Mullerectomy for Upper Eyelid Retraction in Graves’ Orbitopathy

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INTRODUCTION

Graves’ orbitopathy (GO) is the most common orbital inflammatory disorder in adults. It affects 10-15% of patients with thyroid disease. The incidence is 0.4% in the United States, with a female to male ratio of 4:1.

Orbital manifestations include:
- Soft tissue features: chemosis, conjunctival hyperemia, periorbital edema, orbital fat prolapse
- Myopathy: diplopia, extraocular muscle limitation, exophthalmos, increased intraocular pressure
- Eyelid abnormalities: eyelid retraction, lagophthalmos, scleral show, lid lag, lateral or temporal flare
- Orbital apex compression: optic neuropathy

METHODS

We describe a case of a 36 year old woman with Graves’ disease who presents with exophthalmos and upper eyelid retraction. She was bothered by the appearance of her “bulging eyes” and complained of dryness and irritation. She had no keratitis, diplopia, or evidence of optic neuropathy.

RESULTS

Mullerectomy was performed via a posterior conjunctival approach. Operative steps include:
- Evert the upper eyelid to expose the superior palpebral conjunctiva (Figure 2).
- Incise the conjunctiva at the superior tarsal border.
- Dissect the conjunctiva from Muller’s muscle by raising a conjunctival flap (Figure 3).
- Incise Muller’s muscle above the superior tarsal border.
- Dissect Muller’s muscle from the levator aponeurosis (Figure 4).
- Excise Muller’s muscle.
- Close the conjunctival incision with absorbing sutures.

CASE PRESENTATION

We describe a case of a 36 year old woman with Graves’ disease who presented to a tertiary care medical center. Her chief complaints are dry eyes and irritation. She was previously treated with I¹³¹, and is currently euthyroid (TSH 0.62 ng/dl, free T4 1.09 ng/dl) on thyroid replacement medication. She is bothered by the appearance of her “bulging eyes” and complains of dryness and irritation. She denies any history of keratitis, diplopia, loss of vision, or orbital pain.

Physical examination showed (Figure 5):
- Pupils equally round and reactive to light
- Extraocular muscles intact, no entrapment
- MRD1 of 5 mm on L, and 6 mm on R
- No inferior scleral show, R superior scleral show
- No diplopia
- Complete eye closure
- Minimal injection, no chemosis
- No evidence of keratitis

DISCUSSION

Eyelid retraction is the most common eyelid abnormality in patients with GO. This is due to increased sensitivity to circulating catecholamines, and fibrosis and functional shortening of the lid retractor muscles. In some patients, the upper eyelid can peak more laterally (temporal flare sign). This phenomenon has been attributed to levator aponeurosis dominance in the lateral horn and histological evidence of far lateral extension of Muller’s muscle.

Surgery for upper eyelid retraction has focused on lengthening or weakening of Muller’s muscle and/or the levator aponeurosis. Techniques include marginal myotomies, recession with and without use of a spacer, and resection. Up to 2 mm of upper eyelid retraction can be ameliorated with Muller’s muscle excision. Lateral levator aponeurosis tenotomy can help decrease temporal flare.

Simon et al. presented the largest series of patients who underwent transconjunctival Mullerectomy. His study included 78 patients and 108 eyelids, with a mean follow-up of 16.7 months. He showed a mean MRD1 decrease of 2.6 mm and a mean lagophthalmos decrease of 0.6 mm. There was improvement in upper eyelid position, lagophthalmos, exposure keratopathy, and patient comfort. Failure was noted in 8.4% and mostly due to under-correction, which can be addressed with a second surgery. Less common complications include overcorrection, scar formation, eyelid crease asymmetry, contour abnormalities, eyelid perforation, and injury to the lacrimal apparatus.

CONCLUSIONS

The Mullerectomy procedure has received little attention in the otolaryngology literature. Mullerectomy can be performed via a posterior conjunctival approach. It involves delicate separation of Muller’s muscle from the underlying conjunctiva and the overlying levator aponeurosis. Mullerectomy is a safe and effective procedure that has been shown to improve upper eyelid position, lagophthalmos, exposure keratopathy, and patient comfort. The failure rate is low and is most often due to under-correction. Otolaryngologists should consider Mullerectomy as an option for addressing upper eyelid retraction in GO.

REFERENCES