

Micro-Face-lift: A Novel Biplanar, Composite, Less-Invasive Procedure

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Abstract

Background: Facial rejuvenation procedures have been in existence for over a century. Since its first introduction, it improved anatomical understanding and clinical implications and gave rise to numerous techniques and re-ideations of the original face-lift. The increase in popularity of face-lift procedures attracts patients of various ages and with different medical comorbidities. In this paper, we describe the less-invasive facelift procedure, termed the “Micro-Face-lift,” with minimal complications, a short recovery period, and few contraindications. **Materials and Methods:** The authors retrospectively analyzed the medical files of 51 patients who underwent the “Micro-Face-lift” procedure between 2014 and 2019 by three independent surgeons. **Results:** Fifty-one patients met the inclusion criteria for the procedure. Forty-nine patients were women (96.1%) and the remainder were men (3.9%). The mean age at the time of the procedure was 60.8 years (range 45–87). Complications were encountered in five patients (9.8%): two hypertrophic scars (3.8%), one hematoma (2%), one surgical wound infection (2%), and one edema (2%), persistent for more than 2 weeks postoperatively. All complications resolved within 6 weeks of postoperatively. Thirty-five patients (68.6%) underwent additional procedures to maximize the aesthetic outcome. Thirty patients (58.8%) underwent submental liposuction and five patients (9.8%) underwent mid-face lipo-filling. The average satisfaction score on the self-reported “Likert” scale was 4.27 (range 1–5). All patients were followed for a minimum period of 18 months. **Conclusions:** The “Micro-Face-lift” is a less-invasive procedure that can be performed under local anesthesia and sedation in the outpatient setting. Complication rates and mortality are low, contraindications are rare, and the recovery period is short. In our experience, patient satisfaction is high with the Micro-Face-lift procedure, and the learning curve for the experienced practitioner is short.

Keywords: Aesthetic face surgery, composite face-lift, micro-face-lift, neck-lift, neck-lift, rhytidectomy

INTRODUCTION

The aging of the face and neck is a natural and complex process involving the skin and the underlying soft tissues and bony skeleton.

Facial skin physiologically evolves over time with atrophy and thinning of the epidermis, dermis, and hypodermis. The skin becomes thinner and loses its inherent elasticity due to biochemical changes of increased degradation of collagen fibers and decreased number and density of the fibers.^[1]

Changes in the elastic properties of the facial structures affect the facial fat pads in a similar manner. Loss of

elasticity in surrounding ligaments causes a downward migration of the fat pads in accordance to gravity. The movement of the fat alongside the volumetric loss of subcutaneous tissue and physiological muscular atrophy contributes to the appearance of rhytides in the face and neck.^[2]

The growing lust for a young and youthful appearance has created a need for facial rejuvenation procedures. The first procedure aimed at “lifting” of the face and its underlying soft tissues is attributed to Eugene von Hollander in 1901.^[3]

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At first, face-lift procedures consisted of discontinuous skin excisions in natural skin creases and advancement of the skin. The procedure has evolved to the “classic subcutaneous lift” with the extensive subcutaneous undermining of the face.

Over the years, several modifications have been introduced in the literature to the first procedure described by Von Hollander. The increased anatomical knowledge of surgical practitioners allowed for more complex manipulations using multiple facial compartments to achieve optimal results.

The main discovery behind the modern face lifting procedures was the anatomical superficial musculoaponeurotic system (SMAS) layer. The anatomical description of the layer was the basis for the development of the composite flap face-lift.^[4]

However, the need for an aesthetics and the inevitable scarring associated with the procedure has caused patients to seek for less-invasive procedures. Modifications to the composite flap face-lift in the form of the Saylans’s “S” lift^[5] and Tonard’s “MACS” lift^[6] have been introduced to account for these needs. However, practitioners have voiced their concerns regarding the efficacy of such minimally invasive procedures, which caused a shift back to extensive face-lift procedures.

Parallely, a novel minimally invasive procedure of thread facelift was introduced and began to gain recognition. The procedure consists of a percutaneous passage of barbed suspension sutures along a straight trajectory under the skin of the face and neck.^[7] Evidence has gathered that although the interest in thread face-lifts is high, it should not be an alternative to the traditional face-lift due to its limited direct lift effect and short longevity.^[8] Currently, the consensus is that the procedure should be reserved for patients with contraindications to invasive procedures.^[9]

Seeking to replace the questionably effective thread lifts, an office procedure named “Micro-Face-lift”^[10] was developed by the senior author. The results and the surgical technique alongside our preliminary experience with this procedure are reported in this paper.

MATERIALS AND METHODS

The authors retrospectively analyzed the medical files of all patients undergoing the “Micro-Face-lift” from 2014 to 2019, by three independent surgeons.

The procedures were conducted at three separate plastic surgery clinics in two different countries.

Patient selection

Patients were selected for the “micro-face-lift” procedure based on personal patient preference and relative or absolute contraindications for a more extensive and invasive procedure.

Patients with a limiting general condition, mild excess of skin, previous facial scarring, pulmonary disease, heavy smoking history, or previous peripheral facial nerve palsy were considered to benefit from this procedure rather than a more extensive one.

The patients’ preferences were also taken into consideration. Patients seeking minimally invasive procedures that are willing to accept milder results are good candidates for the procedure—as long as they do not fulfill an exclusion criterion.

Patients with vast excess of skin were excluded from the procedure and offered a more extensive face and neck rejuvenation surgery.

Surgical technique

The preoperative marking is made with the patient in the sitting position. The patient’s midline and important anatomical landmarks are marked. The temporal branch path, the mandibular post-lift outline and angle, the incision line, and the sub-SMAS penetration line are marked. The incision line begins at the inferior hairline of the sideburns, then continues into the hairless pre-auricular area. It moves downward along the pre-auricular crease, following the pre-tragal area. From there, it follows the natural angle of the lobule, extending to the posterior conchal area. Finally, it reaches the posterior hairline. Using the pinch technique, the anterior incision line is drawn and continued semi-circularly to the post-auricular skin. Two triangles in the inferior hairline of sideburns and the backward extension of the posterior incision are marked, thus completing the omega shape of planned skin excision [Figure 1].

The Micro-Face-lift is performed as an outpatient procedure and therefore can be performed under local anesthesia, with minimal sedation. Tumescent infiltration with local anesthesia is provided with a 22-gauge spinal needle by using a diluted solution of Lidocaine 0.2%, Adrenalin 1:200,000, Dexacort 1:25,000, and Bicarbonate 0.21% (Solution preparation: 20 mL Lidocaine 1%, 0.5 mg Adrenalin, 4 mg Dexacort, 2.5 mL Bicarbonate 8.4%, diluted with NaCl 0.9% to produce 100 mL of solution) as described by Schoen *et al.*^[10] At least 10 min are allowed for adequate blanching of the infiltrated tissues, at which time, a closed liposuction of the submental region is performed.

The auricular interior incision is made with a No. 15 blade followed by the exterior incision and the excision of the omega-shaped skin pattern. The dissection is then deepened to penetrate the sub-SMAS plane. This deep plane is dissected using blunt “Mezenbaum” scissors in a perpendicular separation fashion, to avoid injury to the parotid gland and disruption of the temporal branch of the facial nerve. The dissection is continued until the anterior SMAS edge is mobilized and can be sawn to the preauricular fascia. Some of the retaining ligaments are partly disrupted



Figure 1: (A and B) Preoperative face and neck markings of skin resection pattern and jaw line. (C) Surgical excision pattern and excess skin resection

in the dissection, namely the posterior segment of the inferior temporal septum, zygomatic cutaneous ligament, most of the parotid cutaneous ligaments, and part of the mandibular septum. The dissection ceases before reaching the superior masseteric and masseteric cutaneous ligaments are normally disrupted in deep plane face-lifts.

The dissection is continued in the area of the neck area using the subplatysmal plane and in the retroauricular area using the subcutaneous plane. The composite flap of SMAS and skin is pulled in the predetermined vector and sutured to the preauricular fascia using 3/0 Vicryl sutures, 3/0 Nylon sutures, or 4/0 Monocryl sutures, according to the surgeon's personal preference. The skin is then approximated with subcutaneous Vicryl 3/0 sutures and intradermal Monocryl 4/0 sutures. Biological glue can be used on top of the incision line [Video 1]. No drains are required.

Surgical application of the micro-facelift by the senior author (V.M.)

The technique relies on the three following core principles:

1. Short skin excisions with minimal future scar visibility: allows for harmonious skin appearance and SMAS re-wrapping.
2. Direct sub-SMAS approach: at the distal edge of the skin excision, the surgeon preserves 3–5 cm of intact SMAS around the ear while remaining above the sternocleidomastoid muscle plane at its caudal and posterior aspects in relation to the ear. The skin and SMAS are then lifted as a composite flap.

3. Limited undermining below the SMAS. When undermining the SMAS, the surgeon must refrain from resecting a large portion of the “Furnas retaining ligaments,” all while gently separating between the ligaments and the perforators in an attempt to minimize postoperative swelling.

RESULTS

During the 5-year period, between 2014 and 2019, 51 patients underwent the “micro-face-lift” procedure.

The mean age of patients was 60.8 years, ranging from 45 to 87 years of age. Forty-nine patients (96.1%) were women and two were men (3.9%).

Three patients (5.9%) had a medical history remarkable for smoking, 47 patients (92%) had previously undergone aesthetic procedures in the facial area. The most common procedure is Blepharoplasty (43%) followed by face-lift (26%) and rhinoplasty (11%).

The most common comorbidities included hypertension, asthma, and hyper-cholesterolemia with 4 (7.8%) patients each.

Patients' demographically and medical characteristics are depicted in Table 1.

During the micro-face-lift procedure, 35 patients (68.6%) underwent additional procedures to maximize the aesthetic outcome. Thirty patients (58.8%) underwent submental

Table 1: Demographical and medical history of study participants

	<i>n, (%) of patients (n = 51)</i>
Age (median, IQR), years	60.8 (45–87)
Gender	
-Female	49 (96.1%)
-Male	2 (3.9%)
Smoking history	
-No	48 (94.1%)
-Yes	3 (5.9%)
Comorbidities	
-Hypertension	4 (7.8%)
-Hyperlipidemia	4 (7.8%)
-Hypercholesterolemia	4 (7.8%)
-Asthma	4 (7.8%)
-Previous malignancy	2 (4%)
-Previous facial palsy	1 (2%)
-Multiple Sclerosis	1 (2%)
Previous facial aesthetic procedures (n = 56)	
-Yes	47 (92.2%)
1. Blepharoplasty (N = 24)	
2. Face-lift (N = 16)	
3. Rhinoplasty (N = 6)	
4. Breast Augmentation (N = 5)	
5. Reduction mastopexy (N = 3)	
6. Abdominoplasty (N = 2)	
-No	4 (7.8%)

Table 2: Intraoperative measures taken in addition to the “Micro-Face-lift”

	<i>N, (%) of patients (n = 51)</i>
Total number of additional procedures	35 (68.6%)
-Submental liposuction	30 (58.8%)
-Mid-face lipofilling	5 (9.8%)

Table 3: Postoperative complications

	<i>N, (%) of patients (n = 51)</i>
Total complications	5 (9.8%)
-Hypertrophic scarring	2 (3.8%)
-Hematoma	1 (2%)
-Persistent edema*	1 (2%)
-Surgical-wound infection	1 (2%)

*Defined as edema lasting more than 2 weeks of postoperatively. Complete resolution was observed with 6 weeks of postoperatively

liposuction, and five patients (9.8%) underwent mid-face lipo-filling [Table 2].

Complications were observed in five patients (9.8%), two patients suffered from hypertrophic scarring, one hematoma (2%), one surgical wound infection (2%), and one edema (2%) lasting more than 2 weeks postoperatively. All complications resolved completely within 6 weeks following the procedure [Table 3].

Table 4: Self-reported satisfaction regarding outcome and scar noticeability, on the “Likert” satisfaction scale

Satisfaction Score	<i>n, (%) of patients (n = 51)</i>
-5	27 (53%)
-4	14 (27.5%)
-3	8 (15.7%)
-2	1 (2%)
-1	1 (2%)

Self-reported satisfaction was measured using the “Likert satisfaction scale,” averaging in a result of 4.27 (range 1–5) [Table 4].

DISCUSSION

Rhytidectomy is an important procedure aimed at restoring the youthful appearance of the patient’s face and neck.

Over the years, it has become the third most common surgical procedure in the aesthetic field, with over 230,000 yearly procedures in the United States alone.^[11]

Due to the popularity of the procedure, different practitioners opt for different surgical techniques, maintaining the patients’ desires, safety, and preference in mind.

Patients referring for rhytidectomy procedures are interested in minimal scarring, surgical trauma, complications, and recovery time while achieving maximal results.

At first, face-lift procedures consisted of discontinuous skin excisions in natural skin creases and advancement of the skin. The procedure has evolved to the “classic subcutaneous lift” with the extensive subcutaneous undermining of the face.

Aufricht^[12] hypothesized that suture plication of subcutaneous fatty tissues could enhance the desired cheek elevation, and began a search for deeper layer manipulation in the face-lift procedures.

Skoog and Hamra^[13] described the use of a dissection plane under the superficial subcutaneous fascia. The author used this underlying fascia together with the skin and platysma to generate a robust combined flap for the suspension of deep tissues, thus achieving long-lasting results with a less-dangerous dissection.

The idea was investigated by Mitz (the senior author) and Peyronie.^[14] They termed this superficial fascial layer “SMAS.”

In the years to follow, several modifications to Skoog’s technique have been proposed. Among the most notable was the “composite flap face-lift” introduced by Hamra.^[4] Hamra suggested that increased mobilization of the SMAS layer while maintaining its combined elevation with the overlying skin as a composite flap could be useful

in decreasing the risk for facial nerve injury. The suggested flap consisted of *en bloc* suspension of the skin, platysma, SMAS, malar fat, and the orbicularis oculi muscles.

The newly described SMAS layer has generated a regained interest in the face-lift procedure and its anatomy, and Rohrich and Pessa^[15] described their anatomical studies in regards to the facial fat compartments' clinical implication in the face-lift procedures.

The new findings allowed for longer-lasting and natural-looking results, with low complication rates.

The regained popularity of the face-lift increased the audience reaching out to surgeons in regards to surgical facial rejuvenation. The heterogeneity audience and their occasional notable medical history shifted the pendulum to less-invasive techniques that allow for similar effect despite contraindications or risks.^[16]

Robbins *et al.*^[17] re-introduced the original subcutaneous rhytidectomy, with the addition of SMAS plication as an alternative to the extensive SMAS elevation previously used. This procedure, and similar ones, decreases preauricular incisions and skin undermining, necessary in extensive SMAS lifts, to only those needed for SMAS plication.

Although the aesthetic results of SMAS maneuvers in its different forms were excellent, patients suffering from extensive comorbidities or those reluctant to undergo extensive surgical procedures with significant scarring or disturbance to the day-to-day schedule, tended to opt for less invasive procedures that result in subpar aesthetic results.

To answer the needs of these patients, several modified procedures that fall under the category of "Mini-Lifts" have been introduced.^[18] These procedures typically include preauricular skin excisions with minimal undermining. Despite their potential, the results appeared to be short-lived and minimal. The evolution of these procedures came in the form of the S-lift with suspension sutures and SMAS plication.^[5]

Baker^[19] introduced the "Minimal incision rhytidectomy with lateral SMASectomy," commonly referred to as the "Short-scar face-lift," in 2001. The procedure was developed out of demand from a younger crowd, mostly in their 40s and 50s, seeking facial rejuvenation, while being opposed to post-auricular scarring.

In addition, the author introduced a classification of patients most suitable for minimally invasive rhytidectomy. The patients were classified into six groups based on age, submental fat, the severity of jowls, cervical skin laxity, and platysma bands.

Patients termed Bakers 1 and 2 were considered good candidates for the minimal incision procedure.

Despite the numerous variations of the "mini-lifts" and the "short scar rhytidectomy," patients sought less-invasive

procedures that can be performed at the outpatient clinic with a minimal recovery period. The need was answered with the "thread-lift" that was referred to as the lunch-time facelift due to its short duration and recovery.

Despite the gained popularity of the procedure, results were variable, unsatisfactory, and short lasting.

The authors of this paper present the concept of the "Micro-Face-lift," a composite, bi-planar face-lifting procedure that was introduced by the senior author in 2014 to oppose the growing trend of the thread-lifts and their inherent limitation of not respecting excessive skin. It was based on three fundamental surgical concepts: a predesigned short scar skin excision, a direct sub-SMAS approach, and limited undermining under the SMAS.

The technique was developed primarily for secondary facelift procedures, in patients unsatisfied with previous more extensive rhytidectomies or those looking to rejuvenate the results of older procedures.

The author then applied this technique as a primary surgical procedure in younger patients, with no previous surgical history, or patients dissatisfied with previous thread lifts.

Patient preselection is of utmost importance, and Baker 1 and 2 patients are considered the optimal candidates. As the procedure does not result in a maximal elevation of skin flaps, the unique indications for this technique permit to include heavy smokers, chronic diabetic patients, and chronically ill patients who cannot bear general anesthesia and are prone to complications. Therefore, providing a solution for a population subgroup that was considered to have relative contra-indications for face-lift procedures.

Ancillary procedures, in the form of submental liposuction or mid-face lipo-filling, can be carried out during the surgery, to improve the aesthetic outcome and patient satisfaction.

The expected recovery period is observed to be approximately 5–7 days during which the moderate facial swelling resulting from the procedure gradually softens and subsides.

In summary, we present our joint experience with a novel biplanar composite flap technique for face lifting and rejuvenation.

We find the "Micro-Face-lift" to be a feasible technique with a short learning curve for the experienced plastic surgeon and an important contribution to the armamentarium of facial rejuvenation. Micro-Face-lift has a wide range of indications, limited contraindications, low downtime, and minimal complications.

We are convinced that the Micro-face-lift is a positive additive to the armamentarium of the plastic surgeon in facial rejuvenation.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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