# Optimizing Surgical Visualization

Adjustable stereo coaxial illumination allows dynamic control of the red reflex.

**BY JAMES KHODABAKHSH, MD**

An optimal view through the surgical microscope is a necessity when performing surgery. After extensive use of many of today's microscopes, I selected the Opmi Lumera 700 (Carl Zeiss Meditec, Inc., Dublin, CA) for my practice's surgical suite (Figure 1). My colleagues and I practice in a center that was one of the first in the country to acquire the Lumera. I have now performed more than 400 cataract, refractive, and glaucoma surgeries with the microscope, which I find possesses the finest optics of any that I have used.

## CLEAR VISUALIZATION

The Lumera features adjustable stereo coaxial illumination, which allows dynamic control of the red reflex (Figure 2). This technology sends two beams of light, which are fully coaxial, to the retina before the light reflects back. Light scatters and floods the entire globe, creating a distinctive orange illumination resulting in a maximum-contrast view. I see with remarkable clarity ocular tissues, including anterior capsular epithelial cells, every nuance of the cortex, strands of viscoelastic, fine capsular folds or tears, and even the zonular insertion points.

With conventional microscopes, the red reflex appears much darker compared with the highlighted red reflex provided by the Lumera (Figure 3). The microscope's integrated depth-of-field management system allows further modification of my view. I can choose between maximum depth of field or higher light transmission with the push of a button. The slit illuminator, which provides additional light during the procedure, is integrated into the system. I can adjust the illumination to achieve a highlighted red reflex and improved contrast for unimpeded visualization.

## SURGICAL APPLICATIONS

The high-contrast view, image stability, and enhanced depth perception of the Lumera are an asset even in routine cataract surgery. Because fibrillar strands of cortical material on the posterior capsule can be more easily appreciated, I can polish the capsular bag with greater precision. I am able to locate cortical remnants with less difficulty, which promotes more meticulous procedures. I have also found I need capsular staining less often during

**Figure 1. The Opmi Lumera.**

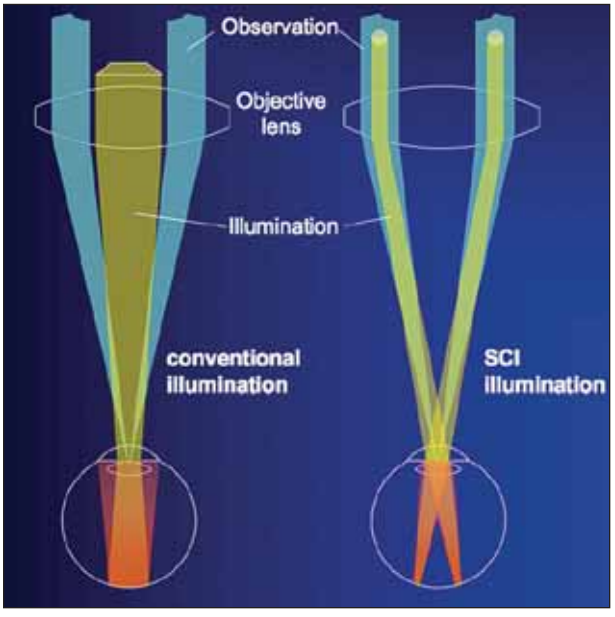


**Figure 2. Adjustable stereo coaxial illumination, which allows dynamic control of the red reflex.**

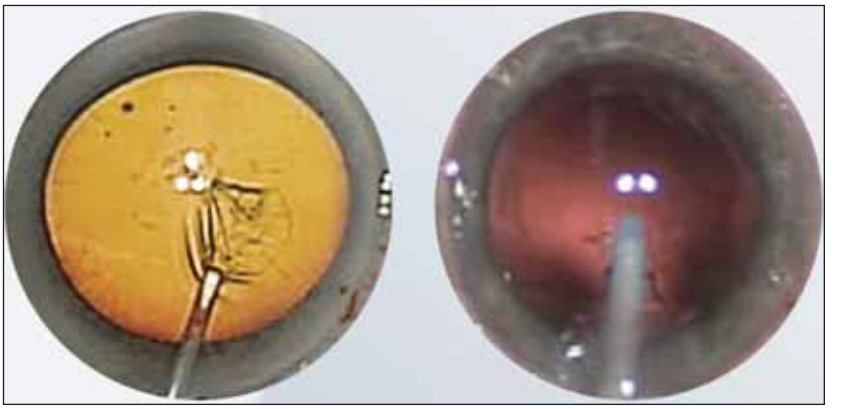

**Figure 3. Comparison of red reflexes: Opmi Lumera (left) versus a conventional microscope.**

surgical procedures.

The Lumera's unique lighting system has been of particular benefit in complex cases. The capsulorhexis is generally considered to be one of the most technically difficult steps of cataract surgery. It can be highly difficult to view the red reflex in patients with small pupils, darkly pigmented eyes, dense anterior cortical spoking, and brunescent cataracts. With the Lumera, a clearer view of the anterior capsule and red reflex enables me to complete the capsulorhexis without difficulty (Figure 3). The stereo coaxial illumination extends this higher-contrast view toward the periphery.

The Lumera has been particularly valuable to me with toric and multifocal lens implants. I can more easily locate the alignment bars on toric IOLs, which have sometimes been difficult to see with other microscopes. With multifocal lenses, the Lumera helps me to create a well-centered and pristine capsulorhexis, which is essential to successful visual outcomes. The aspheric optics of some premium IOLs can tolerate minimal decentration; the high-contrast retroillumination effect of the microscope improves capsular visibility and assists in the completion of the capsulorhexis. This level of clarity allows me to make faster assessments and facilitates decision making.

## CO-OBSERVATION

The microscope can be equipped with a stereo co-observation tube, allowing a second person to see the surgical field at the same level of magnification as the surgeon. This feature helps sterile assistants and is useful for training purposes. The foot control panel allows accurate control of the microscope, and the buttons can be configured according to my preferences.

## CLINICAL BENEFITS

In my experience, the Lumera surgical microscope has provided enhanced visualization and a smoother workflow. Superior illumination, higher contrast, and hands-free operation of the microscope have allowed me to focus all of my attention on the task at hand, which promotes better outcomes. The level of detail this instrument provides has made a clinical difference in my practice. ■

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