possible; however, 2 weeks may be late enough to find the optic disc in a variable process of recovery, whereby the disc may be swollen, may appear normal, or even may start to show some atrophy.

Disc hyperemia and swelling is not an uncommon finding during or after the attack.[2] It may take up to 2 weeks or possibly even longer to resolve. Therefore, a swollen disc may mask the glaucomatous condition of the nerve during the early weeks after the event.

On the other hand, glaucomatous cupping has been observed in animal and human eyes as early as 2 weeks.[3,4] Monkey eyes showed glaucomatous cupping 9 to 10 days after their intraocular pressure (IOP) was highly elevated experimentally. Shen et al concluded that "vertical CDR $>$ 0.7 at baseline . . . was found to be . . . inversely related to the risk of damage." This finding supports the possibility of maximum damage occurring to the optic nerve within the first 2 weeks of the attack. Therefore, no further change might have been detected at follow-up.

We feel that animal models would provide the best approach for observing the progression of the optic nerve from a healthy to a damaged state in response to acute elevations of IOP. Observations from these studies then may prove valuable in the design of clinical/human studies.

Inci Irak Dersu, MD
Deepa Thayi, MD
Little Rock, Arkansas

References

1. Shen SY, Baskaran M, Fong AC, et al. Changes in the optic disc after acute primary angle closure. Ophthalmology 2006; 113:924–9.
2. Hoskins HD Jr, Kass MA. Becker-Shaffer's Diagnosis and Therapy of the Glaucomas. 6th ed. St. Louis: Mosby; 1989: 215.
3. Zimmerman LE, De Venecia G, Hamasaki DI. Pathology of the optic nerve in experimental acute glaucoma. Invest Ophthalmol Vis Sci 1967;6:109–25.
4. Duke-Elder S, Jay B. Diseases of the Lens and Vitreous: Glaucoma and Hypotony. In: Duke-Elder S, ed. System of Ophthalmology. Vol. 11. London: Henry Kimpton; 1969:434.

Author reply

Dear Editor:
We thank Drs Irak Dersu and Thayi for their interest in our article. Due to the unique pathophysiology and clinical presentation of acute primary angle closure, we agree that there are inherent difficulties in designing observational studies of the optic nerve in this condition. We feel that our study design tried to address some of these problems, but the possibility exists that reduced media clarity and residual optic disc swelling in some cases may have affected our results.

Animal models have facilitated greatly our understanding of glaucomatous damage on optic nerve head and glaucoma therapeutics.[1–4] However, no single experimental model is truly representative of glaucoma physiology in humans.[5]

We hope that other groups may improve on our work by conducting studies with larger sample sizes and using better imaging methods of the optic nerve.

Sunny Y. Shen, MRCS(Ed)
Tin Aung, PhD, FRCS(Ed)
Singapore

References

1. Morrison JC. Elevated intraocular pressure and optic nerve injury models in the rat. J Glaucoma 2005;14:315–7.
2. Rasmussen CA, Kaufman PL. Primate glaucoma models. J Glaucoma 2005;14:311–4.
3. Morrison JC, Johnson EC, Cepurna W, Jia L. Understanding mechanisms of pressure-induced optic nerve damage. Prog Retin Eye Res 2005;24:217–40.
4. Goldblum D, Mittag T. Prospects for relevant glaucoma models with retinal ganglion cell damage in the rodent eye. Vision Res 2002;42:471–8.
5. Levin LA. Animal and culture models of glaucoma for studying neuroprotection. Eur J Ophthalmol 2001; 11(suppl):S23–9.

LASIK and Systemic Contraindications

Dear Editor:
I read with great interest the article by Cobo-Soriano et al[1] comparing the anatomic and functional results of LASIK in patients with underlying systemic diseases. There are some important points that should be addressed:

1. After reading this article, one may think that there is no significant systemic contraindication for LASIK and this procedure can be safely performed for all patients who were previously categorized in the "red light" list for refractive surgery, if the disease is quiescent—a dangerous concept. The authors have concluded that "LASIK can be performed effectively and safely in selected patients with stable and controlled systemic diseases with favorable postoperative anatomic and visual outcomes." However, they did not completely explain their definition of selected patients with stable controlled systemic disease for each systemic disease (the practical specific inclusion and exclusion criteria for each systemic disease). For instance, in patients with rheumatoid arthritis what are the criteria that show that the disease is stable and controlled? Most connective tissue disorders such as systemic lupus erythematosis have wax and wane periods with apparently stable and controlled intervals that may mislead surgeons. Tear film tests are also necessary before any refractive surgery to rule out dry eye problems that are common in these patients.
2. In cases of diabetes mellitus, the authors did not mention if there was any sign of diabetic retinopathy before and after surgery.
3. Most of the patients were fairly young, with low amounts of refractive errors (approximately -3 diopters of myopia) and no significant astigmatism. Perhaps the authors' meaning of *selected patients* is this group of myopic eyes.

4. Some patients with connective tissue disease or diabetes mellitus have a progressive destructive course; these young patients may have complex ocular manifestations and retinal disorders late in the disease course. For instance, diabetic patients may need some vitreoretinal surgery that is difficult to perform with a LASIK flap, which may even be lost by surgical trauma. A lot of patients with systemic disease need long-term corticosteroids that may cause cataracts at an earlier age in comparison to the normal population; IOL power calculation is more difficult and unpredictable after LASIK and may cause refractive surprise. Most of the authors' patients were in their fourth decade of life, mostly in the pre-presbyopic age range. They may have acceptable near vision with the present myopia throughout their life. However, after LASIK they may soon need presbyopic glasses.

In conclusion, I think the contraindications for LASIK should remain a red light for refractive surgery due to the unpredictable course of systemic diseases.

MEHRDAD MOHAMMADPOUR, MD
Tehran, Iran

Reference

1. Cobo-Soriano R, Beltran J, Baviera J. LASIK outcomes in patients with underlying systemic contraindications. Ophthalmology 2006;113:1118–24.

Author reply

Dear Editor:
In reference to Dr Mohammadpour's comments, we point out the following:

1. *Objective stability and severity of underlying diseases.* This is an unavoidable shortcoming of a retrospective study in which several different physicians are involved over a long study period. This was the only way to obtain such a large sample otherwise not previously reported. This limitation of the study was stated in the text and reflected in the conclusions of the study.

   Although the exact data about the number of years of stability and the detailed and specific extraocular criteria for severity of the associated systemic diseases have not been determined in all cases, it is important to emphasize that most patients were described as asymptomatic for several years and under good medical control, confirmed by the corresponding physician in all cases. This was also explained in the text.

   A recent guideline from the American Academy of Ophthalmology cataloged the antecedent of connective tissue or autoimmune diseases and systemic immunosuppression as relative contraindications, and only uncontrolled diseases were defined as absolute contraindications,[1] although the parameters of stability and severity are not specified in this guideline either. Other recent retrospective studies[2,3] have reported results comparable to those of our study. Even though these retrospective studies cannot guarantee the safety of refractive surgery in these patients, the absolute contraindication of performing refractive surgery in every patient with an antecedent of the mentioned "red light" list has less support in the literature. Further prospective and evidence-based studies will clarify these specific indications.
2. With regard to diabetes mellitus, no case showed any sign of diabetic retinopathy at time of surgery. This is described in the text and referenced in Table 2, in which the refractive, biomicroscopic, intraocular pressure, and funduscopic findings of both case and control groups are specifically displayed. In this particular instance, the case group had 247 eyes with a normal fundus, 17 eyes with peripheral retinal degenerations, 4 cases of myopic macular changes, equatorial drusen (2 eyes), and chorioretinal scars (4 eyes). As can be observed from biomicroscopic and ophthalmoscopic data in the series, no significant ocular pathology was associated with the systemic disease.
3. As regards the age and refraction of the sample, we are surprised by Dr Mohammadpour's comments that this is a selected young and low-myopic group, as this is a controlled study in which homogeneity between groups is displayed. As a matter of fact, this is a relatively old group (mean age, 36.5 ± 8.4 years) compared with the standard age described in myopic–LASIK studies (32–34 years), and in fact, we had to adjust the age of the control group to compare homogeneous eyes regarding epithelial fragility and other features.

   Regarding refraction, the mean spherical equivalent of the entire sample was -4 ± 2 diopters (D), with a range oscillating between -0.75 and -10.75 D, comparable to the control group (no statistically significant differences).
4. The fourth point generalizes about potential future problems of refractive surgery such as possible vitreoretinal surgery in diabetic patients, difficulty in intraocular lens (IOL) power calculation in cataract surgery, and worsening of presbyopia. We do not find any difference with the general population of patients who undergo vitreoretinal surgery because of a myopic rhegmatogenous retinal detachment after a LASIK procedure, and we do not think vitreoretinal surgery is prone to loss of the corneal flap. Cataract surgery and calculation of IOL power in patients with prior refractive surgery and worsening of near vision in a myopic pre-presbyopic patient are not specific disadvantages for this group of patients.

We appreciate Dr Mohammadpour's suggestions and interest in our study. We have carefully studied the comments, but we remain confident in the conclusion of the