

Surgical Intervention for Phacomorphic Glaucoma

Early detection and timely cataract extraction prevented this patient from developing unnecessary complications.

BY SANDRA M. JOHNSON, MD

CASE PRESENTATION

A 79-year-old white female presented to an outside ophthalmologist with pain in her left eye. She had previously undergone a laser iridotomy in both eyes and had a history of amblyopia in her right eye. In her left eye, the IOP measured in the high 50s, and the visual acuity was count fingers. She was diagnosed with plateau iris syndrome, because her iridotomies were patent but her angle was closed. The patient underwent iridoplasty and began topical glaucoma therapy with Cosopt (dorzolamide hydrochloride-timolol maleate ophthalmic solution; Merck & Co., Inc., West Point, PA), Alphagan P (brimonidine tartrate ophthalmic solution 0.15%; Allergan, Inc., Irvine, CA), and pilocarpine 1%. She was treated with prednisolone postoperatively. Five days after the procedure, her IOP measured 11 mm Hg, and her visual acuity was 20/60+2 OS.

When the patient presented to my office for ongoing management, the vision in her left eye was stable at 20/60+2, and her IOP measured 12 mm Hg OS on the prescribed glaucoma medications. The visual acuity of her right eye was stable at count fingers, and her IOP was 20 mm Hg.

A slit-lamp examination revealed dense nuclear cataracts, shallow anterior chambers, patent iridotomies, and scattered posterior synechiae in both eyes. The central corneal pachymetry measurements were above average at 569 μ m OD and 585 μ m OS. Gonioscopy revealed convex irides in both eyes, and I was unable to view any angle structures, even with compression. Her ciliary processes were clearly visible behind the iris. Her cup-to-disc ratios were 0.3 OD and 0.8 OS, and Humphrey visual field testing (Carl Zeiss Meditec, Inc., Dublin, CA) was full in the left eye and showed a nasal step in the right eye that disappeared on repeat postoperative testing. The patient had no complaints related to her visual acuity.

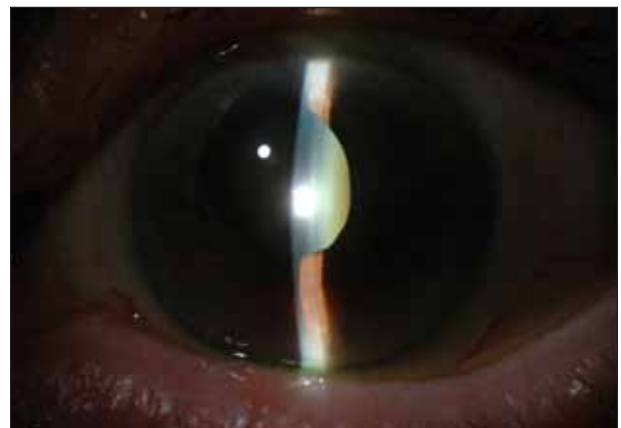
HOW WOULD YOU PROCEED?

1. Would you continue to manage the patient medically?
2. Would you perform additional iridoplasty now or later?
3. Would you perform cataract surgery?
4. Would you perform trabeculectomy?
5. Would you perform combined trabeculectomy and cataract surgery?

SURGICAL COURSE

I diagnosed phacomorphic angle closure versus plateau iris syndrome, because the patient had such dense nuclear cataracts in both eyes (Figure 1).

I decided it would be easier to remove the patient's cataracts while her IOPs were under control and her corneas were clear instead of waiting for a recurrence of her angle closure or the development of uncontrolled IOP due to



(Courtesy of Raymond Mok, COMT, and Thomas Moreno, CRA.)

Figure 1. A preoperative slit-lamp photograph of the patient's left eye shows a shallow anterior chamber and a dense nuclear cataract.

anterior synechiae. The latter would be difficult to follow with gonioscopy because the view of the patient's angles was obstructed. Because the visual field for her left eye was intact and there was no cupping in her right eye, I did not recommend trabeculectomy. After a discussion with the patient, she was scheduled for cataract surgery.

Knowing that the density of endothelial cells can be affected by angle-closure glaucoma (ACG),¹ I removed the cataract from the patient's right eye first to identify any potential problems with postoperative corneal edema. My surgical technique for both eyes involved the generous use of Viscoat ophthalmic viscosurgical device (Alcon Laboratories, Inc., Fort Worth, TX). I approached the cataracts via superior scleral tunnels to facilitate the conversion to a traditional extracapsular cataract technique if necessary.

During surgery on the patient's right eye, poor zonular support was notable. The entire capsular bag scrolled up after the nucleus was extracted. I removed the scant cortex via anterior vitrectomy and left the patient aphakic due to the eye's axial length of 29.36 mm (vs 22.8 mm OS). Her cornea remained clear postoperatively. The surgery on her left eye was uneventful and included the placement of a foldable lens in the capsular bag.

OUTCOME

The axial length of the patient's right eye was diagnostic for the etiology of her amblyopia. The depths of her anterior chambers were more symmetric, measuring 2.16 mm OD (Figure 2) and 2.20 mm OS, but they were shallower than those of a normal eye (approximately 2.8 mm or more).²

Without medication, the IOP in the patient's left eye measured 14 and 19 mm Hg at 2 and 4 months after surgery, respectively. Two months after the second surgery, her refractions were +1.50 +1.00 X 89 = 20/70- OD and plano + 0.75 X 93 = 20/20- OS.



Figure 2. A postoperative slit-lamp photograph of the patient's right eye shows a deeper anterior chamber after cataract removal.

DISCUSSION

The differential diagnosis of a patient who presents with angle closure in the presence of a patent iridotomy includes plateau iris syndrome. In this situation, angle closure occurs with pupillary dilation and is related to an abnormal relationship between the anterior chamber angle and the peripheral iris. Patients with plateau iris syndrome benefit from iridoplasty and miotic therapy to separate the peripheral iris from the trabecular meshwork.³ This condition is not related to the presence of a cataract.

“Phacomorphic ACG occurs when the lens’ diameter increases and the angle becomes closed from a posterior crowding effect.”

Phacomorphic ACG occurs when the lens’ diameter increases and the angle becomes closed from a posterior crowding effect. The disease usually occurs acutely when a lens becomes intumescent, and phacomorphic ACG is often found in patients who have a history of pupillary block with or without iridotomy. The condition can progress to an episode of ACG, much like primary acute ACG, as in the case described herein. Treatment with miotics is not usually advocated, but cycloplegia can shift the lens/iris diaphragm posteriorly and deepen the anterior chamber. Such a patient would benefit from an iridotomy if one were not already present or if there were a question of whether an iridotomy previously placed to treat pupillary block were still patent. If the iridotomy's patency is established, iridoplasty may be performed to manage the phacomorphic angle closure as described by Tham et al.⁴ and Yip et al.⁵ The investigators pursued cataract surgery after iridoplasty in both case series.

A report by Hayashi et al.⁶ reviewed the effect of cataract surgery on IOP control in ACG. Postoperatively, the patients in this series had lower mean IOPs and used fewer medications. These findings support the efficacy of cataract removal for improving the glaucoma status of patients who do not have advanced visual field loss.

Because the patient described in this case underwent cataract surgery soon after her initial angle-closure attack, she did not develop chronic ACG secondary to the formation of anterior synechiae or a recurrence of acute ACG due to lens intumescence. Hayashi et al.⁷

CHALLENGING CASES

have also published a series of cases in which the anterior chambers of glaucoma patients, including those with angle closure, deepened after cataract surgery.

In the case described herein, removing the cataracts increased the depth of the anterior chamber's angles and normalized the patient's IOPs. The early recognition and treatment of shallow anterior chambers and elevated IOPs related to dense cataracts can reduce morbidity and provide ophthalmologists with greater control over the clinical course of phacomorphic glaucoma. □

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1. Setala K. Corneal endothelial cell density after an attack of acute glaucoma. *Acta Ophthalmol.* 1979;57:1004-1013.
2. Lowe RF. Aetiology of the anatomical basis for primary angle-closure glaucoma. Biometrical comparisons between normal eyes and eyes with primary angle-closure glaucoma. *Br J Ophthalmol.* 1970;54:161-169.
3. Ritch R, Tham CCY, Lam DSC. Long-term success of argon laser peripheral iridoplasty in the management of plateau iris syndrome. *Ophthalmology.* 2004;111:104-108.
4. Tham CC, Lai JS, Poon AS, et al. Immediate argon laser peripheral iridoplasty (ALPI) as initial treatment for acute phacomorphic angle-closure (phacomorphic glaucoma) before cataract extraction: a preliminary study. *Eye.* 2005;19:778-783.
5. Yip PP, Leung WY, Hon CY, Ho CK. Argon laser peripheral iridoplasty in the management of phacomorphic glaucoma. *Ophthalmic Surg Lasers Imaging.* 2005;36:286-291.
6. Hayashi K, Hideyuki H, Nakao F, Hayashi F. Changes in anterior chamber angle width and depth after intraocular lens implantation in eyes with glaucoma. *Ophthalmology.* 2000;107:698-703.
7. Hayashi K, Hayashi H, Nakao F, Hayashi F. Effect of cataract surgery on intraocular pressure control in glaucoma patients. *J Cataract Refract Surg.* 2001;27:1779-1786.

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