

Persistent Blurred Vision After Blepharoplasty and Ptosis Repair

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Background: Visual disturbance after upper (eyelid) blepharoplasty is a relatively common postoperative complaint. Recent ophthalmology literature has demonstrated alternations of corneal curvature after procedures that reposition the upper eyelid using corneal topography. Astigmatic changes induced by eyelid repositioning may be a cause of persistent blurred vision after upper eyelid procedures. This observation has not been reported in the facial plastic literature.

Objective: To determine the incidence of persistent visual disturbance after upper blepharoplasty.

Methods: A retrospective review of upper blepharoplasty by 1 facial plastic surgeon and 2 oculoplastic surgeons during the year 2000. Patient interviews were conducted via telephone.

Results: A total of 146 patients were identified, and 106 of them responded to the study request. Six

patients (5.7%) had subjective visual acuity changes 1 year after upper blepharoplasty, and 4 of the 6 patients had combined blepharoplasty and ptosis repair. Three patients had worse vision, 2 had improved vision, and 1 was unable to wear rigid contact lenses because of fogging.

Conclusions: Prior studies have shown that most patients have measurable astigmatic changes 3 months after blepharoplasty and ptosis repair. We found that only a small percentage of them have persistent subjective symptoms 1 year postoperatively. It is important for facial plastic surgeons to properly advise patients, especially those with combined procedures, that upper eyelid repositioning procedures may induce long-term vision changes. Patients may need to obtain new prescription spectacles and contact lenses postoperatively.

Arch Facial Plast Surg. 2004;6:155-157

UPPER (EYELID) BLEPHAROPLASTY is one of the most frequent eyelid procedures performed by facial plastic surgeons. Blurred vision has long been recognized as a potential complication of the procedure. Its cause has often been attributed to dry eye.

Recent literature indicates that procedures that reposition the upper eyelid may alter pressure exerted on the opposing cornea and change preexisting corneal curvature. Such changes potentially alter corneal refraction and may be responsible for persistent blurred vision after upper blepharoplasty, ptosis repair, and gold weight implantation.

Using corneal topography, some investigators found that most patients who underwent blepharoplasty and ptosis repair had measurable refractive changes.¹⁻³ Nevertheless, our clinical experience indicates that few patients require new pre-

scriptions for lenses after blepharoplasty. This study was designed to determine the incidence of persistent symptoms of visual disturbance after upper blepharoplasty.

METHODS

The study design was retrospective and uncontrolled. The patient population was selected from 2 university-affiliated academic practices in Edina, Minn. All patients who underwent upper blepharoplasty by 1 facial plastic surgeon (P.H.) and 2 oculoplastic surgeons (E.N. and A.H.) during the year 2000 were included. Patient information was collected from clinic medical records and telephone interviews were conducted by the first author (W.S.) at the end of year 2001. Patients who could not be contacted were excluded from the study.

Four questions were asked during the telephone interview: (1) Have you had any vision change since your surgery? (2) How long did your vision change last, if any? (3) Did you wear eyeglasses or contact lenses before your sur-

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Patients With Visual Acuity Change 1 Year After Upper Blepharoplasty

Patient No./ Age, y	Procedures	Chief Complaints
1/87	Blepharoplasty and ptosis repair	Improved visual acuity for far vision, no change for near vision
2/50	Blepharoplasty and ptosis repair	Unable to wear rigid contact lenses because fogging of the lens; now uses prescription eyeglasses
3/65	Blepharoplasty and ptosis repair	Improved visual acuity, both far and near vision
4/85	Blepharoplasty and lower-lid ectropion repair	Minor blurred vision but required new eyeglasses
5/43	Blepharoplasty, ptosis repair, and lower-lid blepharoplasty	Blurred vision that required new prescription
6/38	Blepharoplasty, submental liposuction	Blurred vision but did not seek a new prescription

gery? (4) Did you have to get a new eyeglass or contact lens prescription after your surgery?

RESULTS

A total of 146 patients were identified, with 128 from the oculoplastic surgery service and 18 from the facial plastic surgery service. Forty patients could not be contacted and were excluded. For the remaining 106 patients, 94 were from the oculoplastic surgery service and 12 were from the facial plastic surgery service. Of the 94 oculoplastic surgery patients, 39 had upper blepharoplasty and 55 had combined upper blepharoplasty and ptosis repair. Of the 12 patients from facial plastic surgery service, all had upper blepharoplasty. Other concurrent procedures included endoscopic brow-lift, septorhinoplasty, submental liposuction, face-lift, chemical peel, lower eyelid ectropion repair, laser resurfacing, dacryocystorhinostomy, and canthoplasty.

A total of 6 patients (5.7%) reported persistent visual acuity change at least 1 year after surgery (**Table**). Three patients had persistent blurred vision. Two patients had improved visual acuity after their surgery. One patient became intolerant to rigid contact lenses following combined upper blepharoplasty and ptosis repair. After her surgery, she complained of frequent fogging of her rigid contact lenses. The symptom was debilitating and dangerous, especially during driving. She refused to wear soft lenses and now uses prescription eyeglasses.

Four of the 6 patients with visual acuity changes had a combined blepharoplasty and ptosis repair.

COMMENT

Patients who have upper blepharoplasty often complain of blurred vision postoperatively. The symptom is frequently attributed to dry eye and is usually temporary. The common causes of postoperative dry eye include eyelid

edema interfering with normal production and secretion of tear film, increased exposure of ocular surface, lagophthalmos, lower eyelid malposition, a diminished blink reflex from surgical anesthesia or edema, and preoperative dry eyes, either recognized or occult.⁴ Careful preoperative and postoperative evaluation most often yields the correct diagnoses. If edema is the cause, blurred vision usually subsides as the edema resolves from 5 days to 3 weeks after the operation. As we will discuss, long-term visual changes after upper blepharoplasty can be induced by alteration of the shape of the cornea itself in addition to changes in the tear film overlying the cornea.

In recent years, ophthalmologists have noticed refractive changes in the operated eyes after eyelid repositioning.⁵ Knopf⁶ observed that some patients developed a hyperopic refractive shift (better distance vision and worse near vision without spectacles) after ptosis repair. Knopf suspected that long-standing ptosis caused refractive changes by flattening the upper cornea with a subsequent increase in the curvature of the central cornea. Similar effect has also been noted after implanting gold weight in the upper eyelid for improving eyelid closure.⁷ The recent development of computer topography of both central and peripheral cornea has made sequential corneal mapping after eyelid surgery possible. In a prospective study, Brown et al¹ reported that a majority of patients who underwent blepharoplasty and ptosis repair have measurable corneal astigmatic changes 3 months postoperatively. Holck et al³ reported that 72.4% of patients with ptosis repair had astigmatic changes 6 weeks postoperatively and 20% maintained a significant change at 12 months postoperatively.

It has been hypothesized that eyelid-cornea interaction is an important factor in postoperative corneal astigmatism. Gullstrand⁸ suggested that the upper eyelid exerts tension as it naturally drapes over the cornea. It is possible that the aging process loosens the eyelid skin. Upper blepharoplasty or ptosis surgery repositions and tightens the upper eyelid vertically, leading to increased curvature of the anterior cornea in the vertical axis. Such altered contour of cornea curvature changes its focal length and brings about visual disturbances.

On the other hand, our visual system is capable of tolerating mild degree of astigmatism before it becomes symptomatic. In this study, 94% of patients were free of symptoms after 1 year. However 4 (67%) of the 6 symptomatic patients had combined blepharoplasty and ptosis repair. It may suggest that combined blepharoplasty and ptosis repair potentially have added effect on the upper eyelid and may more likely exceed patients' tolerance capability.

In addition to the astigmatic changes and dry eyes, other possible causes of the postoperative blurred vision include acute orbital hematoma, periorbital edema, chemosis, lagophthalmos, previously subtle astigmatism magnified by the postoperative astigmatic changes, worsening cataract, ill-fitting contact lenses, new medications such as diuretics and steroids,⁶ new or worsening diabetes, and uremia. Uremia and other conditions create large shifts in the body's water pool and may produce large refractive changes.⁹

Preoperative contact lenses may not fit properly after upper eyelid procedures owing to the surgery-

induced astigmatism. Ill-fitting rigid lenses in particular can further modify the shape of cornea underneath, leading to greater refractive error.⁹ Patients who obtain a new pair of properly fit rigid lenses can become frustrated when the cornea returns to its stable postoperative shape over time, thereby necessitating another spectacle prescription. Soft contact lenses conform to the anterior cornea and fit more properly. The reason some patients use rigid contact lenses is that they are more gas permeable than soft lenses. Nevertheless, recent technology has made soft contact lenses much more gas permeable than before.

Although most astigmatic changes induced by upper eyelid procedures are probably of low magnitude, patients whose daily living requires a high visual acuity are more likely to notice small vision changes. For patients of certain professions, such as those requiring prolonged binocular vision, we should advise them that any oculoplastic procedure can potentially alter vision as a result of induced or altered astigmatism and that they may have to change their spectacle or contact lens prescriptions postoperatively.

In the study by Brown et al¹ no statistical significance was found among any of the corneal topographic measurements. One major obstacle in analysis of postoperative corneal topography is that a variety of diurnal corneal changes affect its normal topography.¹⁰⁻¹² Besides the effect from reading and sleeping, changes in corneal thickness at the center and the periphery tend to vary throughout the menstrual cycle. It has been shown that at the beginning of the cycle, the cornea is more curved and gradually flattens after ovulation.¹³ It has also been shown that the cornea thickness varies throughout the day. After awakening in the morning, the cornea is 3% to 8% thicker and returns to baseline within 1 to 12 hours.¹⁴ These uncontrollable variations widen the standard error for topographic measurements and pose significant challenges for future prospective and controlled studies.

Because of the lack of prospective preoperative and postoperative corneal topographic measurements, this study cannot directly demonstrate eyelid-cornea interaction in corneal astigmatism after upper blepharoplasty. Nevertheless, the small percentage of symptomatic patients suggests that a large study population is required for future studies to clearly link postoperative corneal astigmatism to persistent blurred vision.

CONCLUSIONS

The anterior cornea tear film and eyelid-cornea interaction are potentially important concepts in understanding some of the postoperative visual acuity changes after oculoplastic procedures. Our study shows that fewer than 6% of patients have symptomatic visual distur-

bance 1 year after their operation, with a majority of them having had combined blepharoplasty and ptosis repair. Every blepharoplasty surgeon will have patients with postoperative blurred vision, which may be long-term. Changing prescription lenses and obtaining ophthalmologic consult are appropriate when patients complain of persistent blurred vision. Proper patient education and prompt ophthalmologic referral and treatment may avoid irreparable damage to the physician-patient relationship. Fortunately, most astigmatic changes induced by eyelid repositioning can be corrected with new prescription spectacles and contact lenses.

Accepted for publication July 22, 2003.

This study was supported in part by an unrestricted grant from Research to Prevent Blindness, New York, NY (Dr Harrison).

This work was presented at the American Academy of Facial Plastic and Reconstructive Surgery Annual Meeting, September 19-21, 2002; San Diego, Calif.

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