Models of Facial Aging and Implications for Treatment

Val Lambros, MD

During one of our many forays into the mighty British Museum in London, we noticed a dull, featureless disc in a corner of one of the Egyptian rooms. It was the oldest artifact in the room as we recall, a bronze mirror dated 3500 BC.

We were taken with the idea that the mirror and the desire to see what it showed was such an early and indispensable invention of man. This idea was followed by the more practical thought that this item was the one device without which a plastic surgeon’s office could never function. In thinking about the Egyptian mirror over the course of years, it became easy to imagine a person looking into it, pulling the cheeks back, and seeing that he or she looked better. It is also easy to imagine the same wistful motion being performed by countless women and men over the course of the last 5500 years.

What the “mirror lift” suggests and surgeons have assumed since at least the early decades of the 20th century is that the face is a structure that ages by gathering excesses of skin and fat that “fall” as the person gets older, and that those excesses are best treated by removal and “lifting.”

Because we are surgeons, we have come to call this concept the “surgical model” of facial aging, for want of a better term. This concept is the surgical cousin of the mirror lift and encompasses the surgeon’s intuitive understanding of the face as it improved in the mirror. (This article discusses the face only, although in truth, much, if not most, of the benefit of facial cosmetic surgery comes from improvement of the neck and lids.)

The surgical model of facial aging proposes that the face accumulates laxities and excesses as it descends under the influence of muscle activity and gravity. One can see the assumptions of the surgical model in almost all plastic surgical articles and books written about the face and its treatment, so much so that further discussions about aesthetic choices when analyzing faces for treatment seem to be unnecessary.

Fingers pulling back on the cheeks smooth the skin, lessen the nasolabial fold, and flatten the jowls. Because finger traction flattens bulges and apparently fills hollows, a corollary to the surgical model is that the face is a closed system and that fullness in one location necessarily means that it came from an adjacent and superior site. Because traditional surgical virtues include the ability to take things out and make things tight, it would seem that by trading fingers for sutures, surgical technique would be a perfect marriage to the aging face. By tightening the laxities and removing the excesses, the face should be made young again. In other words, because improvement in appearance was sometimes obtained by elevating and “tightening” skin people assumed that aging necessarily brought laxity and descent.

Although many patients treated by excision and “tightening” looked better, the degree of improvement did not come close to that of fingers on the cheeks, and as facelifts were performed on increasing numbers of people, more of them had unexpected and unflattering results from surgery intended to be cosmetic (Fig. 1).

TRIUMPHS OF THE SURGICAL MODEL

The surgical model has been a financial success and the standard for treating faces since the 1920s.
The procedures are standard for a reason: they are easy technically and the results are predictable and acceptable to most people. Despite considerable rhetoric to the contrary, facelifts have more similarities than differences in their basic approach. They use incisions around the ears, and the skin is undermined a variable amount onto the face. Unalloyed traction on the skin leads to undesirable sequelae, so most current procedures use the subskin layers of the face in some way to shorten the superficial muscular aponeurotic system (SMAS) layer and overlying skin. Not all techniques are identical and any procedure can be done poorly or well, but most facelifts seek to achieve the same goals through the same general means. The primary method for accomplishing these goals is the use of a superolateral pull to “tighten” the skin and reposition subcutaneous fat along the contour of the underlying skeletal and fascial framework. (We do not think that any real tightening actually occurs; rather, slack skin and subcutaneous tissues are shortened to normal resting tension). In most aging faces, a modest amount of lateral skin shift is a desirable goal because it is the essence of the facelift procedure, just as it is with the mirror lift. With certain exceptions in technique, facelifts are two-dimensional procedures. They pull the skin (either directly or indirectly through the SMAS) closer to the shape-defining bone and muscle, and by doing so, smooth out some of the skin demarcations.

The facelift is an operation that uses soft tissues that are losing, or have lost, their youthful characteristics in an attempt to regain youthful characteristics, and, as such, the better the quality of the tissues (and the less the patient needs a facelift), the better the surgical outcome. The facelift operation fits certain faces well. Faces that are young, have good-quality skin with well-defined bone structure, and do not have extreme amounts of fat uniformly do well. These cases are the types that are published in volumes like this one and presented at meetings to show off the skills of the surgeon and the kinds of patients that are frequently used to describe new surgical techniques. In our opinion, patients like this require the least skill of all because they present the least technical and aesthetic challenges. Although we are by no means technical nihilists, we have the strong conviction that the best predictor of a nice outcome is not the technique used, although of course technique plays a role. It is an already attractive face that fits the operation and has

---

**Fig. 1.** When traction is the only tool for treatment of all aging faces, problems can occur. This patient has had multiple facelifts, with very inelastic skin and tension applied to the skin closure. The vector of closure was too vertical for the skin type. (Courtesy of V. Lambros, MD, Newport Beach, CA.)

**Fig. 2.** A 37-year-old woman with tear troughs and small fat pads. She could have had lower lid surgery but she was treated instead with 0.4 mL of Restylane (Medicis, Scottsdale, Arizona) in the tear troughs. The postinjection picture was taken 3 years and 4 months after the original injection. In the tear troughs, this kind of duration is not uncommon, presumably from the lack of motion. (Courtesy of V. Lambros, MD, Newport Beach, CA.)
good enough tissue quality to maintain a result past the swelling phase.

Proponents of specific techniques like to claim that the operation is made to fit the patient. We find little evidence of this statement being true regarding the face. Surgeons seem to gravitate toward a particular facial support technique and use it all the time.

ISSUES WITH THE SURGICAL MODEL

Unfortunately, the real world is populated by people who do not look like those described earlier. Many of them seek cosmetic surgery. One sees round, heavy faces; tight, inelastic, sun-damaged skin; and deep nasolabial folds. They may be heavy or thin. They may have had multiple previous facelifts. They may have a preponderance of the facial fat just lateral to the nasolabial folds and be thin over the masseters (this latter we find to be the most difficult patient of all to operate on with a good result).

These types of patients do not fare as well with traditional facelift surgery. The same maneuvers that may deliver a surgical triumph in a particular patient may result in an indifferent or poor result in another.

These difficult faces are almost never presented at meetings or in publications, nor is it commonly explained why the techniques that fare so well in an easy patient do poorly in a difficult one. In any event, it is hardly possible to be in any large public area and not see someone with obvious and visible signs of having had “cosmetic” surgery. The public is aware of these odd faces and responds derisively to them.

DEFINITION VERSUS VOLUME

It has long been known and described in literature and art that the face ages in ways not described by the surgical model. One can frequently see a process of shrinking; in our clinical experience, about one third of

Fig. 3. A 42-year-old woman with an anxious look. Hollowing of the superior medial orbital rim resembles the medial brow elevation of consternation. The orbital rim parallels the brows, duplicating a medial brow elevation look of consternation. The patient was treated with 0.5 mL of Restylane in each brow, which was not quite enough, but rid her of the concerned look. The images are 1 year apart. We find this particular filler to have a duration of 1 to 2 years in the brow. (Courtesy of V. Lambros, MD, Newport Beach, CA.)

Fig. 4. A 59-year-old woman with hollow lids and excess skin on her right. She is smiling slightly in the follow-up picture, which was taken 19 months after an injection of 0.75 mL Restylane in each brow. Note how the “excess” skin of the right upper lid has been used up by the added volume. Traditional cosmetic surgery would have dropped her brows and made her more hollow. (Courtesy of V. Lambros, MD, Newport Beach, CA.)
patients age in this way. The standard plastic surgery operations serve to increase the definition of an area by bringing the skin closer to the shape-defining bone while disregarding or discarding its fullness. Areas of high-retaining ligament density, like the preparotid area, the anterior jowl border, and the zygomatic ligament insertions, commonly lose volume and indent. Young, large radii of curvature decrease and the skin collapses into wrinkles. Skin changes can be profound and the skin in some patients seems to demarcate into pigmentedary boundaries and retaining ligament insertions. Even the most traditional plastic surgeon recognizes the existence of “baby fat” while not noticing that in some patients, the baby fat takes a lifetime to disappear and its disappearance has a profound effect on the appearance of the face. A young face is not an old face with tight cheek skin.

No better examples can be seen than in the standard procedures around the eyes. When upper lids are treated surgically, some apparent excess of skin is excised and some is used up in the removal of fat and the creation of a deeper-set, more hollow, round eye. Patients often want what they do not have, but this kind of eye, although dramatic and easier to put make-up on, has an intrinsically older shape. It does not have the characteristics of fullness and ovalness seen in the younger eye.

The idea of inducing volume changes in the face for therapeutic benefit is not new, although it has taken generations of plastic surgeons to rediscover it. In 1911, Frederick Kolle, in his book,
“Cosmetic and Plastic Surgery,” advocated subcutaneous injection of paraffin and petrolatum to build up facial cosmetic defects in areas such as noses, chins, nasolabial folds, cheeks, and foreheads, much as today.\textsuperscript{15,16} Coleman\textsuperscript{17} refers to the work of Nueber, an early user of fat grafts in the face. But in the last 80 years or so, concepts of volume were lost to more surgical concepts of traction. It is interesting to speculate whether the doctors did not see volume issues because they did not have the tools to correct them or whether volume deficiencies were noticed and not discussed because of this lack of tools.

\textbf{TREATMENT CHOICES}

The facelift itself is not a flexible operation. We believe that the flexibility necessary to treat various faces lies in the ancillary procedures that are added to the therapeutic menu.

A face can look good in many ways. No single solution is right for any one person just as no single solution is right for everyone. In traditional facial cosmetic surgery, the skin is draped over bone or muscle, which is what ultimately gives shape to the face and defines the new contour. The outcome is defined by the deeper structures.

\textbf{Fig. 7.} A 62-year-old woman 13 months postfacelift with 7 mL autologous fat in her cheekbone and submalar area. (Courtesy of V. Lambros, MD, Newport Beach, CA.)

\textbf{Fig. 8.} A 52-year-old woman 16 months postfacelift with injection of fat into the jaw defect secondary to a mandibular advancement and a small amount of fat in the malar area. The cheek skin had been elevated so the fat was injected under direct vision into the subplatysmal space. (Courtesy of V. Lambros, MD, Newport Beach, CA.)
Just as augmentation rhinoplasty changed the way noses are looked at and treated, the aesthetic possibilities of volume addition should be considered in the face.\textsuperscript{5–14} If one has a choice about how to treat a particular area (for example, by traction or filling or both), one gets to exercise one’s aesthetic sense about what would look the best.

For the purposes of this article, concepts are more important than techniques. Many thin patients of facelift age will benefit from a combination of volume and traction and, although weaving volume into the face is frequently subtle, in certain places it is common to use volume in the face as an alternative or add-on to traction.

The addition of volume is not something for which surgeons typically have been trained. It is surprisingly difficult to create a subtle, three-dimensional shape in soft tissue using a two-dimensional tool like a needle. There is a learning curve.

**BROWS**

The brows are the most common area in which we inject volume. Typically, the brows that benefit from this procedure have receded to the point where the roundness of the orbit is visible and the eyes look hollow. They may also exhibit a negative vector relationship to the globe. Overly prominent eyes may be made to look less so by advancing the brow anteriorly. Fuller brows frequently look younger.

The use of volume in the brow is not intuitive for the patient (nor frequently for the doctor), and is almost impossible to explain. Patients need to be shown, and the clinician should also want to see how the brows will appear when fuller, because they may not meet expectations. We do what we call a “local preview” in which a small amount of dilute local anesthetic is injected into the brow.\textsuperscript{14} If done with an ice cube and a 30-gauge needle, it is almost painless. Patients like the idea of being able to preview the results of volume addition in the brows before any actual surgery or injection is done. The dilute local anesthetic is injected slowly to follow the curve of the brow and massaged into position. After a few minutes, the local anesthetic distributes and the patient is shown the result. If the patient and doctor like it, then we plan on using either fat in the operating room or another filler in the treatment room. This procedure is also a valuable technique to use in the chin hollow.

**TEAR TROUGH AND INFRAORBITAL AREA**

This area is an important, but sensitive, one for volume in the face (Figs. 2–4). Many techniques have been used to fill the hollow lower lid, including fat flaps with blepharoplasty, various injections, and tear trough implants of various designs. We have come to have a good deal of respect for the treacherous thin skin of the lower lid and the perceptual importance of this part of the face. The use of injected fat in the tear trough and lower lid is perilous, in our opinion. Fat injected here has the appearance of “taking” almost completely and it does so in small firm cylinders of fat and scar. These can easily be seen and felt, and they frequently have the effect of lowering the shadow that the injections were designed to correct, making the patient look far worse than he/she did before. Although we have used fat with some success here, and some people advocate its routine use,\textsuperscript{18} the complication rate is high and the irregularities and increased shadowing in this perceptually sensitive area are so difficult to treat that we do not encourage the use of injected fat in this location. At the time of this writing, we use hyaluronic acid products in the tear trough and to build up the anterior malar area. In the tear trough and brow we have found Restylane to last 2 years and longer. These products may also be reversed with hyaluronidase, thus making mistakes correctable (see Fig. 2).

**CHEEKS**

Hollow cheeks are a good and intuitive place for volume in the face. We frequently use fat for these areas, particularly with a facelift. Hollow cheeks may be addressed and the premalar fat mass may be enlarged. However, care should be taken in enlarging the malar area. The static look can be good but, with smiling, the enlarged malar soft tissue may bunch up by the eye, which some patients emphatically do not care for. We have also found that, in some cases, fat-injected cheeks do not age well; the cheeks can look doughy and heavy.\textsuperscript{19,20} The traction deformities after facelift surgery, collectively known as “joker lines,” may also be improved, which is of great benefit to surgical-looking faces (Figs. 5–9).

**ANTERIOR JAWLINE**

The anterior jawline changes in a characteristic way with age. We think that the changes here are some of the early signs of aging, usually beginning when one is in his/her 30s, and they have a profound effect on the gestalt of the face. Briefly, the jowl expands and the pre- and postjowl areas indent. Placement of a small amount of volume in the face can be made here with excellent result.
This area is not intuitive for patients and we feel that the area is best previewed (Fig. 10).

POSTERIOR JAWLINE

People who are photographed for a living have certain jawline characteristics in common. The jawlines are straight and vertically tall and the face is slightly wide at the masseteric level. Perusal of some fashion magazines will confirm this observation. Patients who have narrow faces or whose faces are narrow posteriorly and then become fuller will frequently benefit from more fullness over the masseters (Fig. 11).

LIPS AND NASOLABIAL FOLDS

These are traditional and, in our opinion, overused areas for volume injections and will not be discussed here.

SUBTLETY IN FACIAL SURGERY

Many of the problems seen with facelifts are a result of having only one tool for improvement (traction) and using it for every deformity of every aging face (see Fig. 1). Although the surgeon can take some comfort in knowing that facelifts and other traditional procedures of the face are the standards, many of the various faces seen in daily practice are not so simple.
practice simply do not fit into the standard operations. A less limited and ritualistic approach to the face seems to be how cosmetic surgery of the aging face is evolving. Until recently, the application of volume to the face was not common practice, but as surgeons come to see the face in a more realistic and less stylized way, all factors that might make a face better are reasonable to entertain.

The point of considering volume addition to the aging face is to make a better-looking face, but volume alone will not make a better-looking face; the use of small amounts of it in the right places will. Just as facelift surgery suffers from overuse of traction, the use of volume must be tempered by what looks good, not by principles such as “the face must be returned to its literal youthful contours.”

In the world of cosmetic surgery, more is often equated with better, and more volume might be considered better than less. This assumption is spectacularly untrue.

We have seen unhappy patients whose faces have been overfilled and who do not look like themselves, either young or old. In addition, the paradigm of attractiveness changes with age. An example is high cheekbones and hollow cheeks. In youth, this contour is an attractive and desired. Make-up techniques try to duplicate the look. As one ages, it becomes less attractive and more gaunt and unhealthy looking and can hasten the perception of age.

Similarly, an overly filled older face doesn’t necessarily look better or younger. It can just look heavier. To try to return a face to the literal appearance that it once had may be disastrous in some cases. Subtlety and understatement still have a place in facial surgery.

We view cosmetic surgery for the aging face to be a process of making the face look better. When it looks better, the patient and others may perceive that he/she looks younger. Some clues may be taken from the younger face to create the illusion of youth, but it remains an illusion. The clinician cannot treat things he or she cannot see; if he or she looks at a face and sees only something to be lifted and skin shortened, then he or she will mistreat a significant number of faces. If the face is only seen as something to be filled, similar and perhaps worse, mistreatment will occur.

The practice of cosmetic surgery of the face should be an empiric one and the guidelines should be to assist a face to look good. No formula or single right answer exists for any patient.

REFERENCES