

# System nets positive initial outcomes

Technology being tested for use in capsulorhexis, creation of limbal relaxing incisions

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**Boston**—Intraoperative use of on-screen image guidance templates with a high-definition three-dimensional (3-D) surgical microscope system (TrueVision) is showing promise for improving the precision and predictability of various maneuvers during small-incision cataract surgery, said Robert J. Weinstock, MD, at the annual meeting of the American Society of Cataract and Refractive Surgery.

Dr. Weinstock presented preliminary results

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NEWS & UPDATES



Dr. Weinstock describes a "heads-up" high-definition, three-dimensional microscope system with improved ergonomics that allows surgeons to perform cataract procedures without hunching over a standard microscope. Go to [OphthalmologyTimes.com/ergonomics](http://OphthalmologyTimes.com/ergonomics)

NEWS & UPDATES

Eric D. Donnenfeld, MD, discusses some of the advantages of digital microscopy. Go to [OphthalmologyTimes.com/digitalmicroscopy](http://OphthalmologyTimes.com/digitalmicroscopy)

## Take-Home Message

A study is investigating three-dimensional (3-D) image guidance templates with a high-definition 3-D surgical microscope system (TrueVision) for performing capsulorhexis and limbal relaxing incisions during cataract surgery. Early data are encouraging that this system can help improve surgical outcomes.

from an ongoing FDA 510(k) trial that is investigating use of the template system for guidance in capsulorhexis creation and for limbal relaxing incisions (LRIs). A template system for guiding toric IOL alignment also is being developed.

Data from 11 eyes where a template for capsulorhexis was used showed the achieved capsulorhexis diameter matched the intended target ( $\leq 6$  mm) in all cases. Results from a 6-week follow-up visit were available for 22 eyes that underwent LRIs.

Preoperatively, mean astigmatism for the group was 1.2 D. At 6 weeks, 94% of eyes had  $< 0.5$  D of residual astigmatism and 39% had no residual astigmatism, said Dr. Weinstock, one of the study investigators and a cataract and refractive surgeon in private practice at the Eye Institute of West Florida, Largo, FL.

"Use of this guidance software in cataract surgery has the potential to improve safety and efficacy outcomes and, in particular, optimize refractive results and reduce complication rates," he said. "Ongoing FDA trials of this investigational technology are measuring

outcomes directly and will establish whether this system has benefit for surgeons and our patients."

## Several components

The surgical system has several components, including a 3-D high-definition camera (TrueZoom 3D Surgical Camera) that mounts to the operating microscope. A beam splitter sends the images to a workstation that interprets



Dr. Weinstock

the input and creates a 3-D high-definition video display on a widescreen monitor. The surgeon operates in a heads-up position, wearing 3-D glasses to view a real-time display of the surgical field on the monitor.

"I have personal experience operating on [more than] 2,000 cases directly from this 3-D HD video display and find the system offers improved depth of field relative to conventional microscope oculars along with an ergonomic advantage from being able to operate with upright posture," Dr. Weinstock said.

For the guidance system, templates are created using preoperative high-definition 3-D photos obtained at a 3-D digital slit-lamp microscope and case-specific surgical parameters, i.e., capsulorhexis size, shape, and location or the location and length of LRIs. The slit-lamp images are imported into the operating room digital visualization system, and the templates generated by the software appear as a screen overlay on the monitor display of the surgical field.

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## Templates

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Accurate placement of the template is achieved by aligning the image with the live eye view. Alignment is verified using

limbal blood vessels, and then iris registration of the preoperative image to the live eye view combined with intraoperative tracking assures the alignment is maintained, even if the eye moves.

"The surgeon creates the capsulorhexis by tearing along the outline on the template or performs the LRIs by literally using the blade to trace along the lines appearing on the screen," Dr. Weinstock said.

He also reported the findings from a retrospective analysis of data collected using the 3-D high-definition surgical microscope system that indicated benefits compared with operating through conventional microscope oculars.

Using the 3-D system in a series of 293 eyes, the rate of posterior capsule tearing was 0.35% versus 1.09% in a cohort of 461 cases performed using

conventional microscope oculars. Use of the 3-D system was associated with a 2.7% reduction in surgical time.

"Clearly, both technologies are safe and effective in routine cases, but these early data support [that] there may be some safety benefits from operating with a heads-up system," he said. **OT**

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