



# Acute corneal edema with subsequent thinning and hyperopic shift following selective laser trabeculoplasty

Jared E. Knickelbein, MD, PhD, Annapurna Singh, MD, Brian E. Flowers, MD, Unni K. Nair, MD, Marina Eisenberg, MD, Rachel Davis, MD, Leela V. Raju, MD, Joel S. Schuman, MD, Ian P. Conner, MD, PhD

We report 4 cases of acute corneal edema with subsequent thinning and hyperopic shift following routine selective laser trabeculoplasty (SLT) for the treatment of primary open-angle glaucoma. Four women from 3 clinical sites developed acute corneal edema and haze within 2 days of uneventful SLT. In the following weeks to months, all treated corneas thinned to below pre-procedure thicknesses with resultant hyperopic shifts of nearly 2.0 diopters (D) to greater than 6.0 D. All eyes were moderately to highly myopic prior to SLT (spherical equivalent from  $-5.00$  to  $-12.5$  D). The corrected distance visual acuity 6 to 11 months after SLT was within 2 Snellen lines of the pre-procedure acuity in all patients; 2 patients required contact lenses. Corneal edema with subsequent corneal thinning and resultant hyperopic shift is an uncommon but possibly underrecognized complication of SLT, the etiology of which remains unknown but may be associated with moderate to high myopia.

**Financial Disclosure:** No author has a financial or proprietary interest in any material or method mentioned.

*J Cataract Refract Surg 2014; 40:1731–1735 © 2014 ASCRS and ESCRS*

Selective laser trabeculoplasty (SLT) is an increasingly common treatment modality for primary open-angle glaucoma (POAG) and is generally considered a safe and effective method for reducing intraocular pressure (IOP).<sup>1</sup> Anterior chamber reaction, ocular discomfort, and an acute rise in IOP may occur but are typically transient and easily treated.<sup>2</sup> Serious complications are rare.

In 2009, Moubayed et al.<sup>3</sup> reported 2 cases of central corneal edema in women who presented 1 week after routine SLT. The corneal edema resolved in 2 to 4 months with topical steroid treatment. In at least 1 of the cases, residual subepithelial haze remained after the edema resolved. In 2011, Regina et al.<sup>4</sup> reported 2 cases of central corneal edema in women, 1 of whom was highly myopic, presenting 1 to 2 days following routine SLT. The edema resolved after several weeks of topical steroid therapy, but central corneal haze and thinning remained, with a hyperopic shift in the myopic patient. In 2014, Song et al.<sup>5</sup> reported a case of central corneal edema and haze in a highly myopic man who presented 1 day after routine SLT and resolved after several weeks of topical steroid treatment with residual corneal thinning. We describe an

additional 4 cases of acute corneal edema with subsequent stromal thinning and hyperopic shift after routine SLT in moderately to highly myopic patients.

## CASE REPORTS

### Case 1

A 63-year-old white woman had SLT in her right eye to treat POAG. Eighty-nine pulses at 0.7 mJ per pulse were applied to the trabecular meshwork over 360 degrees. Before SLT, the IOP was 15 mm Hg; 30 minutes after SLT, it was 19 mm Hg. Before the procedure, the refraction was  $-14.0 + 2.50 \times 10$ , the corrected distance visual acuity (CDVA) 20/25, and the central corneal thickness (CCT) by ultrasound pachymetry 544  $\mu\text{m}$ . The pre-SLT IOP-lowering topical medications, bimatoprost and brinzolamide, were continued. Two days after SLT, the patient presented with mild ocular discomfort, photophobia, and worsening blurred vision in the treated eye. The CDVA was 20/600 and the IOP 19 mm Hg. Diffuse corneal edema and haze affecting the central cornea more than the periphery were observed. No anterior chamber reaction was noted.

Topical prednisolone acetate was initiated. Five days after SLT, the CDVA was 20/80, the IOP was 21 mm Hg, and the corneal edema was significantly improved peripherally, but a well-demarcated area of central stromal edema and haze

remained (Figure 1, A). Two weeks after SLT, the CDVA was 20/50, the IOP was 24 mm Hg, and the area of central stromal haze had thinned (Figure 1, B). At 1 month, the CDVA was 20/50, the refraction was  $-11.50 + 1.25 \times 4$ , the CCT was 432  $\mu\text{m}$ , and the topical steroids were tapered. At 2 months, the CDVA was 20/50, the IOP was 14 mm Hg, and the central corneal haze had improved. At 8 months, the CDVA was 20/40 with a hard contact lens and mild central stromal haze remained.

Tear fluid obtained 2 days after SLT was analyzed for herpes simplex virus (HSV) by polymerase chain reaction (PCR), enzyme-linked immunosorbent assay (ELISA), and culture, all of which returned negative. Specular microscopy (CellChek XL, Konan Medical) performed 2 months after SLT revealed a similar density (right eye 2670 cells/ $\text{mm}^2$ , left eye 2555 cells/ $\text{mm}^2$ ), size, and shape of endothelial cells in the treated and untreated eyes. Corneal tomography (Pentacam, Oculus Optikgeräte GmbH) of the treated eye revealed an area of paracentral thinning inferiorly; the cornea of the fellow untreated eye was normal with no evidence of posterior elevation.

### Case 2

A 56-year-old white woman had SLT in the right eye to treat POAG. One hundred ten spots at 1.0 mJ per spot were applied to the trabecular meshwork over 360 degrees. Before SLT, the IOP was 21 mm Hg; 30 minutes after SLT, it was 30 mm Hg (at which point brimonidine was administered and 30 minutes later the IOP was 24 mm Hg). Before the procedure, the refraction was  $-8.75 + 1.00 \times 47$ , the CDVA 20/20, and the CCT 606  $\mu\text{m}$ . The pre-SLT IOP-lowering topical medications, latanoprost and timolol, were continued. One day after SLT, the patient presented with blurred vision in the treated eye and central stromal edema and haze were observed. The CDVA was 20/30, the IOP was 19 mm Hg, and a rare cell was noted in the anterior chamber. Topical prednisolone acetate and nepafenac were initiated. The CDVA decreased to 20/200 over the

subsequent week. At 3 weeks, the CDVA improved to 20/60; the IOP was 15 mm Hg, the refraction  $-4.50 + 1.75 \times 170$ , and the CCT 478  $\mu\text{m}$ ; the central cornea had flattened with residual anterior stromal haze. Topical steroids were continued for 3 months. At 6 months, the CDVA was 20/30 with a hard contact lens, the CCT was 510  $\mu\text{m}$ , and mild central stromal haze remained.

### Case 3

A 46-year-old white woman had SLT in her right eye to treat POAG. Seventy-nine spots at 1.1 mJ per spot were applied to the trabecular meshwork over 360 degrees. Before SLT, the IOP was 17 mm Hg; 60 minutes after SLT it was 14 mm Hg. The pre-procedure refraction was  $-6.00 + 0.50 \times 16$ , the CDVA 20/20, and the CCT 515  $\mu\text{m}$ . The pre-SLT IOP-lowering topical medications, latanoprost and timolol, were continued, and topical nepafenac was started. Two days after SLT, the patient presented with blurred vision in the treated eye. Diffuse dense stromal opacification that extended almost to the limbus was observed. The CDVA was 20/40<sup>-2</sup> and the IOP 19 mm Hg; trace flare was noted in the anterior chamber. Topical prednisolone acetate was initiated. The CDVA decreased to 20/70 over the subsequent week. Three weeks after SLT, the CDVA was 20/70 and the IOP 19 mm Hg; the peripheral cornea had cleared with residual central stromal haze. At 6 weeks, the IOP was 20 mm Hg and the CCT 444  $\mu\text{m}$ ; a faint central stromal haze remained. Topical steroids were continued for 4 months, at which point the CDVA was 20/40, the refraction  $+0.25 + 0.75 \times 180$ , the IOP 13 mm Hg, and the CCT 475  $\mu\text{m}$ ; a faint central stromal haze remained. At 7 months, the uncorrected distance visual acuity (UDVA) was 20/30 and the cornea had cleared. At 11 months, the UDVA was 20/25 and the cornea remained clear.

### Case 4

A 56-year-old white woman had SLT in her right eye to treat POAG. Ninety-six spots at 1.0 mJ per spot were applied to the trabecular meshwork over 360 degrees. Before SLT, the IOP was 14 mm Hg; 30 minutes after SLT, it was 16 mm Hg. The pre-procedure refraction was  $-5.25 + 0.50 \times 91$ , the CDVA 20/20, and the CCT 575  $\mu\text{m}$ . The pre-SLT IOP-lowering topical medications, bimatoprost and brinzolamide, were continued. Two weeks after SLT, the patient presented with blurred vision and central stromal haze was noted. The CDVA was 20/60, the IOP 5 mm Hg, and the CCT 552  $\mu\text{m}$ ; the anterior chamber was quiet. Topical difluprednate and hypertonic saline were initiated and continued for 3 weeks. Three weeks after SLT, the CDVA was 20/50, the IOP was 12 mm Hg, the manifest refraction was  $-4.25$  sphere, and the stromal haze was less dense. At 7 weeks, the CDVA was 20/25, the IOP 9 mm Hg, the manifest refraction  $-3.75$  sphere, and the CCT 565  $\mu\text{m}$ ; the stromal haze had faded significantly. At 7 months, the CDVA was 20/25, the IOP 13 mm Hg, the refraction  $-2.50 + 0.25 \times 120$ , and the cornea had cleared.

### DISCUSSION

Selective laser trabeculoplasty is generally a safe and effective procedure for IOP reduction. It is often used as an adjunct or alternative to topical IOP-lowering medications for the treatment of open-angle glaucoma.

Submitted: February 17, 2014.

Final revision submitted: March 25, 2014.

Accepted: March 27, 2014.

From the UPMC Eye Center (Knickerbein, Davis, Raju, Schuman, Conner), Department of Ophthalmology, University of Pittsburgh School of Medicine, the Department of Bioengineering (Schuman), Swanson School of Engineering, University of Pittsburgh, Pittsburgh, Pennsylvania; the Cole Eye Institute (Singh, Eisenberg), Cleveland Clinic Foundation, Cleveland, Ohio; Ophthalmology Associates (Flowers, Nair), Fort Worth, Texas, USA.

Supported in part by an unrestricted grant from Research to Prevent Blindness, New York, New York, and The Eye and Ear Foundation, Pittsburgh, Pennsylvania, USA.

Presented at the ASCRS Symposium on Cataract, IOL and Refractive Surgery, Boston, Massachusetts, USA, April 2014.

Corresponding author: Ian P. Conner, MD, PhD, UPMC, Eye & Ear Institute, 203 Lothrop Street, Pittsburgh, Pennsylvania 15213, USA. E-mail: [connerip@upmc.edu](mailto:connerip@upmc.edu).

Download English Version:

<https://daneshyari.com/en/article/4016938>

Download Persian Version:

<https://daneshyari.com/article/4016938>

[Daneshyari.com](https://daneshyari.com)