Alloplastic Midface Augmentation

The author’s anatomic model, dividing the face into 5 distinct zones, is key to his midface augmentation technique. Limiting his approach to intraoral or lower eyelid, he contends that volume alterations within each zone produce easily predictable results. (Aesthetic Surg J 2005;25:512-520.)

Alloplastic midface augmentation is a valuable tool for the aesthetic surgeon. Facial implants with characteristics of mass, shape, and volume enable the surgeon to achieve permanent and precise midface contouring in 3 dimensions. The critical step in optimizing results is making the best selection of implant shape and size and determining the correct position for implant insertion. To make this determination, you must precisely analyze the patient’s facial aesthetics.

There are many models for evaluating the midface (Figure 1). These are excellent tools for illustrating the contour changes sought by the patient and improvements that patients can realistically expect.

Clear communication with the patient is crucial. It is absolutely necessary to understand not only the patient’s verbal descriptions, but also to visualize the patient’s beauty ideal. I ask patients to show me photographs of faces having contours that they wish to achieve through aesthetic surgery. Computer imaging is also an indispensable tool for simulating facial contour changes.

Anatomic Zones

My practical model for anatomic analysis defines skeletal facial zones. Alterations of volume within each zone produce contour changes, which are easily predictable (Figure 1). In my model, there are 5 anatomic midface zones:

- Zone 1 includes the major aspect of the malar bone, extending from the infraorbital nerve to the middle third of the zygomatic arch. Augmentation within this zone produces a high, strong malar bone contour that is frequently requested by young men who desire a more defined, sculptured appearance and by young women who desire a more exotic look (Figure 2). Patients may also present with a deficient maxilla, which produces suborbital flattening, extending from the medial canthus to include the lateral zone 1 space. The suborbital tear trough malar implant was recently innovated to encompass the entire lower orbital rim as well as most of the malar bone (zone 1), obviating the need for placement of autogenous materials, fat transposition, or injectable fillers.

- Zone 2 includes the middle third of the zygomatic arch. When augmented, zone 2 lends greater width to the upper two thirds of the face. Such a change is desirable in someone who has a narrow upper face (Figure 3).

- Zone 3 includes the paranasal, tear trough, and suborbital areas. Volume deficiency in this area lends a tired, hollow appearance. Zone 3 can be augmented with autogenous tissue, such as fat, or alloplastic materials, using a tear trough or suborbital implant (Figures 4 and 5).

- Zone 4 is the posterior third of the zygomatic arch. It is never augmented for aesthetic purposes. In fact, dissecting in this zone may produce temporomandibular joint symptoms.

- Zone 5 is the submalar region, beneath the malar bone, over the surface of the masseter muscle. As fat is lost with aging, this significant facial area, which is the zone most frequently augmented to reestablish youthful facial fullness, becomes deficient (Figure 6). However, this zone is frequently augmented in error, causing much dissatisfaction in patients seeking an accentuated, high malar contour. A deficiency in this area may also be inherited.
Using computer imaging and photos indicating the patient’s beauty ideal, the patient and surgeon agree on a submalar midface contour shape. The implant size is chosen on the morning of surgery. Use a marking pen to outline the lateral orbital rim, the malar zygomatic bone, and the submalar space. Ask the patient to smile. The smile will cause the midface muscle soft tissue mound to elevate, filling the submalar space. Mark the submalar space by placing the pen just over the lower border of the elevated cheek mound. Ask the patient to relax his or her face and mark the skin directly at that point.

I then show the patient a variety of implant sizes. Together, we determine the exact implant location and size according to the computer image that was created (Figure 7). Most commonly, 4-mm–thick implants are selected. The implant surface area size is chosen to conform with the malar zone markings.

**Technique**

After 30 years of experience, I have found that the following 2 approaches work best, and I use them exclusively for midface augmentation: (1) intraoral or (2) lower eyelid, either subciliary or, occasionally, transconjunctival. Implants can also be placed via the temporal region and during a SMAS rhytidectomy.

**Intraoral approach**

This technique is most commonly used, has the least morbidity, and is easiest to perform. Make a 1-cm oblique incision, through the mucosa only, over the canine tooth, and a 1-cm incision extending laterally, creating an L-shaped incision in the left buccal region and a reverse L-shaped incision in the right buccal region (Figure 8). Thrust a 3-mm elevator inferiorly beneath the orbicularis oris musculature, directly through the incision and down to the bony maxillary buttress. Using a wider 10-mm to 13-mm spatula elevator, perform a subperiosteal dissection up the maxillary buttress to the major point of prominence where the masseter muscle and tendon arise from the anterior malar bone, and extend the incision posteriorly along the zygomatic arch (Figure 9). Always make this dissection oblique, avoiding the infraorbital nerve and foramen, unless a tear trough or suborbital tear trough malar implant will be inserted. Proceed with the dissection to a few millimeters below the orbital rim and laterally over the zygomatic arch to the desired point, which is usually the middle of the arch. By dissecting completely on bone, you will avoid injuries to the facial nerve branches, the zygomatic, and the frontalis musculature.

Then sweep the elevator in a downward direction to establish an adequate space for malar implants, which are 3 to 4 cm in height. A certain amount of dissection into the submalar space is necessary, accomplished by sweeping the elevator down onto the anterior surface of the masseter muscle fascia from superior to inferior. Gently lift the elevator anteriorly to open up the natural tissue plane that underlies the zygomatic muscles and nerves. This space will remain empty until the implant is placed in the position designated preoperatively. There are several degrees of dissection into the submalar area, depending on the size of the implant to be used.

For a submalar augmentation, begin dissection along the inferior border of the zygomatic arch and malar bone and extend it downward only. This prevents a natural tendency of the implants to move upward during the encapsulation process, a process that occurs around all smooth-surfaced alloplastic implants.

In many instances, to achieve a more desirable malar...
Figure 2. **A**, Preoperative view of a 32-year-old woman with a round chubby face and more than adequate midface fullness. She desired a more structured and longer face with accentuated cheek bones in the malar zone 1. **B**, Postoperative view 1 year after malar zone 1 augmentation and placement of a vertical extension chin implant.

Figure 3. **A**, Preoperative view of a 37-year-old woman with a strongly defined jaw line and flatness in malar zone 1 and 2 regions. **B**, Postoperative view 1 year after malar shell augmentation in zones 1 and 2.

Figure 4. **A**, Preoperative view of a 41-year-old man who has suborbital and malar deficiency and a "tired look." **B**, Postoperative view 6 months after augmentation of malar zones 1 and 3 with placement of an extended suborbital malar teardrop implant, chin and angle of jaw augmentation, and submental platysma plication and lipectomy.
Operative Strategies

A combined submalar shell, with a submalar thickness of 5 mm and a malar prominence of 4 mm, places the volume thickness of the implant into the inferior aspect of the submalar zone while maintaining malar prominence. The combined submalar shell implants are useful when generous submalar augmentation and accentuation of the malar region are both necessary.

Subciliary or transconjunctival approach

Begin by making a 2.5-cm incision 3 mm below the lash line, extending only to the orbital rim. Elevate a skin-muscle flap above the orbital septum using a Freer elevator. Continue the dissection 4 to 5 mm down over the inferolateral margin of the orbital rim. At this point,
**Figure 7.** Alloplastic midface implants for the malar (A), submalar (B), and suborbital (C) tear trough malar regions.

**Figure 8.** Intraoral approach demonstrating an L-shaped incision in the buccal region above the canine, limited to the mucosa only.

**Figure 9.** Subperiosteal dissection extends up the maxillary buttress and over the malar bone to the midzygomatic arch to create an adequate space for an anatomic malar shell implant.
Operative Strategies

Figure 10. A subciliol lower eyelid approach uses a 2.5-cm incision 3 mm below the lash line, extending only to the orbital rim. The skin-muscle flap is elevated above the orbital septum to access the malar bone 4 to 5 mm below the rim.

Figure 11. Demonstration of the position of a tear trough or suborbital extended malar tear-trough implant in zones 1 and 3. A keyhole slot is cut from the inferior aspect of the implant to fit around the infraorbital nerve trunk.

Pierce the peristeum with a sharp elevator. Then dissect the malar space with a larger elevator, expanding it posteriorly and inferiorly as necessary to accommodate the chosen implant (Figure 10).

For tear trough or suborbital extended malar implant placement, perform the dissection through the lower lid and carry it along the orbital rim and below the orbiculairis oculi origins to open the subperiosteal tear trough space and isolate the infraorbital neurovascular bundle (Figures 11, 12 and 13). In a more difficult case, you can use a combination approach (intraoral plus lower lid) to facilitate accuracy. Dissection inferiorly, around the infraorbital bundle, is easily visualized, thereby avoiding nerve damage. Excise a notch from the medial portion of the suborbital tear trough malar implant to surround the infraorbital nerve (Figure 14).

Suture the implant securely to the arcus marginalis both medially and laterally along the orbital rim, using 1 medial suture and 2 lateral sutures. Then suture any
Figure 12. A lower lid approach can be used for malar, teardrop, or suborbital extended malar implant placement. Incisions can be subciliary or transconjunctival to access malar zones 1, 2, and 3, medial to the infraorbital nerve.

Figure 13. The dissection is performed through the lower lid subciliary incision and carried along the orbital rim below the orbicularis oculi origins and underneath the infraorbital neurovascular bundle to open the subperiosteal zone 1 and 3 space.

Dissecting above the orbital septum, make a transconjunctival incision from the medial to the lateral canthus at the lower border of the tarsal plate. Otherwise, the protruding fat can hinder clear visualization, not only of the anterior orbital rim but also down into the malar region, which is necessary for creating the space required for placement of a tear trough or a suborbital tear trough malar implant (Figure 15).

A malar zone 1 and 2 implant is easily placed through the lateral aspect of a transconjunctival incision or a subciliary incision. When you use a subciliary skin incision,
Figure 14. An intraoral approach for placement of a tear trough or suborbital tear-trough implant can also be used to dissect the proper space and identify and visualize the infraorbital nerve bundle.

Figure 15. A transconjunctival approach is performed at the lower border of the tarsal plate so that dissection can be performed above the orbital rim.
perform a canthal sling canthopexy with 4-0 black nylon. Create a suture loop around the canthal tendon, two thirds of the distance from the anterior orbital rim to the canthus when extended anteriorly by a small 2-prong hook. Decide whether to horizontally extend the canthal angle or elevate it for 2 to 5 mm by precisely marking the distance on the lateral orbital rim periosteum using a caliper and methylene blue. Measure from the orbicularis point of canthal origin inside the orbital rim. Provide a secondary support with an orbicularis muscle flap suture of 4-0 Vicryl secured to the new canthopexy location. In more than 90% of my lower eyelid surgical procedures, I remove very little or no skin and muscle (Figure 16).

I have found that there is a long learning curve in incorporating all the aspects of this approach. Also, patients should be advised that edema in the midface persists longer than anywhere else in the face, requiring nearly one full year before you can see the final midface contour.

References

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