
| RESEARCH ARTICLE

Body-Contouring Surgery After GLP-1–Induced Massive Weight Loss: Surgical Outcomes, Complications, and Patient-Reported Quality of Life

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| ABSTRACT

The rapid adoption of glucagon-like peptide-1 receptor agonists (GLP-1 RAs) has created a growing population presenting for body-contouring surgery after pharmacologically induced massive weight loss (MWL). Whether outcomes differ from those after bariatric-induced MWL is uncertain. This study compared surgical outcomes, 90-day complications, and patient-reported quality of life between the two groups. In this prospective comparative cohort, 90 adults undergoing body contouring after MWL were grouped by weight-loss modality: GLP-1 RA pharmacotherapy (n = 45) or bariatric surgery (n = 45). Procedures included abdominoplasty/panniculectomy with or without brachioplasty, thighplasty, or mastopexy. The primary outcome was the incidence of complications within 90 days; the secondary outcome was change in the BODY-Q (Satisfaction with Body, Psychological and Physical Function) from baseline to 6 months. Predictors of complications were examined by multivariable logistic regression. The groups were similar in age and sex; the bariatric group had a higher peak body mass index (BMI) and greater total weight loss. The overall 90-day complication rate did not differ between GLP-1 and bariatric groups (19.0% vs 22.2%; p = 0.69), nor did any individual complication. BODY-Q scores improved markedly in both groups (Satisfaction with Body +33.3 vs +36.3 points; both p < 0.001), with no significant between-group difference. On multivariable analysis, BMI at surgery (adjusted OR 1.78 per 5 kg/m²; p = 0.02) and current smoking (OR 2.40; p = 0.04) predicted complications, whereas weight-loss modality did not (OR 0.83; p = 0.69). Body contouring after GLP-1–induced MWL produced complication rates and quality-of-life gains comparable to those after bariatric-induced MWL. Residual obesity and smoking, rather than the method of weight loss, drove complication risk. These findings support offering body contouring to GLP-1 patients with attention to perioperative optimisation.

| KEYWORDS

GLP-1 receptor agonists; massive weight loss; body contouring; abdominoplasty; complications; BODY-Q; patient-reported outcomes

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1. Introduction

Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) have transformed weight management, and their widespread use has produced a rapidly expanding population of patients who achieve massive weight loss (MWL) pharmacologically and subsequently present with redundant skin amenable to body-contouring surgery.^[1] As after bariatric surgery, the overstretched, excess skin that follows large-volume weight loss causes functional, hygienic, and psychosocial problems that body contouring is well placed to address.^[2]

Body-contouring surgery after MWL reliably improves body image, satisfaction with appearance, and health-related quality of life (HRQoL), and these gains are durable over years.^[3,4,5] Because the principal benefit is one that patients themselves perceive, contemporary practice measures it with validated patient-reported outcome (PRO) instruments rather than surgeon assessment alone; the BODY-Q, a rigorously developed and Rasch-validated instrument, is the most widely used measure across the weight-loss and body-contouring journey.^[6,7,8]

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The pharmacological route to MWL, however, raises questions that the bariatric literature does not fully answer. GLP-1–induced weight loss differs in its tempo, its effect on lean mass and nutrition, and its metabolic context, and concerns have been raised about wound healing and perioperative risk in these patients. Early comparative data suggest that complication rates after body contouring may be similar regardless of how weight loss was achieved, but the evidence base is new, heterogeneous, and still maturing.^[9,10,11,12] Robust comparative data with validated PROs are therefore needed. The aim of this study was to compare surgical outcomes, 90-day complications, and BODY-Q–measured quality of life between patients undergoing body contouring after GLP-1–induced versus bariatric-induced MWL.

2. Materials and Methods

2.1 Study design and setting

This was a prospective comparative cohort study conducted in a plastic surgery unit over a 24-month period. The study was approved by the institutional research ethics committee, and all participants provided written informed consent. Reporting follows the STROBE statement for cohort studies.

2.2 Participants and grouping

Adults (≥ 18 years) presenting for body contouring after MWL — defined as a reduction of $\geq 20\%$ of total body weight or a fall in BMI of ≥ 10 kg/m² sustained for at least 3 months — were eligible. Patients were grouped by the means of weight loss: GLP-1 RA pharmacotherapy or bariatric surgery. Exclusion criteria were combined modalities, weight instability, active smoking within 4 weeks of surgery without cessation counselling, and inability to complete questionnaires. In keeping with current perioperative guidance, GLP-1 RAs were withheld before surgery to reduce the risk of delayed gastric emptying and aspiration.^[13] Ninety patients were enrolled, 45 per group.

2.3 Procedures and outcome measures

All patients underwent abdominoplasty or panniculectomy, alone or combined with brachioplasty, thighplasty, or mastopexy, by two consultant surgeons using standardised techniques. The primary outcome was the incidence of complications within 90 days (seroma, wound dehiscence, surgical site infection, haematoma, and reoperation), graded by the Clavien–Dindo classification. The secondary outcome was patient-reported quality of life, assessed with the BODY-Q Satisfaction with Body, Psychological Function, and Physical Function scales at baseline and 6 months; raw scores were converted to the 0–100 Rasch-transformed scale, with higher scores indicating better outcomes.^[6,14]

2.4 Statistical analysis

Continuous variables are presented as mean \pm standard deviation (SD) and categorical variables as counts and percentages. Groups were compared with the independent-samples t-test (or Mann–Whitney U test) and the chi-square or Fisher exact test. Pre–post BODY-Q scores were compared with the paired-samples t-test. A multivariable logistic regression model identified independent predictors of 90-day complications, including weight-loss modality, BMI at surgery, resection weight, age, and smoking; results are reported as adjusted odds ratios (OR) with 95% confidence intervals (CI). A two-sided p-value < 0.05 was considered statistically significant.^[15]

3. Results

3.1 Baseline characteristics

The groups were comparable in age and sex. As expected, the bariatric group had a higher mean peak BMI and greater total weight loss, while BMI at the time of surgery was similar (Table 1).

Table 1. Baseline characteristics by weight-loss modality.

Characteristic	GLP-1 MWL (n=45)	Bariatric MWL (n=45)	p-value
Age, years — mean \pm SD	46.8 \pm 10.2	45.3 \pm 9.8	0.48
Female sex — n (%)	37 (82.2)	38 (84.4)	0.78
Peak BMI, kg/m ² — mean \pm SD	42.1 \pm 6.3	48.7 \pm 7.1	< 0.001
BMI at surgery, kg/m ² — mean \pm SD	30.4 \pm 3.8	29.1 \pm 3.5	0.09
Total weight loss, % — mean \pm SD	27.6 \pm 6.1	34.2 \pm 7.4	< 0.001
Current smoker — n (%)	8 (17.8)	7 (15.6)	0.78

Characteristic	GLP-1 MWL (n=45)	Bariatric MWL (n=45)	p-value
Abdominoplasty / panniculectomy — n (%)	45 (100)	45 (100)	—
Additional procedure — n (%)	26 (57.8)	28 (62.2)	0.67

3.2 Surgical outcomes and complications

The overall 90-day complication rate did not differ between groups (GLP-1 19.0% vs bariatric 22.2%; $p = 0.69$), and no individual complication — seroma, wound dehiscence, surgical site infection, haematoma, or reoperation — differed significantly (**Figure 1; Table 2**). Major complications (Clavien–Dindo \geq III) were infrequent in both groups (4.4% vs 6.7%).

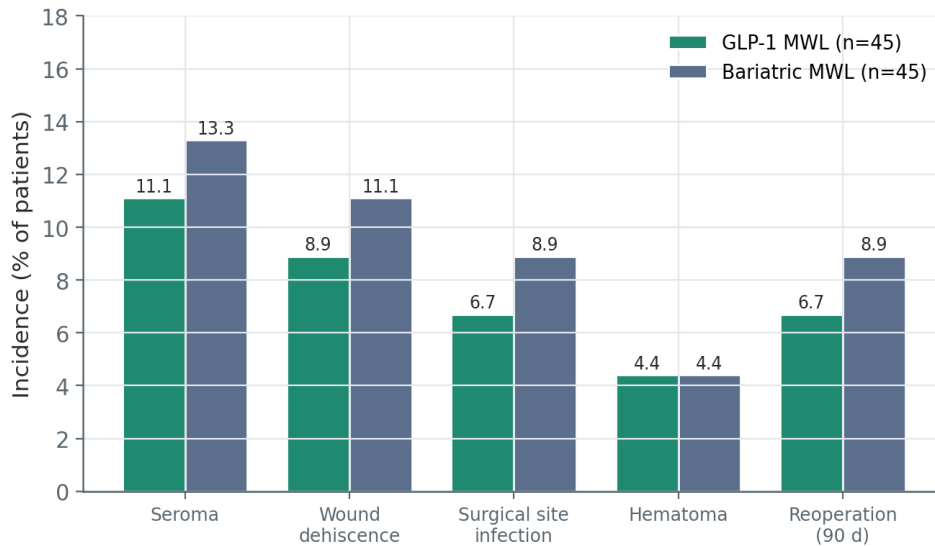


Figure 1. Ninety-day complications by type and weight-loss modality; all between-group differences were non-significant.

Table 2. Ninety-day complications by weight-loss modality.

Complication	GLP-1 (n=45)	Bariatric (n=45)	p-value
Any complication — n (%)	9 (19.0)	10 (22.2)	0.69
Seroma — n (%)	5 (11.1)	6 (13.3)	0.75
Wound dehiscence — n (%)	4 (8.9)	5 (11.1)	0.73
Surgical site infection — n (%)	3 (6.7)	4 (8.9)	0.69
Haematoma — n (%)	2 (4.4)	2 (4.4)	1.00
Reoperation within 90 days — n (%)	3 (6.7)	4 (8.9)	0.69

3.3 Patient-reported quality of life

BODY-Q scores improved substantially from baseline to 6 months in both groups across all measured domains, with no significant between-group difference in the magnitude of improvement (**Figure 2; Table 3**). Satisfaction with Body rose by a mean of 33.3 points in the GLP-1 group and 36.3 points in the bariatric group (both $p < 0.001$).



Figure 2. Mean change in BODY-Q scores at 6 months by domain and group (error bars = SE).

Table 3. BODY-Q outcomes at baseline and 6 months (Rasch-transformed 0–100 scale).

BODY-Q scale	Baseline	6 months	Mean change	p (within)
Satisfaction with Body — GLP-1	38.5 ± 14.2	71.8 ± 13.6	+33.3	< 0.001
Satisfaction with Body — bariatric	36.9 ± 13.8	73.2 ± 12.9	+36.3	< 0.001
Psychological Function — GLP-1	52.1 ± 13.1	70.4 ± 12.4	+18.3	< 0.001
Physical Function — GLP-1	55.2 ± 12.7	70.8 ± 11.9	+15.6	< 0.001

3.4 Predictors of complications

On multivariable logistic regression, a higher BMI at the time of surgery (adjusted OR 1.78 per 5 kg/m²; 95% CI 1.10–2.88; $p = 0.02$), greater resection weight (OR 1.22 per 500 g; $p = 0.03$), and current smoking (OR 2.40; $p = 0.04$) were independently associated with 90-day complications. Weight-loss modality (GLP-1 versus bariatric) was not associated with complication risk (OR 0.83; 95% CI 0.34–2.03; $p = 0.69$), nor was age (Figure 3).

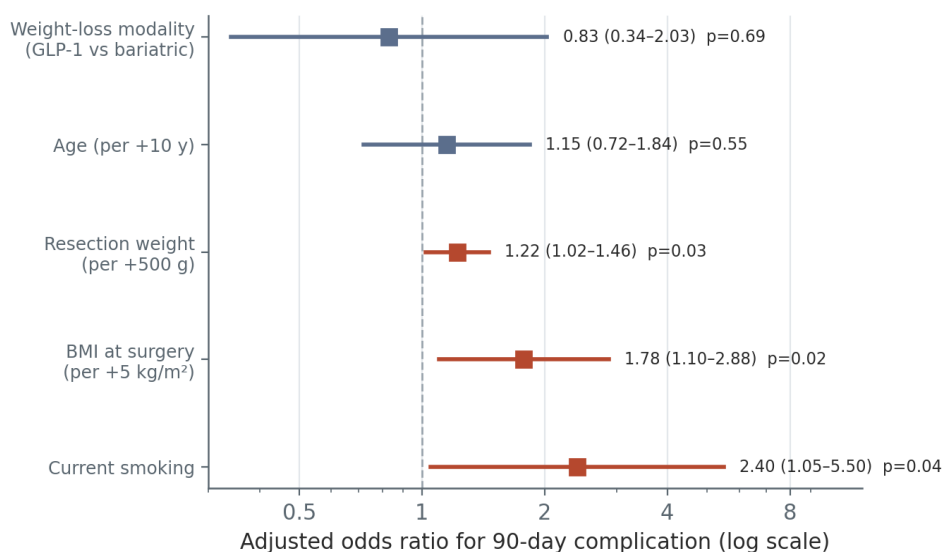


Figure 3. Adjusted odds ratios for 90-day complications (multivariable logistic regression). Markers right of 1.0 indicate higher risk; modality was not a significant predictor.

4. Discussion

In this comparative cohort, body contouring after GLP-1–induced MWL achieved 90-day complication rates and quality-of-life improvements that were statistically indistinguishable from those after bariatric-induced MWL. The clinically important message is that the method of weight loss did not independently influence surgical risk; instead, residual obesity (BMI at surgery) and smoking were the dominant, and modifiable, predictors of complications. This is consistent with emerging comparative evidence that weight-loss modality does not materially change body-contouring complication rates.^[9,10,11]

The large and parallel BODY-Q gains in both groups reinforce a central principle of post-MWL surgery: the value of the operation lies in restoring body image, psychological well-being, and physical function, not merely in removing tissue. The magnitude of improvement seen here is in line with the established literature on body contouring after bariatric surgery, in which validated PROs demonstrate substantial and durable benefit.^[3,4,5] Using a validated instrument such as the BODY-Q rather than an ad hoc satisfaction question makes these outcomes comparable across studies and defensible to reviewers and payers.^[7,8]

Several practical considerations follow. Because residual obesity predicted complications, preoperative optimisation — encouraging further weight stabilisation, nutritional repletion, and smoking cessation — remains central regardless of how weight was lost.^[12] The pharmacological route carries its own perioperative issues, notably delayed gastric emptying with GLP-1 RAs and the consequent aspiration risk, which informs current recommendations to withhold these agents before surgery.^[13] Attention to the patient's psychological trajectory is also warranted, since mood and mental-health factors influence both the decision to undergo surgery and post-operative recovery in this population.^[16]

4.1 Limitations

This study has limitations. Allocation by weight-loss modality was not randomised, so residual confounding cannot be excluded, and patients choosing pharmacological weight loss may differ systematically from bariatric patients. The single-centre design and moderate sample limit generalisability and the power of the regression and subgroup analyses. Follow-up for PROs was limited to 6 months; longer surveillance would better characterise the durability of quality-of-life gains. Finally, the rapidly evolving landscape of GLP-1 therapy means that dosing, duration, and patient profiles may shift, so findings should be revisited as practice matures.^[10]

5. Conclusion

Body-contouring surgery after GLP-1–induced massive weight loss produced complication rates and patient-reported quality-of-life gains comparable to those after bariatric-induced weight loss. Complication risk was driven by residual obesity and smoking rather than by the method of weight loss. With appropriate perioperative optimisation — including withholding GLP-1 agents before surgery, nutritional repletion, and smoking cessation — body contouring can be offered to this growing population with outcomes comparable to the established post-bariatric pathway. Larger, multicentre, longer-term studies are needed to confirm these findings as GLP-1 practice evolves.

Declarations

Ethics approval. Granted by the institutional research ethics committee; written informed consent was obtained from all participants.

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Conflicts of interest. The authors declare no conflicts of interest.

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