Cutaneous Approaches to the Lower Lid and Orbit

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Classically, a cutaneous approach has been used to gain access to the lower lid and orbit for esthetic, reconstructive, and traumatic surgery. Although the transconjunctival approach to the orbit was first published in the 1920s and revisited in the 1970s, it has only become popular during the last 5 to 8 years. In that time, the pendulum has swung from the cutaneous to the transconjunctival approach to the lower lid and orbit, especially for esthetic purposes. The main impetus behind this recent change is concern over lower lid retraction, ectropion, and visible scars associated with lid skin incisions in general, and with the subciliary incision in particular. The purpose of this article is to review the advantages and indications for cutaneous access to the lower lid and orbit and highlight innovations in design and execution of the cutaneous lid approach helpful in preventing complications.

Cutaneous Lid Incisions

The three most commonly used cutaneous lower lid skin incisions are diagrammed in Figure 1. The subciliary incision runs parallel to the lid margin from the punctum medially to the orbital rim laterally. The lateral extent of the incision is tapered inferiorly within a skin crease. This incision is usually placed 2 to 3 mm below the ciliary margin. The subtarsal lid crease incision is similar in design, but placed at a more inferior level, 4 to 6 mm below the ciliary margin and caudal to the inferior aspect of the lower lid tarsal plate. Most, but not all, patients have a defined lid crease just below the level of the tarsal plate that may be used as a guide for incision placement. When absent, it is useful to palpate the lid and use caliper rulers to assist in correct placement. The subciliary and subtarsal incisions can be developed as a skin or skin-muscle flap. Both incisions are useful in esthetic and trauma surgery.

The orbital rim incision overlies the inferior orbital rim. It is typically placed in a skin crease at the junction of the thin eyelid skin and the thicker cheek skin. The incision must be tapered laterally. Failure to do so leads to disruption of lymphatic drainage of the lower lid with concomitant, prolonged lid edema and potential compromise of the final scar appearance. The rim incision is reserved for selected trauma patients who have marked periorbital swelling that precludes accurate placement of an incision at a higher level.

Advantages of Cutaneous Lower Lid Incisions

The anatomy of the eyelid through the cutaneous approach is familiar to most surgeons. Important structures of the lid can be identified confidently and quickly under direct vision. Surgical access is typically excellent for both esthetic and trauma surgery. In esthetic blepharoplasty, direct visualization decreases the likelihood of "missed" lateral fat pads as compared with the transconjunctival approach, at least for the novice surgeon. Hypertrophic orbicularis muscle can easily be resected via the cutaneous approach. Adjunctive procedures, such as lid tightening, can be completed concurrently. As compared with the retroseptal transconjunctival approach for trauma access, there is a lower risk of inadvertent injury to the inferior oblique muscle.

 Conjunctiva is a precious tissue for which there are few good substitutes. Injury and loss of conjunctiva, as well as the wide array of potential complications associated with transconjunctival incisions, including conjunctival granuloma, conjunctival inclusion cyst, cicatricial foreshortening of the fornix, and entropion, are avoided by cutaneous incisions. Skin incisions preclude transection of the lower eyelid retractor muscle (Horner) and the need for canthotomy/cantholysis for exposure. Furthermore, the risk of laceration or avulsion of the lower eyelid and lacrimal system, as well as canthal malposition resulting after canthotomy, is eliminated.
Figure 1. A, Frontal view of three common cutaneous lid incisions: subciliary (a), subtarsal (b), and orbital rim (c). B, Corresponding lateral view.

Comparison Studies

Most of the reports comparing the cutaneous and transconjunctival approaches to the lower lid have involved the trauma patient. Unfortunately, all of these studies have been retrospective analyses. Despite claims to the contrary, the central issues of difference in the rate of scleral show or ectropion, and the appearance of the final scar between the two approaches, have not been conclusively resolved by controlled studies. In 1977 Wray et al. compared 45 subciliary skin-muscle flap access incisions to 45 retroseptal transconjunctival incisions in patients undergoing orbital fracture repair. Four of the 45 eyelids treated by the subciliary approach required subsequent surgery to manage ectropion. There was only one case of ectropion in the transconjunctival group. It is unclear whether the difference in ectropion rate is significant because statistical evidence is not offered. One eyelid in the transconjunctival group was lacerated by traction. This complication, and the limited access provided by the transconjunctival approach, prompted the authors to perform a lateral canthotomy in 25 of the 45 transconjunctival approaches.

In a follow-up study reported in 1981, the authors compared the transconjunctival, subciliary, subtarsal lid crease, and orbital rim incisions for orbital trauma access. The incisions were rated for speed of access, complications, and scar appearance. The rim and subtarsal lid crease incisions were the fastest, with an average skin-to-fracture exposure time of 5 and 8 minutes, respectively. In comparison, the subciliary incision was developed in 15 minutes, whereas the transconjunctival incision took 20 minutes to complete. Surgical access was judged satisfactory in all cases. One transient case of ectropion occurred in a patient treated with a subtarsal lid crease incision. The transconjunctival incision (without canthotomy) was used as the reference to rate scar appearance and assigned an arbitrary value of 1.0. The orbital rim, subtarsal lid crease, subciliary, and transconjunctival/canthotomy incisions were rated 1.8, 1.7, 1.6, and 1.9, respectively. Similar findings were reported by Bähr et al. Based on these findings, the authors recommend use of either the subtarsal lid crease or orbital rim incision for trauma patients.

Appling et al. retrospectively compared 27 subciliary skin/muscle and 36 preseptal transconjunctival incisions in patients undergoing orbital fracture repair. The transconjunctival incision was combined with a canthotomy and cantholysis in all cases. Seven of the 25 patients available for follow-up were noted to have at least 1 mm of scleral show after the cutaneous approach. Interestingly, the one patient used to illustrate scleral show in the article had a similar finding on the untreated right side, suggesting that this was a preexisting condition. One patient in the transconjunctival group had increased scleral show, but three patients had canthal malposition. These patients refused reoperation.

There is only one prospective study of surgical
approach in cosmetic eyelid surgery. Netscher et al recently reported on a prospective, direct, side-by-side comparison of the preseptal transconjunctival and subciliary skin-muscle approach in 10 consecutive patients undergoing lower lid blepharoplasty. Patients with existing lid laxity were excluded. No lid-tightening procedures or skin excisions were performed. All surgery was completed by a staff plastic surgeon. Scleral show occurred with equal frequency and severity in both groups. Ectropion was not observed. The overall outcome was judged to be excellent in both groups, and there were no statistical differences between the sides with regard to missed fat, scleral show, or the resulting appearance of the scar.

**Indications for a Cutaneous Approach**

The indications, contraindications, and selection of the approach for periorbital surgery is based on careful examination, thorough diagnosis and analysis of the deformity, and clinical judgment of the surgeon. Increased scleral show or ectropion can occur after cutaneous or transconjunctival access but are more likely to occur after surgery in patients with preexisting lid laxity or high-risk periorbital morphology (eg, hypoplastic zygoma, relative globe protrusion). When these features are noted before surgery, simultaneous preventive or corrective measures, such as lid tightening, should be considered.

Although most esthetic and traumatic deformities can be managed by skin incisions, there are no absolute indications for a cutaneous approach. The relative indications (Table 1) are based on anatomic and technical factors that must be weighed before surgery. Lateral canthotomy is combined with the transconjunctival approach in most cases to provide adequate surgical exposure. Hence, persistent periorbital edema, worsened by surgical manipulation, can lead to technical difficulty or failure of reinsertion of the canthus at the end of the operation. Correct transconjunctival incision placement and closure can be nearly impossible in the face of persistent chemosis and may lead to inadvertent destruction of the conjunctiva or foreshortening of the fornix. Open globe injury and high-risk corneal injury, such as hyphema, necessitate delay in orbital fracture reduction. In these cases, corneal protection (corneal shield, temporary tarsorrhaphy) and a cutaneous approach to the orbit afford an extra measure of safety during fracture repair. The decision on which skin incision to use is based on personal preference and the amount of lid edema present. The orbital rim incision is indicated in the presence of marked periorbital edema that precludes canthotomy and impedes identification or placement of higher lid incisions.

The esthetic indications for cutaneous blepharoplasty are diminishing because fat can be excised by either the cutaneous or transconjunctival approach, and resection of skin can be performed by direct excision, chemical peel, or laser resurfacing. There are two exceptions to this trend. Malar festoons are well treated by direct excision or through an extended blepharoplasty dissection. Resection of hypertrophic orbicularis oculi muscle can be done in a retrograde fashion with the preseptal transconjunctival approach, but it is more easily accomplished through a subciliary or subtarsal lid crease incision.

**Subtarsal Lid Crease Incision**

The subtarsal lid crease incision (Fig 2) combines the speed, access, and low incidence of lid malposition, with esthetic scar appearance comparable to the subciliary incision. Because the pretarsal orbicularis muscle is not disrupted, the involuntary blink reflex is undisturbed, and the pretarsal lid fullness associated with the youthful eyelid is preserved. Some patients have two or more subtarsal lid creases superior to the orbital rim. Either crease can be used in a trauma setting (Fig 3), whereas the superior crease would be a better choice for the esthetic patient.

In my experience, exposure of the septum and orbit by the subtarsal incision can be accomplished within 2 to 3 minutes. The entire incision is scored with a scalpel. The septum is exposed by blunt dissection, beginning at the lateral edge of the incision. The orbicularis muscle is then undermined by creating a pocket superficial to the septum from lateral to medial using blunt scissors dissection. The skin-muscle unit is cut on a 45° angle (Fig 1B) to maintain additional muscle on the eyelid side of the flap below the level of the skin incision. The orbital septum can then be divided to expose the orbital fat for blepharoplasty. Alternatively, further inferior blunt dissection can be

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<tr>
<td>Trauma</td>
<td>Preexisting lid laceration exposing bone Persistent chemosis Unstable or high-risk corneal/globe injury (eg, hyphema) Persistent periorbital edema</td>
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<tr>
<td>Esthetic</td>
<td>Hypertrophic orbicularis muscle Malar festoons Skin resection planned</td>
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<td>General</td>
<td>Acute or chronic conjunctival disease Presence of globe prosthesis</td>
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performed to access the orbital rim for fracture repair. Skin resection, if indicated, is performed in the usual fashion.

Adjunctive Procedures

Prevention of lid malposition is preferable to the need for revision surgery. Preexisting lid laxity can be addressed in a number of ways, including canthopexy, lid tightening, or tarsal sling procedures. Even when lid malposition is not anticipated after surgery, it may be prudent to consider temporary support of the lower lid to resist the initial forces of scar contraction. One simple technique involves suture fixation of the lower lid to the lateral canthal region. The canthal tendon is exposed by blunt dissection through the lateral extent of the orbicularis muscle. A small noncutting needle is used to grab an "anchor" bite in
Figure 3. A, The patient demonstrates two lid creases superior to the orbital rim. The inferior crease was selected for access. B, Wound closure after orbital floor reduction. Eversion is not generally necessary. C, Comparison view 1 year after surgery. Traumatic mydriasis preceded surgical repair.
FIGURE 4. The lower eyelid can be temporarily supported by placing an anchor suture from the lateral canthal tendon to the orbicularis muscle.

the tendon and then passed through the muscle overlying the tarsal plate to provide support for the lid during the healing process (Fig 4).

Summary

In any discussion of surgical exposure, it is important to remember that of chief importance is what is done in the operative field, rather than how the site is exposed. Selection of approach is based on tradeoffs that must be weighed by the surgeon and tailored to the deformity for a given patient. Despite a recent surge in the popularity of the transconjunctival technique, periorbital surgery by a cutaneous approach is still a valid means of access for a variety of aesthetic and particularly trauma procedures. There are few solid data comparing the two approaches, and what does exist shows little or no significant difference between them. A cutaneous approach spares the conjunctiva, bypasses transconjunctival-related complications, and eliminates the need for lateral canthotomy for access.

The subtarsal lid crease incision appears to offer the benefits of the orbital rim incision with respect to speed, exposure, and low incidence of lid malposition, with cosmetic scar appearance that is comparable to the subciliary incision.

References