Upper Blepharoplasty Combined with Levator Aponeurosis Repair*

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Defects or stretching of the levator aponeurosis are the most common causes of blepharoptosis seen in patients seeking cosmetic eyelid surgery. Upper eyelid blepharoplasty lends itself well to simultaneous correction of blepharoptosis via repair of aponeurotic defects. Blepharoplasty without correction of a preexisting blepharoptosis may aggravate the blepharoptosis. There are several advantages to the use of a combined procedure:

1. Both procedures can be addressed at the same setting with the use of a single incision.
2. The procedures directly correct anatomic defects responsible for dermatochalasis and blepharoptosis and prevent further stretching of the aponeurosis.
3. The conjunctival surface is left undisturbed, leading to less postoperative edema, discomfort, and corneal irritation.

The fact that none of the elements responsible for production of the trilaminar tear film are removed decreases the potential for postoperative tear film dysfunction. The technique of combined blepharoplasty with aponeurotic ptosis repair has proved tremendously successful and is applicable for many patients seeking cosmetic eyelid surgery.

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Evaluation

Preoperative recognition of ptosis is extremely important because postoperative eyelid height asymmetry will not go unnoticed by the scrutinizing patient and the blepharoptosis is frequently more apparent after excess skin is removed. A systematic preoperative evaluation of all patients desiring

*Dr. Burroughs and Dr. McLeish have no financial disclosures. Dr. Anderson is a paid consultant of Allergan Pharmaceuticals, but otherwise has no financial disclosures.
cosmetic eyelid surgery identifies the presence of ptosis as well as other eyelid and upper facial maladies. The examination should also serve to thoroughly educate the patient and engender an amicable and trusting relationship between the patient and physician.

The preoperative examination entails a thorough review of the physical relationships of the patient’s entire upper face. The heights and contours of the upper eyelids are noted with the forehead and eyebrows in a relaxed, natural position. An asymmetric or heavily furrowed brow often masks the presence of ptosis. Frequently, redundant upper eyelid skin must be gently elevated out of the way to visualize the lid margin and the natural eyelid crease, which is typically elevated by an aponeurosis disinsertion.

The amount of levator function present should be recorded. Levator aponeurosis disinsertion results in ptosis with normal levator function. If the levator function measures less than 12 mm, the cause should be sought. The eyelid skin should be examined for scars from previous surgery or trauma. Any lagophthalmos should be noted, as its presence may help to identify a previously uncorrected congenital ptosis or the presence of significant internal scar tissue or symblepharon. Bilateral ptosis with poor levator function may be the only feature of a systemic condition such as chronic progressive external ophthalmoplegia. Variable ptosis and levator function are classically associated with myasthenia gravis. Conditions associated with poor levator function require specialized care, and affected patients may not be candidates for a combined blepharoplasty and aponeurotic ptosis repair.

**Upper eyelid crease**

Symmetry between the two upper eyelids is of paramount importance in achieving the desired cosmetic result. Correct placement of the eyelid crease incision, therefore, is one of the most important steps in the combined blepharoplasty and aponeurotic ptosis repair procedure. The central eyelid crease height should usually be 9–12 mm above the lid margin. It should taper temporally to a height of 5–6 mm above the lateral canthus and medially to 6–7 mm above the punctum. The configuration of this incision roughly corresponds to the superior border of the tarsal plate, the level at which the levator aponeurosis normally sends fibers through the orbicularis oculi muscle to the skin.

The incision continues temporally approximately 1 cm beyond the lateral canthus in a natural skin crease. One should avoid the temptation to extend the incision beyond this point in an attempt to incorporate temporal crow’s feet (rhytids) into the excision. The skin beyond the lateral orbital rim is thicker and less forgiving than eyelid skin, and the incision scar in this area may be visible for months after surgery. Rhytids in the temporal region are best addressed by an upper facial rhytidectomy and not through an ‘extended blepharoplasty’ procedure (see Chapter 4). Alternatively, Botulinum toxin A (Botox®), chemical peeling, and carbon dioxide (CO₂) laser resurfacing has proved quite effective in the treatment of temporal rhytids and are an excellent treatment option for individuals who do not require extensive skin excision.

During simultaneous aponeurotic ptosis repair, there is a tendency for the eyelid crease to establish itself lower than the originally desired height. This occurs when the surgeon must expose the tarsal plate to facilitate placement of tarsal sutures. If desired, the surgeon can counter this tendency by minimizing dissection to the superior border of the tarsal plate, by not excising any pretarsal orbicularis muscle, and by placing aponeurotic sutures at the desired eyelid crease height.

**Surgical technique**

The skin incision is marked superiorly to circumscribe redundant skin and orbicularis muscle tissue. The surgeon establishes the proper amount of skin and muscle that can be safely excised by placing one blade of a smooth forceps on the marked eyelid crease incision and gently pinching sufficient redundant tissue between it and the second blade of the forceps to cause the lid margin to just begin to evert. We use the extra fine point skin marker by Scanlan™ (800-328-9458) as it has an ultra fine tip and allows precise marking. This maneuver is repeated along the length of the eyelid crease incision, and the superior extent of the incision is marked with a pen at each location (Fig. 10-1A). As ageneralguide,thesuperiorlimboftheincisionshouldbeatleast10–12 mm below the inferior margin of the eyebrow at the midpupillary position to ensure adequate anterior lamella remains to allow for complete eyelid closure and to prevent iatrogenic brow ptosis.

After the skin markings have been completed, the tissues are infiltrated with 2 percent lidocaine with 1:100,000 epinephrine to facilitate hemostasis, which takes place approximately 5–10 minutes following injection. No hyaluronidase is used, as it may enhance deep penetration of the local anesthetic, which may result in diminished levator function and subsequent difficulty adjusting the eyelid to the proper height.

After anesthesia is obtained, a 4-0 silk traction suture may be passed through the upper lid margin and secured to the drape below for fixation. The skin incision is made with a No. 15 Bard–Parker or diamond
blade. The skin-muscle flap is excised as a single unit with tenotomy scissors or a cutting cautery unit. Elevation of the skin-muscle flap exposes the suborbicular fascia plane and the orbital septum, greatly speeding the dissection and protecting the levator aponeurosis from iatrogenic damage (Fig. 10-1B). Hemostasis is controlled with bipolar cautery. We have found the non-stick SILVERGlide™ (800-259-6156) bayonet electrocautery forceps allow rapid cauterization of large areas without the need to frequently re-clean the tips during cauterization of multiple sites of bleeding.

Novice surgeons may be unsure whether they are viewing the orbital septum or the aponeurosis at this point. By grasping the structure with a forceps and pulling inferiorly, the surgeon can immediately make the correct identification. The orbital septum fuses with the arcus marginalis at the orbital rim and is immobile. In contrast, the levator aponeurosis travels inferiorly with little resistance and elevates if the patient is asked to look superiorly.

Once identified, the septum is incised centrally. The septum is opened several millimeters above the tarsal plate, where the preaponeurotic fat protects the underlying aponeurosis from accidental injury. The opening in the septum is then extended the length of the eyelid incision. The central preaponeurotic fat compartment is bluntly teased into view. This fat is yellow and generally contains few vessels. The redundant fat can be sculpted with tenotomy scissors. We have found that clamping the fat before excision is not required and bleeding vessels are meticulously cauterized. Sculpting of fat should always be anterior to the orbital rim. The fat generally trimmed to level just outside the orbital rim. Caution must be exercised not to oversculpt, which will yield a displeasing aged appearing eyelid.

The medial fat pocket is more extensive than the central pocket. It can be discerned from the medial compartment by its whitish coloration, thicker and denser consistency, and greater vascularity. Frequently, sharp lysis of normally occurring fibrous septa is required before the fat in this compartment presents itself. Gentle repropulsion of the globe further enhances delivery of the fat. Hemostasis is particularly important in this region because the medial fat pad contains terminal branches of the ophthalmic artery and multiple large-caliber veins. Bleeding from these vessels can be significant, and if inadequately controlled, can result in vision-threatening orbital hemorrhage. Furthermore, blind cautery in this area can lead to damage to the trochlea and to subsequent diplopia. For these reasons, we advocate care to not excise too much fat from the medial and central fat pockets because this can create a depression and hallowed appearance (Fig. 10-1C). Aggressive inferior dissection in this area can damage the medial horn of the levator aponeurosis, aggravating ptosis and ‘lateralization’ of the tarsal plate, as described by Shore and McCord.3

Temporally, the position of the lacrimal gland should be noted. A prolapsing lacrimal gland creates fullness in this area, which can masquerade as fat prolapse and even temporal brow ptosis.4 A prolapsed lacrimal gland needs to be repositioned within the lacrimal gland fossa (see Chapter •). One should avoid the temptation to excise the gland, which will result in diminished aqueous tear production and dry eye symptoms.

With the appropriate preaponeurotic fat now removed, the underlying aponeurosis is visualized. Rarely, a distinct disinsertion between the tarsus and the leading edge of the aponeurosis is encountered (Fig. 10-1D). This is easily recognized because the peripheral arcade running through Müller’s muscle just above the superior border of the tarsal plate is clearly visible. More commonly a rarefied and stretched aponeurosis or an aponeurosis with extensive fatty infiltration is found (Fig. 10-1E).

At this point, a single-armed 5-0 polygactin 910 (Vicryl) suture on a spatula needle is passed vertically in a partial-thickness fashion through the superior border of the tarsal plate just medial to the pupil. The suture position corresponds to the highest point of the natural eyelid contour. We have found that vertical suture passes produce a smoother eyelid contour and less tendency to cause eversion of the lid margin than the more frequently described horizontal mattress suture techniques. It is imperative that the suture bites be placed at the superior border of the tarsal plate to avoid creating an ectropion of the upper eyelid or lowering of the eyelid crease.

The needle is then regrasped and passed through the disinserted edge of the levator aponeurosis (see Fig. 10-1D). No attempt is made to dissect the strongly adherent and vascular Müller’s muscle off the undersurface of the aponeurosis. Any bleeding is immediately controlled with bipolar cautery to avoid creating a hematoma in Müller’s muscle, which can complicate adjustment of the eyelid height and contour. The suture is permanently tied. All subsequent suture passes between the aponeurosis and the tarsus will also be permanently secured at the time of the procedure. Other surgeons have advocated the use of temporarily tied, adjustable aponeurotic sutures, which can be manipulated during the perioperative period to alter the eyelid height as needed.5 We have found these sutures to be awkward to use; more importantly, they have not improved our results over spreading the incision apart and removing the deep suture if overcorrected in the 1–2 week postoperative period.

With the central suture permanently set, the patient is asked to open his or her eyes, and the height of the
**Figure 10-1**

A. Ellipse of upper eyelid skin to be removed is outlined.

B. Elevation of the skin and orbicularis oculi muscle flap facilitates dissection just deep to the suborbicular fascial plane, thus helping to prevent iatrogenic damage to the levator aponeurosis.

C. The medial fat pad and redundant central fat may be conservatively sculpted by sharp excision with tenotomy scissors.

D. Alternative 1: The spontaneously disinserted edge of the levator aponeurosis is identified. The 5-0 polyglactin (Vicryl) sutures are passed vertically through the superior border of the tarsal plate and then passed through the disinserted edge of the levator aponeurosis.

E. Alternative 2: Fatty infiltration of the levator aponeurosis. No distinct disinsertion is noted.
Figure 10-1—cont’d

F, Alternative 2: Excision of the pretarsal orbicularis muscle bares the superior aspect of the tarsal plate.

G, Alternative 2: The levator aponeurosis is elevated off the underlying Müller’s muscle to the desired level.

H, Alternative 2: The 5-0 polyglactin sutures are passed vertically through the superior border of the tarsal plate and then through the levator aponeurosis at the desired height.

I, Alternative 2: The redundant levator aponeurosis is excised.

J, The 5-0 polyglactin sutures are secured.

K, Skin closure with interrupted 6-0 plain gut sutures.
and the height of the contralateral eyelid. If the height of the eyelid margin appears appropriate, the patient may be placed in the sitting position and the eyelid height is reconfirmed if another check is desired. An eyelid height 1–2 mm higher than the intended final position is usually ideal because the eyelid will settle as the effects of the epinephrine dissipate and orbicularis function returns. If the eyelid height is undercorrected, the suture is removed and repositioned higher on the aponeurosis.

Once the desired height is achieved additional sutures may be passed in an identical manner at the temporal and nasal limbal positions (see Fig. 10-1D). Oftentimes, excellent eyelid height and contour may be achieved with only a single suture pass. The temporal suture if used should be undercorrected to avoid temporal flare as temporal overcorrection is a frequent complication of surgeons just beginning with aponeurotic repair. Temporal suture placement is seldom used in our practice except in congenital cases or decreased levator function. Again, the height and contour of the eyelid are reassessed in up and downgaze.

When an attenuated aponeurosis is still attached to the tarsus in blepharopexy cases a thin strip of pretarsal orbicularis muscle and attenuated aponeurosis is excised along the superior border of the tarsal plate (Fig. 10-1F). This maneuver bares the superior border of the tarsal plate of the soft tissue and the aponeurotic adhesions and freshens the edge of the aponeurosis, which will ensure solid fixation. This step may result in the lowering of the eyelid crease as already discussed. The 5-0 polyglactin sutures are passed through the tarsal plate in the manner previously described and are then passed through and above the leading edge of the aponeurosis. The amount of levator advancement and resection is determined by eyelid position as previously discussed.

If more than 4 mm of aponeurotic advancement is required, the aponeurosis is sharply dissected off the underlying Müller’s muscle to the desired level, and the redundant aponeurosis is excised (Fig. 10-1, G–I). No attempt is made to resect Müller’s muscle. The lid height is again checked with the patient in both up and downgaze. If there is any question about the desired height of the eyelid, it is always safest to err on the side of overcorrection, as this can easily be corrected postoperatively. Once the appropriate eyelid height is reached, the temporal and nasal sutures may be placed if necessary (Fig. 10-1, H–J).

The blepharoplasty incision is closed with 6-0 plain gut sutures (Fig. 10-1K). These sutures dissolve in 10–14 days, eliminating the need for suture removal. Interrupted sutures are preferred because they produce better wound apposition and allow egress of postoperative wound fluid. Only the skin layer is closed. The septum should never be incorporated into the closure because doing so could result in postoperative lagophthalmos. A redundant medial skin fold or ‘dog ear’ can be excised in a triangular fashion. Because the orbital septum is fully opened and the redundant preaponeurotic fat is sharply excised in addition to removal of a strip of pretarsal orbicularis muscle, a strong eyelid crease is achieved without the need for supratarsal fixation sutures. We generally avoid the use of supratarsal fixation sutures, as they have been associated with recurrent ptosis, epithelial inclusion cysts, suture abscesses, and asymmetric eyelid creases.

Adjunctive procedures

Many of the patients presenting to us for ‘droopy’ eyelids have a component of both blepharoptosis and dermatochalasis. We therefore highly advise our patients to have both elements addressed. Even if the major problem is ptosis, we will usually remove an appropriate amount of any excess skin and find that a wide, typical upper blepharoplasty incision to be cosmetically superior to smaller incision techniques. Adjunctive procedures that we often perform through the typical upper blepharoplasty incision include internal brow elevation, glabellar furrow reduction, and lateral canthopexy. We strongly encourage internal brow elevation for any patient whose has less than 10 mm of skin between the upper eyelid crease and the inferior brow cilia and are not interested in more aggressive brow elevation. It is ideal for heavy ptotic brow fat pads. This procedure involves the sculpting of the brow fat pads, and release of the orbital ligament in the upper eyelids. The glabellar furrows may effectively be reduced by partially resecting the corrugator and depressor superciliaris muscles through the upper blepharoplasty incision, which gives a permanent Botox®-like effect and has been very useful for those with headaches in this area.

Postoperative care

Postoperatively, the patient is instructed to apply cold compresses to the eyelids for 2 days and to place lubricating drops and ointment in the eyes for several days to weeks until eyelid closure becomes complete. A mild to moderate amount of temporary lagophthalmos is expected postoperatively. Postoperative edema usually clears in 2–4 weeks, but if necessary a Medrol dose pack often helps in more severe cases. We have also
found arnica montana and vitamin C to reduce postoperative bruising and hasten resolution.

Patients should refrain from taking aspirin-containing or non-steroidal anti-inflammatory products as well as garlic, ginger, ginkgo, ginseng, and mega-dose vitamin E for at least 2 weeks before surgery. They also should limit sun exposure to the incision sites to avoid skin and wound discoloration.

Complications

The most common postoperative complications are mild lagophthalmos and exposure keratitis. In almost every case, these complications are self-limiting and respond to topical lubricants and eyelid massage. Other complications include occurrences of wound dehiscence, wound infection, temporary eyelash eversions, rare epithelial suture cysts, and allergic dermatologic and conjunctival reactions from antibiotic ointments.

Treatment of overcorrection and undercorrection

Overcorrection

Postoperative management of lid height asymmetry is relatively simple with the external aponeurotic ptosis repair and can usually be performed in the office. Small overcorrections generally respond to gentle massage of the eyelid for 5–10 minutes four times a day. To accomplish this, we have the patient hold his or her eyebrow up with one hand while pushing the eyelid both down and in with the index finger of the other hand. This massage can begin as soon as the skin incisions have healed.

Significant overcorrections noted in the first 10 days after the procedure can be corrected by opening a portion of the wound and removing one or more of the 5-0 polyglactin sutures suspending the aponeurosis to the tarsal plate. The area surrounding the eyelid crease incision is usually relatively free of sensation during the first few days postoperatively, and typically, minimal local anesthesia is required for this procedure. After the lid height is corrected, the wound is closed with one or two 6-0 plain gut sutures.

Undercorrection

Significant undercorrections are much more difficult to correct. To repass sutures through the tarsal plate and aponeurosis, almost the entire length of the skin incision must be reopened. Once the height of the eyelid is reset, the contour must be readjusted. In effect, the procedure is repeated to correct an undercorrection. For this reason, it is best to achieve a slight overcorrection rather than an undercorrection in aponeurotic blepharoptosis repair.

If an obvious undercorrection (>2 mm) needs to be repaired, it is best to do so within the first two postoperative weeks to take advantage of the relative ease of dissection afforded by the original procedure. If the undercorrection is minimal (1 mm) or considerable swelling is present, we advocate observation of the eyelid until the postoperative edema has cleared before any additional intervention is pursued. In cases with decreased levator function we have found some patients require a small superior tarsectomy to adequately elevate a significantly ptotic eyelid.

Results

The combined upper eyelid blepharoplasty and external levator aponeurotic ptosis repair procedure has been performed in over 3000 patients over the past three decades (Figs 10-2 and 10-3). Good to excellent results, as determined by symmetric lid contour and central lid height within 1 mm of the desired position, were achieved with a single procedure in over 90 percent of patients.

Primary overcorrections requiring removal of aponeurotic sutures in the office occurred in less than 2 percent of patients; all instances were successfully corrected. Primary undercorrections were noted in fewer than 3 percent of patients. Some of these patients required a second procedure with more aggressive aponeurotic advancement. Late blepharoptosis recurrence

Figure 10-2 Preoperative (A) and postoperative (B) appearance following combined upper eyelid blepharoplasty and aponeurotic ptosis repair.
(occurring more than 6 months following the initial procedure) was seen in less than 1 percent of patients. Most of these recurrences were in patients noted to have fatty infiltration of the aponeurosis at the initial procedure. At the time of the second operation, most of these patients were found to have attenuation of the aponeurosis immediately above the tarsal plate or increased degeneration and fatty infiltration. Very few true disinsertions were encountered. Presumably, the levator aponeurosis in this group of patients is inherently weak and prone to stretching and future degeneration. The technique of combined blepharoplasty with aponeurotic ptosis repair has proved tremendously successful. With a thorough knowledge of the eyelid anatomy, proper suture placement, and careful intra-operative assessment or heights and contours, the surgeon can accurately correct dermatochalasis and blepharoptosis using this technique in almost every patient seeking cosmetic eyelid surgery.

References