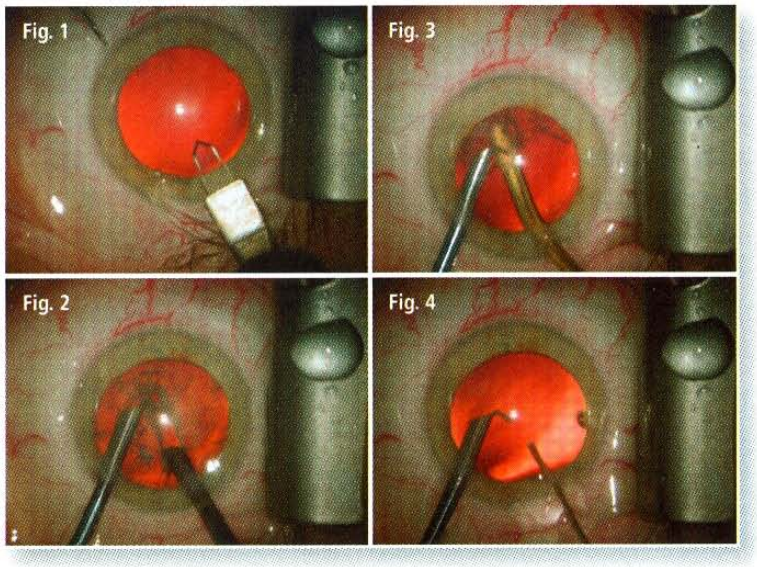
Examining the Akreos® MICS Lens

This innovative IOL is the pivotal step on the path to true sub-2mm cataract surgery.

After attending the first U.S. course on bimanual microincision cataract surgery, given by Drs. I. Howard Fine, Richard Hoffman and Mark Packer in 2003, I became one of the first surgeons in the country to adopt the MICS technique. Making the transition was slow at first, but phaco machines and related software and instrumentation continued to evolve over the years, enabling surgeons to deliver to patients more of the benefits associated with MICS. Until recently, however, we were still missing one crucial piece of the puzzle — an implant and injector system that would allow consistent and repeatable lens insertion through a sub-2mm incision without enlarging the primary wound or creating a separate wound.

Today, we have that missing piece, which is the Akreos AO Micro Incision Lens (model MI60L, Bausch + Lomb, Rochester, NY), known as the Akreos MICS lens. Used in conjunction with the Viscoject Lens Injection System (Medicel AG, Widnau, Switzerland), the Akreos MICS lens can be implanted through an unenlarged 1.8-mm incision. I routinely implant the lens through a 1.5-mm incision, and the injector is designed to easily fit through current microcoaxial and microbiaxial wounds. In this article, I explain why and how I use the Akreos MICS lens in the majority of my cataract surgeries.

I have preferred a bimanual MICS approach to cataract surgery since the technique was first introduced. The separation of irrigation from phacoemulsification and aspiration gives me better control of fluid dynamics and lens particle movement inside the eye. The microincisions contribute to the improved control and stable intraocular environment and provide additional benefits, including better wound sealing for reduced risk of infection and other wound-related complications, a quieter post-op eye with less inflammation, faster healing, faster refractive stabilization, less post-op dry eye and less induced astigmatism.



Advantages for Surgeon and Patient

The Akreos MICS lens is based on a proven platform. The first-generation Akreos IOL was implanted for the first time in France in 1998. Since then, more than 3 million Akreos IOLs have been implanted worldwide. The newest models of the lens, the Akreos AO and Akreos MICS, have an aspheric anterior and posterior surface, which add no spherical aberration to the optical system. The eye is left with its natural degree of corneal positive spherical aberration, plus better contrast sensitivity compared with a spherical IOL. It provides good depth of field as well. Because the aspheric optic has a uniform refractive power from center to edge, it is relatively unaffected by optical misalignment or pupil decentration.

The Akreos MICS lens is thinner than the Akreos AO and in my opinion, offers a perfect balance in terms of design and performance. It has a modified plate haptic design, which means there are no long haptics made of a separate material that are tricky to position. Inside the eye, it opens smoothly and consistently and stabilizes quickly. Despite its pliability and how easy it is to manipulate, this IOL has a high degree of stability in the capsular bag during and after the procedure. The lens tends to take the same central posterior position in every capsule, which translates into postoperative refractive stability. The haptics are flexible at the tips, so the optic doesn't move as the eye heals and the capsule contracts. Any contractile forces that come into play bend the haptics, but do not change the position of the optic.

The asphericity of the Akreos MICS lens and its hydrophilic acrylic material combine to give patients tremendous post-op quality of

Figure 1. Trapezoidal 1.4mm/1.6mm diamond blade for creating the microbiaxial wound.

Figure 2. Initial sculpting using a sleeveless 19-gauge phaco needle on the Stellaris handpiece.

Figure 3. Bimanual I/A is used to gently remove the cortex.

Figure 4. The irrigating chopper is left in the eye without irrigation flowing as Amvisc Plus is used to inflate the capsule and anterior chamber.

Figure 5. The one-handed plunger-style Viscoject injection system for the Akreos MICS lens is placed just under the lip of the external wound, while the irrigating chopper is used for counter traction and the IOL is delivered into the eye.

Figure 6. The Akreos MICS lens gently blossoms into the capsular bag and centers on its own.

Figure 7. With small wounds, the eye seals easily and the implant assumes a stable posterior and central position in the capsular bag. Note the absence of posterior capsule striae, which are usually present at the end of cases when single- and multiple-piece dual-haptic-designed implants are used.

vision. I have yet to have any patient complain of dysphotopsia. I have also been pleasantly surprised by the accuracy of the recommended A-constant and have had no refractive surprises so far.

Given the design and performance of the Akreos MICS lens, it is my monofocal IOL of choice. It is well suited for most of my patients, except those with a compromised posterior capsule. I frequently use the lens in a monovision strategy for my patients who would like spectacle independence but do not want an accommodating or multifocal IOL. I have successfully used the lens in conjunction with limbal relaxing incisions for patients with astigmatism, although I typically consider a toric implant for those with 1.75D of cylinder or higher.

Intraoperative Technique

The Akreos MICS lens is part of Bausch + Lomb's MICS Platform. The components of the platform — Stellaris phaco machine, Storz instruments and Amvisc Plus OVD — work together to enhance the consistency and predictability of procedures. With tight manufacturing tolerances from the phaco machine and tubing to the phaco needles and handpieces, and the Akreos MICS lens and injector system, I know what to expect every time. Using a platform of tools designed to complement one another helps eliminate unknowns and potential causes of complications.

In each case, I make my cataract incision with a Storz 1.4mm/1.6mm diamond trapezoid blade designed for 19-gauge instruments. The well-matched wound-to-instrument size is what provides for the tremendously stable anterior chamber and exquisite control of the intraocular environment during nucleus and cortex removal.

My phaco technique is a combination of sculpting, cracking and chopping. I start with low phaco and vacuum settings to sculpt and divide the lens into two hemispheres. I rotate the entire complex 90° counter-clockwise and sculpt again to crack the distal hemisphere into two quadrants. At this point, I remain at a low phaco power but shift into high vacuum in order to pull the two quadrants into the pupillary plane, or "safe zone." Then I use a combination of chopping and dual-linear vacuum to rapidly evacuate the two quadrants. Next, I spin the remaining hemisphere 180° and pull it into the pupillary plane with high vacuum. I chop it in half and continue to chop it into smaller removable pieces, again using manual chopping and dual-linear vacuum. This approach lets me remove the nucleus using very little phaco energy. I leave the irrigating chopper inside the eye while my assistant switches the phaco handpiece for a 19-gauge aspiration handpiece with a diamond polished tip and a .4mm opening. After cortical cleanup, I remove the aspirating tip but leave the irrigating chopper inside the eye as I fill the capsule and anterior chamber with viscoelastic.

For implanting the Akreos MICS lens, I use a wound-assisted technique. This is dramatically different from the traditional method of using a 2.7-3mm wound through which the injector would actually enter the eye. Instead, with the wound-assisted technique, the incision serves as an extension of the delivery system. The cartridge bevel is tucked just under the lip of the wound, not into the eye. With counter traction using a second instrument through the paracentesis or the other biaxial wound, the IOL can be slowly delivered through the cartridge and the wound tunnel into the capsular bag.

Surgeons new to wound-assisted IOL injection may want to enlarge their incision slightly so the cartridge can be placed well into the wound but not completely into the eye. This will help prevent partial delivery of the lens where counter traction is lost and the lens gets wedged inside the wound. If this happens, the surgeon can grasp the lens with his fingers and gently remove it from the wound. As long as the lens is not damaged, it can be reloaded.

A Milestone Reached

My patients are inquisitive about the technology used in our practice, so I explain how smaller incisions and the Akreos MICS lens help me provide faster recovery and more precise results. The lens is a practice-builder in that regard, and we appreciate its NTIOL status, granted by the Centers for Medicare and Medicaid Services.

I view the Akreos MICS lens as a real milestone for my practice. This IOL makes MICS a reality and legitimizes it as a beneficial service for my patients.