Background: The anthropometric proportions of the maxillofacial skeleton are the foundation on which facial beauty stands.

Objectives: In this article, a procedure for facial cosmetic enhancement of young patients with varying degrees of structural hypoplasia with the use of multiple facial implants is reported.

Methods: Subjective criteria for beauty, proportion, and harmony were used by the author as a basis for modifying the structural architecture of the face. Between 1 and 5 alloplastic facial implants per patient were placed in a single procedure.

Results: Since 1989, a total of 500 implants have been placed in 258 patients, with excellent results and a low incidence of complications.


Although the achievement of beauty is the fundamental goal of facial cosmetic surgery, the concept of beauty is quite abstract and difficult to define. We define facial beauty as the perception that a face is proportionate and demonstrates a harmonious relationship among its various anatomic components, highlighted finally by the delicacy of the facial details. Moreover, it is the face that defines our unique identity and at the same time differentiates us unequivocally from our fellow human beings.

The anthropometric proportions, structural architecture, and spatial relationships among the various anatomic components of the maxillofacial skeleton generate a visual impact that creates a phenotype that ultimately projects our own very personal visual and perceptual image. It is then probably true to state that it is this facial architectural disposition that is the pillor on which the perceived facial beauty of any given individual depends. If we can surgically modify these spatial relationships, we can generate truly profound cosmetic changes that can yield a new image, a new phenotype. Facial aesthetic surgery is therefore the art and science of creating such balance, proportion and harmony.

The pioneering work of Dr. Paul Tessier and the many others who followed him has demonstrated the effectiveness of craniofacial surgery in modifying the spatial proportions of the maxillofacial skeleton. These modifications produce a range of changes, all of which influence the final cosmetic outcome. Although there are innumerable variations among the common structural anatomic components of the maxillofacial skeleton that yield a vast number of different and distinct phenotypes, a particular series of features and characteristics is common to a large part of the population. Structural osseous hypoplasia, which can be expressed as a deficient mid-maxillary-paranasal projection or retrusive labio-columnellar angle, is frequently associated with microgenia and mandibular retrusion. Together these findings may result in a “deflated” or “sad-looking,” prematurely aged face.

In my experience, many patients, ranging from their early teens to late thirties or even early forties, seek facial improvement without a firm understanding of their wants or needs. Most of these patients are not yet candidates for a full face lift. They often focus on the nose or eyelids. However, I have found that many demonstrate some degree of maxillofacial hypoplasia, which must be addressed for the overall harmony and proportion of the face to be improved. The purpose of this article is to demonstrate how the plastic surgeon can enhance the maxillofacial skeleton with the use of multiple alloplastic implants placed simultaneously in the adult who presents with a degree of structural hypoplasia.
In my early years of surgery, I offered just the rhinoplasty and blepharoplasty the patient thought he or she needed. After years of practice and many “halfway good” results, I learned to perceive the face as an integral unit. This was largely a result of the influence of many outstanding colleagues, with Terino the unequivocal leader. I believe it is the task of the plastic surgeon to take an integral approach to aesthetic surgery to obtain excellent, not merely “halfway good,” results.

Materials and Methods

The authors of previous studies have tried to measure and standardize the “ideal” anthropometric relations of the human face. This ideal, of course, does not exist. It is only a general guide and a changing trend modified by a series of variables such as time, age, sex, culture, and, above all, subjective judgment.

In this study, I have used my own perception of beauty and proportion when evaluating the need for cosmetic enhancement or modification of the contour or structural architecture of the face. No preoperative radiologic studies or cephalometric analysis or measurements were performed in patients, other than preoperative and postoperative photography.

I have been using alloplastic implants since September 1989. At first such implants were used only selectively. Today, placement of Medpore (Porex Surgical, Newman, GA) alloplastic implants has become a routine means of treatment in young adult patients seeking facial enhancement who present with variable degrees of structural hypoplasia of the maxillofacial skeleton, be it a sole treatment, a complement to a previous cosmetic procedure, or in association with a concomitant aesthetic procedures. To date, some 500 implants have been placed (Table 1) in some 258 patients of both sexes, ranging in age between 14 and 85 years. A diverse combination of implants has been used, including chin, malar, and paranasal implants, ranging from 1 to 5 implants placed in a single procedure.

Surgical Technique

Patients were placed on a rigorous oral hygiene program, beginning 2 days before surgery, that included frequent mouth washes with a topical antiseptic. Administration of broad-spectrum oral antibiotic (sulbactam/ampicillin) was also initiated 2 days before surgery and was maintained for 3 days after surgery. Surgery was nearly always performed with the patient under general anesthesia; in rare cases, minor procedures were performed while the patient was under intravenous sedation and local anesthesia. The approach to the midface was always through the gingival buccal sulcus. Separate 2- to 3-cm incisions were made in each sulcus, with care taken not to join them in the midline (Figure 1). An ample pocket in a strictly subperiosteal plane was dissected, with care taken to avoid injury to the infraorbital nerves. Once the implant was in place, it was properly secured with a single 7- to 9-mm screw (Mondeal, Tuttlingen, Germany). Thorough irrigation preceded closure of the mucosa, which was carried out with interrupted 4-0 chromic gut sutures. No drains were left.

Chin implants were always placed through an external submental transcutaneous approach, situated in a strictly subperiosteal tunnel and avoiding the mental nerves. Each chin implant was fixed with 2 screws. Closure of the deep soft tissues was accomplished with interrupted 5-0 Vicryl and a running 4-0 Monocryl sutures (Ethicon, Inc., Somerville, NJ) for the skin; again, no drains were left. All other concomitant surgical procedures were car-

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Table 1. Facial implant procedures

<table>
<thead>
<tr>
<th>Kind of implant(s)</th>
<th>No. implants per patient</th>
<th>Total patients</th>
<th>Total implants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chin</td>
<td>1</td>
<td>132</td>
<td>132</td>
</tr>
<tr>
<td>Paranasal</td>
<td>2</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>Malar</td>
<td>2</td>
<td>35</td>
<td>70</td>
</tr>
<tr>
<td>Malar/chin</td>
<td>3</td>
<td>18</td>
<td>54</td>
</tr>
<tr>
<td>Paranasal/chin</td>
<td>3</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td>Malar/paranasal</td>
<td>4</td>
<td>30</td>
<td>120</td>
</tr>
<tr>
<td>Malar/paranasal/chin</td>
<td>5</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>258</td>
<td>500</td>
</tr>
</tbody>
</table>

Figure 1. The right-side pocket was dissected in a strict subperiosteal approach for the implantation of malar and paranasal implants. The edge of the pyriform fossa can be seen.
ried out in standard fashion, either before or after placement of the implants, depending on technical needs and the surgeon’s personal preference.

**Results**

Figures 2 through 5 illustrate a series of patients, all of whom demonstrated varying degrees of maxillofacial hypoplasia, who received 3 to 5 facial implants, either as a sole means of treatment or in combination with or as a complement to other cosmetic procedures. All of these patients refused any form of skeletal maxillofacial surgery.

**Complications**

Even though the surgical procedure itself is quite straightforward, it can pose a series of cosmetic and technical problems; facial implants are, after all, foreign bodies. Probably the single greatest challenge is the final cosmetic appearance. In my experience, if an accurate...
preoperative diagnosis is made and the patient is thoroughly informed before surgery (I usually show prospective patients results of similar cases), the final result is usually highly gratifying.

Technical problems include asymmetries, extrusion, and infection (Table 2). Some degree of asymmetry is present in almost everyone’s face, although these differences are generally subtle and hardly noticeable to the casual eye. Such asymmetries should be specifically pointed out to a prospective patient during the consultation.

Because Medpore is such a hard and unmalleable material, opposing implants occasionally do not fit precisely to their osseous counterparts and must be carved during surgery. On rare occasions, I have used asymmetrically shaped and sized implants to camouflage and minimize this problem.

Infection and extrusion usually go hand in hand. Even though the porous quality of Medpore theoretically allows for tissue ingrowth and tight fixation to the bone, minor asymmetries do permit the surrounding scar tissue.
to slowly and steadily pull on the implant and finally even extrude it. In my practice, spontaneous extrusion has occurred — 4 years after surgery, in one case. In addition to inaccurate fitting, probably inadequate implant sizing and deficient soft tissue coverage are the most common causes of extrusion rather than faulty surgical technique. I have had no cases of extrusion or infection since I began fixing implants with screws 2 years ago. Inadequate soft tissue coverage and communication to the oral cavity pave the way for infection. Medpore itself is quite resistant to spontaneous contamination in the absence of faulty soft tissue coverage and in the presence of adequate routine antibiotic coverage.

**Discussion**

There are many alternatives to alloplastic implants available to the aesthetic surgeon, including osteotomy and a variety of filler materials. Although good results have been achieved with such methods, all have serious drawbacks.
Osteotomy

Osteotomy has several disadvantages for the patient. It involves major surgery, and its results are difficult to modify or reverse. Osteotomy also is expensive in my opinion, entails greater surgical risk, and requires a high degree of expertise on the part of the surgical team.

Fillers

Autologous materials are readily available. Although some excellent results have been published, especially with fat injections, the benefits of these materials are neither predictable nor long-lasting. In my experience, heterologous injectables (soft tissue fillers) are easy to apply but cumbersome and moderately expensive. They are also prone to contour irregularities, asymmetries, extrusion, and infection. Poor results are difficult or impossible to reverse. The fillers frequently migrate and often have the potential for local and systemic allergic reaction.
Table 2. Complications

<table>
<thead>
<tr>
<th>Complication</th>
<th>No. of patients (%)</th>
<th>No. of implants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical revision</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hematoma</td>
<td>1 (0.38)</td>
<td>1 (0.2)</td>
</tr>
<tr>
<td>Migration</td>
<td>3 (1.6)</td>
<td>6 (1.2)</td>
</tr>
<tr>
<td>Asymmetry</td>
<td>4 (1.55)</td>
<td>10 (2.0)</td>
</tr>
<tr>
<td>Inadequate sizing/fitting</td>
<td>8 (3.1)</td>
<td>20 (4.0)</td>
</tr>
<tr>
<td>Surgical removal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient dissatisfaction</td>
<td>2 (0.77)</td>
<td>3 (1.16)</td>
</tr>
<tr>
<td>Extrusion/infection</td>
<td>7 (2.71)</td>
<td>18 (3.6)</td>
</tr>
<tr>
<td>Inadequate sizing/fitting</td>
<td>4 (1.5)</td>
<td>10 (2.0)</td>
</tr>
</tbody>
</table>

Of the various heterologous implantable materials now available, I have had previous experience mainly with polysiloxane (silicone)²³ and polyethylene (Medpore).²⁴, ³⁰ Early in my practice, my first implants (mostly chin implants) were of silicone. After a couple of years I abandoned the use of silicone implants because they eroded the bone,²⁴, ³⁶ with adverse consequences and loss of projection.

Since then I have used Medpore implants. They are available in a variety of shapes and sizes, are simple and safe to use, and do not require specialized equipment or an elaborate surgical team (I require the assistance of only a scrub nurse). They are cost-effective, stable, biocompatible, predictable, long-lasting, tissue-integrated, and 100% reversible. There is no evidence of bone erosion associated with these implants.³⁰

Medpore implants are also resistant to infection, migration, and extrusion. However, the available shapes and sizes do not fulfill every patient’s needs precisely, the implants can be difficult to shape to fit adequately and smoothly against their osseous counterparts because of their hardness, and they require a longer surgical incision than similar malleable implants.

**Conclusion**

With the use of a careful preoperative plan, alloplastic implants can enable the surgeon to improve facial contour with a minimum of complications and a high degree of patient satisfaction. Implant materials that are exactly the right form, size, and shape to serve any given need are still lacking. Until they are developed, Medpore facial implants, although not ideal, probably come the closest among the leading options on the market.

This paper is dedicated to Oscar Ulloa-Gregory, MD, former Chief of Surgery and head of the Department of Plastic and reconstructive Surgery at the University Hospital, Monterey, Mexico, for being an indefatigable fighter, inspiring hard and dedicated work, and accepting nothing less than excellence.

**References**


Accepted for publication July 23, 2003.
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Copyright © 2003 by The American Society for Aesthetic Plastic Surgery, Inc.
1090-820X/2003/$30.00 + 0
doi:10.1016/j.asj.2003.91