

clinical diagnosis

Good nutrition optimizes ocular surface in premium cataract patients

Improvements gained prior to surgery can result in positive outcomes

By William Segal, MD; Special to Ophthalmology Times®

Ocular surface disorder (OSD) is present in the majority of my cataract patients; sometimes the signs are distinguishable prior to surgery and sometimes the symptoms appear following surgery. Undetected and untreated, signs and symptoms can cause significant variability in preoperative measurements as well as inhibit rapid healing following surgery.



Dr Segal

Thoroughly screening and potentially treating patients for OSD can mean the difference between a happy or unhappy patient. Untreated OSD will result in suboptimal outcomes and decreased patient satisfaction.

OCULAR SURFACE ASSESSMENT

Every patient undergoes a comprehensive evaluation as part of the cataract consultation. I use a variety of subjective and objective diagnostic tests to identify OSD or other structural deformities. All patients receive corneal fluorescein and lissamine green staining, and they also are tested for inflammation levels.

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– William Segal, MD

Where the tear film is unstable, I watch for conjunctivochalasis or entropion and ectropion. Dropout areas, irregular topography, measurement inconsistencies, and abnormalities in tear film tests all

can signal OSD, and, in my opinion, are reason to pause and treat the patient before proceeding with surgery.

Typically, I will see a patient back in 3 weeks and repeat testing. Using comparative topographies, I confirm corneal stabilization so that the patient and I are comfortable with the measurements. I also look at the surface asymmetry index, which tells me how asymmetric the corneal astigmatism is, and at the surface regularity index. These provide me the topographic standpoint of the cornea and guide me if I should move forward.

I also look at how the numbers change in response to treatment. For example, I will look at the change in Ks. Once we see 0.25 D or less between measurements, I am satisfied that the ocular surface is stable and we can proceed to surgery.

TREATMENT FOR ALL

As part of my approach to optimizing the ocular surface before cataract surgery and to improve comfort postop, I require all premium lens patients to start taking a nutritional supplement containing the anti-inflammatory omega fatty acid GLA and other nutrients after their first measurement. I also recommend HydroEye (Science-Based Health) because it demonstrated in a clinical trial increased corneal smoothness, decreased inflammation, and improvement in the symptoms of OSD.¹ All of these options are important for cataract patients.

For patients requiring treatment beyond nutritional supplementation, topical immunomodulators, such as lifitegrast or cyclosporine, are usually well tolerated and produce long-term improvements in the ocular surface.

In eyes with significant levels of inflammation, patients may benefit from a brief treatment with a corticosteroid. In addition, punctal occlusion may be utilized to address aqueous tear deficiency. Patients with crusting blepharitis undergo mechanical debridement, short-term antibiotics, hypochlorous acid treatments, or a combination of these to remove inflammation-causing bacteria on the eyelid.

Once patients have been taking nutritional supplementation for 2 weeks and any other necessary OSD treatment has been performed, they return for a second set of keratometry readings and to proceed with cataract surgery. I have my patients continue nutritional supplementation and an immunomodulator, if they were using one, until cataract surgery has been completed in both eyes.

Two weeks following the second surgery, I give patients the option to taper down the supplement and see if their eyes continue to be without symptoms.

Many of my patients with OSD notice a negative change if they discontinue the supplement and choose to continue because of the benefits they see, including better visual quality and an improved level of comfort.

BE WILLING TO WAIT

When patients understand that we need a healthy ocular surface in its natural shape to get the best surgical outcome, they rarely push back. Symptomatic patients are especially

understanding. They are experiencing irritation and visual fluctuations and recognize that this is a consequence of degradation, not cataract. Overall, patients want the best results.

THE “WOW” FACTOR

Patients with premium lenses have high expectations, and failure to deliver can stir up frustration. Managing the ocular surface on the front end is key to producing a “wow” factor postoperatively. First, eliminating residual refractive error is essential when using any multifocal IOL. I always measure the cornea 4 ways, and, ideally, the numbers will coincide.

In patients with OSD, this will not be the case. I frequently get different measurements on the same eye. Moreover, this is an objective test, and it is a red flag to me that I need to improve the cornea surface to obtain the most precise measurements. If not, I am probably increasing the likelihood that the patient will come out of surgery with residual refractive error.

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TAKE-HOME

► Proactively optimizing the ocular surface through a combination of nutraceutical supplementation with topical drop therapies can improve outcomes for patients.

FUTURE

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said. The preliminary data obtained from use of the device show very good compliance and improved VA and stereopsis.

Another new treatment, perceptual learning (Vision Therapy Solutions), is based on repetitive practice of software-based, patient-specific visual tasks with the nonamblyopic eye covered. Improvements in visual performance have been obtained by inducing plasticity in the visual cortex.



“Potentially game-changing treatments are emerging for pediatric inherited eye disorders.”

Alina V. Dumitrescu, MD

The initial studies have shown a 2-fold improvement in contrast sensitivity and letter recognition even in patients as old as 55.

An interesting treatment that does not use occlusion is dichoptic training, in which stimuli are presented separately to each eye and the lower contrast stimuli are presented to the fixing eye to counteract suppression and facilitate binocular combination.

Dumitrescu said if the subjects can successfully complete the task, the contrast in the dominant eye is increased slowly until the contrast levels in both eyes are equal. Initial data from studies are promising, she noted, and show reduced suppression and improved stereoacuity. This led to creation of the binocular treatment system I-BiT (funded by an i4i award from National Institute for Health Research in 2017), which uses video clips and interactive games.

PEDIATRIC, ADULT STRABISMUS

Surgery is the main therapy for strabismus. There is active research examining the use of eye tracking and artificial intelligence for strabismus and

motility measurements.

Two nonsurgical treatments for strabismus are the latest measures to emerge. The first is injection of bupivacaine and botulinum A toxin into the extraocular muscles.

The second has been used to augment surgery for infantile esotropia and partially accommodative esotropia and as a temporary measure in paralytic strabismus to prevent secondary muscle contracture.

Bupivacaine corrects strabismus by increasing a muscle's strength. The efficacy of this approach has been reported in small studies in patients with horizontal comitant strabismus and, importantly, the treatment was stable over time, Dumitrescu

pointed out.

“This can be a low-cost alternative to conventional surgery; however, despite that the success rates are inferior to conventional surgery, this pharmacologic approach appears promising,” she said.

A systemic treatment, teprotumumab (Tepezza, Horizon Therapeutics), a human monoclonal antibody inhibitor of insulinlike growth factor 1 receptor, for adults with active thyroid eye disease, improved diplopia in these patients.

REFRACTIVE ERRORS

Hyperopia is more common in all age groups, and myopia is not common in young patients. In patients over 15, myopia increases in prevalence, in children in junior high school and especially in Asia, but hyperopia still remains more prevalent overall.

“A challenge of the next decade will be myopia progression control via 4 promising approaches,” Dumitrescu said. These are use of diluted atropine drops, orthokeratology, more time spent outdoors, and minimization of peripheral hyperopic defocus using bifocal and progressive lenses.

PEDIATRIC INHERITED EYE DISORDERS

“Potentially game-changing treatments are emerging for pediatric inherited eye disorders,” Dumitrescu noted.

These disorders can be strictly ocular or systemic disorders that have ocular involvement. They can affect any part of the eye and are occur infrequently, although when all ages and diseases are considered, 30 million people in the US alone are affected by a “rare disease.”

Thus far, gene therapy is the most promising approach and only FDA-approved treatment, Dumitrescu explained.

Other potential therapies include oral N-acetylcysteine to improve cone function in retinitis pigmentosa (RP), which currently is in a phase 1 trial. It caused VA improvements and maintenance of the ellipsoid zone in patients with moderately advanced RP. The drug was well tolerated and will be moving into the next trial phase.

Antisense oligonucleotides are used to downregulate a molecular target. Intravitreal injections can redirect normal splicing of aberrantly processed pre-messenger RNA in the photoreceptors. This treatment is being tested to treat Leber congenital amaurosis resulting from mutations in the ciliopathy gene centrosomal protein 290, and Dumitrescu said the results seem promising.

Enzyme replacement therapy has been used in 2 trials, one for CLN2-associated Batten disease and one for mucopolysaccharidosis I, II, VI, and IVA, and the trials have reported optimistic results. The studies used intravitreal and intravenous routes of administration, and the drugs did not penetrate the eye, but these are promising for future combined therapies.

“All of these strategies bring hope for the future of pediatric ophthalmology and create the basis for better and more efficient treatment,” Dumitrescu concluded. ■

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NUTRITION

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Even without residual refractive error, ocular surface discomfort and visual fluctuations can create general health anxiety that may shape the patient's perceptions about the procedure. By taking precautions to ensure the cornea is in optimal condition prior to surgery, we can create a more resilient ocular surface and reduce postoperative keratopathy and negative visual fluctuations.

A PROACTIVE APPROACH DELIVERS THE BEST OUTCOMES

Proactively optimizing the ocular surface through a combination of nutraceutical supplementation and topical drop therapies such as lifitegrast or cyclosporine gives me more confidence in the preoperative measurements, leading to better results and patient satisfaction with their premium procedures. In conclusion, it is a very dramatic effect when a patient experiences quality vision on day 1, and by day 5 they are able to read off their phone in low light. ■

REFERENCE

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