LIGHTENING THE LOAD: GLP-1 THERAPY AND PREOPERATIVE REHABILITATION BEFORE VENTRAL HERNIA REPAIR – A SYSTEMATIC REVIEW AND META-ANALYSIS

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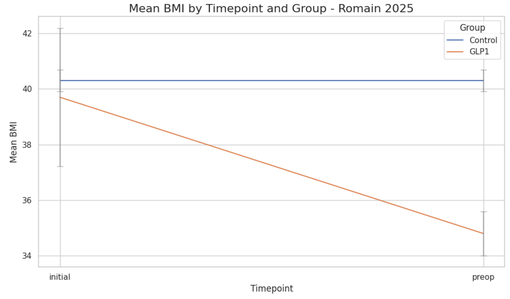
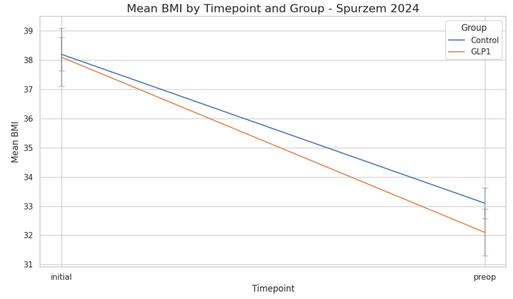
INTRODUCTION

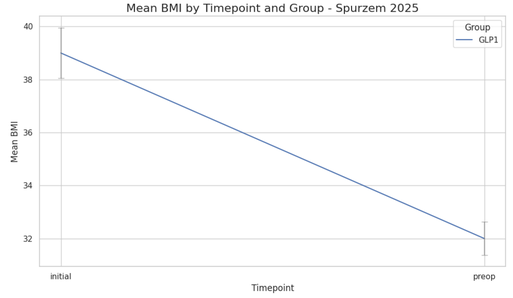
Obesity and type 2 diabetes mellitus (T2DM) are major risk factors for adverse outcomes after hernia repair, including surgical site infections (SSI), wound complications, and recurrence. Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) have shown substantial efficacy in weight loss and glycemic control, making them attractive tools for preoperative optimization. This systematic review and meta-analysis evaluated the impact of GLP-1 therapy on preoperative weight reduction and subsequent postoperative outcomes in patients undergoing abdominal wall hernia repair.

MATERIALS AND METHODS

Following PRISMA guidelines, we searched PubMed, Embase, and Cochrane through July 2025. Eligible studies included adults undergoing abdominal or inguinal hernia repair with preoperative GLP-1 therapy. Data were synthesized with random-effects meta-analyses for dichotomous outcomes and a generalized linear mixed model (GLMM) to analyze BMI trajectories. Risk of bias was assessed using the ROBINS-I tool.



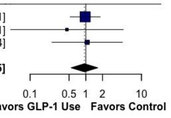




30-Day Surgical Site Ocurrences (SSO)

Study	GLP-1 Group Events	GLP-1 Group Total	Control Group Events	Control Group Total	Weight	RR	95% CI
Romain 2025	9	24	20	52	79.8%	0.97	[0.52; 1.81]
Spurzem 2024	1	24	2	22	5.7%	0.46	[0.04; 4.71]
Tran 2024	3	17	3	18	14.5%	1.06	[0.25; 4.54]
Total (95% CI)	**13**	**65**	**25**	**92**	**100.0%**	**0.95**	**[0.54; 1.65]**

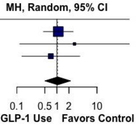
Heterogeneity: $Tau^2 = 0$; $Chi^2 = 0.40$, df = 2 (P = 0.8172); $I^2 = 0.0\%$
Test for overall effect: Z = -0.20 (P = 0.843)



30-Day Surgical Site Infections (SSI)

Study	GLP-1 Group Events	GLP-1 Group Total	Control Group Events	Control Group Total	Weight	RR	95% CI
Romain 2025	6	24	12	52	74.8%	1.08	[0.46; 2.54]
Spurzem 2024	1	24	0	22	5.5%	2.76	[0.12; 64.23]
Tran 2024	2	17	3	18	19.7%	0.71	[0.13; 3.72]
Total (95% CI)	**9**	**65**	**15**	**92**	**100.0%**	**1.05**	**[0.50; 2.19]**

Heterogeneity: $Tau^2 = 0$; $Chi^2 = 0.58$, df = 2 (P = 0.7464); $I^2 = 0.0\%$
Test for overall effect: Z = 0.12 (P = 0.901)



RESULTS

Four studies (n = 227; 135 GLP-1, 92 controls) were included. Semaglutide was the most common agent (43%), with mean treatment duration of 7.6 months. Across studies, mean BMI decreased from mean 39.4 kg/m² at baseline to 32.0–36.1 kg/m² preoperatively in GLP-1 groups, compared to smaller reductions in controls. The GLMM confirmed significant preoperative BMI reduction overall (β = −4.78; 95% CI: −7.92 to −1.63; p = 0.003), however with no difference between GLP-1 and controls. Time to surgery was consistently shorter in GLP-1 cohorts when compared to groups with patients that underwent bariatric surgery. Pooled analyses showed no significant differences between GLP-1 and controls for SSI (RR = 1.05; 95% CI: 0.50–2.19; p = 0.75) or surgical site occurrences (RR = 0.95; 95% CI: 0.54–1.65; p = 0.82). Recurrence rates were low in both groups (0–3% GLP-1 vs 4.5–5.6% controls).

CONCLUSION

GLP-1 therapy appears to facilitate meaningful weight loss with comparable outcomes when compared to other prehabilitation recommendations and bariatric surgery. These findings support GLP-1 agents as a promising non-invasive optimization strategy for high-risk patients. However, evidence is limited by small sample sizes, short follow-up, and heterogeneity in agents and protocols. Prospective studies with standardized reporting and longer follow-up are needed to clarify long-term outcomes and cost-effectiveness.