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# Instruments for Safe and Effective Microincisional Cataract Surgery

Multiuse MICS instruments simplify the surgical tray and save time and money.

BY JEFFREY WHITMAN, MD

*Whereas the past decade of cataract surgery emphasized safety and efficacy, we are entering a new era of surgical precision and accuracy. The diamond knife designed by Dr. Whitman is very accurate, and I agree that our subspecialty continues to move toward smaller, more precise incisions. I also agree that a soft I/A tip is superior to the traditional metal I/A tip. As the father of astigmatic keratotomy combined with cataract surgery, I enthusiastically welcome any new instrument designs that make the target meridian easier to identify for both incisional surgery and toric lens implantation aimed at reducing preexisting astigmatism.*

*—Robert H. Osher, MD*

The microincisional cataract surgery (MICS) platform on the Stellaris Vision Enhancement System (Bausch + Lomb, Rochester, NY) enabled surgeons to perform phacoemulsification through a 1.8-mm incision (the smallest incision in the industry). As a result, ophthalmologists needed a knife and other surgical instruments that could fit through these microincisions. I have worked with Bausch + Lomb/Storz Ophthalmics to perfect my cataract instrument tray and to design a series of instruments for making limbal relaxing incisions (LRIs) so that I may perform safe and efficient MICS.

## TRU-SIZE DIAMOND KNIFE

Prior to MICS, most I/A handpieces required incisions of 2.8 to 3.0 mm, and most of the IOLs we implant—other than the Akreos MICS lens (Bausch + Lomb), which will pass through a 1.8-mm incision—require at least a 2.2-mm incision. I liked the idea of a reusable diamond knife, but I did not want to have to keep knives of different sizes on each of my cataract trays.

The Tru-Size Diamond Knife (EO130; Bausch + Lomb/Storz Ophthalmics) (Figure 1) is a double-use diamond knife that has a 1.8-mm shoulder. Its tapered blade is marked at 1.8 mm and at 2.2 mm so that surgeons can identify the width of the incision though the microscope. (*Visit* www.youtube.com/watch?v=4EINNfGLGCs *to watch a video of the author using the Tru-Size Diamond Knife.*) Surgeons can insert the blade to the 1.8-mm mark for the phaco stage of the surgery. Then, if they decide to implant a larger IOL, they can reinsert the knife to the 2.2-mm line to widen the incision. In this way, the Tru-Size Diamond Knife saves practitioners money and time.

**Figure 1. The tapered Tru-Size Diamond Knife.**

**Figure 2. The CapsuleGuard I/A Handpiece.**

I do not advocate using a 2.2- or a 2.6-mm incision for the entire procedure, because I feel a 1.8-mm wound with MICS better stabilizes the anterior chamber for safer cataract surgery. I prefer to have the excellent control of a 1.8-mm incision throughout the surgery and then to widen the incision for implanting the lens if necessary. This blade allows me to do both.

## THE CAPSULEGUARD I/A HANDPIECE

The advent of MICS necessitated an I/A handpiece that could pass through a sub-2-mm incision. I wanted the instrument to be made of silicone, because metal can be unfriendly to the posterior capsule during cortex removal. The CapsuleGuard I/A handpiece designed by Storz Ophthalmics (85910S; Figure 2) has a soft, 100% silicone tip (not a metal tip covered in silicone) that is designed to minimize damage

to the posterior capsule if the surgeon touches it inadvertently. This soft tip allows for scrubbing of both the underside of the anterior capsule and the posterior capsule itself, and it is bent at a 45º angle so the surgeon may easily reach the subincisional cortex. The tip seems to bring cortical fragments into the aspiration port very nicely. The CapsuleGuard will easily pass through a 2.2-mm incision for MICS, and it is designed to fit up to a standard 3-mm incision to work with any phaco platform. Simply put, the CapsuleGuard makes I/A easier, in my opinion.

Because it is so small and soft, I continually sweep the tip of the CapsuleGuard I/A handpiece in a counterclockwise direction toward myself and peripherally under the anterior capsule. I draw in the peripheral elements of the remaining cortex so I can sweep the handpiece from the periphery to the subincisional cortex in one movement. The CapsuleGuard's soft tip allows me to grab all remaining bits of subincisional cortex. Finally, I scrub the underside of the anterior capsular leaflet and lightly polish the posterior capsule until it is truly clear. Again, the CapsuleGuard allows me to vacuum, polish, and scrub the anterior and the posterior capsule easily and efficiently.

Because it has a 45º bend, I also use the CapsuleGuard to rotate and position the IOL after insertion (this is critical for premium IOLs). I can apply suction through the handpiece to grab the optic of the lens and rotate it into position. The CapsuleGuard I/A handpiece has a bevy of uses that dovetail nicely with our improved microscopes and the MICS technique.

## INSTRUMENTS FOR CREATING LIMBAL RELAXING INCISIONS

### The Whitman Double Ended LRI Marker

The Whitman Double Ended LRI Marker (E2427; Figure 3) is marked in chord length rather than degrees, because I think it is easier to size LRIs by millimeters. Because I did not want to own two different instruments for making LRIs, the axial dial of this marker is double-ended: one side is marked at odd intervals (3, 5, and 7 mm); the opposite side at even intervals (4, 6, and 8 mm). The surgeon dials in the degree at which he or she wants to locate the LRI and then colors the raised bumps on the underside of the marker that correspond with the millimeter marks (a dry cornea will produce the best marks). In short, the surgeon simply turns the marker over, aligns it on the cornea, presses it down, and makes the marks of the desired millimeter length at the correct axis, nicely opposed on each side of the cornea. Thus, the Whitman Double Ended LRI marker simplifies the creation of LRIs by eliminating the need for two separate instruments, one for marking the axis and one for marking the length of the incisions. Storz Ophthalmics provides my nomogram along with the marker. I think it is a great entry-level device for making LRIs.

**Figure 3. The Whitman Doubled Ended LRI Marker.**

### The Whitman Axis Marker

One of the problems I encountered with implanting toric IOLs was aligning them on the visual axis, because the alignment marks on the optic were not near the axis marks I would make at the limbus. The Whitman Axis Marker (E2430; Figure 4) is a long radial marker with radial marks on either side of an astigmatic dial. The surgeon uses this marker in the OR to mark the axis of alignment for the toric implant after he or she marks the 180º axis of the cornea (the 3-o'clock and 9-o'clock positions) at the slit lamp or bedside. For example, if the axis needs to be at 60º, the surgeon will turn the marker to 60º, flip it over, and mark the long radial marks with a marking pen. Then, he or she will align the 0º mark of the instrument with the handmade marks at 3- and 9 o'clock. Finally, the surgeon will simply press the marker on the eye to produce two long, midperipheral marks where the axis of the lens' orientation needs to be.

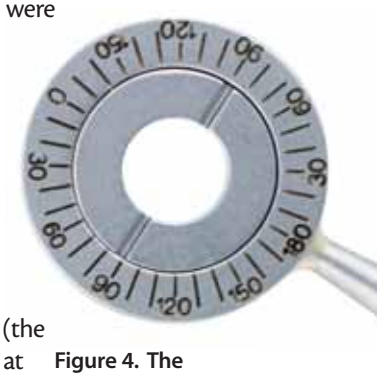


**Figure 4. The Whitman Axis Marker.**

When it comes time to implant the toric IOL, the three dots on either side of the lens will be right next to the radial marks made with the Whitman Axis Marker, so the surgeon does not have to guesstimate the alignment with marks in the corneal periphery. The marks will be aligned over and under each other for greater precision.

This instrument removes a lot of the guesswork from aligning a toric IOL to help ensure better outcomes. ■

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