

Volumetric Facelift with Intra- and Post-Operative Midface Volume Replacement “The Four-Dimensional Facelift”

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KEYWORDS

- Facelift • Facial fillers • Facial aging
- Midface volume restoration • Fat grafting
- Surgical technique • Cosmetic rejuvenation
- Rhytidectomy

With the millennium came an ideological shift in the approach to facial rejuvenation from predominantly subtractive surgical methods to additive volume restoration techniques.¹ Earlier facelift procedures focused on tightening lax skin, without attention to volume, often leading to a pulled post-surgical visage.² More recently, the effects of facial volume loss have been recognized as a central contributor to the aging process. In today's approach to facial rejuvenation, a facelift is not just a facelift but rather is a surgical makeover to restore youthful facial contour. Surgical and aesthetic studies have demonstrated the need to address the midface volume deficit when performing standard facelift techniques. Combining surgical facelift techniques with volume restoration produces a three-dimensional aesthetic improvement. In fact, nearly 95% of the author's patients undergoing facial rejuvenation surgeries receive volume correction at the time of surgery. Although the method of volume replacement can be debated and is highly operator dependant, it should be understood that this three-dimensional restoration does not adequately address the dynamic aspect of aging. The

continued treatment of the facelift patients with appropriately applied filler materials for years following surgery ensures more persistent natural results over time,³ hence the concept of “the four-dimensional facelift.” In this article, the author outlines his methodology from initial consultation, to the surgical and nonsurgical procedures, to the years of volume maintenance. The concepts of progressive treatment of facial maturation over time, of commitment, and of long-term patient care are incorporated into the author's surgical approach to the aging face to achieve enduring, natural results (**Fig. 1**).

UNDERSTANDING FACIAL AND MIDFACIAL AGING

During the aging process, the face loses fat and volume, and the skin loses collagen and elasticity.⁴ Accentuated by full cheeks and voluptuous curves in youth, the aging face becomes framed by bony contours wrapped with thin skin, appearing deflated and aged. Understanding the dynamic facial maturation process is crucial to attaining optimal results with facial rejuvenation

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procedures.¹ The significant contribution of volume loss to aging features has recalibrated the manner in which the maturing face is treated. Now it is recognized that to correct the signs of facial aging, not only the skin but the facial soft tissues,

the subcutaneous muscle–aponeurotic system (SMAS), fat, and even facial bones need to be addressed.

The aesthetics of the youthful face consist of healthy fullness, smooth contours, symmetry,



Fig. 1. (A and B) A 57-year-old woman shown (left) before and (right) 9 months after a facelift, fractionated CO₂ laser resurfacing, and intraoperative filler treatments to the midface including the tear trough and mouth.

and proper proportions. The youthful midface is characterized by voluminous cheeks with an uninterrupted distribution of soft tissue overlying the malar bone and invisible transitions to neighboring facial regions. Although skin laxity yields aging effects that are most prominent along the lower face and neck, volume atrophy is most evident with midfacial aging. Here, tissue involution creates hollow infraorbital depressions and shadowing evident as dark infraorbital circles, where thinned lower eyelid skin permits visualization of the underlying blood vessels and musculature. The formerly seamless contour of soft tissue between the eyelid skin and cheek of the youthful face is interrupted by malar tissue loss with subsequent ptosis of the skin and supporting structures. Inferior migration of the malar fat pad results in a flattened, hollowed midface with pseudoherniation of lower eyelid fat pads and tear trough deformity. Concomitant atrophy of soft tissue, facial bones, and musculature evokes a skeletonized manifestation of the aging face.⁵

The modern approach to surgical rejuvenation of the face seeks to restore lost facial volume and contour to reinstate youthful facial aesthetics. Cosmetic rejuvenation of the lower face can be accomplished effectively with facelift surgery, but significantly improved aesthetic outcomes are possible when midface volume restoration is achieved and maintained over time. Even after successful facelift surgery with or without volume replacement, this loss of volume and volume shift continue to contribute significantly to the ever-progressive process of facial maturation.

MIDFACE VOLUME REPLACEMENT: A DISCUSSION OF SELECT OPTIONS

Combining facelift surgery with midface volume replacement can yield dramatic yet natural-looking improvements. The goals of midface rejuvenation in conjunction with a facelift involve reestablishing malar volume and smoothing the transition between the eyelids and cheeks. Effective restoration of volume can be difficult to accomplish in a predictable long-term manner, however. The plethora of options for midface volume restoration range from surgical techniques, including SMAS plication or midface lifts; procedures using various permutations of autologous materials, including dermis, fascia, or muscle as well as fat grafting; and alloplastic options, including malar implants, thread lifts, and injectable facial filler materials.

Surgical procedures to restore midface volume include SMAS resection, plication, or rotation;

however, these results have demonstrated minimal improvement of the naso- and mentolabial folds and negligible improvement in tear trough contour.⁶ Overall, none of the myriad surgical approaches to the midface has been universally successful.

Currently, one of the more commonly used techniques for intraoperative midface volume enhancement during facelift surgery is autologous fat transfer. Although recent improvements in preparation, harvesting, and injection techniques allow longer-lasting and more predictable results,^{7–10} potential issues include the need for multiple procedures, a high resorption rate, potential contour irregularities, and patient dissatisfaction. Complications that arise after fat grafting, such as lumps and bulges, overcorrection, and asymmetry, can be difficult to manage.⁵ Fat grafted to the delicate tear trough and lower lid areas can be visible and palpable and can possibly worsen the contour abnormalities it was intended to correct. Used in conjunction with a facelift, fat grafting can replenish hollow cheeks, but care should be taken to avoid overcorrecting the midface, which can appear unnaturally heavy after excessive fat transfer.¹¹ In a slender patient who has a low body mass index, finding an adequate supply of donor fat can be a challenge, as is the increased propensity for fat reabsorption in these patients. In addition, weight loss or gain can alter the outcome of fat grafting. A weight loss of 10 pounds or more can result in concomitant loss of the cosmetic result achieved by the fat transfer procedure. In the reverse circumstance, the resultant fatty hypertrophy from weight gain may cause undesirable fullness or contour irregularities to the grafted material.¹² In addition, even where the static result may be successful, with facial animation such as smiling, the enhanced malar soft tissue sometimes gathers abnormally by the eye, yielding an unaesthetic appearance.

Malar implants are limited in their ability to fill the inferior orbital rim and buccal hollows and may create a relative exaggeration of these deficits. In addition, the isolated use of malar implants in an older, volume-depleted patient can accentuate a skeletonized appearance of the face.⁵ Smaller implants often are preferable to replace atrophic volume loss. Medium to large implants should be reserved for the patient who desires not only to replace lost volume but also to augment a previously unsatisfactory aesthetic.¹³ Overall, enthusiasm for cheek implants seems to be diminishing in favor of soft tissue-based treatments, which offer more plasticity and more natural-appearing movement than static implants.

Minimally invasive facial traction techniques, such as thread lifts, should be viewed with caution¹⁴ because of untoward complications such as visible threads apparent through the skin surface and an often unnatural-appearing outcome.

Injectable dermal fillers are an internationally popular option for volume restoration throughout the face.¹¹ A broad spectrum of alloplastic injectable materials suitable for facial revolumization has been approved by the Food and Drug Administration (FDA). Because of their longevity, efficacy, safety, and reversibility, the author primarily uses hyaluronic acid (HA) products (Restylane and Restylane Perlane, Medicis Aesthetics, Scottsdale, Arizona; Juvederm Ultra and Juvederm Ultra Plus, Allergan, Irvine, California) in his practice. Other FDA-approved products, including poly-L-lactic acid (Sculptra, Dermik, Sanofi-Aventis, Bridgewater, New Jersey), collagen-based products (Cosmoderm and Cosmoplast, Allergan, Irvine, California; Evolence, ColbarLife Sciences, Herzliya, Israel), and calcium hydroxyapatite (Radiesse, BioForm Medical, San Mateo, California), provide varying degrees of longevity; however, only HA products claim reversibility through a simple injection of hyaluronidase (Amphadase, Amphastar Pharmaceuticals, Rancho Cucamonga, California; Vitrase, Ista Pharmaceuticals, Irvine, California). Also, the availability of both small- and large-particle HA products permits customization for the most effective treatments. For difficult to treat areas such as tear trough or brow, small-particle HA injections produce unsurpassed aesthetic results with experienced injection.

There are permanent injectable filler materials that can be used in an off-label capacity for correction of midface volume, such as polymethylmethacrylate (Artefill, Artes, San Diego, California) or silicone (Silikon 1000, Alcon, Fort Worth, Texas; Adaptosil 5000, Bausch Lomb, Rochester, New York). However, it should be cautioned that permanent products can yield permanent problems. Because of the need for exquisitely sensitive technique, the possibility of significant complications or corrections, and uncertain long-term risks, these permanent products are not used widely for midface revolumization, either independently or in conjunction with facelift surgery.

PREOPERATIVE EVALUATION

Initial Contact and Consultation

For every potential facelift patient, the first impression of one's practice begins during the initial telephone call or Internet inquiry. Almost independent

of the quality of the surgeon's surgical skills, pleasant employees who are able to answer all patient questions effectively and knowledgeably are vital in determining whether a patient decides to establish a consultation for elective cosmetic surgery. Staff members should convey confidence and enthusiasm about their physician and medical team. Personnel with poor attitudes and an insufficient knowledge base may dissuade a potential surgical candidate.

Developing patient rapport and trust is the most important initial step in any medical consultation. To build a patient-physician relationship, the patient must feel confident in the physician's abilities and judgment. For patients, this confidence can be accomplished by openly and empathetically listening to the patient's concerns. Understanding each patient's motivation for desiring elective physical change to the face is also crucial. Patients who want to "look as young as they feel" or who are motivated to undergo surgery to enhance their own self-esteem often benefit from surgery. Patients interested in appearing refreshed to compete effectively in the job market also are successful candidates. Excluding individuals who have unrealistic expectations of surgery, those who have permutations of body dysmorphic disorders, who may be pressured to have surgery from a relative or spouse, who are unstable mentally or emotionally, or who believe that the surgery will solve a failing marriage or life problems is necessary to avoid a postoperative patient who either is unhappy or who never will be satisfied with the outcome, no matter what the result. Listening to one's own intuition regarding these red flags is as important as listening to the patient. As one of the author's respected mentors wisely stated, "You'll never regret a surgery you *didn't* do."

During a patient's initial consultation in the author's practice, the patient first has a private discussion with an aesthetic coordinator (either an aesthetician or patient coordinator) to elucidate the patient's desired aesthetic goals. The aesthetic coordinator distills the patient's information to facilitate a more productive, efficient consultation with the surgeon. In addition, the aesthetic coordinator explains the spectrum of other cosmetic services available in the practice and reviews before and after photographs with the patient to illustrate the surgeon's surgical style and to generate realistic expectations.

Armed with a synopsis of the patient's goals, the physician's facelift consultation can focus on establishing rapport and efficiently determining a treatment plan. In the author's practice, no consultation regarding full-face rejuvenation would be complete without a discussion of volume

restoration. Each patient is educated regarding the necessity of long-term midface volume restoration to refresh and maintain a youthful, natural appearance. Many patients ask about longer-lasting or permanent options for volume, but, depending on body type, alloplastic products offer many advantages, most significantly reversibility and plasticity. For midface restoration in the author's practice, all FDA-approved fillers are offered in addition to fat-grafting techniques, to achieve natural full-face rejuvenation. During the patient's consultation, concepts of conservative lower eyelid fat removal and the need for long-term perpetuation of cheek volume are discussed. The author's philosophy regarding the importance of maintaining midface volume in a manner that changes dynamically as the face changes over time is central to his successful facelift outcomes. Patients understand that the midfacial volume restoration they receive at the time of facelift is not permanent, and therefore patients are not disappointed when the volume eventually dissipates. Because maintenance of volume is so crucial, the author personally performs all cosmetic injectable treatments, thereby developing strong, long-term relationships with his patients for optimal facial health.

Photographic Documentation

Digital photographs are taken of each facelift candidate including full-face frontal, left and right oblique, and right and left lateral views with attention to consistent lighting and patient positioning. Additional close-up views of the anterior neck and each ear, focusing on the pre- and post-auricular hairlines, are helpful in preoperative planning for facelift surgery. Computer image alterations are performed to illustrate potential facelift results. These images are reviewed carefully with the patient to confirm that they represent realistic, but not guaranteed, outcome scenarios.

OPERATIVE TECHNIQUE

Operative and Injection Techniques

In the operating room, the primary or revision facelift portion of the procedure of the procedure is completed. Although there are many permutations of facelift procedures, the author performs an extended sub-SMAS procedure to achieve successful lift while minimizing facial nerve concerns. This sub-SMAS technique allows some additional fullness resulting from the slight medial dog-ear in the SMAS. The mid-face portion of the SMAS is elevated with a superior vector, and the jaw line and neck region of the SMAS are repositioned posterolaterally behind the ear. After the

facelift closure is sutured carefully, the facial fillers and/or fat are injected into areas requiring volume restoration. Areas to consider include cheeks/midface, nasojugal folds, tear troughs, naso- and mentolabial folds, lips, and any additional areas that are aesthetically depleted. In the midface region, one to two syringes per side of large-particle HA filler are placed deeply in the subcutaneous tissues and along the supraperiosteal plane. After injection, the HA product can be modulated manually to achieve the desired contour. Tear troughs can be rejuvenated successfully with careful injection of a small-particle HA filler placed just beneath the dermis. When treating superficial and delicate areas such as the tear trough, conservative dermal product placement is crucial, because superficial injection can be visible through the skin, worsening the patient's appearance.¹ In the lower face, including the naso- and mentolabial folds, two to three syringes of small-particle filler are injected as cosmetically indicated (**Fig. 2 A and B**).

Two factors paramount to successful filler injections are treating to complete correction and filler placement in the dermis. Except for the periorbital and tear trough areas, where prudent undercorrection is the rule, both the patient and the surgeon are more likely to be satisfied with the treatment outcomes when complete correction is achieved. Anecdotally, experienced injectors have recognized that if complete correction is accomplished initially, the correction persists longer.¹ After completing the filler injections, standard post-facelift pressure dressings are applied using fluffs, Kerlex rolls, and Coban dressings.

Maintenance of Results

During the initial consultation for full-face rejuvenation, patients are educated regarding the need for continued volume replacement to maintain results. To optimize the longevity of the filler injections, the initial re-treatment should be performed between 4.5 and 9 months after surgery.¹⁵ Additional follow-up treatments are scheduled yearly or as needed to maintain the most ideal, customized result.

DISCUSSION: FACELIFT WITH MIDFACE VOLUME

Although previous facelift techniques focused on tightening loose skin and resuspending descended structures, most of these techniques did not address the loss of midfacial volume. For some patients, loss of youthful facial fullness can be the most significant sign of aging. In approaching full-face rejuvenation effectively, a combination of traction and volume can achieve the most natural-appearing results.

A



Fig. 2. (A) A 52-year-old woman shown (*left*) before and (*right*) 9 months after a facelift, fractionated CO2 laser resurfacing, and intraoperative filler treatments to the midface, including the tear trough, lips, and nasolabial folds. (B) A 46-year-old woman shown before and 12 months after a facelift, browlift, upper and lower blepharoplasty, and intraoperative filler treatments to the midface including the tear trough and nasolabial and perioral areas.



Fig. 2. (continued)

Natural-looking and dynamic restoration of volume can be a challenging prospect. The unremitting atrophy of facial volume occurs at multiple levels, in various tissue types, and with variable velocities. As such, there currently is

no single, one-time technology to address this changing system effectively in a fully predictable fashion. Injectable facial fillers provide the natural-appearing volume to address facial atrophy and use the potential downside of

impermanence to an advantage, permitting customized, adaptive results. Studies also have shown that injected HA fillers can stimulate dermal fibroblasts to produce collagen,

yielding potential long-term volume results over time.¹⁶

Although numerous variations of facelift techniques are possible, the author has chosen to



Fig. 3. A 62-year-old woman shown (*left*) before and (*right*) 5 months after a secondary facelift and intraoperative HA filler treatments to the midface including the tear trough, nasolabial and perioral areas (*A, B*).

focus this article on the vital concept of combined facelift plus midface volume restoration rather than a debate about facelift surgical technique. In the earlier phase of his practice, when volume played a small role during surgical procedures, to the present, when 95% of full-face rejuvenation procedures receive concomitant volume replacement, the author has noted a definite evolution in facelift paradigm culminating in this combined approach. This described technique has shown significant volumetric improvement and offers less risk for complications, especially those involving facial nerves. The simultaneous addition of volume sometimes is even more significant at the time of revision surgery or secondary facelifts, because additional contour abnormalities may require correction during these procedures (Fig. 3).

In addition, the temporal component of this method addresses the dynamic nature of facial maturation and allows a healthy, long-term commitment to facial rejuvenation. Albert Einstein theorized that time was the fourth dimension¹⁷; hence, the concept of integrating time into a three-dimensional facial restoration yields the “four-dimensional facelift.”

Although the search for the perfect long-lasting and dynamic midfacial rejuvenation continues, the present understanding of facial aging and the current state of technology make the approach described herein a contemporary and effective option for full-face rejuvenation.

SUMMARY

The twenty-first century approach to the surgical treatment of facial aging is customized to match each patient’s aesthetic needs and desires. The significant contribution of volume loss to aging features has recalibrated the manner in which the maturing face is treated. Modern facial plastic surgery has come a long way from the more limited traction-centered approach, to achieve dynamic, volumetric, natural-looking outcomes that are truly rejuvenating. Viewed as a “four-dimensional” process, the continued treatment of facelift patients with appropriately applied filler materials for years after the surgical procedure can achieve more persistent, natural-looking outcomes.

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