VOLUME 129 • NUMBER 4 • APRIL 2012

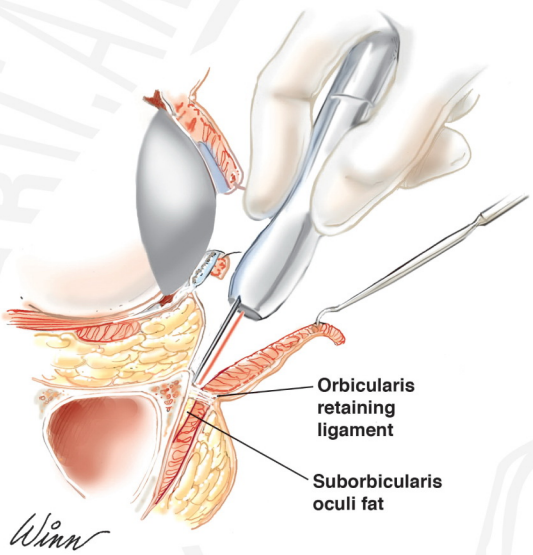
www.PRSJournal.com

New Baker Gordon Video Available at PRSJournal.com

AMERICAN SOCIETY OF PLASTIC SURGEONS

Plastic and Reconstructive Surgery®

Journal of the American Society of Plastic Surgeons
Official Organ of the American Association of Plastic Surgeons
Official Organ of the American Society for Aesthetic Plastic Surgery, Inc.
Official Organ of the American Society of Maxillofacial Surgeons
Official Organ of the Plastic Surgery Research Council



Wolters Kluwer Health | Lippincott Williams & Wilkins

Lysis of the Orbicularis Retaining Ligament and Orbicularis Oculi Insertion: A Powerful Modality for Lower Eyelid and Cheek Rejuvenation

Jeffrey D. Schiller, M.D.
New York, N.Y.

Background: The techniques of lower blepharoplasty are evolving to reflect the concept that the lower eyelid contour does not stop at the inferior orbital rim, and that the lid-cheek junction must often be modified to restore the midface to a youthful configuration. Multiple procedures have been proposed to smooth the lid-cheek junction and tear trough. The author proposes a technique of carbon dioxide laser lysis of the orbicularis retaining ligament and of the orbicularis oculi insertion onto the maxilla to release the tethering of the lower lid and cheek and allow recontouring of the lid-cheek junction in an extended transcutaneous lower blepharoplasty.
Methods: Retrospective review of 80 extended lower blepharoplasty procedures with carbon dioxide laser lysis of the orbicularis retaining ligament and of the orbicularis oculi insertion performed in the past 3 years was undertaken. Follow-up ranged from 4 to 26 months, with an average of 7.2 months. The efficacy, risks, and complications of this procedure were assessed.
Results: The complication rate for this procedure is not significantly higher than that for standard transcutaneous blepharoplasty, and the procedure allows significant improvement of the lid-cheek junction and rejuvenation of the upper midface.
Conclusions: Lysis of the orbicularis retaining ligament and lower orbicularis oculi insertion is a safe and effective adjunct to lower blepharoplasty. It is a powerful modality that allows significant rejuvenation of the lid-cheek complex and upper cheek. (*Plast. Reconstr. Surg.* 129: 692e, 2012.)
CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, IV.

The goal of lower blepharoplasty is the restoration of the youthful contours of the lower eyelid, and it is now widely recognized that this should encompass reestablishment of the smooth contour of the lid-cheek junction, often in conjunction with elevation of the descended or deflated malar fat pad.[1] The anatomical structures underlying the hollow between the upper cheek and the lower eyelid have been investigated extensively in the past decade. This hollow represents the attachment of the orbicularis retaining ligament laterally and centrally, and the insertion of the orbicularis oculi muscle medially.[2–7]

The orbicularis retaining ligament forms part of the fascial compartments of the face, which may serve to prevent the spread of infections.[8] The orbicularis retaining ligament is a collagen-elastin osseocutaneous structure that encircles the orbit. In the lower eyelid, it originates 4 to 6 mm below the inferior orbital rim and traverses the orbicularis oculi in a multilamellar fashion to insert in the dermis at the junction of the lower eyelid and cheek. The ligament has no direct relation to the orbital septum or arcus marginalis. The "tear trough" is generally used to refer to the medial third of the orbitomalar sulcus. This depression overlies the insertion of the medial fibers of the orbicularis oculi onto the maxilla, whereas the central and lateral parts of the orbitomalar sulcus overlie the orbicularis retaining ligament[2] (Fig. 1).

From private practice.
Received for publication April 13, 2011; accepted October 3, 2011.
Copyright ©2012 by the American Society of Plastic Surgeons
DOI: 10.1097/PRS.0b013e31824423c7

Disclosure: *The author has no financial interest to declare in relation to the content of this article. No external funding was received.*

Copyright © American Society of Plastic Surgeons. Unauthorized reproduction of this article is prohibited.

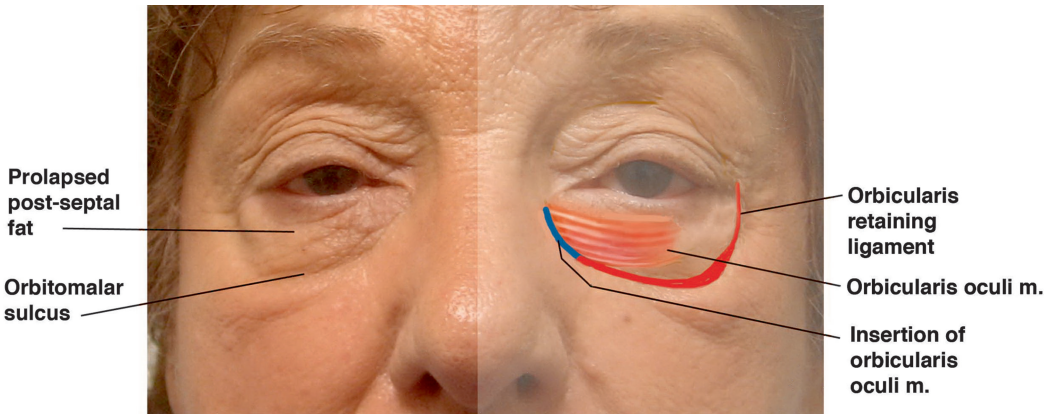


Fig. 1. Tethering of the skin to the zygoma and maxilla by means of the orbicularis retaining ligament creates the central and lateral portions of the orbitomalar sulcus. Insertion of the medial orbicularis oculi onto the maxilla creates the medial aspect of the sulcus, also called the "tear trough."

Given the constituent anatomy, the region of the orbitomalar sulcus appears to consist of three anatomical components: orbital fat prolapse above the sulcus; the orbicularis retaining ligament and orbicularis oculi tethering of the skin to the maxilla and zygoma just inferior to the orbital rim defining the sulcus; and cheek descent or loss of volume inferior to the sulcus. The V-shape that the orbitomalar sulcus sometimes assumes directly reflects the pattern of insertion of the orbicularis retaining ligament.[5]

A wide variety of procedures have been proposed to correct the orbitomalar sulcus, reflecting variations in eyelid and midface anatomy and variations in the aging process. Patients exhibit varying amounts of orbital fat prolapse, skin and orbicularis redundancy, lower eyelid margin and canthal tendon laxity, cheek descent and volume loss, globe prominence, orbitomalar sulcus formation, and midface projection or retrusion. Filling procedures and midface lifting have been advocated to smooth the orbitomalar sulcus. Among the proposed filling procedures are silicone implants, synthetic fillers, orbital fat transfer, and remote fat filling.[1,9–11] Others have suggested midface lifting in various planes and using a variety of incisions, including preauricular and temporal face lift incisions and subciliary or transconjunctival eyelid incisions, combined with subperiosteal, preperiosteal, or multiplane dissections.[12–16] There are also a variety of suspension or fixation techniques for the orbicularis and cheek, including canthopexy or canthoplasty, and fixation to the orbital rim periosteum or deep temporalis fascia.

A few surgeons have advocated extending the suborbicularis dissection in lower blepharoplasty well below the orbital rim, some long before the description of the orbicularis retaining ligament.[17,18] Definitive lysis of the orbicularis retaining ligament is sometimes mentioned as part of lower eyelid or midface rejuvenation.[19,20] The general concept of division of osseocutaneous retaining ligaments to allow tissue mobilization and repositioning is well-established in brow and forehead lifting and some lower face rejuvenation procedures.[4,5]

For the past 3 years, I have been performing direct lysis of the orbicularis retaining ligament combined with division of the insertion of the medial orbicularis oculi muscle onto the face of the maxilla using the carbon dioxide laser as an adjunct to lower blepharoplasty, with suspension and redraping of the orbicularis oculi with fixation to the lateral orbital rim periosteum. Direct lysis of the orbicularis retaining ligament and orbicularis insertion allows correction of even severe lid-cheek hollowing, and provides significant improvement of malar bags and hollows by allowing the lid and upper cheek to reform a smooth contour, and frees the orbicularis for redraping without canthoplasty, canthopexy, or other more elaborate fixation maneuvers in cases without marked lid margin or lateral canthal tendon laxity.

PATIENTS AND METHODS

The author conducted a retrospective clinical study of a consecutive series of 80 patients in whom the lower eyelid aging changes were addressed by transconjunctival removal of herniated orbital fat (in most cases), transcutaneous suborbicularis dissection, and skin-orbicularis resection, with lysis of the orbicularis retaining ligament and the orbicularis insertion with the carbon dioxide laser. Institutional review board approval and verbal and written informed patient consent were obtained. Grading of the results of the last 40 consecutive

Copyright © American Society of Plastic Surgeons. Unauthorized reproduction of this article is prohibited.

patients of the series was performed by three independent cosmetic surgeons (one oculoplastic surgeon and two plastic surgeons).

Operative Technique

Intravenous sedation is administered. Anesthesia is achieved with lidocaine 2% with epinephrine 1:100,000. The fat pockets are infiltrated through the transconjunctival approach, and the suborbicularis plane is injected transcutaneously across the entire lid to 2 cm below the inferior orbital rim, at the lateral canthal region, and over the lateral orbital rim periosteum.

After the placement of a corneal shield, the lower lid is everted and in most cases an incision is made transversely in the inferior fornix with the carbon dioxide laser using the 0.2-mm spot size on continuous mode at 4 to 5 W through the conjunctiva and lower eyelid retractors. With the aid of a Desmarres retractor, orbital fat is exposed and resected conservatively in the medial, central, and lateral fat pockets, depending on the amount of bulging observed preoperatively in the sitting position. The arcuate expansion of the inferior oblique separating the central from the lateral fat pockets is preserved. The conjunctival incision may be closed with one or two interrupted 6-0 plain gut sutures.

Using the carbon dioxide laser, a subciliary incision is then made through the skin and orbicularis oculi 2 mm inferior to the lash line from the junction of the central and medial thirds of the lower lid to the lateral orbital rim, usually 1 to 1.5 cm lateral to the lateral commissure. A suborbicularis dissection with the laser is carried inferiorly to the inferior orbital rim. The skin-muscle flap is retracted and digital palpation and direct visualization beneath the flap localizes the orbicularis retaining ligament. The multiple lamellae of the orbicularis retaining ligament are divided in the suborbicularis/preseptal plane to 2 cm inferior to the orbital rim, including the attachment at the lateral orbital thickening[5] (Fig. 2). In most cases, to achieve full mobilization of the eyelid and cheek and to efface the tear trough when present, the fibers of the orbicularis oculi insertion into the face of the maxilla are divided close to the bone medially until palpation verifies that all tethering of the eyelid to the orbital rim is released. This medial dissection hugs the bone to avoid damaging the angular vessels and superior buccal branch of the facial nerve (Fig. 3). The flap is placed on superior traction and the amount of redundancy is determined and the skin-muscle flap is resected conservatively with the laser in two triangles created by a vertical incision at the lateral aspect of the flap at or lateral to the lateral commissure (Fig. 4). The skin-muscle flap is supported by suturing the orbicularis and its investing fascia to the lateral orbital rim periosteum with a superior and slight lateral vector with 4-0 polyglactin horizontal mattress suture. A horizontal bite is taken through the

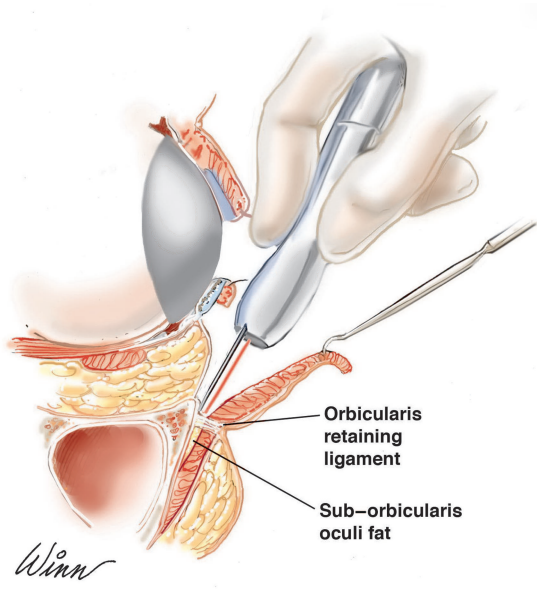


Fig. 2. The carbon dioxide laser allows dissection of the suborbicularis plane with minimal bleeding and permits extension of that plane well below the orbitomalar sulcus, allowing elevation of the upper cheek, with no tethering at the zygoma or maxilla.

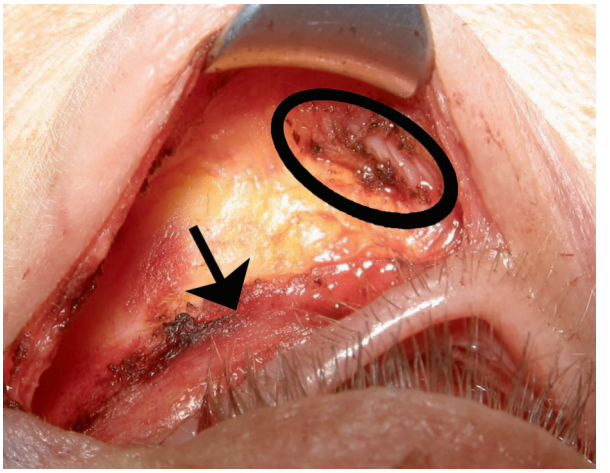


Fig. 3. The surgeon's view beneath the left lower eyelid flap. The *arrow* points to the inferior orbital rim. The suborbicularis fat pad is in the center. The *circle* surrounds the medial orbicularis oculi fibers, which have been partially divided at the maxilla with the carbon dioxide laser.

Copyright © American Society of Plastic Surgeons. Unauthorized reproduction of this article is prohibited.

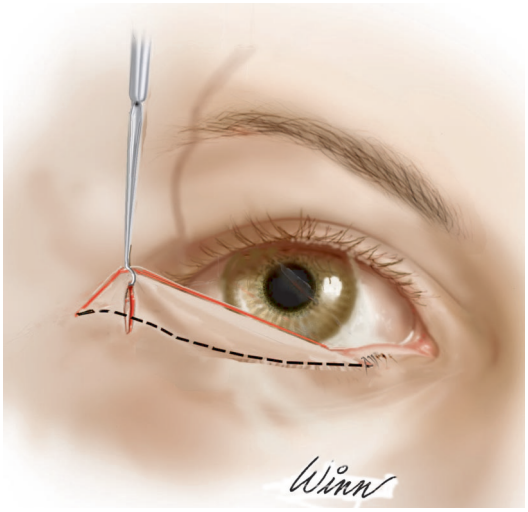


Fig. 4. Conservative excision of redundant skin and orbicularis is performed with the carbon dioxide laser in two triangles based at or lateral to the lateral commissure.

periosteum and a vertical bite through the orbicularis and investing fascia at the edge of the skin-muscle flap. If there is marked lower eyelid margin or lateral canthal tendon laxity, a lateral tarsal tuck canthopexy[21] is performed, approximating the lateral tarsus to the lateral periorbita inside the lateral orbital rim with a 6-0 polypropylene horizontal mattress suture. The skin is closed with a running 6-0 polypropylene suture.

RESULTS

Between December of 2007 and July of 2010, a total of 80 consecutive patients (65 women and 15 men) underwent the procedure. Patients' ages ranged from 40 to 82 years, with an average age of 63 years. Follow-up ranged from 4 to 23 months, with an average of 7.2 months. Twenty patients have been followed longer than 1 year, and eight have been followed for over 2 years. There were two cases (2.5 percent) of lateral canthal rounding and eyelid retraction in the early part of the series that required revision with canthoplasty; one of these was in a patient who developed a hematoma. Six patients (7.5 percent) developed mild conjunctival chemosis that resolved spontaneously after a few weeks of massage and loteprednol etabonate eye drops. There was one case (1.25 percent) of transient upper eyelid paresis with lagophthalmos that resolved spontaneously in 2 weeks. The overall improvement in eyelid contours has persisted in these patients.

Evaluation of the aesthetic outcomes of the last 40 consecutive patients was performed by three independent cosmetic surgeons, two plastic surgeons, and one oculoplastic surgeon, who rated the before-and-after photographs on seven scales. The postoperative photographs of this series were taken an average of 7.4 months after surgery. Six of the scales rated improvement or worsening of the tear trough, orbitomalar sulcus/lid-cheek junction, malar bags or folds, eyelid skin redundancy, malar and upper cheek lift, and overall aesthetic improvement. The rating scale was –1 for worse; 0 for no change; and +1, 2, or 3 for mild, moderate, or marked improvement, respectively. For lower lid position, the raters noted scleral show or rounding, and the scale was –2 for both lids worse, –1 for one lid worse, 0 for no change, and +1 for any improvement of preexisting rounding or scleral show. The results are listed in Table 1, with overall aesthetic improvement rated at 2.64. Improvement of the orbitomalar sulcus and lid-cheek junction was rated at 2.65, and improvement of the malar bags or folds was rated 2.43.

CASE REPORTS

Case 1

An 82-year-old woman underwent simultaneous upper eyelid ptosis repair, left lower eyelid entropion repair, and lower extended blepharoplasty with lysis of the orbicularis retaining ligament and orbicularis oculi insertion (Fig. 5). No canthopexy or canthoplasty was performed. Preoperatively, she has severe lower eyelid and upper cheek skin and orbicularis redundancy with malar festoons. The tethering of the skin and orbicularis oculi at the orbicularis retaining ligament below the inferior orbital rim can be seen. At 7 months after surgery, there is significant correction of malar festoons and rejuvenation of the midface, especially on the left side.

Case 2

A 75-year-old woman who underwent simultaneous upper eyelid ptosis repair and extended lower blepharoplasty with lysis of the orbicularis retaining ligament and orbicularis oculi insertion (Fig. 6). Preoperatively, the sulcus is prominent, and there are malar mounds, especially on the left side. At 11 months postoperatively, the cheek lift and effacement of the malar mounds are pronounced and have been maintained for 21 months.

Table 1. Average of Responses of Three Outside Cosmetic Surgeons Reviewing the Last 40 Consecutive Patients of the Series*

Parameter	Rating
Tear trough	2.37
Orbitomalar sulcus/lid-cheek junction	2.65
Malar bags or folds	2.43
Eyelid skin redundancy	2.48
Upper cheek/malar lift	2.62
Lower lid position: scleral show or retraction	0.03
Overall aesthetic rating	2.64

*See Results for rating scheme.

Copyright © American Society of Plastic Surgeons. Unauthorized reproduction of this article is prohibited.

Fig. 5. Case 1. An 82-year-old woman is shown before and 7 months after left upper eyelid ptosis repair, left lower eyelid entropion repair, and extended lower blepharoplasty with lysis of the orbicularis retaining ligament and orbicularis oculi and orbicularis suspension.

Case 3

A 63-year-old woman presented with upper eyelid ptosis and significant lower eyelid and midface involutional changes with mild malar mounds (Fig. 7). The orbicularis retaining ligament lysis, orbicularis release, and orbicularis suspension rejuvenated her lid-cheek junction and eliminated the orbitomalar sulcus and tear trough.

Case 4

A 59-year-old woman underwent lower blepharoplasty with orbicularis retaining ligament and orbicularis oculi lysis, orbicularis suspension, and upper blepharoplasty (Fig. 8). Release of the orbicularis retaining ligament and insertion of the orbicularis oculi have allowed smoothing of the lid-cheek junction, and there is volume recruited into her upper midface, resulting in rejuvenated upper midface contours.

Case 5

A 41-year-old woman underwent lower blepharoplasty with lysis of the orbicularis retaining ligament and orbicularis insertion (Fig. 9). No orbital fat was removed. Before surgery, there is baring of the orbital rim but no prolapsing of orbital fat. Lysis of the orbicularis retaining ligament and orbicularis oculi insertion have allowed restoration of her youthful lower lid and lid-cheek contours.

Fig. 6. Case 2. A 75-year-old woman is shown before and 11 months after upper eyelid ptosis repair and extended lower blepharoplasty with lysis of the orbicularis retaining ligament and orbicularis oculi and orbicularis suspension.

Case 6

A 44-year-old patient of Middle Eastern descent presented an aesthetic challenge (Fig. 10). There is no prolapsing orbital fat, but she has prominent globes, with marked pigmentation of her lower eyelids and a prominent orbitomalar sulcus. She is shown 6 months after extended lower blepharoplasty with lysis of the orbicularis retaining ligament and orbicularis oculi insertion with no orbital fat removed. There is substantial improvement of the lower lid aesthetics in this problem patient.

Case 7

A 69-year-old woman presented with advanced involutional changes (Fig. 11). She is shown before and 9 months after asymmetric brow lift and upper eyelid ptosis repair and lower extended blepharoplasty with orbicularis retaining ligament and orbicularis oculi release and orbicularis suspension. Although she has facial soft-tissue atrophy, the lid-cheek junction is significantly rejuvenated and the malar contours are improved.

DISCUSSION

There is controversy regarding the pathoanatomy of the lower eyelid and upper cheek aging process,[22] and wide variation in the procedures proposed for rejuvenation of this region. Rohrich et al.[11] have recently pointed out the "conflicting opinions . . . and myriad techniques" now current

Copyright © American Society of Plastic Surgeons. Unauthorized reproduction of this article is prohibited.

Fig. 7. Case 3. A 63-year-old woman is shown before and 15 months after upper eyelid ptosis repair and extended lower blepharoplasty with lysis of the orbicularis retaining ligament and orbicularis oculi and orbicularis suspension.

Fig. 8. Case 4. A 59-year-old woman is shown before and 8 months after extended lower blepharoplasty with lysis of the orbicularis retaining ligament and orbicularis oculi, orbicularis suspension, and upper blepharoplasty.

for lower blepharoplasty, and the "paradigm shifts" now occurring in conceptualization of lower eyelid and midface aging and rejuvenation. The presence of a hollow between the lower eyelid and cheek creates an appearance of sadness and fatigue in addition to advanced age. A youthful eyelid exhibits a smooth convex lid-cheek junction, with a generally concave preseptal lower eyelid contour. We now know that appearance of prolapsing orbital fat is often related to an increase in volume of lower eyelid and inferior orbital fat with age,[23] which suggests that in many patients the removal of a judicious amount of lower eyelid fat is warranted. The hollow below the inferior orbital rim, the orbitomalar sulcus, overlies the osseocutaneous attachments of the skin to the zygoma and maxilla several millimeters below the rim, comprising the orbicularis retaining ligament and medially the insertion of the orbicularis oculi onto the face of the maxilla. This hollow is accentuated with aging by the increased prominence of fat above, and the descent and/or atrophy of the malar fat pad below, with persistence of the soft-tissue tethering to the underlying bone between those convexities.

Although the orbitomalar sulcus is the predominant feature of the aging lower eyelid and midface, its correction has only recently become a focus of lower blepharoplasty. Orbicularis lifting and redraping has been recognized as an important element in correction of the lid-cheek junction for almost two decades. Combined orbicularis and face lifting was described by Hamra in 1992.[24] More recently, McCord et al.[25] and Fagien[26] have emphasized the improvement of the midface contour afforded by orbicularis lifting in lower blepharoplasty. Recently, Rohrich et al. have suggested a five-step lower blepharoplasty, including blunt lysis of the orbicularis retaining ligament combined with malar fat augmentation.[11] Lysis of the orbicularis retaining ligament and orbicularis oculi insertion facilitates restoration of a smooth lid-cheek junction and elevation of the orbicularis oculi and malar fat pad as a single unit with a relatively superficial dissection, and permits re-

Copyright © American Society of Plastic Surgeons. Unauthorized reproduction of this article is prohibited.

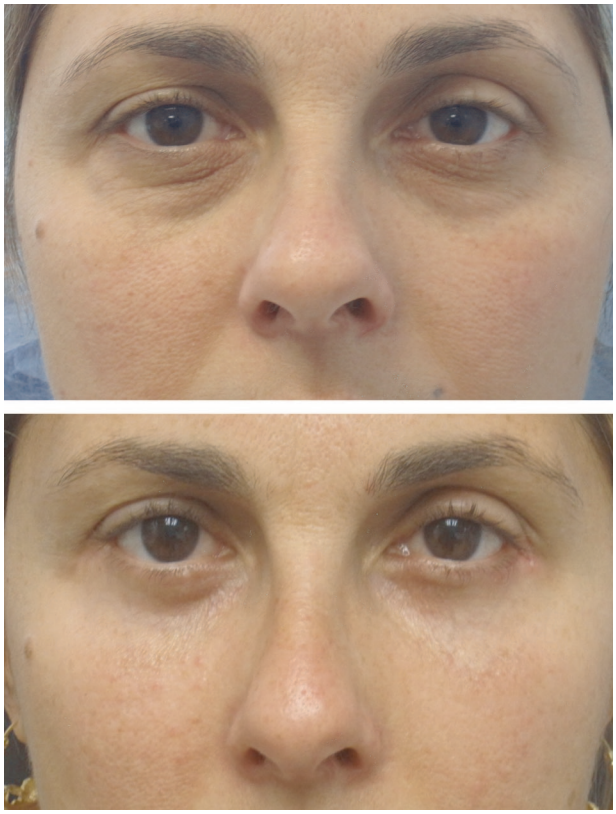


Fig. 9. Case 5. A 41-year-old woman is shown before and 5 months after extended lower blepharoplasty with lysis of the orbicularis retaining ligament and orbicularis insertion, with no fat removed.

Fig. 10. Case 6. A 44-year-old woman with no orbital fat prolapsed is shown before and 6 months after extended lower blepharoplasty with lysis of the orbicularis retaining ligament and orbicularis oculi insertion, and orbicularis suspension. No fat was removed.

draping of the upper cheek and lower eyelid skin with a simple orbicularis suspension suture following skin excision.

The superior border of the malar fat pad is the orbicularis retaining ligament,[27] and thus release of tethering allows the fat pad and overlying skin to be lifted with minimal tension. I believe that more extensive release of the attachments underlying the orbitomalar sulcus and tear trough can be achieved with the carbon dioxide laser because of its ability to cut and coagulate vessels up to 1 mm without the degree of charring and possible secondary scarring seen with the use of monopolar cautery, and this more extensive and aggressive release allows greater mobilization of the upper cheek with consequent improvement of the malar contours as is seen in many patients. The more effective release of tethering may result in less inferior traction on the lid margin, with less chance of lower lid retraction or rounding, and thus the need for less powerful lateral canthal stabilization. I agree with Hester et al.[28] that "good postoperative lower lid position depends more on cheek elevation and fixation and appropriate lower lid skin excision and less on canthal manipulation," but I would add that aggressive release of midface tethering is also an important parameter in preventing lower eyelid retraction as well as facilitating midface elevation.

This is technically a simpler procedure than some other alternatives that have been proposed. Fat repositioning can be technically difficult and has a degree of unpredictability, and free fat transfer likewise has problems of variation in fat retention or later fat expansion. Fat repositioning is not possible in cases of minimal or no excess orbital fat, which can occur even in patients with significant tear trough deformities, as seen in the patients in cases 5 and 7. Lateral canthopexy is often not required with orbicularis retaining ligament lysis in patients with minimal tarsoligamentous sling laxity, and the effect on the orbitomalar sulcus is direct and predictable. Complications of this procedure occur at a rate similar to that of other blepharoplasty procedures,[19,29] and the spectrum

Copyright © American Society of Plastic Surgeons. Unauthorized reproduction of this article is prohibited.

Fig. 11. Case 7. A 69-year-old woman is shown before and 9 months after brow lift and upper eyelid ptosis repair and lower extended blepharoplasty with orbicularis retaining ligament lysis and orbicularis suspension.

of complications is routine, without unusual late developments as may be seen in free fat transfer. It is a safe, effective, and reliable technique for correction of even severe aging changes of the eyelid and midface, with a low rate of complications.

Jeffrey D. Schiller, M.D.
452 West 19th Street, Suite 3C
New York, N.Y. 10011
drschiller@drschiller.com

PATIENT CONSENT

Patients provided written consent for the use of their images.

REFERENCES

1. Carraway JH. Volume correction for nasojugal groove with blepharoplasty. *Aesthetic Plast Surg.* 2010;30:101–109.
2. Kikkawa DO, Lemke BN, Dortzbach RK. Relations of the superficial musculoaponeurotic system to the orbit and characterization of the orbitomalar ligament. *Ophthal Plast Reconstr Surg.* 1996;12:77–88.
3. Pessa JE, Zadoo VP, Adrian EK, Woodwards R, Garza JR. Anatomy of a "black eye": A newly described fascial system of the lower eyelid. *Clin Anat.* 1998;11:157–161.
4. Moss JM, Mendelson BC, Taylor GI. Surgical anatomy of the ligamentous attachments in the temple and periorbital regions. *Plast Reconstr Surg.* 2000;105:1475–1490; discussion 1491–1498.
5. Muzaffar AR, Mendelson BC, Adams WP Jr. Surgical anatomy of the ligamentous attachments of the lower lid and lateral canthus. *Plast Reconstr Surg.* 2002;110:873–884; discussion 897–911.
6. Ghavami A, Pessa JE, Janis J, Khosla R, Reece EM, Rohrich RJ. The orbicularis retaining ligament of the medial orbit: Closing the circle. *Plast Reconstr Surg.* 2008;121:994–1001.
7. Haddock NT, Saadeh PB, Boutros S, Thorne CH. The tear trough and lid/cheek junction: Anatomy and implications for surgical correction. *Plast Reconstr Surg.* 2009;123:1332–1340; discussion 1341–1342.
8. Schaverien MV, Pessa JE, Rohrich RJ. Vascularized membranes determine the anatomical boundaries of the subcutaneous fat compartments. *Plast Reconstr Surg.* 2009;123:695–700.
9. Lambros VS. Hyaluronic acid injections for correction of the tear trough deformity. *Plast Reconstr Surg.* 2007;120(Suppl):74S–80S.
10. Yaremchuk MJ, Kahn DM. Periorbital skeletal augmentation to improve blepharoplasty and midfacial results. *Plast Reconstr Surg.* 2009;124:2151–2160.
11. Rohrich RJ, Ghavami A, Mojallal A. The five-step lower blepharoplasty: Blending the eyelid-cheek junction. *Plast Reconstr Surg.* 2011;128:775–783.
12. Cabbabe SW, Andrades P, Vasconez LO. Lateral orbicularis oculi muscle plasty in conjunction with face lifting for periorbital rejuvenation. *Plast Reconstr Surg.* 2009;124:1285–1293.
13. Cohen SR, Kikkawa DO, Korn BS. Orbitomalar suspension during high SMAS facelift. *Aesthet Surg J.* 2010;30:22–29.
14. Hamra ST. Repositioning the orbicularis oculi muscle in the composite rhytidectomy. *Plast Reconstr Surg.* 1992;90:14–22.
15. Owsley JQ Jr, Zweifler M. Midface lift of the malar fat pad: Technical advances. *Plast Reconstr Surg.* 2002;110:674–685; discussion 686–687.
16. Korn BS, Kikkawa DO, Cohen SR. Transcutaneous lower eyelid blepharoplasty with orbitomalar suspension: Retrospective review of 212 consecutive cases. *Plast Reconstr Surg.* 2010;125:315–323.
17. Small RG. Extended lower eyelid blepharoplasty. *Arch Ophthalmol.* 1981;99:1402–1405.
18. Adamson PA, Tropper GJ, McGraw BL. Extended blepharoplasty. *Arch Otolaryngol Head Neck Surg.* 1991;117:606–609; discussion 610.
19. Codner MA, Wolfli JN, Anzarut A. Primary transcutaneous lower blepharoplasty with routine lateral canthal support: A comprehensive 10-year review. *Plast Reconstr Surg.* 2008;121:241–250.
20. Marshak H, Morrow DM, Dresner SC. Small incision preperiosteal midface lift for correction of lower eyelid retraction. *Ophthal Plast Recon Surg.* 2010;3:176–181.
21. Jordan RJ, Anderson RL. The tarsal tuck procedure: Avoiding eyelid retraction after lower blepharoplasty. *Plast Reconstr Surg.* 1990;85:22–28.
22. Lambros V. Observations on periorbital and midface aging. *Plast Reconstr Surg.* 2007;120:1367–1376; discussion 1377.
23. Darcy SJ, Miller TA, Goldberg RA, Villablanca JP, Demer JL, Rudkin GH. Magnetic resonance imaging characterization of orbital changes with age and associated contributions to lower eyelid prominence. *Plast Reconstr Surg.* 2008;122:921–929; discussion 930–931.

Copyright © American Society of Plastic Surgeons. Unauthorized reproduction of this article is prohibited.

24. Hamra ST. Repositioning the orbicularis oculi muscle in the composite rhytidectomy. *Plast Reconstr Surg.* 1992;90:14–22.
25. McCord CD Jr, Codner MA, Hester TR. Redraping the inferior orbicularis arc. *Plast Reconstr Surg.* 1998;102:2471–2479.
26. Fagien S. Algorithm for canthoplasty: The lateral retinacular suspension: A simplified suture canthopexy. *Plast Reconstr Surg.* 1999;103:2042–2053; discussion 2054–2058.
27. Rohrich RJ, Pessa JE. The fat compartments of the face: Anatomy and clinical implications for cosmetic surgery. *Plast Reconstr Surg.* 2007;119:2219–2227; discussion 2228–2231.
28. Hester TR Jr, Codner MA, McCord CD, Nahai F, Giannopoulos A. Evolution of technique of the direct transblepharoplasty approach for the correction of lower lid and midfacial aging: Maximizing results and minimizing complications in a 5-year experience. *Plast Reconstr Surg.* 2000;105:393–406; discussion 407–408.
29. Schiller JD, Bosniak S. Blepharoplasty: Conventional and incisional laser techniques. In: Mauriello JA Jr, ed. *Unfavorable Results of Eyelid and Lacrimal Surgery: Prevention and Management.* Boston: Butterworth-Heinemann; 2000:3–26.

Copyright © American Society of Plastic Surgeons. Unauthorized reproduction of this article is prohibited.