To accomplish proper astigmatic correction during laser vision correction, the laser treatment must be accurately positioned on the cornea. When a patient moves from the upright to the supine position, cyclotorsion occurs. Additionally, when light conditions vary, the pupil constricts, changing its position. Therefore, cyclotorsion and pupillary centroid shift must be taken into account when centering the laser ablation.

Iris registration technology measures the pupillary centroid shift and compensates for cyclotorsion. This is beneficial to use on astigmatic eyes, because a perfectly aligned axis improves UCVA. Even small rotational misalignments can significantly reduce the effectiveness of an astigmatic treatment. I perform fewer enhancements (less than 1%) since I incorporated iris registration into my surgical plan. The combination of iris registration and Fourier-domain optical coherence tomography has improved the accuracy of my astigmatic corrections.

The iDesign System (Abbott Medical Optics Inc.) is a high-resolution aberrometer that uses Hartmann-Shack sensing technology. It captures more data points than some previous sensors, averaging 1,250 data points from a 7-mm pupil; this is five times more than its predecessor, the WaveScan (Abbott Medical Optics Inc.) aberrometer. iDesign allows the clinician to analyze the aberration data using Fourier reconstruction and to correct the measurements for natural chromatic aberration of the eye. With this device, surgeons can image and evaluate the whole eye, not just the corneal surface. The new high-definition cameras that are available with the iDesign System have increased the iris registration capture rate in my practice up to 95%. In a study of 247 eyes treated with the Star S4IR (Abbott Medical Optics Inc.) and iDesign with iris registration, the mean difference between the magnitude of intended refractive change and the surgically induced refractive correction of astigmatism was essentially zero in all cases, and the mean error of angle was approximately 1° in the evaluated sample, confirming the excellent alignment of the treatment correction. A total of 90.12% of eyes showed an error of angle of 5° or less.

The questions I pose are these: Do you account for cyclotorsion and pupillary centroid shift with manual limbal markings or a wavefront-guided treatment with iris-registration software? If you use iris registration, has this technology improved the accuracy of your astigmatic corrections and decreased your enhancement rate? Take the survey.

Aylin Kılıç, MD, practices at Dunya Eye Hospital, Istanbul, Turkey. Dr. Kılıç states that she has no financial interest in the products or companies mentioned. She may be reached at tel: +90 212 3623232; e-mail: aylinkilikicdr@gmail.com.


Weigh in on this topic now!

Direct link: https://www.surveymonkey.com/s/CRSTEuro31

1. Do you account for cyclotorsion and pupillary centroid shift with manual limbal markings or a wavefront-guided treatment with iris-registration software?
   - Manual limbal markings
   - Wavefront-guided treatment with iris-registration

2. If you use iris registration, has this technology improved the accuracy of your astigmatic corrections and decreased your enhancement rate?
   - Yes
   - No