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## Clinical Benefits of ACTIVE FLUIDICS Technology

Removing a grade 3 cataract using the CENTURION Vision System.

BY ROBERT J. CIONNI, MD

I have been involved with the CENTURION Vision System (Alcon Laboratories, Inc.) since its inception more than 5 years ago, and I have had clinical experience with the beta and gamma unit versions for more than a year. This article describes my clinical experience with the innovative system.

### ACTIVE FLUIDICS TECHNOLOGY

In my opinion, one of the best features on the CENTURION Vision System is the incorporation of ACTIVE FLUIDICS Technology (Alcon Laboratories, Inc.). As opposed to fixed irrigation sources that rely on gravitational pull from a pole-hung bottle, ACTIVE FLUIDICS Technology refers to the system's ability to apply pressure to the irrigation bag, which is housed in the machine itself, in order to maintain an amount of IOP that the surgeon specifies (Figure 1). The level of control that this design affords the surgeon leads to excellent anterior chamber stability.

### AUTOMATED IOL INJECTION

A second feature of the CENTURION Vision System that I have come to greatly appreciate is the INTREPID AutoSert IOL Injector (Alcon Laboratories, Inc.). I initially thought the INTREPID AutoSert Injector was intriguing, but did not consider it essential to my surgical practice. Since having it, however, I have come to rely on the INTREPID AutoSert Injector during surgery. It simplifies the IOL's insertion by eliminating the need for the surgeon to push against the injector with significant force to properly deliver the IOL. By simply pushing down on the INTREPID AutoSert's foot pedal, I am able to deliver an IOL very smoothly into the capsular bag through a small incision with only one hand, which leaves my second hand free to stabilize the eye. Thus, the INTREPID AutoSert Injector reduces the pressure of IOL insertion, and I am able to maintain excellent visualization throughout the implantation.

My practice receives visiting ophthalmologists almost every week, and these physicians are amazed by the ante-



Figure 1. Active Fluidics Technology tightly controls inflow fluid pressure by placing the BSS bag (Alcon Laboratories, Inc.) between two compression plates that dynamically respond to the events of surgery.



Figure 2. The author used a 45° Balanced Tip (Alcon Laboratories, Inc.) in sculpt mode with 60% power to create a central groove in the grade 3 cataract.

rior chamber stability and increased efficiencies afforded by ACTIVE FLUIDICS Technology, and they find the AutoSert IOL Injector to be an impressive advancement for IOL implantation.

### CASE PRESENTATION

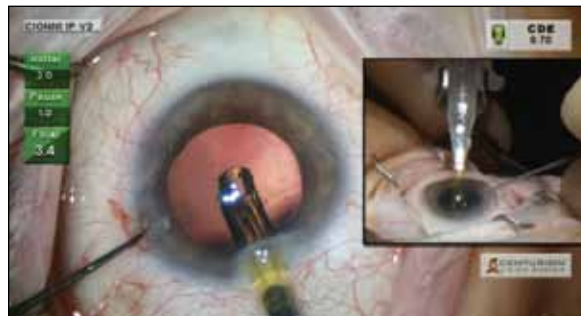
The following case describes the removal of a dense, grade 3 cataract with the CENTURION Vision System. (A video of this case may be viewed at <http://eyetube.net/video/cionni-case-6/>). I like to begin cataract surgery using

a Mastel 5.5-mm optical zone marker to outline the location and size of the capsulotomy. I constructed the sideport incision and injected a combination of lidocaine and epinephrine into the anterior chamber to gain maximal intraocular anesthesia and pupil dilation. I next instilled VISCOAT OVD (Alcon Laboratories, Inc.) to protect the cornea. This dispersive OVD also helps maintain a stable chamber while I make the capsulorhexis.

I prefer to use a bent 22-gauge needle to perform the capsulotomy, which I have been doing since I was a fellow with Robert Osher, MD. I traced the capsulotomy directly underneath the outline that was made by the optical zone marker to produce a capsulotomy measuring about 5 mm. Next, I performed hydrodissection using a Chang cannula (MSI, Phoenixville, PA) and rotated the nucleus to ensure that it was free for emulsification and aspiration.

I prefer to prechop the nucleus with an Akahoshi pre-chopper (ASICO), but in this particular case, the nucleus was too dense to create a nuclear split. So, I proceeded with a divide-and-conquer technique. I began the technique with quadrant removal settings on the CENTURION Vision System to clear a working space at higher vacuum levels, and then I switched to the lower vacuum setting in sculpt mode and reduced the energy to 60% to create a central groove in the nucleus (Figure 2). I used a 45° Balanced Tip (Alcon Laboratories, Inc.), which feels like a straight tip in my hands and performs very efficiently with the CENTURION Vision System. With the INFINITI Vision System (Alcon Laboratories, Inc.), I would typically use 80% to 100% energy with a true Kelman tip. The 45° Balanced Tip has an advanced design that reduces the amount of heat that develops at the incision.

For quadrant removal, the CENTURION Vision System's ACTIVE FLUIDICS Technology is quite advantageous over traditional gravity-based fluidics, because it helps produce a very stable anterior chamber, even in the setting of high vacuum. For this procedure, I used a linear vacuum setting with a maximum level of 600 mm Hg—almost double my maximum on previous phaco systems—which enables more efficient phacoemulsification. I removed the first two quadrants very efficiently with the Balanced Tip, and then I emulsified the second nuclear half as one piece rather than quadrants, because there was enough room in the chamber to do so. The anterior chamber remained stable throughout the procedure, even with occlusion breaks at high vacuum levels. When necessary, I will use a second instrument to protect the posterior capsule during phacoemulsification, but this chamber was stable enough that a second instrument was not needed.



**Figure 3.** The author used the INTREPID AutoSert IOL Injector (Alcon Laboratories, Inc.) to implant a single-piece hydrophobic acrylic IOL into the capsular bag.

My cumulative dispersed energy (CDE) in this case was only 8.70, and my fluid usage was only 34 mL; not bad for a grade 3 cataract. I believe that the CENTURION Vision System afforded me this efficiency and chamber stability.

To remove the cortex, I used a single-use curved polymer I/A tip (Alcon Laboratories, Inc.). Accidentally grabbing a piece of the capsule while using this tip will not likely tear the capsule. I applied a lower vacuum setting to polish the posterior capsule. I have found that brushing the aspiration port against the posterior capsule is an effective way to remove debris. Then, I used a modified Singer-Sweep diamond-dusted polisher (Epsilon USA) to allow for 360° cleaning of the undersurface of the anterior capsule.

After filling the bag with a cohesive OVD (PROVISC; Alcon Laboratories, Inc.), I delivered the single-piece, hydrophobic acrylic AcrySof IQ IOL (SN60WF) (Alcon Laboratories, Inc.) into the capsular bag using the INTREPID AutoSert IOL Injector (Alcon Laboratories, Inc.). I used the instrument's foot pedal position to control the delivery speed. Counter-traction with a second instrument through a sideport incision allowed me to deliver the lens smoothly, without having to push the eye all the way over to the nose (Figure 3). Once the IOL was inside the eye, I manipulated the IOL's optic to aspirate the OVD from behind the lens, and then the lens centered itself beautifully. ■

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