43 Double Ogee Facial Rejuvenation

Oscar M. Ramirez, Charles R. Volpe

43.1 Introduction

The subperiosteal techniques described by Tessier for the treatment of congenital craniofacial abnormalities revolutionized the treatment of the aging face. Close to a decade after suggesting that rejuvenation of the cheek and forehead could be accomplished in a subperiosteal plane, Tessier [1, 2] published his landmark paper, *Lifting facial sous-perioste*. Tessier advocated the subperiosteal approach as a method to treat early signs of aging in young and middle-aged patients. Psillakis [3] adopted the subperiosteal approach and refined the technique further. Subsequently, Ramirez [4] described a safer and more effective method of subperiosteal lifting. The latter two authors demonstrated that the subperisosteal facelift technique could be applied across the full spectrum of facial aging.

Despite the success of the subperiosteal approach, opponents of the technique voiced concern over the high rate of nerve injury and the protracted facial edema associated with this approach. The introduction of the endoscope in the treatment of facial rejuvenation ushered in a new era in aesthetic surgery. Treatment of the forehead could now be performed without the need for a bicoronal incision. The subperiosteal midface dissection with the endoscope resulted in reduced postoperative facial edema, minimal injury to the facial nerve branches, and improved aesthetic correction of the sagging cheek structures [5, 6]. Today, endoscopically assisted subperiosteal undermining of the upper, middle, and lower face can provide a means for repositioning the sagging facial soft tissues in addition to augmentation of the craniofacial skeleton. This approach, refined over the past decade [7–9], has come to be known as the "double ogee" rhytidectomy technique.

43.2 The Double Ogee

The youthful face, when viewed at an oblique angle, maintains a characteristic volume distribution of its soft tissues, previously described in the midface by an architectural ogee or single S-shaped curve [10]; however, on more precise examination, the entire contour the youthful face generates follows a double ogee or double sigma when analyzed in a three-quarter view. To view this reciprocal multicurvilinear line of beauty, the face must be viewed in an oblique position that allows visualization of both medial canthi. In this position, the youthful face demonstrates a characteristic convexity of the tail of the brow that flows into a concavity of the lateral orbital wall (the upper ogee). This is joined by the convexity of the upper midface that flows into the concavity of the lower midface (the lower ogee) (Fig. 43.1).

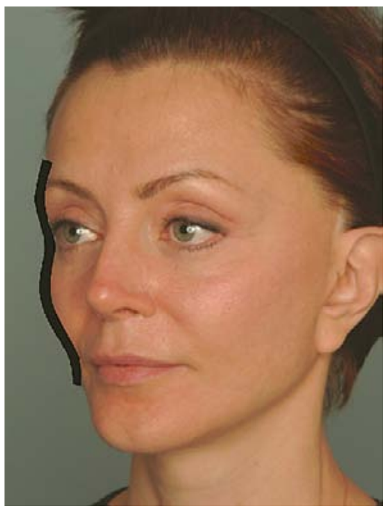

Fig. 43.1. The oblique position (three-quarter view) allows visualization of the "double ogee" outlined on this beautiful face. Note the convexity–concavity–convexity–concavity generated by the profile. Volumetric or three-dimensional facial rejuvenation can restore and accentuate this multicurvilinear line of beauty

The aging face characterized by (1) the development of rhytids secondary to collagen damage, (2) downward, gravitational migration of the soft tissues, and (3) atrophy of the facial fat and bony skeleton allows this youthful double ogee line to become distorted or lost. Rejuvenation of the aging face should address each of these characteristic features in an effort to restore volume and to recreate the reciprocal multicurvilinear line of beauty (the double ogee).

43.3 Indications for Double Ogee Facial Rejuvenation

Patients with considerable aging and ptosis of the central facial structures can benefit most from our endoscopic approach. The eyebrows, eyelid commissures, nasoglabellar soft tissues, nose, nasolabial folds, cheeks, angle of the mouth, and jowls are effectively treated with this approach. Tear trough deformities as well as deep infraorbital hollows can be corrected with the endoscopic techniques. The endoscopic forehead and midface procedures allow recreation of the double ogee that is associated with a youthful appearance.

Additionally, the endoscopic approach is quite effective for patients undergoing secondary or tertiary facelift procedures, for those patients requiring immediate skin resurfacing (e.g., deep chemical peel or carbon dioxide laser [11]), and for patients requiring soft-tissue augmentation via fat grafting. Patients who demonstrate skeletal and soft-tissue disproportion can benefit from endoscopic lifting techniques. The exposed bony structures can be augmented or reduced as needed. The authors recommend this approach in patients with alloplastic facial implants that require removal or exchange.

43.4 Double Ogee Facial Rejuvenation – a Volumetric Approach

Traditional rhytidectomy techniques provide rejuvenation of the aging face through oblique and lateral lifting or through vertical and superolateral lifting maneuvers. These standard techniques address rhytid formation and skin laxity but fail to address the volumetric "deflation" that is characteristic of facial aging. In addition, these two-dimensional or dual-vector techniques often give patients an exaggerated "windswept" or "operated" appearance. By contrast, our approach addresses the volumetric deficiencies associated with facial aging in addition to rhytid formation and skin laxity to provide a more natural three-dimensional rejuvenation of the face. This is accomplished by the addition of techniques developed to enhance the face in an anterior–posterior direction. Methods used to create this three-dimensional or volumetric rejuvenation include augmentation of the subcutaneous fatty layers, imbrication of facial soft tissues, repositioning of fat pockets as pedicle flaps, and/or augmentation of the skeletal framework with alloplastic implants (Fig. 43.2). The authors' approach to three-dimensional rejuvenation utilizes these methods individually or in combination. Proper

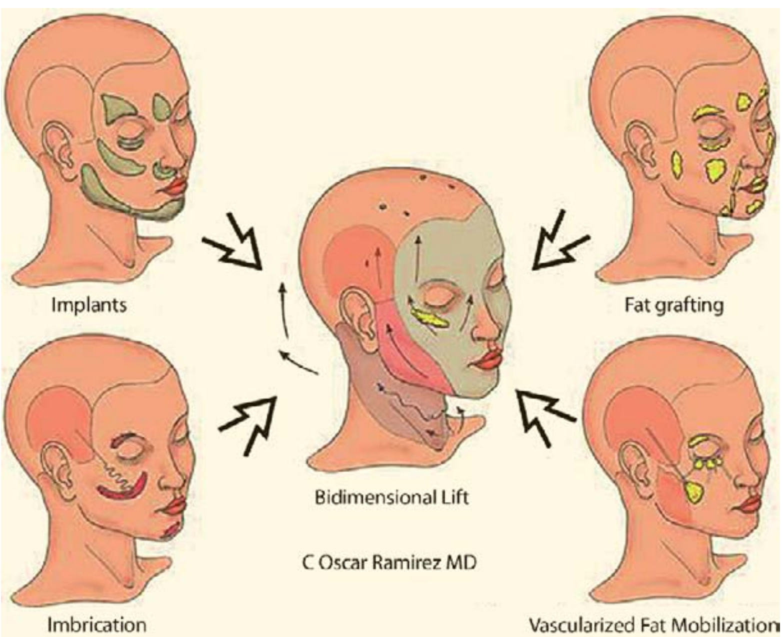

Fig. 43.2. The double ogee facial rejuvenation approach incorporates the selective use of soft-tissue imbrication techniques, vascularized fat pad mobilization, fat grafting techniques, and placement of alloplastic implants to the foundation of endoscopically based two-dimensional lifting techniques. This provides a true three-dimensional or volumetric facial rejuvenation. (From Ramirez [17], used with permission from Springer-Verlag, Berlin Heidelberg New York)

preoperative diagnosis of the aesthetic deficiencies, whether skeletal and/or soft tissue, will determine the most effective plan to achieve excellent results. Common sense dictates that restoration of deficient structures with similar tissues will provide the most natural and long-lasting result.

43.5 The Endoscopic Double Ogee Facelift – Surgical Technique

43.5.1 Endoforehead Procedure

The endoscopic forehead procedure involves the placement of four incisions in the scalp (Fig. 43.3). The first two incisions are located approximately 2.0 cm on either side of the midline, 1.0–2.0 cm posterior to the hairline. For patients with excessively long foreheads (more than 8 cm), these paramedian incisions are placed directly at the hairline. It is important to keep the forehead incisions as anterior as possible. Otherwise, visualization and dissection in the glabellar region will be compromised. The next set of incisions is located in the temple region, bilaterally, 2.0 cm posterior to the hairline. The incisions should be directed parallel to the hair follicles to prevent unnecessary alopecia, postoperatively. Each incision should measure 1.5 cm in length.

Prior to surgical dissection, local anesthesia using 50 ml of 0.5% lidocaine with 1:200,000 epinehphrine is diffusely distributed in both a subcutaneous and a subperiosteal fashion. Early administration of the anesthetic will provide maximal hemostasis required during endoscopic visualization.

To better understand the operative procedure, the forehead is divided into four zones (Fig. 43.4). Zones 2 and 3 can be safely dissected in a "blind" fashion without the use of the endoscope. Owing to the vital neurovascular structures located in zones 1 and 4, dissection in these zones requires the use of the endoscope at all times.

The endoscopic procedure begins through the incision in the temporal area, designated zone 1. A 1 cm incision is made through the skin and subcutaneous tissue, deep to the superficial temporal fascia. Dissection continues inferiorly, remaining above the intermediate temporal fascia. The initial dissection can be performed blindly in a circumferential fashion for approximately 1–2 cm. With the tissues elevated, a silastic port protector is inserted and the remainder of the dissection is performed under endoscopic control.

An elevator is used to dissect to the temporal line of fusion superiorly. The elevator is then used to score and elevate the periosteum 1.0 cm medial to the temporal line of fusion. This is continued superiorly through zones 2, 3, and 4 respectively. This dissection will aid in the connection of the temporal and frontal

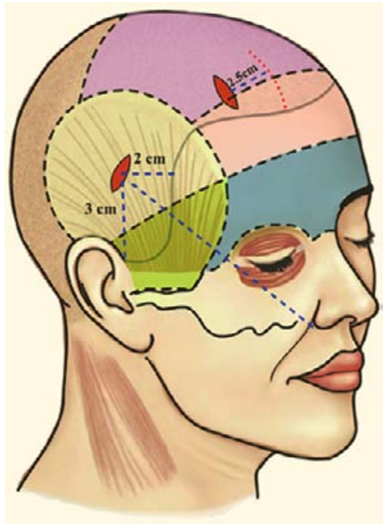

Fig. 43.3. Proper location of the endoscopic incisions. The forehead incisions should be located 1–2 cm away from the hairline (*gray line*), approximately 2.5 cm off the midline, bilaterally. The temporal incisions are situated 2 cm posterior to the hairline and 3 cm cephalad to the root of the helix (ear). Proper positioning of the temporal incision will fall along an imaginary line directed from the lateral nasal ala through the lateral canthus as shown

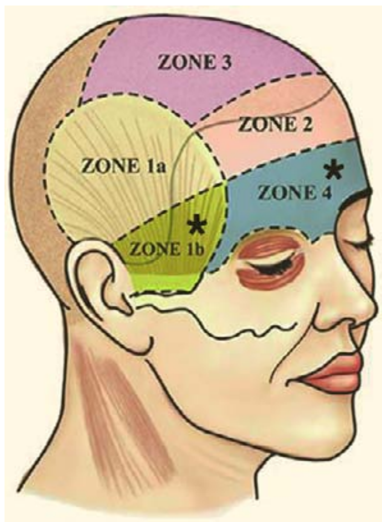

Fig. 43.4. The proposed zones of dissection encountered during the endoscopic forehead and midface procedures. Zones *1a* and *1b* are dissected during the endoscopic midface procedure. Zones *2*, *3*, and *4* are dissected during the endoscopic forehead procedure. The *asterisks* signify zones where strict endoscopic visualization is mandatory

pockets, later in the procedure. Dissection continues from the temporal incision in an inferior and medial direction around the lateral orbital rim. During the course of this dissection, several temporal veins will come into view. Temporal vein no. 1, situated in the region of the zygomaticofrontal suture, is usually sacrificed. Temporal vein no. 2 is encountered while dissecting toward the zygomatic arch. Branches of the zygomaticotemporal nerve may be identified during this dissection. Both temporal vein no. 2 and the branches of the zygomaticotemporal nerve should be preserved when possible. Preservation of these structures is facilitated with a rounded, blunt-tip elevator. As the procedure progresses inferiorly, the dissection plane moves from the temporal fascia proper to the intermediate temporal fascia. The intermediate temporal fat pad will be visualized through the thin intermediate temporal fascia. Dissection along the lateral orbital wall progresses inferiorly to the level of the lateral canthus. This completes the lateral dissection of the endoforehead procedure.

The paramedian incisions are then made as previously described and are carried down through the periosteum. Dissection in zones 2 and 3 can be performed with a blind sweeping technique, as long as the dissection remains in a subperiosteal plane. The endoscope is inserted during dissection in zone 4. In general, zone 4 begins about 3 cm cephalad to the superior orbital rims. Endoscopically assisted dissection should always be performed in zone 4. The initial dissection proceeds toward the lateral aspect of the superior orbital rim. Further dissection laterally toward the temporal line of fusion will allow connection of zones 1 and 4. The dissection then proceeds in a medial direction along the superior orbital rim. Cautious dissection in this area is mandatory given that the authors have noted considerable variation in the supraorbital nerve anatomy.

Occasionally, an accessory branch of the supraorbital nerve can be identified as far as 3.0 cm superior and lateral to the supraorbital nerve proper. Every effort should be made to preserve any accessory nerve branch. After identification of the supraorbital nerve, dissection continues medially, exposing the origins of the corrugator muscles. The supratrochlear nerve travels in the substance of the corrugator muscles, so careful elevation of the corrugators is required. Typically, three fascicles of the supratrochlear nerve are identified and preserved. Prior to resection of the corrugator muscle, the periosteum of the superior orbital rim is released with a curved elevator. The periosteum should be released from the zygomaticofrontal suture line laterally moving medially toward the glabella. In patients with heavy tissues, especially men, the periosteum is released by cutting it with endoscopic scissors. With the periosteum cut medially, the supratrochlear nerve and corrugator muscles are clearly delineated.

The corrugator muscle is extensively resected from its point of origin to just beyond the supraorbital nerve. We prefer to resect approximately 80% of the corrugator muscle to assure that glabellar frown lines are eliminated. Once the corrugator has been removed, the depressor supercilii muscle can occasionally be identified. Resection of the depressor supercilii muscle is indicated if medial brow ptosis is present. An endoscopic scissor then is used to divide the periosteum deep to the procerus muscle. The procerus muscle is resected after being thoroughly exposed. Resection of the procerus muscle should proceed down to the level of the nasoglabellar angle. Occasionally, bleeding will occur during procerus resection. Given the superficial location of the dissection, care must be taken when using cautery in this area. Overzealous cauterization in this location can lead to disastrous consequences (i.e., burning of the skin). When the muscle resection is complete, the area is packed with epinephrine-soaked pledgets. Attention is then directed back to the temporal region where the endoscopic midface lift is started at this point.

Completion of the endoscopic forehead procedure with drain placement, incision closure, and elevation and fixation of the brow proceeds after completion of the endoscopic midface suspension. Briefly, two suction drains are placed through separate stab incisions in the scalp, adjacent to the paramedian access ports. An endoscopic biter is used to direct the tips of the drains to the level of the glabella and the anterior forehead. Each drain is secured with a heavy drain stitch. The paramedian incisions are closed in two layers. A blunt traction hook is then used to elevate the scalp and to position the brow. When proper brow position is obtained, a small stab incision is made in the scalp, with a no. 11 scalpel. A 1.1 mm drill bit with a 4 mm stop is inserted through the stab incision and a unicortical hole is drilled in the calvarium. A 1.5 mm titanium post (Synthes, Paoli, PA, USA) is then placed in the drill hole. In most cases, two paramedian posts (one on each side) are sufficient to maintain the proper brow position. Proper location of the posts will have a significant impact on brow position. Under most circumstances, post placement corresponds to a superomedial axis from the lateral brow. This will provide maximal elevation of the lateral brow. More central post placement is chosen for patients requiring greater elevation of the central and medial brow. Excessive elevation and asymmetric elevation of the brows should be avoided at all costs. The surprised and inquisitive appearances, respectively, that result are poorly tolerated and cosmetically unacceptable.

43.5.2 Endoscopic Midface Procedure

The endoscopic midface procedure begins with the temporal dissection in zone 1, as outlined in the previous section. Temporal vein no. 2 (sentinel vein), temporal vein no. 3, and, the zygomaticotemporal nerves are preserved when possible. The dissection continues in an anterior and inferior direction, remaining above the intermediate temporal fascia. This continues down to the level of the zygomatic arch. The zygomatic arch is entered immediately at the superior border of the arch. The endoscopic visualization allows precise identification of the intermediate temporal fascia, thus exposing the periosteum of the zygomatic arch. The authors prefer elevation of the anterior two thirds of the zygomatic arch periosteum because it enables greater lifting and redistribution of the midface soft tissues. The periosteum of the entire zygomatic arch is elevated when soft tissues lateral to the cheek need to be elevated. Surgeon comfort with the dissection over the zygomatic arch is associated with a significant learning curve. We have found that communication of the midface and temporal dissections is accelerated with pre-elevation of the zygomatic arch, or at least the superior border of the arch.

The midface dissection at this point continues through an intraoral (upper buccal sulcus) incision. The authors' preferred incision is perpendicular to the alveolar ridge (vertical) at the level of the first premolar. We find that the vertically oriented incision preserves the mucosal integrity at the alveolar ridge, allowing a rapid, watertight closure that is associated with fewer complications. Under direct visualization, the initial subperiosteal dissection of the maxilla and malar area is performed. The endoscope is used for the upper malar dissection. The use of the endoscope minimizes trauma to the midface structures caused by excessive traction. The endoscope is most useful during periosteal elevation along the lateral half of the zygoma body, its extension underneath the fascia of the masseter muscle, and the anterior two thirds of the zygomatic arch. The upper (medial) portion of the masseter tendon is also elevated from the zygoma. Endoscopic visualization assists in the preservation of the zygomaticofacial nerve.

Dissection continues along the inferior and lateral orbital rim and continues toward the superior border of the zygomatic arch. Skeletonization of the infraorbital nerve is not necessary under most circumstances.

With the initial midface dissection now complete, the endoscope is returned to the temporal area. An assistant elevates the soft tissue of the midface, thus allowing the surgeon to safely connect the temporal and midface dissection pockets under endoscopic control. Gentle elevation during this step protects the frontal branch of the facial nerve from injury. With wide communication of the temporal and midface pockets, the endoscope is returned through the upper buccal sulcus incision.

The inferior orbital rim is dissected further by elevating the inferior arcus marginalis. A 4-0 PDS suture (Ethicon, USA), introduced endoscopically, is used to imbricate the medial suborbicularis oculi fat (SOOF) to the lateral aspect of the inferior arcus marginalis. It is important to check eye globe mobility at this point with a forced duction test because improper placement of this imbricating suture can trap or place traction upon the inferior oblique muscle.

The lateral aspect of the SOOF is then grasped with a 3-0 PDS suture, providing the first of three suspension sutures (Fig. 43.5). Both ends of this suture are then passed through the temporal incision, under endoscopic guidance. We find it helpful to tag the suture ends with a labeled needle driver. This allows

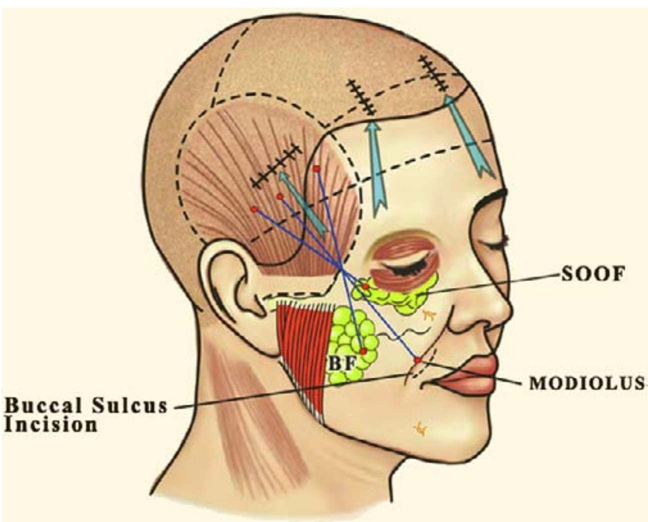

Fig. 43.5. The suspension suture locations and vectors of pull generated with the endoscopic midface technique. Note that the three suspension sutures are initially placed transorally through a gingival buccal sulcus incision and are directed individually to the temporal dissection pocket under endoscopic guidance. *BF* Bichat's fat pad, *SOOF* suborbicularis oculi fat pad

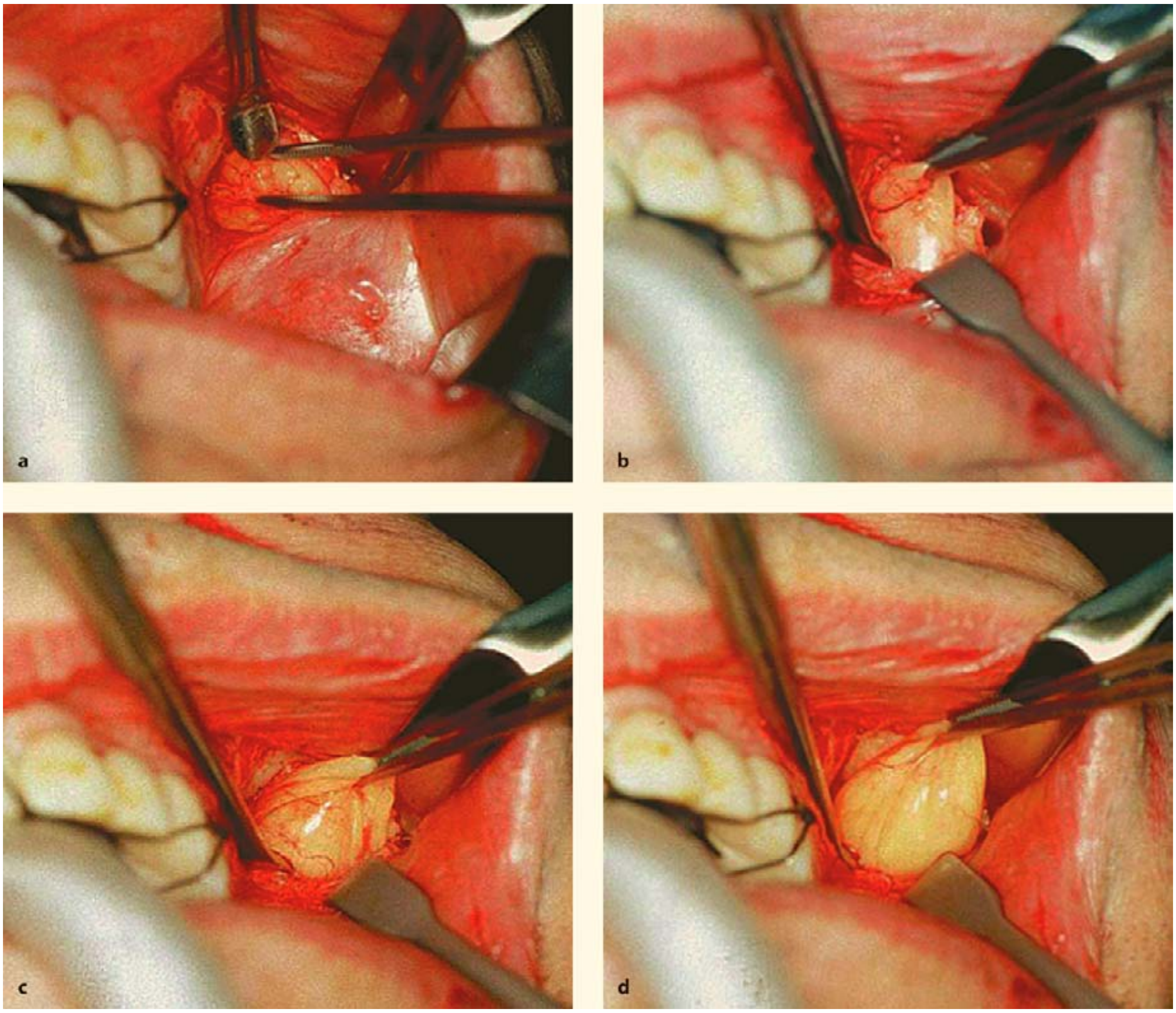

Fig. 43.6. Delivery of Bichat's fat pad. **a** The fat pad herniates through the spread periosteum and buccinator muscle. **b** Gentle dissection with a blunt dissector mobilizes the fat pad. **c** The fat pad is then gently teased from the buccal space with forceps. **d** Continued gentle traction and concomitant blunt dissection will assist the full delivery of the fat pad

the surgeon to keep track of each suspension suture. The second suspension suture is the cheek imbrication, or "modiolus" suture. This suture is placed into the tenuous fascia and fat of the inferior maxillary soft tissue near the upper buccal sulcus incision. Both ends of this suture are then directed through the temporal incision and tagged, as previously described.

Exposure of Bichat's fat pad follows the placement of the last suspension suture. Bichat's fat pad is approached through the superomedial wall of the buccal space. The periosteum and buccinator muscle are spread with the use of a blunt dissector. This allows Bichat's fat pad to herniate through maintaining an intact capsular fascia (Fig. 43.6). The fat pad should be carefully dissected free from the wall of the buccal space. Bichat's fat pad should be easily movable for repositioning as a pedicle flap. A 4-0 PDS suture is then woven into the fat pad and the suture ends are delivered to the temporal area, similar to the previous suspension sutures. The endoscope should be used to visualize the delivery of the pedicled fat flap over the malar bone. The endoscope can also assess the trajectory of the suspensions sutures. It is important to avoid crisscrossing the suspension sutures as they are passed to the temporal area.

Each of the suspension sutures is then secured to the temporal fascia proper, in ordered fashion. The sutures should be placed in the temporal fascia proper, below the level of the temporal incision. The first suture, the Bichat's pad fat suspension, should be placed most medially. The inferior malar fascia and fat or modiolus suture is placed next, in a more lateral location of the temporal fascia proper. The most lateral suture, the suborbicularis oculi suture, is the last

Fig. 43.7. Preoperative (*left*) and postoperative (*right*) views of a 46-year-old female patient exhibiting signs of early facial aging. The preoperative image demonstrates evidence of frontalis muscle hyperfunction in conjunction with "normal" brow position and upper eyelid pseudoptosis. The patient was treated with a full endoscopic forehead and midface double ogee facial rejuvenation, along with bilateral lower lid blepharoplasty. Note the relaxed forehead and improved upper-lid position that results from correction of the true brow ptosis

Fig. 43.8. Preoperative (*left*) and postoperative (*right*) oblique or three-quarter views of the 46-year-old patient shown in Fig. 43.7. The preoperative view clearly shows the flattened midface associated with facial aging. Restoration of midfacial volume gives the patient a youthful, rejuvenated appearance. The double ogee is clearly defined in the postoperative result

Fig. 43.9. A youthful photograph of the patient from Fig. 43.7 and 43.88 taken during her early 20s. Compare this view with her postoperative results. Considerable rejuvenation can be achieved with the double ogee technique

Fig. 43.10. Preoperative (*left*) and postoperative (*right*) views of a 42-year-old female patient who underwent endoscopic forehead and midface rejuvenation in conjunction with bilateral upper and lower blepharoplasties. The preoperative view demonstrates subtle flattening of the brows, glabellar frown lines, and moderate midface soft-tissue decent. The postoperative result shows improved brow shape, smoothing of the glabellar rhytids, and improved midface soft-tissue volume

Fig. 43.11. Preoperative (*left*) and postoperative (*right*) three-quarter views of the 42-year-old patient shown in Fig. 43.10. Moderate brow ptosis with lateral hooding can be seen in this oblique view. Improved brow and cheek soft-tissue position accentuate the double ogee in the postoperative view

to be anchored to the temporal fascia proper. This completes the suspension of the midface.

Butterfly drains are placed bilaterally through separate stab incisions in the temporal scalp. Each drain is carefully directed into the midface and secured to the temporal scalp with a suture. The superficial temporal fascia is then anchored to the temporal fascia proper with two 4-0 PDS sutures, while an assistant provides superomedial traction to the advanced scalp. The intraoral incisions are then closed with interrupted 4-0 chromic catgut sutures. The butterfly drains are placed to gentle suction at the completion of the operative procedure. The drains are typically maintained for 48–72 h postoperatively. Figures 43.7–43.11 provide several patient examples demonstrating the rejuvenative capacity of the volumetric double ogee rhytidectomy technique.

43.5.3 Bichat's Fat Pad Excision

There are a subset of patients who present for facial rejuvenation that demonstrate chubby cheeks, significant bulk, and pseudoherniation of Bichat's fat pad, and good malar bone support. These patients benefit from excision of Bichat's fat pad rather than suspension. Dissection of the fat pad proceeds as previously outlined; however, care must be taken during resection of the fat pad. Undue traction of the fat pad can result in injury to neurovascular structures and/or Stensen's duct. Meticulous hemostasis should be obtained and can be facilitated by the use of bipolar cautery during Bichat's fat pad excision.

43.5.4 Fat Grafting

Structural fat grafting provides an excellent means for treating residual facial asymmetries or contour irregularities [12]. Deep residual creases, such as exaggerated nasolabial folds and marionette lines, can be effectively treated with the subcutaneous placement of harvested fat grafts. The fat grafts are typically obtained from the lower abdomen through a small midline, infraumbilical incision following administration of a standardized tumescent solution. Specialized harvesting cannulas have been developed to allow easy collection of graft material. If the abdomen demonstrates a paucity of fat, grafts should be harvested from alternative locations. Alternative locations for graft harvest include the hips, medial thighs, or posteromedial knee region. Because fat grafts are placed in a subcutaneous plane, the grafts can be safely placed in patients undergoing concomitant subperiosteal or double ogee rhytidectomy. We find this approach advantageous toward the final aesthetic outcome.

43.5.5 Alloplastic Implants

Occasionally, the desired multicurvilinear line of beauty (double ogee) cannot be achieved solely with the volume-enhancing soft-tissue techniques described earlier in the chapter. Under these circumstances, alloplastic augmentation of the craniofacial skeleton should be considered. A variety of alloplastic facial implants are currently available that allow correction of residual volume deficiencies. Rubber polysiloxane (silicone) and high-density porous polyethylene implants are currently the most common alloplastic materials available for facial augmentation procedures.

Solid silicone implants are manufactured in a wide variety of shapes and sizes. The implants are soft and pliable and can be inserted with ease. However, the smooth surface of silicone implants does not permit vascular or soft-tissue in-growth. Fibrous tissue encapsulation is characteristic of solid silicone implants. Morbidity related to silicone implants includes infection, extrusion, and displacement, as well as bone erosion by the implants [13]. The process of encapsulation makes removal of silicone implants technically less challenging when necessary.

High-density porous polyethylene implants such as Medpor (Porex Surgical, Newnan, GA, USA) are also manufactured in a variety of shapes and sizes. (Fig. 43.12). In contrast to silicone, the porous nature of these implants allows in-growth of both soft tissue and bone [14]. The morbidity related to porous polyethylene implants includes infection, extrusion, and seroma formation. The incorporation of the polyethylene implant into native tissue accounts for a significantly lower risk of infection and extrusion compared with the risks with silicone implants [15]. However, morbidity can be significantly increased when removal of porous polyethylene implants is necessary. Bone and fibrous tissue in-growth can make implant removal a formidable task. Patients must be informed of these characteristics when considering alloplastic facial augmentation with porous polyethylene im-

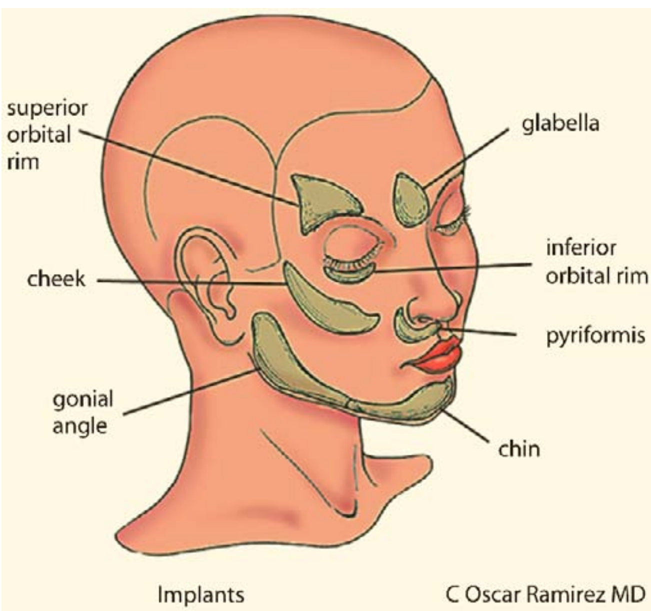

Fig. 43.12. Alloplastic implants have been developed in a variety of anatomic shapes that can be placed to enhance the facial contour. In patients with deficient skeletal features, superior orbital rim and cheek implants can be used to recreate the multicurvilinear line of beauty

plants. We prefer to use porous polyethylene implants based on the aforementioned characteristics in addition to the fact that the implants can be easily shaped (by scalpel) to fit anatomic skeletal variations. We have used preformed porous polyethylene implants along the superolateral orbital rim and/or the malar area to create the optimal convexities of the double ogee when soft-tissue augmentation alone is insufficient. (Fig. 43.13). Placement of mandibular angle and chin implants is also considered, selectively, to maintain an aesthetic balance between the upper two thirds and the lower third of the face. Use of the superolateral orbital rim implant is demonstrated in the patient example shown in Figs. 43.14 and 43.15.

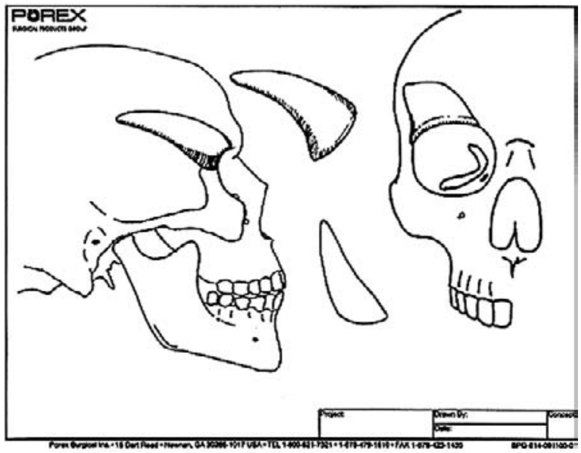

Fig. 43.13. The porous polyethylene superior orbital rim implant designed by Porex Surgical (Newnan, GA, USA). The implant can be placed and secured through a standard upper blepharoplasty incision

Fig. 43.14. The 50-year-old patient shown here demonstrates bitemporal narrowing of the forehead and superior orbital rim deficiency resulting in an aged, emaciated appearance. Preoperative view shown at *top*. The *lower* (postoperative) image was taken 3 months after endoscopic forehead procedure, upper and lower blepharoplasty, and placement of bilateral MedPor superolateral orbital rim implants. The implants were placed through the upper blepharoplasty incisions. Note the improved contour of the lateral forehead. Improved brow position and smoothing of glabellar frown lines are also evident

Fig. 43.15. Oblique or three-quarter views of the 50-year-old patient shown in Fig. 43.14. Preoperative view (*upper*) and postoperative view (*lower*) are shown. Again, the brow position and shape are improved with the endoscopic forehead procedure and the contour of the lateral brow and forehead is improved

43.6 Complications

Complications related to the endoscopic subperiosteal facelift procedures include nerve injury, hematoma, and infection. Nerve injury is typically seen with excessive traction during endoscopic manipulation. Among our patients, neuropraxia of the frontal branch of the facial nerve occurred in 0.4% of patients. Neuropraxia of the zygomaticus branch of the facial nerve and the infraorbital nerve occurred in 0.2 and 0.4% of patients, respectively [16]. No permanent injury to motor nerves has been seen to date.

Hematoma and infection can be minimized with meticulous operative technique and adequate irrigation of the subperiosteal pockets with antibiotic solution prior to closure. Hematoma has been seen in a single patient, on postoperative day 4. This late presentation occurred secondary to an acute hypertensive episode. The hematoma was drained and the patient recovered uneventfully. Infection has been seen in one patient undergoing an endoscopic facelift procedure. The patient complained of severe pain in the cheek, 10 days postoperatively. Fluctuance of the cheek mound and tenderness was noted. Incision and drainage of the collection resulted in resolution of the infection without further sequelae.

43.7 Soft-Tissue Response to Suture Suspension in the Midface

The structural foundation of the double ogee facial rejuvenation technique is formed by the series of suspension sutures placed in the midfacial soft tissues during the endoscopic midface procedure. These suspension sutures can provide elevation, imbrication, and increased volume (anterior–posterior projection) to the midfacial soft tissue, and/or obliteration of the tear trough deformity. The graded effect that each suspension suture provides to the midface is summarized in Table 43.1. The modiolus suspension suture primarily provides imbrication of the cheek soft tissues and secondarily contributes to elevation and volumetric enhancement of the midface. Bichat's fat pad repostitioning (suture) primarily provides volumetric enhancement with secondary elevation of the cheek mass. The medial SOOF suspension suture functions to obliterate the tear trough deformity and exerts a secondary effect on cheek elevation and volumetric enhancement. The upper lateral SOOF suture allows significant elevation, imbrication, and volumetric increase in the cheek soft-tissue mass. It also functions to obliterate the tear trough deformity. The lower SOOF suture provides primary imbrication of the cheek mass with concomitant elevation and volume increase. The lower SOOF suture exerts little to no effect on tear trough obliteration.

43.8 Summary

The endoscope now allows extensive subperiosteal undermining of facial soft tissue through minimal-access incisions. Improved understanding of facial anatomy and the facial aging process now allow surgeons to reposition and remodel the soft-tissue envelope with excellent aesthetic results. Restoration of facial volume following the multicurvilinear line of beauty or double ogee line can be achieved with the endoscopic subperiosteal techniques described in this chapter. Further aesthetic refinement with Bichat's fat

Table 43.1. Midface soft-tissue manipulation (*SOOF* suborbicularis oculi fat)

EFFECT	MODIOLUS	BICHAT'S	MEDIAL SOOF	UPPER LATERAL SOOF	LOWER SOOF
ELEVATION	++	++	++	+++	+++
IMBRICATION	+++	o	o	+++	++++
VOLUMETRIC	++	++++	++	+++	+++
TEAR TROUGH	o	o	++++	++	o / +

pad excision, fat grafting, or the use of alloplastic implants can be achieved in select patients. Overall, the double ogee facial rejuvenation technique can be applied to the full spectrum of patients with lasting results.

References

1. Tessier P (1980) Face lifting and frontal rhytidectomy. In Ely JF (ed): Trans 7th Int Congr Plast Reconstr Surg, Rio de Janeiro, p. 393.
2. Tessier P (1989) Lifting facial sous-perioste. Ann Chir Plast Esthet 34:1993.
3. Psillakis JM, Rumley TO, Camargo A (1988) Subperiosteal approach as an improved concept for correction of the aging face. Plast Reconstr Surg 82:383–392.
4. Ramirez OM, Maillard GF, Musolas A (1991) The extended subperiosteal facelift: a definitive soft tissue remodeling for facial rejuvenation. Plast Reconst Surg 88:227.
5. Ramirez OM (1995) Endoscopic forehead and facelifting: step by step. Oper Tech Plast Reconstr Surg 2:129–136.
6. Ramirez OM, Pozner JN (1996) Correction of the infraorbital hollow with direct cheek lift. Plast Surg Forum 19:152.
7. Ramirez OM (1995) The anchor subperiosteal forehead lift. Plast Reconstr Surg 95:993–1003.
8. Ramirez OM (1994) Aesthetic craniofacial surgery. Clin Plast Surg 21:649–659.
9. Ramirez OM (1994) Endoscopic full facelift. Aesthet Plast Surg 18:363–371.
10. Little JW (2000) Three-dimensional rejuvenation of the midface: volumetric resculpture by malar imbrication. Plast Reconstr Surg 105:267–285.
11. Ramirez OM, Pozner JN (1996) Subperiosteal minimally invasive laser endoscopic rhytidectomy: the SMILE facelift. Aesthetic Plast Surg 20:463–470.
12. Coleman SR (2001) Structural fat grafts the ideal filler? Clin Plast Surg 28:111–119.
13. Friedland JA, Coccaro PJ, Converse JM (1976) Retrospective cephalometric analysis of mandibular bone absorption under silicone rubber chin implants. Plast Reconstr Surg 57:144.
14. Wellisz T, Kanel G, Anooshian RV (1993) Characteristics of the tissue response to Medpor porous polyethylene implants in the human facial skeleton: The long term effects of biomedical implants. J Long Term Eff Med Implants 3:223.
15. Rubin JP, Yaremchuk MJ (1997) Complications and toxicities of implantable biomaterials used in facial reconstructive and aesthetic surgery: a comprehensive review of the literature. Plast Reconstr Surg 100:1336–1353.
16. Ramirez OM (2000) The central oval of the face: tridimensional endoscopic rejuvenation. Facial Plastic Surgery 16:283–298.
17. Ramirez OM (2001) Full face rejuvenation in three dimensions: a "face-lifting" for the new millennium. Aesth Plast Surg 25:152–164.