

EPITHELIAL BASEMENT MEMBRANE DYSTROPHY AND OCULAR SURFACE DISEASE

Can this patient's desire for an advanced technology lens be satisfied?

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CASE PRESENTATION

An 80-year-old man seeking a second opinion presents for a cataract consultation. The patient has difficulty driving at night, watching TV, viewing his phone, and working at a computer. Every day, he wakes with dry eyes and crusty eyelids, neither of which is relieved by the instillation of artificial tears. He also experiences ocular fatigue in the evening.

The patient's right eye is dominant. His BSCVA is 20/30 and J5 OD and 20/50 and J5 OS, which worsens to 20/400 OU with glare testing. A refraction improves the BCVA in his left eye (20/50) but not the right. His manifest refraction is $-5.00 -2.25 \times 90^\circ$ OD and $-5.75 -1.00 \times 75^\circ$ OS.

An examination of each eye reveals 1+ collarettes, 3+ to 4+ meibomian gland dysfunction (MGD), and telangiectasias on both eyelids. The patient has epithelial basement membrane dystrophy (EBMD) that is mild in the right eye and significant in the left eye, where corneal findings extend 3 mm from the limbus superiorly and inferiorly. Each eye has a 2+ nuclear sclerotic cataract. A fundus examination reveals an epiretinal membrane (ERM) in the right eye only (Figure 1).

The tear breakup time (TBUT) is rapid in both eyes. The patient scores an 8 on the Standardized Patient Evaluation of Eye Dryness questionnaire.

His medical history is significant for polymyalgia rheumatica and oral lichen planus, both previously treated with oral prednisone. The patient carries two pages of typed notes and questions. He has researched his comorbidities and asks your opinion regarding their potential impact on his cataract surgery

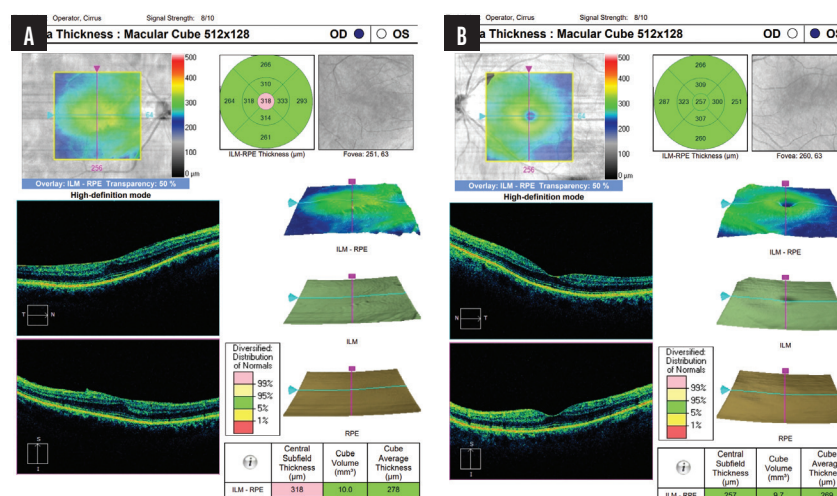


Figure 1. OCT imaging of the macula in each eye. A mild ERM and flattening of the fovea are evident in the right eye (A), whereas the scan of the left eye is normal (B).

OD	(Right Eye)	(Left Eye)	OS
Pre-Op:	08/21/2024 09:55	Pre-Op:	08/21/2024 09:55
K1:	41.80D @93°	K1:	42.34D @86°
K2:	43.57D @3°	K2:	44.38D @176°
R/K:	7.91mm / 42.67D	R/K:	7.79mm / 43.33D
Cyl:	+1.77D @3°	Cyl:	+2.04D @176°
PCA:	N/A	PCA:	N/A
AL:	26.10mm	AL:	25.78mm
ACD:	3.00mm	ACD:	3.07mm
WTW:	11.69mm	WTW:	11.50mm
	P: 3.91mm Px: +0.30mm Py: +0.16mm		P: 3.46mm Px: -0.12mm Py: +0.08mm

Figure 2. Biometry measurements reveal a higher amount of astigmatism in the right versus left eye.

outcomes. He has also conducted extensive research on IOL options and is interested in receiving an advanced technology lens to reduce his spectacle dependence as much as possible. He would like to see at distance and near without glasses.

How would you treat the patient's ocular surface disease (OSD), specifically the blepharitis and EBMD? If you would consider performing a superficial keratectomy (SK),

how would you time the procedure relative to blepharitis treatment and cataract surgery? Would you alter your approach to postoperative management because of the patient's autoimmune conditions? Which IOL options would you consider, and does the patient's OSD raise concern regarding the use of a toric IOL or Light Adjustable Lens (LAL; RxSight)?

—Case prepared by Neda Nikpoor, MD

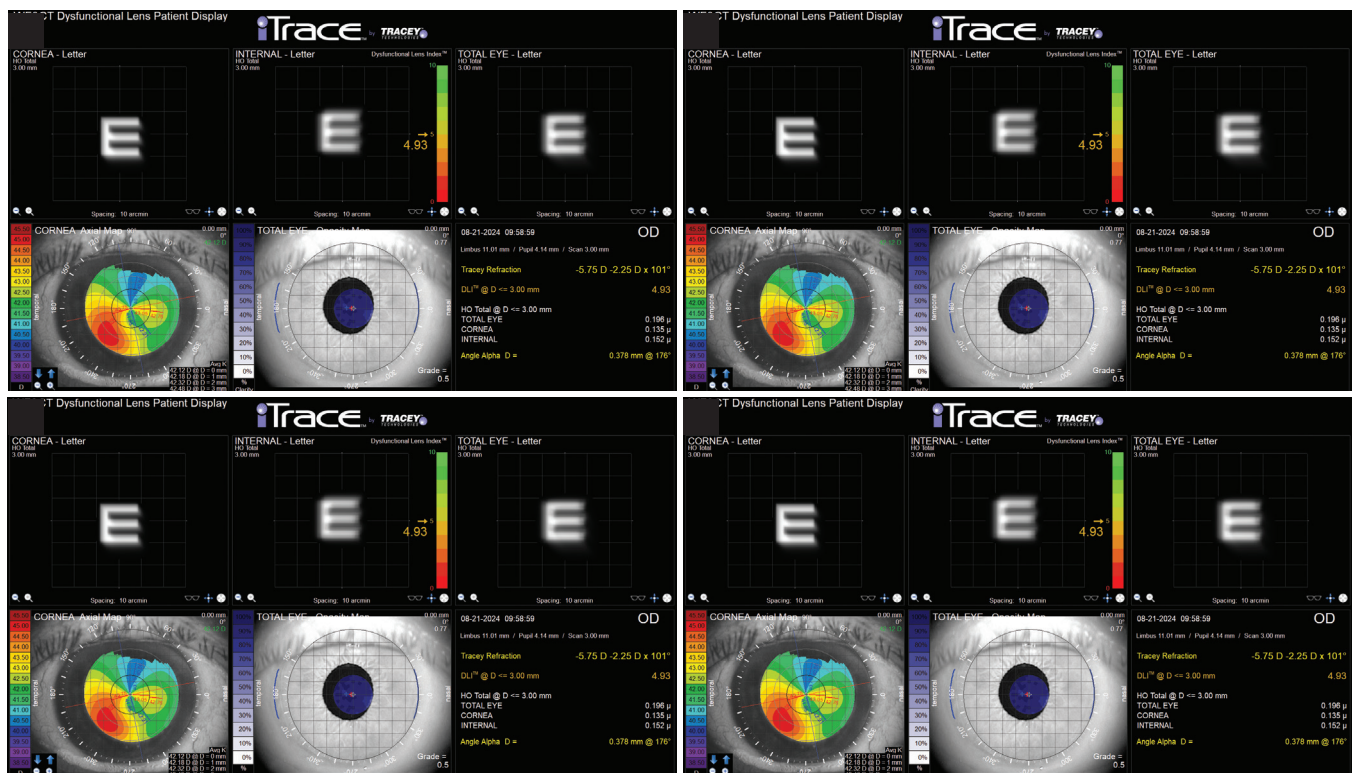


Figure 3. Wavefront aberrometry and corneal topography with the iTrace (Tracey Technologies) find higher-order aberrations and astigmatism in both eyes.



**RACHEL CHAPMAN AND
PRIYA MATHEWS, MD, MPH**

A multifaceted approach is required to manage EBMD and OSD before cataract surgery. Because the patient desires spectacle independence, SK would be performed to smooth and optimize the ocular surface. Multimodal OSD treatment would be initiated before and continued during his recovery from SK to address the complex etiology. The MGD and rapid TBUT suggest an evaporative component. Management might include warm compresses, a vitamin supplement (HydroEye, ScienceBased Health), and a lipid-containing artificial tear. Punctal plugs or Lacrifill canalicular gel (Nordic Pharma) could address aqueous insufficiency. Given the patient's autoimmune history, serum tears might be an excellent option.

The lid crusting and collarettes suggest blepharitis with *Demodex* infestation. Lid scrubs in combination with 6 weeks of therapy with lotilaner ophthalmic solution 0.25% (Xdemyv, Tarsus Pharmaceuticals) would be prescribed. The telangiectasias may be consistent with ocular rosacea, in which case a short course of systemic doxycycline or azithromycin or intense pulsed light (IPL) treatment might be indicated. Additionally, we would communicate with his rheumatologist to confirm that the patient's autoimmune conditions are under control and determine whether pretreatment with oral prednisone might be beneficial.

Two months or more following the SK and OSD management, biometry and topography would be repeated to determine whether an improvement has occurred. The patient's severe OSD and posterior pathology must be considered when choosing an IOL. He is not a candidate for a multifocal IOL due to the ERM in his right eye. To maximize his spectacle independence,

a blended vision strategy using an LAL or a monovision strategy using a toric lens could be pursued if treatment has controlled his OSD and his biometry and topography measurements are consistent.

Following cataract surgery, the patient should be monitored closely for exacerbated OSD and a delayed healing response due to his autoimmune diseases. He must commit to continuing OSD treatment after surgery, especially if he will undergo LAL adjustments.



STEVEN H. DEWEY, MD

The ERM precludes the use of a diffractive multifocal IOL in the right eye.

The effect of dry eye disease on the patient's biometry measurements

would be evaluated, followed by the EBMD. MGD treatment would be initiated. To obtain accurate measurements in the short term, the patient would be instructed to administer erythromycin ointment at bedtime. Specifically, a 2- to 4-mm strip would be rubbed across the closed eyelids along the base of the lashes six or seven times; a greater amount of ointment could blur his vision. The placement of temporary punctal plugs would also be considered.

One month later, the patient's symptoms and collarettes would be reevaluated, with improvement expected. The quality of the ocular surface and the need for EBMD treatment would be assessed using the modulation transfer function (MTF) on the iTrace. If the MTF is poor, SK would be considered. If the MTF is satisfactory, the EBMD has been addressed, and keratometry readings obtained with at least two instruments are stable, then toric IOLs would likely provide him with crisp vision.

A monofocal toric IOL with a distance target would be implanted in the right eye, giving the patient a de facto trial of monovision and allowing him to judge his tolerance of anisometropia. If he is satisfied, a monofocal toric IOL with a near target would be implanted in the left eye. Alternatively, a high-contrast extended depth of focus toric IOL such as a Tecnis Symphony OptiBlue Toric (Johnson & Johnson Vision) with an intermediate refractive target could be implanted to give him intermediate through near vision in the left eye. If, however, the patient cannot tolerate the anisometropia he experiences after surgery on the first eye, a high-contrast, full-range extended depth of focus or trifocal IOL such as a Tecnis Odyssey Toric (Johnson & Johnson Vision) targeted for distance could be implanted in the left eye.

I do not use the LAL.



MARJAN FARID, MD

The patient has *Demodex* blepharitis with secondary MGD, autoimmune-related inflammatory OSD, and anterior basement membrane dystrophy (ABMD). The first step would be a thorough educational review of his OSD. He must understand that cataract surgery cannot be successful if his OSD is not addressed beforehand.

I would begin by treating the patient's *Demodex* blepharitis with a 6-week course of topical lotilaner ophthalmic solution 0.25%. Therapy should also improve his MGD and lid margin inflammation. Combined with hot compresses or an in-office procedure to increase meibum flow, treatment should also improve his TBUT and tear stability. Given the patient's autoimmune diseases, a short course of topical steroids and a long-term immunomodulator would be prescribed to address tear film inflammation.

ABMD management would commence approximately 4 to 6 weeks after the initiation of OSD treatment. An SK seems unwarranted because the ABMD is peripheral and not visually significant in the center of the visual axis. If, however, there is central irregularity and the patient desires an advanced technology IOL, an SK would be performed at the slit lamp, and a bandage contact lens or self-retaining amniotic membrane graft would be placed to facilitate healing.

IOL selection would proceed after epithelial remodeling and stabilization have occurred, as evidenced with consistent topography measurements (approximately 1 month after the SK procedure). The central against-the-rule astigmatism is fairly regular, making a toric IOL a good choice. I would hesitate to select a multifocal or diffractive lens given the likelihood of significant ocular surface irregularity. An LAL would also

be a reasonable option because it would allow the patient's refractive astigmatism to be fine-tuned postoperatively.

Most important in this situation is educating the patient so that he understands the necessity of long-term OSD management to optimize his quality of vision and provide stability.



**TOBIAS H. NEUHANN, MD,
FEBOS-CR, FWCRS**

First, the patient's blepharitis would be treated with BlephEx (BlephEx). The device rotates a medical-grade sponge at high speeds to remove excess bacteria, biofilm, and toxins from the eyelids and outer meibomian glands. In my experience, this treatment can help manage both swollen eyelids and meibomian gland blockages. Depending on the findings after the BlephEx procedure, IPL might be beneficial. Regardless of whether IPL is performed, the patient would be instructed to administer eye drops containing hyaluronic acid regularly until cataract surgery is performed.

Based on the case presentation, the EBMD has not yet affected the central cornea, so treatment would not be pursued at this time. Biometry and topography would be repeated 2 to 3 months after BlephEx treatment.

The patient desires an advanced technology lens. The LAL is not available in Germany, where I practice. Based on my experience with the lens more than 12 years ago, however, the EBMD could be a relative contraindication because the light dosage would not be perfectly predictable. I imagine this may still be true. In my opinion, the best options for this patient would be the Tecnis PureSee IOL (Johnson & Johnson Vision) and the RayOne EMV lens (Rayner). I have found that both IOLs provide excellent distance vision, contrast sensitivity comparable to

that achieved with a monofocal lens, and acceptable near vision for everyday tasks. In my experience, however, patients typically must wear glasses for prolonged reading. The key difference between the lenses is that the PureSee is hydrophobic and the RayOne EMV is hydrophilic.

Topography shows an asymmetric bow-tie pattern, which could make achieving an emmetropic result challenging. Although toric versions of the PureSee and RayOne EMV lenses are available, I would select a spherical model regardless of whether the refractive target is -2.50 D, -1.50 D, or emmetropia. Postoperatively, a minor spectacle prescription could optimize the patient's visual acuity. If he later requests greater spectacle independence, a toric add-on IOL could be implanted in the sulcus based on the subjective refraction. I have achieved excellent results with Rayner's supplementary IOL and the AddOn IOL (1stQ).

Complex presentations are not uncommon in the elderly population. The main goal of these patients is typically a good postoperative outcome, but this may not be achievable with a single treatment. Preoperative planning, clear communication, and stepwise treatment are therefore essential steps to maximizing patient satisfaction.



WHAT I DID: NEDA NIKPOOR, MD

As the panelists note, tempering the patient's expectations was essential. I described the limitations posed by his OSD. Treatment with preservative-free artificial tears, warm compresses, lid scrubs, and cyclosporine ophthalmic emulsion 0.09% (Cequa, Sun Ophthalmics) was initiated. He was unable to obtain lotilaner ophthalmic solution 0.25% because of cost and coverage issues. The

patient also underwent BlephEx and IPL procedures, after which another slit-lamp examination and repeat testing were performed. The scans were variable, and his BCVA had decreased to 20/70 OS.

At this point, the patient's desire for improved vision outweighed his interest in reducing his dependence on spectacles. The pros, cons, and timing of SK were discussed. He decided against the procedure to avoid delaying cataract surgery with the understanding that SK, an IOL exchange, or a piggyback lens could be pursued later if necessary.

The patient's OSD and ERM were contraindications for a diffractive multifocal lens, so I recommended either a toric monofocal IOL or an LAL. I explained that, given his high magnitude of astigmatism and willingness to wear glasses, the simplest way to achieve his goals would be to place a toric monofocal IOL targeted for distance in his worse-seeing, nondominant eye, but I added that an LAL would allow him to trial his visual outcome.

A monovision strategy was an option to reduce his dependence on spectacles, but I advised against the procedure for several reasons. First, he might be unable to tolerate the postoperative result owing to his OSD, ERM, and EBMD. Additionally, the refractive outcome would be unpredictable, and he wished to undergo surgery on his worse-seeing eye first. A blended vision strategy was also an option, but he might be dissatisfied with the visual compromise required.

Because the patient is minimally symptomatic from ABMD and willing to wear glasses, this is a situation in which the enemy of good is better. I therefore sought a careful balance between the pros and cons of ocular surface optimization on the one hand and the patient's goal on the other. Ultimately, whether to maximize speed or chase perfection was his choice. He opted to receive a toric monofocal IOL targeted for distance in each eye. Surgery has been scheduled. Scans continue to be repeated, and ocular surface optimization with perfluorohexyloctane ophthalmic

solution (Miebo, Bausch + Lomb), cyclosporine ophthalmic emulsion 0.09%, preservative-free artificial tears, warm compresses, and lid hygiene is ongoing. ■

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