

How to Decide Between Laser AK and a Toric IOL

Consider the patient's preoperative data to help decide which technique to use.

BY V. NICHOLAS BATRA, MD

I use laser astigmatic keratotomy and toric IOL placement to correct astigmatism during cataract surgery. My patients undergo a series of diagnostic tests that include the use of an IOLMaster (Carl Zeiss Meditec), pachymetry readings, refraction, and OPD-Scan III (Nidek), in addition to our normal cataract workup, to assist in planning astigmatic correction.

I use several variables to help guide the choice between laser astigmatic keratotomy or a toric IOL.

CORNEAL TOPOGRAPHY AND REFRACTION

The best candidates for astigmatic correction are patients who have the power and axis of astigmatism correlated with topography and refraction. When they are different, I try to determine a cause such as dry eye disease or posterior corneal or lenticular astigmatism. The OPD scan is very helpful in determining the cause of astigmatism when the topography and refraction are different. When they are different, I remove the cataract, measure their residual refractive error, and decide between a toric lens and arcuate incisions.

DEGREE OF ASTIGMATISM

When the astigmatism is greater than 2.00 D, I use a toric lens. When it is less than 0.75 D, I plan to use a laser-created arcuate incision. When the degree of astigmatism is between 0.75 and 2.00 D, I may use either technology depending on other factors such as posterior corneal cylinder, refraction, topography and pachymetry readings, and the type of IOL.

PRESBYOPIC CORRECTION

If a patient desires a multifocal lens, a laser arcuate incision is created at the time of surgery. If a patient desires an accommodating lens, then I may choose between the Crystalens (Bausch + Lomb) and the Trulign Toric lens (Bausch + Lomb). I will typically use the latter when a patient has more than 0.75 D of astigmatism. However, I

will measure intraoperatively and occasionally switch to a Crystalens and vice versa.

COST

In my colleagues' and my practice, a toric IOL is priced higher than laser arcuate incisions. As a result, patients will often opt for one or the other technology based on cost.

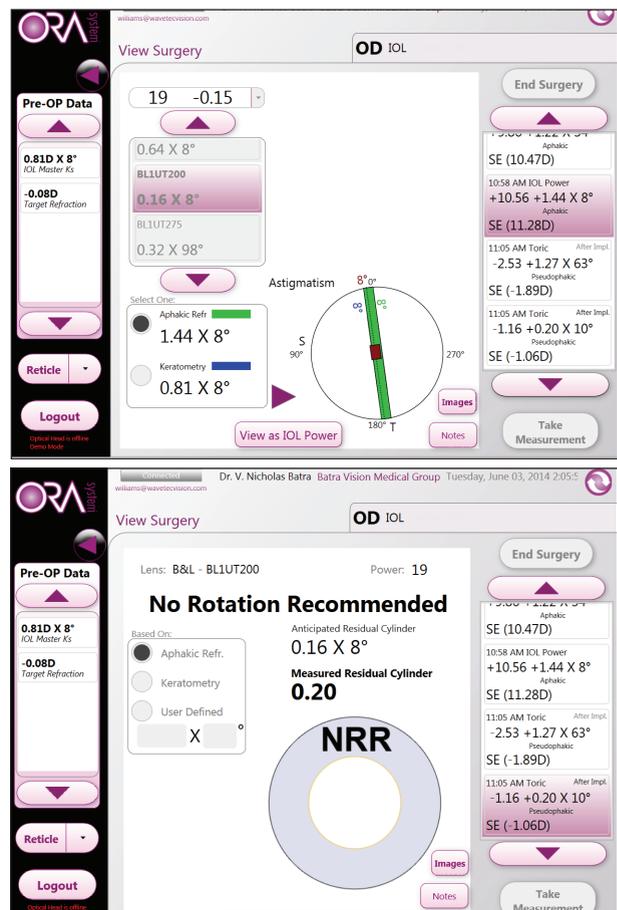


Figure 1. The patient had 1.44 D of astigmatism according to intraoperative aberrometry.

CREATING LASER INCISIONS

For laser-created arcuate incisions, I place information into a limbal relaxing incision calculator such as www.lricalculator.com (Abbott Medical Optics [AMO]). I then make an adjustment based on my experience with the LenSx Laser (Alcon). When the patient has astigmatism along the axis of the primary incision, I will use a single arcuate incision at 100% of the AMO nomogram 180° across from my primary incision. With two paired incisions to correct the astigmatism, I will reduce the treatment by 33% when the treatment is less than 1.00 D, by 25% when it is between 1.00 and 1.50 D, and by 15% for treatments of more than 1.50 D.

Once the cataract is removed, I take an aphakic measurement using the ORA System with VeriEye (WaveTec Vision). This will guide both the lens power and the residual astigmatism. If there is a small amount of residual

cylinder, then I will open the laser arcs with a spatula and remeasure after the IOL is implanted. If there is more than 0.50 D of residual cylinder at this point, I will further enhance the incisions by elongating them with a diamond knife. I will then take an additional measurement to confirm that the residual cylinder is less than 0.50 D.

TORIC LENSES

For toric IOLs, I enter the preoperative information into a toric IOL calculator specific for each type of lens. I remove the cataract and take an aphakic reading with the ORA and use this to make both the selection of the IOL cylinder and sphere power. I insert the lens, take a reading of it, and then rotate the IOL until no further change is recommended by the system.

These case studies illustrate the decision-making process when choosing between a laser arcuate incision and a toric IOL.

PATIENT No. 1

The first patient shows 0.81 D of cylinder at 80° on his IOLMaster keratometry and desired presbyopic correction. A Trulign BLU1T125 was selected based on the Trulign Toric calculator. During intraoperative aberrometry, he had 1.44 D of astigmatism, and a BL1UT200 was selected for him and spun to 8° (Figure 1). In this case, a toric lens with a larger astigmatic correction was selected using the ORA. Postoperatively, the patient had less than 0.25 D of cylinder.

PATIENT No. 2

The second patient shows 1.18 D of cylinder at 90° on her IOLMaster keratometry and desired presbyopic correction as well. During intraoperative aberrometry, she had 0.42 D of astigmatism (Figure 2). I decided to insert a Crystalens. She had 0.67 D of residual cylinder on ORA (Figure 3). Postoperatively, she had less than 0.50 D of residual astigmatism.

CONCLUSION

Both laser-created incisions and IOLs can work well for the correction of astigmatism. It is important to consider the patient's preoperative data to help decide which technique to use and then use intraoperative aberrometry to refine the treatment. ■

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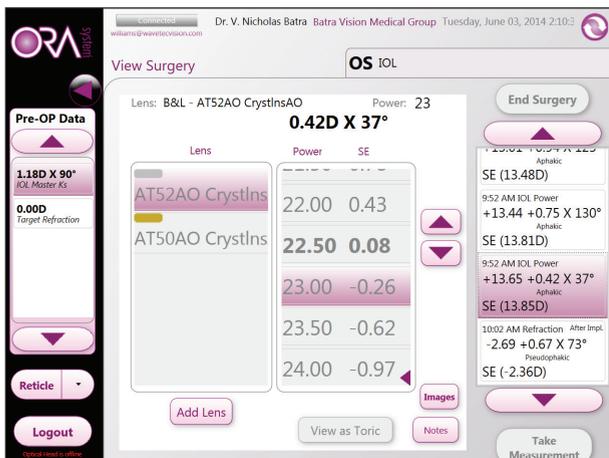


Figure 2. According to intraoperative aberrometry, the patient had 0.42 D of astigmatism.

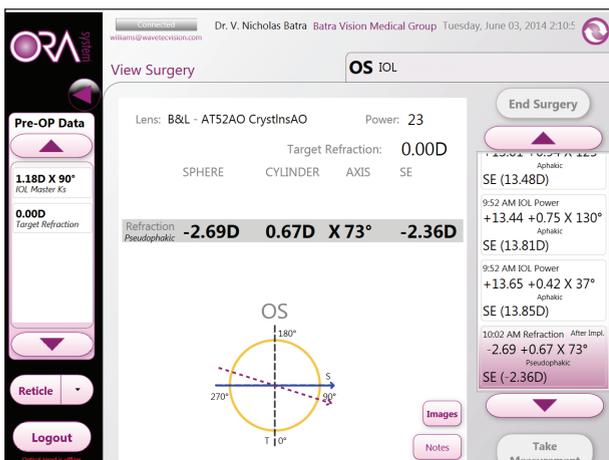


Figure 3. The same patient as in Figure 2 had 0.67 D of residual cylinder according to the ORA.