



Effects of GLP-1 receptor agonists on aesthetic surgery practice: A contemporary review

Mert Ersan, Orhan Özturhan

Department of Plastic, Reconstructive and Aesthetic Surgery, Yeditepe University Hospital, İstanbul, Türkiye

ABSTRACT

Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) have become increasingly relevant to aesthetic surgery because of the significant weight loss they provide in the treatment of type 2 diabetes mellitus and obesity. While these agents expand the pool of surgical candidates, they also raise new clinical questions related to rapid or substantial weight loss, including soft tissue volume loss, skin laxity, nutritional deficiencies, perioperative safety concerns, and the durability of aesthetic surgical outcomes. This contemporary narrative review evaluated the current implications of GLP-1 RAs in aesthetic plastic surgery practice. A targeted PubMed/MEDLINE search covering January 2015 through August 2026 was supplemented by manual reference screening. Retrospective cohorts, database analyses, prospective observational studies, systematic reviews, survey studies, case reports, and selected guidance or opinion articles were evaluated. Current literature indicates increasing demand for facial aesthetic, breast aesthetic, and body contouring procedures among patients using GLP-1 RAs. The facial volume loss and skin laxity popularly described as “Ozempic face” more plausibly reflect rapid or substantial weight loss than a proven drug-specific facial effect. Although the breast surgery literature remains limited, upper-pole volume loss, ptosis, reduced soft tissue support, and healing problems along high-tension closure lines are noteworthy. Outcomes in body contouring surgery are heterogeneous: While some studies report comparable complication rates, others emphasize delayed wound healing, wound dehiscence, altered scar behavior, or nutrition-related risks. Surgical timing, weight stabilization, nutritional balance, and individualized perioperative aspiration-risk assessment are key areas of evaluation. GLP-1 RA use should be considered neither an absolute advantage nor an automatic contraindication in aesthetic surgery. Direct pharmacologic effects often cannot be separated from the consequences of weight loss or baseline metabolic risk. Surgical decision-making should be individualized based on weight stability, metabolic optimization, nutritional status, history of bariatric surgery, psychological adaptation, and procedure-specific risks. Current evidence is promising but heterogeneous, and prospective studies are needed to clarify long-term aesthetic outcomes and procedure-specific risks.

Keywords: GLP-1 receptor agonists, semaglutide, Ozempic face, body contouring, abdominoplasty, breast aesthetics

INTRODUCTION

Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) were initially developed for the treatment of type 2 diabetes mellitus; however, in recent years, they have gained widespread use in obesity management, particularly with agents such as semaglutide, liraglutide, and tirzepatide. The significant weight loss achieved with these medications has led to the emergence of a new patient population in aesthetic surgery practice in terms of surgical candidacy, operative timing, postoperative risk profile, and the predictability of aesthetic outcomes (1,2).

The impact of GLP-1 RAs on plastic surgery is bidirectional. On the one hand, the reduction in body mass index allows some patients who were previously considered unsuitable for surgery to be reconsidered for body contouring and breast aesthetic procedures. On the other hand, rapid or substantial weight loss creates new uncertainties in surgical planning because of its potential effects on tissue quality, nutritional status, weight stability, and wound healing. Available studies generally cannot determine whether these changes reflect a direct pharmacologic effect, the magnitude or velocity of weight loss, or accompanying metabolic factors (3,4).

This change has become increasingly evident in clinical practice and has generated new questions regarding patient screening, nutritional counseling, surgical timing, and perioperative management. GLP-1 RAs have become part of aesthetic surgical practice; however, no standardized approach specific to these patients has yet been established, and proposed strategies remain largely individualized (2,3).

Cite this article as: Ersan M, Özturhan O. Effects of GLP-1 receptor agonists on aesthetic surgery practice: a contemporary review. *Turk J Surg*. [Epub Ahead of Print]

Corresponding Author

Mert Ersan

E-mail: mert.ersan@yeditepe.edu.tr

ORCID ID: orcid.org/0000-0001-6109-8919

Received: 27.04.2026

Accepted: 26.09.2026

Epub: 05.10.2026

DOI: 10.47717/turkjsurg.2026.2026-4-35

Available at www.turkjsurg.com



Changes in the facial region are among the most visible aesthetic consequences associated with medical weight loss. Midfacial volume loss, skin laxity, and an aged appearance due to rapid volume depletion have been described under the popular term “Ozempic face” and subsequently addressed in the plastic surgery literature as a clinical phenomenon associated with facial volume loss and increased demand for facial rejuvenation. Current literature more often interprets this phenotype as a manifestation of global or rapid weight loss than as evidence of selective, drug-specific facial toxicity (5-7).

However, the literature remains heterogeneous regarding the effects of GLP-1 RAs on aesthetic surgical outcomes. While some studies have reported comparable complication rates, others have emphasized delayed wound healing, altered tissue behavior, and nutrition-related risks. Therefore, current data support neither a direct advantage nor an automatic contraindication for GLP-1 RA use; rather, they indicate that surgical decisions should be based on weight stability, metabolic optimization, nutritional adequacy, bariatric history, and procedure-specific risks. Observational associations should not be interpreted as proof of either harm or protection from the medication itself (3,8-10).

In this review, the role of GLP-1 RAs in aesthetic surgery is discussed under the headings of patient selection and surgical timing, facial aesthetics, body contouring, breast aesthetics, aesthetic surgical outcomes, perioperative management, nutrition, and biological mechanisms. The aim is to present this rapidly expanding but methodologically heterogeneous literature within a clinically meaningful framework and to define the strengths and limitations of the current evidence.

MATERIAL and METHODS

This study is a contemporary narrative review prepared to evaluate the current implications of GLP-1 RAs in aesthetic plastic surgery practice. The review was structured in accordance with the principles of the Scale for the Assessment of Narrative Review Articles (SANRA) (11). Only English-language publications were considered. A targeted literature search was conducted through PubMed/MEDLINE for articles published between January 2015 and August 2026. The 2015 start date was selected to capture diabetes-era, mechanistic, and early weight-management literature preceding the recent expansion of aesthetic publications. Manual reference screening of relevant articles was also performed to identify additional publications directly related to the scope of the review; earlier seminal publications were eligible when required to explain foundational biology or post-weight-loss principles. The keywords “GLP-1 receptor agonist”, “semaglutide”, “tirzepatide”, “liraglutide”, “Ozempic”, “Wegovy”, “plastic surgery”, “aesthetic surgery”, “body contouring”, “abdominoplasty”, “panniculectomy”, “breast surgery”, “facial

aging”, “Ozempic face” and “wound healing” were used alone and in combination.

The evaluated sources were selected from retrospective cohorts, database analyses, prospective observational studies, systematic reviews, survey studies, case reports, and selected guidance or opinion articles. Eligible publications addressed the clinical, anatomical, biological, nutritional, perioperative, or aesthetic implications of GLP-1 RA therapy or associated weight loss. The extracted data were synthesized under clinically meaningful themes: Patient selection and surgical timing, facial aesthetics, body contouring, breast aesthetics, durability of aesthetic outcomes, perioperative management, nutrition, and biological mechanisms. Publications were excluded if they were unrelated to GLP-1 RAs, did not address plastic or aesthetic surgery, focused only on general pharmacotherapy without surgical relevance, or represented duplicate or substantially overlapping reports. The updated search and manual screening identified 59 content records. After evaluation for relevance, overlap, and contribution to the final synthesis, 37 content publications were retained in the cited narrative review; the SANRA instrument was cited separately, yielding 38 references in total. Because of the review nature of the study, no formal meta-analysis or risk-of-bias assessment was performed. Throughout the synthesis, direct drug effects were distinguished from weight-loss-associated findings whenever the study design allowed; where separation was impossible, this uncertainty was stated explicitly. The completed SANRA self-appraisal is provided as Supplementary Table S1.

FINDINGS of the REVIEW

Patient Selection, Surgical Timing and Perioperative Management

In patients using GLP-1 RAs, surgical eligibility should not be assessed solely according to the reduction in body mass index (BMI). The rate and magnitude of weight loss, documented weight stability, metabolic comorbidities, nutritional adequacy, bariatric history, psychological adaptation, and procedure-specific risks should all be evaluated together. Current body contouring data show that the method of weight loss alone is not the strongest determinant of risk; BMI at the time of surgery, the presence of diabetes, and the overall biological substrate of the patient are often more decisive factors (8).

The fundamental principle in surgical timing is to wait for weight stabilization, similar to the experience after bariatric surgery; however, no GLP-1 RA-specific interval has been validated as a universal standard for aesthetic surgery. In the STEP 5 trial, semaglutide-associated weight loss largely plateaued after approximately 60 weeks and was maintained with continued treatment, whereas the STEP 1 extension demonstrated substantial weight regain after treatment withdrawal (12,13).

A plastic-surgery-focused review similarly emphasized the need to document a stable weight trajectory rather than relying on a fixed interval alone (14). These data support waiting until active weight loss has ceased and the treatment plan is stable, but they do not establish a procedure-specific evidence-based waiting period.

In abdominoplasty and general body contouring cohorts, when evaluating surgical outcomes after GLP-1 RA-related weight loss, it appears that the complication profile depends not only on medication exposure but also on BMI at the time of surgery, diabetes, nutritional status, procedure type, and concomitant bariatric history (8-10). Data showing increased wound dehiscence and systemic complaints, particularly in patients with both bariatric surgery and GLP-1 RA use, demonstrate that patient selection cannot be reduced solely to the amount of weight loss (9). Conversely, some cohorts evaluating body contouring outcomes after GLP-1 RA use have found similar rates of rehospitalization, emergency department visits, and major wound complications, suggesting that surgery can be safely planned in selected and well-optimized patients (10). These observational findings support risk stratification but do not prove either harm or protection from GLP-1 RAs.

The second component of patient selection is nutritional and metabolic preparation. GLP-1 RA therapy reduces appetite and total energy intake, and changes in body composition may include loss of lean mass as well as fat mass (4,15). This is particularly important in patients undergoing excisional body contouring surgery, because nutritional deficiencies may impair collagen synthesis, fibroblast activity, angiogenesis, and immune response. Current multidisciplinary guidance recommends baseline nutritional assessment, adequate protein intake, resistance training, and monitoring for micronutrient vulnerability during GLP-1-based obesity treatment; however, evidence linking a specific nutritional protocol to improved aesthetic-surgical outcomes in GLP-1 RA users remains unavailable (15).

For this reason, a proposed preoperative approach may include assessment of albumin, hemoglobin, ferritin and iron indices, vitamin B12, folate, vitamin D, and zinc when clinically indicated, particularly in patients with restrictive intake, previous bariatric surgery, anemia, or symptoms of deficiency (15,16). This panel is extrapolated largely from obesity and post-bariatric nutrition literature rather than validated as a mandatory GLP-1 RA-specific surgical standard. Testing should therefore be individualized according to history, examination, procedure magnitude, and local perioperative practice.

Adequate protein intake and resistance exercise may help preserve lean body mass during active weight loss (4,15). No universal protein threshold has been validated specifically

for GLP-1 RA users awaiting aesthetic surgery; intake should therefore be individualized according to nutritional status, renal function, body composition, ordinary dietary intake, and dietitian assessment. Oral supplementation may be considered when ordinary intake is insufficient, but this represents a pragmatic clinical approach rather than an evidence-based drug-specific standard (15-17).

The most debated perioperative effect of GLP-1 RAs is the theoretically increased risk of pulmonary aspiration due to delayed gastric emptying. A prospective gastric-ultrasound study found a higher prevalence of increased residual gastric content among patients using weekly GLP-1 RAs despite standard fasting (18). Therefore, preoperative assessment should include not only whether the patient is using the medication, but also the type and dose of the agent, timing of the last dose, gastrointestinal symptoms, dose-escalation phase, comorbid conditions, and procedural risk. Current multisociety guidance favors individualized assessment rather than automatic discontinuation for every patient (19). Because residual gastric content is a surrogate and aspiration events remain uncommon, the absolute clinical risk is still uncertain; local anesthesia protocols and multidisciplinary judgment remain important (18-20).

The third component of patient selection is psychological adaptation. After rapid weight loss, some patients may experience rapid changes in body perception, leading to early requests for corrective procedures, dissatisfaction with appearance, and sometimes a temporary sense of alienation from their own body. This does not always indicate fixed body dysmorphic disorder; however, particularly in patients planning facial and breast aesthetic procedures, expectation management, psychological adaptation, and, when necessary, evaluation for body dysmorphic disorder are important. Evidence specific to GLP-1 RA users is scarce, and this approach is extrapolated mainly from post-massive-weight-loss literature, in which body image and quality of life are important determinants of treatment experience (21).

Facial Aesthetics

Rapid or substantial weight loss associated with GLP-1 RA therapy has been linked to facial volume reduction, soft tissue volume loss, and increased skin laxity. In the plastic surgery literature, this appearance has most commonly been discussed under the term "Ozempic face"; volume loss in the temporal region and midface, accentuation of the tear trough, deepening of the nasolabial fold, prominence of marionette lines, and increased jowling have been described as its main components (5-7). These observations do not establish a selective pharmacologic effect on the face. The phenotype is more plausibly interpreted as the facial manifestation of global soft tissue loss, with age,

baseline adiposity, weight-loss velocity, and skin quality as potential modifiers.

Direct clinical evidence remains limited. In a retrospective cohort focusing on the periorbital region, GLP-1 RA use was associated with increased consultations or interventions related to brow ptosis, dermatochalasis, blepharoplasty, and rhytidectomy (22). Because observational datasets are vulnerable to surveillance, selection, and weight-loss confounding, these findings should not be interpreted as proof that the medication itself causes specific oculo-facial pathology.

Public analyses show increased searches for facial volume restoration, fillers, and lifting procedures in association with “Ozempic face” (23,24). However, social media visibility and clinical prevalence are not the same. Search activity measures awareness and changing consultation narratives rather than prevalence, severity, or causality. Therefore, although facial changes are increasingly recognized, heterogeneity remains regarding their frequency and severity.

The biological mechanism of these facial changes has not yet been fully clarified. Reviews and experimental studies raise hypotheses involving dermal and subcutaneous white adipose tissue, mesenchymal stem-cell differentiation, and local tissue homeostasis (7,25-27). A systematic review on human mesenchymal stem cells reported that GLP-1 RAs may exert context-dependent effects on proliferation and differentiation and may alter the balance between osteogenesis and adipogenesis (25). Earlier experimental data also indicate that GLP-1 receptor expression may be associated with adipose-derived stem-cell differentiation (26). However, most mechanistic data are experimental, indirect, or derived from non-aesthetic settings; they are hypothesis-generating and should not be presented as a definitive clinical cause-and-effect pathway.

In clinical practice, management of this patient group does not differ entirely from standard facial rejuvenation principles; however, because reduced tissue volume and skin excess often coexist, the approach is frequently combined. After weight stabilization, fillers or autologous fat grafting may be considered for volume restoration, whereas facelift and neck lift procedures may become more prominent when skin laxity predominates (5-7,23). These are proposed clinical options based on phenotype and conventional practice; comparative outcome studies specific to GLP-1 RA users are not available.

Body Contouring

When overall body contouring outcomes are considered, some studies indicate that the complication profile of patients who lose weight with GLP-1 RAs is comparable to that of patients who lose weight after bariatric surgery. In the large single-center cohort by Abbott et al. (8), the method of weight loss alone did not determine complication rates; rather, the main risks were

associated with BMI at the time of surgery and the presence of diabetes. Similarly, in a 10-year retrospective analysis, no overall significant increase was found in rehospitalization, emergency department visits, hematoma, seroma, or wound dehiscence among body contouring patients using GLP-1 RAs (10). In an abdominoplasty series comparing GLP-1 RA-associated weight loss with post-bariatric massive weight loss, the GLP-1 RA group demonstrated better nutritional parameters, a lower tendency toward complications, and higher patient satisfaction (28). Residual confounding prevents attribution of these differences to the medication itself.

However, the literature is not unidirectional. In a comparative analysis focusing on abdominoplasty, GLP-1 RA use alone was not associated with a marked increase in hematoma or seroma; however, when combined with a history of bariatric surgery, it was associated with increased wound dehiscence and systemic complaints (9). This finding suggests that the issue may not be GLP-1 RA use alone, but rather the combined clinical context created by medication exposure and bariatric history. Similarly, in a non-bariatric panniculectomy cohort, patients using GLP-1 RAs had higher rates of delayed wound healing but lower rates of seroma, suggesting that tissue and procedure-specific effects cannot be summarized simply as either “good” or “bad” (29). These mixed findings do not establish a uniform drug effect.

In a large propensity-matched database study, increased wound complications after abdominoplasty, panniculectomy, and breast reduction were reported, particularly in non-diabetic patients (30). This finding is important; however, because the study grouped heterogeneous procedures together and could not fully account for major confounders such as nutritional status, weight trajectory, and medication timing, it is insufficient to draw absolute conclusions. Part of the inconsistency observed in the body contouring literature may therefore result from interpreting different patient populations and procedures under the same umbrella.

From the perspective of systemic effects, a prospective single-center abdominoplasty study is noteworthy. Patients using GLP-1 RAs showed lower increases in thromboinflammatory markers such as C-reactive protein (CRP), interleukin (IL)-6, fibrinogen, D-dimer, and PAI-1, providing a biological signal that GLP-1 RAs may reduce systemic inflammation and hypercoagulability (31). However, because the study was not powered for clinical venous thromboembolism outcomes, this biomarker advantage should be regarded as hypothesis-generating rather than definitive clinical superiority.

Breast Aesthetics

Rapid or substantial weight loss may result in loss of upper-pole fullness, increased ptosis, and laxity of the breast skin envelope. These changes resemble the post-massive-weight-loss breast

phenotype and may make tissue support more critical in mastopexy, augmentation-mastopexy, and implant-based planning (32). At present, the morphological changes are better attributed to weight loss and baseline tissue quality than to a proven direct pharmacologic effect of GLP-1 RAs.

Post-weight-loss breast surgery literature supports individualized planning according to skin excess, parenchymal distribution, soft tissue thickness, and the need for reshaping or support (32). In patients with marked upper-pole deflation and thin soft tissue coverage, cautious implant selection, fat grafting, internal support, or staged surgery may be considered. For GLP-1 RA users, however, these options represent experience-based or post-weight-loss extrapolation rather than evidence-based drug-specific standards.

In the retrospective comparative series by Friedman and Tal (33) evaluating patients who underwent mastopexy simultaneously with implant explantation, the GLP-1 RA group showed an unfavorable trend regarding wound-healing problems, seroma, and fat necrosis. The same study also demonstrated lower albumin, prealbumin, and hemoglobin levels in this group (33). These findings raise concern about nutritional and healing capacity in a selected breast-surgery population, but the study design does not separate medication effects from weight loss, intake, or baseline tissue characteristics.

Lower-level evidence from case reports points in a similar direction. In two cases reported by Taraschi and Salgarello (34), delayed wound closure and fat necrosis were described after mastopexy or breast reduction in patients using GLP-1 RAs. Case reports cannot establish incidence or causality. They support vigilance in patients with high-tension closure lines, poor tissue quality, and limited soft tissue reserve, but should not be generalized to all GLP-1 RA users.

Durability of Aesthetic Surgical Outcomes

The long-term durability of aesthetic surgical outcomes in patients using GLP-1 RAs remains one of the least answered questions in the current literature. This issue is particularly important because GLP-1 RA-associated weight loss is a dynamic process, and surgical outcomes depend not only on operative technique but also on how the patient's weight trajectory evolves during the postoperative period. Semaglutide trials demonstrate that weight loss may be maintained during continued treatment, whereas substantial regain may occur after withdrawal (12,13). A plastic-surgery-focused review likewise recommends confirming weight stability before body contouring, but no study has established a universally valid duration of stability for each aesthetic procedure (14).

In this context, the greatest risk is performing surgery during the active weight-loss phase or the early weight-regain period. Continued weight loss may lead to recurrent skin excess or

unexpected contour changes after excisional procedures such as abdominoplasty and panniculectomy. Conversely, significant weight regain may result in relapse, re-volumization, or contour irregularities after lifting and body contouring procedures (13,14,28). These concerns are biologically and surgically plausible, but procedure-specific prospective evidence remains limited. Durability therefore appears to be more closely related to postoperative stability of the weight curve than to the method of weight loss itself.

In facial and breast surgery, the question of durability is even more complex. The effects of fillers, fat grafting, or lifting procedures performed for weight-loss-associated facial volume loss may be influenced by ongoing fat loss, tissue elasticity, dermal support, and possible weight regain (5-7,23). In patients undergoing autologous fat grafting, the effect of continued weight loss on graft volume and the effect of weight regain on facial contours have not yet been sufficiently studied. Similarly, in breast surgery, weakened soft tissue coverage and fluctuating weight trajectories may affect the long-term stability of implant-based or mastopexy results (32,33). These possibilities are inferred from conventional and post-weight-loss principles rather than long-term comparative data specific to GLP-1 RA users.

Scar quality is also an important component of long-term aesthetic outcomes. Panniculectomy and mixed-procedure studies have reported signals involving delayed healing or wound complications, while a trigger-finger-release cohort reported more fibrotic scar formation, persistent symptoms, and reintervention among GLP-1 RA users (7,29,30,35). Although these observational and procedure-specific data are not sufficient to establish a definitive cause-and-effect relationship, they indicate that long-term outcomes should be evaluated not only in terms of contour or volume, but also in terms of scar quality, tissue laxity, and the need for revision surgery. Prospective, long-term, and procedure-specific follow-up studies are needed.

Biological Mechanisms

The most difficult aspect of GLP-1 RAs to interpret in plastic surgery is that systemic benefits and tissue-specific effects do not always progress in the same direction. Experimental and non-aesthetic literature suggests that GLP-1 signaling may suppress chronic inflammation, influence macrophage polarization, improve endothelial function, and affect metabolic homeostasis (3,27). This framework is consistent with the lower thromboinflammatory response reported in one clinical series (31). However, the clinical relevance of these mechanisms for wound healing, thrombosis, or aesthetic outcomes remains unproven; they should be regarded as hypotheses rather than established explanations for surgical findings.

However, tissue-level effects cannot be explained solely through an anti-inflammatory axis. Reviews focusing on aesthetic

medicine and skin health emphasize that rapid or substantial weight loss may lead to reductions in superficial and deep soft tissue volume, thinning of subcutaneous support tissue, loss of lean mass, and consequent loss of mechanical support (4,7). This observation is clinically meaningful, particularly in areas such as the face and breast, where volume loss directly affects aesthetic outcomes. These changes can occur during effective obesity treatment without requiring a direct toxic effect of the drug on skin or adipose tissue.

This biological framework may help explain some of the contradictions observed clinically. On one hand, lower increases in markers such as CRP, IL-6, fibrinogen, D-dimer, and PAI-1 suggest the possibility of a more balanced thromboinflammatory response (31). On the other hand, delayed wound closure, reduced tissue support, or wound complications have been reported in specific procedures (29,30). Cross-study differences in population, procedure, diabetes, bariatric history, nutrition, and weight trajectory preclude a single biological conclusion. A more accurate interpretation is that tissue- and procedure-specific responses may occur.

In a retrospective cohort study evaluating outcomes after trigger finger release, patients using GLP-1 RAs showed unfavorable signals regarding fibrotic scar formation, persistent symptoms, and the need for reintervention (35). This study suggests that regions containing tendon, fascia, and dense fibrous tissue may respond differently from adipose tissue-dominant areas. Because tendon and fascial healing differ from aesthetic soft tissue surgery, however, this finding cannot be directly extrapolated to the face, breast, or abdominal skin envelope and is best regarded as a rationale for further investigation (Table 1).

DISCUSSION

Although the effects of GLP-1 RAs on plastic surgery may initially appear to be interpretable mainly through weight loss, the literature reveals a more complex picture. GLP-1 RA use affects aesthetic practice through two overlapping pathways: Pharmacologic effects of treatment and anatomical or metabolic consequences of weight loss. Current evidence rarely separates these pathways. Reviews therefore emphasize comprehensive assessment of weight trajectory, nutrition, gastrointestinal risk, and procedure type rather than treating medication exposure as an isolated risk factor (2,3,15,17).

When this broader framework is evaluated together with clinical data, it becomes clear that GLP-1 RA use alone does not uniformly create a dramatic increase in complications; rather, surgical outcomes are influenced by the biological substrate of the patient and the planned operation. The same exposure may result in neutral or acceptable outcomes in a patient with good nutritional reserves, stable weight, and no bariatric history, while producing a different healing response in another patient with

more fragile tissue reserves. Comparable outcomes have been reported in selected body contouring cohorts, while wound-related signals appear in other populations and procedures (8-10,28-30). The available evidence therefore supports neither assuming equivalent risk in every user nor attributing all complications directly to the medication.

This complexity in patient selection is also reflected at the psychological level. In some patients experiencing rapid weight loss, the demand for surgery may arise not only from anatomical deformity, but also from difficulty adapting to rapid bodily change. This point is particularly important in facial and breast surgery, where patient satisfaction is determined as much by subjective perception as by objective deformity. Because direct GLP-1-specific psychological evidence is limited, screening and expectation management are proposed on the basis of post-massive-weight-loss experience rather than a validated drug-specific protocol (21).

From the perspective of facial aesthetics, the literature shows that the GLP-1 era has entered surgical practice not only through complication debates, but also through new consultation patterns. Broader plastic surgery reviews have emphasized that GLP-1 RA users may present not only as thinner patients, but also with a recognizable post-weight-loss phenotype that is aesthetically different (2,17,36,37). Therefore, facial changes should be regarded not merely as a social media phenomenon, but as one of the possible aesthetic consequences of medical weight loss. At the same time, the evidence base remains dominated by reviews, retrospective observations, and public-interest analyses; the term "Ozempic face" should not imply proven selective facial tissue injury from receptor agonism.

Public-interest analyses show that "Ozempic" and its aesthetic sequelae have rapidly become visible in public discourse and that interest extends to facial volume restoration and corrective procedures (23,24). This cultural visibility can shape patient expectations and consultation narratives, but it does not substitute for clinical incidence data or procedure-specific outcome evidence.

Risk assessment must remain grounded in clinical variables. Across body contouring studies, BMI, diabetes, bariatric history, nutritional status, weight trajectory, and procedure mix repeatedly influence observed outcomes (8-10,28-30). Independent abdominoplasty data also identify BMI as an important risk modifier (38). This may help explain why some GLP-1 RA cohorts appear to have better outcomes while others appear more problematic: Medication exposure may be similar, but baseline metabolic and procedural burdens are not. Prospective studies that measure weight trajectory, body composition, nutritional indices, dose, treatment duration, and discontinuation timing are required.

Study	Design/procedure/ domain	Key finding	Direction of effect	Main limitation
Garvey et al. (12)	Randomized trial; weight trajectory	Weight loss was sustained for 104 weeks during continued semaglutide treatment.	Favorable for stability	Not a surgical study
Wilding et al. (13)	Trial extension; treatment withdrawal	Participants regained approximately two-thirds of prior weight loss within 1 year after withdrawal.	Unfavorable after withdrawal	Post-hoc extension; no surgical outcomes
Karakasis et al. (4)	Systematic review and network meta-analysis; body composition	GLP-1-based therapies reduced fat mass and also produced variable lean-mass loss.	Mixed	No aesthetic-surgical endpoints
Abbott et al. (8)	Retrospective cohort; body contouring	Weight-loss method alone did not determine complications; BMI and diabetes were more influential.	Neutral by exposure	Single-center observational design
Boukind et al. (9)	Comparative analysis; abdominoplasty	Combined bariatric history and GLP-1 RA use was associated with more wound dehiscence and systemic complaints.	Unfavorable in combined subgroup	Residual confounding
Liang et al. (10)	10-year retrospective analysis; body contouring	No overall increase in rehospitalization, emergency visits, hematoma, seroma, or wound dehiscence.	Neutral	Retrospective exposure classification
Friedman and Tal (28)	Retrospective comparative case series; abdominoplasty	GLP-1 RA-associated weight-loss patients had better nutritional indices, fewer complications, and higher satisfaction than post-bariatric patients.	Favorable	Small, selected cohorts
Koenig et al. (29)	Retrospective cohort; non-bariatric panniculectomy	Delayed healing was more frequent, while seroma was less frequent, among GLP-1 RA users.	Mixed	Observational; competing outcomes
Lee et al. (30)	Propensity-matched database study; mixed plastic procedures	Higher wound complications were reported, particularly among non-diabetic patients.	Unfavorable	Heterogeneous procedures; limited nutritional data
Bruno et al. (31)	Prospective single-center study; abdominoplasty	Postoperative thromboinflammatory marker increases were lower among GLP-1 RA users.	Favorable biomarker signal	Underpowered for clinical VTE outcomes
Saffari et al. (22)	Retrospective cohort; periorbital/facial	GLP-1 RA use was associated with consultations or interventions for brow ptosis, dermatochalasis, and facial rejuvenation.	Association with increased intervention	Selection and weight-loss confounding
Friedman and Tal (33)	Retrospective comparative study; explantation with mastopexy	Unfavorable trends in wound problems, seroma, and fat necrosis accompanied lower nutritional indices.	Unfavorable	Selected operation; limited causal separation
Taraschi and Salgarello (34)	Two case reports; mastopexy/breast reduction	Delayed closure and fat necrosis were described.	Unfavorable signal	Case reports; no incidence estimate
Sen et al. (18)	Prospective cross-sectional gastric ultrasound study; anesthesia	Weekly GLP-1 RA use was associated with increased residual gastric content despite standard fasting.	Unfavorable surrogate	Residual content, not aspiration events
Dameron et al. (35)	Retrospective cohort; trigger-finger release	More fibrotic scar, persistent symptoms, and reintervention were reported.	Unfavorable indirect evidence	Non-aesthetic tissue and procedure

Direction refers to the reported association or signal, not to proven causality. GLP-1 RA: Glucagon-like peptide-1 receptor agonist, VTE: Venous thromboembolism, BMI: Body mass index.

Study Limitations

The main limitation of this review is the marked heterogeneity of the existing literature. Because this review was designed as a narrative synthesis rather than a systematic review or meta-analysis, no formal risk-of-bias assessment was performed; therefore, the strength of the conclusions depends on the

quality, heterogeneity, and clinical relevance of the available literature. The included studies involve different procedures such as abdominoplasty, panniculectomy, mastopexy, blepharoplasty, and other aesthetic or reconstructive interventions; different GLP-1 RAs such as semaglutide, liraglutide, and tirzepatide; and variable dosages, durations of use, treatment timing, and weight-

loss trajectories. Comparison groups are also heterogeneous and include post-bariatric surgery patients, individuals who lost weight through lifestyle modification alone, controls without GLP-1 RA use, or pretreatment periods. Most observational studies cannot distinguish receptor-mediated drug effects from the consequences of rapid or substantial weight loss, diabetes control, bariatric history, nutritional intake, or selection for surgery.

Another important limitation is the lack of standardization in outcome measures and complication definitions across studies. While some publications report only major surgical complications, others include minor wound dehiscence, seroma, or delayed closure under the category of complications. This reduces direct comparability between studies.

A significant portion of the available data is based on retrospective designs. In addition, many studies do not report clinically important variables in detail, such as nutritional status, protein intake, micronutrient deficiencies, body composition, weight stability, gastrointestinal symptoms, adjunctive supportive treatments, and medication discontinuation timing. Residual confounding and surveillance bias therefore limit causal interpretation of both favorable and unfavorable associations.

Finally, the amount of data regarding facial aesthetics, breast aesthetics, scar quality, and the durability of aesthetic outcomes remains limited; therefore, interpretations in these areas are based on lower levels of evidence compared with the body contouring literature. Recommendations in these domains should be understood as a proposed clinical framework informed by conventional post-weight-loss and perioperative principles, not as validated standards specific to GLP-1 RA users.

CONCLUSION

GLP-1 RAs have reshaped plastic surgery practice because of their success in obesity treatment. These medications have enabled some patients who would previously not have qualified for surgery to become operative candidates and have increased demand for procedures related to facial and body contour refinement. On the other hand, rapidly developing skin laxity, volume loss, nutritional vulnerability, perioperative management challenges, and uncertainty regarding the durability of surgical outcomes have made it necessary for surgeons to evaluate patients in a more comprehensive manner. Current studies often cannot determine whether these findings arise from the medication itself, the magnitude or velocity of weight loss, or baseline metabolic factors.

In light of the current literature, GLP-1 RA use alone is neither a complete advantage nor an absolute contraindication. Surgical decisions should be made on an individual basis by evaluating documented weight stability, BMI, diabetes and

metabolic control, history of bariatric surgery, nutritional status, gastrointestinal risk, psychological adaptation, and the nature of the planned procedure together.

For plastic surgery, the central question is no longer “Can a patient using a GLP-1 RA undergo surgery?” but rather “Which GLP-1 RA patient is most suitable, at what time, with what preparation, and for which procedure?” Therefore, a multidisciplinary approach, individualized planning, transparent discussion of the limited evidence, patient education, and long-term follow-up are the key elements of this new era.

Acknowledgments

For transparency, the authors note that an artificial intelligence-assisted language model (ChatGPT, OpenAI) was utilized to support text editing and language correction. This assistance was limited to linguistic refinement; all scientific content, critical analysis, and final editorial decisions were made exclusively by the authors.

Footnotes

Author Contributions

Concept - M.E.; Design - M.E., O.Ö.; Data Collection or Processing - M.E.; Analysis or Interpretation - M.E., O.Ö.; Literature Search - M.E.; Writing - M.E., O.Ö.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

Supplementary Table Link: <https://d2v96fxpocvxx.cloudfront.net/a8b2a838-ca73-407f-ba5b-c86ead59dd3/content-images/da175925-4dad-4f29-b500-684ad5efe172.pdf>

REFERENCES

1. Wilding JPH, Batterham RL, Calanna S, Davies M, Van Gaal LF, Lingvay I, et al.; STEP 1 Study Group. Once-weekly semaglutide in adults with overweight or obesity. *N Engl J Med*. 2021;384:989-1002.
2. Stanton EW, Manasyan A, Banerjee R, Hong K, Koesters EC, Daar DA. Glucagon-like peptide-1 agonists: a practical overview for plastic and reconstructive surgeons. *Ann Plast Surg*. 2025;94:121-127.
3. Cedirian S, Donati M, Rapparini L, Pampaloni F, La Placa M, Sgarzani R, et al. Benefit-risk assessment of GLP-1 receptor agonists: implications for dermatologists and plastic surgeons. *Dermatol Ther (Heidelb)*. 2025;15:3173-3193.
4. Karakasis P, Patoulas D, Fragakis N, Mantzoros CS. Effect of glucagon-like peptide-1 receptor agonists and co-agonists on body composition: systematic review and network meta-analysis. *Metabolism*. 2025;164:156113.
5. Humphrey CD, Lawrence AC. Implications of Ozempic and other semaglutide medications for facial plastic surgeons. *Facial Plast Surg*. 2023;39:719-721. Erratum in: *Facial Plast Surg*. 2023;39:e1.
6. Mansour MR, Hannawa OM, Yaldo MM, Nageeb EM, Chaiyasate K. The rise of “Ozempic face”: analyzing trends and treatment challenges associated with rapid facial weight loss induced by GLP-1 agonists. *J Plast Reconstr Aesthet Surg*. 2024;96:225-227.
7. Haykal D, Hersant B, Cartier H, Meningaud JP. The role of GLP-1 agonists in esthetic medicine: exploring the impact of semaglutide on body contouring and skin health. *J Cosmet Dermatol*. 2025;24:e16716.

8. Abbott EN, Giannas E, Dorjsuren N, King D, Li R, Christopher A, et al. Post-weight loss body contouring surgery: complication rates following bariatric surgery, injectable GLP-1 pharmacotherapy, combination therapy, and lifestyle modification. *Aesthet Surg J*. 2026;sjag049.
9. Boukind A, He K, Speller N, Badran SM. Abdominoplasty after bariatric surgery and GLP-1 receptor agonists: independent vs combined complication risks. *Aesthet Surg J*. 2026;46:728-736.
10. Liang J, Pillai T, Chopra S, Cathey JM, Patel A. Postoperative outcomes in body contouring procedures following glucagon-like peptide-1 receptor agonist use: a 10-year analysis. *Aesthet Surg J*. 2025;45:501-507.
11. Baethge C, Goldbeck-Wood S, Mertens S. SANRA-a scale for the quality assessment of narrative review articles. *Res Integr Peer Rev*. 2019;4:5.
12. Garvey WT, Batterham RL, Bhatta M, Buscemi S, Christensen LN, Frias JP, et al.; STEP 5 Study Group. Two-year effects of semaglutide in adults with overweight or obesity: the STEP 5 trial. *Nat Med*. 2022;28:2083-2091.
13. Wilding JPH, Batterham RL, Davies M, Van Gaal LF, Kandler K, Konakli K, et al.; STEP 1 Study Group. Weight regain and cardiometabolic effects after withdrawal of semaglutide: the STEP 1 trial extension. *Diabetes Obes Metab*. 2022;24:1553-1564.
14. Garbaccio NC, Smith JE, Posso A, Schonebaum DI, Foster L, Cordero JJ, et al. Plastic surgery in the Ozempidemic: considerations for the timing of body contouring surgery in patients with semaglutide-associated weight loss. *Aesthetic Plast Surg*. 2025;49:6078-6088.
15. Mozaffarian D, Agarwal M, Aggarwal M, Alexander L, Apovian CM, Bindlish S, et al. Nutritional priorities to support GLP-1 therapy for obesity: a joint advisory from the American College of Lifestyle Medicine, the American Society for Nutrition, the Obesity Medicine Association, and The Obesity Society. *Am J Clin Nutr*. 2025;122:344-367. Erratum in: *Am J Clin Nutr*. 2026;123:101303.
16. Sherf Dagan S, Goldenshluger A, Globus I, Schweiger C, Kessler Y, Kowen Sandbank G, et al. Nutritional recommendations for adult bariatric surgery patients: clinical practice. *Adv Nutr*. 2017;8:382-394.
17. O'Neill ES, Wiegmann AL, Parrella N, Pittman T, Hood K, Kurlander D. Injectable weight loss medications in plastic surgery: what we know, perioperative considerations, and recommendations for the future. *Plast Reconstr Surg Glob Open*. 2024;12:e5516.
18. Sen S, Potnuru PP, Hernandez N, Goehl C, Praestholm C, Sridhar S, et al. Glucagon-like peptide-1 receptor agonist use and residual gastric content before anesthesia. *JAMA Surg*. 2024;159(6):660-667.
19. Kindel TL, Wang AY, Wadhwa A, Schulman AR, Sharaiha RZ, Kroh M, et al.; American Gastroenterological Association; American Society for Metabolic and Bariatric Surgery; American Society of Anesthesiologists; International Society of Perioperative Care of Patients with Obesity; Society of American Gastrointestinal and Endoscopic Surgeons. Multisociety clinical practice guidance for the safe use of glucagon-like peptide-1 receptor agonists in the perioperative period. *Clin Gastroenterol Hepatol*. 2025;23:2083-2085.
20. Davila Diaz R, Campos Barrera E, Diaz Fosado LA, Reyes Esparza A, Perez Benitez OA. Glucagon-like peptide-1 receptor agonists in plastic surgery: perioperative considerations and safety protocols. *Cureus*. 2025;17:e99865.
21. Song AY, Rubin JP, Thomas V, Dudas JR, Marra KG, Fernstrom MH. Body image and quality of life in post massive weight loss body contouring patients. *Obesity (Silver Spring)*. 2006;14:1626-1636.
22. Saffari PS, Davila N, Pradeep T, Wong B, Lee WW. Periorbital changes following glucagon-like peptide-1 receptor agonist use: a retrospective cohort study of oculo-facial complications and interventions. *Ophthalmic Plast Reconstr Surg*. 2026;42:414-419.
23. Mnajjed L, Mims MM. Interest in facial volume restorative procedures with the rise in "Ozempic face": a Google Trends analysis. *Plast Reconstr Surg Glob Open*. 2025;13:e7282.
24. McCarthy AD, Durairaj K, Linneman-Heath J, Sajic D, Dacso M, Durkin A. Rising public interest in weight loss medications and growing awareness of their aesthetic sequelae: an infodemiologic Google Trends analysis and clinical diagnostic patterning. *J Cosmet Dermatol*. 2026;25:e70670.
25. Weber L, Hashemnia Sharbabaki M, Fuchs B, Alberton P, Giunta R, Mert S, et al. The influence of GLP-1 agonists on human mesenchymal stem cells: a systematic review. *Stem Cell Rev Rep*. 2026;22:26-46.
26. Jeon YK, Bae MJ, Kim JI, Kim JH, Choi SJ, Kwon SK, et al. Expression of glucagon-like peptide-1 receptor during osteogenic differentiation of adipose-derived stem cells. *Endocrinol Metab (Seoul)*. 2014;29:567-573.
27. Mehdi SF, Pusapati S, Anwar MS, Lohana D, Kumar P, Nandula SA, et al. Glucagon-like peptide-1: a multi-faceted anti-inflammatory agent. *Front Immunol*. 2023;14:1148209.
28. Friedman O, Tal D. Abdominoplasty outcomes after GLP-1 agonist-induced versus post-bariatric massive weight loss: a retrospective comparative case series. *Plast Reconstr Surg*. 2026;157:860e-868e.
29. Koenig ZA, Rashid S, Hobbs GR, Uygur HS. Perioperative GLP-1 receptor agonist use and surgical outcomes in nonbariatric abdominal panniculectomy: a 10-year retrospective analysis. *Plast Reconstr Surg*. 2026;157:645-655.
30. Lee CC, Newland M, Yau A, Chroneos R, Johnson TS. Impact of GLP-1 agonist on surgical wound complications following plastic and reconstructive surgery: a propensity-matched cohort large database analysis. *Plast Reconstr Surg*. 2026;158:481e-490e.
31. Bruno A, Schirosi M, Foti R. Preoperative GLP-1 receptor agonists and thromboinflammatory markers in patients undergoing abdominoplasty: a prospective monocentric study. *Aesthetic Plast Surg*. 2026. Epub ahead of print.
32. Beidas OE, Rubin JP. Breast reshaping after massive weight loss. *Clin Plast Surg*. 2019;46:71-76.
33. Friedman O, Tal D. Breast implant explantation with mastopexy in patients using GLP-1 receptor agonists: a retrospective comparative analysis. *J Plast Reconstr Aesthet Surg*. 2025;111:76-85. Erratum in: *J Plast Reconstr Aesthet Surg*. 2026;119:342.
34. Taraschi F, Salgarello M. GLP-1 agonists in plastic surgery: impact on aesthetic outcomes-two case reports. *Aesthetic Plast Surg*. 2025;49:4527-4530.
35. Dameron LS, Bank NC, Raghava N, Himmelberg S, Knoll GM. The influence of glucagon-like peptide-1 receptor agonists on outcomes following trigger finger release. *J Hand Surg Glob Online*. 2026;8:100923.
36. Sciscent BY, Goldrich D, Eberly HW, Walen S. Semaglutide, popularly known as Ozempic-what the facial plastic surgeon needs to know. *Facial Plast Surg Aesthet Med*. 2025;27:127-128.
37. Seidel DU, Bode S. Rapider Gewichtsverlust durch GLP-1-rezeptor-agonisten als lifestylephänomen und implikationen für die plastisch-ästhetische medizin [Rapid weight loss through GLP-1 receptor agonists as lifestyle phenomenon and implications for plastic esthetic medicine]. *HNO*. 2025;73:765-770. German.
38. Ghnnam W, Elrahawy A, El Moghazy M. The effect of body mass index on outcome of abdominoplasty operations. *World J Plast Surg*. 2016;5:244-251.