

Electronic Leveling Device for Implantation of a Toric IOL

The senses of sight and hearing indicate where the surgeon should mark the horizontal axis.

BY TAKAYUKI AKAHOSHI, MD

I give my patients the option of having a toric IOL implanted during cataract surgery. As opposed to conventional IOLs, toric IOLs correct preexisting corneal astigmatism during cataract surgery. Achieving the best result with a toric IOL requires properly marking the axis on which the toric IOL should be implanted, which can be determined with toric IOL web-based calculators. For every 1° that the axis is misaligned, a toric lens loses 3% of its corrective effect.¹ I could not achieve an accurate marking with conventional toric IOL markers, because I was unable to confirm that I was holding the instrument perfectly horizontally. In addition, I found it difficult with bubble and pendulum markers to simultaneously focus on the marker and the patient's eye. I therefore worked with ASICO LLC to design an electronic toric marker that uses my senses of sight and hearing to help me easily and accurately pinpoint the horizontal axis and stay focused on my patient.

SENSORY FEEDBACK

The marker, which is an electronic leveling device, uses green, orange, and red light-emitting diode lights and a beeping sound to indicate the degree to which the marker is aligned on the horizontal axis (Figure). A red light and fast beep indicate that the marker is severely tilted, an orange light and slow beep mean that the marker is slightly tilted, and a green light with no beep signals that the marker is perfectly horizontal.

Two models are available. The first is a one-step axial marker that completes all of the markings in a single step. The surgeon simply turns the dial to the desired

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Figure. The electronic toric marker.



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axis, asks the patient to sit up and look straight, and marks the axis when the light indicator on the marker is green and the beeping stops.

The two-step electronic toric marker is for patients with narrow eyelids or deep-set eyes. This model precisely marks the 0° and 180° positions preoperatively, and the ophthalmologist uses these as points of reference to mark the desired axis during the surgery.

The sensitivity of the device can be adjusted to five settings, ranging from 0.2° to 1.0°. If they wish, surgeons can choose to completely turn off the beeping or program the instrument to beep only when the toric marker is perfectly horizontal.

DESIGN FEATURES

The surgeon holds the flat handle with his or her thumb and index finger. The electronic device is attached to the body of the marker by a magnet and can easily be removed for sterilization. The head on both designs may be used for all types of eyes, including those with small orbits.

TIPS

When using the toric marker, I apply topical anesthesia and wait until the secretion of tears subsides. I paint the blades of the toric marker with a marking pen, and set the desired axis on the dial. I ask the patient to sit upright while gazing straight ahead with both eyes open. I gently hold the patient's eyelids with my fingers to prevent the patient from closing his or her eyes as the marker approaches. The surgeon should sit at the same eye level as the patient; this position is helpful for placing the marker on the center of the cornea. ■

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1. Visser N, Berendschot TT, Bauer NJ, et al. Accuracy of toric intraocular lens implantation in cataract and refractive surgery. *J Cataract Refract Surg.* 2011;37(8):1394-1402.