CASE REPORT

Lagophthalmos of the medial upper eyelid after Mohs surgery of the medial canthus

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INTRODUCTION

Lagophthalmos is characterized by incomplete eyelid closure and can lead to exposure keratopathy. It is often attributed to injury or pathology of the facial nerve innervating the orbicularis muscles. Lagophthalmos can be seen after eyelid surgeries that involve transection of terminal facial nerve fibers within the suborbicularis fascial plane. However, it has not been reported after Mohs surgery (MS) of the medial canthus. We present a case of transient medial upper eyelid lagophthalmos and hypometric blink resulting from MS of the medial canthus. Transient lagophthalmos is a well-described complication after external dacryocystorhinostomy (DCR), an ophthalmologic procedure in which a cutaneous incision is placed in the same region as our patient’s defect. Post-DCR lagophthalmos is hypothesized to result from injury to variant orbicularis innervation via the “angular” branch of the facial nerve.

CASE REPORT

A 75-year-old woman with an infiltrative basal cell carcinoma of the left medial canthus and nasofacial crease was treated with MS. After clear margins were achieved, the defect extended into skeletal muscle and was closed with an island pedicle flap, as shown in Fig 1. The patient was found to have medial upper eyelid lagophthalmos and delayed (hypometric) blink at a 4-week follow-up (Fig 2). The flap was well healed, with appropriate lower lid position and no evidence of ectropion. Exposure keratopathy developed in the patient, and she was managed with lubricating drops and nightly occlusion. Complete lid closure, normalization of the blink, and resolution of keratitis were noted 3 months later.

DISCUSSION

Incomplete eyelid closure in this patient was caused by partial paresis of the medial upper eyelid rather than by malposition of the lower lid. As upper lid lagophthalmos is usually attributed to a facial nerve injury, this finding was unexpected due to the defect’s location and predicted course of the facial nerve. A literature search revealed that postoperative medial upper eyelid lagophthalmos is well described after DCR for lacrimal duct obstruction. The incision for external DCR is placed in a region corresponding with our patient’s defect. Nasojugal, vertical, and eyelid margin incisions were all associated with this complication. Resolution of lagophthalmos was seen in all the patients by 32 weeks. In another series of 79 patients undergoing external DCR, 28.6% experienced lagophthalmos and hypometric blink. Nasojugal, vertical, and eyelid margin incisions were all associated with this complication.

Abbreviations used:

DCR: dacryocystorhinostomy
MS: Mohs surgery
inferomedial fashion. Findings resolved by 5 weeks in all patients. An additional 3 cases (out of 10 DCR patients) of medial upper eyelid lagophthalmos were reported with resolution by 3 months. The authors of these studies did not feel that local anesthetic myotoxicity, damage to the orbicularis muscle inferior to the medial canthal tendon, or even disinsertion of orbicularis from the periosteum adequately explained the findings.

Post-DCR lagophthalmos was instead attributed to facial nerve injury at the location of the cutaneous incision. The orbicularis oculi are innervated by zygomatic, buccal, and temporal branches of the facial nerve. These branches are thought to form superior (temporal and zygomatic) and inferior (zygomatic and buccal) plexuses that course lateral to medial to insert into the orbicularis complex. Nemoto et al have demonstrated that a terminal branch of the buccal nerve (superficial buccal branch) courses across the cheek to run over the medial palpebral ligament with the angular artery, as shown in Fig 3. In the “triangular window” near our patient’s defect, the nerve runs between the inferomedial orbicularis and levator labii superioris alaeque nasi and over the levator labii superioris. These branches variably innervate the orbicularis oculi, procerus, and corrugator supercili. Forty-two percent of examined specimens had branches innervating the upper orbicularis oculi.

Caminer et al have described the superficial buccal branch of the facial nerve as the “angular” nerve. Their cadaveric dissections revealed a confluence of the zygomatic and buccal nerve branches coursing medially across the cheek to the medial canthus. They demonstrated that the angular nerve innervated the corrugator and procerus. Presumably, some patients rely on this angular nerve to control upper orbicularis contraction if minimal redundancy is provided by other branches.

In the context of the DCR literature and orbicularis innervation summarized above, our patient may have had an injury to the angular branches of the facial nerve. Their cadaveric dissections revealed a confluence of the zygomatic and buccal nerve branches coursing medially across the cheek to the medial canthus. They demonstrated that the angular nerve innervated the corrugator and procerus. Presumably, some patients rely on this angular nerve to control upper orbicularis contraction if minimal redundancy is provided by other branches.

In the context of the DCR literature and orbicularis innervation summarized above, our patient may have had an injury to the angular branches of the facial nerve. The defect was deep and extended through skeletal muscle overlapping the predicted path of the nerve through the triangular window to the medial canthal tendon. Alternatively, lagophthalmos may have resulted from damaged muscle fibers, postoperative edema, or an unidentified stimulus. Our patient’s postoperative edema was significant but resolved in days while her upper lid pathology persisted for weeks. The muscle fibers...
affected by tumor extirpation were inferior to the medial canthal tendon and would be less likely to affect the upper eyelid function. Lower lid ectropion is a feared complication of medial canthus surgery and can lead to exposure keratopathy. However, this patient’s lower lid was in an appropriate position without scleral show or ectropion and did not seem to contribute to her upper eyelid pathology.

This is our first episode of upper eyelid lagophthalmos resulting from MS of the medial canthal region. This case may represent a rare confluence of defect location and depth and facial nerve variation. As rapid recovery seems to be the rule after DCR, we may have missed other cases. In either scenario, this region is not necessarily a “danger zone” for facial nerve injury. If observed, the resolution of lagophthalmos is likely, but measures to ensure eye lubrication should be taken to reduce the risk of exposure keratopathy until muscle function normalizes.

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