Special Topic

Volumizing the Brow With Hyaluronic Acid Fillers

Val Lambros, MD

Background: Aging eyes often are treated by excision of apparent excess skin and fat and, in some instances, by elevation of the brow. The result of these traditional approaches is increased definition of the orbit, which is not of benefit for all patients. In some cases, the addition of volume in the periorbital area may provide a better-looking result than traditional surgical alternatives.

Objective: The author describes the use of hyaluronic acid (HA) fillers for improvement of the periorbital region.

Methods: Using local anesthetic, patients are provided with a preview of the aesthetic result of treatment with HA fillers to add volume to the brow. Most treatments are performed using HA fillers, which have the benefit of results that are both reversible and long-lasting. The author uses a fanning technique to inject small quantities of material.

Results: The use of these techniques results in a high degree of patient satisfaction. Occasional minor irregularities may occur, but these can be smoothed out by massage or blended by further injection. Results lasting two years are common and we have observed longevity of three years or more in some patients. Some brow configurations that falsely project emotional states, such as anxiety, may also be corrected.

Conclusions: As in other types of cosmetic surgery, patient selection is key. In properly selected patients, increased fullness of the upper lids is preferable to the greater definition of the lids resulting from traditional surgical techniques. The longevity of treatment and reversibility of changes to the upper lids with HA fillers render this approach both cost-effective and safe. (Aesthetic Surg J 2009;29:177–179.)

From the Department of Plastic Surgery, University of California–Irvine School of Medicine, Irvine, CA.

...A fair face will wither; a full eye will wax hollow: but a good heart, Kate, is the sun and the moon...

For the student of periorbital aging, a fashion magazine or, better, a high school yearbook can be very informative. In younger persons, the eye generally looks long, flat, and full, the bony orbit is not visible, the upper lid crease is usually concealed by the overhanging lid, and the skin is elastic and thick (Figure 1, A). All of these characteristics are affected by aging in predictable ways. The brows may descend, but usually only by a few millimeters. The upper lid orbital fat may recede or enlarge. The skin becomes less elastic and considerably thinner. The relationships between subcutaneous volume and skin elasticity, thickness, and quality all change at different rates depending on the individual’s genetics, degree of sun exposure, facial fat, and other variables.¹

Because they were the only treatments available, traditional surgical maneuvers for the aging upper lid and brow have been used indiscriminately. In these techniques, excess or crinkly skin is either removed or elevated by means of a brow lift. The brow removed directly is elevated to the height necessary to present a smooth superior orbital rim, sometimes resulting in significant and undesirable overelevation of the brow. By removing orbital fat, apparent skin excess is redistributed in the increasing hollow of the upper lid, providing room for makeup and defining the orbit.

These procedures have withstood the test of time; they are predictable, reproducible, and (for the most part) technically simple. However, the standard operations have limitations. Many—although certainly not all—orbits lose volume with age. As more upper lid tissue is excised or atrophies, the bony orbit becomes more visible and the upper lid appears more rounded and hollow. As the eye looks taller vertically, its horizontal appearance is shortened, an illusion compounded by the fact that the lateral canthal tendon stretches with time, truly shortening the lid aperture.¹ ²

Therefore, the increased definition of the periorbital area resulting from conventional techniques is achieved by creating a round, hollow, shortened eye—quite the
opposite of a younger eye³ (Figures 1B and 2). Despite these shortcomings, this approach is considered desirable by some patients and surgeons because it creates a dramatic appearance and allows for the easy application of makeup. The resulting configuration is often seen in the literature and in clinical presentations; it has traditionally been considered a good result.

AESTHETIC CHOICES

In traditional upper lid surgical techniques, there are only a few fundamental aesthetic choices to be made. Tissue is removed from the eyelids and brows may be elevated. We and others have observed that the addition of some volume in certain brows and upper lids may improve the overall appearance of the eyes. There is nothing new in this. The ancient Greeks knew how the eye aged, as did Shakespeare. From the 1890s to the 1920s, paraffin was used to augment the face, just as fillers and fat are used today.⁴,⁵

The concept of adding volume in the periorbital area is very similar to that of augmentation rhinoplasty. In the past, all nasal deformities were treated with traditional reduction techniques. The ability to augment the nose vastly increased the range of treatable configurations. Similarly, with respect to the periorbita, the appearance of the eye may be best improved by removing tissue, adding volume, or both. These are true aesthetic choices decided through consultation with the patient, not by reflex or dependence on traditional methods alone. The application of the concepts underlying volumization of the brow and face in general is difficult and requires a practiced eye and hand,
which is why the “previewing” of results is encouraged whenever practical.

METHODS

The “Local Preview”
Communication is, or should be, an important skill in cosmetic surgery. It is not at all intuitive to patients (or their surgeons) how enlarging the brow volume might improve the appearance of the eyes. Try as we might, we have never been able to explain this notion to a patient and have him or her understand exactly how filling the brows might look. It is a visual change which needs to be demonstrated visually.

For the last 18 years, we have shown the potential results of brow augmentation to patients by injecting dilute local anesthetic into the brow. Very few patients decline this option once they understand that significant improvement in the appearance of the eyes might be possible and that an informed decision about the procedure can be made before actual treatment through the use of a reasonable simulation. The concept is similar to that of trying on clothes before buying them. In addition, the surgeon may not always correctly predict the aesthetic outcome of the augmentation, so previewing the result can be useful to both parties.

Our technique is to use an ice cube and lidocaine 0.5% or 0.25% with epinephrine to numb the brow skin in one or two sites. We prefer to use epinephrine in the local anesthetic because, in our opinion, the resulting vasoconstriction helps protect against the risk of intravascular injection. The procedure is surprisingly painless; the ice application usually hurts more than the needle. Once the skin is numb, dilute local anesthetic is threaded into the brows and molded into shape. A typical volume would be 1 cc across the brow. This is not easy to do well because the tendency is to balloon the tissues unevenly, which does not simulate the intended result.

The anesthetic levels out after a few minutes and the patient can see how the brows look, both close-up and from a distance (Figure 4). Most patients approve the results of the preview and, interestingly, many interpret the effect as making the eyes look larger. Those who are not satisfied with the results will at least have avoided the prospect of discovering this only after undergoing treatment. An added benefit is that, if treatment is performed in the same session as the preview, the brows are already anesthetized.

Injection Technique
We have treated the brow and upper lid with injected fat since the early 1990s and with hyaluronic acid (HA) since its introduction in 2005 in the United States. These are common treatment areas in older and thinner patients, so our experience using HA covers at least several hundred cases.6

Off-the-shelf products have changed the landscape of periorbital volume correction. Our preference is to use HA products, for a number of reasons. Although not yet systematically studied, the longevity of HA is decidedly site-dependent. We have consistently found that the duration of HA in the lower lids and the brow exceeds two years. This longevity belies the claimed advantages of other classes of fillers that are now available. We have the distinct impression that the more particulate, “harder” gels like Restylane (Medicis Pharmaceutical Corp., Scottsdale, AZ) have greater projection than the liquid ones, such as Juvéderm (Allergan Inc., Irvine, CA). The effects of HA may be reversed with hyaluronidase, which provides additional confidence to the surgeon because it enables any treatment problems to be resolved immediately.

The main difficulty in using any injectable filler is achieving even distribution. Novice injectors tend to spot-fill and then manipulate the material. While such maneuvers may be successful in thick tissues, more reliable results will be achieved by trying to inject a perfect contour, followed by massage to further smooth the injected product. When using HA, we inject the material with many small strokes in a fan-like fashion, using very small amounts in each pass, similar to the technique used for fat injections. This may cause additional bruising, although that is uncommon in the upper lid. We usually use a 30-gauge 0.50-inch needle, injecting laterally to medially. We also inject deeply though; some clinicians have advocated very superficial placement in the lids.7
For volume injection in the brows and elsewhere on the face, the product is injected into the subcutaneous or suborbicularis fat, not in the dermis. It is injected on withdrawal, only while the needle is moving, and is stopped before reaching the site of skin penetration. In general, injections are made parallel to

Figure 5. A, Pretreatment view of a 62-year-old woman with hollow eyes from aging. B, Posttreatment view 22 months after hyaluronic acid volumizing of the brow. The additional light reflected from the expanded brow eliminates shadows visible in part A.

Figure 6. A, Pretreatment view of a 45-year-old woman who had undergone multiple lid surgeries and a canthopexy, but was troubled by the hollowness of her brows. B, Posttreatment view two years after two treatments of fat injection in the brows, administered one year apart. The subtle difference was important to her.

Figure 7. A, Pretreatment view of a 52-year-old woman who had undergone upper lid blepharoplasty. She felt that her upper lids were not youthful. B, Posttreatment view five months after injection of Restylane (0.5 mL per side). Her right brow is elevated slightly from botulinum toxin A injection. The eyes have an overall younger look.

Figure 8. A, Pretreatment view of a 47-year-old woman with excess upper lid skin and a hollow upper lid sulcus who had previously undergone lid surgery. B, Posttreatment view 14 months after fat injection (2.5 mL). Note how the injections of the brow elevated the upper lid skin and reduced wrinkling. Some clinicians have attributed this to stem cells in the fat improving the appearance of the dermis.
the brow, going no lower than the inferior border of the superior orbital rim, rather than into the lids themselves. The presence of local anesthetic in the tissues neither obscures the injection contour nor impedes our ability to read the tissues; on the contrary, HA seem to mold better in a wet environment.

RESULTS

Two patterns of brows are commonly seen and improved by filling: those with a loss of volume in their medial third (sometimes called an “A-frame deformity”) and those with a loss of volume across their length. Patients with an A-frame deformity have a characteristically anxious look, probably because the shadow caused by the medial loss of eyelid fullness parallels the brow position in an anxious or concerned state (Figure 5). In treating such patients, even a small degree of correction can make a great difference in the emotional projection of the face. In those patients whose brows have lost volume across their entire length, an even fill with HAs can improve their appearance (Figures 6-10).

Because patients are able to preview the effects of treatment, the results conform to their expectations and most are satisfied with the outcome. We have never had to resort to the use of hyaluronidase to reverse treatment effects because of patient dissatisfaction. Minor bumps can occur and these can be treated by massage or a blending injection.

DISCUSSION

In aesthetic surgery, as in life, there is a place for subtlety and understatement. The brow qualifies as such a place. Brow volume procedures should not be overdone; more is not better. Although the upper lid can be improved with injections, the area we treat is the brow, going no lower than a few millimeters below the inferior border of the superior orbital rim.
border of the superior orbital rim. The typical amount injected is 0.5 to 1 mL per brow. Because of the expense, most candidates for brow improvement with HA elect to begin treatment with small amounts of product and are satisfied with undercorrection.

Patients with very hollow orbits require the addition of considerable volume in the area between the lid and the orbit, where the levator mechanism is located. We have not treated this area because of the risk of inducing upper lid ptosis.8

Volume injections are highly technique-dependent; it is surprisingly difficult to create an accurate three-dimensional fill with a two-dimensional instrument, such as a needle or injection cannula. Too much volume generally looks worse than too little and overfills with fat are difficult to correct, particularly in the lower lid.

The brow appears to rise after injection of HA. In most cases, this is an illusion caused by the replacement of a dark hollow with a reflective surface. However, on occasion, an elevation of a few millimeters does occur. As a primary tool for brow elevation, volume injection of the brow is inefficient and may lead to an odd or primitive look if overdone.

Intravascular injections are the most serious complications in the periorbital area.8 They are caused by the needle penetrating a vessel with a flow rate of product high enough to create a significant vascular obstruction. We believe that proper technique can aid in avoiding this problem. We inject very small amounts on each pass, using minimal pressure. Bolus injections into the brow, especially medially, may increase the likelihood of an intravascular injection. If an intravascular injection is recognized very early, flooding the area with hyaluronidase avoids the problem. We inject very small amounts on each pass, with lidocaine and epinephrine for vasoconstriction.

In some cases, filling in the brow expands the lid skin sufficiently to smooth wrinkles (Figures 8 and 9). Observation of this phenomenon in patients treated with grafted fat led some clinicians to speculate that stem cells or preadipocytes were somehow responsible for the better appearance of the skin.7,9 However, the same effect is visible when HA (Figure 8) or even saline is used. Because these products presumably lack stem cells, we conclude that the improvement of the skin results from enlargement of the subcutaneous fat and mechanical support to aged, irregular skin. In addition, some patients have brows that have a negative vector with respect to the globe, analogous to the negative vector relationship of the inferior orbital rim in the lower lid; in other words, the globe projects more than the brow. Eyes like this can appear overly prominent or even bulging. By bringing the brow forward, the eye looks less prominent (Figure 10). Very small changes can have a significant effect on the gestalt of the eyes and face.

Although this article discusses the use of off-the-shelf injectable fillers to improve the upper lid and brow, the standard method for volumizing since the 1980s has been injected fat, largely because of the lack of alternatives.6,10 Operating with fat requires a high tolerance for variability.

Equal distribution of the fat at injection does not guarantee equal survival. The fat may not survive or, worse, it may grow as the patient ages and/or gains weight, presumably because grafted fat behaves metabolically like the area from which it was harvested (typically the abdomen or thighs). Fat growth in the face can make patients look very abnormal and is difficult to correct. We still use fat grafting in the upper lid and brow, although we are not as aggressive with it as we once were. We centrifuge the fat and use 18-gauge injection cannulas (Grams Medical, Costa Mesa, CA). We will fill to achieve an even correction and refill with HA later if required. In our clinical experience, HA injections into the brows produce better aesthetic results than fat because contouring is easier and HA is less subject to the variability of a biologic filler.

CONCLUSION

The periorbital area is visually so important that even small anatomic changes can result in significant differences to the perceived gestalt of the face and can amplify changes made elsewhere. The use of off-the-shelf injectable fillers such as HA to achieve these changes is safe, effective, and long-lasting. Injection of anesthetic solution to preview results, as described, can improve treatment technique and lead to increased patient satisfaction. As ever in plastic surgery, the main challenges are patient selection and knowing when to stop.

DISCLOSURES

The author has no financial interest in and receives no compensation from manufacturers of products mentioned in this article.

REFERENCES


Accepted for publication February 3, 2009.
Reprint requests: Val Lambros, MD, 360 San Miguel #406, Newport Beach, CA 92660. E-mail: lambrosone@aol.com.