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SURGILŪM

THE iLIGHT SPECULUM

A new transilluminative approach offers stunning clarity for the anterior segment.

BY WILLIAM F. WILEY, MD



Coaxial illumination has been paired with operating room microscopes for over 60 years. Despite its limitations, it has been our only option. With coaxial illumination, glare is reflected into our eyes, obscuring fine details, while

our patients risk retinal phototoxicity in longer procedures.

Enter the iLight Speculum (Surgilūm; Figure 1), a first-in-class device that represents a truly new approach to how we use light to visualize the anterior segment.

This mini slit-lamp LED module magnetically attaches to the blade of a specially designed Surgilūm Speculum. A small battery with an on/off button connects to the handle, and the light source connects closer to the eyelid. The iLight's slit beam can be pivoted up and down the speculum blade at any angle, allowing both sclerotic scatter and retroillumination of the anterior segment anatomy.

The iLight's close proximity to the eye allows surgeons to apply the light directly where it is needed. The result is an amazing ability to see details that were previously lost in the glare of the microscope's coaxial light.



Figure 1. The iLight Speculum.

DRAMATICALLY DIFFERENT ILLUMINATION

When you see iLight's LED retroillumination, two things stand out immediately. First, the structures that we need to see and differentiate in the eye are much clearer and easier to see. Second, you are instantly aware that the reason for this clarity is not only the effect of the LED light, but also the absence of coaxial illumination. Lighting the target area for surgery with the coaxial light requires intense illumination that is spread on a much larger area—much more illumination than the iLight requires to light it directly. Unlike coaxial lighting, which shines down through the eye from a superior position, the iLight illuminates just the side and anterior segment, never shining into the retina. Patients don't perceive it as bright.

In a study performed by Surgilūm, a photometer was placed in the macula of an eye bank eye (data on file). The coaxial microscope light, set on medium brightness, was aimed into the eye as it would be during surgery, and then the iLight transilluminator was used. The photometer showed that iLight shed 4 lux of illumination on the macula. In comparison, the coaxial light, set on medium, measured 43 lux—10 times more illumination on the retina.

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The direction of the LED light also creates a different perspective that allows us to see outlines more clearly and visualize structures in the eye. We had refractive lasers in the past that incorporated an overhead slit beam, but iLight is the first adjustable illumination right on the speculum. Similar illumination has only been possible when we had an assistant hold a retinal light pipe to help us see details better. Now we can get a better view of anterior segment anatomy very conveniently in daily practice.

MY SURGICAL EXPERIENCES

I have been using the iLight for about a year in LASIK, small incision lenticule extraction (SMILE), and corneal inlay procedures. It has made those surgeries easier and, in some cases, faster. As we remove the lenticule of clear corneal tissue in the SMILE procedure, it can be hard to understand the dissection planes. Even for an experienced surgeon, it can be challenging to find the dissection or to be certain that we have removed the lenticule entirely. The iLight illuminates the cornea and the lenticular interface from a different angle during SMILE, which makes it easier to find the dissection planes and remove the lenticule safely and completely in less time, with far less searching and manipulation (Figure 2). I think the iLight may reduce the learning curve for SMILE and encourage its wider adoption.

For the same reasons it enhances SMILE, iLight helps illuminate corneal inlays for easier positioning within the cornea and makes it easier to visualize the LASIK flap.

In addition to its direct clinical advantages, iLight improves the patient experience and reduces phototoxicity. Patients don't see the brightness, so they don't reflexively squint their eyes to avoid the light. I can often turn off the coaxial light completely, so patients see very little light.

Photo stress recovery is not an issue. Tests on volunteers aged in their 20s to mid-50s showed photo stress recovery times in all ages to be an average of 2.5 seconds with transillumination, compared to 25 to 30 seconds with the coaxial microscope light. These results were similar to the eye bank eye test, again showing that transillumination had about a tenfold benefit over coaxial illumination (data on file).

I plan to expand my use of the iLight into other procedures this year. Because it allows you to see the edge of the

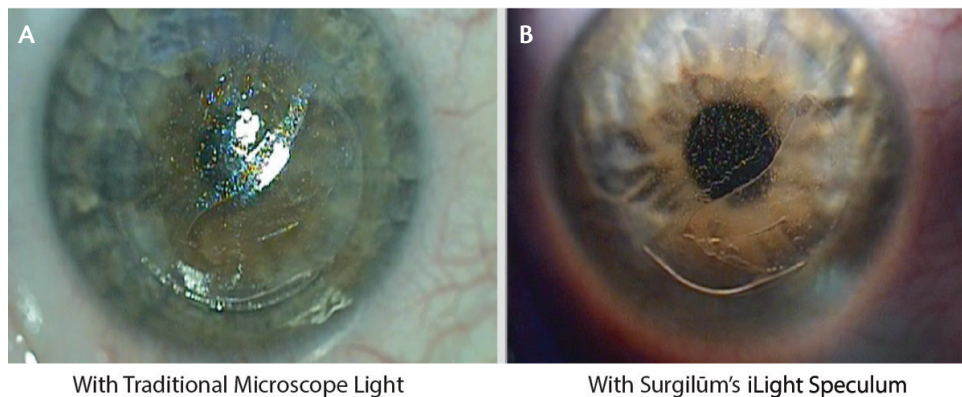


Figure 2. The image on the left shows coaxial illumination of the SMILE procedure (A). Notice how the light reflection blurs the margin of the lenticule, making it harder to visualize. On the right is an eye undergoing SMILE while illuminated with the iLight (B). Notice you can easily see the edges of the lenticule. Note also the never seen before posterior boundary glow of the anterior chamber with iLight.

anterior chamber by shedding light through the sclera, I could see using the illumination of that anatomy to help guide instrument placement for sewn-in IOLs, as well as offer advantages for Descemet's stripping endothelial keratoplasty or Descemet's membrane endothelial keratoplasty. The iLight also transilluminates the trabecular meshwork, and a future attachment will direct the light to a more nasal location for microinvasive glaucoma surgery.

SEE FOR YOURSELF

Until you've seen the iLight, you definitely don't understand what you're missing. We are all used to seeing what we're used to seeing. We see well enough with the microscope's coaxial illumination, but when you see this light from a new angle, it changes your perspective. In my experience, it makes surgery easier, and as a result, it also can help you get through the learning curve for newer or more complicated procedures faster.

I'm experienced in performing SMILE and other complex anterior procedures, but I reach for the iLight in every case, because it gives me a better perspective and visualization. Any technology that can make a technically challenging procedure easier is exciting to see. ■

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