Evidence-Based Medicine: A Graded Approach to Lower Lid Blepharoplasty

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Learning Objectives: After studying this article, the participant should be able to: 1. Define the anatomy of the lower eyelid tarsoligamentous framework and the related periorbital retaining ligaments, and cite their surgical relevance. 2. Perform a systematic functional and aesthetic evaluation of the lower eyelid focusing on the lid-cheek junction, and clinical tests that predict the need for lateral canthal tightening. 3. Enumerate the different approaches to lower eyelid rejuvenation and discuss their merits/limitations. 4. Describe surgical strategies to blend the lid-cheek junction and tighten the lateral canthal retinaculum.

Summary: Modern lower lid blepharoplasty requires a thorough understanding of periorbital anatomy, age-related changes of the lid-cheek junction, and the variables controlling lower lid tone and position. The surgical strategies are best used in a graded fashion. The patient with isolated lower lid bags may be treated by transconjunctival fat resection alone. Additional mild skin laxity can be improved with skin pinch or skin-only undermining. Skin resurfacing using chemical peeling or laser can further address fine lines. In these patients with an abnormality of the lid-cheek junction, release of the medial orbicularis oculi muscle and variable amounts of the orbicularis retaining ligament is essential. This is combined with orbital fat resection or repositioning through a transconjunctival or transcutaneous skin-muscle flap. The transcutaneous approach most often necessitates lateral canthal tightening to optimize lid margin control. Generally, the degree of laxity dictates whether a canthopexy or a canthoplasty is most appropriate. Lateral canthal procedures can be applied to patients displaying clinical signs predictive of lid malposition and to those presenting with varying degrees of established lid descent. (*Plast. Reconstr. Surg.* 139: 139e, 2017.)

The eyelids and periorbital tissues undergo significant changes with aging and often constitute a major concern for those seeking facial rejuvenation. Although patients often limit their complaints to the eyelids, aging is invariably a global phenomenon. Clinical evaluation of the brow and midface are particularly important, given the significant interplay with eyelid position and support. Functional deficits often occur, but are not necessarily noted by the patient. For example, treatment of upper eyelid ptosis will enhance the surgical result. In contrast, eyelid surgery can exacerbate dry eyes, leading to long-term adverse sequelae.

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Traditional upper lid blepharoplasty focused on aggressive skin and fat resection. This often led to poor long-term results, including the aggravation of the supratarsal hollow, periorbital soft-tissue deflation, lagophthalmos, and worsening of periorbital aging in the long term. Modern upper lid blepharoplasty emphasizes the following: (1)

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conservative skin resection; (2) minimal upper lid fat removal usually restricted to the medial compartment; (3) limited muscle excision; (4) preservation of soft-tissue volume in the upper lid; and (5) attention to brow position, addressing the lateral brow when indicated.

Traditional lower lid blepharoplasty focused on excision of skin, muscle, and fat through skin or skin-muscle flaps. Although aesthetically effective in many patients, potential long-term problems with this approach include lower lid malposition, scleral show, rounded palpebral fissures, and hollow lower lid area.[1] Modern lower blepharoplasty highlights less aggressive fat resection, fat repositioning through either transconjunctival or subciliary approaches, minimal skin resection, and lower lid support through canthopexy and canthoplasty techniques.[1–3] The contribution of brow and midface surgery to periorbital aesthetics is increasingly recognized, highlighting the importance of global facial assessment for optimal outcomes. Although a global assessment of upper face aging should be emphasized, this review focuses on the lower eyelid only, highlighting the complex and less well-understood anatomy, the graded options and routes for surgery, and importance of ancillary techniques that may accompany blepharoplasty surgery.

ANATOMICAL CONSIDERATIONS

The orbicularis oculi muscle is a major contributor to lower eyelid tone. Lower lid malposition (scleral show, retraction, and ectropion) is a risk following lower blepharoplasty and midface lift. The causes are multifactorial, and include overly aggressive anterior lamellar resection, middle lamellar scarring, and lower lid denervation. The muscle receives its neural input from frontal, zygomatic, and buccal rami of the facial nerve.[4–7] Although a number of anatomical studies emphasize the significance of the lateral zygomatic branches,[4,7] clinical studies have demonstrated that lower lid denervation cannot be totally accounted for by zygomatic branch injury alone. These reports highlight the importance of the medial canthal part of the orbicularis oculi, which is innervated by the medial branch of the buccal ramus of the facial nerve[6,8,9] (Fig. 1).

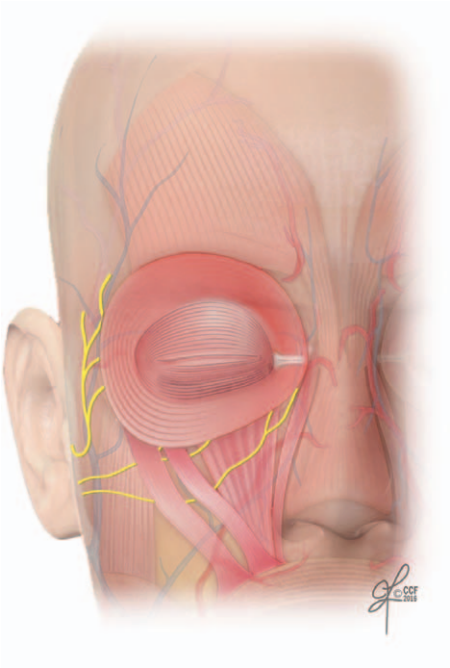

Fig. 1. Diagrammatic representation of the innervation of the orbicularis oculi muscle from frontal, zygomatic, and buccal rami of the facial nerve. Injury to the medial branch of the buccal ramus runs the risk of denervation of the lower lid and altered lower lid tone.

Retractors of the Lower Eyelid

The capsulopalpebral fascia and the inferior tarsal muscle are the lower lid analogues of the levator palpebrae superioris and Müller muscles of the upper eyelid. The capsulopalpebral head arises from the fascia covering the inferior rectus muscle, splits to enclose the inferior oblique muscle, then blends with the Lockwood ligament, before it finally fuses with the orbital septum and tarsal plate. The inferior tarsal muscle is a layer of smooth muscle deep to the capsulopalpebral fascia that inserts into the inferior tarsal border. A reciprocal relationship has been suggested between the lower lid retractors and the orbicularis oculi. When the inferior rectus contracts, the eye needs to look downward. Consequently, the lid retractors pull the lower lid caudally, while the orbicularis oculi relaxes, allowing the lower visual field to expand. Transection/release of these "retractors" during transconjunctival incisions is suggested to help the lid margin to rise.[10–13]

Tarsoligamentous Complex

Lateral Retinaculum

Previously described as the superficial and deep heads of the lateral canthal tendon, this structure is more aptly described as the lateral retinaculum.[6,10,14] This complex fibrous structure is formed by fusion of crura from upper and lower tarsal plates. The common band thus formed extends laterally to the lateral orbital rim. Anatomical studies have shown this structure to be

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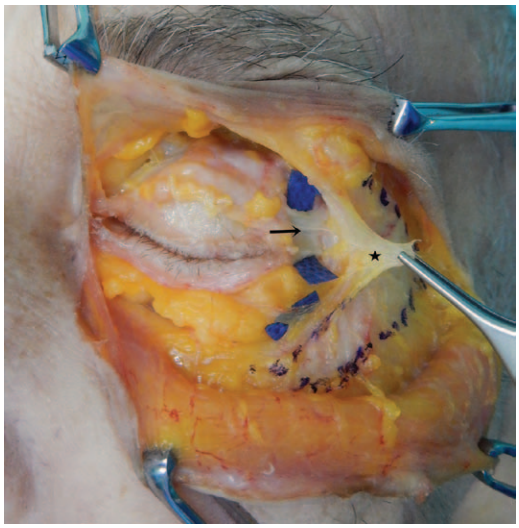

Fig. 2. Cadaver dissection showing the following: (1) the superficial part of the lateral canthal tendon incised and held with forceps (*star*), (2) the deep part of the lateral canthal tendon (*right arrow*) with blue background underneath, (3) the arcuate expansion is shown inferior to the lower eyelid with blue background underneath, and (4) the triangular lateral orbital thickening is marked with *blue dots*.

composed of bifurcated superficial and deep components.[15,16] The superficial part (septal band) is part of the orbital septum and attaches laterally to the orbital rim periosteum. Knize has shown the utility of lateral canthal suspension based on isolated release and superior repositioning of this superficial component. This can be achieved through a temporal approach with dissection between superficial and deep temporal fascia, or through an upper blepharoplasty incision, avoiding the frontal branches of the facial nerve.[15,16] The deep component (tarsoligamentous band), in contrast, passes posteriorly to insert into the orbital (Whitnall) tubercle, 2 to 4 mm deep to the lateral orbital rim (Fig. 2). A pocket of adipose tissue enclosed between these two parts (Eisler fat pad) serves as a useful landmark during canthal surgery. The posterolateral vector of the deep component helps maintain the eyelids in close apposition to the globe and should be replicated during canthal tightening procedures.[3] (**See Video, Supplemental Digital Content 1**, which demonstrates lateral canthopexy technique. Based on clinical assessment, a canthopexy is indicated in mild laxity (lid distraction <6 mm), whereas a canthoplasty is considered in more severe cases (lid distraction >6 mm). This video is available in the "Related Videos" section of the full-text article on PRSJournal.com or at ***http://links.lww.com/PRS/B905***.)

The retinaculum is connected to a multitude of adjacent fascial support structures. Anteriorly, it is attached to extensions of the preseptal and pretarsal orbicularis oculi. Superiorly, it fuses with the lateral horn of the levator aponeurosis and the Whitnall ligament, and inferiorly it blends with the Lockwood ligament. Posteriorly, it is contiguous with the lateral rectus capsulopalpebral fascia, and thus is linked to the lateral rectus check ligament.[14] Unlike the medial canthal tendon, which is a strong unyielding structure, the lateral retinaculum is a dynamic structure, displaying greater mobility.[17] With aging, descent and/or stretch of the

Video 1. Supplemental Digital Content 1 demonstrates lateral canthopexy technique. Based on clinical assessment, a canthopexy is indicated in mild laxity (lid distraction <6 mm), whereas a canthoplasty is considered in more severe cases (lid distraction >6 mm). This video is available in the "Related Videos" section of the full-text article on PRSJournal.com or at ***http://links.lww.com/PRS/B905***.

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lateral canthal area is thus often observed, precipitating lateral canthal rounding, scleral show, or frank ectropion. Studies suggest racial differences in the severity of age-related descent of the lateral canthal complex, with African American patients exhibiting greater drop than age-matched Caucasians.[18]

Orbicularis Retaining Ligament

The significance of this anatomical structure (also called the orbitomalar ligament) originates from clinical observations of constant strong attachments of the orbicularis oculi to the inferolateral orbital rim. Release of these attachments is often essential for adequate muscle mobilization and lid redraping. Release of the medial orbicularis oculi, the tear trough ligament, and varying portions of the orbicularis retaining ligament has become an essential part of a variety of lower lid blepharoplasty techniques used to treat the tear trough, palpebromalar groove, and malar mounds. It is described as an osteocutaneous ligament arising from the periosteum of the orbital rim and traversing the orbicularis oculi to insert into the dermis of the lid-cheek junction (Fig. 3). (**See Video, Supplemental Digital Content 2**, which demonstrates release of the medial orbicularis oculi. Release of the medial orbicularis oculi and orbicularis retaining ligament is often performed to treat the tear trough and palpebromalar groove. Adequate release is ensured by visualization of the levator labii superioris muscle. The orbicularis retaining ligament is difficult to identify medially where the orbicularis oculi is adherent to the infraorbital rim. It lengthens laterally and shortens again at the lateral orbital thickening. This video is available in the "Related Videos" section of the full-text article on PRSJournal.com or at ***http://links.lww.com/PRS/B906***.) It is not well defined medially where the orbicularis oculi arises directly from bone. The ligament extends circumferentially around the orbital rim, and thus forms the roof of the preseptal space in the upper eyelid and the floor of the preseptal space in the lower eyelid.[6,19–22]

Laterally, a fibrous thickening (lateral orbital thickening) connects the orbicularis retaining ligament to the lateral canthal tendon through the orbital septum and the tarsal plate. This is a triangular condensation of fascia overlying the frontal process of the zygoma and extending laterally to the deep temporal fascia. The base is at the lateral orbital rim, and the apex is at the deep temporal fascia (Fig. 2). Release of this complex therefore

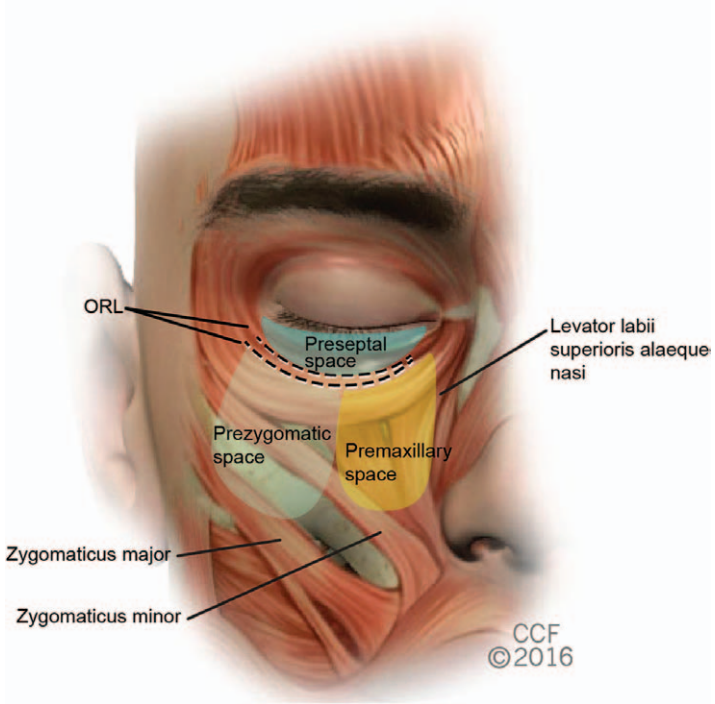

Fig. 3. Diagrammatic representation of the orbicularis retaining ligament (*ORL*) forming the floor of the lower preseptal space and the roof of the prezygomatic and premaxillary spaces.

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Video 2. Supplemental Digital Content 2 demonstrates release of the medial orbicularis oculi. Release of the medial orbicularis oculi and orbicularis retaining ligament is often performed to treat the tear trough and palpebromalar groove. Adequate release is ensured by visualization of the levator labii superioris muscle. The orbicularis retaining ligament is difficult to identify medially where the orbicularis oculi is adherent to the infraorbital rim. It lengthens laterally and shortens again at the lateral orbital thickening. This video is available in the "Related Videos" section of the full-text article on PRSJournal.com or at ***http://links.lww.com/PRS/B906***.

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allows mobilization of the lateral eyelid and adjacent periorbital area as one unit.[19]

The orbicularis retaining ligament further represents the roof of the prezygomatic space, which is bounded caudally by the medial extent of the zygomatic ligaments (Fig. 3). The size and morphology of the ligament are variable. Medially (superior to the levator labii superioris origin), the orbicularis oculi is directly attached to the medial aspect of the inferior orbital rim extending laterally to the level of the medial corneoscleral limbus. Farther laterally, the muscle is only indirectly attached to the rim by way of the orbicularis retaining ligament. The orbicularis retaining ligament thus is short medially and lengthens centrally (10 to 14 mm) to reshorten again laterally, where it merges with the lateral orbital thickening. It simulates the leash of a dog that is restricted medially, given away centrally, becoming longest level with the arcuate expansion. The ligament then shortens again laterally. Thus, the laxity of the ligament creates a V-shaped structure. Morphologically, the ligament is a bilaminar structure where the cranial leaf is a reflection of the septum orbitale and the caudal leaf is a continuation of the fascia covering the preperiosteal fat of the prezygomatic space. The zygomaticofacial nerve and foramen always lie peripheral to the orbicularis retaining ligament.[19]

CLINICAL EVALUATION

General Screening

A thorough screening for hemorrhagic diathesis minimizes bleeding complications. Antiplatelets and vitamin K suppressors should be stopped 1 to 2 weeks before surgery. Documentation of previous orbital or periorbital surgery, thyroid disease, glaucoma, hypertension, and diabetes is essential. Dry eye symptoms and visual acuity should be carefully assessed, and preoperative ophthalmologic evaluation should be performed if necessary. After blepharoplasty, transient dry eyes can be observed in a proportion of patients. Laser-assisted in situ keratomileusis surgery can increase the risk of this occurrence secondary to diminished corneal tearing reflex. Thus, delaying blepharoplasty for at least 6 months after laser-assisted in situ keratomileusis has been advocated.[23] A systematic approach is critical to reach an accurate diagnosis and formulate an optimum treatment plan.

Lower Eyelid Clinical Assessment

Although upper eyelid aesthetic correction is generally directed toward skin excision, lower eyelid surgery is directed toward the correction of lower lid bags. Bulges represent soft-tissue laxity (i.e., laxity of the overlying septum), whereas creases represent ligamentous attachments (i.e., attachments

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created by the orbicularis retaining ligament).[19] The degree of overlying soft-tissue laxity in combination with the severity of lid-cheek junction abnormality will dictate the extent of lower lid or midface surgery needed. In addition, skin excision, lateral canthal laxity, and skin color changes will dictate the ancillary procedures that may accompany lower lid blepharoplasty techniques.

Functional Evaluation

Lateral canthal descent and lid laxity may manifest by rounding of the palpebral fissure, scleral show, lid margin eversion, and/or frank ectropion. Tepper et al. identified seven key preoperative clinical parameters that measure canthal laxity and are potentially helpful for appropriate treatment selection. They were able to show that (1) vector analysis, (2) snap-back and distraction, (3) scleral show, (4) canthal tilt, (5) lateral canthal to orbital rim distance, (6) midface position, and (7) vertical lid restriction are predictive of lateral canthal laxity, and their presence suggests the need for canthal tightening.[24]

Vector analysis allows identification of those patients with an unfavorable globe-to–lower eyelid relationship. Those patients with a negative vector are at increased risk for lid malposition. Lid distraction allows for objective measurement of lid laxity. Those patients with 6 mm or less of lid distraction can be adequately treated with canthopexy techniques, whereas those with distraction greater than 6 mm require cantholysis and canthoplasty.[23]

Scleral show can be objectively measured by measuring the light reflex to lower lid vertical distance (margin reflex distance 2). Margin reflex distance 2 measurements should be less than 5 mm in lids with adequate tone.[1,23–25]

A positive canthal tilt is a favorable situation. Generally, the lateral palpebral fissure should be 1 to 2 mm higher than the medial canthus. Rohrich et al. demonstrated that the intercanthal angle was maintained or improved in the large majority of patients they treated with their five-step lower lid blepharoplasty.[21] Finally, vertical restriction is generally a sequela of previous lower lid surgery and suggests middle lamellar scarring.[24]

Lid-Cheek Junction

A proportion of patients present with a prominent sulcus that accentuates the lower lid bags and indents the lid-cheek junction. This periorbital hollow coincides anatomically with the confluence of preseptal and orbital portions of orbicularis oculi, the infraorbital rim, and the orbicularis retaining ligament.[26] The portion of this hollow extending from the medial canthus to the midpupillary level has been described as the "tear-trough deformity," whereas the lateral part is more appropriately termed the "palpebromalar groove."[26] More caudally, a second groove may appear delineating a cheek bulge ("the malar mound" or "festoons"), the pathophysiology of which is still debated[27] (Fig. 4).

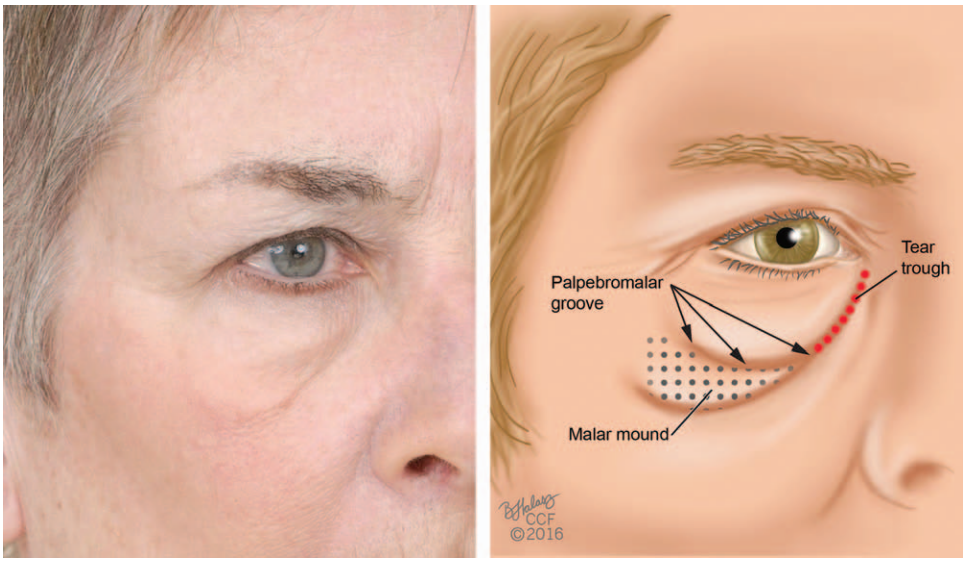

Fig. 4. (*Left*) Photograph of a 66-year-old patient showing the tear-trough deformity, the palpebromalar groove, and the malar mound. (*Right*) Diagrammatic representation of the tear-trough deformity, the palpebromalar groove, and the malar mound. The *red dots* represent the tear-trough deformity, the palpebromalar groove is the lateral continuation thereof, and the malar mound is the prominence of cheek tissue underneath.

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LOWER BLEPHAROPLASTY

Although upper blepharoplasty is performed through an anterior transcutaneous approach, lower blepharoplasty can be accomplished with either anterior transcutaneous or posterior (preseptal or postseptal) transconjunctival incisions. The postoperative lower lid margin position in relation to the inferior corneal limbus and corneal light reflex (margin reflex distance 2) and the lateral canthal angle are objective means of assessing successful maintenance of lower lid contour following blepharoplasty.[21] The location of the lower lid margin is affected by the reliability of lateral canthal support, orbicularis muscle tone, the integrity of the tarsoligamentous sling, and skin adequacy. Therefore, malposition may be secondary to untreated eyelid laxity, muscle denervation, middle lamellar scarring, or overly aggressive skin resection. Numerous blepharoplasty techniques or combinations of techniques have been recently advocated, all designed to prevent or minimize complications and maximize the aesthetic result. We suggest a graded approach depending on the degree of deformity, the particulars of the anatomy, and the amount of soft-tissue laxity.

In those patients with isolated lower lid bags and little or no skin excess (rare), a retroseptal transconjunctival approach is all that is needed. This allows direct access to lower lid fat without violating the orbicularis oculi muscle and results in no midlamellar scarring. Lower lid retractors are also released, resulting in potential lower lid elevation. In those patients with mild skin excess, a variety of techniques have been combined with the transconjunctival approach and have been recommended to prevent deflation of the soft tissue. These include trichloroacetic acid peel,[2] phenol croton oil peel,[28] skin pinch,[29,30] and skin undermining[2] (Fig. 5).

In those patients with more advanced aging in the lower lid area, a number of authors have combined the transconjunctival approach with a variety of techniques in an effort to improve the lid-cheek junction and minimize the potential for lid malposition. This includes transconjunctival fat removal or repositioning combined with transconjunctival or transcutaneous orbicularis retaining ligament release. Skin excess is then treated with either skin pinch or skin-only undermining.[2,20,31,32] Hidalgo addresses the palpebromalar groove and lid-cheek junction by way of a transconjunctival approach to release the medial orbicularis oculi and the orbicularis retaining ligament, and to reposition retroseptal fat over the orbital rim. He then treats skin excess by undermining a skin-only flap and resecting excess skin.[2] In this "inside-outside" approach, Hidalgo believes that skin flap undermining is preferable to the pinch technique. It releases the attachments between orbicularis oculi and skin, thereby enhancing the skin smoothening effect not obtained by skin pinch alone. At the same time, the orbicularis oculi is not violated, sparing muscle denervation and middle lamellar scarring, which may occur with traditional skin muscle flaps. Using this approach, Hidalgo demonstrated lower lid malposition in only three of 248 consecutive patients.[2] Similarly, Rosenberg showed no postoperative difference in margin reflex distance 2 or lateral canthal rounding using this approach (the inside-outside approach) in 78 consecutive patients.[33] Rohrich et al. used the transconjunctival approach in their five-step lower blepharoplasty technique. They emphasized the added importance of malar soft-tissue support using fat grafting in addition to the transconjunctival approach. Their approach includes the following:

Fig. 5. A 63-year-old woman who underwent secondary upper lid blepharoplasty, pinch lower eyelid blepharoplasty, and lower eyelid phenol peel (*left*) before and (*right*) after surgery. Note the decrease in fine lines on postoperative photography. The patient declined concomitant brow and glabellar treatments.

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(1) deep malar compartment lipofilling, (2) transconjunctival removal of lower lid fat, (3) orbicularis retaining ligament release, (4) lateral retinacular canthopexy, and (5) skin pinch removal or skin flap to address the skin. Objective preoperative and postoperative analysis of the margin reflex distance 2, intercanthal angle, and tear-trough height demonstrated significant improvement in all measurements, with minimal complications.[21]

TRANSCUTANEOUS APPROACH TO CORRECTION OF THE LID-CHEEK JUNCTION

The standard skin muscle flap lower lid blepharoplasty popularized by Rees and Dupuis as early as 1970 is perhaps the most frequently performed lower lid blepharoplasty technique. Although a 30-year review published by Maffi et al. in 2011 documented the low morbidity associated with this procedure, recent efforts have emphasized additional measures/techniques to improve the lid-cheek junction.[1,34]

In his carbon dioxide laser–assisted extended blepharoplasty, Schiller emphasizes aggressive release of both the medial orbicularis oculi at the orbital rim and the orbicularis retaining ligament, in an effort to improve lower lid contour and blend the lid-cheek junction. In this approach, fat is first resected transconjunctivally rather than repositioned. Then, through a transcutaneous skin-muscle flap, the medial orbicularis and orbicularis retaining ligament are released as far laterally as the lateral orbital thickening. Release extends 2 cm below the orbital rim and thus is significantly more aggressive than other described orbicularis retaining ligament release techniques. The orbicularis is then suspended to the lateral orbital rim. He rarely performs lateral canthal tightening, citing Hester et al., who also believe cheek release and suspension is more important to lower eyelid integrity than canthoplasty techniques. This procedure essentially achieves cheek lifting.[20,35]

An alternative transcutaneous approach embraced by Codner et al. and favored by the current authors has the benefit of repositioning and tightening the anterior lamella through the use of the orbicularis oculi muscle-skin flap. The drawback is that the orbicularis oculi muscle is violated, and denervation and middle lamellar scarring are more likely.[3]

TECHNIQUE

A subciliary incision is used and a skin flap developed for 5 mm to preserve preseptal orbicularis oculi muscle. A muscle incision allows entering the preseptal plane and a myocutaneous flap is raised to the infraorbital rim. The medial orbicularis oculi muscle is released and the orbicularis retaining ligament is incised to the medial corneoscleral limbus. Supraperiosteal dissection over the anterior orbital rim is performed until the levator labii superioris is visualized. This ensures release of the tear-trough ligament.[36] The orbicularis retaining ligament release extends laterally as far as the extent of the tear trough/palpebromalar groove determined preoperatively (**see Video, Supplemental Digital Content 2**, ***http://links.lww.com/PRS/B906***).

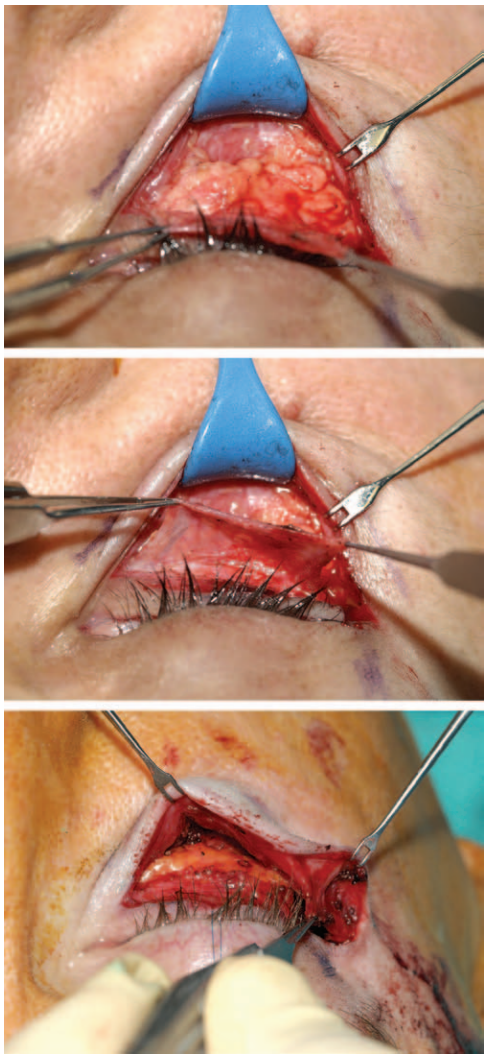

Fig. 6. Intraoperative photographs. (*Above*) After orbicularis retaining ligament release through a subciliary incision, fat is repositioned over the inferior orbital rim. (*Center*) Orbital septum is redraped over transposed fat. (*Below*) Orbicularis oculi muscle is repositioned superolaterally over the lateral orbital rim, tightening the anterior lamella.

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Supraperiosteal rather than subperiosteal dissection is favored, because the periosteum yields little lift and blood supply of the flap overlying the transposed fat is superior. Care should be taken during the medial infraorbital rim dissection, to avoid injury to the medial buccal branch of the facial nerve, which would lead to blink dysfunction, lower lid atony, and lacrimal pump failure. Troublesome bleeding can also occur because of angular artery injury in this vicinity. The lower orbital septum is released at the arcus marginalis, and fat is transposed over the orbital rim (Fig. 6). Fat can be sutured transcutaneously[2] or sutured in situ.[32] Alternatively, no sutures are used.[26] Canthal tightening is an integral part of the procedure. If less than 6 mm of lid distraction is present, canthopexy is adequate (**see Video, Supplemental Digital Content 1**, ***http://links.lww.com/PRS/B905***). If greater than 6 mm, cantholysis and canthoplasty are favored.[3,23] When severe horizontal tarsoligamentous laxity exists and lid shortening is indicated, canthotomy, lid margin resection (2 to 3 mm), and tarsal strip canthoplasty should be performed with care to restore the lateral canthal angle. The myocutaneous flap is then redraped in a superior and lateral direction and sutured to the lateral orbital rim at the level of the canthoplasty (Fig. 7). Skin and muscle are then conservatively trimmed laterally.

Postoperative irregularities may occur and generally resolve over 3 months. Possible causes include postoperative scarring or liponecrosis resulting from a lack of adequate blood supply of the fat flaps.[31,32] Other postoperative adverse sequelae include chemosis, reported in approximately 12 percent of patients. The cause of this is generally multifactorial and may be attributable to lymphatic disruption or lower lid separation from the globe.[3] Lid malposition occurs infrequently in practiced hands, when either the transconjunctival[2] or the subciliary approach is used[3] (Figs. 7 through 9).

LID MALPOSITION

Lid malposition is most effectively prevented by proper lateral canthal tightening procedures, which should be performed in virtually all patients undergoing subciliary lower lid blepharoplasty and fat repositioning, or those patients with clinically evident laxity of the lower lid. It should

Fig. 7. (*Above*) Preoperative photographs of a 62-year-old woman with lax lower lids (lid distraction >6 mm), scleral show, tear trough, palpebromalar groove, and malar mound. (*Above*, *left*) Frontal view. (*Above*, *right*) Profile view. (*Below*) Photographs 6 months after bilateral upper lid blepharoplasty, transcutaneous lower lid blepharoplasty, fat repositioning, orbicularis muscle flap, and bilateral tarsal strip canthoplasty. The patient declined concomitant brow and glabellar treatments. (*Below*, *left*) Frontal view. (*Below*, *right*) Profile view.

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be realized that lower lid laxity is present in the majority of middle aged patients. The degree of lid laxity dictates the type of canthal tightening required. For those patients with mild laxity (i.e., <6 mm of lid distraction), a canthopexy without canthotomy or cantholysis should suffice. In these cases, a double arm 4-0 permanent or absorbable suture is used to sew the tarsal plate and lateral retinaculum to the inner aspect of the lateral orbital rim periosteum. The lower lid should sit at the inferior level of the pupil. In those patients with a negative vector or negative canthal tilt, the lid should sit at the superior edge of the pupil. In those patients with lid laxity greater than 6 mm, a canthoplasty with cantholysis with or without horizontal lid shortening is preferred using either the inferior lateral retinaculum or tarsal strip canthoplasty technique[3] (Figs. 7 through 9). (**See Video, Supplemental Digital Content 3**, which demonstrates the tarsal strip canthoplasty. Excess

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Fig. 8. (*Left*) Preoperative photograph (frontal view) of 68-year-old woman with lax lower lids (lid distraction <6 mm), tear trough, palpebromalar groove, and malar mound. (*Right*) Photograph (frontal view) 15 months after bilateral upper lid blepharoplasty, transcutaneous lower lid blepharoplasty, fat repositioning, orbicularis muscle flap, and bilateral canthopexy. The patient declined concomitant brow and glabellar treatments.

Fig. 9. (*Above*) Preoperative photographs of a 46-year-old woman, with scleral show, mild laxity of the lower lid (lid distraction <6 mm), negative vector, and palpebromalar groove. (*Above*, *left*) Frontal view. (*Above*, *right*) Profile view. (*Below*) Postoperative photographs, 6 months after transcutaneous lower lid blepharoplasty with fat repositioning and bilateral canthopexy. (*Below*, *left*) Frontal view. (*Below*, *right*) Profile view. The patient declined concomitant brow and glabellar treatments.

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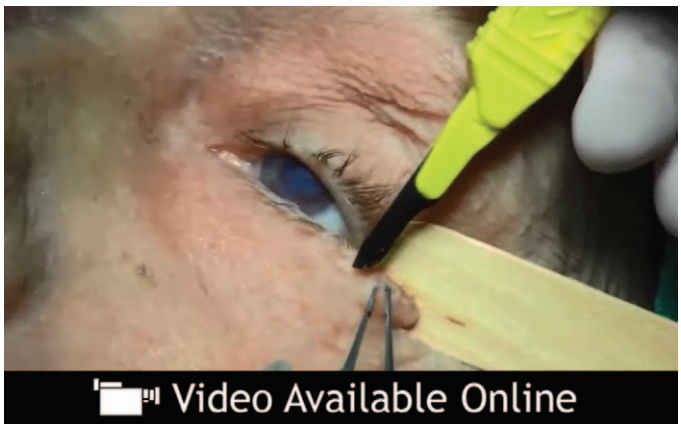

Video 3. Supplemental Digital Content 3 demonstrates the tarsal strip canthoplasty. Excess horizontal laxity of the lower lid can be addressed with the tarsal strip technique, which in addition to lid tightening enables a controlled shortening of the lower eyelid horizontal length. This video is available in the "Related Videos" section of the full-text article on PRSJournal.com or at ***http://links.lww.com/PRS/B907***.

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horizontal laxity of the lower lid can be addressed with the tarsal strip technique, which in addition to lid tightening enables a controlled shortening of the lower eyelid horizontal length. This video is available in the "Related Videos" section of the full-text article on PRSJournal.com or at ***http://links.lww.com/PRS/B907***.)

CONCLUSIONS

A graded approach to lower lid blepharoplasty has been emphasized in this article. Lower lid bags resulting from isolated orbital fat with no or minimal skin excess, although rare, are adequately treated through transconjunctival fat removal. Associated mild skin excess can be improved by ancillary skin pinch, or skin-only flap elevation and skin excision. Skin quality or pigment changes can be further addressed by skin resurfacing. Although the traditional skin-muscle approach is a time-honored method, recent emphasis has focused on improving the lid-cheek junction. The presence of a tear-trough or palpebromalar groove requires varying degrees of orbicularis retaining ligament release with or without fat repositioning. Canthal laxity is treated with canthopexy or canthoplasty techniques, depending on the degree of laxity identified.

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PATIENT CONSENT

Patients provided written consent for the use of their images.

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