
Reconstruction of the Horizontal Palpebral Aperture After Failed Ectropion Surgery with Temporal Migration of Punctum

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Abstract

Involitional ectropion of the lower lid is the result of progressive stretching and elongation of the lid margin and medial and lateral canthal tendons. The relative laxities of the components of the lower lid-canthal tendon complex will determine the location and extent of the ectropion. Whereas inadequate canthal tightening or horizontal lid shortening will result in recurrent ectropion, overzealous lid shortening without tendon plication will result in a noticeably narrower horizontal palpebral fissure, a persistent ectropion, or temporal migration of the punctum. We used lateral cantholysis, medial canthal tendon plication, and punctal rotation to return the punctum to its normal position and temporalis muscle to support the lower lid in eight cases in which previous procedures had failed to correct the lid malposition. In all eight cases there was improvement of the lid position. In one case of severe medial ectropion, the punctal eversion was not completely corrected. This technique is not recommended as an initial procedure for ectropion repair. It is only used to manage previous surgical failures. It is a new application and combination of well accepted techniques.

Introduction

Involitional lower-lid ectropion is the result of senescent stretching and progressive elongation of the medial and lateral canthal tendons as well as the lid margin. The segment of the canthal tendon lid margin complex that is the most lax will manifest the most pronounced ectropion and will need well

directed repair horizontally shortening the lower lid with a wedge resection without first strengthening the lax canthal tendon will result in a distortion of the palpebral aperture and a residual ectropion. If the lid has been maximally resected without prior canthal tendon tightening, subsequent attempts at tendon plication might be difficult. In eight cases of failed ectropion correction we have applied the technique of temporalis muscle transfer to support the lower lid after the punctum was returned to its normal position with lateral cantholysis, medial canthal tendon plication, and punctal rotation. In seven of the cases the residual lid malposition was adequately corrected. This technique also added additional bulk to markedly atrophic lids.

Technique

The temporally migrated punctum is advanced nasally by performing a lateral cantholysis, a small semicircular temporal advancement flap, and plicating the medial canthal tendon with a 4-0 Mersilene suture. It may be rotated with a retrocanalicular conjunctival resection. A 4-cm pre-auricular incision is then extended into the scalp behind the hair line over the anterior aspect of the temporalis muscle (Fig. 1). The anterior surface of the muscle is exposed. A disposable nerve stimulator is used to identify the terminal branches of the facial nerve, which are very superficial and prominent over the malar eminence, and care is taken to avoid transecting them (Fig. 2). A 15-mm wide and 45-mm long pedicle of temporalis muscle, including as much fascia and insertional epicranium as possible, is developed. A vertical incision 10 mm in length and straddling the insertion of the medial canthal tendon is made. The superficial arm of the tendon is isolated carefully with blunt and sharp dissection. A 10-mm subciliary incision is made at the temporal one-third of the lower lid, extending over the lateral palpebral raphe. The lateral canthal tendon is exposed with blunt and sharp dissection. A subcutaneous tunnel joining the pre-auricular incision to the lateral canthal incision is developed with face-lift scissors (Fig. 3). A second subcutaneous tunnel is developed from the lateral to the medial canthal tendon. The temporalis muscle suture deep to the tendon and aim it superiorly, with firm bites in the tendon and then the periosteum (Fig. 4, inset A). If the temporalis muscle and fascia pedicle do not reach the medial canthal tendon, they can be lengthened by transposing the anterior lamella of anterior temporalis fascia (Fig. 4, inset B). pedicle flap is



FIGURE 1. A pre-auricular incision is extended into the scalp.

transposed into the lower lid, passed through the subcutaneous tunnel (Fig. 4). It is anchored to the medial canthal tendon with a double armed 4-0 Mersilene suture (Fig. 4, inset A). Care is taken to place the Mersilene suture deep to the tendon and aim it superiorly, with firm bites in the tendon and then the periosteum (Fig. 4, inset A). If the temporalis muscle and

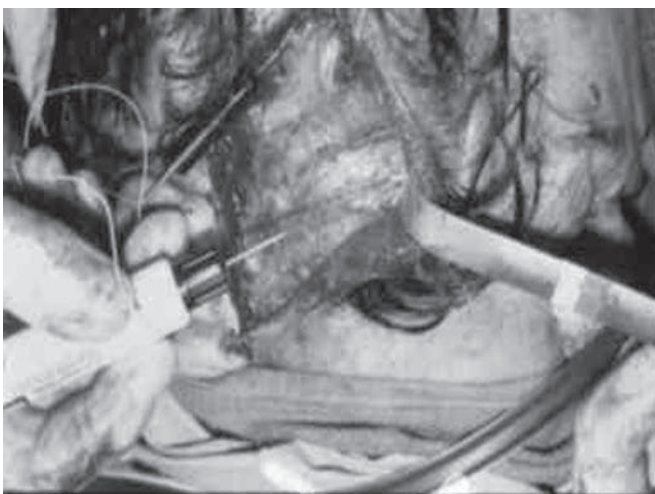


FIGURE 2. The terminal superficial branches of the facial nerve are identified with a nerve stimulator.

fascia pedicle do not reach the medial canthal tendon, they can be lengthened by transposing the anterior lamella of anterior temporalis fascia (Fig. 4, inset B).

The medial canthal incision is closed with 6-0 nylon sutures. Polyethylene tubing on a 23 butterfly intravenous set is placed in the temporalis muscle defect as a drain. The temporalis fascia is closed with 4-0 chromic sutures. The pre-auricular skin incision is closed with 4-0 nylon sutures. The 23 butterfly needle is inserted into a vacutainer tube; it is changed daily and removed when there is no further drainage. A pressure dressing and a headroll are applied to the temporalis wound. All skin sutures are removed in 7 days.

Results

Medial canthoplasty, lateral advancement, and temporalis transfer were performed on eight patients (Table 1). The follow-up period was from 29 to 34 months. The patients' ages ranged from 57 to 87 years. This technique effectively corrected secondary involutional ectropion (ectropion that recurred after an initially satisfactory surgical result or was not satisfactorily corrected after a previous procedure) in seven of the eight patients (Fig. 5a and 5b). In case 1, although the lid contour was improved, residual medial lower-lid malposition was believed secondary to inadequate medial canthal support. In cases 2, 5, and 8, retrocanalicular conjunctival resections were used to rotate displaced inferior puncta into the lacrimal lake.

Comments

Significant lower-lid laxity exists if the lid can be pulled more than 6-8 mm from the globe.^{1,2} If pulling the lid laterally results in lateral displacement of the lower punctum, medial canthal tendon laxity exists (Fig. 6). If pulling the lid medially narrows the horizontal palpebral aperture and displaces the lateral canthal angle medially, lateral canthal tendon laxity exists^{2,3} (Fig. 7).

If coexistent canthal-tendon and lid-margin laxity are not appreciated preoperatively, an unsatisfactory result might follow. In patients with extreme lower-lid laxity and ectropion, the procedures that normally are effective for the correction of the lid malposition may not be sufficient. Effective procedures must be directed at each of the senescent structures in the lid-tendon complex.³ Cicatrization after unsatisfactory surgical procedures may be difficult to remedy. Maximum lid wedge resection without prior tendon tightening might result in an inadequate correction of the lid malposition distortion of the palpebral fissure, and displacement of the punctum.

Figure 3. A subcutaneous tunnel is developed from the base of the temporalis muscle to the lower lid.



Subsequent attempts to tighten the medial canthal tendon and shift the punctum nasally will first require lateral canthal release. Temporalis muscle can then be used to support the lower lid and prevent sagging of the lateral canthal angle.

Temporalis muscle has long been used to reanimate eyelids in patients with facial palsy⁴⁻⁸ More reconstruction of the horizontal palpebral aperture recently, ophthalmic

surgeons have found temporalis fascia and muscle autografts convenient and effective material for reconstructing the periocular area.⁹ We describe a technique of releasing the lateral canthus, tightening the medial canthal tendon, rotating the punctum, and using temporalis muscle for suspension of the lower lid.

This technique is not recommended as an initial procedure for ectropion repair. It is used only to manage previous surgical failures with residual ectropion and temporal migration of the punctum. These are new applications of well-accepted techniques.

This procedure adds bulk to a thinned atrophic lower lid and gives significant support laterally. Medial fixation is critical and difficult, however. In some older patients the temporalis muscle-fascia-epicranium complex is not long enough; it can be lengthened by transposing the anterior lamella of fascia from the temporalis flap (Fig. 4, inset B). In cases in which the recurrent ectropion is strictly medial and no additional lid mass is desired, it might be easier to attempt correction with autogenous temporalis fascia or preserved fascia lata.

The procedure has the disadvantage of being more

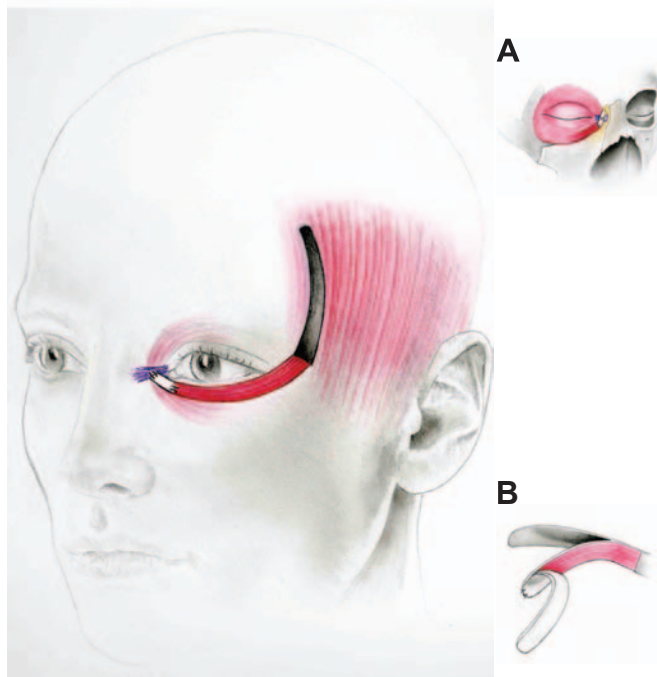


FIGURE 4. The temporalis muscle can be sutured to tarsus with direct exposure if it is to be combined with a wedge resection of the eyelid; or it can be tunneled under the lower-lid pretarsal skin and then sutured to the medial canthal tendon and periosteum (insert A). Adequate superiorly directed medial canthal fixation is essential for proper medial lid support. If the temporalis muscle is not long enough to reach the medial canthal tendon, the anterior fascia can be reflected (insert B.)

TABLE 1
Summary of Results

Cases	Age (years)	Procedure	Follow-up (months)
1	87	TT, LAF	34
2	82	TT, PR, LAF	34
3	75	TT, LAF	31
4	77	TT, LAF	31
5	67	TT, PR, LAF	31
6	72	TT, LAF	31
7	67	TT, LAF	30
8	68	TT, PR, LAF	29

TT, temporalis transfer; PR, punctum rotation; LAF, lateral advancement flap.

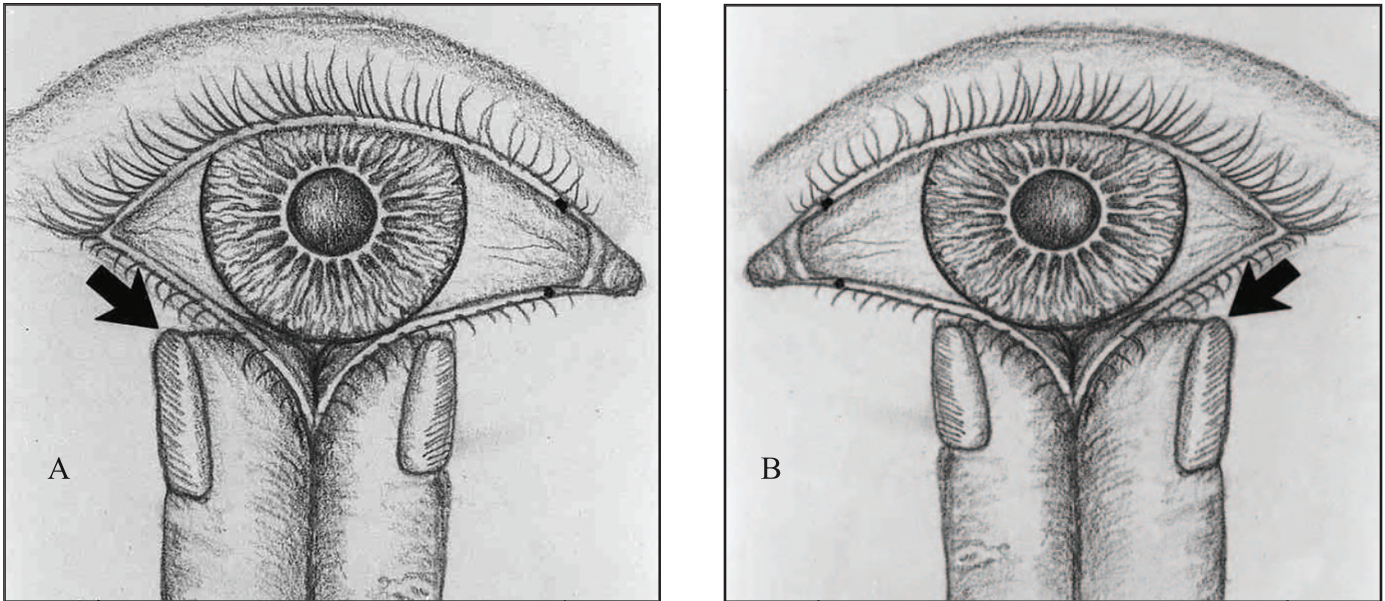


Figure 6. (A) and (B) Laxity of the medial canthal tendon can be determined by grasping the lower lid, pulling it laterally, and noting displacement of the inferior punctum.

complicated to perform than standard ectropion techniques. The surgeon must be familiar with the technique for harvesting temporalis fascia before attempting this procedure.

Postoperative complications included one hematoma of the temporalis donor bed that required drainage and two cases of persistent punctal eversion with medial ectropion that was believed secondary to inadequate medial fixation.

In conclusion, although a statistically significant series of cases is lacking, after 34 months of follow up it appears that this combination of techniques might be used effectively

to correct severe residual or recurrent ectropion in patients with extreme lid-tendon complex laxity that have previously undergone inadequate surgical repair and have a deformity of the horizontal palpebral aperture with temporal migration of the punctum.

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