Precise and Accurate Guidance to Optimize Outcomes

The ORA System offers direction during refractive cataract surgery.

BY ROBERT J. WEINSTOCK, MD

Today's cataract surgery patients have high expectations for their visual outcomes; often, they anticipate spectacle freedom after surgery. The ORA System (WaveTec Vision) is an innovative, intraoperative, computer guidance system that helps cataract surgeons optimize outcomes, refine the IOL power calculation, better manage astigmatism, and even minimize patients' need for refractive enhancements.

STATE-OF-THE-ART DESIGN

The ORA System uses Talbot-Moiré interferometry, a form of wavefront analysis that accommodates the range of refractive errors observed in aphakic and pseudophakic eyes. The intraoperative aberrometer's specialized Optiwave technology enhances the precision with which surgeons calculate IOL power and place toric IOLs or limbal relaxing incisions (LRIs). The system's super luminescent light-emitting diode technology augments the quality of the wavefront image by using a brighter light source that yields crisp, clear fringe patterns. In addition, refined optics—such as new precision lenses that more accurately transmit light—maximize the consistency of readings, further improve wavefront imagery, and reduce the chance of inducing higher-order aberrations. I have found that the system's accuracy and repeatability translate into improved outcomes for my patients.

THE IOL's SELECTION

For IOL power selection, the ORA System's real-time aphakic intraoperative information allows me confidently to select the best IOL power for each eye. Information provided by the device may differ by up to ±2.00 D from the power indicated by preoperative biometry, although the disparity is more commonly ±0.50 D. It is not uncommon for me to base my final choice of IOL power on the system's guidance. In several cases, I have trusted its recommendation, which differed significantly from my calculation with the IOLMaster (Carl Zeiss Meditec Inc.), and the former turned out to be right on target.

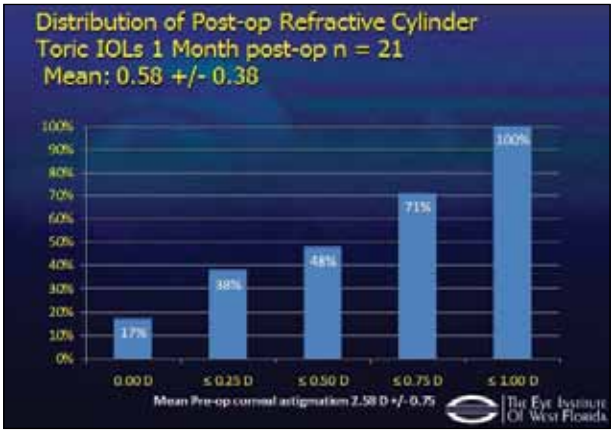

Figure. In a recent study using the ORA System to guide the placement of toric IOLs, 90% of patients' cylindrical correction was within ±1.00 D of plano.

I find the system's live capture feature especially useful. With it, I have a full field of view of the patient's eye intraoperatively, making it easy for me to visually confirm quality captures. In addition, the device has been extremely helpful in cases of previous corneal refractive surgery such as LASIK, for which conventional IOL power calculations are inaccurate. After removing the cataract, I can take an aphakic measurement, and the device uses postrefractive surgery nomograms to suggest an appropriate lens power for the eye.

ADVANCED ASTIGMATIC TREATMENT

The device has improved my treatment of cataract patients who have astigmatism. I find the system-aligned reticle especially helpful, because it provides me with easy-to-use intraoperative guidance. After selecting the lens power and placing the IOL in the eye, I use the system to guide my rotation of the toric IOL to the correct axis. In my recent study using the ORA System to guide toric IOLs' placement in a total of 88 subjects, 90% of patients'

outcomes were within 1.00 D of plano for cylindrical correction, and more than half of the patients were within 0.50 D (Figure).[1]

When the amount of astigmatism does not warrant a toric IOL, I use the system to aid my formation and placement of LRIs. I align the on-demand reticle to a preoperative mark on the cornea, find the correct axis as indicated on the device, and create the LRI. After using the device to take measurements to determine the LRI's effect, I decide if it needs to be deepened or lengthened or if I need to create another LRI. I can shut off the reticle, as needed, during the cataract procedure. In addition, some surgeons are using the system to determine whether or not to open arcuate incisions made by a femtosecond laser.

In my aforementioned study using the ORA System for the placement of LRIs and toric lenses, 99% of patients achieved a cylindrical correction within 1.00 D of plano. Fifty percent of patients were within 0.25 D, and nearly 40% had no remaining cylinder.[1]

PREMIUM LENSES

Some surgeons are using the pseudophakic refraction to confirm emmetropia. If the cataract procedure does not achieve emmetropia, they perform a lens exchange (for certain lenses). For example, owing to its hinged haptic design, the Crystalens (Bausch + Lomb) may not rest in the predicted effective lens position depending on a particular patient's ocular anatomy. This will negatively affect visual outcomes. By using the ORA System to obtain a pseudophakic refraction while the patient is on the table, I can anticipate the unwanted result and immediately exchange the lens, thereby avoiding a second surgery. Pseudophakic refractions also allow me to adjust an IOL's position in the bag to maximize the final refraction.

CONCLUSION

For me, intraoperative aberrometry is an essential tool for optimally treating all refractive cataract patients. The ORA System enhances the precision and accuracy of my surgical outcomes, thus helping my patients to achieve the outstanding refractive results they are seeking. ■

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1. Weinstock RJ. Novel approach to refractive cataract surgery using intraoperative aberrometry combined with 3-D guidance software to improve visual outcomes. Paper presented at: ASCRS/ASOA Symposium and Congress; April 23, 2012; Chicago, IL.