Blepharoplasty

An Overview

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One of the most commonly performed surgical procedures involving the eyelids is blepharoplasty. Quite simply, this entails the removal of excess or dermatochalastic skin and prominent fat from the eyelids. In recent years a host of health care providers have become interested in this procedure, partly as a result of patient demand and partly to further augment their surgical repertoire. Variations and nuances in surgical technique abound, as each individual performing this surgery develops his or her own approach based upon experience and training. This article will first provide an overview of eyelid anatomy, followed by a basic discussion of the evaluation of the blepharoplasty patient, the basic surgical technique for performing both upper and lower eyelid blepharoplasty, and insight into avoiding postoperative complications. This is not an all-encompassing work, and entire monographs have been written on this subject, but it is hoped that this information will provide a framework upon which those interested in blepharoplasty can further build their knowledge and skill.

Although blepharoplasty is often performed purely for cosmetic purposes, more often it is used to treat functional problems including superior visual field loss when lax skin overhangs the eyelashes or dermatitis and skin irritation when the lashes rub this skin (Fig. 1).

It is also an important part of surgery to repair congenital or acquired eyelid abnormalities including eyelid asymmetry, ptosis, ectropion, or entropion. The pathology underlying most acquired dermatochalasis as well as the seeming herniation of orbital fat into the eyelid is related to the normal aging process of both the skin and the underlying eyelid structures. Sun damage is an important contributing factor to these changes. Skin laxity occurs in conjunction with the breakdown of collagen and elastic fibers within the dermis as well as changes in dermal mucopolysaccharides and proteins. In addition, the epidermis becomes atrophic with aging, and there are abnormal changes in both melanocytes and keratinocytes. Certainly, a genetic predisposition to such aging changes, as well as mechanical factors such as eyelid rubbing in patients with allergies, can contribute to early or excessive skin laxity.

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ANATOMY

An understanding of eyelid anatomy is essential for performing a successful blepharoplasty, identifying problems that cannot be corrected by blepharoplasty alone, and avoiding intra- and postoperative complications (Fig. 2). The eyelid is a complicated structure containing three distinct muscles, multiple nerves and blood vessels, a "skeleton" of dense fibrous connective tissue, the anterior extent of the orbital fat, portions of the lacrimal gland as well as other glandular structures and pilosebaceous structures, and septal attachments to the surrounding bone. In general, the eyelid skin is the thinnest in the body with little underlying dermis. This is important in understanding the reason for the relative paucity of scar tissue following eyelid surgery when compared with skin incisions elsewhere in the body. Normally, there is some excess upper eyelid skin. This allows for normal eyelid movement that would otherwise be restricted. In contrast, usually there is minimal excess lower eyelid skin. This explains eyelid retraction and inadequate eyelid closure when overvigorous skin removal is performed during a blepharoplasty.

When the upper eyelid is in the open position, the skin forms a roll or fold. This fold is usually several millimeters above the lashes. In some individuals it may be so minimal as to be almost absent. When the eyelid is closed, a horizontal crease can be visualized at the bottom of this fold. This crease represents the place where fibers from the levator aponeurosis attach to the posterior surface of the skin. In general, this crease is approximately 10 mm above the upper eyelid margin, although this can be quite variable depending on age and racial characteristics. The skin above this crease is loosely attached to the underlying structures, whereas that below the crease is more firmly attached, accounting for the presence of the skin fold. Generally, the inferior aspect of the upper eyelid blepharoplasty incision is placed so that it becomes hidden within the eyelid crease when the eyelid is opened. A similar crease is present in the lower eyelid, where fibers from the capsulopalpebral fascia and septum attach to the skin about 3 mm below the lower eyelid lashes.

Beneath the eyelid skin is the orbicularis muscle. This is basically a sphincter-like structure surrounding the entire bony orbital margin. During normal blinking the muscle contracts from its lateral attachments at the lateral orbital rim toward its medial connections at the anterior and posterior lacrimal crests. This so-called pumping phenomenon propels tears produced from the lacrimal gland towards the canaliculi and nasolacrimal apparatus. The medial and lateral attachments of the orbicularis muscle form the medial and lateral canthal tendons. Below the superior aspect of the orbicularis muscle in the upper eyelid and the inferior aspect of the orbicularis muscle in the
Figure 2. Cross-sectional view of eyelid anatomy. (From Putterman AM: Cosmetic Oculoplastic Surgery, ed 2. Philadelphia, WB Saunders, 1993, p 73.)
lower eyelid lies the orbital septum. This is an extension of the periosteum of the orbital rim that ultimately inserts into the levator aponeurosis of the upper eyelid and the capsulopalpebral fascia of the lower eyelid. The vertical extent of the orbital septum in the upper eyelid is between 10 and 15 mm. It is about 10 mm in the lower eyelid.

Posterior to the orbicularis muscle over the inferior 10 to 15 mm of the upper eyelid is the levator aponeurosis. This structure is approximately 20 mm in length and extends from the levator muscle as it passes over Whitnall’s ligament. The aponeurosis inserts into the anterior surface of the inferior 3 to 4 mm of tarsus. The capsulopalpebral fascia is the analogue of the levator aponeurosis. It extends beyond the orbital septum at the inferior border of the lower eyelid tarsus to insert onto the anterior surface of this structure. The anterior extent of the orbital fat is posterior to the orbital septum. It is restrained from traveling down into the inferior aspect of the upper eyelid by the attachments of the orbital septum to the levator aponeurosis. It is similarly restrained from traveling superiorly in the lower eyelid by the attachments of the orbital septum to the capsulopalpebral fascia. There are two so-called fat pads in the upper eyelid—the medial fat being pale in color, whereas the central fat is yellow. Laterally, the fat is replaced by the orbital portion of the lacrimal gland. There are three “fat pads” in the lower eyelid. The medial fat is separated from the central by the inferior oblique muscle, and the medial fat is separated from the lateral by fascial attachments from the inferior oblique muscle. It is common to see relatively low upper eyelid creases and fullness of the inferior aspect of the upper eyelid and superior aspect of the lower eyelid in individuals of Chinese, Korean, and Japanese descent. In these individuals the orbital septum in the upper eyelid attaches at a much lower level to the levator aponeurosis, and the septum in the lower eyelid attaches at a higher level.

Posterior to the levator aponeurosis is the tarsus, beginning at the upper eyelid margin and extending superiorly for 10 mm. Attached to the superior border of the tarsus is Müller’s muscle, a sympathetically innervated muscle. This muscle is approximately 10 to 12 mm in length, inserting into the levator aponeurosis. The palpebral conjunctiva covers the entire posterior aspect of the upper and lower eyelids. The lower eyelid is similar in structure to the upper, with the exception that Müller’s muscle and the capsulopalpebral fascia are fused and the tarsus in only 4 mm in vertical dimension.

**PATIENT EVALUATION**

Thorough preoperative patient evaluation is the most important aspect of blepharoplasty. It is essential to determine before surgery if blepharoplasty will successfully correct the problem for which the patient initially sought consultation, or if underlying conditions such as brow ptosis, eyelid ptosis, lower eyelid and cheek laxity, significant facial wrinkling, facial asymmetry, or dry eye will necessitate additional surgery or a modified surgical approach.

Patients presenting for blepharoplasty often have a variety of complaints that give the examiner clues as to their underlying problems. Complaints of headache, heaviness of the eyelids, fatigue, malaise, loss of superior visual field, and difficulties reading for long periods of time are common. These arise from continued overaction of the frontalis muscle in an attempt to elevate the eyebrows, and by so doing pull the excess eyelid skin up and off the eyelids. With time, the frontalis muscle finally fatigues or feels strained, and the excess eyelid skin again droops. The lax skin resting on the eyelashes or hanging over the eyelid margin often blocks the superior visual field. In some instances patients may develop a significant irritation and crusting from dermatitis owing to the abrasive action of the eyelashes or debris retained under the lax eyelid skin.

A complete ocular examination is recommended prior to the performance of any eyelid surgery. Changing the position of the eyelid can modify a patient’s refractive error, which can result in a postoperative visual disturbance. Exacerbation of a previously existing dry eye condition by decreasing the ability to close the eyes, by altering the
blink phenomenon, or by changing the position of the eyelid margin relative to the cornea can result in corneal irregularity, postoperative corneal and ocular irritation and redness, and decreased vision.

The presence of eyebrow ptosis is another confounding factor in blepharoplasty. The normal position of the eyebrow in a woman is above the superior orbital rim, whereas the normal position in man is at or below the orbital rim. Eyebrows that are too low relative to their normal position will give the erroneous impression that there is more excess skin than is truly present. Excising skin in such cases may result in further lowering of the eyebrow, an inability to close the upper eyelid adequately, or the appearance of inadequate skin removal. Patients with eyebrow ptosis in addition to dermatochalasis require a brow lift as an adjunctive procedure. In contradistinction, some patients may have eyebrows that are at too high a level (Fig. 3).

![Figure 3. Patient with eyebrow retraction to elevate ptotic eyelids, significant ptosis, severe herniated orbital fat, dermatochalasis, and prolapsed lacrimal glands (most evident on left).]
Generally, these patients are using the frontalis muscle to add extra lift to ptotic eyelids or to pull excess upper eyelid skin out of the way. Failure to adequately assess these situations may result in a failure to correct a ptotic eyelid by performing surgery on the levator aponeurosis or Müller’s muscle or inadequate skin removal.

THE NORMAL EYELID

It is essential to have some knowledge of the position and appearance of the normal eyelid to prevent the misdiagnosis or failure to diagnose such common conditions as ptosis, ectropion, and entropion during the evaluation of a patient for possible blepharoplasty (Fig. 4).

Figure 4. The normal eyelid.
It is not unusual in the aging individual to have both dermatochalasis and excessive prominence of the orbital fat as well as other eyelid abnormalities that require correction at the same time as the blepharoplasty (see Fig. 3).

The normal palpebral fissure height—that is, the distance between the central aspect of the upper eyelid margin and the central aspect of the lower eyelid margin—is between 8 and 10 mm (Fig. 5).

Figure 5. Normal and abnormal palpebral fissures and Margin Reflex Distance 1 (MRD-1).
This measurement, however, can disguise an upper eyelid that is ptotic and a lower eyelid that is retracted or sagged. Therefore, the palpebral fissure height can be divided into a margin reflex distance 1 (MRD-1), which is the distance between the central corneal light reflex and the upper eyelid margin, and a margin reflex distance 2 (MRD-2), which is the distance between the central corneal light reflex and the lower eyelid margin (see Fig. 5). The normal MRD-1 is from 2.5 to 5.0 mm. If the MRD-1 is less than 2.5 mm, the patient has a ptotic upper eyelid irrespective of the presence of excessive upper eyelid skin (Fig. 6).

Figure 6. Patient with bilateral ptosis and dermatochalasis. A. Preoperative. B. Postoperative after both ptosis repair and four-lid blepharoplasty.
A recessed upper eyelid crease—that is, one that is greater than 10 mm above the upper eyelid margin—suggests a dehiscence of the levator aponeurosis as the cause of the upper eyelid ptosis. Removing upper eyelid skin does not correct ptosis. Ptosis correction involves either surgery on the levator aponeurosis or Müller's muscle (see Fig. 6). An MRD-1 greater than 5.0 mm suggests eyelid retraction. Thyroid disease, trauma, and proptosis are some of the more common causes of eyelid retraction. An upper eyelid blepharoplasty in such cases will not correct the eyelid retraction and occasionally can worsen it.

The normal MRD-2 is approximately 5 to 6 mm. This places the lower eyelid margin at or just below the inferior limbus. If the MRD-2 is greater than about 6 mm, lower eyelid retraction may be present. This suggests thyroid disease, previous trauma, or proptosis, as well as other causes of lower eyelid retraction. Excision of lower eyelid skin in such cases may worsen the amount of eyelid retraction. A lower eyelid that is much above the inferior limbus is unusual, but it can occur in association with anophthalmos or following retinal detachment surgery. Excision of lower eyelid skin in such cases may slightly retract the lower eyelid margin.

Among other changes, aging result in laxity of the canthal tendons. Sometimes, this is obvious from the presence of an ectropion or an entropion (Fig. 7); however, many times a few simple tests are required to expose this problem.

Figure 7. Patient with bilateral lower eyelid laxity, dermatochalasis, and herniated orbital fat.
Many individuals with eyelid laxity will complain that their eyes tear intermittently, often when reading. Failure to correct this at the time of blepharoplasty may result in lateral eyelid sagging, ectropion, or worsened tearing. The snap back test, eyelid distraction test, and the canthal distraction test can quickly and easily expose the presence of eyelid laxity. In the snap-back test the lid is gently pulled down and allowed to snap back into its normal position (Fig. 8).

Figure 8. Demonstration of snap-back test.

In the normal individual, the lid will return to its original position quickly, whereas in the presence of eyelid laxity the lid will hang back before returning to its original position when the patient blinks. In the lid "distraction" test, the eyelid is pulled away from the globe. In the normal individual the lid can be "distracted" only about 1 to 3 mm. The ability to move the lid further away suggests eyelid laxity. In the tendon "distraction" test, the lid is moved horizontally away from the lateral and medial canthal tendons. The lid should be firmly attached both medially and laterally to underlying bone, and it should not be possible to stretch it or pull it away from these attachments.
It is important to demonstrate the presence of an adequate tear film, an adequate blink, and good eyelid closure prior to blepharoplasty. Dry eyes and lagophthalmos is uncomfortable and causes tearing, irritation, redness, and mucous discharge. It is easily worsened by blepharoplasty by preventing the eyelids from blinking or closing adequately, or by changing the position of the eyelids relative to the globe. A slit lamp examination of the tear film, cornea, and eyelid margin will help to identify this problem preoperatively, allowing the surgeon to modify the amount of surgery performed. Simple observation of the frequency or completeness of the blink phenomenon and the completeness of eyelid closure is also important. The strength of the orbicularis muscle can be estimated by having the patient close his or her eyelids tightly and forcibly try to separate the eyelids. In most instances it should be quite difficult to separate the eyelids. Schirmer tear testing is one of the primary tests for evaluating dry eyes. Usually this is performed both with and without topical anesthesia. It is not infrequent for individuals without the application of topical anesthesia to have excessive wetting of the tear strip owing to irritation from the strip. Normal measurements without anesthesia are about 15 mm of tear strip wetting, and about 10 mm of wetting with anesthesia. Individuals with significantly lower values are at an increased postoperative risk for worsening dry eye symptomatology.

One of the major reasons individuals present for blepharoplasty is to remove wrinkles. The blepharoplasty procedure has some limitations in this regard. Although it will remove excess skin, most fine wrinkles as well as significant deep wrinkling cannot be removed without such adjunctive procedures as skin resurfacing with either chemical peels or the CO₂ laser or face or brow-lift surgery. In addition, it is important for patients to understand that the aging phenomenon is persistent, and that the skin will continue to age with both time and sun exposure. Generally, blepharoplasty procedures will show their effects for 10 to 15 years before new sagging of the skin can be seen. In contrast, removal of orbital fat has a longer lasting effect. This is probably due to postblepharoplasty scarring as well as the number of fat cells that are present in the orbit. Preoperatively, it is important to determine both the excess amount of skin that is present especially medially and laterally, and the position and extent of any prominent fat. Often, the surgical incision needs modification with a W-plasty to adequately excise excess medial eyelid skin, and a brow-lift may be required to manage lateral hooding. The presence of a lateral upper eyelid bulge suggests that the orbital lobe of the lacrimal gland has prolapsed and will need to be repositioned intraoperatively (see Fig. 3).

Visual field testing is usually required by insurance companies to demonstrate loss of superior visual field secondary to overhanging eyelid skin. Although simple confrontation field testing is the easiest method for evaluating the visual field, either Goldmann or Humphrey automated visual field testing is the best way for quantifying field loss secondary to dermatochalasis. Finally, preoperative and postoperative photodocumentation of the eyelid appearance is an important aspect of the medical record. Such pictures are often required by the patient’s insurance carrier and can be useful for demonstrating to the patient various aspects of his or her appearance that might require clarification or be otherwise overlooked.

**SURGICAL PROCEDURE: UPPER EYELID BLEPHAROPLASTY**

Unless it is combined with other surgeries such as face or brow lifting, blepharoplasty is usually performed under local anesthesia with sedation on an outpatient basis. Surgery is performed in a variety of settings such as an outpatient surgery center, a doctor’s office, or a hospital operating room. In general, the time allotment for the surgical procedure is about 30 minutes for each eyelid.
After the patient is prepared and draped in the usual manner for face and eyelid surgery, a surgical marker is used to outline the areas for skin incision and the amount of skin for excision (Fig. 9A).

Figure 9. A. Incision for upper eyelid blepharoplasty. B. Determination of amount of vertical skin for removal. C. Excision of eyelid skin. D. Incising the orbital septum. E. Orbital fat freed from overlying septal attachments. Above the fat is the remnant of the orbital septum. Below the fat is the levator aponeurosis. At the very bottom of the photo, near the finger, is a portion of the orbicularis muscle.

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Figure 9 (Continued). F. Orbital fat freed from the levator aponeurosis and ready for excision with a Colorado (Colorado Biomedical Inc., Evergreen, CO) needle. G. The skin is sutured with nonabsorbable suture material. The unoperated left eye is for comparison.
In the upper eyelid, the inferior border of the skin incision is at the eyelid crease. As already mentioned, this about 10 mm above the upper eyelid margin; however, this can range from 8 to 12 mm. Men tend to have a crease at a slightly lower level than do women. Occasionally, the normal eyelid crease is at an abnormally low level. In these cases the incision should be marked out at the normal height in those cases in which the crease is abnormally high or recessed, consideration should be given to the presence of upper eyelid ptosis with a levator aponeurosis dehiscence. The incision curves gently upward from its medial aspect to about the center of the eyelid and then gently curves down as it proceeds laterally. It conforms to and follows the eyelid crease across the entire eyelid. Medially, it is helpful to stop the incision at about the punctum and at that point direct the incision line upward towards the bridge of the nose. This segment is about 5 mm in length. Laterally, the incision follows a crow’s foot in a slightly superior direction towards the lateral eyebrow. Depending upon the amount of lateral eyelid skin requiring removal, the lateral incision is generally carried laterally for 1 to 2 cm beyond the lateral canthal angle.

The simplest method for determining the amount of skin to be outlined for skin excision is the “pinching” technique (see Fig. 9B). This is carried out by taking a smooth forceps and placing the inferior blade at the eyelid crease mark. The superior blade is then used to grasp or pinch the amount of skin to be excised. The eyebrow is elevated and fixed to place the eyelid skin on slight upward stretch. The correct amount of skin is that required to slightly tilt the eyelashes upward. Generally, this equals 12 to 16 mm of vertical skin. Marks are made medially, centrally, and laterally along a gentle curve that corresponds to the skin that will be surgically excised. A sterile marker is then used to connect the medial and lateral ends of the eyelid incision line, connecting the marks outlining the skin for excision. This forms the outline of a modified ellipse with slightly tapered ends. The incision can be made with any of a number of instruments such as the CO₂ laser, a Colorado (Colorado Biomedical, Inc., Evergreen, CO) needle, scalpel blade, or scissors. Scissors provide excellent control and allow the surgeon to undermine the skin in the suborbicularis muscle level prior to making the complete skin incision (see Fig. 9C). Both the laser and the Colorado needle provide excellent hemostasis during skin incision. The former does not incise as deeply as the latter and requires several passes in a particular area before achieving the proper depth of incision at the level of the orbicularis muscle. The Colorado needle cuts deeply, and care must be taken not to incise through the orbicularis muscle.

After the skin incision is made, a scissors is used to excise the skin and a superficial portion of the orbicularis muscle. Slight pressure is placed on the globe to prolapse the orbital fat forward beneath the orbital septum (see Fig. 9D). This helps to identify the septum, which is then incised across its medial two thirds. Care must be exercised not to incise too deeply or too inferiorly; otherwise, the levator aponeurosis may be inadvertently damaged. After the orbital fat is visualized, it is teased from its loose attachments to the surrounding fascia, levator aponeurosis, and septum (see Fig. 9E). Because there are two fat pads in the upper eyelid, the medial one being paler in color than the lateral, the surgeon must take care to expose both fat pads. Cutting cautery, the CO₂ laser, or a Colorado needle can be used to excise the fat (see Fig. 9F). The medial fat pad and the medial aspect of the central fat pad are closely associated with both the superior orbital vessels and the superior oblique muscle tendon. Care must be taken not to damage either of these structures while excising fat. At the time of fat excision, the lacrimal gland can also be repositioned behind the superior orbital rim if it is noted to be prolapsed. This is performed with an absorbable 5-0 polyglactin suture placed in a horizontal mattress fashion through the peristeum of the orbital roof and the body of the orbital portion of the lacrimal gland.
In those instances in which the eyelid crease was too low preoperatively, the pre-tarsal skin and orbicularis muscle can be dissected from the tarsus and resutured to the inferior aspect of the levator aponeurosis with 6-0 or 7-0 absorbable or nonabsorbable suture material. Three sutures are usually used with bites taken laterally, centrally, and medially. If the levator aponeurosis is noted to be dehisced with an associated ptosis, this can also be repaired at the same time with 6-0 nonabsorbable suture material. Care must be taken not to inadvertently suture the orbital septum to the tarsus or the levator, because this will prevent the eyelid from closing normally. Ultimately, the skin incision is closed with either running or subcuticular 6-0 or 7-0 nonabsorbable suture material (see Fig. 9G). It is unnecessary to suture either the orbicularis muscle or the septum and doing so could result in inadequate eyelid closure and corneal exposure. The preoperative and final result of an upper lid blepharoplasty appears in Figure 10, A and B.

Figure 10. A, Preoperative view prior to upper eyelid blepharoplasty. B, Postoperative view.
SURGICAL PROCEDURE: LOWER EYELID
BLEPHAROPLASTY–TRANSCONJUNCTIVAL APPROACH

The transconjunctival approach to the lower eyelid is an excellent method for performing blepharoplasty in younger individuals and those who need minimal or no skin removal. It leaves no visible scar and requires no sutures; however, it is an approach with which most surgeons are uncomfortable owing to unfamiliarity with both the eyelid anatomy and the posterior surgical approach. The surgery involves incising the conjunctival and the eyelid retractors without incising the orbital septum. Instrumentation is similar to that used for the upper eyelid, with local anesthesia given via either the transcutaneous or transconjunctival route (Fig. 11A). The surgeon must remember that there are three fat pockets in the lower eyelid, as opposed to the two fat pockets in the upper eyelid.

Figure 11. A, Transconjunctival anesthetic injection prior to transconjunctival blepharoplasty. B, Exposure of central fat pocket following transconjunctival incision. C, Orbital fat completely prolapsed from lower eyelid transconjunctival incision. D, View of transconjunctival incision and orbit following fat removal.

Illustration continued on opposite page
With the eyelid retracted outward and downward using either a small rake or Desmarres retractor, an incision is made approximately 3 mm inferior to the inferior tarsal border across the entire eyelid, going no more medial than the punctum (see Fig. 11B). A scleral protector can be placed over the cornea during the surgery both to block the bright operating room lights and to protect the globe. Gentle pressure is applied to the globe to prolapse the orbital fat, and the fibrous tissue surrounding the fat is incised. Cotton-tipped applicators are used to tease out the fat from the surrounding tissues (see Fig. 11C). Care must be taken to protect the inferior oblique muscle, which courses between the medial and central fat pockets. The fat is excised with cutting cautery until all easily prolapsed fat is removed (see Fig. 11D). At the end of the procedure, the lower eyelid is pulled upwards to return it to its normal level. No sutures need be placed to close the incision.
If removal of skin is required following the transconjunctival excision of fat, a forceps or small hemostat can be used to pinch up the excess skin, beginning about 1 cm lateral to the lateral canthal angle and extending across the eyelid in the subciliary area (see Fig. 11E). The skin can be simply snipped off without removing any muscle, and the resulting incision is closed with 6-0 nonabsorbable suture (see Fig. 11F). Care must be taken not to remove more than 2 to 3 mm of vertical skin below the eyelid, because eyelid retraction can easily occur following too-vigorous skin removal from the lower eyelid, especially in a younger individual. More vertical skin can be removed laterally without causing eyelid retraction, unless there is a concomitant lateral canthal tendon laxity that is not identified or repaired. The preoperative status and final postoperative results from a lower lid blepharoplasty using a transconjunctival approach appear in Figure 12, A to D.

Figure 12. A, Front view of patient prior to blepharoplasty. B, Side view of patient prior to blepharoplasty. Illustration continued on opposite page
Figure 12 (Continued). C, Front view of patient following four-eyelid blepharoplasty. D, Side view of patient following four-eyelid blepharoplasty.
SURGICAL PROCEDURE: LOWER EYELID
BLEPHAROPLASTY—TRANSCUTANEOUS APPROACH

The transcutaneous lower eyelid blepharoplasty is the traditional method for performing this surgery. Either a skin-muscle or skin flap can be utilized, although the former is easier and associated with less bleeding. Some surgeons prefer a skin flap for the removal of lower eyelid skin. The skin-muscle flap is a more versatile approach, and it is useful both for skin removal and for performing a cheek-lift for the correction of malar festoons. Infiltrative anesthesia is also used with this technique, with additional injections given into the orbital fat pads.

The skin incision for the transcutaneous lower eyelid blepharoplasty is made as close to the lashes as possible, beginning at the punctum and extending to the lateral canthal angle before sloping at a downward angle for approximately 1 cm (Fig. 13A).

Figure 13. A. Skin and muscle incision for lower eyelid blepharoplasty. B. Exposure and excision of fat from lower eyelid via transcutaneous approach. C. Lateral skin and muscle excision following transcutaneous blepharoplasty.
This lateral incision may require further extension when malar festoons are removed and a cheek-lift is performed. The incision can be started with a scalpel blade and extended with a scissors, or the entire incision can be performed with either a CO₂ laser or a Colorado needle. Cutting cautery is then used to incise the orbicularis muscle laterally, and the suborbicularis plane is entered. A small skin hook or rake is helpful for providing downward traction on the flap as it is dissected across the eyelid. The flap is undermined inferiorly until the orbital septum is encountered and the fat pad identified. Pulling upward on the lower eyelid and placing pressure on the globe will help to prolapse the fat forward, making it more visible (see Fig. 13B). The orbital septum is then incised along with the fascia covering the fat pads, and the fat is then excised with cutting cautery. It is helpful to place a protective corneal shell over the globe during the dissection and fat removal. This blocks out the surgical light and the actual visualization of the surgery by the patient, and it protects the globe from inadvertent injury. After all fat that prolapses easily is excised, additional fat can be cauterized to further contour the eyelid. It is essential to aggressively remove the lateral fat pad to prevent the appearance of a lateral bulge in the lower eyelid.

If there is evidence of lateral canthal tendon laxity at the time of lower eyelid blepharoplasty, the tendon should be plicated to the lateral canthal tubercle and periorbicularis. This will prevent sagging of the lower eyelid after skin is removed. Usually, a 5-0 nonabsorbable suture is utilized for this. The needle is passed through the lateral superior portion of the eyelid several millimeters below the lid margin and then through the lateral orbital rim periosteum on the medial surface of the lateral orbital wall posterior to the actual orbital rim. If a cheek-lift needs to be performed to correct "festoons," it is easily accomplished by undermining the muscle, fat, and fascia layers overlaying the malar area and resuspending this tissue to the periosteum covering the lateral aspect of the lateral orbital wall at or superior to the level of the lateral canthal angle. It is important to reinforce the lateral canthal tendon as well when performing a correction of "festoons" to prevent postoperative lateral sagging of the lower eyelid.

After removal of lower eyelid fat and correction of laxity and festoons, excess skin and muscle may be excised from the lower eyelid skin-muscle flap (see Fig. 13C). This is performed by pulling the skin-muscle flap upward and laterally towards the upper tip of the ear. After the desired tension is determined, a marking pen is used to mark the incision for removal of lateral skin and muscle overlying the lateral eyelid incision. This portion of the skin-muscle flap is then sutured to either the temporalis fascia or periosteum, providing support for the flap and lateral wound. The suture should be placed several millimeters lateral to the lateral canthal angle to avoid lateral canthal webbing. After the flap has been trimmed laterally, the skin and muscle inferior to the lower eyelid skin incision can be excised. Usually, only a few millimeters of skin and muscle need be excised; however, this depends on the amount of skin present preoperatively. In any event, care must be exercised not to remove excessive amounts of skin, which could otherwise result in lid retraction and lagophthalmos or cicatricial ectropion. The skin incisions can then be used in standard fashion with running nonabsorbable suture material.

**POSTOPERATIVE CARE**

Ice compresses, frozen peas, or cold packs are the mainstay of care for blepharoplasty for the first 48 hours postoperatively. It is important to stress to the patient that this will reduce both swelling and bruising. Warm compresses can be used after the first 48 hours. This will help to reduce any swelling that remains after the use of cold compresses. An ophthalmic antibiotic ointment such as bacitracin or tobramycin can be used to prevent infection and to keep the sutures clean and lubricated for easy removal. A moistened cotton-tipped applicator is also helpful for removing debris, mucus, and crusts. A short course of oral steroids may be helpful in reducing postoperative swelling. Intraoperative steroids may be similarly helpful. Patients should be instructed
to sleep on their backs with the head elevated to reduce swelling around the eyes. They should also be instructed that sleeping preferentially on one side will result in greater swelling on that side. In addition, they should know that it is not uncommon to have more swelling in the morning after lying flat all night, and that this may take some time to resolve. Patients should also be instructed that for several days postoperatively they should not engage in activities that could increase intravascular pressure, because this can increase swelling and postoperative bleeding. Because most patients have mild to moderate discomfort after surgery, postoperative pain management is also important. Skin sutures are usually removed 4 to 7 days postoperatively.

**COMPLICATIONS**

A large number of possible complications are associated with blepharoplasty. The prevention and management of many of these have already been mentioned. In general, careful preoperative evaluation is essential for avoiding a variety of postoperative problems. Adequate assessment of the location of prominent orbital fat, excess eyelid skin, and position of the upper and lower eyelids is essential. Understanding patient expectations and informing patients about what can and cannot be achieved with a blepharoplasty will avoid much postoperative patient discontent. Preoperative patient preparation is important to avoid intraoperative and postoperative bleeding. Patients taking anticoagulants such as warfarin should stop them 3 days prior to surgery. Some patients may require heparinization prior to surgery. Patients on aspirin or similar medication, or ingesting certain foods such as cloud ears, a fungus used in Chinese cooking, all of which interfere with platelet function, should be asked to stop these items if possible.

Intraoperatively, corneal abrasion, damage to the levator aponeurosis or inferior oblique muscle, bleeding following fat or muscle excision, and failure to adequately excise fat are important problems. Corneal abrasion can be easily avoided through careful surgical technique, intraoperative lubrication, and the use of a corneal protector. Postoperatively, patients can be placed on an ocular lubricant and referred for immediate evaluation by an ophthalmologist if corneal damage is suspected. Damage to eyelid structures is best avoided by careful surgical technique and a thorough understanding of eyelid anatomy. This also applies to adequate removal of fat and skin. Intraoperative bleeding can be reduced through the use of coagulation cautery to excise fat and adequate coagulation of oozing tissue. This is particularly important because it has been shown that postoperative oozing is associated with increased intraocular pressure and blindness. This particular complication requires early identification and is the reason for not patching eyes postoperatively. This allows the recovery room personnel to quickly inform the surgeon about excessive bleeding. Occasionally, it may be necessary to open the skin incision in the recovery room or return the patient to the surgical suite to remove clots and control bleeding.

Dehiscence of the surgical wound after suture removal is an occasional occurrence and can be managed with resuturing, taping, or simple observation, because such wounds usually heal closed without scarring. Eyelid necrosis and infection are unusual complications and are best managed with intravenous antibiotic therapy and debridement of necrotic tissue. Hyperbaric oxygen may be a useful adjunctive intervention in cases of significant tissue necrosis. Further surgical intervention to reconstruct eyelids damaged by tissue necrosis should be avoided until all inflammation has resolved and scarring has stabilized. Every attempt should be made to keep the cornea protected and lubricated during the healing phase prior to any reconstructive effort. Such patients require close follow-up with an ophthalmologist.

Eyelid retraction, a complication that occurs with too-vigorous skin removal as well as scarring and canthal tendon laxity, should be initially managed with massage. The upper eyelid is massaged downward and the lower eyelid is massaged upward. Persistence of eyelid retraction can be both a cosmetic problem and a functional one
associated with lagophthalmos and corneal erosion. When there is inadequate skin, grafting may be required. Other interventions to correct lower eyelid retraction include interpositional grafts of hard plate and ear cartilage and a tarsal strip horizontal shortening procedure to resuspend the lower eyelid.

Scarring and milia are fairly common postoperative complications. Prominent incisions are best managed with massage, using bland ointments or topical creams such as cocoa butter or vitamin E cream; steroids, either topical or intraleisional; and excision with or without tissue rearrangement. The latter intervention should be avoided until there has been adequate scar maturation, as long as 6 to 12 months after surgery. Milia can be easily treated with laser ablation or can simply be unroofed with a needle or sharp blade. Other fairly common complications include inadequate skin and fat removal. Re-excision is needed in such cases. Finally, persistent wrinkles, especially fine wrinkling, is best managed with either facial peeling or laser resurfacing, because blepharoplasty will not adequately treat this problem.

CONCLUSION

Blepharoplasty is a commonly performed procedure that is within the surgical repertoire of many different health care providers. A successful surgical outcome and the avoidance of postoperative complications is predicated on a clear understanding of eyelid anatomy, careful preoperative patient evaluation, meticulous surgical technique, and careful follow-up. Overlying this is the importance of a good working relationship between the patient and the doctor, unimpeded lines of communications, and a clear understanding of what can be achieved through this surgical procedure.

References


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