

THE MANAGEMENT OF INVOLUTIONAL LOWER LID ECTROPION

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ABSTRACT

Lower lid ectropion is caused by the imbalance of the lower lid protractors and retractors. Laxity of the canthal tendons will affect the degree and location of the ectropion as well as the surgical decisions for its repair. A schema for the individualization of surgical correction as well as a new application of temporalis muscle transfer is presented.

Key Words: Involutional ectropion; Medial canthal tendon laxity; Lateral canthal tendon laxity; Wedge resection; Double wedge resection; Lateral tarsal strip; Medial canthal tendon plication; Temporalis muscle transfer.

Involutional lower lid ectropion is the manifestation of a combination of factors. Laxity of the suspensory canthal tendons as well as ischemia and atrophy [1, 2] of the pretarsal and preseptal orbicularis muscles disturb the delicate balance between the lid protractors and retractors resulting in an ectropion. The relative contribution of each of these components will determine the nature and extent of the deformity. Prominent medial canthal tendon laxity may yield a spectrum of medial ectropion ranging from minimal punctal eversion to frank ectropion. Lateral canthal tendon laxity may be responsible for a lateral or a generalized ectropion. Complete eversion of the entire lid margin may be the result of diffuse laxity involving both canthal tendons and the orbicularis muscles. Correction of these deformities must be individualized so that the relative contribution of each component can be corrected. Only in this manner can an adequate anatomic and cosmetic correction be achieved.

PREOPERATIVE EVALUATION

Lacrimal Excretory System

Palpebral conjunctiva that has been exposed and desiccated becomes keratinized with long-standing lower lid ectropion. If there is medial ectropion the puncta may be obliterated; therefore, the puncta and lower canalicular system must be evaluated preoperatively.

Cicatricial Component

A lower lid that has been everted for many months or years may develop subcutaneous cicatrization and shortening of the anterior lamella of the lid. This cicatricial component must be determined preoperatively. It must be corrected with a free skin graft or Z-plasty [3] at the time of surgery.

Localization of Laxity

The pinch test is an effective means of determining if lower lid laxity exists. If the lid can be pulled more than 6 mm away from the globe [4], the lid is lax. Grasping the lid and pinching it will also give information about canthal tendon laxity [5]. If the punctum is displaced laterally toward the nasal limbus, medial canthal tendon laxity exists (Figure 1). If the lid is shortened horizontally without prior medial canthal tendon plication, the punctum will be permanently displaced. If the horizontal palpebral diameter is shortened and the distance between the temporal limbus and the lateral canthal angle is decreased, there is laxity of the lateral canthal tendon (Figure 2). If the lateral canthal tendon is not tightened before horizontal shortening of the lid, a narrowing of the horizontal palpebral aperture will result.

Inferior Scleral Show

Inferior scleral show may be a function of canthal tendon laxity, shortening of the posterior lamella of the lid, proptosis, shallow orbits, or high myopia with large globes. Regardless of its etiology it can occur concomitantly with ectropion. A simple lower lid wedge resection may correct the lid contour, but accentuate the inferior scleral show. The lid must also be vertically lengthened with sclera or auricular cartilage and supported laterally with a lateral canthoplasty.

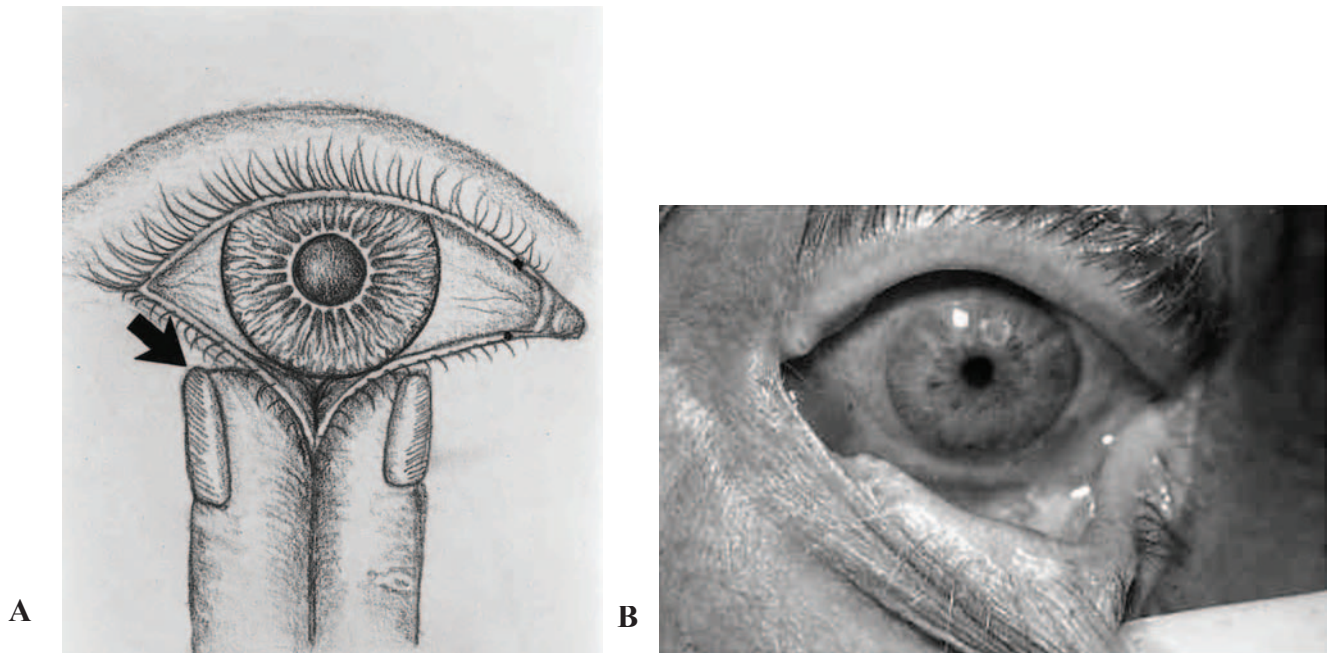


FIGURE 1. (A)(B) If the medial canthal tendon is lax, the punctum will be displaced laterally when the lid is pinched

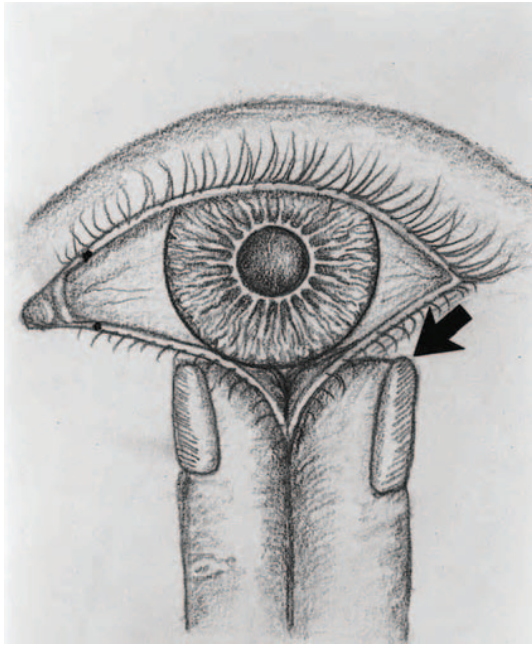


FIGURE 2. If the lateral canthal tendon is lax, the horizontal palpebral aperture is shortened as is the distance from the lateral limbus to the lateral canthal angle.

SURGICAL TECHNIQUES

If medial canthal tendon (MCT) laxity is not apparent, we have found the following techniques useful for the correction of involutional ectropion (See Table 1).

1. Lower lid wedge resection for mild to moderate involutional ectropion

(Figure 3: left lower lid). This procedure is well known by most ophthalmic surgeons, and is adequate in the majority of cases. An inverted pentagonal wedge resection is performed at the junction of the lateral one third and medial two thirds of the lower lid. A vertical cut is made from lid margin to inferior fornix. The corneal protector is removed. And the wound edges are overlapped until the lid margin approximates the globe snugly (Figure 4). The nasal lid margin is notched at the point that it overlaps the temporal edge. The pentagonal resection is completed.

The lid margin is reapproximated with three interrupted 6-0 black silk sutures placed first through the Meibomian orifices, then through the lash line and finally through the grey line. The suture ends are left long so that they can be anchored under the skin sutures and kept off the cornea. The tarsus and conjunctiva are closed with one or two mild 5-0 chromic sutures. The skin is closed

TABLE 1. SURGICAL TECHNIQUES FOR CORRECTING LOWER LID ECTROPION WITHOUT MCT LAXITY.

1. Mild to Moderate	Wedge Resection
2. Moderate	Lateral Tarsal Strip
3. Marked	Double Wedge Resection
4. Extreme	Temporalis Muscle Transfer



FIGURE 3. This 68-year-old man has a mild to moderate medial ectropion of his right lower lid (note the punctal eversion) and a moderate ectropion of his left lower lid with keratinization of his palpebral conjunctiva.

with 6-0 nonabsorbable sutures.

If there is not an obvious excess of lower lid skin, the resection may be performed through full thickness eyelid. If there is a marked redundancy of skin, then the resection is best performed under a blepharoplasty skin flap [6]; the skin is trimmed superiorly and laterally as in a blepharoplasty. Marked lower lid asymmetry may occur if the skin is trimmed aggressively.² *Lateral tarsal strip for moderate generalized or lateral involucional ectropion* (Figure 5). The lateral canthal tendon (LCT) is exposed with a horizontal incision extending laterally from the lateral canthal angle. The inferior arm of the LCT is transected with a vertical incision through full thickness lower lid at the lateral canthal angle. The severed edge of the lid margin is overlapped with the lateral canthal angle. The lid margin is pulled laterally and notched at the point where the lid is in tight apposition to the globe. A triangular portion of the temporal lid is resected, sparing the tarsus (Figures 6, 7). A mattress suture of 4-0 Mersilene, Prolene, or



FIGURE 4. This lateral ectropion was the result of a medial canthal tendon plication with an inadequate horizontal lid shortening.

Supramyd is used to anchor the tarsal strip to the periosteum laterally and superiorly after passing it through the superior arm of the lateral canthal tendon (Figures 8, 9). A periosteal flap from the superior aspect of the lateral wall may be reflected for additional support (Figure 10).

If there is an obvious excess of lower lid skin, this procedure may be performed under a blepharoplasty skin flap. The skin is gently draped superiorly and trimmed where it overlaps the incision (Figure 11).

3. Double wedge resection for marked involutional ectropion (Figure 12). When the ectropion is severe and prominent laxity of the lateral canthal tendon is apparent, a combination of procedures is necessary to adequately correct the deformity. A lateral lid resection with tarsal strip combined with a pentagonal resection temporal to the punctum will effectively correct the ectropion without distorting the canthal angle or significantly narrowing the horizontal palpebral aperture (Figure 13).

A subciliary lower lid skin incision is made. A lateral tarsal strip is developed and anchored to the periosteum. A pentagonal wedge resection is performed 4 mm temporal to punctum. The lid is overlapped and resected appropriately. If there is residual punctal retrocanalicular diamond resection of conjunctiva and submucosa is performed 4 mm inferior to the lower canaliculus and closed with 6-0 plain catgut sutures. (Figure 13 insert)

4. For extreme, recurrent involutional ectropion temporalis muscle transfer. The previously described procedures are relatively easy to perform. Although it is a straightforward application of basic principles, this procedure involves tissue not often handled by the ophthalmic surgeon. It is reserved for the most severe cases of ectropion with marked generalized periocular laxity

laxity that has recurred after a previous surgical correction. Temporalis muscle transfer has been effectively used to correct paralytic ectropion [7, 10]. Involutional and paralytic ectropion share one common etiologic factor-orbicularis muscle atrophy. Recent studies imply that microinfarctions and ischemia affect the orbicularis muscles in involutional ectropion [1].

We have no follow-up longer than 6 months available on the use of this procedure for the correction of involutional ectropion, but there are several potential theoretic advantages to its application. It provides a viable lower lid sling as well as additional pretarsal muscle mass. As a secondary benefit it may initiate myo-neurotization of the atrophic orbicularis muscle.

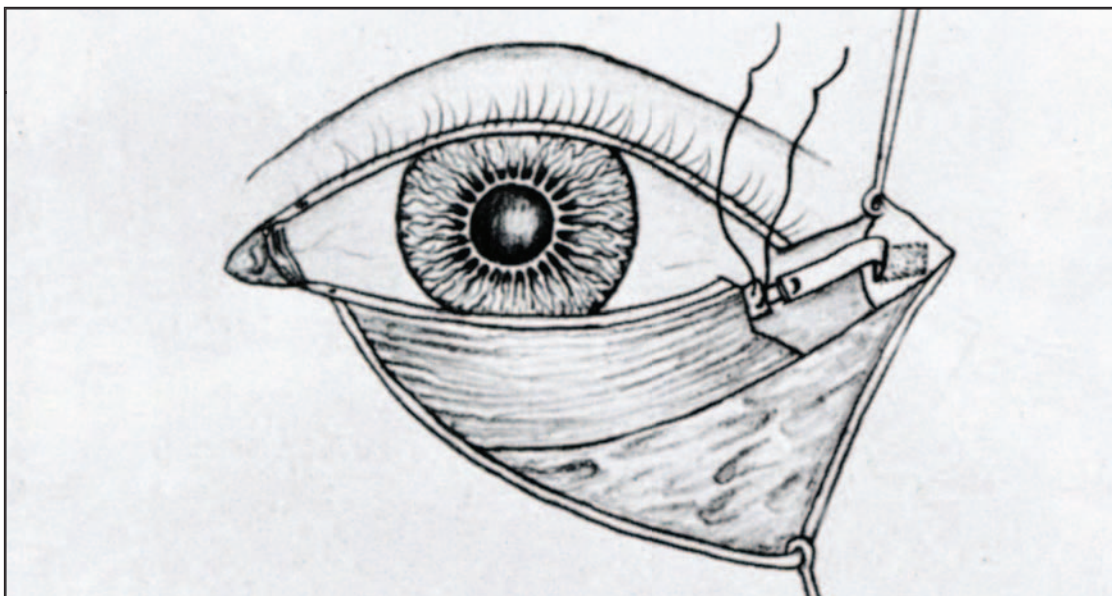


FIGURE 5. A reflected strip of periosteum may be used to reinforce the lateral tarsal strip.

There are some obvious drawbacks. It is a slightly more complicated procedure. Although its sling effect is very predictable laterally, the length and availability of the temporalis muscle may limit its medial sling effect. Distortion of the lateral canthal angle has not been a problem.

Since we are reserving this technique for secondary cases, the localization of the residual deformity will determine which adjunctive techniques will precede the muscle transfer. But punctual rotations and wedge resections may easily be accommodated.

A lateral scalp incision overlying the mid portion of the temporalis muscle is made, dissecting the scalp in a plane just superficial to the temporalis fascia so that the entire temporalis muscle may be identified and isolated. The length and bulk of the muscle mass is evaluated. An appropriate amount of muscle is outlined in Methylene Blue so that the arc of transposition needed to reach the medial canthal tendon can be evaluated (Figure 14). It is important to dissect the epicranium that is adherent to the temporalis muscle. The muscle is elevated off the cranial vault and a tunnel is made in a sub-muscular plane lateral to the lateral canthal region and extending just beneath the cilia superficial to the tarsal plate as far as the medial canthal region. It is imperative to isolate and identify the facial nerve branches that are superficial, overlying the zygomatic arch region. A facial nerve stimulator is considered necessary for this portion of the procedure.

The muscle is then appropriately transposed. If additional length is necessary, the superficial temporalis fascia is back cut and reinforced with 4-0 Mersilene sutures at the distal edge of the muscle as in the diagram (insert, Figure 14). The medial canthal tendon is exposed. A deep bite in the tendon anchors the fascial component of the temporalis transposition and affords a superior and posterior pull. Tunneling may be performed without a lid skin incision. Alternatively, a skin muscle flap as prepared in a lower lid blepharoplasty can be used to expose the tarsus if an additional wedge resection is necessary. The transposed temporalis muscle can then be sutured directly to tarsus.

The defect left by the transposed temporalis fascia is relatively unnoticed. A drain is placed in the area, preferably a suction type apparatus, and the reconstructed area is then taped to stabilize the wound. No other precautions are necessary. Postoperative antibiotics are prescribed for 10 days.

The following techniques are helpful if there is medial ectropion (see Table 2).

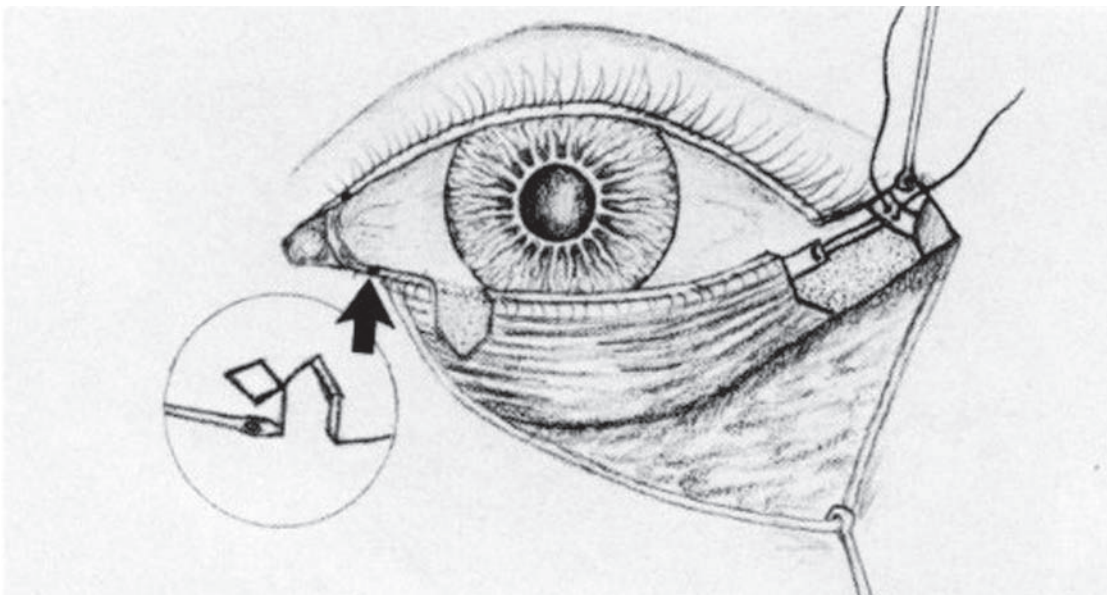


FIGURE 6. Double wedge resection of the lower lid combining a lateral tarsal strip and Lazy "T" is used for severe involutinal ectropion.

TABLE 2. SURGICAL TECHNIQUES FOR CORRECTION LOWER LID MEDIAL ECTROPION.

1. Mild	Retrocanalicular Resection
2. Moderate	Lazy "T"
3. Marked	MCT Plication Plus Lazy "T"
4. Extreme	Temporalis Muscle Transfer

1. *Retrocanalicular resection for mild punctal eversion.* If the punctum is visible without grasping the lid, the punctum is everted.

2. *Lazy "T" for moderate medial ectropion [8]* (Figure 3, right lower lid; Figure 13, insert). 4 mm lateral to the lower punctum a pentagonal lid resection is performed. Before the lid margin is reapproximated, the medial aspect of the lid is easily everted and the posterior lamella exposed. A Bowman probe is inserted into the lower canaliculus. 4mm inferior to the canaliculus, a horizontal incision through conjunctiva and submucosa is made with a razor blade fragment. This incision is made contiguous with the lid resection. The submucosa is undermined into the inferior fornix. The wound edges are overlapped and an appropriate amount resected to return the punctum to the lacrimal lake. The conjunctiva and submucosa are closed with 6-0 plain sutures. The lid margin is closed with 6-0 black silk sutures, tarsus with 5-0 chromic and the skin with 6-0 black silk.

3. *MCT plication plus Lazy "T" for severe medial ectropion [11]* (Figure 15). A Bowman probe is inserted into the lower canaliculus.



FIGURE 6. A 10 mm wide strip of temporalis muscle is transposed to support the lower lid and canthal tendon. If the muscle is not long enough to reach the medial canthal tendon, it can be back cut (see insert A.)

A subciliary incision beginning 3 mm lateral to the inferior puncta is extended medially paralleling the medial canthal angle and sweeping superiorly above the level of the MCT. The pretarsal MCT are exposed. A mattress suture of 4-0 Mersilene or Prolene is pulled through the nasal edge of the tarsus and overlying orbicularis, and then through the periosteum under the insertion of the superficial arm of the MCT, maintaining superior and posterior tension. Care must be taken not to pass the plication suture through the lacrimal sac. A modified medial canthal sling [12] is fashioned by pulling the skin superiorly and trimming it where it overlaps the incision. The wound is closed with 6-0 black silk. After the MCT is pllicated, the Lazy "T" is performed.

4. *For extreme recurrent medial ectropion, a MCT plication with Lazy "T" is reinforced with a temporalis muscle transfer.*

SUMMARY

Lower lid ectropion may present as a continuum of deformities depending on the relative laxities of the medial or lateral canthal tendons. Individualization of the surgical procedures are necessary for adequate correction.

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