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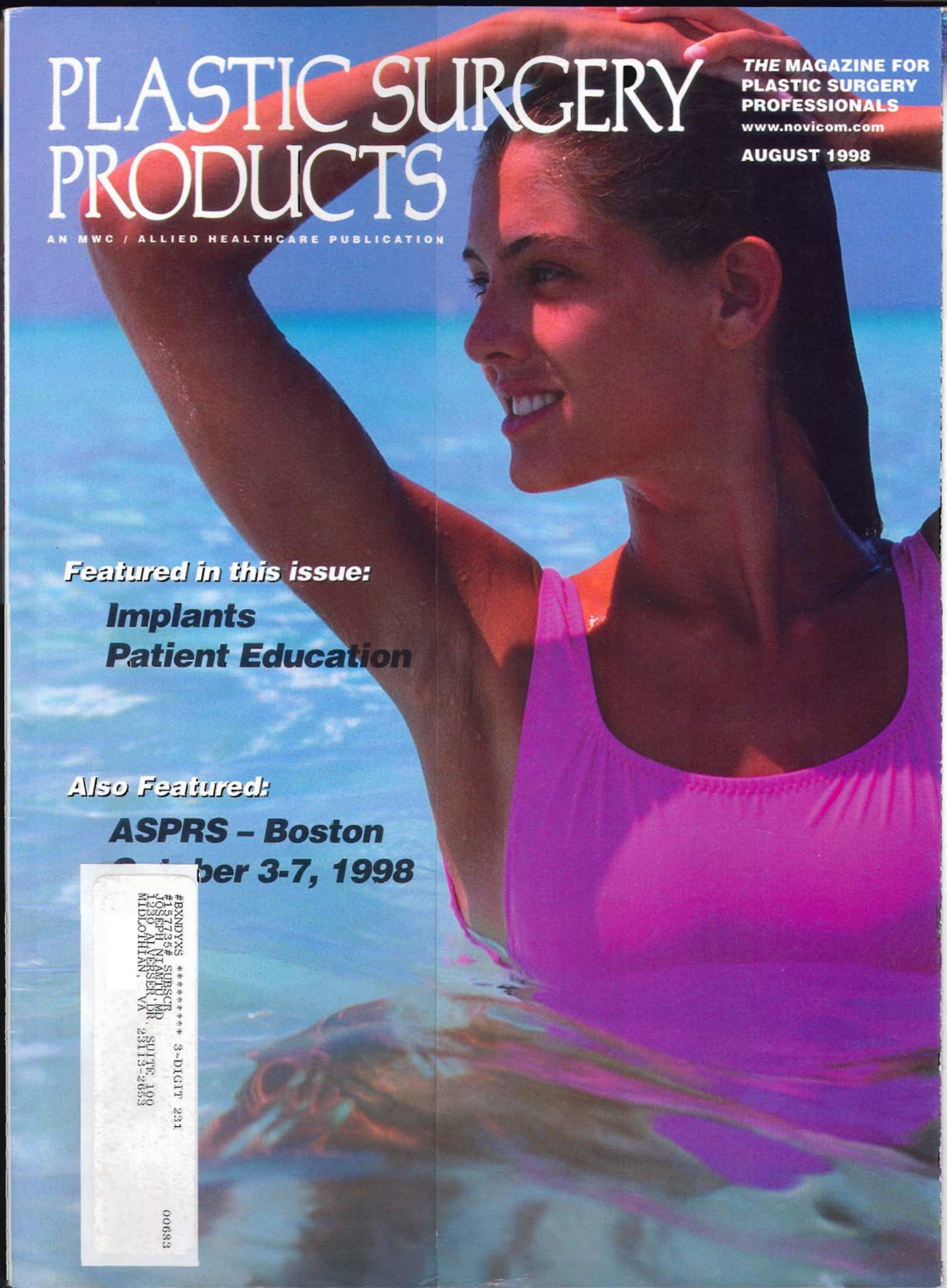

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Implants
Patient Education

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ASPRS – Boston
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Implant Applications for Cosmetic Facial Surgery

by Joseph Niamtu, III DDS

Reconstructive, augmentative and cosmetic options in cosmetic facial surgery frequently require filler materials and an ongoing debate has existed for centuries between autogenous and alloplastic materials. Many clinicians are diametrically opposed to the alternative of their school of thought, while many practitioners are somewhere in between. The literature is replete with supporting documentation of natural and artificial materials so in essence, everyone is correct.

Even though, I at times, use autogenous materials for cosmetic or reconstructive augmentation, I have, for the past 15, years used alloplastic materials with a high degree of success in various facial applications. When challenged by colleagues on this issue, my standard answer has always been "this procedure with this material has worked well in my hands." I truly feel that as long as one is using standard care of treatment and materials, many positives exist for alloplastic augmentation.

Although the touchstone for any alloplast is minimal tissue reaction and longevity, my personal list of an ideal material would be as follows:

1. A material certified by the FDA for implantation in humans.
2. A biocompatible material with proven histological studies to support minimal tissue reaction and longevity in use in humans.
3. A material that is pliable enough to tolerate a natural feel as well as to have the ability to permit movement of surrounding tissues without failure.
4. A material which will allow a degree of tissue ingrowth to assist in securing the implant to prohibit migration, but not to such a degree that implant removal is impossible or destroys extensive native tissues upon removal.
5. A material that possesses the physical properties that allow production of various morphologic shapes, sizes and forms to accommodate anatomic variety as well as rigid and non-rigid forms.
6. A material that is easily altered by the surgeon at the time of placement without the need for special armamentaria.
7. A material that can withstand conventional sterilization techniques.
8. A material that is permanent and does not resorb.
9. A material that is cost-effective.

Gore-Tex is the trade name for expanded polytetraflouroethylene which was developed by W.L. Gore in 1969. This material is well known for its hydrophobic qualities in rain wear. The structure is such that the material is impermeable to water, but due to the microfibrillar structure, allows breathability. This material is made in a paste and extruded through a dye which presents the unique structure of e-PTFE nodes connected by fibrils. The pore size of this material varies from 10-30 microns. This pore size allows sufficient soft tissue ingrowth to anchor implants, but not so much as to make removal difficult or destructive to adjacent structures. In addition, the e-PTFE polymer has a bond with four fluorine atoms which imparts the nonstick surface.

"The doctors that favor extraoral incision usually place considerably smaller implants than do those who favor intraoral implants."

This material has been used for almost 30 years for vascular and general surgical applications. More than five million vascular grafts have been placed without a single case of rejection.

Recently, e-PTFE has been approved for use in subcutaneous augmentation and has many facial cosmetic and reconstructive applications. e-PTFE is not approved for the use in the augmentation of lips, but has been reported in multiple publications without complication. Tissue necrosis has been reported in lip applications but the positive reports vastly outweigh the few reported complications.

Augmentation Genioplasty

Many materials have been used with success in cosmetic augmentation of the chin. In addition, many surgeons use external approaches while in-

traoral approaches are also common. I prefer the intraoral approach for a variety of reasons. Number one, there is no scar on the skin. The external incision is small, but this precludes placing a substantial implant and also does not allow great exposure, manipulation or anchorage. The doctors that favor extraoral incision usually place considerably smaller implants than do those who favor intraoral implants. I personally feel that many implant failures are a result of mobility and with any implant anywhere in the body, fixation is imperative. I have treated a number of failed implants placed through extraoral skin incisions and all of them have had granulation tissue encapsulation with a pocket much larger than the size of the original implant.

In addition, many of the implants placed through extraoral incisions are quite small in order to accommodate the tiny incision and because of this, do not cover enough area on the chin and parasymphysis areas. With these small implants and the limited incision, the surgeon has less control of the position of the implants which may be important in lengthening the chin or increasing lower facial height.

I perform sliding osteotomy augmentation and reduction genioplasty, but usually reserve this procedure for very large deformities, vertical augmentation or patients that deny implanted materials.

Proplast, methylmethylacrylate, polyethylene, silastic and gortex have all been used with good success. Beginning in 1996, we have used Gore-Tex exclusively for alloplastic augmentation genioplasty.

The operative procedure is performed in the office environment using sedation and local anesthesia. The patient begins oral cephalosporins 24 hours preoperatively and also is prescribed a tapering dose or oral steroids.

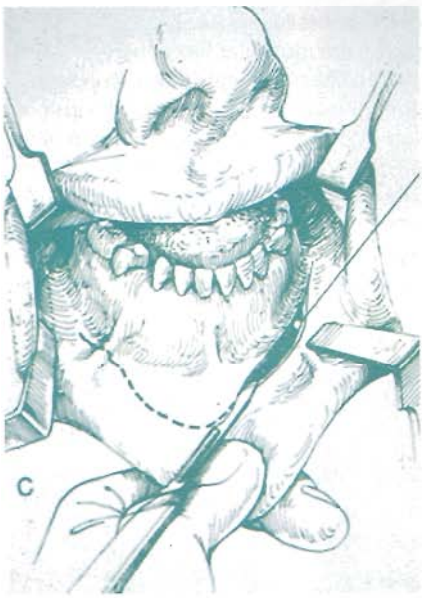

Figure 1 – Mucosal genioplasty incision.

In virtually every case of chin augmentation, submental liposuction is first performed. Many microgenic patients have lipodystrophy in this area which greatly enhances the end result. Even in those patients that do not have excess submental fat, the liposuction produces a more favorable soft tissue drape to cover the implant and releases tension over the implant. Care must be used to place the liposuction incision a little more posteriorly on the neck, as it will move foreword after the implant placement. If the standard submandibular crease is utilized, the incision may end up being visible. This is obviously more relevant if open lipectomy or platysmaplasty is performed with the chin implant.

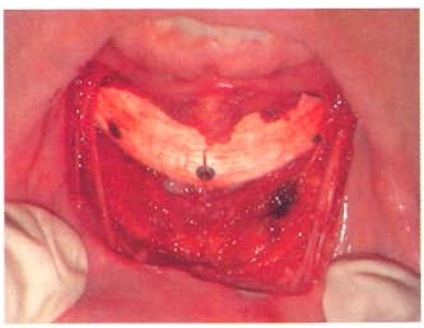

Figure 2

Operative Sequence

The lower lip is retracted and the intraoral submucosa and mentalis regions are anesthetized with 2 percent lidocaine and 1:100K epinephrine and a mucosal incision is made with an electrocautery approximately 1 cm anterior to the depth of the vestibule (Figure 1).

At this point, blunt dissection is performed with fine hemostats to identify the

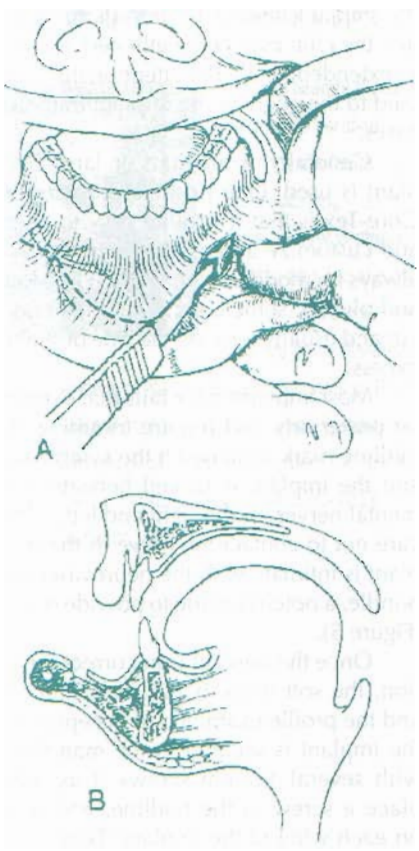

Figure 3

labial branches of the mental nerve (Figure 2).

These branches are dissected and retracted laterally. The orbicularis and mentalis layers are incised obliquely to the mandible (Figure 3). At this point, subperiosteal dissection is performed and the mental nerve and foramen are identified bilaterally. In most cases, lateral mandibular augmentation is desired and a freer elevator is used to dissect a tunnel inferior and posterior to the mental foramen to accommodate the implant tail (Figure 4).

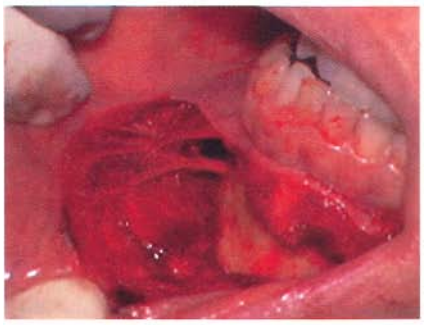

Figure 4

I also dissect just past the inferior border of the mandible in the chin area. This is especially important in cases which require vertical augmentation of the lower 1/3 of the face. By extending the implant inferior to the inferior border, the chin may be lengthened as well as extended. Particular attention must be paid to the angle of the implant in these cases.

Generally, a medium or large implant is used. One positive property of Gore-Tex is that it is quite easy to alter and customize and a large implant can always be modified. Since e-PTFE is soft and pliable, some compression can occur and usually error on the side of slight excess.

Most implants have tails that extend far posteriorly and require trimming. A midline mark is made on the symphysis and the implant is tucked beneath the mental nerves on the right and left, with care not to contact the nerve. If the implant is intimate with the neurovascular bundle, a notch is made to provide relief (Figure 5).

Once the implant is in correct position, the soft tissue is passively draped and the profile examined. If acceptable, the implant is secured to the mandible with several 12 mm screws. I usually place a screw in the midline, and one on each wing of the implant (Figure 6). At this point, the surgical site is irrigated

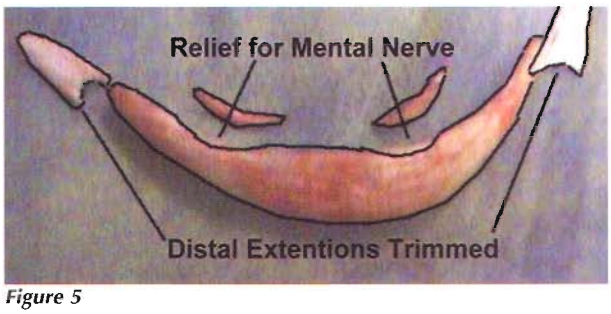

Figure 5

with an antibiotic solution and the layers are closed. It is absolutely imperative to approximate the mentalis musculature or lip incompetence with excessive show of the lower incisors can occur. Figure 7 shows the muscular layers being closed.

I also feel strongly that a proper post-operative dressing will assist the end result. We place tape in two directions (Figure 8) and then use a facial sling to compress the chin and liposuction surgical sites. I recommend continuous wear for five days and evening wear for two weeks. Resorbable sutures are utilized so

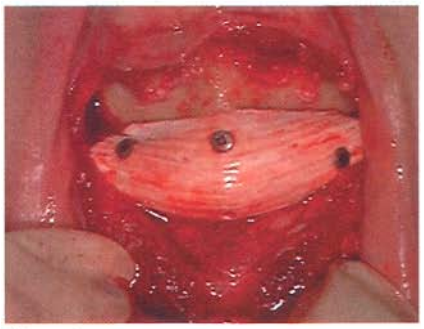

Figure 6

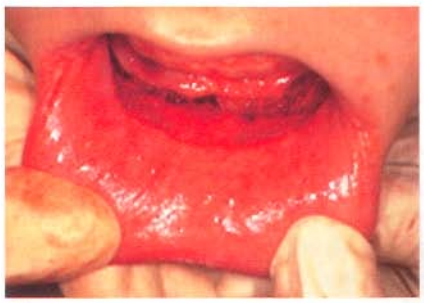

Figure 7

no removal is necessary. The patient is cautioned against pulling the lip down to examine the surgical site as this may violate the suture line. Post-operative antibiotics and steroids are used for five days.

Figures 9 and 10 illustrate combined cases of Gore-Tex and submental liposuction. No cases of infection have resulted in more than 40 Gore-Tex facial implants. No cases of permanent paresthesia have been encountered, although one patient has experienced unilateral dysesthesia.

Even though resorbtion of the anterior mandible can occur with alloplastic or sliding genioplasty, I have not seen this to be clinically significant. I feel that the implant fixation prevents excessive bone resorbtion, possibly by limiting implant movement and providing less inflammatory response. Additionally, some surgeons place the implant too high on the chin and overlie the thin bone that covers the lower incisors. This can accelerate osteolysis, whereas the cortical bone on the lower chin is quite thick.

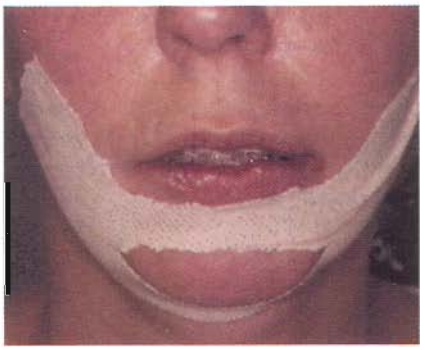

Figure 8

Malar Augmentation

Much of what can be said about chin implant placement also applies to malar

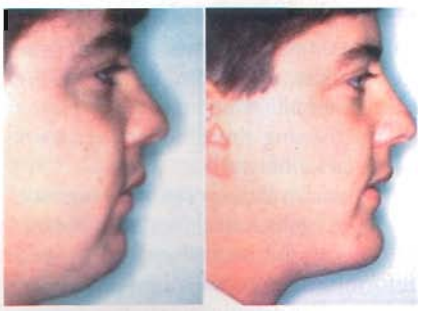

Figure 9

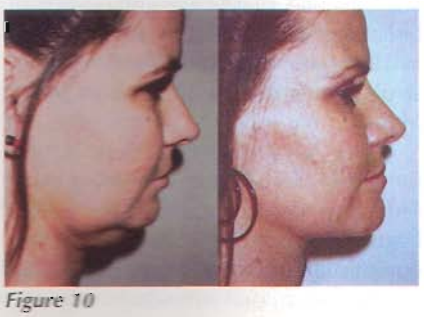

Figure 10

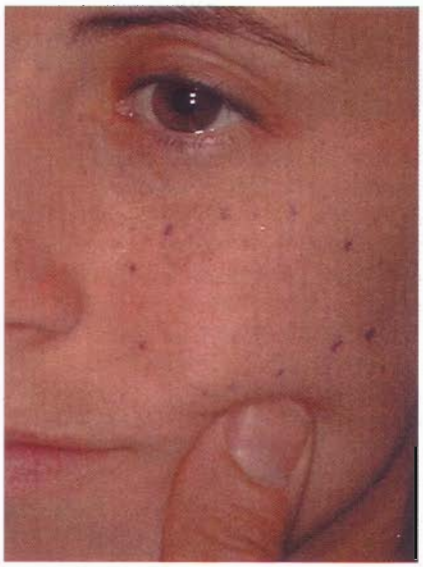

Figure 11

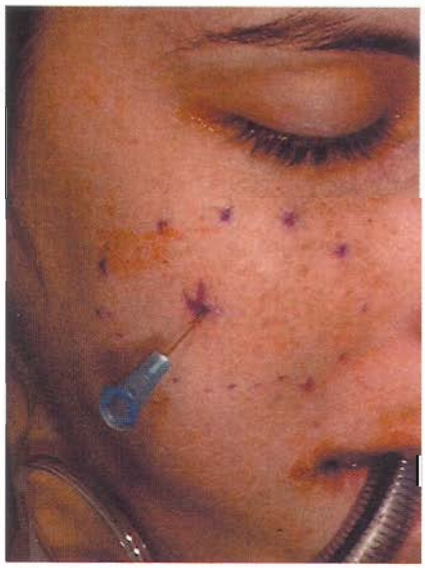

Figure 12

augmentation. I feel that the single most common problem with malar augmentation is using too large of an implant. Most malar implants are quite large and have extensive area in the infraorbital area. Some implants even have notches to circumvent the infraorbital nerve. Placing an implant with this type of configuration can create a shelf anterior to the orbital rim, making the patient appear to have sunken eyes.

Although many different clinical measurements exist to describe malar prominence, I feel that this should be customized for each patient. I always give the patient input in the specific regions to be augmented. I have found a simple means of determining the area of maximum

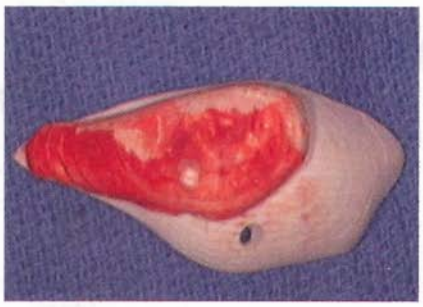

Figure 13

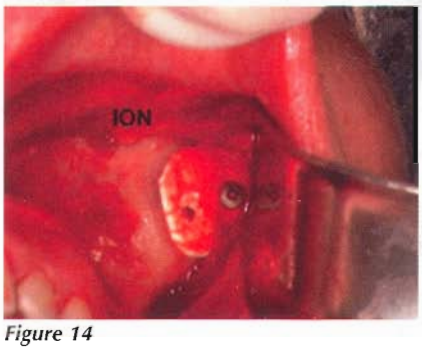

Figure 14

augmentation by placing a finger over the most hypoplastic area and elevating the cheek to an acceptable position. At this point, markings are made to guide the actual implant placement (Figure 11). When placing the malar implant, a 25 gauge needle is placed through the skin at the area of maximum augmentation to guide the exact implant placement (Figure 12).

I usually use a small or medium implant and perform extensive reduction in all dimensions. I feel strongly that a small well-placed implant will provide a more natural end result and many patients are over-augmented and have an unnatural appearance. Misplacing the area of maximum augmentation will also provide an unnatural clinical result.

The malar implants are usually performed in the office with IV sedation. The canine fossa area is injected with local anesthethetic and vasoconstrictor and a full thickness mucoperiosteal incision is made 1 cm above the mucogingival junction and the canine fossa is exposed. The dissection exposes the infraorbital nerve and extends laterally to the zygomatic arch. If more posterior lateral augmentation is required, a tunnel is made along the zygornatic arch to accommodate the implant tail.

The Gore-Tex implants are trimmed from their original shape into a teardrop shape (Figure 13) and reduced in thickness if necessary. Again, I extensively trim the implants and feel that subtle augmentative change ensures a more natural result.

As with chin implants, I anchor each malar implant with a single 8 mm screw (Figure 14). I try to place the screws in the thick bone of the zygomatic buttress as opposed through the thin bone overlying the maxillary sinus. I have had a malar implant betome infected from a tract through the maxillary sinus. The surgical site is irrigated with antibiotic solution and the incision is closed with resorbable sutures in a single layer. No external dressing is placed.

Alternate Implant Applications

Advancing technology has given me an increased variety means of dealing with the reconstruction of cosmetic or traumatic defects. CAD/CAM (computer assisted design/computer assisted manufacturing) technology provides a means of producing customized facial implants specific to the patient's anatomy and required level of augmentation.

Although this technology is readily available, its expense is usually prohibitive for routine facial augmentation. More often, in my experience, these applications are used with post-traumatic or congenital facial defects which are covered by insurance. ■

ABOUT *the author*

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