



Ear Lobule Rejuvenation in Face-Lifting: The Role of Fat Augmentation

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Background: Ear lobule ptosis and deflation are characteristics of facial aging. A rhytidectomy without rejuvenation of a deflated ear lobule may fail to address all aspects of facial aging. Fillers have been used to treat ear lobule deflation; however, autologous fat transfer has never been utilized for ear lobule rejuvenation. This investigation studies the success of autologous fat transfer to the ear lobule as part of volume augmentation rhytidectomy.

Methods: A retrospective review of patients who underwent rhytidectomy between 2000 and 2014 by a single surgeon was performed. Patients between 2000 and 2004 who did not receive autologous fat transfer served as controls (group A). Patients between 2010 and 2014 who received autologous fat transfer to the ear lobule formed the treatment group (group B). Three independent observers reviewed preoperative and postoperative photographs for both groups at 1 year postoperatively. The following ear lobule volume grading scale was applied to numerically assess the patients: concave = 0, flat = 1, convex = 2, and round = 3.

Results: Groups A and B each consisted of 65 consecutive patients (130 ears). In group A, the mean preoperative ear lobule grading score was 1.20, and the mean postoperative score was 1.22 (mean difference, 0.02; $P = 0.42$). In group B, the mean preoperative ear lobule grading score was 0.98, and the mean postoperative score was 2.00 (mean difference, 1.02; $P < 0.0001$).

Conclusion: In patients receiving autologous fat transfer to the ear lobule during rhytidectomy, there was a significant change from a deflated ear lobule preoperatively to a more voluminous lobule at 1 year postoperatively. (*Plast Reconstr Surg Glob Open* 2016;4:e597; doi: 10.1097/GOX.0000000000000476; Published online 22 January 2016.)

The ear is an aesthetically important and defining feature of the face, as evidenced by a common location for jewelry. Recently, authors have focused on the morphology of the lobule and

its associated changes with aging.¹⁻⁶ The lobule is a fibrofatty structure devoid of cartilage. The youthful lobule is 1.5–2 cm in length, and the ratio of its length to the long axis of the ear is 25–30%.^{7,8} Mowlavi et al² have characterized the lobule as having 2 components: attached cephalic segment and free caudal segment. They report that the free caudal segment elongates with age, whereas the attached cephalic segment remains relatively unchanged.⁴ Surgical techniques have been designed to correct ear lobule ptosis by reducing the free caudal segment.^{9,10}

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However, less attention has been directed toward the deflated volume of the lobule with aging.

The aesthetically ideal ear lobule is elastic and voluminous with a convex or round projection in a plane perpendicular to the face. The aged lobule is elongated and flaccid with a flat or concave appearance in the profile view. Previous publications have documented that lobule ptosis and deflation are aesthetically undesirable.^{2,11-13} Deflation of the ear lobule is synonymous with facial aging secondary to concurrent loss of elastic fibers and gravitational pull.^{1,14} Thus, a rhytidectomy without lobule rejuvenation may fail to address all the components of facial aging and yield an incomplete result.

Bioengineered fillers have been used recently to successfully treat ear lobule deflation with improved lobule aesthetics and overall facial rejuvenation.¹¹⁻¹³ However, these fillers have numerous disadvantages, including high cost, temporary effect requiring maintenance treatments, and potential hypersensitivity reactions to foreign material.^{12,15} Despite its reported success in facial contouring, autologous fat transfer has never been described for ear lobule rejuvenation. The advantages of autologous fat transfer include little to no cost, permanence of effect, use of patients' own tissue, and potential stem cell rejuvenation of the overlying skin.^{15,16} This investigation studies the success of autologous fat transfer to the ear lobule as a complement to volume augmentation rhytidectomy.

METHODS

A retrospective chart review was conducted on an institutional review board-approved database of patients who had an individualized component rhytidectomy between 2000 and 2014 by the senior author (R.J.R.). Patients underwent either superficial musculoaponeurotic system (SMAS) "stacking" (modified imbrication) or SMASectomy; the indications for each were described in a previous study.¹⁷ Patients who did not have autologous fat transfer served as controls between 2000 and 2004 (group A). Patients who received autologous fat transfer to the ear lobule were identified between 2010 and 2014 (group B). Patients who received bioengineered fillers to the ear lobule within a year of operation or who underwent surgical reduction of the lobule were excluded from the study.

For the autologous fat transfer cohort, adipose tissue was harvested from either medial thigh or central abdomen using a 10-mL syringe attached to a 14-gauge cannula. No wetting solution was used. Lipoaspirated fat was centrifuged at 1200 rpm for 3 minutes, followed by oil and blood removal. Approx-

imately 1 mL of the concentrated fat was transferred to each ear lobule using a 22-gauge, 1.5-inch needle and a 1-mL syringe. The needle was inserted at 2-3 sites along the anterior surface of the lobule, and the fat was injected into the central mound; the injected fat was manually massaged for uniform distribution (See video, Supplemental Digital Content 1, which shows a video of fat injection to the left and right ear lobules being performed during rhytidectomy. <http://links.lww.com/PRSGO/A161>). Patients were instructed to avoid wearing earrings for 2 weeks postoperatively after fat transfer. No dressings were applied over the ear lobules, and no specific postoperative care of the lobules was performed. All patients received only 1 session of fat grafting to the ear lobules at the time of rhytidectomy with no subsequent sessions.

Three independent plastic surgery observers reviewed preoperative and postoperative photographs for both cohorts. All postoperative photographs were approximately 1 year after the surgical procedure. The following ear lobule volume grading scale was created to numerically score the degree of lobule deflation ranging from 0 to 3 (0 = concave, 1 = flat, 2 = convex, 3 = round). Figure 1 displays a photograph example of each grade of lobule deflation. Complication rates after fat transfer were also assessed. Statistical analysis was performed using paired *t* tests with a *P* value of less than 0.05 selected for statistical significance.

RESULTS

From 2000 to 2004, there were 65 consecutive patients (130 ears) with adequate photographs that underwent rhytidectomy without ear lobule rejuvenation (group A). Group A consisted of 55 women and 10 men. From 2010 to 2014, there were 65 consecutive patients (130 ears) who underwent rhytidectomy with autologous fat transfer to the ear lobule (group



Video 1. See Video, Supplemental Digital Content 1, which shows the injection technique for fat transfer to a patient's left and right ear lobule. <http://links.lww.com/PRSGO/A161>.

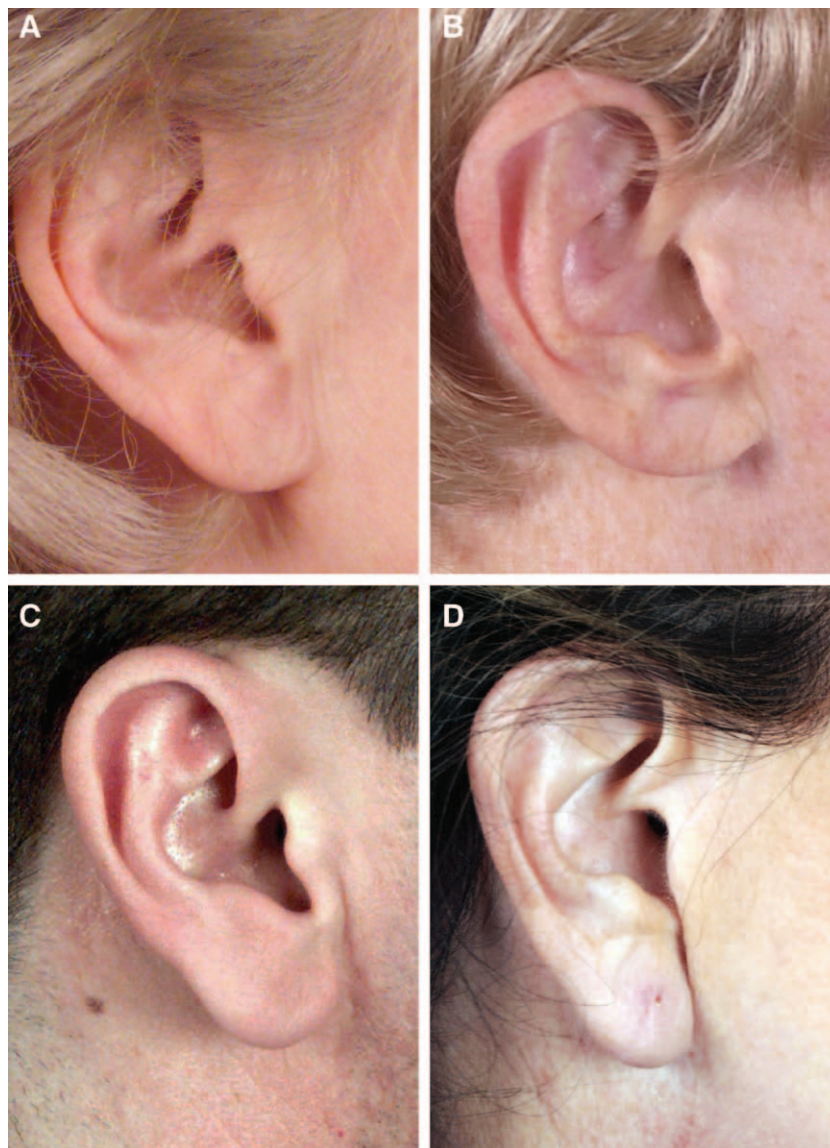


Fig. 1. Photographs from 4 patients demonstrating each category of the ear lobule volume grading scale. A, Concave = 0; B, flat = 1; C, convex = 2; D, round = 3. Note how the varying degrees of deflation are independent of the lobule length as a sign of aging.

B). Group B consisted of 63 women and 2 men. The mean age of patients in each group was similar.

In group A, the mean preoperative ear lobule grading score was 1.20, and the mean postoperative ear lobule grading score was 1.22. The difference of 0.02 between the preoperative and postoperative mean score in group A was not statistically significant ($P = 0.42$). Preoperative and postoperative photographs of a patient who underwent rhytidectomy without ear lobule rejuvenation are demonstrated (Fig. 2).

In group B, the mean preoperative ear lobule grading score was 0.98, and the mean postoperative grading score was 2.00. The difference of 1.02 between the preoperative and postoperative mean score in

group B was highly significant ($P < 0.0001$). Preoperative and postoperative photographs of 2 patients who underwent rhytidectomy with autologous fat transfer are demonstrated, revealing a more youthful shape to their lobules at 1 year postoperatively (Figs. 3, 4). There were no complications such as cellulitis, hematoma, or fat necrosis associated with fat transfer in any of the patients, and no patients required revision. Additionally, all earring-wearing patients had no problems with their piercings postoperatively.

DISCUSSION

The effect of aging on deflation and descent of facial soft tissues has been well established, and vol-



Fig. 2. Preoperative (A) and postoperative (B) photographs of a woman who underwent rhytidectomy without ear lobule rejuvenation. Preoperatively, she had a short but flat ear lobule. Postoperatively, her lobule remained unchanged with a persistent deflated appearance.

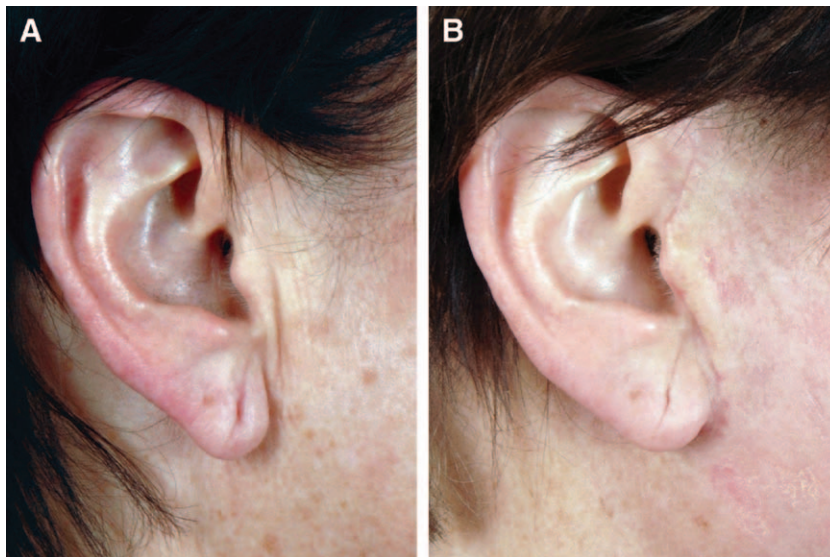


Fig. 3. Preoperative (A) and postoperative (B) photographs of a woman who underwent rhytidectomy with autologous fat transfer. The patient had a flat, deflated ear lobule preoperatively; note the abrupt downslope where the helix meets the lobule and its narrow width. After fat transfer, the lobule was wider and more convex, giving it a youthful appearance.

ume restoration has long been a key part of facial rejuvenation. Consequently, there has been a greater acceptance of autologous fat transfer in combination with SMAS repositioning during face-lifts.¹⁸ Additionally, the deep malar region, temporal fossa, and ear lobule suffer volume loss with aging and cannot be corrected with face-lift alone. When not augmented at the time of rhytidectomy, these anatomic areas remain noticeably deficient of volume,

and subsequently, the patient fails to obtain a global facial rejuvenation.

In this study, there was a significant mean change from a senescent, deflated ear lobule to a more youthful, voluminous lobule in patients undergoing autologous fat transfer to the lobule during rhytidectomy. As such, autologous fat transfer can provide an important contribution to ear lobule cosmesis during face-lifts. Thus, to maximize facial aesthetics, the

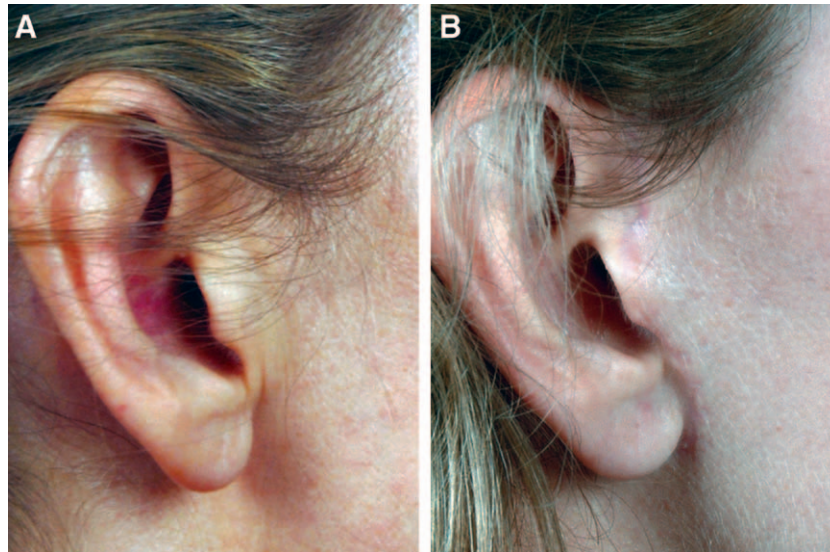


Fig. 4. Preoperative (A) and postoperative (B) photographs of a woman who underwent rhytidectomy with autologous fat transfer. Preoperatively, her lobule showed clear signs of deflation. After fat augmentation, the lobule was fuller and more robust.

ear lobule should be addressed in a similar fashion as the central facial components during a “lift and fill” rhytidectomy.

Most studies evaluating the effects of aging on the ear lobule have focused on the length of the lobule, as the progressive elongation of the entire external ear throughout life has been well characterized. In a study of 547 adults, Azaria et al¹ found that lobule length increased by 30–35% from age 20 to 60 years. Mowlavi et al² reported that the ideal free caudal segment is 1–5 mm in length, and the ideal attached cephalic segment is ≤ 15 mm based on illustrations placed in preferential order by surveyed North American Caucasians; an attached cephalic segment greater than 15 mm was considered pseudoptosis. In a separate study, Mowlavi et al¹⁹ found that the attached cephalic segment increased significantly after a face-lift, but the free caudal segment did not change significantly. Despite their thorough investigation of lobule lengths and creation of a grading scale for lobule ptosis, they did not take into account the deflation of the lobule as it relates to aging. Therefore, a new grading scale that assesses ear lobule volume was created by our group. This grading scale should be considered a useful means of assessing the need for ear lobule augmentation in patients seeking rhytidectomy.

A flaccid and elongated ear lobule is a telltale sign of aging. Recognition of these characteristics and subsequent patient education are important when assessing a patient seeking facial rejuvenation. Upon presentation, patients may even complain of

their aged ears. Thus, concurrent ear lobule rejuvenation with a rhytidectomy may enhance patient satisfaction and improve postoperative cosmesis. In patients undergoing a “lift and fill” face-lift, a small amount of fat already harvested for filling the facial fat compartments can be used to augment the ear lobules without additional donor site morbidity. Only a small volume of fat is needed to fill an ear lobule, and there is excellent take with minimal resorption, as is evidence by the need for only a single session in all of the patients in this study. The lobule moves minimally compared with the rest of the face, which is highly mobile with expressions; this lack of repetitive motion may be a contributing factor to the excellent fat take in the lobule.

Of note, nearly all of the female patients had pierced ears. However, patients with pierced lobules did not require any alterations in treatment or postoperative management. With the aforementioned injection technique, the lobule was filled with fat circumferentially around the pierced opening. Two weeks postoperatively, patients were able to use earrings without complications. Patients with or without piercings may exhibit a prominent, oblique crease in their lobules. This distinct crease in the ear lobule is a common finding in older patients that was once believed to be a warning sign for cardiovascular disease²⁰; however, it is now considered to be merely another sign of aging.²¹ The plastic surgeon should be aware of this diagonal crease and its association with lobule deflation because the crease can be improved as volume is replaced with autologous fat transfer.

Several authors have found a lack of symmetry between bilateral ears.^{1,22,23} Nakamura et al²² classified lobules as either tapering, square, or pendulous based on their angle of attachment, and found that 30% of individuals did not have the same type of lobule bilaterally. Although not performed for asymmetries in this study, autologous fat transfer can also be used to improve asymmetries between bilateral ear lobules and should be a topic for future study.

Fat grafting cannot decrease the length of an already elongated lobule, but it may create an optical illusion of a shorter, rounder ear because of the increase in fullness of the lobule with grafting. However, if patients have a markedly elongated lobule, they may need a surgical reduction, and fat grafting may only serve as an adjunct in that situation. Long-term outcome studies are needed to evaluate the effects of ear lobule fat grafting on the natural progression of lobule ptosis with aging. Based on the results of this study, fat grafting to the lobule can be an additional powerful option for surgeons to achieve a more youthful appearance in patients undergoing rhytidectomy.

CONCLUSIONS

This investigation is the first to document the safety, longevity, and efficacy of autologous fat as an ear lobule filler. Because of the aesthetic improvements with autologous fat transfer to the ear lobule as seen with the ear lobule volume grading scale, this surgical adjunct should be considered as a fundamental component of face-lifts.

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