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Removing Dense Cataract With the CENTURION Vision System

Demonstrating technological advances.

BY KHIUN F. TJIA, MD

As a member of the first group of surgeons to evaluate the CENTURION Vision System (Alcon Laboratories, Inc.) during its development, I have used the system through all of its iterations before its commercial launch. I have switched to the CENTURION Vision System because this innovative phaco machine provides superior efficacy and safety compared with the INFINITI Vision System (Alcon).

TECHNOLOGICAL ADVANTAGES

The CENTURION Vision System offers two innovations that I consider groundbreaking for cataract surgery. The first function is its ACTIVE FLUIDICS Technology, which allows the surgeon to perform surgery at a low IOP that I firmly believe is more within the eye's appropriate physiological range. I can preset the CENTURION Vision System to maintain my target IOP, which currently is 36 mm Hg. In my practice, I strive not to let the eye exceed 50 mm Hg or higher for more than 5 minutes. With older phaco systems, the IOP would constantly fluctuate depending on the manipulations in the eye. With the CENTURION Vision System, I can perform almost the entire surgery at a near physiological IOP. Another important improvement is the unique, low-compliance fluidic management system that is designed to significantly reduce occlusion break surge and ensure stability of the anterior chamber, even at high vacuum settings. I work with 500 mm Hg of vacuum, which provides more holding power as well as very efficient phacoemulsification and aspiration. The following case, the video of which is available at <http://eyetube.net/video/tjia-centurion-case-review/>, showcases the power and efficiency of the CENTURION Vision System.

The second groundbreaking innovation with this system is Balanced Energy. A new double-curved shaped phaco tip has been specifically designed to optimize the efficiency and safety of Torsional ultrasound.

Phaco Stroke - OZil Amplitude Comparison			
Stroke/ Amplitude at 100% Power	Traditional Phaco	Kelman Miniflared	Balanced Mini
At Cutting Edge	89 μ m (Torsional)	130 μ m	192 μ m

Table 1. The INTREPID Balanced Mini Tip (Alcon) allows for nearly twice the lateral movement of other phaco tips.

The INTREPID Balanced Mini Tip's design enables approximately 50% more lateral movement compared to previous tips, and it cuts more easily through very dense lens material (Table 1). This allows me to reduce the maximum set amplitude to 65% during quadrant removal.

The tip is designed to transfer energy to its distal end. Longitudinal ultrasound intrinsically induces phaco tip friction against the sleeve, potentially resulting in unwanted wound changes. Kelman tips in combination with Torsional ultrasound also show tip shaft motion at the level of the incision.

CASE PRESENTATION

This case involved a grade 3 nucleus. Although not brunescant, it was certainly denser than an average cataract. Because I work in a teaching hospital, I use standard surgical techniques in cataract surgery. After making the initial incisions, I inject Viscoat OVD (Alcon). This dispersive viscoelastic coats and protects the corneal endothelium, which is particularly important with denser cataracts and/or compromised corneal endothelium cases. I have noticed that, since I began using the CENTURION Vision System, more Viscoat OVD remains in the eye when I am done performing phacoemulsification.

Advanced-Technology Cataract Surgery



Figure 1. The INTREPID Balanced Mini Tip demonstrates great holding power yet contributes to low IOP in the setting of high vacuum.

CAPSULORHEXIS AND NUCLEAR DISSECTION

I created my standard manual capsulorhexis, which I aim to be smaller than the IOL optic size, and then I performed hydrodissection. I approached nuclear disassembly in this case with a straightforward divide-and-conquer technique.

I have optimized this divide-and-conquer technique with less sculpting than the original technique. After creating an initial groove, I hemicrack the nucleus. I subsequently impale the heminuclei in the middle and crack them straight away without additional sculpting (Figure 1). I then introduce the INTREPID Balanced Mini Tip, and during sculpting and quadrant removal, one can witness the increased emulsification efficiency and the absence of any significant tip movement inside the incision. One can also see the lack of any signs of anterior chamber instability. There is no iris trampoline, posterior capsule movement, etc., and this stability of the anterior chamber is designed to be maintained while using high vacuum settings and a low target IOP!

Since switching to the CENTURION Vision System with the INTREPID Balanced Mini Tip from the INFINITI Vision System with the Mini tip, I have seen a 30% to 40% decrease in my cumulative dissipated energy during phacoemulsification. A recent comparison study conducted by Solomon et al found a similar rate of energy reduction (Figure 2),¹ and I presented a paper on this improvement at the 2014 ASCRS meeting in Boston as well.²

CORTICAL CLEANUP AND IOL IMPLANTATION

The next step in this case was cortical cleanup, for which I inserted the bimanual polymer I/A tip (Alcon) into the eye. In Europe, bimanual I/A is much more

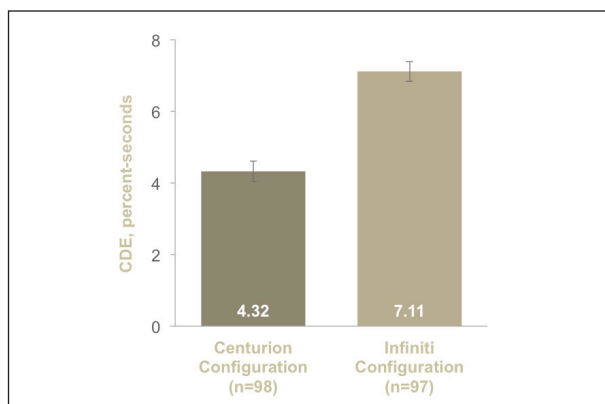


Figure 2. In one study, the CENTURION Vision System showed less observed CDE compared with the INFINITI configuration. The mean difference between the groups was -2.78 percent-seconds.¹

popular than coaxial, and interestingly, the bimanual technique is experiencing a resurgence of sorts in the United States with the advent of femtosecond cataract surgery. I advocate hollow, disposable instruments for I/A³; I prefer to use a soft polymer I/A tip as opposed to a metal one for polishing the capsule.

For IOL implantation, I prefer a cohesive viscoelastic (Provisc OVD; Alcon), which is easy to remove at the end of the case. To inject the IOL, I used the INTREPID AutoSert IOL Injector (Alcon), which provides a controlled implantation without any jerky movements. This device, which is operated via a foot pedal, controls every step of the IOL injection process at the surgeon's chosen speed. In my experience, single-handed push injectors can sometimes expel the IOL too fast and create the possibility of harming delicate intraocular tissue. Two-handed screw-type injectors often involve some manipulation and/or rotation within the incision. The INTREPID AutoSert IOL Injector is simple to use; the surgeon simply holds it steady just inside the incision while the IOL advances into the eye. ■

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