

Cataract Surgery in Uveitic Eyes

It is imperative to control inflammation before and after operating.

BY UDAY DEVGAN, MD, FRCS

A history of uveitis can hasten a patient's development of cataracts and complicate cataract surgery. The crystalline lens changes due to the intraocular inflammation as well as the topical steroids used to treat the uveitis. Even with an anatomically successful cataract procedure, patients are at increased risk of postoperative complications that could limit their recovery of vision.

PREOPERATIVE PLANNING

Although uveitis can affect any part of the uveal tissue from the front of the eye to the back, the most commonly encountered form of the condition is anterior uveitis, the focus of this article. The list of the potential causes of acute anterior uveitis is long, but ophthalmologists are usually unable to pinpoint the origin of the inflammation. Before phacoemulsification, it is imperative that the uveitis be controlled and the eye be quiet. This requirement means that, for at least a few weeks if not months, the anterior chamber should be free of cells. A minor degree of baseline flare is permissible, because complete resolution is often nearly impossible.

To blunt the postoperative inflammatory response, patients begin using topical steroids and nonsteroidal anti-inflammatory drugs (NSAIDs) days to weeks prior to cataract surgery. Uveitic eyes are prone to a pronounced postoperative inflammation as well as to complications such as cystoid macular edema. Subconjunctival, sub-Tenon, or even intravitreal injections of steroids can be administered prior to surgery, although they are not generally required. Systemic steroids or other immunosuppressive drugs are sometimes prescribed in cases of particularly aggressive uveitis.

INTRAOPERATIVE TECHNIQUE

Many eyes with anterior uveitis have posterior synechiae. These adhesions and any pupillary membrane can limit pupillary dilation and the surgeon's access to the



Figure. This patient had a history of anterior uveitis with formation of posterior synechiae, a pupillary membrane, and a visually significant cataract.

cataract. He or she can dissect the membrane and synechiae with a forceps, a blunt spatula, or even viscoelastic solutions. The pupil can then be expanded mechanically and, if necessary, held in position with iris hooks or other devices for expansion. A sufficiently large capsulorhexis (at least 5 mm in diameter) is needed, because the iris tends to adhere to the anterior lens capsule, which will lead to further synechiae formation during the postoperative period.

Some surgeons advocate implanting a three-piece IOL in the sulcus in order to prevent the iris from contacting the anterior lens capsule, but this positioning may lead to chafing of the iris and additional inflammation. A monofocal lens design is recommended to maximize image quality, as spectacle independence tends not to be a priority for these patients. The commonly used IOL materials are hydrophobic acrylic or silicone polymer. Both are reasonable choices, but some surgeons believe that the former is generally quieter in the eye.

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Pre- and Postoperative Cataract Care of Eyes With Inflammatory Disease

By initiating management prior to surgery, ophthalmologists can improve the success of the cataract procedure and increase patients' satisfaction.

BY EDWARD J. HOLLAND, MD, AND ERIC D. DONNENFELD, MD

Patients with coexisting inflammatory disease are at increased risk of delays in visual recovery and complications after cataract surgery. It is imperative that ophthalmologists diagnose during the preoperative examination inflammatory conditions that may complicate patients' postoperative recovery. Common examples include aqueous tear-deficient dry eye disease (DED), meibomian gland dysfunction (MGD), and uveitis.

AQUEOUS TEAR-DEFICIENT DED

The visual recovery after cataract surgery of patients with aqueous tear-deficient DED is often delayed, especially if corneal staining is evident preoperatively. Aggressive management before surgery is therefore preferable to postoperative treatment, when the patient is likely to be frustrated and unhappy.

The level of matrix metalloproteinase-9 has consistently been shown to be elevated in the tears of patients with inflammatory DED.¹ Testing for this inflammatory marker is extremely sensitive and specific. InflammADry (Rapid Pathogen Screening Inc.; not available in the United States) is a new, accurate, in-office immunoassay that detects elevated levels of matrix metalloproteinase-9 in tears in 10 minutes. This test allows the clinician to more effectively diagnose inflammatory DED and begin appropriate therapy.

Initial treatment should include the frequent instillation of unpreserved artificial tears and a lubricating gel or

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ointment at night. Therapy with topical cyclosporine A (Restasis; Allergan, Inc.) also deserves strong consideration, because DED is a progressive condition that often worsens after cataract surgery. Although several weeks may elapse before cyclosporine therapy produces a significant response, treatment should continue during the postoperative period. An improved tear film often increases patients' satisfaction and quality of vision.

Punctal occlusion is a valuable technique for treating severe DED. We prefer the punctal plugs from Odyssey Medical, Inc., for their comfort and stability. Plugs can be placed preoperatively or at the time of cataract surgery. Thermal cautery for permanent punctal occlusion merits consideration in cases of Sjögren syndrome.

Patients with significant conjunctival injection and discomfort from DED may benefit from topical corticosteroids preoperatively. Combined with cyclosporine A, a corticosteroid will provide immunomodulation, decrease ocular burning, and more rapidly relieve DED. Loteprednol (Lotemax; Bausch + Lomb) is an excellent option in these cases due to its high efficacy on the ocular surface and

inside the eye. Moreover, the safety parameters of this ester steroid reduce the risk of IOP elevation.² The availability of loteprednol as an ointment makes it particularly helpful in patients with ocular surface disease who need a steroid after cataract surgery. Applying the drug at night lubricates the surface and increases anti-inflammatory coverage.

If the preoperative workup identifies severe DED, it may be appropriate to delay cataract surgery until the ocular surface improves.

MEIBOMIAN GLAND DYSFUNCTION

Patients with MGD often have a difficult postoperative course. Their most frequent complaint is a fluctuation of vision due to an unstable tear film, which ultimately leaves them frustrated with their surgery. Treating MGD and improving the quality of the tear film before the cataract procedure is therefore critical to satisfying these patients.

Preoperative management should include a protocol for lid hyperthermia and hygiene treatment. Patients often do not comply with this regimen for long periods of time but will perioperatively if the surgeon stresses its importance to the surgical outcome. The LipiFlow Thermal Pulsation System (TearScience, Inc.) is a new device that applies heat to the palpebral surfaces of the upper and lower eyelids directly over the meibomian glands, while simultaneously delivering graded pulsatile pressure to the outer eyelid. The heat helps to liquefy the contents of the meibomian glands. The pulsation transiently decreases blood flow to the tissue surrounding the meibomian glands, thus increasing the efficiency of heat transfer and resulting in the evacuation of the glands' liquefied contents to alleviate the obstruction.

Another first-line therapy for MGD is oral omega-3 nutritional supplements. The recommended dose is 3 g per day. In our experience, topical azithromycin (AzaSite; Merck & Co., Inc.) q.d. for long-term therapy is also very beneficial for these patients. The drug is best applied as a drop in the cul-de-sac and then massaged into the lids.³ Many patients benefit from prolonged therapy postoperatively, either as long-term maintenance or cycled as a few months on and off.

Most patients whose MGD does not respond to the aforementioned treatments will experience significant anti-inflammatory effects from oral doxycycline.³ A regimen of 50 mg per day avoids the frequent gastrointestinal complications of the typical, higher anti-infective dosing.

A combined antibiotic-steroid may help MGD patients who have concomitant anterior blepharitis or who require the short-term treatment of significant

inflammation. Tobradex ST (Alcon Laboratories, Inc.) delivers a broad-spectrum antibiotic (tobramycin) and a powerful steroid (dexamethasone) in a new preparation that adheres well to the eyelids. The product contains xanthan gum, which forms an ionic interaction with tobramycin and reduces the settling of dexamethasone. The agent's viscosity increases sevenfold from the bottle to the tears, extending retention time.

Patients with corneal involvement of MGD or a significant conjunctival reaction should undergo treatment with a topical steroid. We prescribe loteprednol suspension during the day and loteprednol ointment at night for these patients. The latter reduces inflammation in the lids and meibomian glands while delivering anti-inflammatory treatment to the ocular surface.

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UVEITIS

The patient with a history of uveitis is at significant risk for an exacerbated inflammatory reaction after cataract surgery. The normal trauma of the procedure can precipitate a severe uveitic reaction and postoperative complications such as cystoid macular edema (CME), the formation of anterior and posterior synechiae, and secondary glaucoma. Postoperative treatment with oral corticosteroids 1 mg/kg starting on the day of surgery is a powerful prophylactic regimen. These agents can be tapered over 2 to 3 weeks.

Topical steroids should be used more frequently during the immediate postoperative period in patients with uveitis. Because the goal is to suppress inflammation before its occurrence, we also treat uveitic patients with a topical corticosteroid prior to surgery. The most powerful topical agent available is difluprednate ophthalmic emulsion 0.05% (Durezol; Alcon Laboratories, Inc.). In a trial of uveitic patients, this drug dosed q.i.d. controlled inflammation better than prednisolone acetate dosed eight times a day.⁴ Difluprednate achieves its increased efficacy and strength in part from its fluorination at both the C6 and C9 positions, making it a difluorinated prednisolone derivative. Dermatologists have used fluorinated corticosteroids for decades, and these agents are well established as the most potent topical anti-inflammatory medications available. Durezol is formulated as an emulsion, which, unlike a suspension,

does not require shaking and maintains an even distribution of its active ingredient.

Topical nonsteroidal anti-inflammatory drugs also play an important role in achieving successful outcomes in cataract surgery, and these agents are critical for uveitic patients. They should begin using nonsteroidal anti-inflammatory drugs 5 to 7 days preoperatively and continue them for at least 2 to 3 months postoperatively to help reduce the risk of CME. For individuals with significant vitritis, an intravitreal injection of triamcinolone (Triesence; Alcon Laboratories, Inc.) can provide long-term control of inflammation, reduce the risk of CME, and improve cataract surgical outcomes.⁵

CONCLUSION

The aggressive treatment of DED and MGD prior to cataract surgery will increase both its success and patients' satisfaction. Managing patients with cataracts and uveitis requires expert surgical care with minimal trauma to the eye. Anti-inflammatory therapy should continue significantly longer than after conventional cataract surgery. An aggressive treatment plan to suppress inflammation preoperatively and control it postoperatively will dramatically improve surgical results. ■

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“Ophthalmologists can use their standard surgical technique for the cataract procedure, but they should consider additional steps to help control postoperative inflammation.”

Ophthalmologists can use their standard surgical technique for the cataract procedure, but they should consider additional steps to help control postoperative inflammation. The injection of preservative-free triamcinolone into the anterior chamber or vitreous cavity can be a powerful adjunctive therapy. A subconjunctival or sub-Tenon injection of triamcinolone or other steroids can further enhance the anti-inflammatory effect. In some cases, systemic steroids are administered as an intravenous infusion during surgery and are then continued orally in the postoperative period (Figure).

POSTOPERATIVE FOLLOW-UP

The patient's use of topical steroids and NSAIDs should be prolonged to ensure that inflammation is completely controlled after surgery. Although prednisolone acetate 1% ophthalmic suspension is commonly prescribed after cataract surgery, stronger medications such as difluprednate 0.05% ophthalmic emulsion may be a better choice.¹ When discontinuing steroids, a slow taper helps to prevent rebound inflammation. Continuing NSAIDs for at least 6 weeks may help to prevent cystoid macular edema. The ophthalmologist can follow serial optical coherence tomography measurements of the macula to watch for edema at the postoperative visits.

Once the eye has recovered from cataract surgery and is free of inflammation, the patient should have a relatively routine postoperative course. There is always the chance, however, that uveitis will recur in the future. ■

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