The Bipedicled Orbicularis Oculi Myocutaneous (BOOM) Flap for Repair of Severe Paralytic Ectropion

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Introduction

The orbicularis oculi muscle, the main eyelid protractor, is innervated by the temporal, zygomatic, and buccal branches of the facial nerve.

Paralytic ectropion is often seen in patients with facial paralysis, and is caused by denervation, loss of tone, and descent of the Orbicularis Oculi muscle. Together these result in a relative anterior lamellar deficiency.

Patients present with incomplete eye closure, reduced blink, lower lid malposition, retraction and ectropion. Without treatment, this eventually leads to exposure of conjunctiva, corneal desiccation and exposure keratopathy.

Surgical correction via re-suspension of the lower lid is often indicated to prevent keratopathy and obtain cosmesis.

Traditionally this has been accomplished with lateral canthopexy and canthoplasty, in the form of lid shortening or tightening. However, rates of recurrence are high.

We describe a novel surgical technique: the bipedicled orbicularis oculi myocutaneous (BOOM) flap, based on the medial and lateral palpebral arteries, for reconstruction of severe paralytic eyelid syndrome.

The BOOM flap is a modification of Anderson and Weinstein’s full thickness bipedicled flap, which was described in 1987, and utilizes both the anterior and posterior lamellae of the upper eyelid for reconstruction of total lower lid defects. Our proposed BOOM flap utilizes the anterior lamella of the upper eyelid, and applies towards reconstruction of ectropion.

Surgical Technique

An infraorbital incision is marked inferior to the lower canthal tendon, and extended 5mm lateral to the lateral canthus. A standard upper blepharoplasty incision is marked at the supratarsal crease. The two markings are connected at the lateral canthus. After estimating the vertical height of the flap, a third incision is marked 4-7mm superior to supratarsal crease. Local anesthetic is then infiltrated.

A 15-blade is used make the infraorbital incision through the skin and orbicularis oculi, staying superficial to the orbital septum. The inferior tarsal tendon is released from the anterior lamella.

On the upper eyelid, the supratarsal incision is carried through the skin and Orbicularis muscle, and connected to the infraorbital incision laterally. After confirmation of the vertical height of the flap, the superior incision is made, and carried through the Orbicularis muscle. Sharp dissection is carried deep to the orbicularis oculi, in a pre-septal plane, taking care to preserve the vascular supply medially and laterally. The resulting BOOM flap is then interpolated into the subciliary incision.

The inferior limb and supratarsal incision are closed with a 7-0 nylon suture on P1 needle in running fashion. The infraorbital incision of the BOOM flap is closed last, with a 6-0 Fastgut suture on a P1 needle.

A 4-0 Vicryl suture is placed over a Telfa pad for 5 days.

Results

Six patients with paralytic lower lid ectropion underwent the BOOM flap. All patients underwent a single-stage anterior lamellar reconstruction. Horizontal lid shortening (lateral canthopexy and/or canthoplasty) and upper lid weight procedures were performed, if indicated.

All patients achieved excellent anterior posterior apposition of lid margin to glabellar conjunctiva. Vertical lower eyelid position improved in all cases, with a margin reflex distance-2 (MRD-2, the distance between the center of the pupil in primary position and the central margin of the lower eyelid) of 4-6mm. No wound dehiscence or loss of flap viability occurred. Donor site morbidity was minimal and incision scar was well camouflaged in the supratarsal crease.

All patients reported improvement in cosmetics, dry-eye symptoms, pain, and epiphora. One case resulted in some residual medial laxity, with incomplete apposition of eyelid to globe. This required a trans-curvicular medial canthoplasty. All cases had some early, expected, pin-cushioning which resolved with time and manual massage.

Discussion

There are numerous options for periorcular reconstruction in paralytic eyelid syndrome, which are aimed at restoring physiologic cornoidal protection, preserving vision, and achieving facial symmetry.

Upper eyelid loading is often performed in conjunction with lower eyelid tightening. Gold or platinum implants are used to augment gravity-dependent closure and induce relative ptosis of the upper eyelid.

The BOOM flap is a simple and useful procedure that reliably reconstructs and resuspends the lower lid in patients with paralytic eyelid syndrome. It addresses lower eyelid laxity while correcting eyelid malposition. This reconstructive technique corrects lagophthalmos, creates posterior apposition of the eyelid to the globe, and improves the MRD-2. The BOOM Flap may be performed with or without upper eyelid loading, or other lateral canthall suspension procedures such as canthoplasty or canthotomy.

References


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