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Transconjunctival Blepharoplasty: The Method, Indications, and Complications

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Transconjunctival lower eyelid blepharoplasty represents a valuable addition to the armamentarium of the facial plastic surgeon. This technique has important advantages over transcutaneous blepharoplasty when appropriate guidelines and patient selection are used. This technique not only affords an excellent approach for cosmetic blepharoplasty, but can also be used for noncosmetic indications such as orbital floor reconstruction and tumor excision.

The most commonly used techniques of lower eyelid blepharoplasty employ transcutaneous surgery with an external lower eyelid incision. This is routinely performed as a skin flap or skin-muscle flap, but several variations have been described. In contrast, the transconjunctival technique of lower eyelid blepharoplasty allows the removal of pseudoherniated orbital fat without the use of an external incision. We will review the technique of transconjunctival blepharoplasty to address the issues of when it is most appropriately used and the patient selection for the procedure. Advantages, disadvantages, and complications of the technique will be presented. We will discuss various ancillary procedures that can be combined with this technique of transconjunctival blepharoplasty, as well as a review of noncosmetic uses of the transconjunctival approach to the lower eyelid and orbit.

GOALS OF BLEPHAROPLASTY

The goals of blepharoplasty include the restoration and rejuvenation of the eyelids. This is accomplished through the elimination and correction of laxity and redundancy of skin, the removal of pseudoherniated fat, and the correction of abnormal eyelid position. Ultimately, favorable characteristics to be achieved should include a sharp well-defined lateral canthus, maintenance of a good lower eyelid position with an absence of scleral show, and the preservation of normal eyelid function. In the approach to the lower eyelid, every effort should be made to prevent scar contracture in the vertical dimension, lower eyelid retraction, and ectropion. Scars must be either invisible or unnoticeable (Fig 17–1).

ANATOMY

Since we are focusing on the topic of lower eyelid blepharoplasty, this discussion of anatomy will be limited to that pertinent to the understanding of lower eyelid transconjunctival blepharoplasty.

On cross-section, (Fig 17–2) the lower eyelid is composed of several closely associated structures. These are considered as being divided into anterior and posterior lamellae. The anterior lamella is formed by the skin and the orbicularis muscle. The posterior lamella is composed of the conjunctiva, the tarsal plate, the lower lid retractors, and associated capsulopalpebral fascia.

The lower eyelid conjunctiva is tightly attached to the underlying tarsal plate and extends inferiorly from the gray line (which marks the free edge of the tarsal plate) along the inner surface of the lower eyelid toward the fornix. It has attachments to the underlying capsulopalpebral fascia at the fornix and then proceeds vertically again to attach to the sclera at the limbus. The underlying capsulopalpebral fascia is a fibroelastic structure that is analogous to the levator aponeurosis of the upper eyelid. It originates from the tendinous portion of the inferior rectus and envelopes the inferior oblique muscle and sends attachments to the lower tarsal plate and conjunctival fornix. It is fused with the orbital septum approximately 5 mm below the inferior edge of the lower tarsal plate. It is this fused structure that then continues to the edge of the tarsus. Attachments between the capsulopalpebral fascia and conjunctiva pull the

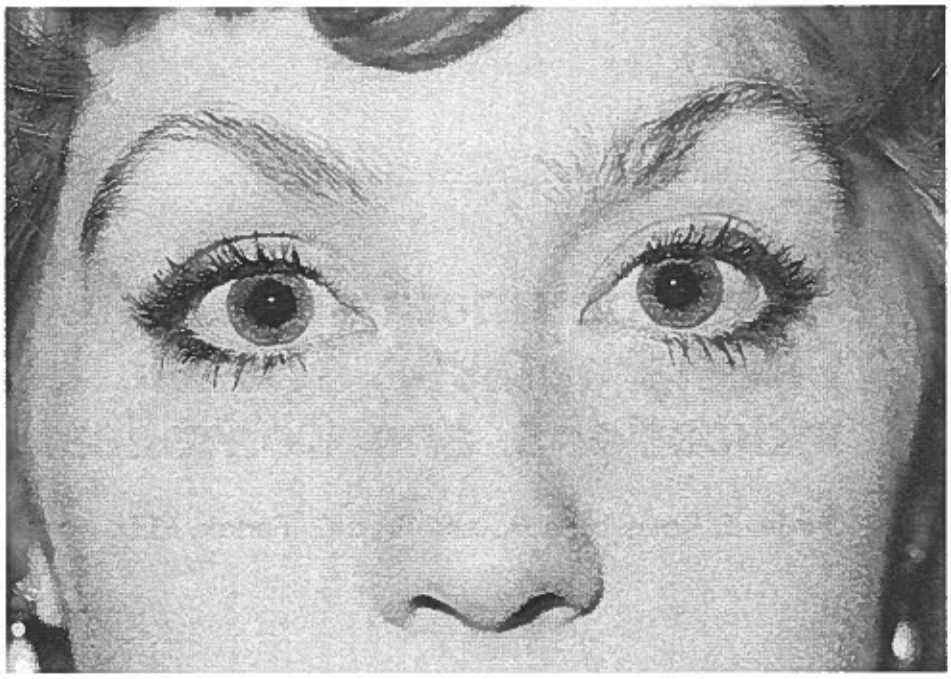

FIG 17–1.
Photograph of patient with favorable features of her eyelids.

fornix and tarsus inferiorly on downward gaze and prevent prolapsing of the conjunctiva. The inferior palpebral muscles, analogous to Müller's muscle of the upper eyelid, are adjacent to the capsulopalpebral fascia and serve to retract the conjunctiva and possibly the tarsus on downward gaze. In the transconjunctival technique of lower lid blepharoplasty, these lower lid retractors (the capsulopalpebral fascia and the inferior palpebral muscle) are released from the tarsus. It can be postulated that this aids to preserve the position of the lower eyelid by reducing retraction in the vertical dimension.

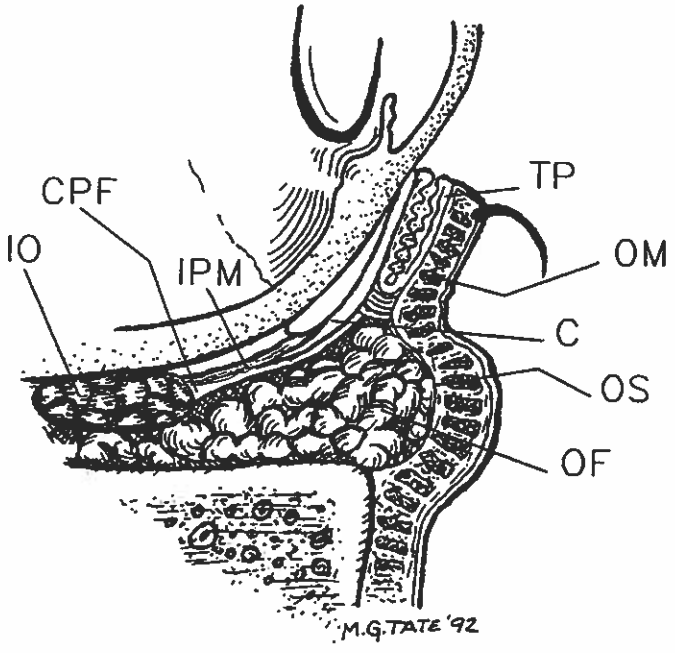

FIG 17–2.
Sagittal cross-section of the lower eyelid and associated structures. *C*, conjunctiva; *CPF*, capsulopalpebral fascia; *IPM*, inferior palpebral muscle; *IO*, inferior oblique muscle; *OM*, orbicularis muscle; *OS*, orbital septum; *TP*, tarsal plate; *OF*, orbital fat. See text for further explanation.

The orbital septum, which extends from the periorbita at the orbital rim and fuses with the capsulopalpebral fascia en route to the lower tarsal plate, is ideally preserved during transconjunctival blepharoplasty. It is postulated scar contracture is thus avoided and lower lid vertical shortening is prevented.

The orbicularis oculi is also a critical structure in lower lid blepharoplasty. The orbicularis has three main components. The orbital expansion is that portion of the orbicularis that extends outside the eyelids themselves. It is superficial to the frontalis, temporalis, and cheek muscles. It inserts on the medial portion of the orbital rim and the frontal process of the maxillary bone (Fig 17–3).

The preseptal portion of the orbicularis overlies the upper and lower orbital septa. In addition to inserting into the medial canthal ligament, it also inserts on the lacrimal diaphragm and the posterior lacrimal crest. It is a major contributor to the lateral palpebral raphe.

The pretarsal portion of the orbicularis is that portion that overlies the tarsal plates. Laterally this gives rise to the lateral canthal tendon. The lateral canthal tendon is a distinct structure; it attaches inside the orbital rim at Whitnall's tubercle. The pretarsal portion of the orbicularis muscle fuses to become the medial canthal ligament medially, and attaches to both the anterior and posterior lacrimal crest. Thus, the preservation of the pretarsal orbicu-

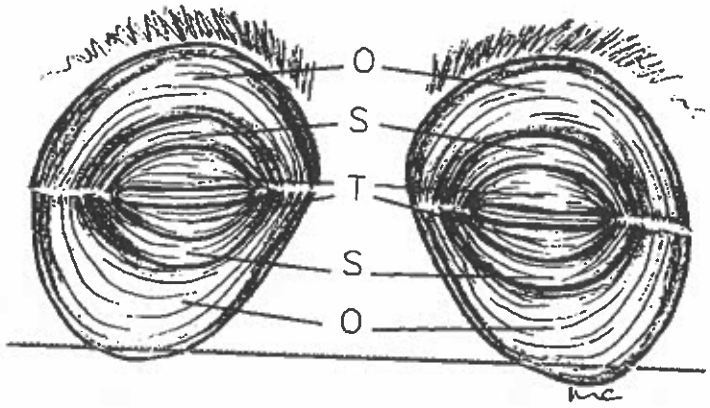

FIG 17–3.
Illustration of the three main components of the orbicularis oculi muscle. *O*, orbital portion; *S*, preseptal portion; *T*, pretarsal portion.

laris is important in the preservation of the support of the lower eyelid after blepharoplasty.

Three fat compartments of the lower eyelid are described. The medial or nasal compartment is bounded by the medial rectus muscle medially, and the inferior oblique muscle laterally. The middle compartment is bounded by the inferior oblique muscle medially, and fascial attachments between the inferior rectus and lateral rectus muscles laterally. Finally the lateral compartment is bounded by the same fascial compartment between the lateral and medial rectus and the lateral rectus.

BASIC DIFFERENCES IN TRANSCUTANEOUS VERSUS TRANSCONJUNCTIVAL BLEPHAROPLASTY TECHNIQUE

In transcutaneous blepharoplasty, an incision is made through the skin of the lower eyelid. Authors vary as to the placement of this incision. Some authors recommend a relatively high immediate subciliary incision in an effort to camouflage the incision. On the other hand, some authors recommend a relatively low incision in order to preserve as much of the pretarsal orbicularis as possible.[6, 10] At times it is recommended to incise the skin and orbicularis at different levels. In all of these transcutaneous approaches, as the incision is made in the course of the transcutaneous procedure, the skin, the orbicularis, and the orbital septum are divided. The advantages of the transcutaneous technique are that the surgeon can readily remove excess skin and orbicularis muscle as is necessary. Overall, the technique, and this is somewhat dependant on training, allows relatively easy wide surgical exposure. The disadvantages of the technique include the creation of a visible skin incision. There may also be more of a risk of rounding and ectropion since there may be vertical contraction and lower lid vertical shortening because of scar contracture in the plane of the orbicularis and the orbital septum. A tendency to ectropion and scleral show may be further enhanced because of the orbicularis incision and difficulty in preserving the orbicularis "sling" of the pretarsal orbicularis (Fig 17–4).

Transconjunctival blepharoplasty, on the other hand, involves an incision in the lower eyelid conjunctiva, thus avoiding a disruption of the orbicularis. The dissection then proceeds along one of two different routes. One approach involves the placement of the incision high along the inside of the lower eyelid conjunctiva so that the dissection proceeds anterior to the orbital septum and under the orbicularis. These authors do not recommend this particular technique, since dissection proceeds in the plane between the orbital septum and orbicularis and it is felt that this may result in vertical scar contracture and hence, lower lid shortening and ectropion.

The transconjunctival technique recommended by these authors is for the incision to be placed approximately 5 mm or more behind the tarsal plate. In this location, the fat compartments will be entered directly after the lower lid retractors are incised. Along this route, dissection takes place in a plane behind the orbital septum and orbicularis. By avoiding these structures, the risk of the scleral show and rounding may be reduced (Fig 17–5).[2, 3, 15, 18, 21]

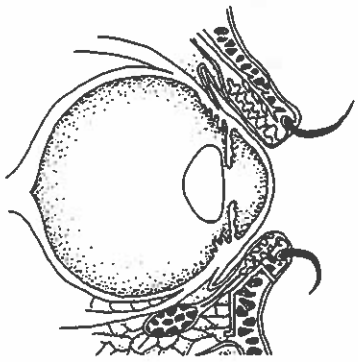

FIG 17–4.
Schematic drawing of course of incision and dissection of typical skin-muscle flap transcutaneous blepharoplasty. The striped area shows path of the incision and dissection through skin, orbicularis oculi muscle, and orbital septum.

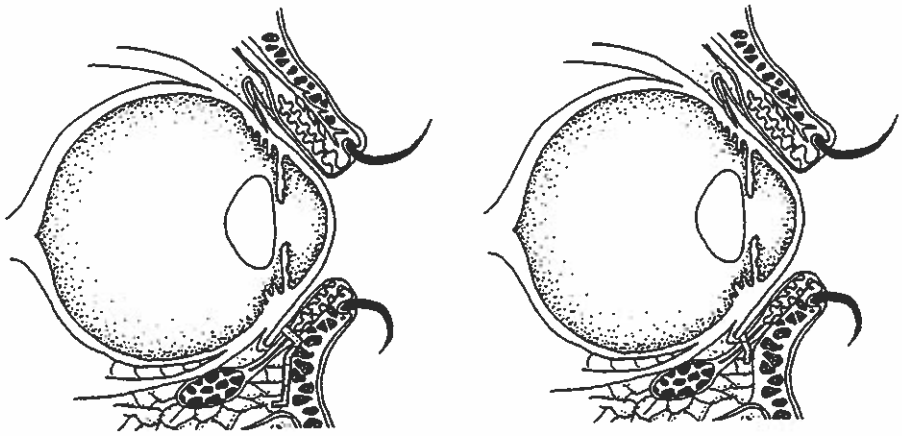

FIG 17–5.
Schematic drawing of course of incision and dissection of transconjunctival blepharoplasty depicted in striped area. The left and right figures demonstrate two different potential methods. *Left,* transconjunctival technique in which conjunctiva and lower eyelid retractors are incised close to the tarsal plate and dissection initially proceeds anterior to the orbital septum. The orbital septum is then incised and the fat pads entered. *Right,* alternative method depicted in which the conjunctiva and lower eyelid retractors are incised at a more posterior/inferior level in the lower lid conjunctiva. The orbital septum is avoided and the fat pads are entered directly after the incision of the conjunctiva and retractors. Dissection proceeds behind and avoids the orbital septum and the orbicularis.

WHO IS A CANDIDATE?

Who is a candidate for transcutaneous blepharoplasty? All patients are evaluated regarding the following parameters: visual acuity, lacrimal function, eyelid function, presence of ptosis and lagophthalmus, tone and position of the lower eyelid, presence of excess and laxity of eyelid skin, pseudoherniation of orbital fat, and rhytids. Of course, they are screened for the presence of medical and psychologic factors that would contraindicate blepharoplasty.

An ideal candidate for a transconjunctival blepharoplasty is depicted in Fig 17–6,A and B. These patients should ideally have significant fat pseudoherniation, minimal excess of skin, and minimal orbicularis hypertrophy. These characteristics are dictated by the fact that transcutaneous blepharoplasty "without ancillary procedures" is an ideal procedure for removal of pseudoherniated fat. It does very little, however, to correct skin excess or hypertrophy of the orbicularis muscle. At times, it appears that the use of a transconjunctival blepharoplasty works very well in the patient with tendency to rounding. It can be postulated that release of the lower lid retractors during the course of the procedure may allow the eyelid to settle in a more favorable position postoperatively.

The following patient, on the other hand, displays characteristics that identify him as being an unfavorable candidate for a simple transconjunctival blepharoplasty. The patient identified in Fig 17–7 is noted to have little evidence of fat herniation, and has instead almost exclusively an excess of skin. There will be little change in the amount of laxity and redundancy of his lower eyelid skin with only the performance of transconjunctival blepharoplasty. This patient would be better served using a transcutaneous blepharoplasty or a transconjunctival blepharoplasty with a pinch method of managing the excess skin. Alternatively, this patient could be approached using a transconjunctival blepharoplasty combined with a phenol-based chemical peel.

TECHNIQUE

Sedation and anesthesia

We usually perform blepharoplasty using a "twilight" monitored intravenous sedation local anesthesia technique. Patients are fully monitored with continuous electrocardiographic monitoring, oximetry, and frequent intermittent blood pressure monitoring. The patients are placed supine with the head of the bed slightly elevated to 15° to 20°. It is helpful to premedicate the patient with oral diazepam 20 mg administered 30 minutes prior to the procedure. Intravenous sedation is carried out using a variety of agents. Typically, we use intravenous diazepam by titrating to a sedative effect using 2 to 3 mg increments to a maximum of 20 mg. Intravenous hydromorphone is used similarly in 0.2 mg increments, up to a total of 2 mg. Other agents frequently used include intravenous midazolam and fentanyl.

Topical anesthesia of the eye itself is obtained with the administration of proparacaine drops 0.5%. Infiltrative anesthesia is obtained using 2% lidocaine with 1:100,000 epinephrine. This agent is used to provide both local anesthesia and hemostasis through vasoconstriction. This agent is mixed in a ratio of 9:1 cc with hyaluronidase (100 USP units/ml). It is felt that the hyaluronidase facilitates the dissipation of the anesthetic agents through the soft tissues.[13]

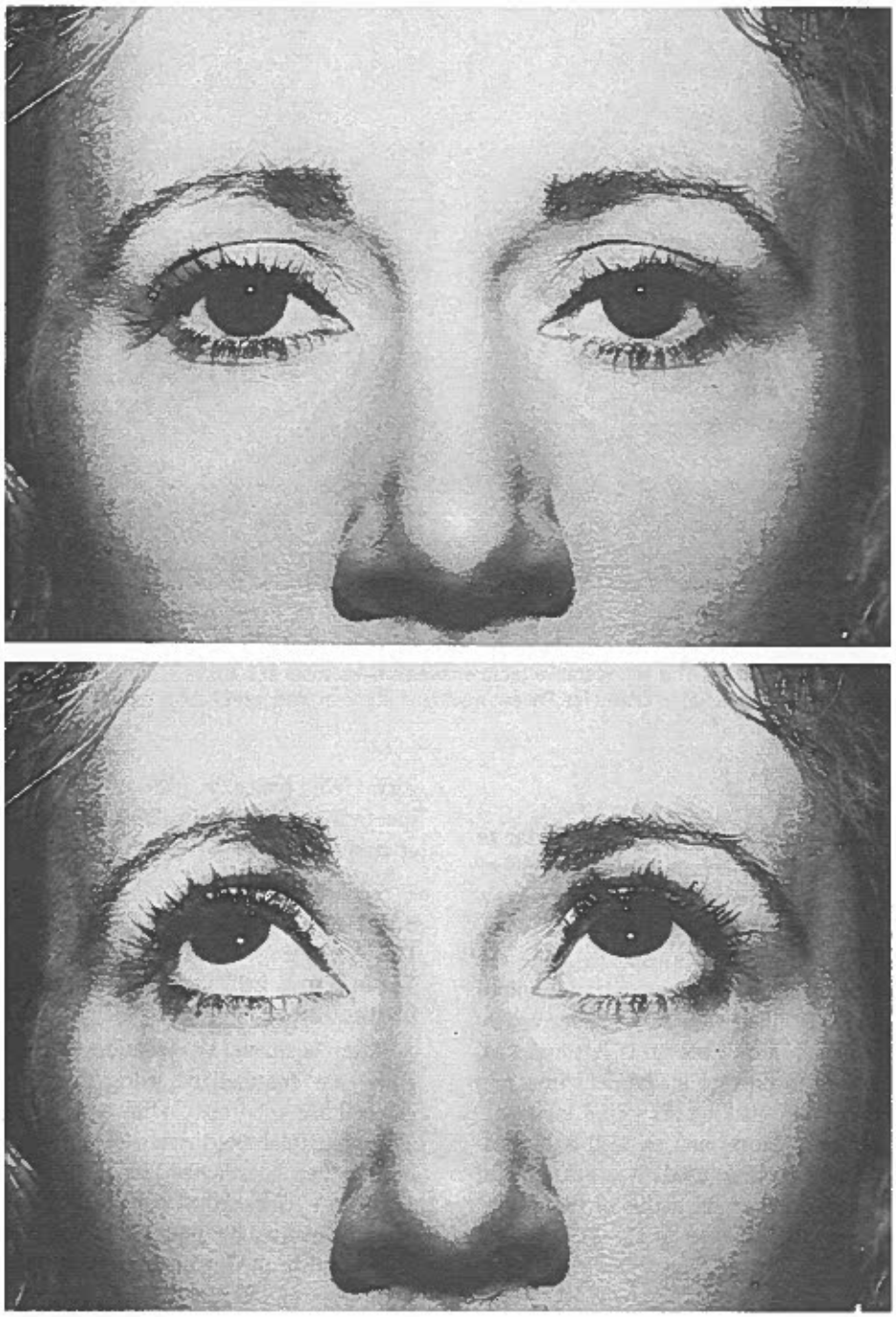

FIG 17–6.
A, B, preoperative photographs of patient who is an excellent candidate for transconjunctival blepharoplasty. Patient exhibits abundant pseudoherniation of the lower eyelid fad pads, but has little skin excess.

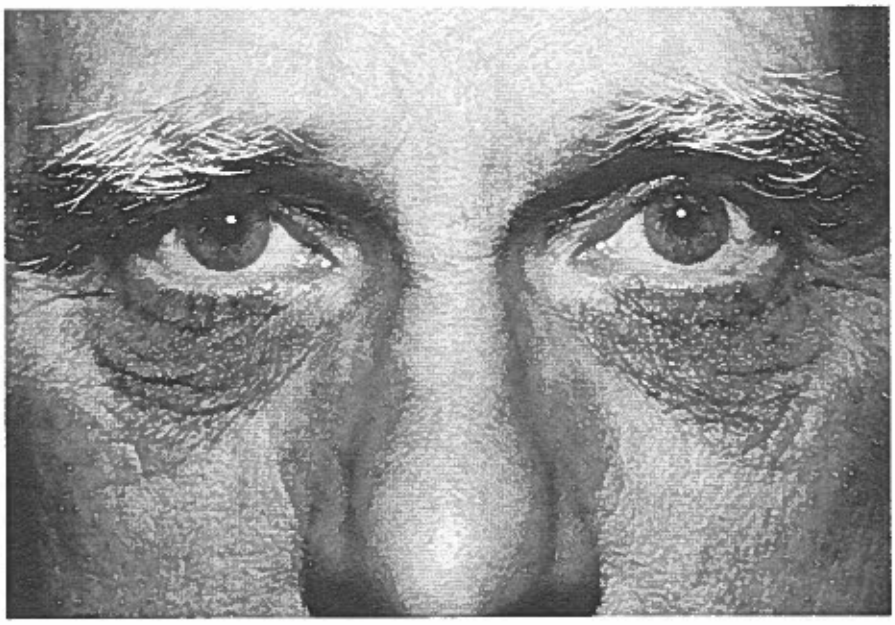

FIG 17–7.
Preoperative photograph of patient who is a poor candidate for only a simple transconjunctival blepharoplasty. This preoperative picture reveals substantial skin excess, but only minimal pseudoherniation of orbital fat. Patient would benefit from other procedures as described in text.

Instrumentation

The instrumentation and positioning is very similar to more traditional approaches to blepharoplasty. A number of instruments are used, however, that may not be typically used in more conventional blepharoplasty.

A unipolar needle-tipped cautery is used to make the conjunctival incision. This is a standard needlepoint unipolar cautery that has been sheathed with an 18-gauge angiocath. Only approximately 2 mm of the tip is left exposed. The metal tip is sheathed to prevent inadvertent injury to the globe or the eyelids while making the initial incision.

A Jäegar clear lid plate [Storz] and as well as a Desmarres lid retractor [Storz] are also used. It is also helpful to use bipolar cautery to cauterize the stalks of the orbital fat pads prior to excision (Fig 17–8,A to C).

Postoperative care

Postoperative care of these patients is similar to that of other patients undergoing blepharoplasty. We usually emphasize that patients remain in a relative head upright position, usually at least 30° to 45° during the initial postoperative period. We recommend that the patients sleep upright like this for at least 2 weeks postoperatively. Cold compresses are applied immediately postoperatively. We have found an iced folded hand towel works perfectly. These are changed every 15 minutes during the first night following surgery. This not only affords excellent reduction in swelling, but it also ensures that the eyes are examined every 15 minutes during those crucial hours after surgery. We typically use antibiotics, such as a broad spectrum cephalosporin, for a full week after an initial preoperative dose.

SALIENT FEATURES OF TRANSCONJUNCTIVAL TECHNIQUE

Topical and infiltrative anesthesia and corneal protection

After adequate IV sedation, the patient's cornea and globe are anesthetized using topically instilled proparacaine 0.5% eyedrops. After sufficient time has passed to allow maximal anesthesia, the conjunctiva and lower eyelid are then anesthetized using infiltrative anesthesia (Fig 17–9). A 27-gauge, 1½-inch needle is used. The lower eyelid is everted by digital lower lid traction. The needle is introduced in the lower eyelid conjunctiva and a total of 2 cc or less of the anesthetic solution is used with two or three passes of the needle. Gentle pressure is then applied over the closed eyelids in order to minimize the formation of hematoma and ecchymoses. A period of 10 minutes is allowed to pass in order to allow a maximal hemostasis.

Lid retraction

A Desmarres retractor is then inserted in the lower eyelid conjunctival sac and the lower eyelid is retracted. A Jäegar lid plate is then inserted. This instrument is used to protect the globe, to palpate the inferior orbital rim, and to provide countertraction. The lid plate is then positioned just inside the edge of the orbital rim. Through the careful

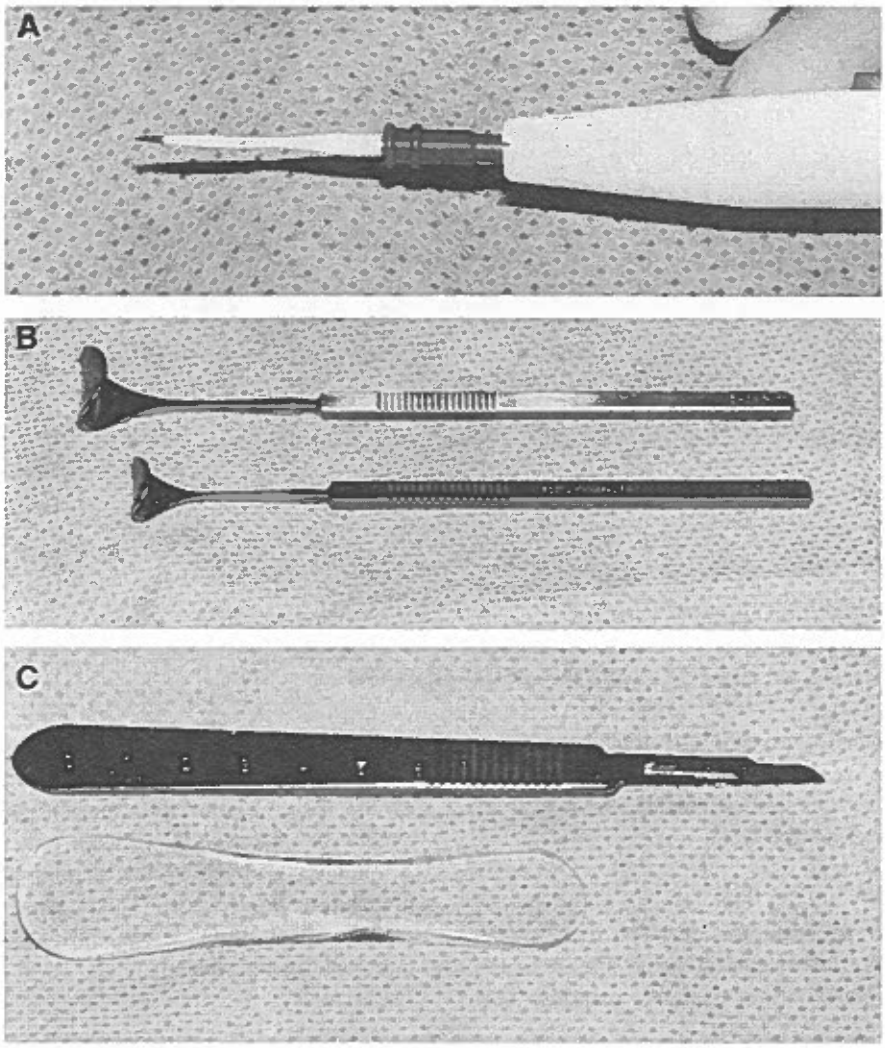

FIG 17–8.
A, photograph of needle-tip unipolar cautery with tip insulated with 18-gauge angiocath. **B,** the Desmarres retractors; two sizes are depicted. **C,** The Jäegar lid plate *(bottom).*

positioning of both the Jäegar lid plate and the Desmarres lid retractor, the lower lid conjunctiva and orbital fat is made to bulge outward (Fig 17–10). An incision is then made in the conjunctiva using the shielded unipolar cautery. The cautery is used in cutting mode in the minimal necessary power to complete the incision. The incision is planned to lie midway between the conjunctival fornix and the inferior margin of the tarsal plate, and at least 5 mm from the tarsal plate. The incision is made to extend from caruncle to the lateral canthal area (Fig 17–11,A and B). After this incision has been completed, there are at times some remnants of the capsulopalpebral fascia that can be bluntly dissected using scissors.

After the incision has been completed, a 3-0 silk suture is placed through the upper conjunctiva margin adjacent to the incision and the conjunctiva is retracted superiorly. The silk suture serves as a traction stitch to both facilitate the identification of the fat pads and associated structures and to position the conjunctiva to protect the globe.

Identification and removal of fat and closure of conjunctiva

The fat pads are then identified. We usually start with the lateral fat pad. After the lateral fat pad has been identified, the amount of fat to be removed is determined by gently teasing on the fat pad and also by applying gentle pressure to the globe. After all the fat to be excised has been identified, the base of this stalk is anesthetized using an injection of 1% lidocaine without epinephrine using a 30-gauge needle. The stalk is then cauterized using bipolar cautery and after sufficient cautery has taken place, it is removed. The removal of the middle and the medial pads takes place in similar fashion. In this procedure, the inferior oblique muscle is frequently identified and will serve as a recognizable landmark. At the end of the procedure.

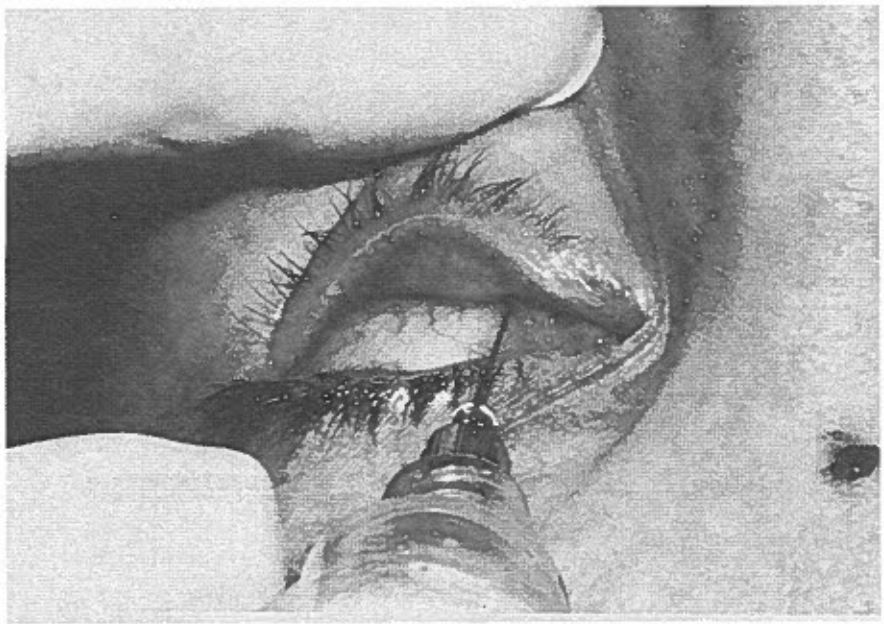

FIG 17–9.
Lower eyelid conjunctiva being injected with local anesthetic.

the eyes are checked for symmetry and adequacy of vision. The conjunctiva is closed with two interrupted 6-0 fast-absorbing catgut sutures placed medial and lateral to the limbus to avoid corneal irritation.

ILLUSTRATIVE CASES

The following two patients illustrate the results that may be achieved in the lower eyelid using simple transconjunctival blepharoplasty. Both patients demonstrated pseudoherniation of orbital fat preoperatively. Postoperatively, there has been a significant reduction in the bulging of the lower eyelid fat, and the position of the lower eyelid is maintained. These patients also underwent simultaneous upper eyelid blepharoplasties and other rejuvenation procedures. There was no other procedure performed on their lower eyelids except for transconjunctival blepharoplasty (Figs 17–12,A and B and 17–13, A to D).

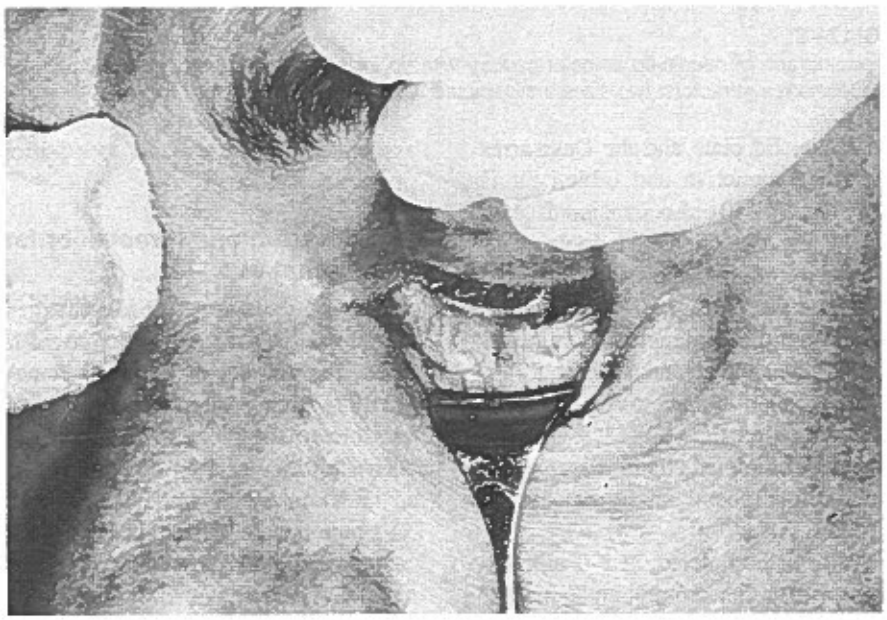

FIG 17–10.
The Desmarres and Jäegar retractors are properly positioned, creating a bulging of the lower eyelid conjunctiva.

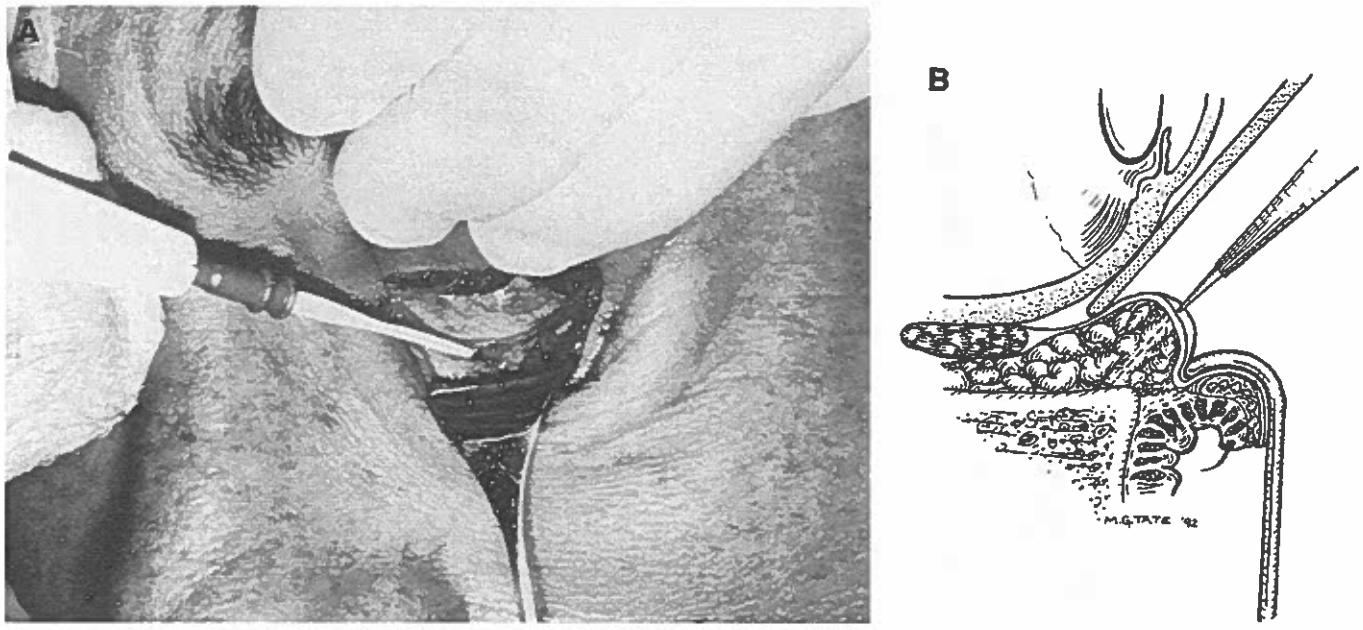

FIG 17–11.
A, the incision being made in the lower fornix using unipolar cautery. The incision will be carried from the caruncle to the lateral canthal area. Note the shielding of the globe with the Jäegar lid plate. **B,** schematic drawing of the path of the initial conjunctival incision. Note the incision is carried behind the plane of the orbital septum.

ANCILLARY PROCEDURES

The pinch

As mentioned previously, a simple transconjunctival blepharoplasty is primarily directed at the removal of pseudoherniated fat. The procedure itself does very little to correct redundancy of skin. Although there is an observed contraction of the lower eyelid skin after the removal of pseudoherniated fat, patients with an abundance of excess skin will usually require another procedure to remove the excess skin, such as a pinch technique as described by Parkes.[12]

This technique has been described previously, and we will not elaborate on all of the details here. Briefly though, the procedure is performed after the subconjunctival removal of fat has been completed. The amount of skin that is to be removed is determined by grasping the excess with fine-toothed forceps (Fig 17–14). It can then be removed with fine sharp scissors. The resultant incision is closed with fine absorbable sutures. This procedure unfortunately produces an external incision and, therefore, one of the main advantages of the transconjunctival approach is thus compromised. In doing the pinch, however, the orbicularis is not violated and the orbicularis sling is thus retained. Theoretically, the support of the lower lid is maintained and the risk of scleral show may be less than in the standard skin muscle flap.

The chemical peel

Rhytids are another problem that are usually not eliminated with a transconjunctival blepharoplasty (or even a transcutaneous technique). Accordingly, for lesser degrees of excess skin and rhytids, we have found it is possible to chemexfoliate the skin of the lower eyelid after undergoing transconjunctival blepharoplasty. This has been performed during the same procedure as transconjunctival blepharoplasty, and also as a secondary procedure. The patient in Fig 17–15 demonstrates a phenol-based chemical peel being performed at the time of transconjunctival blepharoplasty. We have been successful with the use of both phenol and trichloracetic acid-based peels.

Lateral tarsal suspension

Finally, although the transconjunctival approach to blepharoplasty appears to minimize the risks of ectropion for the aforementioned reasons, patients who exhibit such tendencies preoperatively or who have frank ectropion prior to the procedure will benefit from a lid shortening or tightening procedure. We advocate the use of a lateral tarsal suspension. Once again, this can be performed at the time of transconjunctival blepharoplasty. It can also be done postoperatively if significant scleral show or ectropion develops. A horizontal lid shortening at the limbus can also be performed. Because of the advantage of avoiding a scar in the middle portion of the eyelid and the ability to elevate the eyelid in even the patient with prominent eyes, we usually perform a tightening procedure at the lateral canthus.

If the procedure is performed at the same time as a transconjunctival blepharoplasty, the blepharoplasty and removal of fat is carried out first. To perform the lateral

FIG 17–12.
A, preoperative and **B,** postoperative photographs of patient who underwent transconjunctival lower eyelid blepharoplasty. Note improvement in the pseudoherniation of lower eyelid fat pads and maintenance of favorable lower lid position. Patient also underwent upper eyelid rejuvenation during the same procedure.

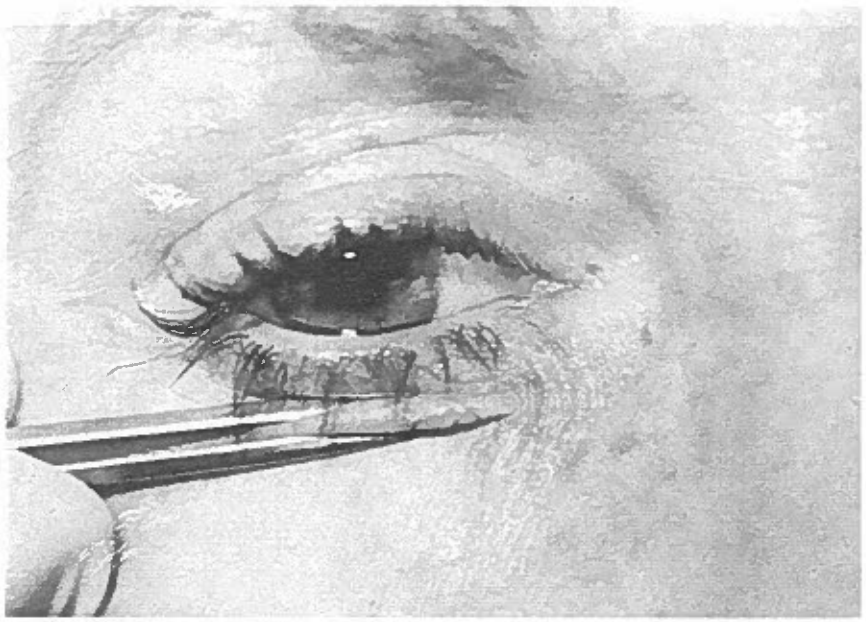

FIG 17–13.
Photograph demonstrating the amount of lower eyelid skin that might be safely removed without changing eyelid position using the pinch technique.

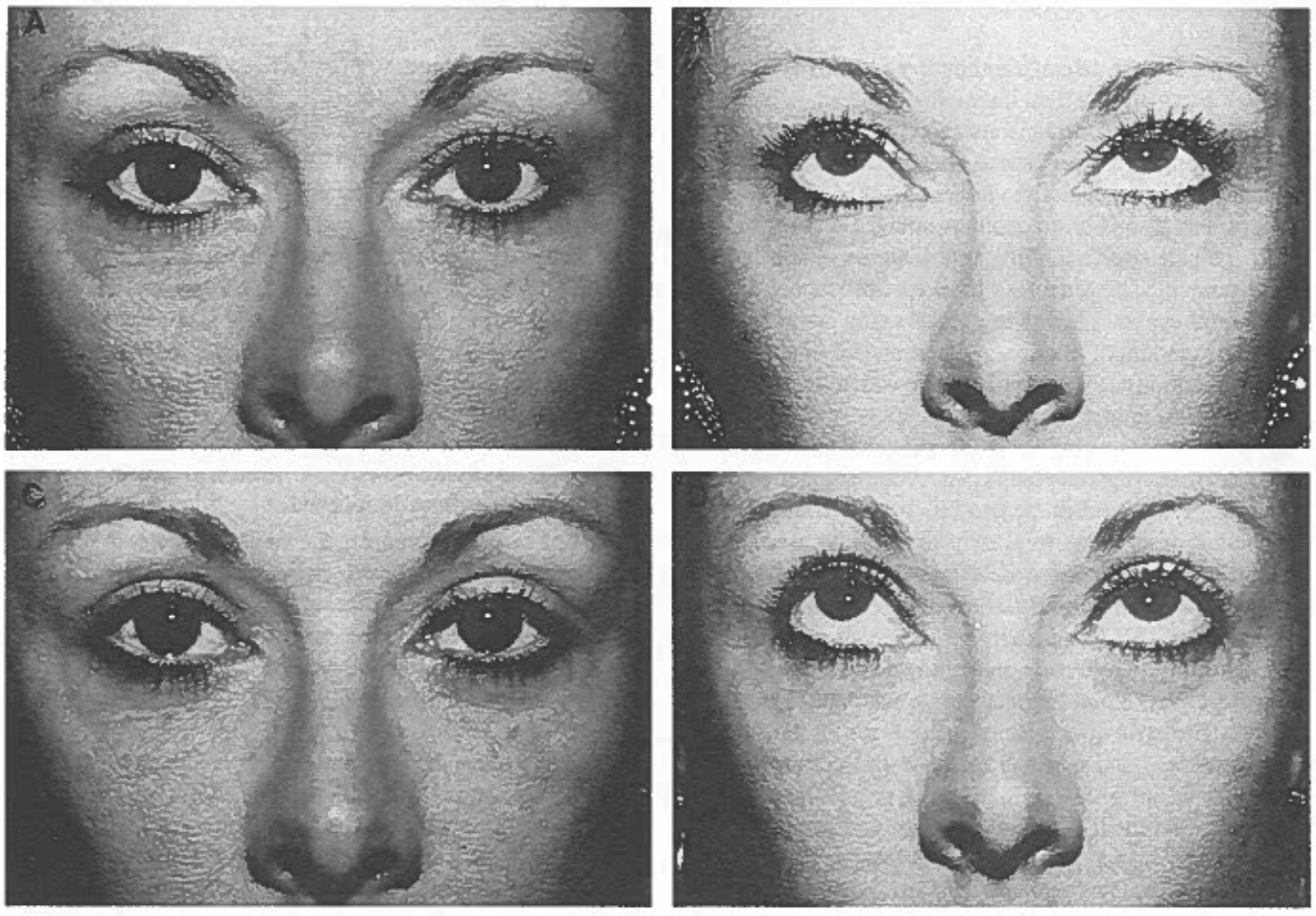

FIG 17–14.
A, B, preoperative and **C, D,** postoperative photographs of patient who underwent transconjunctival lower eyelid blepharoplasty for lower eyelid rejuvenation. **A, B,** preoperative photographs demonstrate pseudoherniation of lower eyelid fat that was improved with the transconjunctival procedure. The patient also underwent upper eyelid rejuvenation.

FIG 17–15.
Photograph of patient during lower eyelid transconjunctival blepharoplasty and simultaneous phenol-based chemical peel. The photograph demonstrates the "frost" that occurs after the application of the peel solution.

tarsal suspension, a lateral canthotomy is initially carried out. We usually make the initial lateral canthal incision with a scalpel. The subcutaneous and conjunctival portions of the canthotomy are performed with a sharp straight scissor. Next, the free edge of the lower eyelid is grasped with a forceps and placed on traction. A straight scissor is then used to palpate the underlying inferior crus of the lateral canthal tendon. The tendon is then cut, producing a free lower lateral eyelid. The lower eyelid is then advanced laterally. The amount of traction is determined by the following considerations. First, the lower eyelid must be tightened enough to reduce the amount of laxity, but care must be taken so as not to displace the medial canthus and punctum so far that epiphora results. Also, the amount of eyelid skin to be removed at the canthus must account for the construction of a lateral tarsal strip that will be used in the reconstruction. After these determinations are made, the amount of skin and orbicularis to be removed is determined and excised. The underlying tarsus is preserved as a strip. Carefully, the underlying mucosa is removed. The above maneuvers should produce a well-defined lateral tarsal strip. The area of the lateral orbital rim is then minimally dissected, and a slit is made in the periosteum so that the tarsal strip can be fixed at a point superior and posterior to Whitnall's tubercle. Using a mattress stitch, the tarsal strip is then sutured to the orbital periosteum using a 4-0 teflon impregnated braided polyester or 5-0 polyglycolic acid suture. An absorbable suture is then used to reconstruct the lateral canthal angle at the grey line. The orbicularis and skin are then closed and reconstructed using absorbable suture.[1, 7, 14, 20] (Figs 17–16,A and B and 17–17, A to C).

NONCOSMETIC INDICATIONS

The transconjunctival approach has been performed for a variety of noncosmetic procedures. These include surgical access for the management of craniofacial trauma, orbital floor reconstruction in the primary and secondary trauma setting, access for the biopsy and removal of tumors, access for decompression of the orbit for Graves ophthalmopathy, and for the management of congenital anomalies.[4, 5, 8, 9, 16, 17]

Trauma: orbital blowout, malar complex fractures, midface fractures

In the setting of trauma, the transconjunctival approach allows access for the exploration of the orbital floor and the placement of grafts for reconstruction. Frequently in this situation, the exposure has to be maximized by the extension of the transconjunctival incision with a lateral canthotomy and inferior cantholysis (Figs 17–18,A and B and 17–19,A and B).

In the management of malar complex fractures, the exposure that is obtained frequently allows access to the frontozygomatic suture. Overall, the surgical approach is similar to that used in performing a lateral tarsal suspension. After the standard transconjunctival incision has been made, a lateral canthotomy and inferior cantholysis is performed. For most applications, this will provide sufficient exposure. In cases of trauma management when it is at-

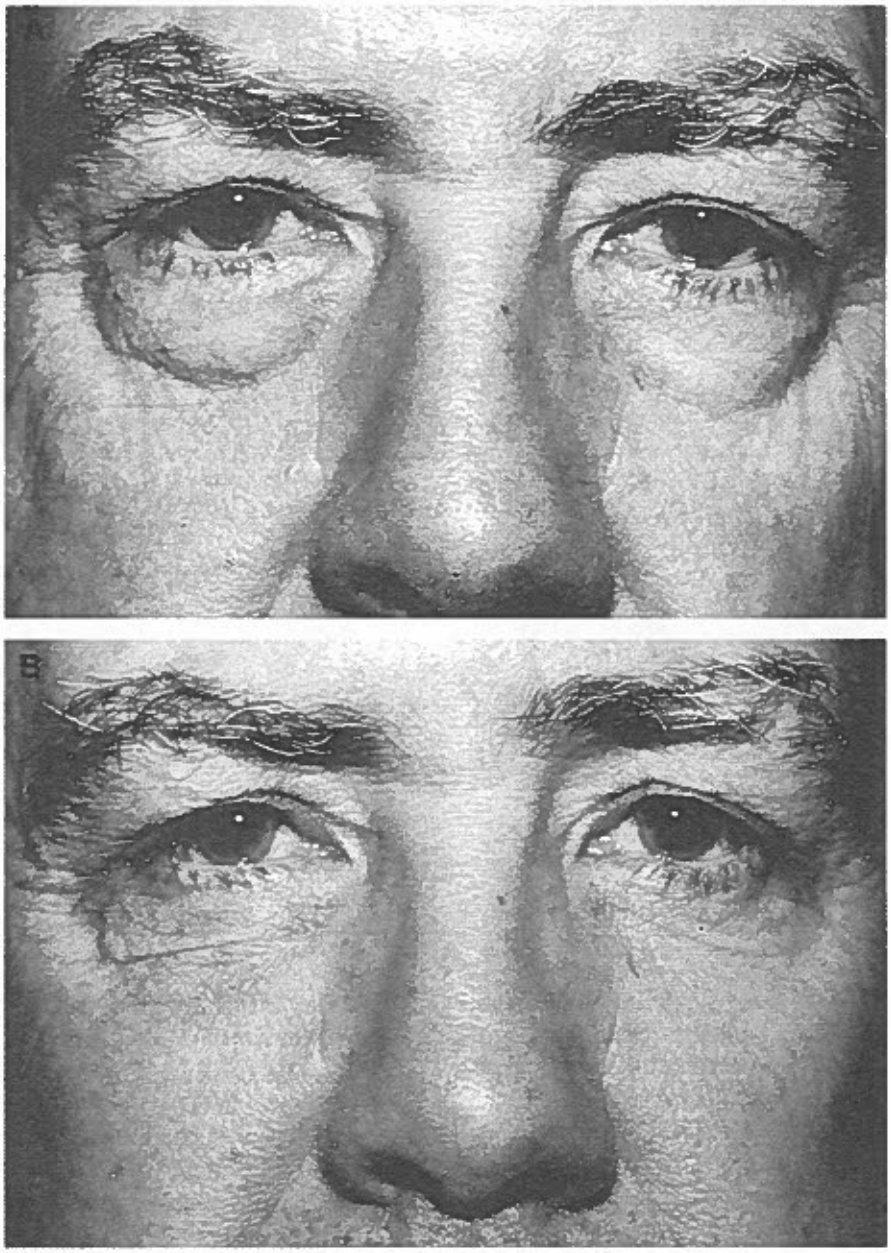

FIG 17–16.
A, preoperative and **B,** postoperative photographs of patient who underwent simultaneous transconjunctival blepharoplasty and lateral tarsal suspension. Preoperative assessment had revealed excessive laxity of the patient's lower eyelids. In order to prevent an ectropion, lateral tarsal suspension had been recommended and performed.

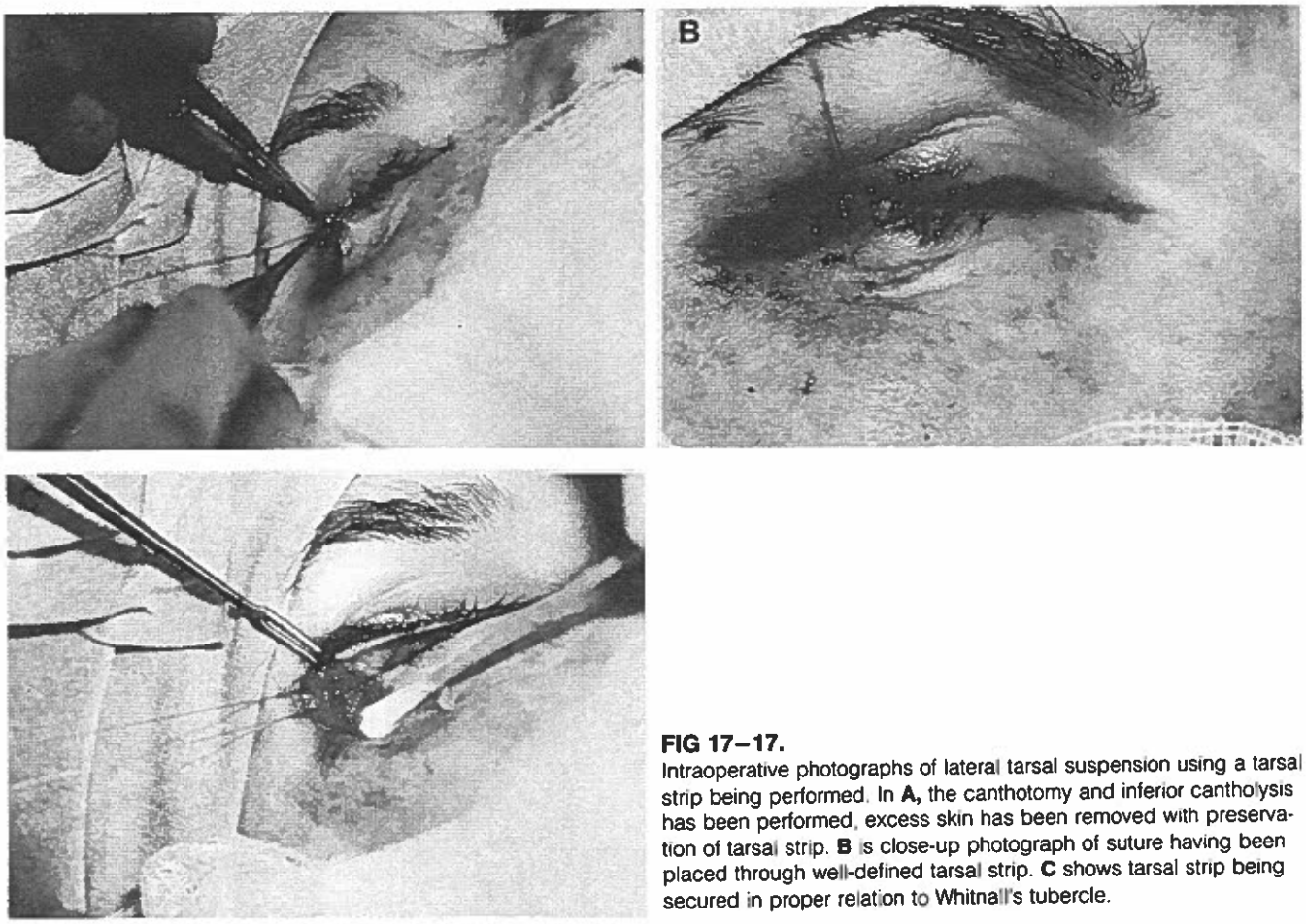

FIG 17–17.
Intraoperative photographs of lateral tarsal suspension using a tarsal strip being performed. In **A,** the canthotomy and inferior cantholysis has been performed, excess skin has been removed with preservation of tarsal strip. **B** is close-up photograph of suture having been placed through well-defined tarsal strip. **C** shows tarsal strip being secured in proper relation to Whitnall's tubercle.

tempted to gain access to the frontozygomatic suture, it is sometimes necessary to perform an upper cantholysis.

After the completion of the procedure, the lateral canthus must be reconstructed. When there has been limited dissection of the orbital periosteum, this is a relatively easy procedure. When there has been extensive dissection, the task becomes more difficult. Care must be used in reconstructing the lateral canthus, since even 2 mm of inferior displacement will be noticeable. At times, in the trauma setting, a hole must be drilled in the proper location on the lateral orbital rim so the lateral canthus can be properly reconstructed. The correct fixation point for the lateral canthus is posterior and superior to Whitnall's tubercle. When there has been a cantholysis of both the upper and lower eyelids, the difficulty is further compounded and reconstructing the anatomy will be even more difficult.

The same exposure allows access to the orbital floor for reconstruction in both the acute and the secondary trauma setting. It should be remarked, however, that exposure of the medial orbit through the transconjunctival approach is limited and sometimes has to be provided through another approach.

Orbital exploration: neoplasia, orbital decompression

The transconjunctival approach has been used for the exploration of the orbit for the removal of foreign bodies and benign tumors. Such exposure is valuable in preventing external scarring of the skin and avoiding lower lid retraction. It is not recommended, however, that malignancies be routinely managed by this approach. In the case of orbital decompression for Graves ophthalmopathy, it has been found that precision of bone removal is possible though the exposure of a lower fornix incision.

COMPLICATIONS

There are several potential complications to blepharoplasty. These include scleral show/ectropion, entropion, granulation tissue, injury to inferior oblique/diplopia, enophthalmos, corneal abrasion, hematoma, wrinkling of the skin, infection, asymmetry, epiphora, injury to the inferior oblique muscle, and blindness. These occur in both standard transcutaneous blepharoplasty as well as in transconjunctival blepharoplasty. Complications that appear to occur with greater frequency in lower lid transconjunctival

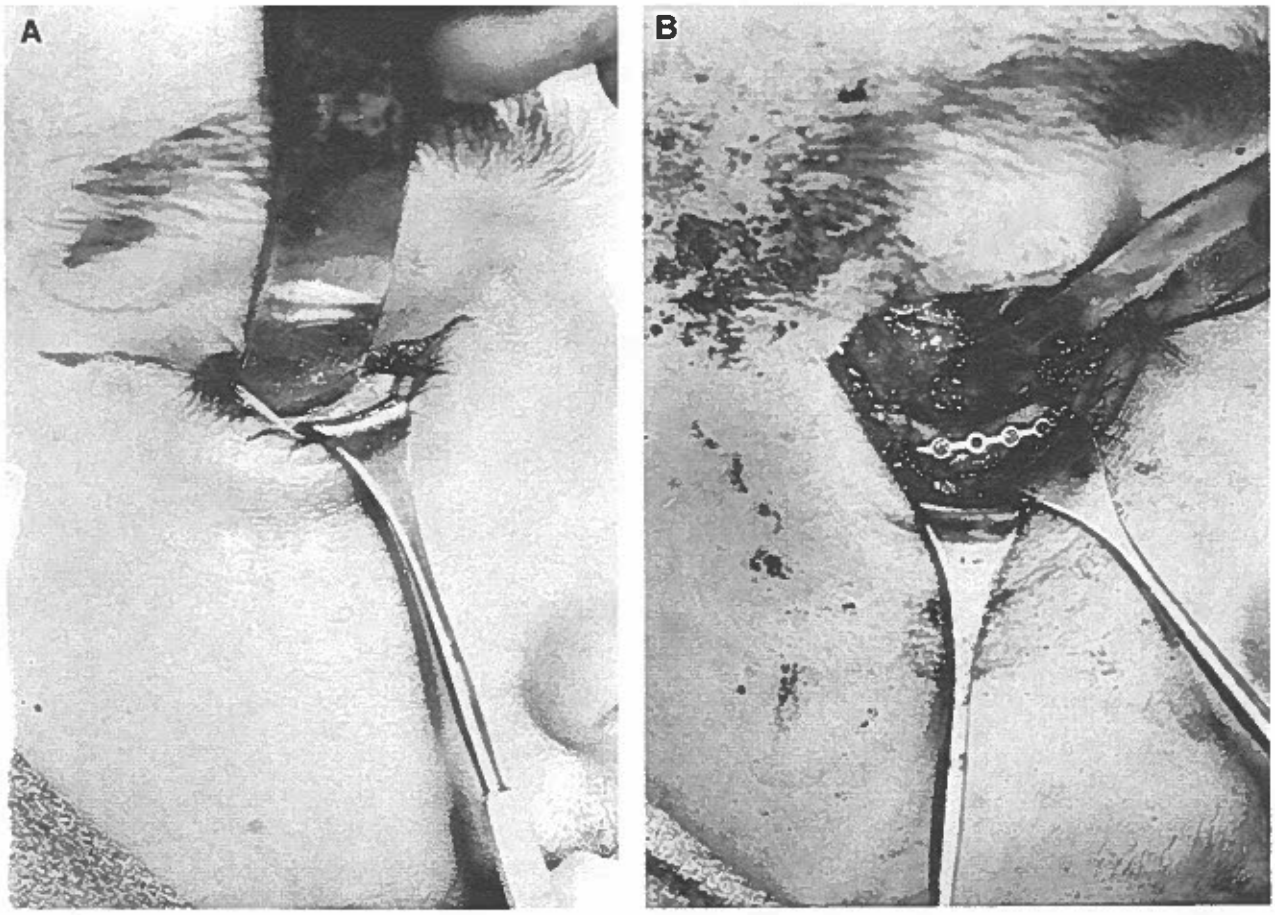

FIG 17–18.
Intraoperative photograph of patient with malar complex fracture requiring fixation of orbital rim, fixation of frontozygomatic suture, and orbital floor reconstruction. **A,** retraction performed using Desmarres and malleable retractor. Three markings have been made at lateral canthus region revealing incision options to gain access to frontozygomatic suture. The options depicted from superior to inferior are traditional brow incision, lateral blepharoplasty/supratarsal crease, and lateral canthotomy. **B,** this is a photograph of same patient as in **A** after transconjunctival incision has been made. Access to orbital rim, orbital floor, and frontozygomatic suture has been accomplished by extending exposure with lateral canthotomy and inferior and superior cantholysis.

blepharoplasty are eyelid avulsion, vertical eyelid laceration, and canthal dehiscence. Conjunctival chemosis appears to be more a problem with this approach.

We will comment more specifically on some of the complications that will be of particular interest in the setting of transconjunctival blepharoplasty.[3, 11, 19]

Ectropion/scleral show/entropion.—The transconjunctival approach appears to reduce the risk of these complications in the postoperative period. They can and do occur, however, and hence patients must be evaluated for such tendencies and proper management must be instituted, that is, lateral tarsal suspension. It has also been observed that cutting the conjunctiva too close to the tarsal plate may predispose to entropion, so this must be avoided.

Avulsion of the eyelids/vertical laceration.—This complication would appear to be more probable in the setting of the noncosmetic use of the transconjunctival procedure such as trauma management. Care must be taken to avoid putting too much tension on the lower eyelid with the Desmarres retractor. The use of a lateral canthotomy and cantholysis may reduce the occurrence of this complication.

Also, to avoid entropion, ectropion and granulation tissue in the fornix, and cicatrix, these authors recommend closing the conjunctiva at the completion of the procedure. Additionally, the cutting cautery must also be set at the lowest effective power to avoid excessive thermal injury to the tissues when making the initial conjunctival incision.

SUMMARY

The transconjunctival approach is an important technique that appears to preserve much of the anatomic support of the lower eyelid. These anatomic mechanisms include preservation of the "orbicularis sling" that includes the pretarsal orbicularis and its attachments to the medial

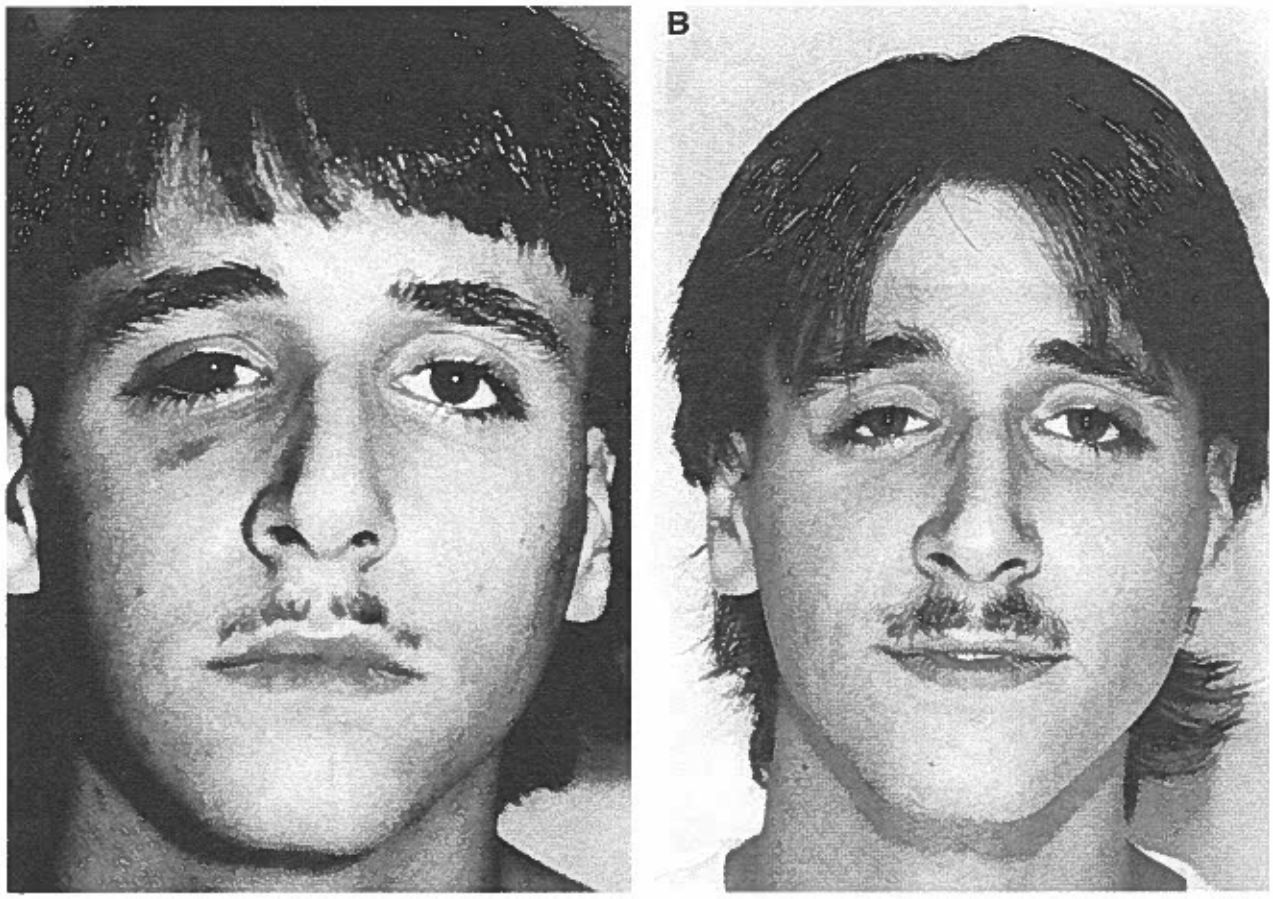

FIG 17–19.
A, preoperative and **B,** 1-year postoperative photographs of patient from Fig 17–18.

and lateral canthal ligaments and avoidance of the orbital septum thus reducing scar contraction. Finally, the lysis of the lower eyelid retractors may play a role in preserving a favorable postoperative lower eyelid position. The technique allows excellent exposure in routine cosmetic blepharoplasty and has been adapted for use in a variety of other clinical settings.

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REFERENCES

1. Anderson RL, Gordy DD: The tarsal strip procedure. *Arch Ophthalmol* 97:2192, 1979.
2. Baylis HI, Sutcliffe RI: Conjunctival approach in lower eyelid blepharoplasty. In Bosniak SL, Smith BC, editors: *The aging face*, New York. 1983, Pergamon Press.
3. Baylis H, Long J: Transconjunctival lower eyelid blepharoplasty—technique and complications. *Ophthalmology* 96:1027–1032, 1989.
4. Converse JM et al: The conjunctival approach in orbital fractures. *Plast Reconstr Surg* 52:656, 1973.
5. Jackson I et al: The conjunctival approach to orbital floor and maxilla: advantages and disadvantages. *Ann Plast Surg* 19:46–48, 1987.
6. Kamer FM, Mikaelian AJ: Preexcision blepharoplasty. *Arch Otolaryngol Head Neck Surg* 117:995–999, 1991.
7. Lisman RD et al: Experience with tarsal suspension as a factor in lower lid blepharoplasty. *Plast Reconstr Surg* 79:897–905, 1987.
8. Lynch D: The conjunctival approach for exploration of the orbital floor. *Plast Reconstr Surg* 54:153–156, 1974.
9. Maniglia A. Conjunctival approach for the repair of pure orbital blowout fractures. *Otolaryngol Clin North Am* 16:575–583, 1983.
10. McCollough EG, English JL: Avoiding plastic eyelids. *Arch Otolaryngol Head Neck Surg* 114:645–648, 1988.
11. McCord CD Jr, Shore JW: Avoidance of complications in lower lid blepharoplasty. *Ophthalmology* 90:1039–1046, 1983.
12. Parkes M, Gern W, Brennan HG: Punch technique for repair of cosmetic eyelid deformities. *Arch Ophthalmol* 89:324–328, 1973.
13. Pettersson LO, Akerman B: Influence of hyaluronidase upon local infiltration anesthesia by lidocaine: an experimental study in the guinea pig. *Scan J Plast Reconstr Surg Hand Surg* 18:297, 1984.
14. Rees TD: Prevention of ectropion by horizontal shortening of the lower lid during blepharoplasty. *Ann Plast Surg* 11:17, 1983.
15. Schwarz F, Randall P: Conjunctival incision for herniated orbital fat. *Ophthalmic Surg* 11:276–279, 1980.

16. Tenzel RR, Miller GR: Orbital blowout fracture repair conjunctival approach. *Am J Opthalmol* 71:1141–1146, 1971.
17. Tessier P: The conjunctival approach to the orbital floor and maxilla in congenital malformation and trauma. *J Maxillofacial Surg* 1:3, 1973.
18. Tomlinson FB, Hovey LM: Transconjunctival lower lid blepharoplasty for removal of fat. *Plast Reconstr Surg* 56:314–318, 1975.
19. Westfall CT et al: Operative complications of the transconjunctival inferior fornix approach. *Ophthalmology* 98:1525–1528, 1991.
20. Whitaker LA: Selective alteration of palpebral fissure form by lateral canthopexy. *Plast Reconstr Surg* 74:611, 1985.
21. Zarem HA, Resnick JI: Expanded applications for transconjunctival lower lid blepharoplasty. *Plast Reconstr Surg* 88:215–220, 1991.