Submalar Augmentation: An Alloplastic Method for Aesthetic Contouring of the Midface

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The desire for permanent beauty and youth has been mankind’s eternal fantasy. Throughout history, each culture has formulated its own unique criteria and perceptions for evaluating the ideal beauty of its people. In the ancient Greek culture, classical beauties such as Phryne and Aphrodite were described as having features of regular, symmetric proportions, with high cheekbones, but not excessively so, and with a bright and joyous expression.7

Subsequent neoclassical doctrines delimiting facial measurements have attempted to define the ideal facial form. However, it has been recently demonstrated that these detailed tables of measurements do not necessarily represent the general population or define the absolutes of beauty.8,9 To date, there are still no standardized measurements that can define the essence of beauty for all civilizations. Therefore, it is important to emphasize that the only factor found as a constant in almost all historical definitions of beauty is the inclusion of that which exemplifies youth. One of the strongest characteristics of youth is depicted by a fullness of the cheeks, indicating presence of healthy midfacial soft tissue. In improving facial form, emphasis should therefore be placed on supplementing the midfacial area as well as smoothing out faltches, tightening sagging skin, or augmenting the zygomatic prominences.

It is universally established that a combination of both strong and well-balanced skeletal features will best endure the ravages of age. Moderate to severe underdevelopment of the mid-third of the face and degenerative soft-tissue changes often combine to produce signs of facial aging, which are
difficult to treat. These changes are commonly revealed by the development of folds and cutaneous depressions of the cheeks. Patients who prematurely exhibit these signs of aging become early candidates for facial rejuvenation procedures.

Conventional rhytidectomy presents acknowledged limitations and, sometimes, subsequent problems as a sole treatment for facial rejuvenation. For many in the early age group (mid-30s to late-40s), midfacial depressions and hollows may not be remedied—indeed, they may be exaggerated—if dealt with via rhytidectomy. There are also patients who are poor candidates for rhytidectomy, others for whom the face-lift procedure is only a partial solution to appearance problems, and still others who require follow-up enhancement of successful rhytidectomy. Although the newer methods of rhytidectomy, utilizing superficial musculoaponeurotic system (SMAS) platysmal flaps, and fat sculpting, have made substantial progress in reducing jowls and submental pathologic features, there has been minimal success in long-term reversal of the degenerative signs of aging found in the mid-third of the face.

Other aesthetic contouring procedures, such as malar or chin augmentation, that strive to attain more ideal facial proportions may not simultaneously restore youthful qualities. For example, conventional or "standard" malar implants placed over the prominent part of the zygoma will enhance the lateral facial profile, but in some patients may also emphasize undesirable submalar depression.

The primary motivation of the majority of patients seeking coxalization for the purpose of facial rejuvenation surgery is to restore attractiveness or correct perceived facial flaws that have become visible or more pronounced with age. Usually, they do not want to drastically alter their basic facial architecture or to insisting on a preset surgical procedure, instead they simply want to look younger.

The goal of submalar augmentation is to deal effectively with many of the problems encountered in midfacial rejuvenation. This is accomplished by surgically positioning anatomically designed silicone rubber (Silastic) implants of various sizes over the midthird of the face in a safe and consistent method. In addition to augmenting bone structure, the submalar implant emphasizes midfacial correction, stimulating the appearance of adequately padded skin at healthy levels of tension and elasticity, while avoiding distortion of normal facial anatomy.

When used alone, submalar augmentation provides a single alternative method for midfacial rejuvenation in younger patients. When used in conjunction with rhytidectomy, particularly in patients with deficient bone structure or atrophy of overlying soft tissue, it establishes the foundation for enhanced and longer-lasting face-lift results, and avoids a stretched or made-up appearance.

CONSIDERATIONS

A complete understanding and accurate analysis of the processes of aging is a prerequisite for obtaining successful results in facial rejuvenation surgery. In one simple formulation, the submalar deformities may be primarily due to normal loss or atrophy of adipose tissue (Fig. 27-1A). In another, the perceived flaws may be the revelation by aging of previously hidden imperfections or deficiencies in facial skeletal structure.

Adult loss of quantity and character of a submalar/subcutaneous fat buffer over the face, renders the skin inelastic, and hastens wrinkling.10,12 Atrophy of the buccal fat pad and relaxation of the skin also deepen nasojugal folds and thin the vermilion border of the lip.13 The inferior suggestion and relaxation of cheek skin form jowls and indentations, contributing to a typical midfacial sign of aging9 (see Fig. 27-1B).

In the aged, progressive loss of facial skeletal volume, generalized fibrosis and shortening of facial musculature, and degenerative soft-tissue changes combine synergistically so that the skin, lacking subcutaneous tissue, comes into contact with the deep, receding structures of the face. This results in a giant appearance with marked hollows and depressions (Figs. 27-2A and B).

Sudden weight loss or cachexia evokes similar changes. Watanabe and colleagues14 described an equivalent hollowed-out appearance in a group of Japanese patients showing loss of adipose tissue in the temporal fossa. Coelho15 described two patients having a "cauters-like appearance" of marked cheek

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Fig. 37.1. Variations of midfacial aging. A. Example of 69-year-old patient with focal area of midfacial soft-tissue atrophy. B. Forty-four-year-old man with severe anterior facial folds, demonstrating a greater loss of soft tissue than laxity of skin.

Fig. 37.2. A and B. The aging process causes the soft tissues of the face to lose inherent structural integrity. Inferior migration of less elastic, thinner soft tissue over a receding skeletal structure forms redundant folds and depressions that contribute to the characteristic midfacial signs of aging. The addition of a more prominent supporting structure can slow this process.
depressions resulting from premature lipodystrophy localized to the canthal-inlet. Facial contour was restored by means of placing curved silicone rubber on the nose, beneath the nasolabial sulcus. This was a unique treatment because the augmentation of the underlying facial skeletal with a solid structure simulated the replacement of deficient soft tissue.

Developmental alterations in facial skeletal structure range from minor imperfections to severe deformity. Recently, emphasis has been placed on avoiding arbitrary distinctions between deformity and deficiency. Primary surgical anterior-posterior repositioning of bony segments using Le Forte-type maxilofacial procedures can provide more ideal facial skeletal relationships, particularly in severe congenital malformations and associated malocclusions. However, grafts or facial prosthetics have been used to mask the aesthetic deformity that may still remain even after completion of successful orthopedic surgery. In selected cases, alloplastic augmentation has been used alone in an attempt to eliminate more extensive maxilofacial procedures.

Since the soft tissues of the cheek may camouflage maxilofacial skeletal defects throughout the first four decades of life, it becomes particularly important to inform patients who use contem- plating cosmetic surgery about the presence and significance of these deficiencies. It is the experience of most surgeons during preoperative counseling that most patients are usually not aware of the presence of moderate facial asymmetry or the significance of more major abnormalities. However, for most of these patients, even after adequate counseling, the idea of extensive maxilofacial surgery for the purpose of facial repositioning is usually not an acceptable alternative.

Conventional rhytidectomy was proposed as an adjuvant procedure in an attempt to reduce some of the structural difficulties encountered in face-lift surgery. It did not address deformities encountered in the area of the nasolabial or subnasal area that are responsible for producing the early and persistent manifestations of facial aging. This area is embodied by the zygomatic arch, and the area overlying the tendinous insertions of the zygomatic muscle along the inferior border of the malar complex.

Noting the importance of restoring depressions in this region of the face, Guevremont suggested using cartilage grafts covered with fascia, and Whitaker and Lyon proposed using paddle-shaped polyethylene (Propiast) implants, which, however, additionally accentuated the malar-zygomatic prominence.

PREOPERATIVE EVALUATION

The aesthetic correction of contour deficiencies, particularly in relationship to overlaying soft tissue, requires precise evaluation and careful patient selection. Meticulous analysis of the size and shape of the patient's face and accurate placement of appropriate alloplastic implants are ultimately responsible for successful results in aesthetic facial contouring.

Over the past few decades, craniofacial analysis using cephalometrics has formed the basis for preoperative planning in facial restructurings. Less consideration has been devoted to quantitative measurements of the overlaying soft tissues. Calculations, such as the facial proportion index, will only give a general idea of facial form. Negret pointed out the importance of assessing soft-tissue structure while measuring the skeletal structure. It was shown anatomically that soft tissue does not always distribute itself in a uniform manner. As the aging process continues, this asymmetrical distribution will continue to have an adverse effect on facial harmony.

Similarly, patients in their mid-30s may suddenly discover facial asymmetry; previously camouflaged by "baby checks." In pronounced skeletal asymmetry, the smaller side of the face will display more flattening and drooping of anterior facial skin, and greater deepening of the nasolabial groove than the larger side.

It has been further emphasized that smoothing out sharp angles or depressions can restore symmetry and render a softer appearance, as well as enhance the aesthetic quality of the face. For example, deep-set eyes, prominent nasal-symmetrical arches, or a prominent
nose can produce a shallow lobe in the medial nasal region. Alternatively, enhancing the fullness and curvature in the premaxillary area can effect a relatively decreased anterior-posterior projection to the nose, and provide a softer appearance to the total face.2

Some patients seeking aesthetic surgery comment on their apparent "loss" of high cheekbones. Comprehensive preoperative evaluation of these patients reveals that actual skeletal structure has not changed significantly. Instead, the overlying soft-tissue pad that formerly was positioned prominently over the malar eminence has both atro-

phied and migrated inferiorly, losing its enhancing effect. Pronounced underlying bone structure then becomes most important in slowing down this process (see Fig. 27-28).

Relatively young patients (ages 30 to 50) with degenerative soft-tissue changes or deficient midfacial bone structure may have a sunken or flattened facial appearance, demonstrating premature loss of a youthful expression. These patients say they look depressed, mean, or haggard; this was described by one author as the "gestalt of suf-
ferral." 17 (Fig. 27-3). It is this flattened appearance that often motivates pa-
tients to seek early consultation for facial rejuvenation surgery.

Face-lift surgery is usually unsuc-
cessful as a long-term solution in cor-
recting many of these structural problems of facial form. The commonly accepted rule that the ideal face-lift candidate is thin, is in the mid 40s, and has prominent malar eminences and mandibular angles does not necessarily apply to all patients, given the limited ability of rhytidectomy to correct mid-
facial problems. 19 Patients with cavi-
tary changes in the cheeks and thin, atrophic skin may demonstrate minimal or no jowl formation or redundancy of skin or muscles of the neck. It is more to their advantage to fill out their specific midfacial deficiencies (Fig. 27-4A through D). In older patients, in-
sufficient underlying skeletal deficiency makes draping of inelastic skin difficult, resulting in early recurrence of redund-
ant skin folds, yielding a less than de-

The day before surgery, the patient is started on a broad-spectrum antibiotic regimen, which is continued for 5 days. Intravenous antibiotics are also given just prior to beginning the procedure.

Before anesthesia is started, the ex-
act area of midfacial deficiencies to be augmented is outlined with a marking pen, with the patient in the upright po-
tion (Fig. 27-5A). The patient is then asked to smile broadly so that the most medial position of the implant can be determined without interfering with mimetic function. In addition to a rou-
tine preparation, both areas of the ca-
nine fossae are also prepped by insert-
ing gauze sponges impregnated with povidone-iodine (Betadine) into the buccal-gingival sulcus for approximately 5 to 10 minutes, and then removing the sponges.

The type of anesthesia used is pri-
marily intravenous sedation accompa-
nied by a wide-field local block. The addition of hyaluronidase (Witch-hazel) fa-
cilitates dispersion of the local anes-
thetic and reduces distortion of soft tis-

...sponse. General endotracheal anesthesia can also be used, particularly if re-
quired by concurrently performed pro-
cedures.

A small incision, approximately 1 to 1.5 cm, is made on the inner surface of the lip at the buccal-gingival sulcus over the lateral part of the canine fossae. Bleeding is minimized by first
comprising the success against the underlying bone before making the incision. The incision is made high enough so that it does not interfere with degloving. The periorbita is snipped and elevated superiorly off the anterior surface of the maxilla. Although it is not always necessary to do so, the infraorbital nerve may be easily identified, particularly if the implant is to be positioned in a more medial location (see Fig. 27-30).

Using both a 1-soft’s and “spatula-type” periosteal elevator, the dissection is continued laterally and a subperiosteal pocket is created, providing exposure from the anterior surface of the maxilla to the lateral maxillary zygomatic areas of the facial skeleton (see Fig. 27-31). The pocket may be continued inferiorty by bluntly removing the anterior surface of the tendinous insertions of the masseter muscle beneath the anterior-inferior surface of the zygoma. The attachments of the masseter muscle are left intact because they function as a supporting structure on which to place part of the implant. The pocket is always made large enough so that there will be no compression of soft tissues on any part of the

Fig. 27-5. **A.** Prior to any implantation of local anesthetic, the areas of maximum midfacial deficiencies are specifically outlined with the patient sitting in the upright position. **B.** A small incision is made over the zygoma and the periorbita is elevated. The infraorbital nerve may be identified as a landmark, or used to indicate the medial border of the dissection. **C.** Dissection continues laterally around the zygoma and zygomatic arch inferiorly and posteriorly over the anterior surface of the superior tendinous insertions of the masseter muscle. **D.** The subperiosteal implant is specifically designed to deal with the three-dimensional problem encountered in midfacial structure. **E.** An appropriately sized subperiosteal implant is chosen and placed over the canine fossa, wrapping around the zygoma and zygomatic arch and may rest partially on the tendinous attachments of the masseter muscle. **F.** The subperiosteal implant is adjusted to the desired position so that the two most medial perforations of the implant correspond to the markings on the external skin surface. **G.** A double-armed 4-0 polyglycolic acid is passed around the posterior surface and through the perforations of the implant. From inside the pocket, the needles are passed directly perpendicularly to the skin, exiting at the external markings, corresponding to perforations of the implant. **H.** The implant is stabilized by tying the suture directly over an external bolster (comprised of two cotton rolls).
implant, particularly from the posterior portion of the dizziness. It is thought that making a small, tight soft-tissue pocket surrounding an implant provides for stabilization. However, it has also been shown that a pocket that is too small can actually be the cause of implant displacement.10

Using a retractor, the anatomical configuration is identified by direct vision and sizers are used to choose the appropriate submalar implant. The submalar implant consists of soft, solid silicone rubber (Silastic) in a three-dimensional anatomical design, specifically contoured to accommodate variations of midfacial bone structure (see Fig. 27-SD). If required, the implant may be further refined by carving it to conform more precisely to unusual anatomical bony or soft-tissue variations. This is particularly beneficial for patients with thin skin or facial asymmetry.

The bulk of the implant is placed over the anterior surface of the maxilla. Extreme medial placement near the premaxillary area is avoided. The tapered, posterior-lateral extension wraps around the zygomatic arch to rests on the superior tendinous attachments of the masseter muscle, depending on where augmentation is most required (see Fig. 27-SF). Once the correct implant size is chosen, it is removed from the pocket and placed on the anterior skin surface to ensure that the preoperative skin markings coincide with the size and shape of the implant. The position of the two most medial incisions on the implant are also marked on the skin (see Fig. 27-SF).

The implant is inserted back into the pocket and is adjusted in position until the desired facial contour is achieved. It is then determined whether the two medial incisions of the implant correspond to the external markings on the skin. Symmetrical placement of the implant is determined by measuring the distance from the midline of the upper lip to both right and left medial markings.

The implants are then removed and a double-armed 6-0 silk suture with cutting needles is booped around the undersurface and through the fenestrations of the implant. The needles are advanced through the pocket and then passed perpendicularly through the skin, exiting at the external markings (see Fig. 27-SG). The implant, following the needles, is placed into the pocket in the predetermined position. It is then stabilized by tying the sutures externally over a holder (using 2 cotton rolls), thereby immobilizing the implant (see Fig. 27-SH).

After the central ipsilateral side is completed, both implants should be examined by palpation and direct vision to ensure that they are positioned symmetrically. The incision is then closed in two layers. At the conclusion of the procedure, stretch adhesive bandages are placed over the holder to further immobilize the implants.10

The introral route of insertion has been used exclusively when performing submalar augmentation. This approach allows for direct visualization of all structures and ease of implant insertion and it leaves no external scars.10

The direct suture technique allows for a large pocket to be made for accurate placement, and prevents implant slippage. It also provides a method for measurement to ensure symmetry and more predictable results. We have found that adequate fixation by the surrounding tissues occurs by the third postoperative day, at which time the sutures are cut and the holders removed.

RESULTS
Indications for Submalar Augmentation

From May 1982 to February 1990, submalar augmentation was performed on 293 patients. All patients underwent bilateral augmentation, with the exception of eight patients in whom submalar implants were used for correction of a unilateral bony or soft-tissue facial deformity. Initially, Silastic implants of varying sizes and consistencies were carved to conform to the more medial and inferior portion of the midfacial area, which evolved to the shape of the present submalar implant. These implants were placed over the canine fossa and anterior face of the maxilla, as well as around the zygomatic prominence.

During the past 8 years, submalar augmentation was used primarily for four major aesthetic purposes (Table 27-C). It was utilized as the sole or native method for midfacial rejuvenation in 185 patients between the ages of
<table>
<thead>
<tr>
<th>Indications</th>
<th>No. of patients</th>
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<tbody>
<tr>
<td>Sole aesthetic procedure for midfacial rejuvenation</td>
<td>140</td>
</tr>
<tr>
<td>Adjuvant procedure to enhance rhinoplasty</td>
<td>87</td>
</tr>
<tr>
<td>Method used for correction of midfacial problems after facelift (inc., “mum look”)</td>
<td>14</td>
</tr>
<tr>
<td>Malrepair alternative</td>
<td>12</td>
</tr>
<tr>
<td><strong>Reconstructive indications</strong></td>
<td></td>
</tr>
<tr>
<td>Unrecovered, depressed zygomatic complex fracture</td>
<td>4</td>
</tr>
<tr>
<td>Large atrophic midfacial depressions secondary to long-term acne scarring</td>
<td>2</td>
</tr>
<tr>
<td>Defects of midfacial area after excision of soft-tissue tumors</td>
<td>2</td>
</tr>
<tr>
<td>Soft-tissue loss secondary to trauma</td>
<td>2</td>
</tr>
<tr>
<td>Soft-tissue loss after radiation of hemangiomata</td>
<td>1</td>
</tr>
<tr>
<td>Facial atrophy after permanent unilateral, facial nerve paralysis</td>
<td>1</td>
</tr>
<tr>
<td>Reconstruction after midfacial lipocontaction</td>
<td>3</td>
</tr>
<tr>
<td>Midfacial bone resorption secondary to extraction of teeth</td>
<td>4</td>
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<tr>
<td><strong>Other indications</strong></td>
<td></td>
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<tr>
<td>“Long face syndrome”</td>
<td>5</td>
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<tr>
<td>Replacement for previously inserted malar or midfacial implants</td>
<td>5</td>
</tr>
<tr>
<td>Periorbital (accelerated) midfacial fat resorption in athletes (i.e., marathon runners)</td>
<td>3</td>
</tr>
<tr>
<td>Correction of specific midfacial asymmetry</td>
<td>2</td>
</tr>
<tr>
<td>Patients with scleroderma, unable to undergo face-lift surgery</td>
<td>1</td>
</tr>
<tr>
<td>Combined subnasal-malar augmentation</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total no. of patients</strong></td>
<td>303</td>
</tr>
<tr>
<td><strong>Total no. of implant procedures</strong></td>
<td>508</td>
</tr>
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30 and 50. In the second group of 57 patients, subnasal augmentation was used as an adjunctive procedure to enhance and prolong the results of rhytidectomy. In the third group, it was used successfully to treat recurring or postoperative midfacial problems in 14 patients who had previously undergone face-lift surgery. In the fourth group, subnasal augmentation was used in 13 patients as a substitute for traditional malarplasty, providing greater anterior projection to achieve the effect of a rounder, more natural high cheekbone.

Subnasal augmentation has evolved as a practical treatment technique for numerous pathological defects. Some of these were traumatic or postablative midfacial soft-tissue defects, depressed, unrecovered zygomatic-complex fractures, and localized, atrophic areas of the midface after prolonged acne scarring. Over the past year (1989 to 1990), the indications for midfacial augmentation have expanded development of a combined “subnasal-malar” implant for simultaneous treatment of both skeletal and soft-tissue deficiencies of the midfacial area (E. Terino, personal communication, 1990) (see Table 27.1).

**Complications**

In this series, overall the complications were minor and the incidence small. The greatest difficulty encountered when performing any bilateral surgical procedure is establishing perfect symmetry. As Corney and Hare's [7] illustrated, preexisting facial asymmetry may become more apparent to the patient after aesthetic surgery. Four patients who complained of mild postoperative asymmetry reviewed their preoperative photographs and were satisfied that the same degree of facial asymmetry existed prior to surgery.

Eight patients with postoperative asymmetry, due to either slippage or malposition, required adjustment of the implant. In five patients, replacement of the implant was required due to improper size or shape. In only one patient were the implants removed due to patient dissatisfaction. No difficulties occurred when an implant was repositioned during a secondary procedure. In each case, a smooth capsule formed around both the anterior and the posterior surface of the implant. On no occasion was bone erosion observed or
Three patients developed unilateral infections that were successfully treated by drainage and antibiotics. Since the nonporous Silastic does not harbor bacteria, all infections were satisfactorily resolved without requiring removal of the implant.

Eight patients who experienced partial numbness of the upper lip had complete return of sensation within 3 months. In one patient, it persisted for 6 months before final resolution. Unilateral reduced mobility of the upper lip was found in five patients. Four of these patients had complete return of function within 4 weeks. In these cases it was thought that localized swelling rather than neurapraxia was the most likely cause of muscle dysfunction. In one of these patients, reduced upper lip mobility lasted 10 weeks before complete return of function. In this series, there was no instance of permanent motor or sensory nerve damage.

The majority of patients experienced very little postoperative discomfort. Three patients were seen for a delayed onset of premaxillary pain at least 6 months following surgery. Concurrent sinusitis or an acute exacerbation of chronic allergic rhinitis and nasal congestion was found to be the etiological factor in all three. As soon as the nasal or sinus problem was appropriately treated with antibiotics and decongestants, the symptoms were alleviated within 48 hours. Subsequently, this problem did not occur in any of these patients.

The overall results have shown submalar augmentation to be an extremely low-risk procedure. Owing to placement of the implant under the thicker, more medially positioned soft-tissue mass, most patients reported that they could not feel the implant, regarding it as a normal, natural part of their facial structure. To date no implant has been rejected.
DISCUSSION

Since replacement material for laryngeal soft-tissue defects does not yet exist, we have provided a technique that simulates the appearance of increased soft-tissue bulk to return youthful, natural contours back to the face (Figs. 27-6 and 27-7). Placing the submalar implant over the anterior surface of the maxilla provides a wider, convex surface area that supports and repositions the displaced soft tissue toward their original superior-anterior location (Fig. 27-8). Correct placement of the implant following normal anatomical configurations augments the skeletal structure and corrects many of the problems of hollowness, folds, and integumentary collapse (Figs. 27-9 and 27-10).

Successful alloplastic augmentation depends on the type of material, correctly configured implant shape, and adequate amount of soft-tissue covering. Placement of Silastic beneath the more protective, thicker skin flaps of the malar midface of the face ensures longevity and security of the submalar implant. This avoids certain...

Fig. 27-7. A and C, A 40-year-old patient seeking early consultation for facial rejuvenation surgery. The patient complained of looking "tired" and "haggard," and having a generalized "depressed" appearance, resulting from loss of soft tissues in the malar region. B and D, Appearance 18 months after operation. Submalar augmentation was used alone to provide the appearance of soft-tissue enhancement and to restore the brightness and vibrancy of the malar third of the face.
Fig. 27-A. A. The submalar implant augments skeletal structure while providing a scaffolding for the soft tissues. This repositions the related subfacial soft tissues to a more anterior-inferior location and fills out this recessed area, thus providing a more youthful look. Lateral and anteroposterior views. B and D. Preoperative. C and E. After blepharoplasty and submalar augmentation. The amount of subfacial soft-tissue projection obtained is demonstrated.

Limitations imposed by traditional malarplasty techniques whereby relatively bulky implants, positioned over prominent skeletal structure, are protected by only a thin layer of soft tissue (Fig. 27-11).

If desired, the unique design of the implant can provide a natural high cheekbone effect by additionally emphasizing projection over the anterolateral portion of the malar complex (Fig. 27-12). In selected cases, the submalar implant can also establish the appearance of more harmonious facial proportions in patients exhibiting the large face syndrome.
Although there is no perfect alloplastic implant, we believe the properties of silicone rubber fulfill many of the requirements of an ideal synthetic implant. Silicone rubber (Silastic) has advantages over other available materials, particularly concerning the tendencies that Proplast implants have toward shrinkage, migration, and the bacteria-entrapping ingrowth of granulation tissue. Unlike resilient Silastic, Proplast, which is easily fragmented, makes secondary repositioning difficult. Silastic (silicone rubber) is biologically inert, has mechanical and thermal stability, and causes little tissue reaction. It is not absorbed, can be shaped precisely, and does not warp or disintegrate. Silastic can be obtained in different consistencies, and its compressibility allows insertion through small openings. Since silicone rubber is nonporous, it is resistant to infection and can be resterilized. By contrast, once an infection is diagnosed, the Proplast implant must be removed and discarded.

Many patients with deficient facial skeletal structure or severe degenerative soft-tissue changes, or both, are considered poor candidates for face-lift surgery and are sometimes denied its...
Fig. 27-10. A and C. Preoperative views, illustrating significant depth to the mandibular folds but without a similar degree of redundancy or chabosis of the skin. B and D. Six months after submalar augmentation via a subperiosteal approach. The skin, smooth out the folds, and reduce the midfacial recontour.

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Fig. 27-11. A. Normal relationship of skin covering the midfacial skeleton. B. A standard cheek implant inserted over an already prominent part of the facial skeleton, covered by thinner skin, which can sometimes produce an overcorrected facial contour. C. The submalar implant is positioned in a more inferior and medial location where it is protected by thicker soft-tissue covering. This location also provides for a smoother, more natural facial contour.

benefits. By enhancing midfacial deficiencies, submalar augmentation has the unique ability to change the status of a patient from that of a poor candidate to one who can benefit from rhytidectomy (Fig. 27-11).

It has been accepted that gravitational folds located in the central midfacial area are among the most difficult to improve by means of face-lift surgery. Attempts to treat these problems have consistently met with patient dissatisfaction. The persistence of the submalar folds after rhytidectomy has prompted development of many primary as well as ancillary surgical procedures. These include direct skin excision, re-
neled dermal grafts, imbrication facial techniques, extended rhytidectomy procedures, injection of silicone or collagen, and the recent reported use of liposuc-
tion.  

We have found that liposuction can actually accentuate the problem. Ex-
cessive fat excision, particularly of the buccal fat pad, done or in conjunction
with rhytidectomy, can have the long-term effect of causing, loss in elasticity, 
producing thinner, loose, and more redundant skin. A youthful, vibrant ap-
pearance is then lost.  

It is generally agreed, however, that a
smooth nasolabial fold is part of
youthful facial expression. In an at-
tempt to reduce the nasolabial folds,
multiple or overextended face-lift tech-
niques mobilize and stretch already
thin and inelastic skin over a shrinking
skelatal mus. This may result in an un-
natural, skin-toned, mask-like ap-
pearance with general loss of facial
expression or cause lateral "pull lines" 
often found in older patients with thin
skin.  

(Figs. 27-14 and 27-15). Extensive undermining with excision can also
cause ischemic changes in the skin, in-
crease the chance of skin slough or tem-
poral alopecia, and cause hypertrophic
periocular scarring.

The extended underlying skeletal
structure satisfies the need for supple-

Fig. 27-12. A and C, Preoperative views. 
This 32-year-old woman has adequate
lateral projection to the nasal complex,
but a flatten to the midfacial area below
the zygoma. B and D, Postoperative views
18 months after submalar and chin
augmentation. The malar implant pro-
vides a more anterior projection than
do the traditional, laterally positioned
cheek implants, and achieves a more
natural high cheekbone effect.
Fig. 27-13. A and C. Preoperative views, showing insufficient facial skeletal structure unable to support collapse of degenerative soft tissue and aging skin. The underlying bone structure must first be enhanced in order for own extensive face-lift surgery to provide a satisfactory, long-lasting result. B and D. Views 2 years postoperatively, showing the results of submalar augmentation and chin augmentation before planned rhinoplasty. The enhanced facial structure will now provide the basis for more successful face-lift surgery.

As a means of renewing youthful facial appearance, submalar augmentation provides particular advantage for those in whom face lift is not yet indicated, or for those who are not ready for a complete face lift. Overall, it reduces the need for secondary "back up" procedures and allows the face-lift operation to achieve enhanced, longer-lasting results with an increased rate of patient satisfaction (Figs. 27-20 and 27-21).

By utilizing submalar augmentation in aesthetic facial contouring, a restorative approach to facial rejuvenation surgery is emphasized.
Fig. 27-14. A. Preoperative view. Too much skin tightening from prior face-lift surgeries can produce a stretched, mask-like appearance. B. View 10 months postoperatively. Instead of removing more skin or soft tissues, submalar augmentation was used to restore lost fullness and animation to the midface, particularly around the perioral area.

Fig. 27-15. This patient demonstrates the linear "pull lines" extending laterally from the oral commissure, caused by multiple face-lift procedures.
Fig. 27-16  A and C, Preoperative views. A major part of this patient's problem is associated with the extensive wrinkling and depth of folds around the nasolabial and perioral areas of the face. Face-lift surgery alone would have difficulty in eliminating this problem, potentially producing a stretched appearance around the mouth.
B and D, Views 1½ years postoperatively. Submalar augmentation was performed first, followed by face-lift surgery. The enhanced facial structure provided by submalar augmentation enabled the face-lift operation to smooth out the wrinkles and folds around the mouth without pulling the skin too tight, thus achieving a more natural and longer lasting face-lift result.
Fig. 27-17. A. Preoperatively the loss of subfacial soft tissue is depicted by a flattened appearance of this area. B. View 12 months after submalar augmentation and rhytidectomy. By enhancing subfacial bone structure, submalar augmentation gives rhytidectomy the capacity to achieve enhanced, longer lasting results.

Fig. 27-18. The submalar implant augments the anterior facial structure so that instead of drooping the skin over a smaller concave structure (A), it is dropped over a larger convex structure, requiring more surface area of skin to cover it (B). This also avoids applying excessive tension on the skin and reduces the amount of temporal hair-bearing skin that must be excised during rhytidectomy.

Fig. 27-19. A. Preoperative view. B. View 18 months postoperatively illustrates how submalar augmentation establishes the foundation for improved results in rhytidectomy. Notice the significant enhancement of the left buccal area.
Fig. 27-20. A and C: Preoperative views. B and D: Postoperative views after upper and lower blepharoplasty, rhinoplasty, rhytidectomy, submalar augmentation, and perioral dermabrasion. Although dermabrasion helped the vertical lip lines, there is also an overall subtle improvement in the shape of the lips and entire perioral area as well as enhanced facial architecture.
Fig. 27-21. A and C. Preoperative views. B and D. Postoperative views 2½ years after upper and lower blepharoplasty, rhytidectomy, and volumetric augmentation were performed. By producing a slight convexity to the midface, volumetric augmentation has been able to provide a more vibrant and youthful appearance as well as to improve the results of rhytidectomy.


