*Sponsored by Alcon Laboratories, Inc.*

# Microincisional Surgery With the CENTURION Vision System

ACTIVE FLUIDICS Technology is designed to enable maximum flexibility in phaco parameters.

**BY RICHARD J. MACKOOL, MD**

As the technology incorporated into the CENTURION Vision System (Alcon Laboratories, Inc.) was developed over the past decade, I had the opportunity to participate first in laboratory testing of its unique fluidic and ultrasonic components, and eventually in the beta site evaluations of the product. I now have more than 2 years of experience with the CENTURION Vision System, and it has become the primary phaco instrument for the 45 surgeons at our ASC.

## CASE PRESENTATION AND EARLY STEPS

The following is a description of the removal of a moderately dense cataract with the CENTURION Vision System. (The video of the procedure may be viewed at http://eyetube.net/video/mackool-case-3/)

The cataract displayed areas of dense anterior subcapsular opacities in the vicinity of the capsulorhexis. After creating a 1-mm tapered sideport incision and a 2.4-mm primary clear corneal incision, I injected trypan blue dye in order to stain the anterior capsule. I then placed my left index finger at the medial canthal fornix in order to fixate the globe while I inserted the keratome.

After an intracameral injection of lidocaine, I injected VISCOAT OVD (Alcon Laboratories, Inc.), and then PROVISC OVD (Alcon Laboratories, Inc.) in the soft shell technique to expand the anterior chamber. I used the tip of the 25-gauge disposable needle that had been placed on the PROVISC syringe to open the central region of the anterior capsule. Because of the patient's marked Bell's phenomenon, I introduced a blunt spatula through the sideport incision in order to both center and stabilize the globe. I then used a Mackool capsulorhexis forceps to create a capsulorhexis of approximately 4.5 mm.

I next performed hydrodissection using a Mackool 22-gauge cannula (Crestpoint Management Ltd.) that I slightly elevated against the undersurface of the anterior capsule as I injected BSS (Alcon Laboratories, Inc.), and then I depressed the nucleus to permit egress of the BSS. I repeated this procedure at a location 180°

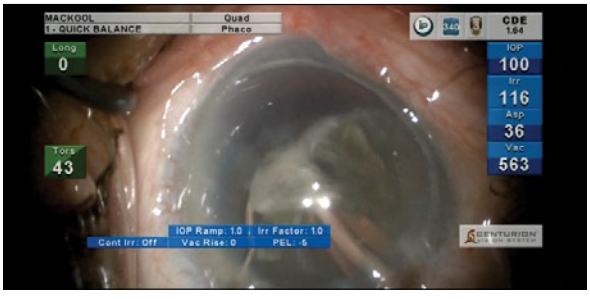


**Figure 1. ACTIVE FLUIDICS Technology maintains stability in the anterior chamber during phacoemulsification, even when vacuum levels approach 600 mm Hg.**

from the original injection site. This I followed with viscodissection with VISCOAT OVD for 180° opposite the primary incision, thereby creating a visible space between the anterior capsule and the underlying lens cortex/nucleus.

## NUCLEAR SCULPTING AND REMOVAL

I inserted a curved Mackool Big Ball Chopper (Crestpoint Management Ltd.) through the sideport incision and the 45° Balanced Tip with the UltraSleeve (Alcon Laboratories, Inc.) through the 2.4-mm clear corneal incision. The combination of the 2.4-mm incision and the UltraSleeve creates a near-perfect incision seal, so that little if any BSS leaks around the incision sleeve during the procedure. The curvature of the Balanced Tip increases the efficiency of torsional phaco. Thus, for a given amount of rotation of the tip's proximal portion, there is approximately a 30% greater rotation of the distal tip than with any other tip design. This results in the more efficient removal of both soft and firm cataracts.

During sculpting, I placed the Big Ball Chopper over the nuclear equator opposite the phaco incision. This maneuver stabilized the nucleus and permitted precise sculpting. The nucleus remained perfectly still while I gradually deepened the nuclear bowl until a red reflex became visible. I then accomplished the first chop by impaling the nucleus (foot pedal position 3 to impale,

Please see page 3 for important information about these products.

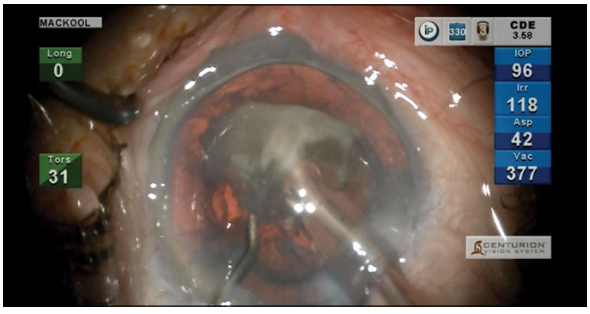


**Figure 2. An aspiration flow rate of 42 cc/min easily draws nuclear material to the phaco tip.**

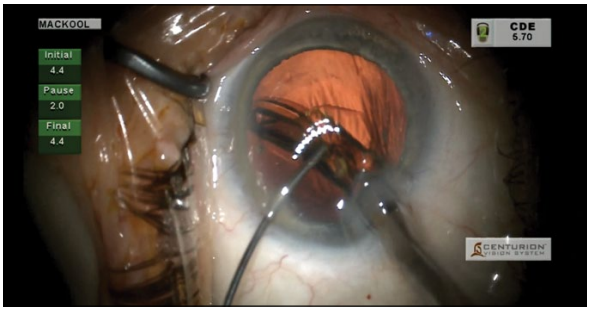


**Figure 3. The AutoSert IOL Injector enables the surgeon to use the nondominant hand to stabilize the globe.**

then foot pedal position 2 to maintain vacuum). With an achieved vacuum of 250 to 300 mm Hg, the nucleus remained immobilized by the phaco tip as I successfully performed the horizontal chop maneuver. I sequentially rotated the nucleus as I performed three additional horizontal chops without utilizing vacuum to impale the nucleus (non-impale technique).

With the nucleus now divided into four quadrants, the CENTURION Vision System demonstrated its flexibility during the removal of each quadrant. The ACTIVE FLUIDICS Technology maintained maximum anterior chamber volume, even as I achieved vacuum levels approaching 600 mm Hg (Figure 1). Although I prefer to work at a high IOP setting (100 mm Hg), the same anterior chamber volume maintenance can be achieved with much lower IOP settings should the surgeon prefer a softer globe during phacoemulsification. The aspiration flow rate of 42 cc/min that I employed during the nuclear segment removal provided great attraction of nuclear material to the phaco tip and enabled the tip to remain in the center of the anterior chamber as the quadrants were attracted to it (Figure 2).

The handpiece of the CENTURION Vision System features a leur-lock mechanism. With the infusion line thereby firmly attached to the handpiece, inadvertent detachment of the infusion line from either the phaco or I/A handpiece is impossible.

## CORTEX REMOVAL AND LENS IMPLANTATION

I prefer a 90° I/A tip, and I use a lower IOP setting of 60 mm Hg to remove the lens cortex and to vacuum the epithelium from the undersurface of the anterior capsule. This eye was highly myopic, a situation in which many patients experience mild to moderate discomfort with IOP elevation as a result of scleral distention. Because this patient experienced only transient discomfort, it was unnecessary to lower the IOP setting.

Some fibrosis of the posterior capsule was present in this eye, but it may not have been of visual significance. I injected PROVISC OVD into the capsular sac and anterior chamber, using the tip of the OVD cannula to gently polish the posterior capsule as the viscoelastic entered the eye. Next, I inserted the IOL using the AutoSert IOL Injector (Alcon Laboratories, Inc.), with an injection rate of 4.4 mm/sec and a pause duration of 2 seconds (called the *dwell time*). This injector delivers the IOL under linear control via the foot pedal and thus frees the surgeon's nondominant hand to stabilize the position of the globe as the IOL advances into the eye (Figure 3). Immediately upon injection, I used the same spatula that I had used to stabilize the globe to position the IOL within the capsular sac, and then to rotate the IOL slightly so the haptics were horizontally oriented.

## VISCOELASTIC REMOVAL AND CLOSING THE EYE

I removed the retained viscoelastic with the I/A tip, and then I manually irrigated the chamber angle to remove OVD from this region and thereby reduce the risk of an IOP spike. The incisions were sealed by stromal hydration, antibiotic was injected intracamerally, and the IOL appeared to be centered within the capsular sac. I also noted that the margins of the capsulorhexis covered the surface of the optic for 360°.

Within minutes, this patient reported markedly improved acuity. On the following day, the UCVA was 20/20 (plano target). It should be noted, however, that the final refractive outcome is subject to variation for 7 to 14 days because of slight variations of the effective lens position that can occur during that time. ■

*Richard J. Mackool, MD, is the director of The Mackool Eye Institute and Laser Center in Astoria, NY. He is a paid consultant for Alcon Laboratories, Inc. Dr. Mackool may be reached at (718) 728-3400, ext. 256; mackooleye@aol.com.*



Please see page 3 for important information about these products.

**CENTURION® Vision System Important Safety Information**

Caution: Federal (USA) law restricts this device to sale by, or on the order of, a physician.

As part of a properly maintained surgical environment, it is recommended that a backup IOL Injector be made available in the event the AutoSert® IOL Injector Handpiece does not perform as expected.

Indication: The CENTURION® Vision system is indicated for emulsification, separation, irrigation, and aspiration of cataracts, residual cortical material and lens epithelial cells, vitreous aspiration and cutting associated with anterior vitrectomy, bipolar coagulation, and intraocular lens injection. The AutoSert® IOL Injector Handpiece is intended to deliver qualified AcrySof® intraocular lenses into the eye following cataract removal.

The AutoSert® IOL Injector Handpiece achieves the functionality of injection of intraocular lenses. The AutoSert® IOL Injector Handpiece is indicated for use with the AcrySof® lenses SN60WF, SN6AD1, SN6AT3 through SN6AT9, as well as approved AcrySof® lenses that are specifically indicated for use with this inserter, as indicated in the approved labeling of those lenses.

Warnings: Appropriate use of CENTURION® Vision System parameters and accessories is important for successful procedures. Use of low vacuum limits, low flow rates, low bottle heights, high power settings, extended power usage, power usage during occlusion conditions (beeping tones), failure to sufficiently aspirate viscoelastic prior to using power, excessively tight incisions, and combinations of the above actions may result in significant temperature increases at incision site and inside the eye, and lead to severe thermal eye tissue damage.

Good clinical practice dictates the testing for adequate irrigation and aspiration flow prior to entering the eye. Ensure that tubings are not occluded or pinched during any phase of operation.

The consumables used in conjunction with ALCON® instrument products constitute a complete surgical system. Use of consumables and handpieces other than those manufactured by Alcon may affect system performance and create potential hazards.

AEs/Complications: Inadvertent actuation of Prime or Tune while a handpiece is in the eye can create a hazardous condition that may result in patient injury. During any ultrasonic procedure, metal particles may result from inadvertent touching of the ultrasonic tip with a second instrument. Another potential source of metal particles resulting from any ultrasonic handpiece may be the result of ultrasonic energy causing micro abrasion of the ultrasonic tip.

ATTENTION: Refer to the Directions for Use and Operator's Manual for a complete listing of indications, warnings, cautions and notes.

**AcrySof® IQ Intraocular Lenses – Physician Brief Statement**

CAUTION: Federal (USA) law restricts this device to the sale by or on the order of a physician.

INDICATIONS: The AcrySof® IQ posterior chamber intraocular lens is intended for the replacement of the human lens to achieve visual correction of aphakia in adult patients following cataract surgery. This lens is intended for placement in the capsular bag.

WARNING/PRECAUTION: Careful preoperative evaluation and sound clinical judgment should be used by the surgeon to decide the risk/benefit ratio before implanting a lens in a patient with any of the conditions described in the Directions for Use labeling. Caution should be used prior to lens encapsulation to avoid lens decentrations or dislocations.

Studies have shown that color vision discrimination is not adversely affected in individuals with the AcrySof® Natural IOL and normal color vision. The effect on vision of the AcrySof® Natural IOL in subjects with hereditary color vision defects and acquired color vision defects secondary to ocular disease (e.g., glaucoma, diabetic retinopathy, chronic uveitis, and other retinal or optic nerve diseases) has not been studied. Do not resterilize; do not store over 45° C; use only sterile irrigating solutions such as BSS® or BSS PLUS® Sterile Intraocular Irrigating Solutions.

ATTENTION: Reference the Directions for Use labeling for a complete listing of indications, warnings and precautions.

**VISCOAT® OVD**

CAUTION: Federal (USA) law restricts this device to sale by, or on the order of, a physician.
INDICATION: VISCOAT® OVD is indicated for use as a surgical aid in anterior segment procedures including cataract extraction and intraocular lens (IOL) implantation. VISCOAT® OVD maintains a deep chamber during anterior segment surgeries, enhances visualization during the surgical procedure and protects the corneal endothelium and other ocular tissues. The viscoelasticity of the solution maintains the normal position of the vitreous face and prevents formation of a flat chamber during surgery.

CONTRAINDICATIONS:
• At present there are no known contraindications of the use of VISCOAT® Ophthalmic Viscosurgical Device when used as recommended.

WARNINGS/PRECAUTIONS:
• Failure to follow "Directions for Use" on attachment of the cannula or use of an alternate cannula may result in cannula detachment.
• Precautions are limited to those normally associated with the surgical procedure being performed. Although sodium hyaluronate and sodium chondroitin sulfate are highly purified biological polymers, the physician should be aware of the potential allergic risks inherent in the use of any biological material.
• A transient rise in intraocular pressure in the early postoperative period may be expected due to the presence of sodium hyaluronate, which has been shown to effect such a rise. It is therefore recommended that VISCOAT® OVD be removed from the anterior chamber by thorough irrigation and/or aspiration at the end of the surgery to minimize postoperative IOP increases. Do not overfill anterior chamber.

ATTENTION: Reference the Package Insert for a complete listing of indications, warnings and precautions.

**ProVisc® OVD**
Caution: Federal (USA) law restricts this device to sale by, or on the order of, a physician.

Indication: ProVisc® OVD is indicated for use as an ophthalmic surgical aid in the anterior segment during cataract extraction and intraocular lens (IOL) implantation. Ophthalmic viscoelastics serve to maintain a deep anterior chamber during anterior segment surgery allowing reduced trauma to the corneal endothelium and surrounding ocular tissues. They help push back the vitreous face and prevent formation of a flat chamber during surgery.

Contraindications:
• At present there are no known contraindications of the use of ProVisc® Ophthalmic Viscosurgical Device when used as recommended.
Warnings/Precautions:
• Postoperative increases in intraocular pressure have been reported with sodium hyaluronate products. The IOP should be carefully monitored and appropriate therapy instituted if significant increases should occur. It is recommended that ProVisc® OVD be removed by irrigation and/or aspiration at the close of surgery. Do not overfill anterior chamber. Although sodium hyaluronate is a highly purified biological polymer the physician should be aware of the potential allergic risks inherent in the use of any biological material; care should be used in patients with hypersensitivity to any components in this material. Cannula assembly instructions should be followed to prevent patient injury.
• Postoperative inflammatory reactions such as hypopyon and iritis have been reported with the use of ophthalmic viscoelastics, as well as incidents of corneal edema, corneal decompensation, and a transient rise intraocular pressure.

ATTENTION: Reference the Package Insert for a complete listing of indications, warnings and precautions.

Cataract & Refractive Surgery TODAY

Alcon
a Novartis company