Optimizing Cataract Surgery: Lessons from LASIK

Five strategies to improve your results.

BY ROBERT K. MALONEY, MD

Twenty years ago, it was said that if radial keratotomy were the only method to correct myopia, and then someone invented eyeglasses, he would win the Nobel Prize. That may have been true; even in the best of hands, radial keratotomy was an unpredictable procedure. Only approximately half of eyes achieved 20/20 UCVA,[1] and enhancement rates were as high as 40%.

Luckily, those days are behind us. Now, with modern laser refractive surgery, more than 90% of eyes see 20/20 uncorrected.[2] Enhancement rates of 5% are typical.

It may be fair to say that if LASIK were the only way to correct myopia and someone came along and invented eyeglasses, its inventor would be no more famous than the inventor of the monocle (whoever that was). Can the same things be said about the refractive results of cataract surgery? Can we confidently achieve 20/20 UCVA in 90% to 95% of eyes after cataract surgery? Is the enhancement rate for premium IOLs generally less than 10%?

MISSING THE TARGET

In short, the answer is no. We are still in the radial keratotomy era of cataract surgery. In fact, in the hands of skilled surgeons, only 33% of patients see 20/20 uncorrected after cataract surgery, even though 75% of eyes have a BCVA of 20/20 or better.[3] The reason for this is clear: Uncorrected vision is not as good because the refractive outcomes miss the desired target. The standard deviation of manifest refraction spherical equivalent (MRSE) after cataract surgery is approximately 0.60 D in the best of hands.[4-6] From basic statistics, we know that one-third of eyes are more than one standard deviation away from the mean. This implies that one-third of eyes after modern cataract surgery will have a residual MRSE of 0.75 D or more away from the desired target. Compare that with our wavefront-guided lasers, where 90% of eyes are within 0.50 D of target. With refractive cataract surgery, even if the surgeon manages to get the MRSE correct, there is still the problem of residual astigmatism. Lest anyone doubt that we are still in the radial keratotomy era of cataract surgery, astigmatism is typically handled with relaxing incisions, another name for arcuate keratotomy. Relaxing incisions are inaccurate. In a recent study, half of eyes still had 1.00 D or more of astigmatism.[7]

STRATEGIES TO BETTER YOUR RESULTS

What are we cataract surgeons to do? Below is a list of five strategies to consider that will help you to optimize your cataract outcomes.

No. 1: Biometry. Better biometry is certainly part of the answer—and a good place to start. Partial coherence interferometry (IOLMaster; Carl Zeiss Meditec, Jena, Germany) is a more reproducible way of measuring axial length than immersion or contact ultrasound. The instrument should be calibrated daily. For eyes that cannot be measured with the IOLMaster, immersion ultrasound is more accurate than contact biometry.

No. 2: IOL constants and tracking results. Using better A-constants and other IOL constants is another important step; surgeons should regularly update the IOL constants in their IOLMaster from the ULIB Web site, available at http://www.augenklinik.uni-wuerzburg.de/eulib/index.htm. Keeping track of your own results is important, particularly with a new IOL before pooled data from multiple centers are available to more accurately determine an IOL constant.

No. 3: Incorporate toric IOLs into your practice. Toric IOLs offer more accurate correction of astigmatism than relaxing incisions, just as LASIK corrects myopia better than radial keratotomy.[7] Currently, approved presbyopic IOLs in the United States do not correct astigmatism, so surgeons and patients must choose between toric and presbyopia-correcting IOLs. However, our European colleagues do have available toric presbyopia-correcting IOLs, including the Acri.LISA (Carl Zeiss Meditec); other toric IOLs will be available in the near future.

No. 4: Approach multifocal IOLs cautiously. In the early days of laser refractive surgery, the small optical zone treatment often created a multifocal effect, and some patients were unhappy. As lasers became more monofocal, with larger optical zones and wavefront-guided treatments, patients were happier with the outcomes. In the future, improved accommodating IOLs will lessen the need for multifocals.

TAKE-HOME MESSAGE

- Partial coherence interferometry is a reproducible measurement of axial length.
- Regularly update the IOL constants in your IOLMaster.
- Approach multifocal IOLs cautiously and consider using toric IOLs when appropriate.

No. 5: Keep your eye on new technologies. We may soon have IOLs that can be adjusted noninvasively after they are in the eye, such as the Light Adjustable Lens (LAL; Calhoun Vision, Inc., Pasadena, California). It is made from a photosensitive polymer that responds to UV light postoperatively by changing shape. In clinical trials, the LAL allowed correction up to 2.00 D of myopia, hyperopia, and astigmatism.[8-10] The LAL may also allow control of spherical aberration, providing an expanded depth of near focus (personal communication, Pablo Artal, MD, PhD, May 2009). The LAL is available commercially in Europe and is currently in US Food and Drug Administration (FDA) phase 2 trials. When that time comes, we will confidently be able to say that cataract surgery is indeed a modern refractive procedure. ■

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