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All the Clinical News in Sight

New Technology IOLs

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New technology in IOLs includes the Synchrony™ lens, the thermodynamic SmartLens (Medennium, Inc), and the light-adjustable lens (Calhoun Vision). The Synchrony™ lens is a dual optical lens with flexible hinges available in a single-mold injection. Due to the dual optic, it takes minimal movement between the lenses to get a large accommodative effect. With the use of an injector, the 6-mm lenses can be inserted into a 3.5-mm opening.

Although studies using the Synchrony™ lens will soon begin in the United States, more than 100 of these lenses have already been implanted in patients outside the country. Vision correction has been impressive—95% of patients have been corrected to J4 or better with best distance correction, and 100% of patients have visual acuity of 20/40 or better with best distance correction. There is documented lens movement; the lenses are separating. Also, the dynamic motion of the lenses seems to be resisting anterior capsular reaction and contraction. Some have concerns about refractive precision with the Synchrony™ lenses. “My standard is no longer ± 1 D. I want to be 90% within ± 0.5 D predicted. I think that kind of refractive precision between the lenses at this time appears to be difficult to achieve,” stated Dr. Olson. In addition, explanting the lenses out of the capsular bag may be problematic.

The SmartLens is a thermoplastic, malleable rod that can be imprinted with any type of optics, including multifocality. Once the rod is implanted into the eye, it turns into a lens with the desired cylinder and sphere. A future 1-mm rod could be inserted through a 1.5-mm incision. Body temperature and continuous irrigation help the lens unfold and fill the capsular bag. The lens has an optic that fills the capsular bag, is made of hydrophobic acrylic material, and is very malleable. One variation functions similarly to the AcrySof® MA60 lens.

Dr. Olson noted, “We still have questions about the SmartLens. Does the anterior capsule have to be intact if accommodation is to occur?” Laboratory studies have suggested that a capsulotomy plug is needed in the anterior area for better outcomes with this lens. Dr. Olson strongly believes that since the lens fills the capsular bag completely, occurrence of unwanted light images should be eliminated.

Light-adjustable lenses have photosensitive, free-floating macromers that bind to the substrate and come out of solution once they've been hit with light. The free-floating macromers readjust to the shape of the lens, and the lenses can be reshaped exceedingly accurately for sphere, cylinder, and coma. Currently, the lens being tested and implanted in humans is a standard three-piece silicone lens and has not been associated with any toxicity. A hydrophobic acrylic lens appears to work the same as the silicone lens in laboratory tests.

**Sally Letson Symposium 2004:
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