Aesth. Plast. Surg. 29:313–316, 2005
DOI: 10.1007/s00266-004-0131-4

Aesthetic Plastic Surgery

Myopic Change After Transconjunctival Blepharoplasty Using Carbon Dioxide Laser: Case Report

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Abstract. The case of a patient who experienced temporary myopic change after transconjunctival blepharoplasty using the carbon dioxide (CO_2) laser is reported. Transconjunctival lower lid blepharoplasty using the CO_2 laser, one of the most frequent laser procedures performed in aesthetic surgery, is considered to be a safe and reliable approach that does not incur significant complications. This report describes temporary myopia in a 38-year-old woman as a rare complication after this procedure. As for the possible etiology of the postoperative myopia, the authors strongly suspect a temporary mild deformity of the eyeball leading to the change in refraction, including scleral edematization and/or retinal indentation attributable to thermal injury as a result of CO_2 laser irradiation adjacent to the eyeball. The purpose of this case report is to inform others of the complication the authors encountered and to discuss the possible etiology.

Key words: Myopic change—Transconjunctival blepharoplasty—Complication

Case Report

A 38-year-old woman presented with a puffy deformity of her lower eyelids. As a result of her consultation, we proposed and performed a bilateral lower lid blepharoplasty with orbital fat reduction. The operation was performed via the transconjunctival approach using the carbon dioxide (CO_2) laser, as previously described [1,3,5,8]. Anesthesia was achieved using a single transconjunctival injection of of 1% xylocaine (1 ml) with 1: 100,000 epinephrine after conjunctival topical anesthesia.

The CO_2 laser was used in a focused delivery at a spot size of 0.2 mm in the ultrapulse and continuous modes with an output power of 5 W, and an incision was made all the way to the palpebral conjunctiva and septum to expose the fat pad. A moist swab was placed beneath the prolapsed orbital fat, and the fat was excised using the CO_2 laser. The conjunctival incision was not sutured.

After the surgery, the patient was treated with an ice pack for 30 min, then discharged home. The day after the operation, she came back to the clinic reporting poor vision in her right eye.

The patient's uncorrected visual acuity was 20/400 in her right eye and 20/100 in her left eye. Although her best corrected visual acuity was 20/20 in both eyes, the cycloplegic refraction was -6.50 -0.75×180 in the right eye and -2.75 -1.0×170 in the left eye. Because she wore identical soft contact lenses on both sides, her right eye was proved to have undergone a myopic change. Fundoscopy of the right eye showed peripheral edema of the retina, and ultrasound tomography showed a protrusive deformity of the same area (Figs. 1 and 2). Within 1 week without any treatment, her refraction returned to -3.0 -0.75×160, and her report of blurred vision ceased. Both the retinal deformity on the ultrasound tomography and the edematous change in the retina had disappeared by this time. The patient was pleased with the operative results for the lower lid, and to date has had no complaint regarding her vision.

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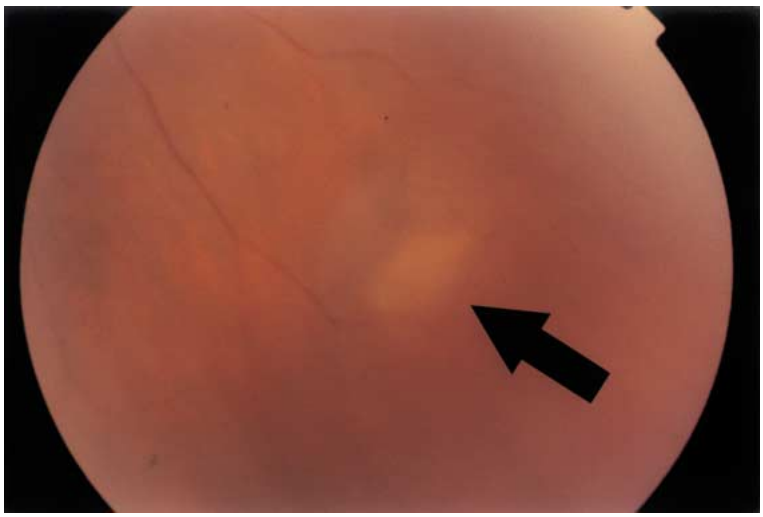

Fig. 1. Fundus photograph of the right peripheral retina showing a laser spot and retinal edema (*arrows*).

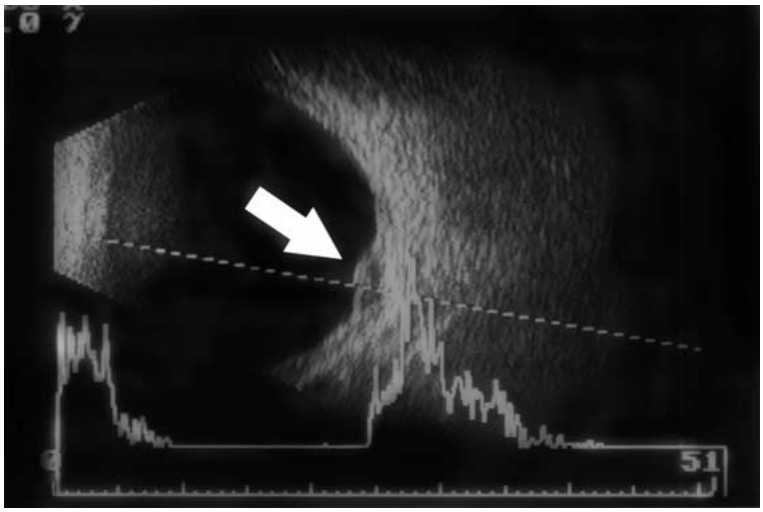

Fig. 2. Ultrasonogram of the right eye showing retinal protrusive deformity (*arrow*).

Discussion

Transconjunctival orbital fat reduction for the puffy or baggy deformity is not a new technique. With the spread of laser skin resurfacing, transconjunctival lower lid blepharoplasty has re-emerged, and the procedure using CO_2 laser has increased in popularity over recent years [2,7,9]. There are no differences among the principles of the procedure, whether the surgical scalpel, the high-frequency electric scalpel, or the CO_2 laser is used. The basic technique involves removing only the prolapsed orbital fat, with no damage to remaining fat. It is important not to damage the peripheral tissue, especially in cauterizing the blood vessels of the medial fat pad. The authors try to remove the fat only and to leave the vascular bundle of the medial fat pad intact.

The procedure using the CO_2 laser is reportedly a safe and reliable way to perform transconjunctival lower lid blepharoplasty without severe complication

Table 1. Complications of Transconjunctival Blepharoplasty

During operation related to laser procedure
Corneal injuries
Eyelid perforation
Eyelid burning and burning of the eye lash
Bleeding
Ordinary complications after operation
Ecchymosis
Hematoma
Hemosiderosis
Infection
Uveitis
Complications related to wound healing
Granuloma
Seroma
Lymphatic edema
Temporary entropion and trichiasis
Diplopia attributable to restricted extraocular muscle movement

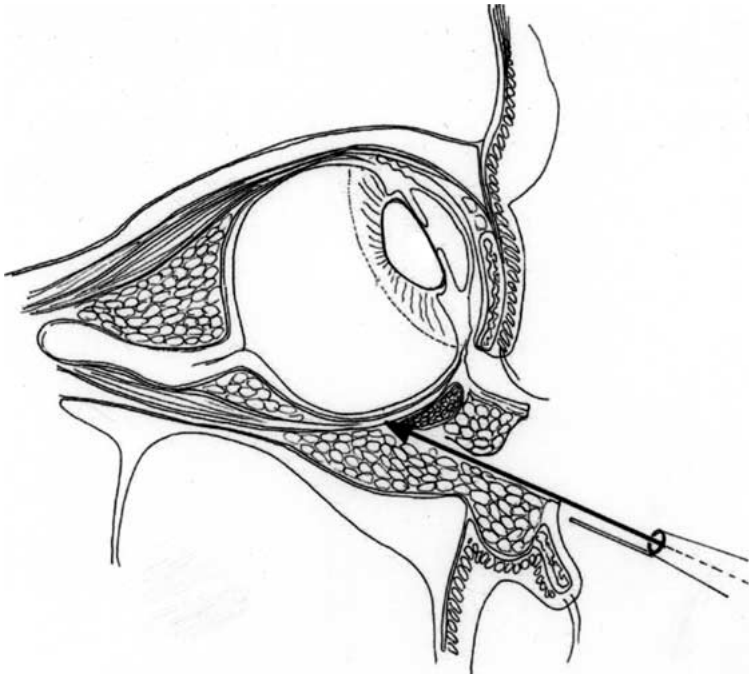

Fig. 3. There is a potential risk of irradiating the posterior portion of the eyeball when it is turned upward as shown.

[8]. The incident rate for severe complications also has proved to be extremely low in the authors' personal experience with more than 250 cases. Nevertheless, we should pay attention to the possible complications resulting from a no-contact incision with laser instruments. The various complications related to this procedure can be divided into three categories: those caused by the laser procedure during the operation, ordinary complications after the operation (e.g., infection, hematoma), and complications related to wound healing [2,8] (Table 1). Most of these complications are transient and not severe.

Noncontact incisions with laser instruments, because of the associated photothermal effect, could be associated with an increased risk of injury to the peripheral tissue, leading to edematization of the retina or sclera that may result in temporary eyeball deformity. In the reported case, we assumed that the CO_2 laser was irradiated around the fundus area while the eyeball was turned upward (Fig. 3).

The retinal protrusive finding recognized in the ultrasonogram also is supposedly a retinal deformity caused by the thermal effect of laser irradiation. Although the reason for the myopic change is not certain, it is known that with scleral buckling in retinal detachment therapy, indentation of the retina occurs, which sometimes causes a myopic change in refraction [6]. Because this same retinal deformity was identified in this case of myopic change after laser blepharoplasty, the identical mechanism may have been present: indentation of the retina leading to the deformation of the eyeball resulting in myopia.

Another possible complication related to photothermal injury is diplopia attributable to restricted eye movement. Mechanisms of extraocular muscle disturbance may include intramuscular hemorrhage and edema, as well as cicatricial changes within and around the muscle [4]. There is a possibility that the use of the laser is associated with a photothermal effect, which could damage the external ocular muscles and result in a fibrous adhesion. To prevent such complications, a thorough anatomic knowledge of the orbit is necessary, and the laser incision should be limited to the surface. Any blind emission of the laser in the deeper layer should be avoided. Also, to minimize the risk of complications, specific measures should be taken, such as avoidance of continuous irradiation on a single spot, or use of a short pulse mode to lessen the thermal effect of irradiation. To date, there are no reports of myopia as a complication of this procedure, but we believe that surgeons should keep this in mind as a possible complication.

Conclusion

Laser transconjunctival lower lid blepharoplasty is a safe, quick, and effective procedure. There are almost no severe complications when this procedure is performed by experienced hands. However, it should be performed by those who have a thorough knowledge and understanding of the contents and anatomy of the orbit. We encountered a complication of transient myopic change after the procedure, and believe that the mechanisms described in this report are responsible for this complication.

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