Sponsored by Alcon Laboratories, Inc.

In Cataract Surgery, Options = Control

Optimizing settings on the CENTURION Vision System.

BY CHRISTER JOHANSSON, MD

I began using the CENTURION Vision System (Alcon Laboratories, Inc.) in June 2012 as one of its clinical investigators. My clinic, the Department of Ophthalmology at the Lanssjukhuset in Kalmar, Sweden, was the second investigational site worldwide to test the beta system, with which we performed 100 cases. We received a precommercial gamma version of the system in June 2013, and I have used it in several hundred cases since then. This article details my preferred fluidic settings with the CENTURION Vision System and describes a recent cataract surgical case that illustrates the advanced performance of this system.

ADVANTAGES OF THE CENTURION VISION SYSTEM

From the very first case with the CENTURION Vision System, it was obvious that this machinery meant a paradigm shift in fluidics, with anterior chamber stability taken to a new level. The technical background to these advances is found at the back of the console, where a bag compartment contains the irrigation solution. Pressure plates inside this compartment can compress and decompress the BSS bag as needed in a very fast action to provide adjustable irrigation pressure. Pressure sensors at the cassette and in the bag's bay provide input to the software, which precisely calculates the resulting IOP. Altogether, this fluidics management system (FMS) lets the surgeon set a target IOP, which the system is designed to maintain throughout the entire procedure. Thus, the system manages the balance between irrigation and aspiration in such a manner that the IOP remains constant and the anterior chamber stable. In other words, the CENTURION Vision System maintains IOP independent of pump speed, as opposed to conventional gravity-fed phaco systems.

During postocclusion surge, fast changes in volume can overrun the speed of software-dependent systems. By contrast, the CENTURION Vision System offers a robust solution in the form of high-resistance tubing with very low compliance. This FMS helps to reduce postocclusion surge during each sequence of the case.

MY PREFERRED SETTINGS

Anterior chamber stability as a result of balanced I/A and surge resistance enables the surgeon to choose between a broad range of parameter settings with the CENTURION Vision System. My own preferred setup stems from a concept for efficiency; I prefer nuclear material to tumble at the tip in constant repositioning due to balance between attraction and repulsion. Ten years ago, this was not an easy task. With the development of Torsional ultrasound (Alcon) and more recently, Intelligent Phaco (IP) technology, this is achievable. To fine-tune this balance, however, we must take fluidics into consideration. Different nuclear densities will need different vacuum settings, and different vacuum settings should be balanced with the right irrigation and flow parameters.

Figure 1. With a combination of pressure sensors and advanced calculations, the CENTURION Vision System is designed to maintain the target IOP that the surgeon sets at the beginning of surgery.

I have three different vacuum settings I frequently change between using the CENTURION Vision System's foot pedal. Usually, I use all three of them during a case, as different parts of the nucleus have different densities. I like to attract material from a distance and keep the phaco tip in the middle of the anterior chamber, so I use a high pump speed relative to the vacuum level. High-resistance tubing with low internal volume means a very short rise time and excellent followability. It also means a high vacuum level in the aspiration line, even without occlusion. The higher the pump speed, the higher the vacuum level. To adapt to this, I set the pump speed close to the highest possible level for a given vacuum setting. With 400 mm Hg of vacuum, I have 45 cc/min; with 300 mm Hg of vacuum, I set 35 cc/min; and for 200 mm Hg of vacuum, my setting is 25 cc/min. In my experience, this typically creates a smooth transition between vacuum-driven and flow-driven aspiration (Figures 1-3).

Please see page 3 for important information about these products.

Advanced-Technology Cataract Surgery

Figure 2. First, I set the vacuum at 400 mm Hg and the pump at 45 cc/min. Both are in linear mode, foot pedal position 2. With max vacuum set to 327, there is only 73 mm Hg of difference between the occluded and unoccluded states of the phaco tip.

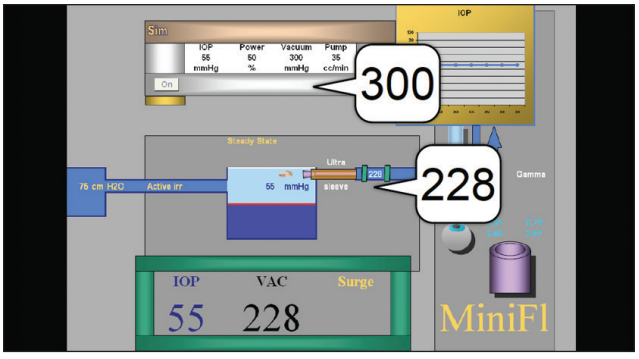

Figure 3. If there is too much attraction at the phaco tip, I will increase the vacuum to 300 mm Hg and a pump speed of 35 cc/min, which has the same vacuum interval.

I set the target IOP to balance surge and vacuum settings. With vacuum at 400 mm Hg, I need just 40 mm Hg of target IOP with the CENTURION Vision System. This corresponds to a bottle height of 54 cm (hydrostatic). I prefer, however, a target IOP of 55 mm Hg, as I feel the eyeball is a bit too soft with low target IOP settings.

CASE PRESENTATION

The following case describes the removal of a moderately dense cataract from an 82-year-old patient. View the video of this case at http://eyetube.net/video/johansson-centurion-case-review.

After a 1-mm sideport incision, I instilled lidocaine intracamerally. I created a 2.2-mm square incision for the main incision. Next, I instilled DisCoVisc OVD (Alcon) and created a 5-mm capsulorhexis. After performing hydrodissection, I sculpted the nucleus and divided it into two halves.

I used Torsional ultrasound in linear mode and an amplitude of 0 to 80% for sculpting the central part of the nucleus, and then I switched to longitudinal ultrasound in linear mode at 0 to 60% power for deeper sculpting. Once the nucleus was divided, I changed to a chopping technique with a blunt sideport instrument. I began this technique with a setting of 400 mm Hg and 45 cc/min to hold, chop, and aspirate the nucleus. For dense nuclei, I will stay with this setting for most of the procedure and then step down to 300 mm Hg of vacuum and 35 cc/min (or even possibly 200 mm Hg and 25 cc/min) at the end (Figure 4). If the nucleus is soft, I will immediately step down to a reduced vacuum/pump level.

In this case of a grade 3 nucleus, I stayed within 400 mm Hg and 45 cc/min to emulsify and aspirate most of the first half of the nucleus, and then I lowered the settings to 300 mm Hg and 35 cc/min for the last portions. The balance at the phaco tip was quite good with 400 mm Hg and 45 cc/min, but decreasing these settings slightly to 300 mm Hg and 35 cc/min gave me the desired nuclear tumbling. I stayed with these settings to emulsify most of the second half of the nucleus, and then I switched to 200 mm Hg and 25 cc/min for the final fragments.

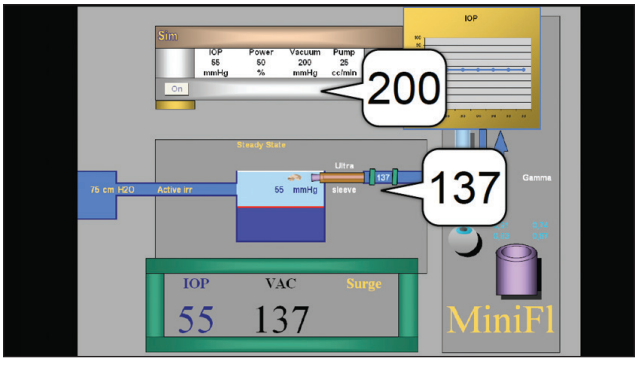

Figure 4. If I need to reduce the vacuum to 200 mm Hg, I will also reduce the pump speed to 25 cc/min to maintain the right balance.

Since I began working with CENTURION Vision System, I have changed from a two-handed to a single-handed technique for removing the epinucleus and the last remaining fragments. The anterior chamber remains stable, and there is little to no leakage from the sideport incision. I/A demonstrates the high degree of followability provided by CENTURION Vision System's fluidics.

To conclude the case, I implanted a +18.00 D AcrySof IQ IOL using the Monarch III injector and D cartridge (Alcon). I then removed the DisCoVisc OVD and injected intracameral moxifloxacin for antibiotic prophylaxis to finish. ■

Christer Johansson, MD, practices in the Department of Ophthalmology at the Lanssjukhuset, Kalmar, Sweden. He has been a clinical investigator for the CENTURION Vision System and is a paid consultant to and has received travel grants from Alcon Laboratories, Inc. Dr. Johansson may be reached at +46 48081477; christer.ptab@telia.com.

CENTURION® Vision System Important Product 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.

DisCoVisc® OVD Brief Statement

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

Indications: DisCoVisc® Ophthalmic Viscosurgical Device is indicated for use during surgery in the anterior segment of the eye. It is designed to create and maintain space, to protect the corneal endothelium and other intraocular tissues and to manipulate tissues during surgery. It may also be used to coat intraocular lenses and instruments during cataract extraction and IOL insertion.

Warnings: Failure to follow assembly instructions or use of an alternate cannula may result in cannula detachment and potential patient injury.

Precautions: 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.

Adverse Reactions: DisCoVisc® Ophthalmic Viscosurgical Device was very well tolerated in nonclinical and clinical studies. 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 affect such a rise. It is therefore recommended that DisCoVisc® OVD be removed from the anterior chamber by thorough irrigation and/or aspiration at the end of surgery to minimize postoperative IOP increases.

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

CRST

Cataract & Refractive Surgery Today

Alcon®

a Novartis company