Glaucoma and Cataract in a Uveitic, Pregnant Patient

BY STEVEN V. L. BROWN, MD, FACS

CASE PRESENTATION
In March 1995, a 32-year-old white female presented for initial consultation. The patient was in the third trimester of her second pregnancy and had a 5-year history of HLA-B27–related chronic uveitis, which was associated with secondary open-angle glaucoma. Upon initial evaluation, her vision was correctable to 20/25 OD and 20/20 OS. Her refractive error was -3.00 D of sphere OU. The patient’s IOP measured 42 mm Hg OD and 16 mm Hg OS with applanation tonometry. The referring ophthalmologist had noted that, over the previous 6 to 8 weeks, the patient’s IOP had fluctuated in the low 40s in her right eye and in the high teens to low 20s in her left eye.

The anterior segment examination was remarkable for bilaterally clear corneas without evidence of keratic precipitates, despite previous episodes of small, inferocentrally located, nongranulomatous precipitates and the absence of afferent pupillary defects. Additionally, small, central-posterior subcapsular cataracts were present to a greater degree in her right eye than in her left. Her anterior chambers were deep, and I noted minimal flare and cell bilaterally. On gonioscopy, the angles appeared to be open 360º to the scleral spur, with minimal irregular pigmentation of the trabecular meshwork throughout the angles’ entire circumferences. Stereoscopic visualization of the optic nerves with a +78.00 D lens showed slight asymmetry; the right optic nerve had inferotemporal neuroretinal thinning and a cup-to-disc ratio of 0.4, whereas the left had a cup-to-disc ratio of 0.3. Threshold visual field testing showed an early, superior nasal step in her right eye. The threshold visual field of the patient’s left eye was full. Pachymetry was not performed.

The referring ophthalmologist had noted that topical steroids exacerbated the patient’s IOP elevation bilaterally. Topical steroids had therefore been administered in a pulse regimen for no more than 1 week at a time. The patient had not been on topical steroid therapy for the past 2 months. Upon presentation, topical Betagan 0.5% (Allergan, Inc., Irvine, CA) q.d. OU and systemic Diamox 125 mg (Wyeth Pharmaceuticals, Philadelphia, PA) q.i.d. composed her drug regimen. Previously, she had taken topical pilocarpine and topical Iopidine (Alcon Laboratories, Inc., Ft. Worth, TX), which were discontinued secondary to increased periocular sensitivity (ie, dermatitis).

HOW WOULD YOU PROCEED?
1. What would be your next step in managing this patient?
2. What concerns exist with the use of medications and/or anesthesia in pregnant patients?
3. Would you perform a trabeculectomy, a viscocanalostomy, or implantation of a glaucoma drainage device? If you chose a trabeculectomy, would you use an antimitabolite?

Figure 1. The author created a limbal-based, thin-walled, avascular filtration bleb.
SURGICAL COURSE

The patient’s history of uveitis, secondary glaucoma with uncontrolled IOP, and progressive optic nerve changes combined with her pregnancy indicated surgical intervention. Prior to surgery, I carefully reviewed glaucoma filtration surgery and its associated complications, including the use of antimetabolitic agents, as well as concerns of using anesthesia during pregnancy with the patient.

Using topical and subconjunctival local anesthesia, I performed a limbal-based trabeculectomy on her right eye and used an adjunctive, low dose of mitomycin C at 0.3 mg/mL for 90 seconds (Figure 1). Her early, 3-month postoperative course was unremarkable, and her IOP remained between 6 and 10 mm Hg. Fortunately, the remainder of her pregnancy was uneventful, and she delivered a healthy boy, who weighed 8 pounds, 3 ounces. The patient’s vision, however, soon diminished to 20/50 OD secondary to worsening posterior subcapsular cataracts, cystoid macular edema, and possibly hypotony-related macular and choroidal folds.

Six months after the trabeculectomy, the patient’s vision was 20/60 in her right eye and 20/25 in her left eye. I noted persistent, low-grade, bilateral iritis in addition to progression of her right eye’s posterior, subcapsular cataract. Her IOP measured 8 mm Hg OD and 17 mm Hg OS.

At 16 months postoperatively, vision in the patient’s right eye diminished to 20/70 due to an increase in the posterior, subcapsular cataract and choroidal folds secondary to the relative hypotony. IOP fluctuated between 6 and 8 mm Hg in her right eye and 15 to 17 mm Hg in her left eye. The low-grade iritis was quiescent. I performed a fluorescein angiogram that confirmed the choroidal folds in her right eye and cystoid macular edema in both eyes. Because of her glare dysfunction and increasing difficulty with routine visual tasks, I considered performing cataract surgery.

I performed phacoemulsification with a clear corneal, temporal approach and inserted a PMMA IOL in her right eye. At the time of surgery, I made an autologous blood patch to the filtration area and left viscoelastic in the eye upon completion of the case. The procedure was finished without complications.

OUTCOME

Unfortunately, the early postoperative IOP was relatively hypotonous, with a fluctuation between 8 and 10 mm Hg OD. To contract the filtration bleb, I applied argon laser to the filtration bleb’s surface with a 200-μm spot size and an energy level of 200 mW for 0.2 seconds. To further inflame the filtration bleb, I applied an adjunctive trichloroacetic acid solution (100%) to its surface.

At 3 months after cataract surgery, the patient’s IOP rose to 12 mm Hg OD, and the choroidal folds had resolved. Her vision improved to 20/25 OD, with a refractive error of +1.25 + 0.75 X 70. At 1 year after the cataract surgery, the patient’s vision remained 20/25 OD with a refractive error of -0.75 + 0.50 X 170. Her IOP fluctuated in the low teens in her right eye without topical hypotensive agents.

DISCUSSION

Recalcitrant iridocyclitis may result in secondary open-angle glaucoma or secondary angle-closure glaucoma. The former may result from an obstruction of the trabecular meshwork by cellular exudates and inflammation of the trabecular meshwork’s endothelial cells. Additionally, treatment with topical steroids may contribute to dysfunctional outflow of the trabecular meshwork, perhaps as a result of the accumulation of glycosaminoglycan, which can further elevate IOP. Individuals who have iridocyclitis and who are steroid responders warrant close observation. Those who are also pregnant present additional challenges.

Unquestionably, there is a paucity of information regarding the use of topical ophthalmic medications during pregnancy, especially in those who also have glaucoma. The FDA’s 1979 drug classification system labels most ophthalmic, topical agents as category C drugs. The drug information for these medications states that they should be used during pregnancy only if clearly indicated because risks are present, but the potential benefits of topical ophthalmic agents may...
outweigh these potential risks. Because topical beta-blockers, topical steroids, and acetazolamide are all category C drugs, they should be used only in the lowest doses and for a limited time.

To mitigate potential complications from anesthesia, especially for pregnant patients, filtration surgery may be performed with local anesthesia and/or using a peribulbar technique.\(^2,3\) Because of the potential for diminished aqueous production following surgery in uveitic eyes, a tight scleral flap is likely warranted, with a subsequent gradual release of guard sutures, an aggressive regimen of topical steroids, and occasionally cycloplegia. Frequent postoperative evaluations are key to ensuring filtration success.

Youth, myopia, and exposure to antimetabolites are risk factors for hypotony after glaucoma filtration surgery.\(^4,5\) Cataract surgery has been shown to be beneficial in increasing the IOP and reversing the hypotony-related macular changes.\(^6\) In eyes with prior glaucoma filtration surgery, a clear corneal, temporal approach is the recommended technique for cataract removal.\(^7\) If the eye is uveitic, a large capsulorhexis and a PMMA IOL placed in the bag may reduce the risk of anterior capsular contraction and/or opacification. This placement may limit possible dislocation of the IOL and subsequent pupillary capture. A three-piece PMMA lens may be less likely than a silicone lens to exacerbate postoperative inflammation. An intrableb, autologous blood injection may further raise the IOP perioperatively (Figure 2), but it should be performed while viscoelastic remains in the anterior chamber to prevent the possibility of a blood reflex. During the early postoperative course, the clinician may further contract the bleb by applying argon laser energy and trichloroacetic acid solution to the filtration bleb\(^8\) (Figure 3).

Calculations of IOL power are difficult in eyes that have previously undergone filtration surgery, because the axial length diminishes after filtration surgery.\(^9\) This decrease is thought to be due, in part, to a thickening of the choroid that accompanies a low IOP. If the calculations of the axial length are based on the postfiltered, hypotensive eye, then the calculated IOL power will be too great after the IOP rises and causes a corresponding increase in axial length. It may be helpful, therefore, to obtain an A-scan ultrasound in all phakic eyes undergoing initial filtration surgery. My IOL power calculations anticipated a subsequent IOP elevation, which indeed occurred during the postoperative course. Interestingly, in this case, the axial length was 23.97 mm OD and 24.13 mm OS before surgical intervention, but it decreased to 21.75 mm OD after filtration surgery. At 1 year following cataract surgery, the axial length increased to 23.57 mm OD. At the time of cataract surgery, I decided to consider the IOL power of the left eye (because I was uncertain about the extent of the axial length change) and to leave the patient slightly myopic. Fortunately, the surgical outcome was satisfactory.

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