Cataract Case of the Month CME Series

CHALLENGING CASES MADE ROUTINE

This Month’s Case

LEARNING METHOD AND MEDIUM
This educational activity consists of a case discussion and study questions. The participant should, in order, read the learning objectives at the beginning of this case discussion, read the case discussion, answer all questions in the post test, and complete the Activity Evaluation/Credit Request form, to receive credit for this activity, please visit:
http://www.tinyurl.com/EyeOnCataract-6 and follow the instructions provided on the post test and Activity Evaluation/Credit Request form.

CONTENT SOURCE
This continuing medical education (CME) activity captures content from an expert roundtable discussion held in San Diego, California, on April 16, 2015.

ACTIVITY DESCRIPTION
Cataract surgery is the most commonly performed surgery among adults in the United States, and the number of patients undergoing this procedure is continuing to increase. For patients who are identified as candidates for cataract surgery, optimization of the ocular surface is critical for obtaining optimal patient outcomes. A host of new tools can help cataract surgeons with their preoperative evaluations. Among these are several tests that are useful for diagnosing dry eye/meibomian gland dysfunction. The purpose of this activity is to update ophthalmologists on recent advances in the care of patients with cataracts.

TARGET AUDIENCE
This activity is intended for ophthalmologists.

LEARNING OBJECTIVES
Upon completion of this activity, participants will be better able to:
• Manage preoperative ocular surface conditions, with the potential to affect surgical outcomes in patients with cataracts
• Demonstrate optimal IOL selection, knowledge of appropriate refractive targets, and understanding of strategies for achieving intended goals
• Discuss the risks and benefits of cataract surgery with patients
• Describe the benefits of new diagnostic and surgical technologies with applications in cataract surgery

ACCREDITATION STATEMENT
This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of New York Eye and Ear Infirmary of Mount Sinai and MedEdicus LLC. The New York Eye and Ear Infirmary of Mount Sinai has accredited this activity for the ACCME to provide continuing medical education for physicians. In July 2013, the Accreditation Council for Continuing Medical Education (ACCME) accredited this activity through 2018-2019 for New York Eye and Ear Infirmary of Mount Sinai. This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of New York Eye and Ear Infirmary of Mount Sinai and MedEdicus LLC. The New York Eye and Ear Infirmary of Mount Sinai has accredited this activity for the ACCME to provide continuing medical education for physicians. In July 2013, the Accreditation Council for Continuing Medical Education (ACCME) accredited this activity through 2018-2019 for New York Eye and Ear Infirmary of Mount Sinai.

AMA CREDIT DESIGNATION STATEMENT
The New York Eye and Ear Infirmary of Mount Sinai designates this enduring material for a maximum of 0.75 AMA PRA Category 1 Credit™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

GRANTOR STATEMENT
This continuing medical education activity is supported through an unrestricted educational grant from Bausch + Lomb Incorporated.

DISCLOSURE POLICY STATEMENT
It is the policy of New York Eye and Ear Infirmary of Mount Sinai that the faculty and anyone in a position to control activity content disclose any real or apparent conflicts of interest relating to the topics of this educational activity, and also disclose discussions of unlabeled/unapproved uses of drugs or devices during their presentation(s).

CME Reviewer for New York Eye and Ear Infirmary of Mount Sinai

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Source: https://www.tinyurl.com/EyeOnCataract-6

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A 51-year-old man with a 20-year history of keratoconus presents with complaints of glare and decreased vision. The glare first developed approximately 1 year ago and is now severe. He needs rigid gas permeable (RGP) contact lenses for vision correction and has been wearing them successfully for 12 years. He has progressive posterior subcapsular cataracts (PSCs) OU, which were first diagnosed 3 years ago. His history also includes seasonal allergic rhinoconjunctivitis, for which he has been using intranasal fluticasone and oral loratadine. In addition, he has hypertension that is being treated with a thiazide diuretic.

On examination, his best corrected visual acuity (measured while wearing RGP contact lenses) is 20/40 OD and 20/50 OS, 20/60 OD and 20/100 OS on manifest refraction, and 20/100 OD and > 20/400 OS with glare (brightness acuity testing). His intraocular pressure is 11 mm Hg OD and 10 mm Hg OS. Digital contact pachymetry measurements are 428 µm OD and 388 µm OS.

Endothelial cell counts by specular microscopy are 1800 cells/mm² OD and 1500 cells/mm² OS. Tear osmolarity is elevated at 308 mOsm/L OD and 317 mOsm/L OS. The matrix metalloproteinase-9 assay is negative OU.

Eversion of the superior lids reveals + tarsal papillae OU. Slit-lamp examination shows 1+ corneal striae OD and an early corneal scar OS (Figure 1), along with 1+ PSC OU. Despite corneal scarring only in the left eye, the patient is more bothered by his vision in the right eye because of dominance. His posterior segment examination is normal.

On slit-lamp topography, done 1 month after the patient stopped wearing his RGP contact lenses, sim K values (Kmax/Kmin) are 46.8/44.3 D OD and 51.6/44.2 D OS (Figure 2). Corneal pachymetry measured by optical low-coherence reflectometry (OLCR) is 490 µm OD and 473 µm OS. Wavefront aberrometry shows significantly more total.
corneal higher-order aberration OS than OD (0.878 µm vs 0.299 µm) and particularly higher total coma OS than OD (0.790 µm vs 0.017 µm).

Astigmatism measurements obtained with 4 different methods (manual keratometry, automated keratometry, topography, and OLCR) are fairly consistent in the right eye for magnitude (range, 2.57-3.5 D) and axis (117°-123°), but the range of magnitude values is wider in the left eye (7.5-9.26 D).

Intraocular lens (IOL) calculations (Figure 3) performed using the OLCR IOL calculator with a target refraction of 0.00 D generates biometric stability, and need for concurrent or SRK formulas, but found poorer predictability overall in eyes with moderate or severe keratoconus vs those with only mild disease.

Another paper reviewing refractive outcomes after cataract surgery in eyes with keratoconus reported good results using actual keratometry (K) values and targeting low myopia in eyes with mild (n = 35) or moderate (n = 40) keratoconus. Use of actual K values with a mean target refraction of -5.4 D in 8 of 17 eyes with severe keratoconus (defined as mean K > 55 D) resulted in a large hyperopic biometry prediction error (mean, +6.8 D). For the remaining eyes with severe keratoconus, use of a standard K value of 43.25 D and a mean target refraction of -1.8 D yielded much better results (mean biometry predicted error, +0.6 D).

In a study including 23 eyes, surgeons obtaining measurements for IOL power calculation, although stabilization may occur earlier in some patients. Because change in refraction after CXL can continue for years, patients should be counseled that continued contact lens use may be likely even after successful, uncomplicated cataract surgery.

KERATOCONUS MANAGEMENT

Corneal cross-linking (CXL) can be performed to stabilize mild-to-moderate keratoconus. When CXL is performed prior to cataract surgery, surgeons should ideally wait at least 6 months for the topography to stabilize before obtaining measurements for IOL power calculation, although stabilization may occur earlier in some patients. Because change in refraction after CXL can continue for years, patients should be counseled that continued contact lens use may be likely even after successful, uncomplicated cataract surgery.

ALLERGY MANAGEMENT AND OCULAR SURFACE OPTIMIZATION

This case is a reminder that ocular allergies, including allergic conjunctivitis and vernal keratoconjunctivitis, are often associated with keratoconus. Thus, clinicians managing patients with keratoconus should attend to preventive and therapeutic measures for allergy management and ocular surface optimization prior to any surgical planning. In a patient with keratoconus, optimizing the condition of the ocular surface may also be important for enabling successful RGP contact lens wear postoperatively.
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The patient in this case presents with several issues that can be affecting the condition of his ocular surface, including long-term contact lens wear, use of medications that can cause ocular dryness (an oral antihistamine and an oral diuretic), and allergic conjunctivitis.

When there is concern about the effects of any systemic medication on dry eye, the ophthalmologist should speak to the prescribing physician about finding an alternative treatment or safe dosage reduction.

Oral antihistamines used to treat an allergy are well-substantiated risk factors for dry eye. Options for managing significant allergic rhinitis that do not cause ocular dryness include an intranasal corticosteroid, an oral antihistamine, and the oral leukotriene receptor antagonist montelukast. Although intranasal corticosteroids are generally considered to have a better ocular safety profile than ophthalmic or systemic corticosteroids, they have been associated with the development of a PSC. As the bottom line, however, any corticosteroid used in or around the eye may have ocular side effects, so ophthalmologists need to carefully monitor all patients being treated with these medications.

Allergen avoidance, when possible, is one of the most effective interventions for controlling allergic disease. Allergy testing can now be performed in the ophthalmologist’s office with a US Food and Drug Administration–approved skin test for 60 common allergens, and patients often appreciate the convenience of this testing.

**SURGICAL DECISION**

This patient urgently needed to have cataract surgery to continue functioning in his daily activities and drive safely at night. Thus, it was decided that performing CXL for the keratoconus in his right eye would not meet his needs.

The patient was offered cataract surgery with a toric IOL for the more symptomatic dominant right eye. A toric IOL was deemed acceptable in the context of his having reliably produced keratometric axis measurements from 4 different devices and a normal healthy endothelium with minimal corneal scarring.

First, however, the patient was treated to rehabilitate his ocular surface. He underwent allergy skin testing and, on the basis of the findings, practiced allergen avoidance, which, together with use of topical antiallergy medications, resulted in an improvement of his allergy signs and symptoms. He was able to discontinue the oral antihistamine.

Furthermore, his dry eye improved with modification of his oral antihypertensive medication and an aggressive dry eye management regimen that included topical loprednol, punctal plugs, and an oral nutritional supplement containing omega fatty acids, antioxidants, and other nutrients. His tear osmolality decreased to 300 mOsm/L OD and 299 mOsm/L OS. His topographic parameters after ocular surface rehabilitation did not change.

One week after undergoing uneventful phacoemulsification with implantation of a 15.5 D single piece hydrophobic acrylic aspheric IOL with 2.57 D cylinder power at the corneal plane (3.75 D cylinder power at the IOL plane) at 12°, the patient was pleased to see 20/25-2 uncorrected OD. With his improved vision, the patient was able to function without his RGP contact lens OD whenever convenience dictated and binocular vision was not required. Most of the time, however, he continued wearing his RGP contact lenses OU because they provided better overall binocular vision. The patient eventually underwent successful monofocal IOL implantation OS with a target of -2.0 D myopia.


**SUMMARY**

Cataract surgery will eventually be required in some eyes with keratoconus, and the presence of PSCs at a relatively young age in this patient and other patients with keratoconus may be associated with the use of corticosteroid medications to control allergic disease.

The decision of whether to perform cataract surgery alone or combined with CXL or keratoplasty will need to be individualized, taking into account the keratoconus stage and topographic stability, along with the patient’s goals and preferences. Cataract surgeons must recognize the complexities of IOL power selection in eyes with keratoconus, along with the benefits and limitations of correcting astigmatism with a toric IOL, and discuss these issues with patients for shared decision making. As in all patients undergoing cataract surgery, optimization of the ocular surface prior to obtaining preoperative biometry is mandatory for maximizing the refractive outcome and patient satisfaction. Control of the ocular surface disease and allergy should be initiated prior to biometry and throughout the perioperative period, and then with adequate maintenance doses indefinitely thereafter.

**REFERENCES**