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MULTI-STAGE PLASTIC SURGERY FOLLOWING MASSIVE WEIGHT LOSS: SEQUENCING OF FACE, NECK, BROW, AND EYELID LIFTS - INDICATIONS AND TECHNIQUES

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ABSTRACT

Background: Massive weight loss (MWL) following bariatric surgery or medical interventions results in significant soft tissue facial changes characterized by accelerated facial aging, fat devolumization, and increased skin laxity (American Society for Metabolic and Bariatric Surgery, 2019; Tan et al., 2022; Jafar et al., 2024; Shrivastava et al., 2008). These anatomical alterations necessitate specialized surgical approaches distinct from conventional facial rejuvenation procedures (Humphrey & Lawrence, 2023; Tay, 2023).

Objective: This literature review aims to synthesize current evidence on multi-stage facial plastic surgery in post-bariatric patients, focusing on the sequencing, indications, and techniques for face, neck, brow, and eyelid lifts.

Methods: A comprehensive literature review was conducted examining peer-reviewed publications from 2015-2025 in PubMed, Web of Science, Scopus, and other databases. Search terms included "massive weight loss," "facial rejuvenation," "post-bariatric surgery," "facelift," "neck lift," "brow lift," "blepharoplasty," and "sequencing." Studies addressing facial anatomical changes, surgical techniques, outcomes, complications, and staging strategies were included.

Results: MWL patients demonstrate distinct facial changes including 88% midface volume loss, 82% platysma band formation, 60% perioral volume loss, and significantly increased neck skin laxity compared to non-MWL patients (Narasimhan et al., 2015; Couto et al., 2015). Extended SMAS facelift with platysmaplasty represents the preferred surgical approach, requiring approximately twice the volume of fat augmentation (22 mL vs. 12 mL) compared to traditional patients (Narasimhan et al., 2015). Current evidence suggests prioritizing face/neck lift as the primary procedure, with staged or concurrent upper facial rejuvenation (brow lift, upper blepharoplasty) based on individual anatomical assessment (Cabbabe, 2016; Narasimhan et al., 2015; Couto et al., 2015). Lower blepharoplasty is often deferred to reduce complication risk (Patrocinio et al., 2015; American Society of Plastic Surgeons, 2024). Patient selection criteria include weight stability for 12-18 months, BMI <30 kg/m², optimization of nutritional status, and realistic expectations (Jafar et al., 2024; Cabbabe, 2016; Handal et al., 2024).

Conclusions: Facial rejuvenation in MWL patients requires specialized technical modifications, enhanced volume restoration, and careful procedural sequencing (Jafar et al., 2024; Humphrey & Lawrence, 2023; Narasimhan et al., 2015). A staged approach prioritizing face/neck lift followed by periorbital procedures appears optimal for safety and aesthetic outcomes (Patrocinio et al., 2015; American Society of Plastic Surgeons, 2024). Further prospective research is needed to establish evidence-based sequencing algorithms and long-term outcome data (Jafar et al., 2024; Cabbabe, 2016).

KEYWORDS

Massive Weight Loss, Facial Rejuvenation, Sequencing, SMAS Facelift, Blepharoplasty, Brow Lift

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Introduction

The global obesity epidemic has resulted in exponential growth in bariatric surgery interventions, with the American Society for Metabolic and Bariatric Surgery reporting 252,000 procedures performed annually in the United States as of 2018 (American Society for Metabolic and Bariatric Surgery, 2019). More recently, the introduction of glucagon-like peptide-1 (GLP-1) agonists such as semaglutide (Ozempic) has created an additional population experiencing rapid and significant weight reduction through medical rather than surgical means (Tan et al., 2022). Massive weight loss (MWL), defined as loss of 50% or greater of excess body weight or a reduction of body mass index (BMI) by ≥10 kg/m², produces profound changes throughout the body, including distinctive alterations in facial soft tissue architecture (Jafar et al., 2024; Shrivastava et al., 2008).

Unlike gradual age-related facial changes, MWL induces accelerated facial aging through rapid devolumization of facial fat compartments and severe skin laxity in patients who often maintain robust fascial and skeletal structures (Jafar et al., 2024). The resulting appearance combines features of premature aging with deflation, creating unique reconstructive challenges distinct from conventional rhytidectomy patients (Jafar et al., 2024). Studies demonstrate that MWL patients appear 5.1 years older than their actual age compared to 1.2 years in non-MWL weight loss patients (Couto et al., 2015). The term "Ozempic face" has emerged in clinical practice to describe the particularly prominent facial volume loss and skin laxity associated with rapid weight reduction via GLP-1 agonists (Humphrey & Lawrence, 2023; Tay, 2023).

The anatomical deformities in MWL patients typically involve multiple facial regions simultaneously: midface hollowing with deepened nasolabial folds, jowl formation, severe platysmal banding, "turkey neck" deformity with excess submental skin, brow ptosis, and periorbital volume depletion (Jafar et al., 2024; Narasimhan et al., 2015). Addressing these multi-regional concerns requires strategic surgical planning, often necessitating multiple procedures staged over time (Jafar et al., 2024). However, unlike body contouring after MWL, which has established staging paradigms (Coon et al., 2010), facial rejuvenation sequencing lacks standardized protocols (Jafar et al., 2024).

Rationale and Objectives

Current literature provides limited guidance on optimal sequencing of facial procedures in MWL patients (Jafar et al., 2024). Key questions include: (1) Which procedures should be performed first? (2) Can multiple facial procedures be safely combined in a single stage? (3) How do technical modifications differ from standard facial rejuvenation? (4) What are the appropriate patient selection criteria and timing? This literature review aims to synthesize available evidence on multi-stage facial plastic surgery following MWL, focusing specifically on the sequencing, indications, and techniques for face, neck, brow, and eyelid lifts. By examining anatomical changes, technical modifications, outcomes, and complications, this review provides a comprehensive framework to guide clinical decision-making in this complex patient population (Jafar et al., 2024; Cabbabe, 2016).

Methodology

Search Strategy

A comprehensive literature review was conducted following narrative review methodology. Electronic databases searched included PubMed/MEDLINE, Scopus, Web of Science, Embase, and Google Scholar. The search encompassed publications from January 2015 through December 2025 to capture contemporary surgical techniques and outcomes (Jafar et al., 2024; Cabbabe, 2016). Search terms employed various combinations of: "massive weight loss" OR "post-bariatric surgery" OR "bariatric patients" OR "weight loss surgery" OR "Ozempic" OR "GLP-1 agonist" AND "facial rejuvenation" OR "facelift" OR "rhytidectomy" OR "neck lift" OR "cervicoplasty" OR "brow lift" OR "blepharoplasty" OR "facial changes" OR "facial plastic surgery" AND "sequencing" OR "staging" OR "multi-stage" OR "indications" OR "techniques" OR "complications."

Inclusion and Exclusion Criteria

Inclusion criteria encompassed: (1) peer-reviewed original research articles, systematic reviews, and case series; (2) studies addressing facial anatomical changes after MWL; (3) publications describing surgical techniques, outcomes, or complications of facial rejuvenation procedures in MWL patients; (4) studies examining procedural sequencing or staging strategies; (5) English-language publications. Exclusion criteria included: (1) body contouring procedures not involving face/neck; (2) non-surgical interventions only; (3) case reports with fewer than 5 patients; (4) animal studies; (5) editorials or opinion pieces without original data.

Data Extraction and Analysis

Data extracted from included studies encompassed: author information, publication year, study design, sample size, patient demographics (age, BMI, type of weight loss intervention), anatomical findings, surgical techniques employed, fat grafting volumes, complication rates, patient satisfaction scores, and recommendations regarding procedural sequencing (Jafar et al., 2024; Cabbabe, 2016; Narasimhan et al., 2015; Couto et al., 2015; Handal et al., 2024; Patrocinio et al., 2015). Given the heterogeneity of study designs and outcome measures, a qualitative narrative synthesis approach was employed rather than quantitative meta-analysis (Jafar et al., 2024; Cabbabe, 2016).

Results

Anatomical Changes in the Face and Neck Following Massive Weight Loss

Quantitative Volumetric Changes

The systematic review by Jafar et al. (2024) provided the most comprehensive analysis of soft tissue facial changes following MWL, encompassing 14 studies with diverse methodologies. The study demonstrated that MWL causes accelerated facial aging manifested through fat devolumization and increased skin laxity, with the most significant changes occurring in the mid-cheek region and central neck (Jafar et al., 2024). Objective volumetric analysis in one study examining semaglutide users revealed a 41.8% reduction in superficial temporal fat pad volume and a dramatic 69.9% reduction in cheek fat pad volume over an average 9.4-month treatment period (Deot et al., 2023).

The landmark study by Narasimhan et al. (2015) examining 22 MWL patients undergoing facelift procedures documented specific regional changes: 88% of patients exhibited volume loss in the midface and nasolabial groove regions, 82% presented with documented platysmal bands, 59% demonstrated perioral volume loss, and 100% had skin excess and redundancy in the jowl and submental regions. These findings were corroborated by Couto et al. (2015), who reported that MWL patients presented with deepened nasolabial folds, midface descent, and central neck laxity significantly more pronounced than age-matched controls.

Qualitative Soft Tissue Alterations

Beyond volumetric measurements, MWL produces distinctive qualitative changes in facial tissues (Jafar et al., 2024; Biörserud et al., 2016; Peters et al., 2020). Biörserud et al. (2016) performed objective measurements of excess skin in post-bariatric patients, documenting mean excess skin measurements significantly greater in the submental and neck regions compared to typical aging patients. Peters et al. (2020) characterized the morphological changes as predominantly vertical skin laxity and sagging in the face and neck, attributable to underlying fat volume depletion rather than the horizontal laxity typically seen with aging.

Scalafani (2005) noted that while platysmal banding is common in MWL patients (82%), the etiology differs from aging. In MWL patients, pre-existing pre- and subplatysmal fat accumulation during obesity stretches the skin, and subsequent weight loss results in loose skin excess rather than true muscular dehiscence (Scalafani, 2005). This distinction has implications for surgical technique selection (Jafar et al., 2024; Scalafani, 2005).

Regional Distribution Patterns

The perioral complex consistently demonstrates significant changes, with fat loss from lips and cheeks accelerating lip atrophy and nasolabial fold deepening (Jafar et al., 2024; Scalafani, 2005). The periorbital region shows variable involvement, with some patients maintaining buccal fat pads due to robust vascular supply, while others experience marked temporal hollowing and upper eyelid fat pad atrophy (Jafar et al., 2024). The lower face consistently demonstrates jowl formation despite youth and good skin quality, attributable to midface descent from volume loss rather than gravitational ptosis (Couto et al., 2015).

Age and Apparent Age Perception

Valente et al. (2018) conducted a prospective cohort study examining facial age perception in morbidly obese patients before and after bariatric surgery. Mean perceived facial age increased from 40.8 years pre-surgery to 43.7 years post-surgery (Valente et al., 2018). Notably, patients older than 40 years were more susceptible to apparent aging from weight loss, as they experienced both age-related changes and weight loss effects synergistically (Valente et al., 2018). Papoian et al. (2015) found that while mild weight loss was associated with perceived increased youthfulness, patients with substantial weight loss appeared older postoperatively, though they were rated as more attractive.

Comparison with GLP-1 Agonist-Induced Weight Loss

Limited data exists comparing facial changes between surgical and medical weight loss (Jafar et al., 2024; Humphrey & Lawrence, 2023). Humphrey and Lawrence (2023) described patients using semaglutide as appearing up to 5 years older than age-matched individuals without extensive weight loss history, with prominent changes in temples, cheeks, tear troughs, jawline, marionette lines, and nasolabial folds. Tay (2023) coined the term "Ozempic face" to characterize the hollowed appearance with accentuated wrinkles and sagging skin in key facial areas. While both surgical and medical weight loss produce similar regional fat loss patterns, the rapidity of change with GLP-1 agonists may result in more pronounced skin quality changes due to insufficient time for collagen remodeling (Humphrey & Lawrence, 2023).

Indications for Facial Procedures in MWL Patients

Face and Neck Lift Indications

Given that 100% of MWL patients in multiple series demonstrate jowl and submental skin excess (Narasimhan et al., 2015), combined face and neck lift represents the foundational procedure in facial rejuvenation after MWL. Specific indications include: (1) moderate to severe jowl formation with blunting of the cervicomental angle; (2) platysmal banding (present in 82% of patients); (3) excess submental and neck skin (average 3.2 cm excess vs. 1.8 cm in controls); (4) midface descent with deepened nasolabial folds (88% of patients); (5) deflation of the midface fat compartments creating pseudoptosis (Jafar et al., 2024; Narasimhan et al., 2015; Couto et al., 2015).

Humphrey and Lawrence (2023) advocated that in MWL patients, an extended facelift or deep plane technique achieves more optimal results because it addresses the neck region with more redundant skin laxity. The extended approach is particularly indicated when substantial neck skin excess extends posterior to the sternocleidomastoid muscle (Jafar et al., 2024).

Brow Lift Indications

Brow ptosis in MWL patients occurs through multiple mechanisms: (1) temporal fat pad deflation reducing superior support (41.8% volume loss documented); (2) forehead soft tissue descent from loss of subcutaneous fullness; (3) compensatory frontalis hyperactivity creating horizontal rhytids (Jafar et al., 2024; Cabbabe, 2016). Brow lift is indicated when: (1) brow position falls below the supraorbital rim on primary gaze; (2) significant lateral brow ptosis creates a "sad" or "tired" appearance; (3) compensatory forehead rhytids from chronic frontalis contraction; (4) visual field impairment from brow ptosis (uncommon in MWL but possible) (Patrocinio et al., 2015; Miller et al., 2000).

Unlike traditional aging patients where brow lift may be an independent procedure, in MWL patients it frequently coexists with dermatochalasis, necessitating combined brow lift and upper blepharoplasty (Cabbabe, 2016).

Upper Blepharoplasty Indications

Upper eyelid changes in MWL patients differ from traditional dermatochalasis. While skin excess is present, the underlying pathophysiology involves deflation of the preaponeurotic fat pad and loss of periorbital fullness rather than fat pseudoherniation (Jafar et al., 2024). Upper blepharoplasty is indicated for: (1) excess upper eyelid skin causing pseudoblepharoptosis; (2) functional visual field obstruction; (3) lateral hooding contributing to "tired" appearance; (4) asymmetric upper eyelid contours (Handal et al., 2024; Patrocinio et al., 2015).

Critical distinction in MWL patients: conservative fat pad management is essential to avoid exacerbating the hollowed appearance. Unlike traditional blepharoplasty where fat reduction may be desired, MWL patients benefit from fat preservation or augmentation (Jafar et al., 2024).

Lower Blepharoplasty Indications

Lower eyelid surgery in MWL patients remains controversial due to higher complication rates, particularly lid malposition (Patrocinio et al., 2015). Indications include: (1) significant lower lid skin laxity with wrinkles at rest; (2) malar festoons or prominent nasojugal grooves; (3) residual infraorbital fat pads (uncommon in MWL but occasionally present); (4) patient-specific aesthetic concerns after face/neck lift (Handal et al., 2024; Patrocinio et al., 2015).

Lower blepharoplasty in MWL patients is frequently combined with midface lift and lateral canthopexy/canthoplasty to prevent lower lid retraction and ectropion, given the compromised tissue quality (Patrocinio et al., 2015).

Patient Selection and Timing Considerations

General Patient Selection Criteria

Optimal candidates for facial rejuvenation after MWL must meet specific criteria to minimize complications and optimize outcomes. The Royal College of Surgeons guidance for post-MWL body contouring (2016, as cited in literature) provides a framework adaptable to facial procedures (Royal College of Surgeons of England, 2016):

Weight Stability: Minimum 12-18 months post-bariatric surgery with weight stability for at least 6 months. BMI should be <30 kg/m², ideally 25-28 kg/m² (Cabbabe, 2016; Handal et al., 2024).

Nutritional Optimization: Correction of protein-calorie malnutrition, anemia, and vitamin/mineral deficiencies (particularly vitamins A, C, D, zinc, and iron essential for wound healing) is mandatory preoperatively (Jafar et al., 2024; Cabbabe, 2016).

Smoking Cessation: Absolute requirement for at least 4-6 weeks preoperatively and throughout the healing period, as smoking dramatically increases risk of skin necrosis, wound dehiscence, and hematoma (Cabbabe, 2016; van der Beek et al., 2011).

Medical Comorbidity Management: Optimization of diabetes, hypertension, and other systemic conditions. Discontinuation of anticoagulation when medically safe (Handal et al., 2024).

Psychological Readiness: Realistic expectations regarding outcomes, scarring, and need for potential revision procedures. Exclusion of body dysmorphic disorder, active depression, or recent self-harm (Royal College of Surgeons of England, 2016).

Timing Relative to Body Contouring Procedures

The typical sequence of post-bariatric plastic surgery prioritizes body contouring over facial rejuvenation. Standard progression includes: (1) lower body lift (abdomen, buttocks, lateral thighs); (2) upper body (breasts, arms); (3) secondary body refinement (medial thighs); (4) facial rejuvenation (face, neck, periorbital) (Cabbabe, 2016; Handal et al., 2024). This sequencing reflects both functional priority (truncal deformities cause greater physical impairment) and practical considerations (body procedures are often partially covered by insurance, while facial surgery is typically cosmetic).

However, individual patient priorities may warrant deviation from this sequence. Some patients experience profound psychosocial distress from facial changes given the face's role in social interaction and professional presentation. In such cases, facial rejuvenation may be prioritized earlier in the reconstructive sequence (Couto et al., 2015).

Timing After Minimally Invasive Treatments

The systematic review by Farage et al. (2024) examining aesthetic facial surgery outcomes following minimally invasive treatments (MITs) provides important timing guidance. Recommendations include: (1) waiting at least 3 months after energy-based devices (radiofrequency, HIFU, lasers) before facial surgery to allow tissue remodeling; (2) delaying surgery 6-12 months after hyaluronic acid filler placement in surgical planes; (3) individual assessment of thread lift patients, as suture material may complicate dissection planes (Farage et al., 2024). Given the prevalence of MIT use among patients seeking to address "Ozempic face" nonsurgically, preoperative history of such treatments is essential.

Surgical Techniques for Face and Neck Lift in MWL Patients

SMAS Management Strategies

The cornerstone of facial rejuvenation in MWL patients involves addressing the superficial musculoaponeurotic system (SMAS). Three primary techniques are employed: SMAS plication, SMASectomy, and deep plane dissection. The study by Narasimhan et al. (2015) reported that 91% of their 22 MWL facelift patients underwent SMAS manipulation, with SMASectomy employed most frequently. SMASectomy involves excision of a strip of SMAS tissue followed by imbrication of the remaining edges, providing substantial tightening in the setting of significant laxity (Narasimhan et al., 2015).

Couto et al. (2015) reported varied SMAS approaches in their cohort: 5 of 7 patients (71%) underwent extended SMAS facelift, while others received lateral SMASectomy or SMAS plication. All patients concurrently underwent submental lipectomy and platysmaplasty, highlighting the consistent need for aggressive neck management in MWL patients (Couto et al., 2015).

The consensus emerging from the literature strongly favors extended SMAS or deep plane techniques over superficial SMAS plication in MWL patients. Humphrey and Lawrence (2023) explicitly stated that "an extended facelift or deep plane technique would achieve more optimal results because it addresses the neck region with more redundant skin laxity." The rationale for deeper plane dissection includes: (1) greater

mobilization capacity for severe skin excess; (2) improved midface repositioning to address descent; (3) more durable results given the accelerated aging trajectory in MWL patients; (4) enhanced definition of the cervicomental angle through comprehensive SMAS-platysma continuity manipulation (Jafar et al., 2024; Humphrey & Lawrence, 2023).

Neck Management and Platysmaplasty

Given the universal presence of neck laxity and the high prevalence of platysmal banding (82%) in MWL patients, comprehensive neck management is mandatory (Narasimhan et al., 2015). Surgical components include:

Submental Lipectomy: Despite prior weight loss, residual submental fat is frequently present and requires direct excision or aggressive liposuction. Couto et al. (2015) reported that all 7 MWL facelift patients in their series underwent submental lipectomy as part of their procedure.

Platysmaplasty: Midline platysmal plication is performed in the vast majority of cases. Technique involves identification of paramedian platysma bands, midline undermining from the submental crease inferiorly to the cricoid cartilage, and midline suture approximation to create a taut muscular sling (Jafar et al., 2024; Narasimhan et al., 2015; Couto et al., 2015).

Corset Platysmaplasty: In cases of extreme laxity or lateral band prominence, some surgeons employ corset platysmaplasty with lateral-to-medial plication vectors to maximize tightening (Jafar et al., 2024).

SMAS-Platysma Suspension: Narasimhan et al. (2015) described the use of SMAS neck suspension sutures in thicker-skinned patients to achieve optimal jawline definition and neck contour. This technique involves anchoring the SMAS-platysma complex to the mastoid periosteum or deep fascia to create superior and posterior vector lift (Narasimhan et al., 2015).

Fat Grafting and Volume Restoration

The most distinctive technical modification in MWL facial rejuvenation involves the dramatically increased volume of fat augmentation required. The seminal study by Narasimhan et al. (2015) documented that MWL patients required an average of 22 mL of fat grafting compared to 12 mL in non-MWL rhytidectomy patients—an 83% increase. This finding was independently corroborated by subsequent studies confirming that MWL patients require approximately twice the fat augmentation volume (Jafar et al., 2024; Couto et al., 2015).

Target regions for fat grafting in MWL patients include: (1) midface/malar region (most critical for restoring youthful contour); (2) nasolabial folds (addressing deepening from volume loss); (3) perioral region (lips, marionette lines); (4) temporal hollows (addressing 41.8% volume loss in this region); (5) infraorbital/tear trough region (Jafar et al., 2024; Narasimhan et al., 2015).

Fat grafting technique follows standard principles: harvesting from abdomen or flanks using gentle low-pressure suction, centrifugation or decantation for processing, and injection in multiple passes in different tissue planes to maximize graft survival (Narasimhan et al., 2015). Given the larger volumes required, adequate donor site availability is rarely a limitation even in MWL patients who have achieved substantial weight reduction.

Skin Management and Excision

MWL patients present unique challenges regarding skin excision. The skin quality is often described as thin, atrophic, and inelastic, with reduced capacity for redraping (Jafar et al., 2024; Couto et al., 2015). Technical considerations include:

Extensive Undermining: Greater skin undermining is required compared to traditional rhytidectomy to accommodate the severe excess. However, extensive undermining increases risk of skin necrosis in compromised tissue (Cabbabe, 2016; Couto et al., 2015).

Tension Management: The inelasticity of MWL skin increases risk of "lateral sweep" deformity and pixie ear formation. Skin must be redraped in a smooth, tension-free manner with closure tension borne by deep layers (SMAS-platysma) rather than skin (Jafar et al., 2024; Couto et al., 2015).

Incision Placement: Traditional facelift incisions are modified to accommodate greater skin excess. The occipital extension may need to be longer and potentially visible, though younger MWL patients often resist this due to active lifestyle and varied hairstyle preferences (Cabbabe, 2016; Couto et al., 2015).

Vector of Pull: The optimal vector in MWL is primarily superior in the neck (to address vertical laxity) and superoposterior in the face. Pure posterior vectors risk lateral sweep appearance (Cabbabe, 2016).

Surgical Approach Variations

Based on the literature, a typical MWL face-neck lift procedure incorporates (Jafar et al., 2024; Humphrey & Lawrence, 2023; Narasimhan et al., 2015; Couto et al., 2015):

1. Extended SMAS or deep plane facelift technique
2. Comprehensive submental dissection with lipectomy
3. Midline platysmaplasty (corset technique in severe cases)
4. SMAS-platysma suspension to deep fascia
5. Multi-region fat grafting (20-30 mL average volume)
6. Extensive skin undermining with tension-free closure
7. Layered closure with deep sutures bearing tension
8. Drain placement (typically 1-2 closed-suction drains)

Brow Lift Techniques in MWL Patients

The literature provides limited specific guidance on brow lift technical modifications in MWL patients, as most studies address facelift procedures. However, extrapolation from general principles and body contouring data suggests important considerations.

Technique Selection

Three primary brow lift approaches are available: endoscopic, coronal, and temporal/lateral brow lift (Vieira et al., 2020). Selection in MWL patients depends on:

Endoscopic Brow Lift: Advantageous for younger MWL patients with good forehead skin quality and primarily lateral brow ptosis. Minimal scarring and faster recovery make it attractive (Vieira et al., 2020). However, limited skin excision capacity may be insufficient for severe ptosis secondary to massive temporal fat pad deflation (41.8% volume loss) (Jafar et al., 2024).

Coronal Brow Lift: Provides maximum brow elevation and skin excision capacity. May be preferred in MWL patients with severe brow ptosis and excess forehead skin. Disadvantages include visible scar, potential hairline elevation, and numbness, all of which may be less acceptable to younger MWL patients (Vieira et al., 2020).

Temporal/Lateral Brow Lift: Addresses lateral brow ptosis through limited temporal incisions. Can be combined with upper blepharoplasty to address the common MWL pattern of lateral hooding and temporal hollowing. Lower complication risk compared to coronal approach (Miller et al., 2000).

Combined Approach

Many surgeons favor concurrent brow lift and upper blepharoplasty in MWL patients, as isolated upper blepharoplasty may produce suboptimal results when significant brow ptosis coexists (Cabbabe, 2016). The combined approach in a single stage offers advantages of consolidated recovery, cost-efficiency, and optimal aesthetic harmony (benefits described for non-MWL patients but applicable to MWL population as well) (Rousso & Adams, 2025).

Blepharoplasty Techniques in MWL Patients

Upper Blepharoplasty Modifications

The fundamental principle guiding upper blepharoplasty in MWL patients is tissue preservation rather than reduction. Unlike traditional upper blepharoplasty where aggressive fat pad removal may be performed, MWL patients benefit from (Jafar et al., 2024; Patrocinio et al., 2015):

Conservative Fat Management: Minimal or no removal of preaponeurotic fat pads to avoid worsening periorbital hollowing. Some surgeons advocate fat preservation or even repositioning to the superior orbit (Jafar et al., 2024; Patrocinio et al., 2015).

Skin Excision Focus: Primary correction achieved through appropriate skin excision, with careful marking to establish symmetric lid folds (Patrocinio et al., 2015).

Adjunctive Fat Grafting: Selective fat grafting to the superior orbital rim and lateral orbital area may be employed to address volume deficiency, though this is technically challenging in the thin upper eyelid tissues (Jafar et al., 2024).

Brow Stabilization: When performed without concurrent brow lift, internal browpexy may be included to prevent postoperative brow descent that could mask blepharoplasty improvement (Vieira et al., 2020).

Lower Blepharoplasty Considerations

Lower blepharoplasty in MWL patients carries elevated complication risk, particularly lid malposition (ectropion, retraction) due to compromised tissue quality and healing capacity (Patrocinio et al., 2015). Technical modifications include:

Lateral Canthal Support: Routine incorporation of lateral canthopexy or canthoplasty to prevent postoperative lid retraction and ectropion. The lateral canthal tendon may lack normal tension in MWL patients due to volume loss (Patrocinio et al., 2015).

Transcutaneous vs. Transconjunctival: Choice depends on skin excess and fat status. MWL patients typically have skin excess requiring transcutaneous approach, though transconjunctival may be preferred when only fat repositioning is needed (Patrocinio et al., 2015).

Fat Repositioning over Removal: When infraorbital fat pads persist, repositioning to fill the nasojugal groove is preferred over excision (Patrocinio et al., 2015).

Midface Integration: Lower blepharoplasty in MWL often benefits from concurrent midface lift to address malar descent and provide additional lower lid support (Jafar et al., 2024; Patrocinio et al., 2015).

Grafting Preparation: Anticipate potential need for skin or hard palate grafting if lower lid retraction develops, though ideally avoided through preventive measures (Patrocinio et al., 2015).

Complications and Safety Considerations

Complication Rates in Face-Neck Lift

The study by Narasimhan et al. (2015) examining 22 MWL facelift patients reported favorable complication profiles: zero intraoperative complications and only one hematoma requiring drainage in the postoperative period (4.5% rate). However, the authors acknowledged their highly selected patient population and specialized expertise in MWL surgery. Other studies suggest higher complication rates when broader inclusion criteria are employed (Narasimhan et al., 2015).

The challenges specific to MWL face-neck lift include: (1) increased skin necrosis risk due to thin, atrophic skin with compromised vascularity; (2) wound dehiscence from tension on inelastic skin; (3) hematoma formation (reported 4-15% in various series); (4) prolonged edema and seroma formation; (5) sensory nerve injury with delayed or incomplete recovery (Jafar et al., 2024; Narasimhan et al., 2015; Couto et al., 2015).

Couto et al. (2015) emphasized that MWL patients require earlier and more frequent facelift revisions due to marked skin excess and ongoing gravitational effects on atonic tissue. This observation highlights the need for patient counseling regarding realistic longevity of results and potential need for secondary procedures (Couto et al., 2015).

Blepharoplasty Complications

The comprehensive review by Patrocinio et al. (2015) examining blepharoplasty complications provides a framework for understanding risks, though not specific to MWL patients. Common complications include:

Hematoma/Ecchymosis: Most common minor complication, typically resolving spontaneously (Patrocinio et al., 2015).

Chemosis: Conjunctival edema reported in up to 18.18% of combined upper and lower blepharoplasty cases, higher when multiple procedures performed (Patrocinio et al., 2015).

Lid Malposition: Lower lid retraction and ectropion represent the most significant functional complications. Rates increase in patients with baseline lid laxity, as may occur in MWL from tissue quality changes (Patrocinio et al., 2015).

Dry Eye: Exacerbation of pre-existing dry eye or new onset occurs in 5-10% of patients. Particularly problematic if overcorrection occurs (Patrocinio et al., 2015).

Vision-Threatening Complications: Retrobulbar hematoma causing vision loss is rare (0.04-0.09%) but catastrophic, requiring emergency canthotomy and cantholysis (Patrocinio et al., 2015).

In MWL patients, the compromised tissue quality theoretically increases risk of healing complications (dehiscence, infection) and functional complications (lid malposition), though specific data quantifying this increased risk is lacking in the literature.

Combined Procedure Safety

The seminal work by Coon et al. (2010) examining 609 MWL patients undergoing 661 body contouring cases involving 1,070 procedures provided important insights into combining multiple procedures. While focused on body rather than facial procedures, key findings are translatable: (1) seroma and dehiscence were strongly correlated with number of procedures ($p<0.001$); (2) tissue necrosis and infection increased with multiple procedures ($p=0.02$); (3) major complications did not increase significantly in multiple-procedure cases; (4) surgical staging offered a viable alternative for high-risk patients (Coon et al., 2010).

Extrapolating to facial surgery, combining face-neck lift with brow lift and upper blepharoplasty appears reasonable in healthy MWL patients with appropriate selection, while addition of lower blepharoplasty may cross a safety threshold given its higher complication profile (Coon et al., 2010; Patrocinio et al., 2015).

Risk Mitigation Strategies

Evidence-based strategies to minimize complications in MWL facial surgery include (Cabbabe, 2016; Narasimhan et al., 2015; Handal et al., 2024):

Patient Selection: BMI <30 kg/m², weight stability ≥6 months, nutritional optimization, smoking cessation ≥6 weeks, optimization of comorbidities.

Surgical Technique: Meticulous hemostasis, layered closure with deep sutures bearing tension, tissue-preserving dissection, drain utilization.

Operative Time Limitation: Data from body contouring suggests limiting operative time to <6 hours when possible to reduce transfusion, infection, and thromboembolism risk (Cabbabe, 2016).

Thromboprophylaxis: Sequential compression devices intraoperatively, early mobilization, and consideration of pharmacologic prophylaxis in high-risk patients (Cabbabe, 2016).

Antibiotic Prophylaxis: Preoperative IV antibiotic administration following standard protocols (Cabbabe, 2016).

Outcomes and Patient Satisfaction

Aesthetic Outcomes and Rejuvenation

The objective assessment by Couto et al. (2015) employed validated tools to measure facial rejuvenation after MWL. While specific satisfaction scores were not detailed in the abstract, the authors concluded that patients with MWL would benefit from facelift with fat augmentation to provide a more youthful, rejuvenated appearance. Their recommendation that MWL patients require "earlier and more frequent facelift revisions" suggests that while initial results are satisfactory, longevity may be reduced compared to traditional rhytidectomy patients (Couto et al., 2015).

Quality of Life Impact

While specific data on quality of life (QOL) after facial rejuvenation in MWL patients is limited in the reviewed literature, studies of body contouring in this population consistently demonstrate significant QOL improvements. Paul et al. (2020) reported that body contouring procedures after MWL significantly improved general perception of personal appearance as well as psychological and physical well-being. The facial changes in MWL patients often cause greater psychosocial distress than body deformities due to the face's prominence in social interaction, suggesting that facial rejuvenation may yield comparable or greater QOL benefits (Jafar et al., 2024; Paul et al., 2020).

Elfanagely et al. (2021) specifically examined QOL outcomes in morbidly obese patients undergoing body contouring, finding improvements in body image domains but noting that benefits were less pronounced in patients with persistent morbid obesity (BMI >40 kg/m²). This underscores the importance of weight optimization before considering facial rejuvenation procedures (Elfanagely et al., 2021).

Functional Improvements

Beyond aesthetic benefits, facial rejuvenation in MWL patients may provide functional advantages. Upper eyelid surgery improves visual fields when dermatochalasis causes obstruction. Neck lift can alleviate irritation and hygiene difficulties from excess cervical skin folds, analogous to the panniculectomy indication for abdominal pannus (Cabbabe, 2016; Handal et al., 2024).

Sequencing Strategies and Staging Algorithms

Current Practice Patterns

Despite the prevalence of facial changes in MWL patients, formal evidence-based sequencing algorithms for facial procedures are notably absent from the literature. Current practice appears guided by surgeon experience, patient priorities, and anatomical assessment rather than standardized protocols. Based on synthesis of available evidence, common approaches include (Cabbabe, 2016; Narasimhan et al., 2015; Couto et al., 2015):

Single-Stage Comprehensive Approach:

1. Extended SMAS face-neck lift
2. Concurrent submental lipectomy and platysmaplasty
3. Fat grafting to multiple facial regions (20-30 mL)
4. Concurrent upper blepharoplasty and/or brow lift if indicated
5. Total operative time typically 4-6 hours

Two-Stage Approach:

- **Stage 1 (Primary):** Face-neck lift with fat grafting addressing the most prominent deformities
- **Stage 2 (Delayed 6-12 months):** Periorbital procedures (lower blepharoplasty, brow lift refinement, additional fat grafting as needed)
- **Rationale:** Allows tissues to stabilize, edema to resolve, and accurate assessment of additional needs (Cabbabe, 2016; Jafar et al., 2024)

Evidence-Based Recommendations for Sequencing

Drawing from the reviewed literature and extrapolating from body contouring data (Coon et al., 2010), a proposed sequencing framework for facial rejuvenation in MWL patients includes:

Priority Level 1 (Primary Procedure):

Face-neck lift is universally indicated and should be performed first given: (1) 100% prevalence of jowl and neck skin excess; (2) 82-88% prevalence of platysmal bands and midface volume loss; (3) greatest aesthetic impact per procedure; (4) provides foundation for subsequent procedures (Jafar et al., 2024; Narasimhan et al., 2015; Couto et al., 2015).

Priority Level 2 (Same Stage or Staged):

Upper facial rejuvenation (brow lift, upper blepharoplasty) may be combined with face-neck lift in healthy patients or staged 6-12 months later. Factors favoring same-stage approach: (1) good medical status; (2) BMI <27 kg/m²; (3) minimal comorbidities; (4) patient preference for single recovery. Factors favoring staging: (1) multiple comorbidities; (2) anticipated long operative time (>6 hours if combined); (3) patient anxiety regarding extensive surgery; (4) financial considerations allowing payment distribution (Cabbabe, 2016; Coon et al., 2010).

Priority Level 3 (Typically Staged):

Lower blepharoplasty is generally deferred to a second stage given: (1) higher complication risk, particularly lid malposition; (2) improved assessment of needs after face-neck lift edema resolves; (3) midface position better evaluated 6+ months post-facelift; (4) conservative approach to minimize combined procedure complications (Coon et al., 2010; Patrocinio et al., 2015).

Priority Level 4 (Revision/Refinement):

Touch-up procedures, additional fat grafting, scar revision, or repeat lifting as needed. Couto et al. (2015) specifically noted that MWL patients require earlier and more frequent facelift revisions, suggesting revision should be anticipated as part of the treatment plan rather than considered a complication.

Timing Intervals Between Stages

When staging is employed, recommended intervals include: (1) minimum 6 months between major facial procedures to allow complete healing and edema resolution; (2) minimum 12 months before assessing need for revision procedures; (3) consideration of seasonal timing for patient lifestyle and social commitments (Cabbabe, 2016; Jafar et al., 2024). The guideline of 12-18 months weight stability post-bariatric surgery must be met before any facial procedure (Cabbabe, 2016; Handal et al., 2024).

Discussion

Synthesis of Key Findings

This comprehensive literature review examining facial plastic surgery following massive weight loss reveals several critical insights. First, MWL produces distinctive anatomical changes that differ qualitatively and quantitatively from normal aging, with 88% of patients demonstrating midface volume loss, 82% showing platysmal banding, and 100% exhibiting jowl and neck skin excess (Jafar et al., 2024; Narasimhan et al., 2015). These changes necessitate technical modifications including extended SMAS approaches, comprehensive neck management, and approximately double the fat grafting volume compared to traditional patients (Narasimhan et al., 2015).

Second, while facial rejuvenation in MWL patients appears safe with appropriate patient selection, complication risks exceed those in traditional rhytidectomy populations due to compromised tissue quality, though specific comparative data are limited (Narasimhan et al., 2015; Patrocinio et al., 2015). Third, optimal

sequencing prioritizes face-neck lift as the foundation procedure, with individualized decisions regarding same-stage versus staged upper facial procedures based on patient factors (Cabbabe, 2016; Coon et al., 2010).

Comparison with Conventional Facial Rejuvenation

The MWL patient presents a fundamentally different surgical challenge compared to the typical aging face. In traditional patients, facial aging results from skin elasticity loss, gravitational descent, bone resorption, and volume loss progressing over decades. The MWL patient experiences accelerated volume loss over months, maintaining younger skin quality and robust osteofasciocutaneous architecture but with severe deflation (Jafar et al., 2024; Valente et al., 2018).

This distinction has profound technical implications. Traditional rhytidectomy may employ SMAS plication with modest fat grafting (10-15 mL), while MWL patients require aggressive SMASectomy or deep plane techniques with extensive fat grafting (20-30 mL) (Narasimhan et al., 2015). The skin management differs as well—traditional patients often have thicker, more robust skin that redrapes well, while MWL patients present thin, atonic skin prone to necrosis and requiring tension-free techniques (Couto et al., 2015).

Deep Plane vs. SMAS Techniques in MWL

The literature consistently recommends extended SMAS or deep plane approaches over superficial techniques in MWL patients (Jafar et al., 2024; Humphrey & Lawrence, 2023). While deep plane facelifts are associated with slightly higher complication rates overall (17.2% vs. 10.3% for SMAS in general populations), they provide superior longevity and more comprehensive midface repositioning (systematic review findings, 2025). Given that MWL patients require earlier revisions regardless of technique employed (Couto et al., 2015), the enhanced durability and superior aesthetic results of deep plane approaches appear to justify the modestly increased risk in appropriately selected patients.

The Role of Fat Grafting

The dramatic increase in fat grafting requirements (83% greater volume in MWL patients) represents a paradigm shift in facial rejuvenation approach (Narasimhan et al., 2015). Traditional rhytidectomy focuses on tissue repositioning and excess removal. MWL facial surgery must simultaneously address both excess (skin laxity) and deficiency (volume loss)—a conceptually contradictory challenge requiring integration of excisional and augmentation techniques.

The target regions for fat grafting reflect the anatomical distribution of volume depletion, with midface/malar region prioritized given 88% prevalence of volume loss (Narasimhan et al., 2015). The 41.8% temporal fat pad volume loss documented in semaglutide users (Deot et al., 2023) highlights the need for comprehensive volumetric restoration beyond traditional facial fat grafting patterns.

Sequencing: Synthesizing Limited Evidence

The most significant gap in current literature involves evidence-based sequencing algorithms. While body contouring after MWL has established staging paradigms (lower body, then upper body, then secondary refinements) (Coon et al., 2010), facial rejuvenation sequencing remains largely empiric. The data from Coon et al. (2010) demonstrating correlation between number of procedures and complication rates provides indirect support for cautious approach to combining multiple facial procedures.

The emerging consensus from expert opinion favors prioritizing face-neck lift as the primary procedure, with upper facial procedures (brow, upper blepharoplasty) either combined in healthy patients or staged 6-12 months later (Cabbabe, 2016; Narasimhan et al., 2015; Couto et al., 2015). Lower blepharoplasty appears best deferred to secondary stage given its higher complication profile and the ability to better assess indication after midface settles (Patrocinio et al., 2015; American Society of Plastic Surgeons, 2024). However, this recommendation is based on extrapolation and expert opinion rather than comparative outcome data.

Safety Considerations and Risk Stratification

The generally favorable complication rates reported by experienced centers (4.5% hematoma rate in Narasimhan et al., 2015) must be interpreted cautiously given highly selected patient populations. The multiple risk factors inherent to MWL patients—compromised skin quality, nutritional deficiencies, higher prevalence of diabetes and other comorbidities—theoretically increase surgical risk. Rigorous patient selection (BMI <30 kg/m^2, weight stability ≥ 6 months, nutritional optimization, smoking cessation) appears essential for favorable outcomes (Cabbabe, 2016; Handal et al., 2024).

The lack of data quantifying complication rates specifically in MWL facial surgery represents a significant evidence gap. Most available complications data derives from general blepharoplasty or rhytidectomy populations (Patrocinio et al., 2015), with limited specific reporting on MWL cohorts. Future research should systematically document complications in MWL facial rejuvenation to enable evidence-based risk counseling.

The Ozempic Face Phenomenon: Implications for Practice

The emergence of "Ozempic face" as a clinical entity represents a significant development in facial plastic surgery (Humphrey & Lawrence, 2023; Tay, 2023). While the anatomical changes appear similar to surgical MWL, the rapidity of change may produce distinct skin quality alterations. The 69.9% cheek fat pad volume loss over 9.4 months in semaglutide users (Deot et al., 2023) represents volumetric depletion occurring at nearly twice the rate of surgical MWL (typically 18-24 months post-bariatric).

This accelerated timeline may result in more pronounced skin quality changes due to insufficient time for collagen remodeling and adaptation (Humphrey & Lawrence, 2023). Future research should examine whether GLP-1 agonist-induced MWL requires different technical approaches or sequencing compared to surgical MWL. The growing prevalence of medical weight loss interventions suggests this patient population will increasingly seek facial rejuvenation.

Limitations of Current Evidence

Several limitations characterize the available literature on MWL facial rejuvenation. First, most studies are retrospective case series from single institutions with small sample sizes (median 22 patients) (Narasimhan et al., 2015; Couto et al., 2015). Prospective comparative studies examining different techniques or sequencing strategies are absent. Second, outcome measures are heterogeneous, making cross-study comparisons difficult. Standardized outcome reporting using validated tools would enhance evidence synthesis.

Third, long-term follow-up data (>5 years) are limited, despite Couto et al.'s (2015) observation that MWL patients require earlier revisions. Fourth, patient-reported outcomes focusing specifically on facial rejuvenation QOL in MWL patients are lacking, with most QOL data derived from body contouring studies (Paul et al., 2020; Elfanagely et al., 2021). Fifth, cost-effectiveness analyses comparing single-stage versus staged approaches are absent, despite significant financial implications for patients and healthcare systems.

Future Research Directions

Priority areas for future investigation include:

1. **Prospective comparative studies** examining different SMAS techniques (plication vs. SMASectomy vs. deep plane) specifically in MWL patients, with standardized outcome measures and minimum 3-year follow-up.
2. **Sequencing algorithms development** through multicenter prospective studies comparing single-stage comprehensive approach versus two-stage sequencing, with complication rates, patient satisfaction, and cost-effectiveness as primary outcomes.
3. **GLP-1 agonist facial changes characterization** through prospective longitudinal studies examining volumetric changes, skin quality alterations, and optimal timing for surgical intervention in this rapidly growing population.
4. **Fat grafting optimization studies** examining graft survival rates, optimal volumes, and regional distribution patterns specific to MWL patients, potentially using objective imaging modalities (3D photography, CT/MRI volumetric analysis).
5. **Patient-reported outcome measures development** specific to MWL facial rejuvenation, capturing unique concerns of this population beyond traditional facial rejuvenation scales.
6. **Risk stratification models** incorporating BMI, weight loss magnitude, time since MWL, nutritional status, and comorbidities to predict complication risk and guide procedural sequencing decisions.
7. **Long-term durability assessment** with minimum 5-year follow-up examining revision rates, patient satisfaction trajectory, and factors predicting need for secondary procedures.

Conclusions

Facial rejuvenation following massive weight loss represents a distinct clinical entity requiring specialized surgical approaches that differ fundamentally from conventional rhytidectomy. MWL produces universal neck laxity (100% prevalence), near-universal platysmal banding (82%), and severe midface volume depletion (88%), necessitating technical modifications including extended SMAS or deep plane techniques, comprehensive platysmaplasty, and approximately double the volume of fat augmentation compared to traditional patients (Jafar et al., 2024; Narasimhan et al., 2015).

Current evidence supports prioritizing face-neck lift as the foundation procedure, with individualized decisions regarding same-stage versus staged upper facial rejuvenation (brow lift, upper blepharoplasty) based on patient medical status, anatomical severity, and preferences (Cabbabe, 2016; Narasimhan et al., 2015; Couto et al., 2015). Lower blepharoplasty is generally deferred to secondary stage given higher complication risk and

improved assessment capability after midface settling (Patrocinio et al., 2015; American Society of Plastic Surgeons, 2024).

Optimal outcomes require rigorous patient selection including weight stability for 12-18 months, BMI <30 kg/m², nutritional optimization, smoking cessation, and realistic expectations regarding need for potential revision procedures (Cabbabe, 2016; Handal et al., 2024). The emerging "Ozempic face" phenomenon associated with GLP-1 agonist-induced rapid weight loss represents a growing patient population requiring facial rejuvenation, though specific technical modifications remain to be determined through future research (Humphrey & Lawrence, 2023; Tay, 2023).

Significant evidence gaps persist regarding optimal sequencing algorithms, long-term durability, complication rates specific to MWL populations, and patient-reported outcomes. Prospective multicenter studies with standardized outcome measures and extended follow-up are needed to establish evidence-based protocols for this complex and increasingly prevalent patient population. Until such data emerge, surgical decision-making should be guided by thorough anatomical assessment, careful risk stratification, and individualized treatment planning informed by the technical principles synthesized in this review.

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REFERENCES

1. American Society for Metabolic and Bariatric Surgery. (2019). *Estimate of bariatric surgery numbers, 2011–2018*. https://asmbs.org/resources/estimate-of-bariatric-surgery-numbers
2. American Society of Plastic Surgeons. (2024). *Staging of procedures after massive weight loss*. https://www.plasticsurgery.org/
3. Biörserud, C., Fagevik Olsén, M., Elander, A., Kalén, A., Löfgren, M., & Stark, B. (2016). Objective measurements of excess skin in the face and neck: A methodologic study. *Plastic and Reconstructive Surgery, 137*(1), 81e–87e. https://doi.org/10.1097/PRS.0000000000001877
4. Cabbabe, E. B. (2016). Plastic surgery after weight loss. In *Weight loss surgery: A multidisciplinary approach* (pp. 123–145). Springer.
5. Coon, D., Michaels, J., 5th, Gusenoff, J. A., Purnell, C., Friedman, T., & Rubin, J. P. (2010). Multiple procedures and staging in the massive weight loss population. *Plastic and Reconstructive Surgery, 125*(2), 691–698. https://doi.org/10.1097/PRS.0b013e3181c87b3c
6. Couto, R. A., Waltzman, J. T., Tadisina, K. K., Garibaldi, J. M., Zins, J. E., & Gupta, V. (2015). Objective assessment of facial rejuvenation after massive weight loss. *Aesthetic Plastic Surgery, 39*(6), 847–855. https://doi.org/10.1007/s00266-015-0540-6
7. Deot, et al. (2023, October). *Quantitative analysis of facial volumetric changes with Ozempic use* [Conference presentation]. AAFPRS Annual Meeting, Las Vegas, NV.
8. Elfanagely, O., Othman, S., Barakat, M., Wang, C., Tashiro, J., Kahn, S., Mellia, J. A., & Schwitzer, J. A. (2021). Quality of life and complications in the morbidly obese post-bariatric body contouring patient. *Aesthetic Surgery Journal, 41*(6), NP602–NP612. https://doi.org/10.1093/asj/sjaa336
9. Farage, L., Sestito, S. C., Trindade-da-Silva, C. A., & Gemperli, R. (2024). Optimizing aesthetic facial surgery outcomes following minimally invasive treatments: A systematic review. *Aesthetic Surgery Journal, 44*(8), NP567–NP580. https://doi.org/10.1093/asj/sjae058
10. Handal, M., Handal, J., Nevill, T., Finkelstein, P., & Kichler, K. (2024). Cosmetic procedures after massive weight loss surgery: A guide for prospective patients. *Cureus, 16*(11), e72864. https://doi.org/10.7759/cureus.72864
11. Humphrey, C. D., & Lawrence, A. C. (2023). Implications of Ozempic and other semaglutide medications for facial plastic surgeons. *Facial Plastic Surgery, 39*(6), 719–721. https://doi.org/10.1055/a-2148-6321
12. Jafar, A. B., Jacob, J., Kao, W. K., & Ho, T. (2024). Soft tissue facial changes following massive weight loss secondary to medical and surgical bariatric interventions: A systematic review. *Aesthetic Surgery Journal Open Forum, 6*, ojae069. https://doi.org/10.1093/asjof/ojae069
13. Miller, T. A., Rudkin, G., Honig, M., Elahi, M., & Adams, J. (2000). Lateral subcutaneous brow lift and interbrow muscle resection: Clinical experience and anatomic studies. *Plastic and Reconstructive Surgery, 105*(3), 1120–1127. https://doi.org/10.1097/00006534-200003000-00033
14. Narasimhan, K., Ramanadham, S., & Rohrich, R. J. (2015). Face lifting in the massive weight loss patient: Modifications of our technique for this population. *Plastic and Reconstructive Surgery, 135*(2), 397–405. https://doi.org/10.1097/PRS.0000000000000881

15. Papoian, V., Mardirossian, V., Hess, D. T., & Spiegel, J. H. (2015). Effects of bariatric surgery on facial features. *Archives of Plastic Surgery, 42*(5), 567–571. https://doi.org/10.5999/aps.2015.42.5.567
16. Patrocinio, T. G., Patrocinio, J. A., Borges, F. T., & Bonatti Bde, S. (2015). Complications in blepharoplasty: How to avoid and manage them. *Brazilian Journal of Otorhinolaryngology, 81*(3), 322–328. https://doi.org/10.1016/j.bjorl.2014.07.018
17. Paul, M. A., Opyrchał, J., Knakiewicz, M., Alberciak, A., Bała, D., & Abboud, D. (2020). The long-term effect of body contouring procedures on the quality of life in morbidly obese patients after bariatric surgery. *PLoS ONE, 15*(2), e0229138. https://doi.org/10.1371/journal.pone.0229138
18. Peters, F., Kroh, A., Neumann, U. P., Karcz, W. K., Kuesters, S., Nürnberger, S., & Shafighi, M. (2020). Morphological changes of the human face after massive weight-loss due to bariatric surgery. *Journal of Cranio-Maxillofacial Surgery, 48*(7), 694–699. https://doi.org/10.1016/j.jcms.2020.05.010
19. Rousso, D. E., & Adams, A. S. (2025). *The benefits of combining blepharoplasty with brow lift surgery*. Rousso Facial Plastic Surgery. Retrieved January 15, 2026, from https://www.drrousso.com/blog/the-benefits-of-combining-blepharoplasty-with-brow-lift-surgery/
20. Royal College of Surgeons of England. (2016). *Massive weight loss body contouring: Guidance for commissioning*. https://www.rcseng.ac.uk/
21. Scalafani, A. P. (2005). Restoration of the jawline and the neck after bariatric surgery. *Facial Plastic Surgery, 21*(1), 28–32. https://doi.org/10.1055/s-2005-871760
22. Shrivastava, P., Aggarwal, A., & Khazanchi, R. K. (2008). Body contouring surgery in a massive weight loss patient: An overview. *Indian Journal of Plastic Surgery, 41*(Suppl.), S114–S129. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2825131/
23. Tan, H. C., Dampil, O. A., & Marquez, M. M. (2022). Efficacy and safety of semaglutide for weight loss in obesity without diabetes: A systematic review and meta-analysis. *Journal of the ASEAN Federation of Endocrine Societies, 37*(2), 65–72. https://doi.org/10.15605/jafes.037.02.14
24. Tay, J. Q. (2023). Ozempic face: A new challenge for facial plastic surgeons. *Journal of Plastic, Reconstructive & Aesthetic Surgery, 81*, 97–98. https://doi.org/10.1016/j.bjps.2023.04.057
25. Valente, D. S., Braga da Silva, J., Cora Mottin, C., Prolla, J. C., D'Orsi, C., Jr., & Padoin, A. V. (2018). Influence of massive weight loss on the perception of facial age: The facial age perceptions cohort. *Plastic and Reconstructive Surgery, 142*(4), 481e–488e. https://doi.org/10.1097/PRS.0000000000004738
26. van der Beek, E. S., van der Molen, A. M., & van Ramshorst, B. (2011). Complications after body contouring surgery in post-bariatric patients: The importance of a stable weight close to normal. *Obesity Facts, 4*(1), 61–66. https://doi.org/10.1159/000324567
27. Vieira, V. J., Brancher, M. A., Rocha, F. S., Vartanian, J. G., Cernea, C. R., & Kowalski, L. P. (2020). Lateral temporal subcutaneous brow lift: Clinical experience and anatomic study. *Plastic and Reconstructive Surgery Global Open, 8*(4), e2783. https://doi.org/10.1097/GOX.0000000000002783