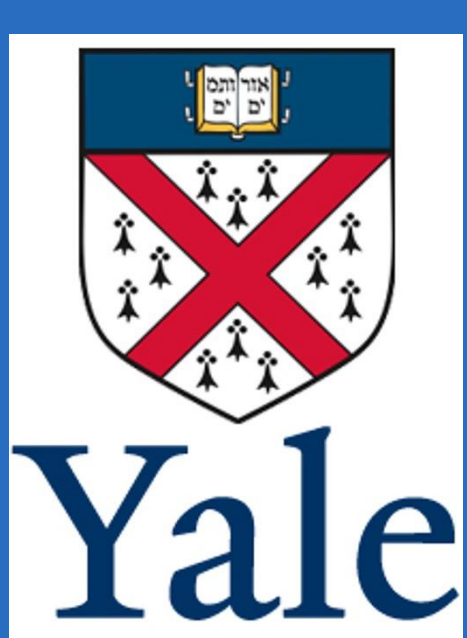
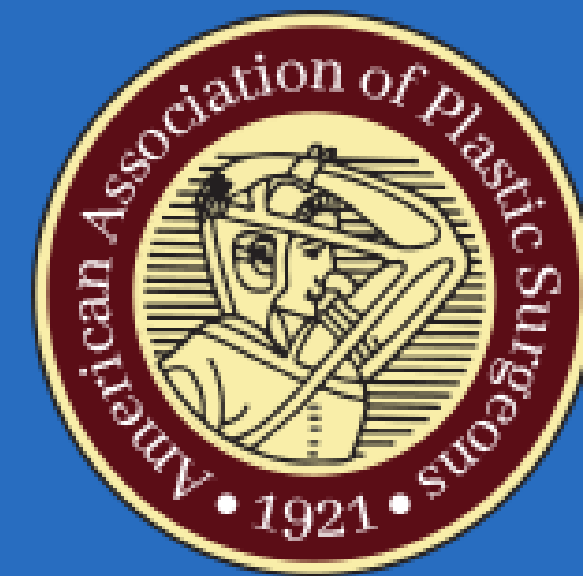




GLP-1 Receptor Agonist Use, Diabetes, And Surgical Complications In 66,528 Patients: Evidence From The NIH All Of Us Program



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Background

GLP-1 receptor agonists (GLP-1 RAs), including semaglutide and tirzepatide, are increasingly prescribed for the management of obesity and type 2 diabetes. These metabolic conditions are well-established predictors of perioperative complications and surgical outcomes. As GLP-1 RA use expands, it is important to understand whether these medications independently influence perioperative risk profiles.

Objective

To evaluate association between GLP-1 RA use and postoperative complications.

Methods

- Retrospective cohort study of 66,528 patients in the NIH *All of Us* Registered Tier Dataset (v8) undergoing procedures within the “Surgical procedure” concept set.
- 6-month postoperative complications identified using SNOMED-OMOP.
- Patients stratified by diabetes status at surgery and GLP-1 RA use within 1-year preoperatively.
- Outcomes compared across groups and stratified by BMI.
- K-means clustering (age, BMI, hemoglobin A1c) used to identify metabolic risk phenotypes.

Results

- Mean age: 55.9 years (SD 12.4); mean BMI: 30.0 0.0 kg/m² (SD 7.3); 29.6% had diabetes.
- GLP-1 RA use: 8,808 procedures (1.5%), most commonly semaglutide, liraglutide, and dulaglutide.
- GLP-1 RA users had higher BMI at surgery (35.7 vs 29.9 kg/m², p<0.001).

Procedure-level outcomes

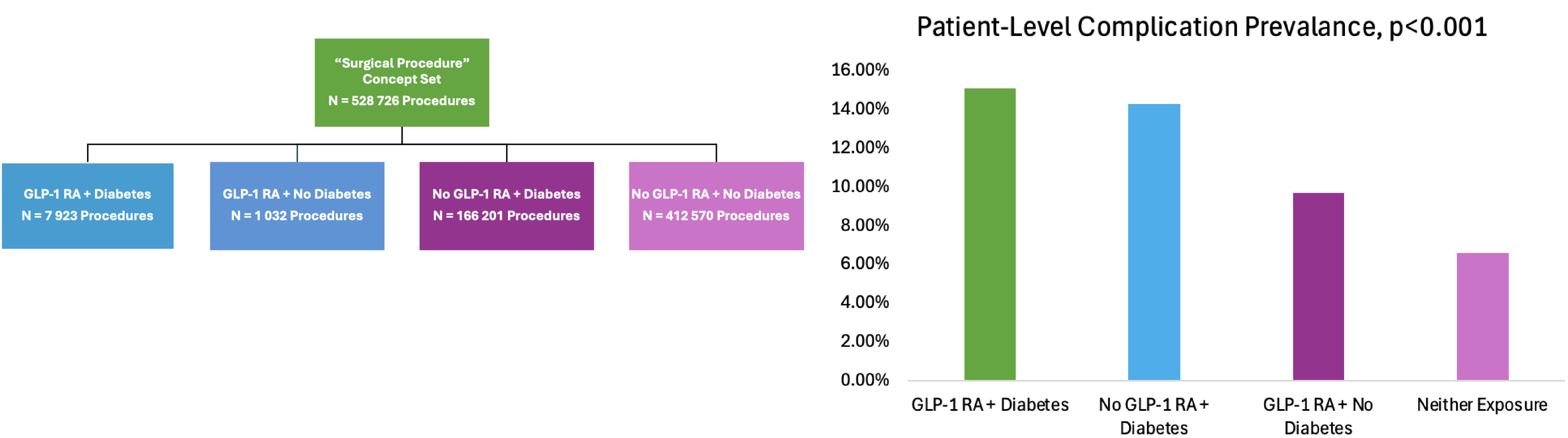
- Lower odds: bleeding (OR 0.60), hematoma (OR 0.54), infection (OR 0.78).
- Higher odds: VTE (OR 1.85), PE (OR 1.39), wound dehiscence (OR 2.94) (all p<0.05).

BMI effects:

- Highest complication risk in underweight (<18.5 kg/m²) and morbidly obese (>40 kg/m²) patients, particularly for infection and dehiscence.

Diabetes subgroup (174,124 procedures):

- Overall complication rates similar between GLP-1 RA users and non-users (7.3% vs 7.5%; OR 0.97, p=0.53).
- GLP-1 RA use associated with lower bleeding, hematoma, and infection, but slightly higher VTE and dehiscence.



Conclusions

- Preoperative GLP-1 RA use shows dual risk profile
- Lower risk – bleeding, hematoma, infection
- Higher risk – DVT/PE and wound dehiscence
- Diabetes remains the strongest predictor of overall postoperative complications.
- Among patients with diabetes, GLP-1 RA use does not reduce overall complication rates but shifts the pattern of complications.
- Perioperative risk stratification should account for GLP-1 RA exposure, particularly in patients with diabetes.

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