Surgical Treatment of Essential Blepharospasm

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Essential blepharospasm is an incurable disease for which many treatment modalities have been tried. The author has performed the Anderson's muscle stripping procedure involving the meticulous extirpation of all eyelid protractors and reinforcement of the retractors in three patients with essential blepharospasm with gratifying results.

Key words: essential blepharospasm, surgical treatment.

INTRODUCTION

Essential blepharospasm is an involuntary tonic, but spasmodic, bilateral contraction of the orbicularis oculi. The spasms of the eyelid may last from several seconds to several minutes, with periods of relaxation of varying lengths interspersed. This condition is usually progressive in that the periods of spasm become more frequent and periods of relaxation become shorter. Many patients gradually stop reading, watching television, working, and avoid social contacts. The neuroanatomic location for blepharospasm is unknown. However, because abnormal blink rates and blepharospasm occur in various extrapyramidal disorders, it has been suggested that the basal ganglia are primarily involved in blepharospasm. Among various medical and surgical therapies have been tried with various success rates. Among those therapeutic modalities, the Anderson's muscle stripping procedure is considered to be superior to the other procedures with an 88% functional improvement. The author has used the procedure described by Anderson and Gillum in three patients with essential blepharospasm and was pleased with the functional results.

SURGICAL TECHNIQUE

A standard browplasty incision and an upper lid blepharoplasty incision are marked with gentian violet (Fig. 1). The skin and deep tissues are injected with 2% lidocaine hydrochloride with epinephrine 1:100,000 mixed with an equal volume of 0.5% bupivacaine hydrochloride. Vertical brow incisions are made parallel to the hair follicles with a No. 15 blade (Bard-Parker). A full-thickness skin and muscle is removed. This includes the lower portion of the frontalis muscle. Through this incision all of the orbital orbicularis and corrugator supercilii muscles are removed with scissors. The procerus muscle is excised by undermining the two brow incisions across the midline.

An upper lid blepharoplasty incision is made through the skin and orbicularis muscle with a No. 15 blade and the flap of skin and muscle excised (Fig. 2). The lower border of this incision is placed at the expected lid crease. Through this incision, all preseptal and pretarsal orbicularis are removed meticulously with scissors (Fig. 3). The facial nerve fibers are also removed in the postorbicular fascia. Through the temporal portions of upper lid incision, the orbicularis and nerves at the lateral raphe are removed as far as possible. Throughout the operation adequate hemostasis has to be obtained with wet field bipolar cautery.

The levator aponeurosis is attached to the upper tarsus with 3 horizontal mattress 6-0 black silk sutures (Fig. 4). Skin is closed with running 6-0 black silk suture and several interrupted...
Fig. 1. A standard browplasty incision and an upper lid blepharoplasty incision are marked with gentian violet.

Fig. 2. An upper lid blepharoplasty incision is made after removal of orbital orbicularis through a browplasty incision.

Fig. 3. Removed orbital orbicularis, corrugator superciliaris, and procerus (A), removed preseptal orbicularis (B), and removed pretarsal orbicularis (C) are shown.

Fig. 4. The levator aponeurosis is attached to the tarsus with three 6-0 black silk sutures.

Fig. 5. One day after surgery. The skin is closed and the rubber drains are placed.

Sutures placed in the levator aponeurosis to make the upper lid crease. The brow is closed in three layers. Deep brow tissues are attached to the periosteum and to the resected edge of the frontalis muscle with 5-0 nylon. The subcutaneous tissues are closed with 5-0 chromic catgut interrupted and skin is reapproximated with 6-0 nylon.

Rubber drains are placed through the stab incision with No. 11 blade at the most dependent area (Fig. 5). After antibiotic ointment is placed on both eyes and along the wounds, a moderate-pressure dressing with elastic bandage is applied.
CASE REPORTS

Case 1

A 62-year-old female suffered from eyelid closure in both eyes for years (Fig. 6). She visited several eye clinics and took several medications and eyedrops without symptomatic improvement. Visual acuity was R.E.: 0.9 and L.E.: 0.6. The anterior segment was normal by slit-lamp examination. Fundus examination showed preretinal macular fibrosis in the left eye. She was diagnos-
ed as having essential blepharospasm, grade 3 and underwent a muscle stripping procedure. One year postoperatively, she was satisfied with the result and there is no residual eyelid spasms (Fig. 7).

Case 2

A 68-year-old female suffered from eyelid closure in both eyes for one year (Fig. 8). She could read, watch television, or work. She went to many eye clinics without receiving a specific diagnosis or treatment. Visual acuity was R.E. : 1.0 and L.E. : 1.0. The ocular examination including slit-lamp, funduscopy, tonometry and Schirmer test showed no abnormalities. She was diagnosed as having essential blepharospasm, grade 4, and underwent a muscle stripping procedure. Nine months postoperatively she was happy with the result (Fig. 9). No residual eyelid spasms remained.

Case 3

A 41-year-old female had a complaint of eyelid closure in both eyes for one year (Fig. 10). She could not open her eyes voluntarily and avoided all social contacts. She visited many clinics without any symptomatic improvement. Visual acuity was R.E. : 1.0 and L.E. : 1.0. A thorough ocular examination showed normal findings. She was diagnosed as having essential blepharospasm, grade 4, and underwent a muscle stripping procedure. Eight months postoperatively she was satisfied with the result. No residual eyelid spasms remained.

DISCUSSION

Surgical myectomies have been performed for many years. The early operations were unsuccessful because insufficient muscle was removed and the anatomic defects were not fully corrected. Fox advocated the excision of all of the orbicularis muscle of the upper lid except the pretarsal fibers, but the spasm was still present.8,9 Callahan reported a 75% recurrence rate with partial denervation of the orbicularis muscle by excision of the lateral portion.10 Castanares added upper eyelid blepharoplasties and psychotherapeutic measures11 and Puttermann added bilateral fascia lata slings7 to partial myectomies in an attempt to improve the success rate.

In most patients with essential blepharospasm, certain anatomic deformities are present because of longstanding muscle contracture. Those deformities are brow ptosis, dermatochalasis, disinsertion of the levator aponeurosis and lateral canthal tendon laxity. The surgical approach which corrects all the anatomic deformities is necessary to treat blepharospasm patients successfully. In the past ten years, avulsion of the facial nerve fibers to the eyelids described by Reynolds et al. has been considered to be the best surgical procedure for essential blepharospasm.3 The long term recurrence rate after Reynolds's facial nerve avulsion is about 50%.5 The iatrogenic facial nerve palsy often exacerbates preexisting brow ptosis, dermatochalasis, lower eyelid ectropion and laxity, and causes epiphora secondary to lacrimal pump dysfunction, and corneal exposure from lagophthalmos. Upper lid paresis, mouth droop, and absent facial expression also occur when cervicofacial fibers are also damaged. Even with successful facial nerve avulsion, many patients are dissatisfied with their cosmetic disfigurement.

The surgical approach of Anderson's muscle stripping procedure is as follows: (1) browplasty and blepharoplasty incisions with meticulous extraposition of all protracting muscles of the eyelids, including orbital orbicularis oculi, procerus, corrugator supercilii, pretarsal, and preseptal orbicularis; (2) removal of facial nerves in the postorbicular fascia of the eyelid and the lateral canthal region; (3) brow elevation with fixation to frontalis muscle; (4) levator aponeurosis reinsertion and/or lateral canthal tendon plication in patients demonstrating defects in the levator aponeurosis and/or laxity of the lateral canthal tendon.11 Anderson's muscle stripping procedure corrects all the anatomic defects and can improve cosmetic appearance in many case. Patient acceptance is much greater than the Reynolds's procedure and its success rate is approximately 80-90%.14 In fact, the three patients presented in this report are very satisfied with their surgical results.

McCord performed the myectomy operation via bicoronal or hairline incision combined with an eyelid incision to avoid the problem of adherent brow scars of the suprabrow incisions.14 This procedure is good for the female patients with minimal brow ptosis. However, patients with long foreheads, male pattern baldness,
receding hair lines and thin hair are not good candidates. This method risks vascular compromise because the blood supply to the coronal flap comes from the area in which the myectomy is performed.\textsuperscript{15}

Recently, the spasms have been treated with injections of botulinum A toxin.\textsuperscript{16-23} The benefits of botulinum toxin are its ease of administration, its low complication rate and its high rate of success. The major disadvantages of the toxin are its loss of effect after three months, requiring repeated injections\textsuperscript{20,23} and difficulties to obtain the toxin. It is especially difficult to obtain the toxin in Korea. The anatomic deformities caused by spasm are left uncorrected. In patients who are willing to have repeated injections, it is a useful alternative to surgical intervention and may eliminate residual spasms following surgery. If the patient tires of the injections, a therapeutic response is not achieved, or if injections are required too frequently, a muscle stripping procedure is indicated.

REFERENCES