

Lip Augmentation with Superficial Musculoaponeurotic System Grafts: Report of 103 Cases

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Many patients suitable for a lip augmentation are of face lift age, and could benefit from a simultaneous lip enhancement during the rhytidectomy procedure. The healthy, live superficial musculoaponeurotic system (SMAS) tissue obtained from the face lift can be recycled and grafted with minimal additional operating time. From April of 1995 to January of 2000, 103 patients (99 women and four men) underwent a lip augmentation procedure by the senior author (N.L.) using SMAS grafts harvested from a simultaneous rhytidectomy. Indications for surgery were purely aesthetic in all 103 cases. The surgical technique used for the SMAS graft lip augmentation is as follows: Using a narrow tenotomy scissors, an intramuscular tunnel was created with blunt and sharp dissection across the lip. The graft, obtained from the posterior edge of the SMAS dissection, is left as long as possible, and is pulled through the tunnel with a tendon forceps. The lips are then stretched manually from the central point upward and downward, respectively. It is important to avoid suturing the ends of the graft into the closure; the grafts should be allowed to move freely, to avoid postoperative tethering on smiling or mouth opening.

Most patients expressed some initial concern with their early appearances caused mainly by the swelling. By 2 weeks, most patients were extremely pleased with the size and shape, and their main concern was that the lip fullness would shrink even more. By 3 to 4 weeks, shrinkage largely ceased and the correction remained for varying periods, some as long as 5 years. A sampling of the results was obtained by means of a questionnaire mailed to all patients having undergone the SMAS graft lip augmentation. Fifty-four patients (52 percent) returned the questionnaire with their responses. Of those who responded to the survey, 42 patients (78 percent) reported fuller lips than before their operation. Significantly, 11 of 14 patients (79 percent) followed up after 24 months postoperatively reported fuller lips and excellent or good results. Complications and unsatisfactory results were very rare, occurring generally at the beginning of the learning curve of the series.

SMAS grafts are useful for long-lasting lip augmentation, producing a youthful appearance by adding nat-

ural, soft roundness and fullness to lips without the artificial look and feel of synthetic material. (*Plast. Reconstr. Surg.* 109: 319, 2002.)

The soft, full, rounded lips of youth have been a recurring goal in aesthetic surgery, but few techniques have been reported to give a reliable, lasting effect. The growing and, it is hoped, soon-to-be-waning use of synthetic materials has proven to be unacceptable and even disastrous in a large percentage of patients. These patients, lured by slick advertising and by the momentum of a device-driven marketing campaign, have suffered a sadly familiar variety of problems, the commonest and most benign being artificially hard, ridged, and immobile lips that only under the most desperate circumstances would pass the "kiss test."

Various allograft or xenograft products produce acceptable but brief improvement. Injectable collagen, either bovine or human, is the mainstay of lip enhancement in the United States, but the pain and the need for repeated injections prove to be limiting. Cadaver dermis is readily available, but longevity of results is disappointing. Autologous live-tissue grafting is most desirable in these circumstances; yet within this category conflicts abound. Temporalis fascia does not have the desirable thickness or pliability, and dermal or dermal-fat grafts,^{1,2} although they may produce acceptable results with proper technique, require a donor site, with attendant potential problems.

Since many, although certainly not all, pa-

tients suitable for lip enhancement are of face lift age,^{3,4} it would be appropriate to consider using tissue readily available during the rhytidectomy procedure. The popular SMAS-based face lift procedure provides an ample source of this material for lip augmentation. SMAS grafts in lips have been mentioned briefly in the past, and their usage has been demonstrated for augmentation of the nasal dorsum.⁵ SMAS is potentially an ideal soft-tissue graft material,⁶ consisting of fascia and varying amounts of fat and striated platysma muscle. The proportions of the components may vary widely between individuals, and also may vary depending on the location of the donor site: in the cheek, fat, and fascia predominate, whereas over the mandibular and cervical area there is mainly platysma muscle. Secondary rhytidectomies may also provide suitable material; often, however, if the SMAS has been previously undermined, the tissue is more fibrotic and less muscular. The objective of this article is to compare and evaluate the patients' responses as well as to present the benefits, longevity, and practicality of SMAS grafts when performing a concurrent rhytidectomy.

MATERIAL AND METHODS

From April of 1995 to January of 2000, 103 patients (99 women and four men) underwent a lip augmentation procedure by the senior author (N.L.) using SMAS grafts harvested from a simultaneous rhytidectomy. Upper and lower lips were augmented in 98 patients; in four patients only the upper lip was done. Results were evaluated by both patient follow-up visits and a mailed questionnaire.

Surgical Technique

After moderate subcutaneous undermining, the sub-SMAS layer is entered through an incision extending from the malar area to the prelobar area, and extending inferiorly along the anterior border of the sternomastoid muscle into the neck. The scissors dissection proceeds carefully over the parotid and buccal fat pads (some of which are teased out as needed) anterior to the zygomaticus muscle. Restraining ligaments are cut as needed for mobilization. The extent of the dissection in all cases is determined by the individual degree of correction required. After dissection is complete, the superior

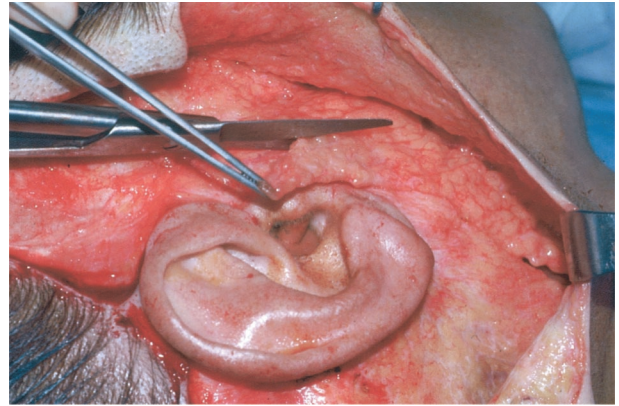


FIG. 1. Harvesting of the posterior edge of the SMAS flap, from the preauricular area into the neck.

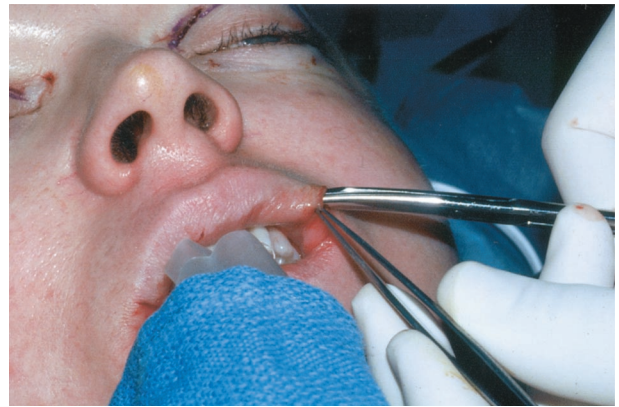


FIG. 2. Dissection of intramuscular tunnel with tenotomy scissors.

border of the flap is pulled superiorly and posteriorly and sutured with two rows of 4-0 clear nylon to the malar periosteum and the temporalis fascia overlying the zygomatic arch. At this point, the amount of redundant tissue at the posterior border of the flap can be easily assessed and excised from the superior edge all the way inferiorly into the neck, the length of the graft being determined by the extent of the cervical dissection (Fig. 1). Lengths vary from 6 to 10 cm. The grafts are wrapped in antibiotic saline-soaked surgical gauze and placed on the back table for later use. At the conclusion of the rhytidectomy operation, including any other surgical procedure such as blepharoplasty or forehead/brow lift, the lips are infiltrated with 2 cc each of anesthetic solution containing epinephrine. A 7- to 8-mm vertical incision is made in the vermilion 1 cm medial to the lateral commissure on the upper and lower lips. Using a narrow tenotomy scissors, a tunnel is created with mostly blunt dissection

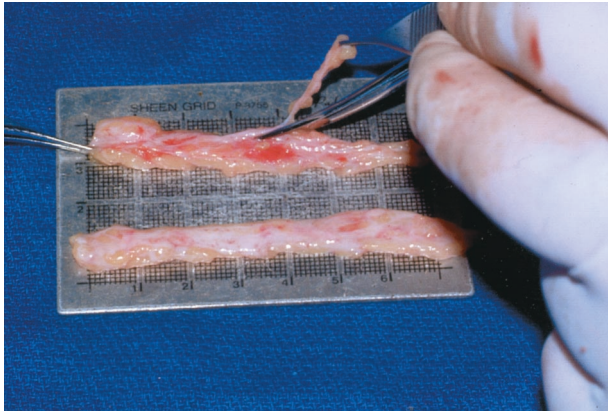


FIG. 3. Trimming SMAS grafts.



FIG. 4. Implantation of SMAS graft through tunnel with tendon forceps.

completely across the lip, care being taken to stay centered within the bulk of the muscle (Fig. 2). After the tunnel is made and bluntly enlarged with the scissors, a curved tendon forceps is inserted. The SMAS grafts are then trimmed of irregular fatty or muscular outcroppings until smooth narrow cylindrical shapes are achieved (Fig. 3). It is best to try to have each component (fascia, muscle, and fat) extend evenly across the length of the graft. The width of the graft may vary between 5 and 10 mm and the thickness between 3 to 5 mm, depending on the desired correction and the amount of material available. If greater enlargement in the center is desired, the graft can be appropriately shaped, but this must be done cautiously because of the possibility of the graft moving to one side before becoming incorporated into the lip; in most cases, a straight cylindrical shape is adequate, the desirable contour of the lip being created by the existing anatomy.

The graft is left as long as possible, usually



FIG. 5. Stretching upper lip to pull the ends of the graft into the tunnel.

6 to 8 cm, and then pulled through the tunnel with the tendon forceps (Fig. 4). Some back-and-forth manipulation of the graft within the tunnel is performed to ensure that the graft slides smoothly, thus minimizing postoperative lumps. The lips are then stretched manually from the central point upward and downward, respectively (Fig. 5). During this manipulation, the protruding ends of the graft will be seen to pull into the tunnel. The ends of the grafts are then trimmed, leaving about 1 cm excess, which is then pushed into the tunnel with smooth forceps. The incisions are then closed with three interrupted sutures of 5-0 chromic each. It is important to avoid suturing the ends of the graft into the closure; the grafts should be allowed to move freely, to avoid postoperative constriction on smiling or mouth opening.

In most cases, upper, and lower lips are augmented with grafts of approximately equal size within a similar tunnel. A larger or smaller graft may be placed in one lip or the other depending on existing lip size and relative balance, patient preferences, and graft availability.

The patient is kept on a liquid diet for 2 days and soft foods for 5 days later. Antibiotics are administered intraoperatively and for 5 days postoperatively. The mouth is rinsed with mouthwash after every meal to prevent coagulum on the sutures and subsequent breakdown of the wound. Lip movement is not restricted.

RESULTS

Between April of 1995 and January of 2000, 103 patients underwent lip augmentation with concurrent rhytidectomy by the senior



FIG. 6. An early result at 2 months. (*Above, left*) Preoperative frontal view of 62-year-old woman before rhytidectomy and lip augmentation of upper and lower lips. (*Above, right*) Postoperative view at 2 months. Note some edema still present in augmented lips. (*Below, left*) Preoperative oblique view. (*Below, right*) Postoperative oblique view at 2 months.



FIG. 7. Result at 4 months. (*Above, left*) Preoperative frontal view of lips in a 55-year-old woman before rhytidectomy, quadrilateral blepharoplasty, SMAS augmentation to the upper and lower lips, and perioral peel. (*Above, right*) Postoperative view at 4 months. (*Below, left*) Preoperative lateral view. (*Below, right*) Postoperative lateral view at 4 months.



FIG. 8. Result at 18 months. (*Above, left*) Preoperative lateral view in a 52-year-old woman before rhytidectomy, coronal brow lift, lower blepharoplasty, rhinoplasty, and lip augmentation of upper and lower lips. (*Above, right*) Postoperative lateral view at 18 months. (*Below, left*) Preoperative close-up frontal view. (*Below, right*) Postoperative close-up frontal view.

author (N.L.). Most patients expressed some initial concern with their early appearance, mainly because of the swelling. By the end of the first week, most patients had begun to accommodate to the fullness, even as the

swelling subsided. By 2 weeks, most patients were extremely pleased with the lip size and shape, and their main concern was that their lips would shrink even more—which they did. However, at the end of 3 to 4 weeks,



FIG. 9. Result at 42 months. (*Above, left*) Preoperative frontal view of a 51-year-old woman before rhytidectomy with lip augmentation of upper and lower lips. (*Above, right*) Preoperative lateral view. (*Below, left*) Postoperative view at 42 months. Note small swelling near the right end of the upper lip graft. (*Below, right*) Postoperative lateral view at 42 months.

shrinkage largely ceased and the correction remained for various lengths of time (Figs. 6 through 11). None of the patients in these photographs had any injections of collagen or other filler substance during the follow-up period.

The duration of the correction is difficult to measure precisely, inasmuch as the evaluation is not subject to double-blind studies, measurements are at best subjective, and long-term follow-up of aesthetic surgery patients is notoriously difficult. However, in postoperative evaluations ranging from 6 weeks to 5 years postoperatively, the majority of patients showed natural-appearing, soft enhancement. These findings were based on direct examination by the author and self-evaluation by the patients.

A wider sampling of the results was obtained by means of a questionnaire mailed to all SMAS graft lip augmentation patients. The questionnaire surveyed the patients' sense of lip fullness since the operation and their general evaluation of the postoperative results. Fifty-four patients (52 percent) returned the questionnaire with their responses.

Of those who responded to the survey, 42 patients (78 percent) reported having fuller lips at the time they answered the question-

naire than preoperatively (Fig. 12). Significantly, 11 of 14 patients (79 percent) followed for at least 24 months postoperatively reported fuller lips, with 11 of 14 (79 percent) of these patients reporting excellent or good results. Dissatisfaction was generally related to loss of correction and unhappiness with immediate postoperative swelling.

Complications

Complications and unsatisfactory results were rare, occurring mostly at the beginning of the learning curve of the series. One patient had prolonged (9 months) dysesthesia, with a disquieting combination of discomfort and numbness. A second patient had a prolonged (6 months) fatty bump in the upper lip, the secondary excision of which gave the opportunity to show the presence of transplanted fat (Fig. 13). One patient (Fig. 9) noted a small swelling near the end of the upper lip graft that became more visible after 3 years, most likely caused by irregular graft resorption around a nonresorbed area. Treatment in this case was by injection of a small amount of collagen around the prominence (after the postoperative photographs were taken). Two patients experienced some irregularity of the lip surface on puckering. In all of these early cases,



FIG. 10. Result at 45 months. (Above, left) Preoperative view of a 49-year-old woman before rhytidectomy with SMAS grafting to upper and lower lips. (Above, right) Preoperative oblique view. (Below, left) Postoperative view at 45 months. (Below, right) Postoperative oblique view. Note the mild asymmetry and whistle deformity present preoperatively, with similar asymmetry postoperatively.

attempts had been made to keep the tunnel close to the overlying vermilion skin rather than deep in the muscle. These problems did not occur once the level of tunneling had deepened. There were no infections, hematomas, paralyses, or permanent anesthetics.

CONCLUSIONS

SMAS grafts harvested during rhytidectomy have substantial long-term benefits in lip en-

hancement. The procedure gives a long-lasting, natural, soft roundness and fullness to the lips, without the artificial look and feel of synthetic material. SMAS grafts produce pliability and longevity that are essential in lip enhancement. Positive feedback expressed in the patients' returned questionnaires and excellent results seen in long-term follow-up support the overall effectiveness of this operation in appropriately selected face lift patients.



FIG. 11. Result at 54 months. (Left) Preoperative view of a 62-year-old woman before rhytidectomy, quadrilateral blepharoplasty, and SMAS graft augmentation of upper lip only. (Right) Postoperative view at 54 months. The fullness in the upper lip is still present and visible.

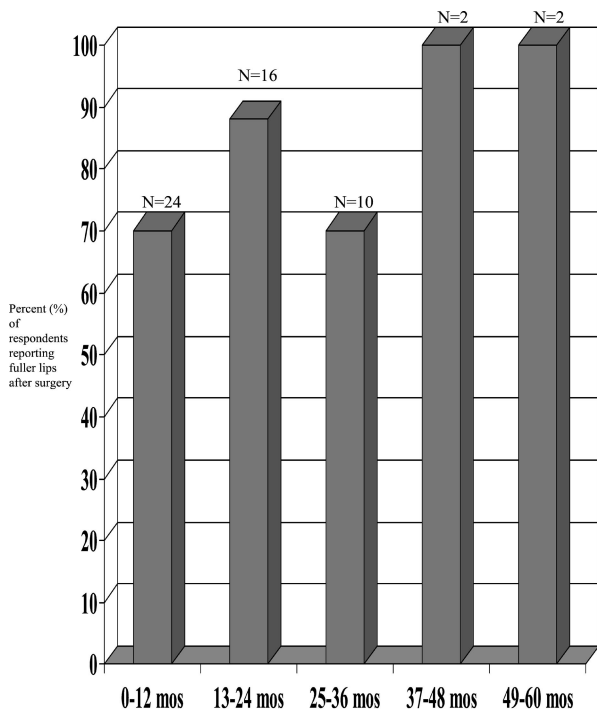


FIG. 12. Questionnaire results: percentage of respondents reporting fuller lips. Postoperative months in 12-month intervals. N, number of respondents that had the SMAS graft lip augmentation during 12-month period of time.

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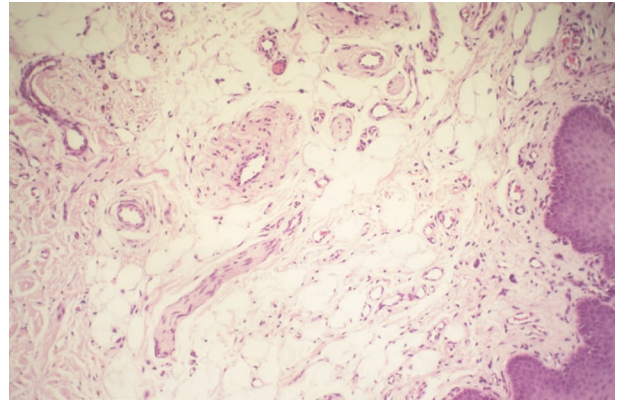


FIG. 13. Histologic section: lip glands and viable grafted fat cells.

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