Research Article

ISSN 2689-1093

Surgical Research

# Perioperative Recommendations for Enhanced Recovery in Full Face Rejuvenation Surgery

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**Received:** 05 Jun 2026; **Accepted:** 10 Jul 2026; **Published:** 21 Jul 2026

**Citation:** Jorge Espinosa, Roberto Quijano, Juan Ochoa, et al. Perioperative Recommendations for Enhanced Recovery in Full Face Rejuvenation Surgery. Surg Res. 2026; 8(4): 1-11.

## ABSTRACT

***Background:*** *Full facial rejuvenation surgery addresses multi-dimensional structural changes associated with aging. While generally safe, the combination of multiple procedures increases the relative surgical time and complication rate, with hematoma being the most common serious adverse event.*

***Methods:*** *This review consolidates adapted evidence from January 2005 to December 2025 to establish an optimized perioperative framework.*

*Key findings and Recommendations: Successful management depends on the strict modulation of the surgical stress response. Total Intravenous Anesthesia (TIVA) supplemented is recommended to achieve superior cardiovascular stability. Rigorous hemodynamic monitoring remains the most critical intervention, with a target systolic blood pressure below 140 mmHg throughout the perioperative period. Multimodal, opioid-sparing analgesia—utilizing gabapentinoids, NSAIDs, and long-acting local anesthetics—is essential to minimize nausea and facilitate rapid emergence. Early functional recovery is promoted through mobilization within six hours and the routine use of incentive spirometry to prevent pulmonary complications. Furthermore, early nutritional intake is encouraged to counteract postoperative insulin resistance and protein breakdown. Conventional reliance on bulky dressings and routine surgical drains is challenged; management should instead prioritize a moist wound environment and frequent visual inspection for early detection of vascular compromise.*

***Conclusions:*** *Standardizing these enhanced recovery elements represents a mandatory shift from anecdotal practices to an evidence-based model. This comprehensive approach reduces physiological morbidity and facilitates an accelerated return to the preoperative functional baseline. By integrating these strategies, the surgical team ensures a safer perioperative journey and superior aesthetic outcomes.*

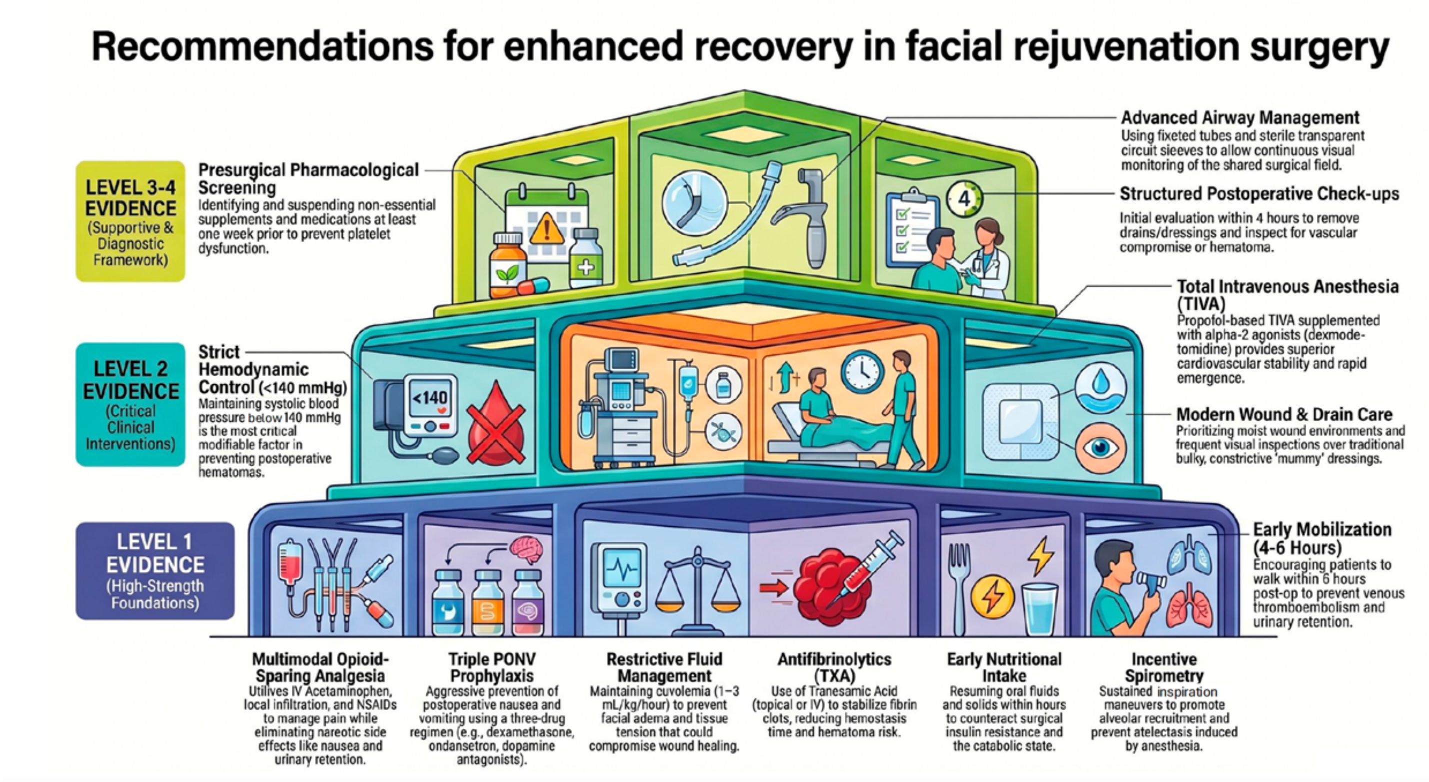
## Keywords

Rhytidectomy, Full face rejuvenation surgery, Comprehensive facial rejuvenation, Enhanced recovery after surgery, Facial plastic surgery, Perioperative recommendations

Full face rejuvenation surgery is a comprehensive surgical approach, designed to simultaneously and systematically address the multidimensional structural changes associated with facial aging. Rather than focusing on the isolated correction of a single anatomic region, this approach proposes coordinated intervention across all relevant tissue planes, including the skin, subcutaneous layers, superficial and deep fat compartments, the superficial musculoaponeurotic system (SMAS), retaining ligaments, bony support structures, and periorificial aesthetic units [1,2].

This concept integrates a variable combination procedures, such

## Graphical Abstract




as rhytidectomy, cervicoplasty, upper and lower blepharoplasty, brow and midface liftings and volumentric restoration techniques (like autologus fat grafting for example). This transcends isolated facial subunit corrections. The goal of a full face rejuvenation is to restore deep architectural relationships that shape facial expression, achieving a more natural, stable and youthful appearance [1,2].

The technical complexity of combining all these surgeries generates a great challenge for the entire surgical team. It is of utmost importance to standardize not only the surgical technique; but also the actions and clinical management that will be given to the patient throughout the whole perioperative context, in order to guarantee a quick and complication-free postoperative recovery.

## Background

The core procedure of rhytidectomy involves repositioning and tightening facial tissues, removing excess skin, and integrating volumetric enhancements, such as fat grafting. Contemporary surgical techniques have evolved focusing on the manipulation of deeper support structures, including the Superficial Musculoaponeurotic System (SMAS) and the deep plane facelift. The modern rhytidectomy is a mix of multiple techniques, moving from a "one-size-fits-all" method to an approach focused on component analysis customized for each patient. Surgical facial rejuvenation usually involves adjunct procedures. A recent large scale analysis that included 13,346 patients identified that, on average, 2.3 procedures were performed per patient, with mean surgical time measures over 4 hours The most common concomitant procedures where blepharoplasty and cervicoplasty (neck lift or rhytidectomy of the neck) [1,2].

The variety of surgical procedures combined has an impact in the operating time. Cohorts like the previously mentioned indentify the prolonged OR time as a significant risk factor for adverse events (+1.11 Odds Ratio). However other analysis of outpatient procedures where the average duration of the longest cases surpass 400 minutes, concluded that the duration of anesthesia by itself is not an indicator of morbidity and mortality [1,3].

Facial rejuvenation procedures are remarkably safe when taken the proper precautions. In an isolated facelift the reported complication rate is of 1.8%; however when they are combined with multiples procedures the relative complication rate is increased to 3.7%. The most frequent complication is hematoma. Other complication risk factors are: male gender (OR, +1.69), obesity (+OR, 1.73), the use of general anesthesia (OR+1.73) and combined procedures.[2,4] Previous surgeries, minimally invasive aesthetic treatments and meticulous hemodynamic management are usual challenges encountered in this surgeries [4-6].

The high incidence of modifiable risks, such as postoperative hypertension and complications related to general anesthesia, underscores the critical need to establish clear perioperative anesthetic management protocols [2,5,7]. Care cannot fall solely on the surgeon, but must be a shared responsibility by multiple disciplines of health professionals, requiring an open and constant dialogue between the surgeon, the anesthesiologist, the operative room personel, and the recovery staff [5,7]. The Enhanced Recovery After Surgery (ERAS) framework has established itself as the standard for optimizing care, focusing on minimizing the response to stress in complex surgery [7,8]. Anesthesiologists play a critical role, monitoring several elements of ERAS, including hemodynamic stability, prevention of nausea and vomiting (PONV), and multimodal analgesia [9-12]. However, in the field of facial plastic surgery, and specifically facial rejuvenation, the literature in this matter is scarce compared to other specialties [1,5,7]. For Otolaryngology and Head and Neck Surgery (OHNS), ERAS guidelines have been developed mainly for head and neck oncologic cases that require complex reconstruction, but it is recognised that the quality of the evidence is variable and recommendations are often based on extrapolation of data from other surgical populations [7,8]. The specialty of facial plastic surgery lacks exclusive established perioperative management guidelines. This lack of robust data can lead to actions based only on time limits or anecdotal conclusions. Therefore, this review seeks to consolidate the adapted evidence to guide optimized perioperative anesthetic management in full facial rejuvenation [3,7].

## Methods

A comprehensive literature search was conducted to identify evidence based perioperative strategies for facial rejuvenation surgery. The search was performed across PubMed/MEDLINE, Scopus, and the Cochrane Library for articles published between January 2005 and December 2025. Search terms included "rhytidectomy", "facial rejuvenation surgery", "enhanced recovery after surgery (ERAS)", "perioperative anesthesia", "hemodynamic control", and "postoperative nausea and vomiting (PONV)".

Inclusion criteria focused on clinical trials, systematic reviews, meta-analyses, and expert consensus guidelines relevant to facial plastic surgery and ambulatory anesthesia. Given the scarcity of ERAS protocols specifically designed for facial rejuvenation, evidence was also compared from related surgical specialties (e.g., comprehensive plastic surgery and head and neck surgery) where appropriate. All recommendations were graded according to the Orford Centre for Evidence Based Medicine (OCEBM) 2011 Levels of Evidence to provide a transparent framework for clinical decision-making.

### Key concepts in the perioperative management of a full face rejuvenation surgery patient

All patients considered for comprehensive facial rejuvenation receive a preoperative clearance from the anesthesiology team. Non essential medication, herbal and nutritional supplements and non steroidal antiinflammatory drugs are suspended at least a week before surgery.

### Anesthesia modality

The selection of the anesthetic modality is a cornerstone of the ERAS framework, as the primary objective shifts from simple sedation and relaxation to the precise modulation of the surgical stress response [1,5,9]. The magnitude of this physiological response is a key determinant of the postoperative functional decline; therefore, the anesthetic plan must prioritize strategies that minimize such disruption to facilitate a return to the preoperative baseline [9]. The use of short acting agents, such as propofol for induction and sevoflurane or desflurane for maintenance, is preferred to ensure a rapid, clear and predictable emergence. This allows for the early achievement of discharge criteria and facilitates immediate postoperative mobilization, which is critical for preventing respiratory complications and venous thromboembolism while promoting faster functional recovery [10,11].

Hemodynamic stability remains the most critical intraoperative goal to mitigate the risk of hematoma, the most frequent complication in facial rejuvenation surgery [12]. In our clinical setting general anesthesia is commonly performed by using a combination of an intravenous sedatives and analgesics induction, followed by volatile anesthesics maintenance (sevoflurane). Although both general anaesthesia and deep sedation have been historically used for these surgeries, total intravenous anaesthesia (TIVA) has received significant support, especially when supplemented with $\alpha_2$-adrenergic agonists such as dexmedetomidine [13]. This combination provides a remarkably stable cardiovascular profile, effectively attenuating sympathetic spike during the most stimulating parts of the procedure and significantly reducing overall opioid consumption. Evidence from large-scale clinical reviews indicates that such rigorous control of anaesthetic depth and sympathetic tone is essential to maintain systolic blood pressure below the threshold of 140 mmHg, which is the most significant modifiable factor in reducing the incidence of postoperative bleeding and the subsequent need for surgical evacuation [5,9,14,15].

In addition, the anesthetic plan should proactively address postoperative nausea and vomiting (PONV) using an aggressive, multimodal approach. Sudden spikes in intravascular and venous pressure caused by gagging or vomiting during the emergency phase or early recovery period are important triggers for acute bruising [5]. Implementing a triple prophylaxis regimen—integrating agents such as dexamethasone, ondansetron, and dopamine antagonists—ensures a smooth transition from the operating room to the recovery zone. This comprehensive anesthetic strategy aligns with global consensus guidelines to improve recovery, ensuring that the patient remains comfortable and hemodynamically stable throughout the perioperative period [10,11,16,17].

### Advanced ventilation circuit management

Facial rejuvenation surgery is performed under the concept of a shared field and shared airway between the surgical and the anesthesia team. The risk of inadvert mobilization or accidental disconnection of an element of the ventilation circuit is higher in surgeries where there is constant mannipulation of cervicofacial structures. An endotracheal tube is fixated to the upper labial frenulum with silk 2-0, and the anesthetic airway circuit is exchanged in a sterile manner during drapping for one covered by a sterile transparent sheet. This measure allows the surgical and anesthesiolgy team to maintain a visual control of the airway circuit during the whole surgery while maintining a fuly sterile operative field (Figure 1) [18,19].

### Transoperative Fluid Management

Inappropriate fluid management is associated with postoperative complications. A restrictive approach and euvolemia intravenous (IV) fluid management is a modifiable risk factor that can substantially affect perioperative stress if poorly executed [9,20,21]. Hemodynamic parameters are kept very stable in facial rejuvenation surgeries and there is no high volume turnover throughout the surgery. In addition to this, all patients are infiltrated into the surgical site with a solution of epinephrine 2 cc (1 mg/ml) diluted in saline solution, allowing vasoconstriction to be generated. ERAS protocols seek to avoid volume overload, associated with an increased risk of postoperative morbidity [21-23]. A restrictive or "zero balance" strategy has been shown to be key, with the aim of preventing significant weight gain [24].

Restrictive Strategy/Maintenance: International guidelines recommend maintenance fluids of 1–2 mL/kg/hour for major or long procedures [20-24]. Fluid replacement should be individualized, using a restrictive approach [11-20].

Goal-Directed Fluid Therapy (GDFT): This strategy seeks to optimize stroke volume by means of fluid boluses only in "fluid responsive" patients. GDFT may be beneficial in high-risk populations and has been shown to reduce morbidity and length of hospital stay in initial studies [21,25,26]. However, the evidence is mixed when applied within a well-established ERAS protocol, suggesting that the restrictive approach itself is the primary factor [20,21]. The choice of fluid policy (restrictive versus goal-directed) is of greater importance than the choice of fluid type. Type of Fluid: 0.9% saline ("Normal" saline) is not physiological and can cause sodium overload and hyperchloremic acidosis; therefore, routine use is not recommended [21-28].

### Rationalization of the Use of Urinary Catheter (CU)

Placement of an indwelling urinary catheter (UC) is a routine practice in major surgeries, but it carries significant risks, especially Catheter-Associated Urinary Tract Infection (CAUTI). The risk of infection increases with duration, so its use must be rationalized [9,29,30]. UC can act as a restraint, limiting mobility and early ambulation [30]. The guidelines for general and orthopedic surgery consider the use of a UC inappropriate if the expected surgical duration is less than 180 minutes or if the the expected bed rest is less than 24 hours [30-32]. While full facial rejuvenation often exceeds 3 hours, the low incidence of bleeding and the focus on restrictive euvolemia in these procedures reduce the need for tight monitoring of urine output, making the risk of UC outweigh the benefit [1,3,4]. In the context of long duration rhytidectomy, irritation caused by UC can lead to anxiety and hypertension in the male patient, increasing the risk of postoperative hematoma. Therefore, our usual protocol for facelift does not requiere the strict use of a UC, and if used, evidence advocates for its removal before extubation in male patients [4,33]. A recent study in head and neck reconstructive surgery (prolonged procedures) suggests that early removal (between 21 and 48 hours after surgery) may decrease the risk of postoperative urinary retention (POUR) without increasing the rate of CAUTI. Early or immediate removal of postoperative CU is associated with a shorter time for ambulation [32-36].

### Postoperative Dressings and Drains

The application of postoperative dressings and surgical drains constitutes a traditional pratice of rhytidectomy; however, their role and technique is increasingly scrutinized under the lens of evidence-based practice. Historically, bulky "mummy-style" or Barton dressings were advocated to eliminate dead space and limit edema through compression. Nevertheless, comprehensive literature reviews indicate that such dressings do not significantly reduce the incidence of postoperative hematoma [37,38]. Furthermore, excessive or uneven compression carries the inherent risk of exceeding capillary perfusion pressure, which may compromise flap viability and lead to skin necrosis [38,39].

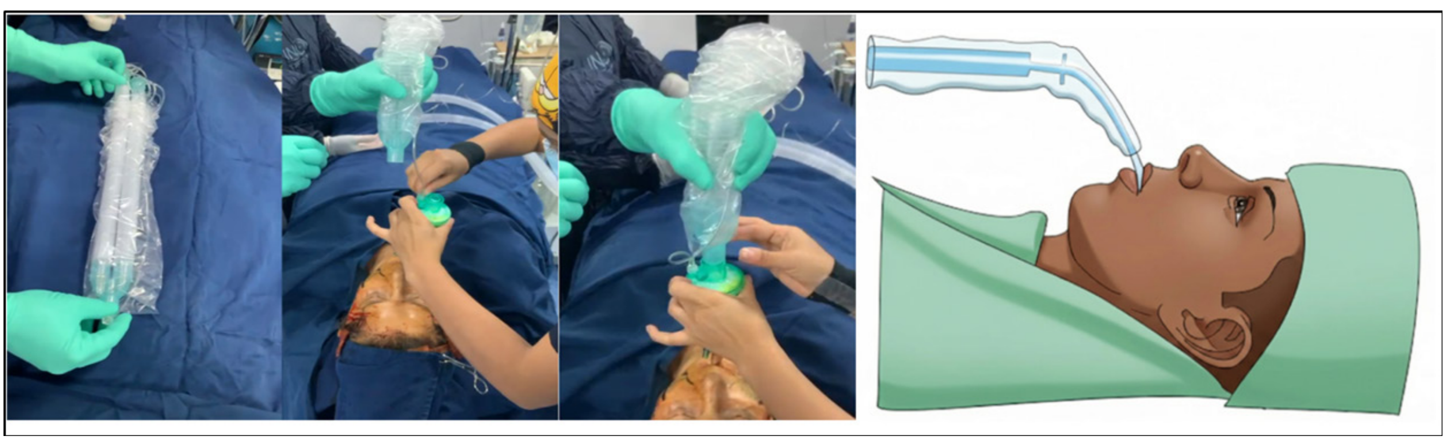


**Figure 1:** Advanced anesthesia ventilation circuit management with full visualization throughout the duration of the surgery. The images illustrate sequentially a-the preparation of the sterile anesthetic circuit, b- the placement of the sterile segment of the anesthetic circuit onto the filter attached to the endotracheal tube, c-the advancement of the sterile transparent circuit sleeve to cover the endotraqueal tube, d-a lateral viewrepresentation of the finalize set of the sterile circuit

To address the limitations of traditional bandaging, specifically the obstruction of the surgical field, alternative strategies have emerged to improve monitoring. Transparent dressings utilizing sterilized PVC film allow for the immediate and continuous assessment of flap color and capillary refill, facilitating the early detection of expanding hematomas while significantly improving patient comfort and hygiene [37]. Additionally, anatomically tailored techniques, such as the "X"-shaped cross-compression method for the nasal root, have demonstrated efficacy in providing localized stabilization and reducing localized complications in other extensive facial procedures [40]. In our clinical setting we use tailored elastic bandages that allow an easy and fast wound revision while maintining compression. Conversely, some clinical series suggest that the complete elimination of dressings does not negatively impact outcomes and may help by removing constrictive and disconcerting materials [41,42].

The utility of surgical drains is subject to similar controversy. Although intended to evacuate residual serosanguinous fluid and minimize early ecchymosis, systematic data do not advocate for a reduction in major hematoma rates through their routine application [37,42]. While the use of vacuum-assisted or "mini-vent" drainage systems, based on specific technical preferences, helps reducing postoperative seromas and swelling; their presence does not substitute for the primary interventions of meticulous intraoperative hemostasis and strict perioperative blood pressure management [37,38,42].

### Postoperative Multimodal Analgesia and Early Mobilization

Effective pain management in facial rejuvenation requires a shift from traditional opioid-centric protocols to multimodal strategies. This approach targets different points along the nociceptive pathway simultaneously to optimize analgesia while minimizing the adverse effects associated with narcotics [17,43]. This begins in the preoperative phase with the administration of gabapentinoids and non-steroidal anti-inflammatory drugs (NSAIDs), which help attenuate central sensitization before the initial surgical stimulus [17,44]. Intraoperatively, the use of long-acting local anesthetics through nerve blocks or infiltration provides a primary peripheral blockade [45].

The implementation of these opioid-sparing techniques is particularly relevant in ambulatory facial surgery, where rapid recovery is paramount. Evidence demonstrates that standardized ERAS protocols in facial surgery cohorts significantly reduce total morphine milligram equivalents and lower the incidence of postoperative nausea and vomiting [17,44]. By utilizing non-opioid adjuncts such as intravenous acetaminophen and COX-2 inhibitors, clinicians can maintain patient comfort without the respiratory depression or sedation that often delays discharge. This comprehensive strategy ensures that pain control is maintained throughout the perioperative [17].

To optimize postoperative analgesia, in an ambulatory setting, an elastomeric pain pump is recommended to patients that present a lower pain threshold. The elastomeric pain pump contains a variable combination of analgesics, antiemetics (ondasetron 40 mg) and antiinflmmatory medication (ketorolac 180 mg, dexamethasone 8 mg) in 0,9% saline solution at a steady infusion rate between 3-5 cc/hour for 4-5 days [43] (Figure 2).

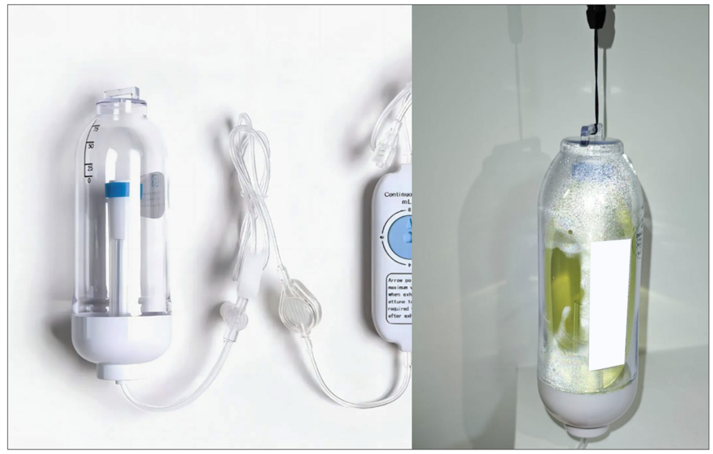


**Figure 2:** Elastomeric pain pump for postoperative ambulatory pain, inflammation and nausea management.

Early postoperative mobilization is a core pillar of the ERAS framework, designed to counteract the functional decline and muscle atrophy triggered by the surgical stress response [9,46]. In the context of facial rejuvenation, patients are encouraged to ambulate within 4 to 6 hours following the procedure. This early activity is the primary intervention for preventing common postoperative complications, including hypostatic pneumonia and venous thromboembolism [46].

Beyond systemic protection, early mobilization has a direct impact on the recovery of the autonomic nervous system. It significantly reduces the risk of postoperative urinary retention (POUR), with clinical data suggesting a low number needed to treat (NNT) to prevent this complication through movement alone [46]. The success of this milestone is intrinsically linked to the efficacy of the preceding analgesia protocol, as uncontrolled pain remains the most significant barrier to patient participation in early movement [17]. A structured, multidisciplinary approach to mobilization ensures that the patient achieves the necessary functional independence for safe discharge while facilitating an accelerated return to their preoperative physiological baseline [9,46].

### Antifibrinolytics in Blood Loss Prophylaxis and Equimosis Prevention

TXA is a synthetic lysine analogue that inhibits conversion of plasminogen to plasmin by preventing plasminogen from binding to the fibrin molecule. TXA also inhibits plasmin activity directly, although only at higher doses [47-51].

It is regarded as a well tolerated and safe therapy for blood loss prophylaxis, with few and mild adverse reactions and rare reports of severe adverse events on literature [47,52-55].

The main purpose of TXA is the reduction of perioperative bleeding and transfusion requirements in both cardiac and non-cardiac surgery. There are clear benefits both from the mortality-morbidity and economic-cost perspectives. In a recent meta-analysis of over 100 RCTs that compared TXA vs no TXA or a placebo in more than 10,000 patients undergoing surgery, there was overwhelming evidence that TXA reduces the probability of transfusion by 38%. Moreover, a cumulative meta-analysis suggests that this evidence has been available for more than 10 years [49,54,56].

TXA is a reliable agent in the reduction of blood loss in different types of plastic surgery, including rhinoplasty and rhytidectomy. These reviews demonstrate that regardless of whether TXA was administered topically, intravenously, or orally, it reduces intraoperative blood loss and the development of postoperative hematomas (Table 1). The most common TXA regimen used is an IV bolus of 10 mg/kg followed by a continuous infusion of 5 mg/kg/h. However, several studies show that both TXA oral and topical forms can be as efficacious as IV TXA. Nonetheless, the halflives of IV TXA and oral TXA are 2 and 10 hours respectively [48,49,56-58].

## Incentive Spirometry

Incentive spirometry (IS) is a fundamental mechanical intervention utilized to mitigate postoperative pulmonary complications (PPCs). The device encourages patients to perform sustained maximal inspiration, mimicking the physiological sigh mechanism [47]. This maneuver generates increased transpulmonary pressure, which facilitates alveolar recruitment and prevents the development of atelectasis [47,48].

The implementation of IS is particularly vital for reversing the restrictive ventilatory patterns and decreased functional residual capacity secondary to anesthesia [48]. Clinical data indicate that IS improves postoperative oxygenation and reduces the incidence of pneumonia when combined with early mobilization [48,49]. Adherence to a structured IS protocol facilitates the rapid restoration of preoperative lung volumes and enhances the overall quality of surgical recovery [47,49].

## Postoperative Nutrition

Postoperative nutrition is a fundamental pillar of the ERAS framework. It is designed to attenuate the catabolic state and modulate the metabolic response to surgical trauma. Surgical stress naturally induces a state of postoperative insulin resistance (PIR). This metabolic shift is characterized by hyperglycemia and accelerated protein breakdown [50]. PIR is a recognized marker of surgical stress and is strongly associated with increased morbidity and prolonged hospital stays. Nutritional interventions aim to minimize these effects by transitioning from traditional prolonged fasting to early feeding [50-52].

Early oral intake is the preferred route for the majority of patients. It should be initiated within hours of the procedure once the patient has regained protective reflexes. For full facial rejuvenation, the early introduction of oral fluids and solids is generally safe and feasible [51]. This practice stimulates gastrointestinal motility and helps maintain the integrity of the intestinal mucosal barrier. Delayed feeding is counterproductive, as it exacerbates PIR and delays the recovery phase [50]. Therefore, "nothing by mouth" (NPO) orders should be avoided in the immediate postoperative period unless strictly indicated by specific surgical complications [51].

The achievement of nutritional adequacy is paramount for successful outcomes. Patients should aim to reach at least 60% of their calculated energy and protein demands early in the postoperative period. Underfeeding is a known risk factor for delayed wound healing and increased infectious complications [52]. High-protein intake is especially beneficial in plastic surgery to support tissue remodeling and collagen synthesis [53]. Oral nutritional supplements (ONS) should be integrated if the patient's spontaneous intake is insufficient to meet these physiological requirements [51,53].

Furthermore, the nutritional strategy must be closely integrated with the anesthetic and analgesic plan. Effective management of postoperative nausea and vomiting (PONV) is a prerequisite for successful oral intake [54]. A multidisciplinary approach ensures that nutritional goals are met without compromising hemodynamic

**Table 1:** Tranexamic Acid (TXA) administration strategies.

| Administration Route | Dosage Used in Studies | Most Common Procedures | Advantages | Limitations |
|---|---|---|---|---|
| Intravenous (IV) | 10–15 mg/kg or 1 g bolus | Rhinoplasty, rhytidectomy | - Uniform systemic effect<br>- ↓ Intraoperative bleeding | - Higher theoretical thrombotic concern<br>- Timing variability |
| Oral | 1 g preoperative | Rhinoplasty | - Easy administration<br>- Less invasive | - Less robust evidence |
| Topical | 500mg–2 g diluted | Facelift, rhinoplasty | - High local concentration<br>- ↓ Localized bleeding | - Lack of standardization |
| Local Infiltration | 0.5–1 mg/mL in tumescent solution | Rhytidectomy, facial surgery | - Direct action in tissue<br>- ↓Hematoma/drainage | - Technique dependent |
| Combined (IV + Local) | Variable | Complex aesthetic surgery | - Potential synergistic effect | - Limited comparative evidence |

Common dosage and administration routes for TXA in plastic surgery.

**Table 2:** Summary of recommendations of perioperative management of full facial rejuvenation surgery.

| Intervetion | Recommendation | Clinical Rationale | Leve lof Evidence (OCEBM) |
|---|---|---|---|
| Presurgical Pharmacological Interaction Screening | Preoperative screening and avoidance of non-essential medication, herbal and nutritional supplements, and anticoagulants | Avoidance of platelet dysfuntction and bleeding. | 4 |
| Anesthesia Modality | Combined IV induction and inhaled maintainance (Sevoflurane/Desflurane) | Achieve hemodynamic stability and rapid emergence time | 2 |
| Hemodynamic control | Maintain systolic blood pressure (SBP) below 140 mmHg throughout the perioperative period | Primary prevention of postoperative hematoma | 2 |
| Anxiety And Emesis Control | Preoperative clonidine and benzodiazepines. Dual or triple PONV prophylaxis, | Attenuate sympathetic response and minimize retching and hypertension. | 1 |
| Intraoperative fluid management | Restrictive Strategy (1–3 mL/kg/hour / Goal: Directed euvolemia | Prevent facial edema and tissue tension that compromises healing | 1 |
| Urinary catheter | Avoid routine use, if necessary for duration, promote early removal (24 hours). | Reduce the risk of CAUTI and facilitate early mobilization. | 1 |
| Analgesia | Implement Multimodal Opioid-Sparing Analgesia (IV Acetaminophen, local infiltration, NSAIDs). | Manage pain while reducing opioid side effects (PONV, POUR). | 1 |
| Antifibrinolytics | Intraoperative local infiltration (1mg/mL) or intravenous administration of tranexamic acid (TXA) | Stabilize fibrin clots to reduce time to hemostasis, drainage volume and hematoma risk | 1 |
| Mobilization | Early postoperative ambulation (within 4-6 hours) | Preven DVT/PE and POUR (NNT 5) | 2 |
| Early Nutrition | Initiation of oral fluids and solids within hours of recovery. | Modulate postoperative insulin resistance and reduce the catabolic response. | 1 |
| Incentive Spirometry | Sustained maximal inspiration maneuvers performed multiple times hourly. | Promote alveolar recruitment and prevent anesthesia-induced atelectasis. | 1 |
| Dressings & Drains | Avoidance of routine bulky and inmobilizing compression dressings. | Prevent flap perfusion compromise; facilitate early visual detection of complications. | 2 |
| Wound Management | Daily cleansing and application of petroleum-based occlusive ointments. | Maintain a moist healing environment to optimize epithelialization and scar quality. | 2 |

Levels of Evidence: 1 (Systematic reviews/Meta-analyses), 2 (Randomized controlled trials/High quality cohort), 3 (Case-control studies), 4 (Case series/poor quality cohort), 5 (Expert opinion).

stability. Consistent monitoring of daily intake is necessary to identify and correct nutritional deficits promptly [52]. This proactive management facilitates a faster return to the patient's preoperative functional baseline [51].

## Wound Care and Postoperative Consultation

Postoperative wound management focuses on optimizing the biological healing environment through meticulous local care. A moist wound environment is essential to facilitate rapid epithelial migration and reduce the risk of hypertrophic scarring [55]. Incision lines should be cleaned daily with dilute hydrogen peroxide or sterile saline to prevent the accumulation of fibrin crusts [56]. The application of petroleum-based ointments or antibiotic salves serves as a critical occlusive barrier against tissue desiccation and bacterial contamination [55,57]. This practice also minimizes the formation of eschar, which can physically impede the migration of keratinocytes across the wound surface. Later in the recovery phase, silicone-based sheets or gels may be utilized to modulate collagen remodeling and improve the long-term aesthetic quality of the scar [55].

The postoperative consultation schedule is strategically structured for the early detection and management of complications. The initial evaluation occurs within 4 hours of the procedure. During this visit, compressive dressings and surgical drains are typically removed. This encounter is paramount for the identification of expanding hematomas or compromised flap perfusion, which require immediate surgical intervention [56,57]. Early visual inspection remains the gold standard for assessing tissue viability and ensures that any vascular compromise is addressed within the critical therapeutic window [57].

Suture removal follows a standardized sequence to minimize tension and prevent scar widening. Preauricular and eyelid sutures are generally removed between postoperative days 5 and 7 [56,57]. Remaining sutures, specifically those in the postauricular area and within the hairline, are typically excised between day 7 and 10 [56]. Following suture removal, the application of surgical tape or steri-strips may provide additional mechanical support to the maturing incision lines. This help to distribute tension and optimize the final aesthetic result [58].

Comprehensive follow-up must address both the physiological and psychological transitions of the patient. Peak facial edema and ecchymosis often trigger a transient "postoperative blues" period. Providing consistent reassurance regarding the typical timeline of resolution is vital for maintaining patient confidence and satisfaction.57 Furthermore, strict activity restrictions are enforced during the first two weeks to prevent late-onset bleeding or seroma formation [58]. Patients may gradually resume low-impact exercise, such as light walking, after the third week. However, strenuous activities, heavy lifting, and any maneuvers that increase cephalic venous pressure must be avoided for a minimum of six weeks [57]. The integration of telemedicine into the follow-up protocol can effectively supplement these in-person milestones, ensuring continuity of care and providing a platform for frequent wound monitoring during the initial stages of recovery [59].

An overview of the previously mentioned recommendations is summarized in Table 2.

## Conclusions and Recommendations

The implementation of enhanced recovery principles in full face rejuvenation surgery represents a shift from historical and anecdotal practices to a standardized and evidenced based framework. Modernization is not merely a change in protocol but a fundamental reorientation of perioperative care towards the precis modulation of the surgical stress response. By systematically addressing the physiological burden of surgery through a multidisciplinary lens, clinicians can facilitate a faster return to the preoperative functional baseline. This shift ultimately improves clinical safety, reduces hospital stay, and elevates the overall patient experience.

Rigorous hemodynamic control is established as the most critical modifiable factor in the prevention of postoperative hematoma, which remains the most frequent serious complication in rhytidectomy. Maintaining systolic blood pressure strictly below the 140 mmHg threshold throughout the entire perioperative journey—including induction, maintenance, and the immediate recovery phase—is a non-negotiable requirement for surgical excellence. Achieving this target requires a departure from traditional anesthetic maintenance in favor of Total Intravenous Anesthesia (TIVA) supplemented with alpha-2 agonists such as dexmedetomidine. This approach provides a superior cardiovascular stability profile, effectively attenuating sympathetic surges during high-stimulation phases without the respiratory depression and prolonged sedation associated with high-dose opioids.

Multimodal analgesia stands as a core pillar of contemporary facial surgery. The transition toward opioid-sparing protocols—integrating gabapentinoids, non-steroidal anti-inflammatory drugs, and long-acting local anesthetics—is essential for optimizing the recovery profile. By targeting multiple points in the nociceptive pathway simultaneously, these strategies provide effective pain control while virtually eliminating the side effects of narcotics, such as postoperative nausea, vomiting, and urinary retention. Mitigating these adverse events is vital, as they frequently trigger the sudden pressure spikes and sympathetic activation that lead to early postoperative bleeding and patient distress.

Functional recovery must be approached with a proactive, milestone-driven strategy rather than a reactive one. Early mobilization within the first four to six hours post-surgery is the primary intervention to prevent venous thromboembolism and respiratory complications. Similarly, the routine use of incentive spirometry is vital for reversing the restrictive ventilatory patterns induced by general anesthesia and ensuring proper alveolar recruitment. These mechanical interventions, when paired with the early resumption of oral nutrition to counteract the catabolic state and postoperative insulin resistance, create an environment conducive to rapid tissue healing and physiological stabilization.

Furthermore, standard practices regarding constrictive dressings and routine surgical drainage require significant reevaluation. Scientific evidence suggests that traditional bulky dressings do not prevent major hematomas and may inadvertently compromise flap perfusion while increasing patient discomfort. Management must instead prioritize a moist wound environment and frequent visual inspection for the early detection of vascular compromise. The elimination of unnecessary drains further streamlines the recovery process, reducing potential sites for retrograde contamination and improving the patient’s psychological transition during the immediate postoperative period.

Ultimately, the future of facial rejuvenation surgery depends on fluid interdisciplinary communication. The surgeon, anesthesiologist, and nursing staff must operate as a cohesive unit dedicated to maintaining physiological homeostasis and promoting early functional independence. This collaborative model ensures that every perioperative intervention is aligned with the goal of rapid, safe recovery. As facial plastic surgery continues to evolve, the integration of these standardized ERAS elements will become the defining characteristic of high-quality surgical care, offering a reliable path toward superior aesthetic outcomes and reduced morbidity.

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