Managing Dry Eye Disease in Cataract Patients

Diagnostics and paradigms for optimal results.

BY EDWARD C. LAI, MD, AND CHRISTOPHER E. STARR, MD

Dry eye disease (DED) is a multifactorial syndrome that can cause visual disturbance, ocular discomfort, and permanent damage to the ocular surface. In 2007, the International Dry Eye Work Shop (DEWS) amended the definition of DED to include tear hyperosmolarity and inflammation of the ocular surface.[1] Several studies suggest that the prevalence of asymptomatic DED in cataract patients is high and that cataract surgery can induce or exacerbate existing DED.[2-4] Cataract patients with concomitant DED merit special consideration to prevent worsening existing symptoms and making asymptomatic disease symptomatic. In addition, patients with DED must be properly informed of the risks of dry eye associated with cataract surgery—namely, visual fluctuations and blur. These side effects can cause patients' dissatisfaction postoperatively, especially those who receive multifocal IOLs.

ASSESSING THE SIGNS AND SYMPTOMS

Ocular surface disease is often overlooked during the preoperative cataract evaluation because the correlation between the signs and symptoms of DED is notoriously weak. A complete history and ocular examination, combined with a thorough battery of clinical tests, should be performed and documented for cataract patients for whom the clinician has even the mildest suspicion of DED. Physicians should inquire about symptoms such as ocular burning, irritation, redness, tearing, artificial tear use, and visual fluctuations. The discomfort reported by patients is often out of proportion with their clinical signs, although many patients with clinical signs of DED do not report significant symptoms.[5,6] To ensure that a complete ocular history is obtained from each patient preoperatively, DEWS recommends the use of a validated dry eye questionnaire such as the Ocular Surface Disease Index or Standard Patient Evaluation of Eye Dryness.[1]

Figure 1. Technicians find the TearLab osmometer to be easy to learn and use.

PERFORMING OBJECTIVE TESTING

There are many new noninvasive objective tests for assessing DED. These include tear osmolarity analysis (TearLab Osmolarity System; TearLab Corporation; Figure 1), the detection of matrix metalloproteinase 9 in tears (InflammaDry; Rapid Pathogen Screening, Inc.), optical coherence tomography for quantification of the tear meniscus, lipid layer interferometry (LipiView Ocular Surface Interferometer; TearScience, Inc.), wavefront aberrometry, and noncontact topography-based tear breakup time (Keratograph 5; Oculus Optikgeräte GmbH). The basic slit-lamp examination is still considered the standard of care, however, and should be performed under minimal illumination before eye drops are instilled. A tear meniscus height in the inferior eyelid margin of less than 0.25 mm has high specificity and sensitivity for the presence of DED.[7] A tear breakup time of less than 10 seconds is indicative of DED, but a period of less than 5 seconds has also been advocated and may be more sensitive.[8,9] The meibomian glands at the eyelid's margins should be carefully examined and expressed for signs of dysfunction and, if necessary, treated before cataract surgery is performed.

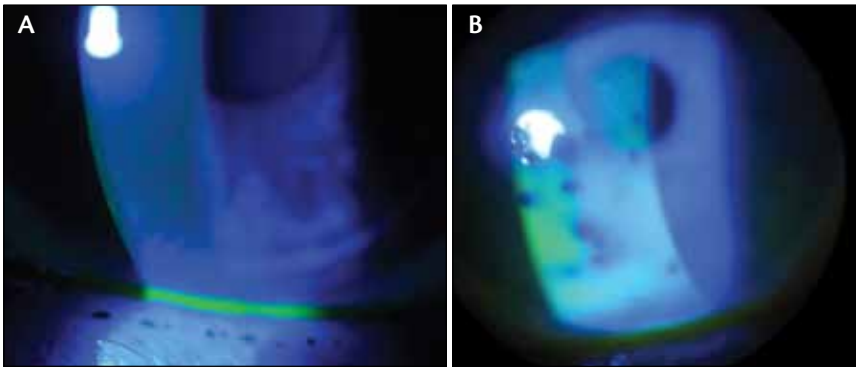

Figure 2. A preoperative cataract patient with corneal staining and rapid tear breakup time (A). The patient desired a premium IOL, and thus surgery was delayed until the tear film was optimized and corneal staining eliminated (B).

Perhaps the most important component of the slit-lamp examination is vital dye staining of the cornea and conjunctiva. Fluorescein and/or lissamine green dye reveals punctate corneal and conjunctival staining in early moderate to severe DED. Conjunctival hyperemia and redundant folds are frequently encountered, especially in elderly patients. When the signs and symptoms are suggestive of DED or tear osmolarity testing is confirmatory, Schirmer testing can be useful for identifying aqueous-deficient DED. Although some debate continues, a basic secretion test score of 5 mm or less of filter paper wetting is generally accepted as indicative of DED.[1]

OPTIMIZING THE OCULAR SURFACE

Preoperative measurements used in IOL selection (keratometry, topography, etc.) should be delayed until the tear film and ocular surface are optimized and corneal staining is absent (Figure 2). The treatment of DED should be tailored to the severity of the disease. In cases of mild to moderate dry eye, artificial tears and environmental management are often adequate treatment. Artificial tear ointment or gel, administered immediately before bedtime, is a useful adjunct to artificial tear therapy in cases of suspected nocturnal exposure.

Reducing inflammation of the ocular surface is a primary goal in the treatment of early moderate to advanced DED. A commonly prescribed regimen for cataract patients with moderate DED includes cyclosporine ophthalmic emulsion 0.05% (Restasis; Allergan, Inc.) dosed twice daily in conjunction with a tapering course of a topical steroid.[10] In eyes with multifocal IOLs, cyclosporine significantly improved mesopic and photopic contrast sensitivity, with a trend toward enhanced visual acuity.[11] Punctal occlusion is another option for increasing tear volume and should be considered in the preoperative period for patients with moderate to severe aqueous-deficient DED. Before initiating punctal occlusion, however, we recommend first reducing the inflammation of the ocular surface.

Meibomian gland dysfunction (MGD) can result in evaporative DED, as evidenced by tear film instability and reduced tear breakup time. Daily warm compresses and antimicrobial eyelid hygiene should be performed for 14 to 28 days prior to cataract surgery. Oral nutritional supplementation with omega-3 fish and flaxseed oils and the adjuvant use of oral doxycycline and/or topical azithromycin (AzaSite; Merck & Co., Inc.) can also be useful preoperatively in appropriate cases of MGD. Newer treatments such as thermal pulsation systems (LipiFlow System; TearScience, Inc.), meibomian gland probes, and intense pulsed-light therapy may also be useful adjuncts for treating MGD in cataract patients.

CONCLUSION

The treatment of DED may delay cataract surgery in some cases, but it is often a worthwhile investment. Although DED is not an absolute contraindication to cataract surgery, the condition should be aggressively

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treated before the surgical plan and IOL selection are finalized. Because cataract surgery has been shown to induce or exacerbate preexisting DED, it is important for physicians to be vigilant for the syndrome when evaluating cataract patients, to plan surgery accordingly, and to aggressively treat the condition in the preoperative and postoperative periods. The improved quality and stability of the tear film result in a more regular ocular surface, allow for more accurate preoperative measurements, and improve refractive outcomes after cataract surgery. ■

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