A Useful Augmented Lateral Tarsal Strip Tarsorrhaphy for Paralytic Ectropion

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Objective: Patients with paralytic ectropion and lagophthalmos may experience keratitis and may pose a functional and aesthetic surgical challenge. Various methods are used to reduce the vertical palpebral aperture, including lateral tarsal strip (LTS) or a lateral tarsorrhaphy. We modified the LTS to differentially shorten and elevate the lower lid more than the upper: an augmented LTS tarsorrhaphy (aug-LTS-T). This study aimed to evaluate the technique.

Design: Prospective noncomparative surgical trial in which preoperative and postoperative symptoms, margin reflex distances, vertical palpebral aperture (PA), lagophthalmos, and corneal findings were recorded. The data were analyzed at 6 months after surgery using the Wilcoxon sign-rank test for nonparametric data.

Participants: Fourteen consecutive adult patients (15 eyelids) with chronic lagophthalmos and paralytic ectropion.

Methods: Patients underwent aug-LTS-T. This consisted of a long strip (10–15 mm) that is attached to the outer temporal orbital rim, at a point higher than a conventional LTS. It included removal of a small part of the upper eyelid anterior lamella laterally to pass the long strip up high enough.

Main Outcome Measures: Improvement of symptoms, reduction of lower margin reflex distance, lagophthalmos, and improvement of corneal signs.

Results: Minimum follow-up was 6 months. There was a significant reduction in PA ($P = 0.005$) and lagophthalmos ($P = 0.0002$) with improvement of corneal signs (14 of 15 eyelids = 93%). Surgery was successful anatomically in 14 of 15 eyelids (93%) with low morbidity.

Conclusions: We describe the augmented LTS tarsorrhaphy and find it effective in the treatment of severe lower eyelid ectropion resulting from facial palsy. *Ophthalmology 2006;113:84–91 © 2006 by the American Academy of Ophthalmology.*

Patients with keratitis from paralytic ectropion pose a functional and aesthetic oculoplastic challenge.[1–4] There is dysfunction with upper and lower eyelid retraction as well as horizontal laxity resulting in lower eyelid ectropion or sag, lagophthalmos, and a significant risk of exposure keratopathy. This is greatest when there is coexistent corneal anesthesia and a greatly reduced vertical palpebral aperture is needed to reduce the lagophthalmos. The aims of rehabilitative eyelid surgery are multiple: to reduce the vertical palpebral aperture and not to shorten the horizontal palpebral aperture unduly and to improve eyelid closure, ocular surface lubrication, and the aesthetic appearance of the patient.

Previous techniques to correct paralytic ectropion have included the lateral tarsal strip (LTS) and lateral tarsorrhaphy. Unfortunately, the LTS does not always adequately address the marked horizontal eyelid laxity found in unrecovered facial nerve palsy, nor does it always elevate the lower eyelid sufficiently to provide corneal protection.[5,6] The lateral tarsorrhaphy shortens the horizontal palpebral aperture, causing a blinkering effect on lateral versions.

We describe an evolution of the LTS. The augmented LTS tarsorrhaphy (aug-LTS-T) is a long strip (10–15 mm) that addresses excessive horizontal laxity and reduces the vertical palpebral aperture. It is brought up through the anterior lamella of the upper eyelid then attached high up on the orbital rim, for maximal effect. It differs from the LTS in that it differentially shortens and tightens the lower more than the upper eyelid, as well as elevating the lower eyelid. It also has a greater effect than the Tenzel lateral canthal sling in terms of both elevating and shortening.[7] It has a greater shortening effect on the lower eyelid than a lateral tarsorrhaphy, without reducing lateral field of vision.

The aim of this study was to describe how to select patients for an aug-LTS-T rather than LTS alone, how to perform the aug-LTS-T, and how to evaluate its use with respect to effectiveness and complications in adult patients with unrecovered facial palsy.

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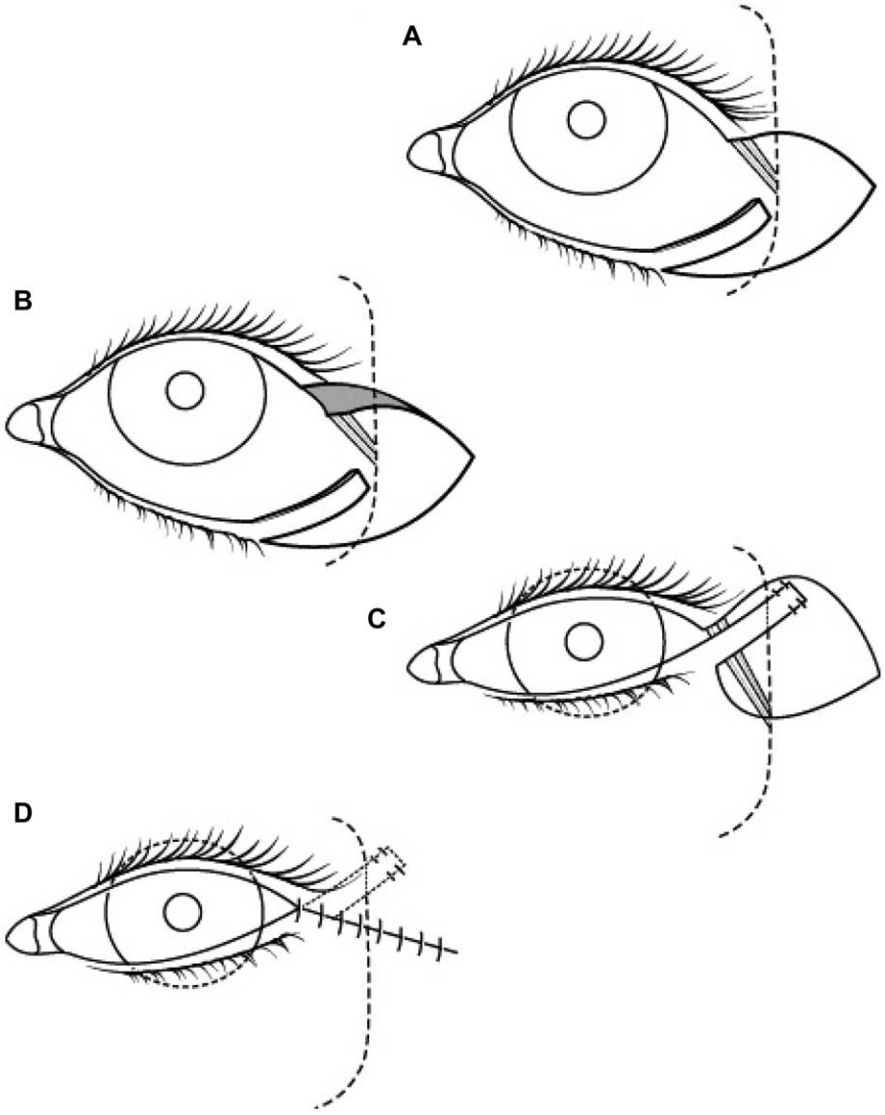

Figure 1. Diagram showing the technique for augmented lateral tarsal strip surgery. **A**, Lateral canthotomy and cantholysis with preparation of a long lower tarsal strip. **B**, The lateral part of the upper eyelid is split and a wedge of anterior lamella is removed. **C**, The lower lid strip is draped over the posterior lamella of the lateral part of the upper eyelid directed superolaterally to the orbital rim. The strip is attached to the outer aspect of the superolateral orbital rim as high up as it will go with 5.0 Ethibond sutures (Ethicon, Inc., Woluwe, Belgium). The conjunctiva is closed with 8.0 Vicryl sutures (Ethicon, Inc.; not shown). **D**, Reformation of the new lateral canthal angle is with 6.0 Vicryl, either performed at the end of the procedure or before the augmented strip is secured firmly to the rim. Orbicularis and skin are closed in layers with 6.0 Vicryl sutures.

Patients and Methods

Study Design

This was a prospective, noncomparative, interventional case series of consecutive adult patients with lagophthalmos and keratitis from severe, unrecovered facial palsy. All patients had marked facial palsy present for more than 1 year and fell broadly into 2 groups: congenital (e.g., Moebius' syndrome) or acquired (e.g., longstanding after childhood poliomyelitis or unrecovered resulting from parotid gland surgery or after acoustic neuroma excision).

Preoperative clinical evaluation of patients showed the following features for the patient to be suitable for aug-LTS-T: chronic unrecovered lower motor neurone facial palsy, lagophthalmos causing keratitis, lower eyelid sag, demonstration by pinching and elevating the lower lid that it is necessary to overlap slightly the outer part of the upper lid with the lower eyelid to achieve better closure and to reduce lagophthalmos more effectively, and absence of associated cicatricial cause of lower eyelid sag and lagophthalmos. If these features were present, no patients were excluded and previous eyelid surgery was not an exclusion criteria. Surgery aimed to reduce symptoms, to decrease vertical palpebral aperture, lagophthalmos, and anterior segment signs, and to provide an aesthetic improvement.

Surgical Technique

The surgical technique as designed by one of the authors (JO) is illustrated in Figures 1 and 2. A 10- to 12-mm long horizontal lateral canthal skin and orbicularis incision is made, followed by a lower limb lateral canthotomy and cantholysis. The periosteum on the lateral orbital rim is exposed higher than for a standard LTS. A