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Automated IOL Insertion

Improved eye stabilization with the INTREPID AutoSert IOL Injector.

BY CHRISTER JOHANSSON, MD

I have used the twist-style MONARCH Injectors I, II, and III (Alcon Laboratories, Inc., Fort Worth, Texas) since they became available in the 1990s. I have also used the plunger-style Royale injectors. In my experience, the MONARCH III Injector with D cartridge works very well with incisions down to as small as 2.2 mm, but using it becomes challenging with sub-2-mm incisions. In my view, the new INTREPID AutoSert IOL Injector (Alcon Laboratories, Inc.; Figure 1) is ideal for implanting IOLs, especially through microincisions. This article describes my pre-market experience with the AutoSert IOL Injector.

Figure 1. The INTREPID AutoSert IOL Injector.

THE INTREPID AUTOSERT IOL INJECTOR

In my experience, the AutoSert IOL Injector provides the best aspects of the twist-style and plunger-style injectors. This motor-assisted, automated injector attaches to the INFINITI Vision System (Alcon Laboratories, Inc.). The surgeon controls its operation via surgeon-selected parameters and the phaco system's foot pedal. The AutoSert IOL Injector helps the surgeon implant IOLs with a controlled, uninterrupted delivery. In my view, the AutoSert IOL Injector helps the surgeon manage forces involved in IOL delivery. He or she simply advances the IOL using the AutoSert IOL Injector at the desired velocity. I usually begin the implantation process by positioning the AutoSert IOL Injector and cartridge parallel to the iris. Then, I adjust the injector downward during the injection so that the IOL enters at the back of the capsulorhexis. I found there is no stopping and starting, like with twist-style injectors, and no risk of uncontrolled overshoot, as can happen with plunger-style inserters. Furthermore, because the AutoSert Injector is controlled by the foot pedal, it frees both of the surgeon's hands so he or she can improve the stabilization of the eye during IOL insertion. Being able to use both hands also allowed me to better orient the injector at the right angle and titrate the optimal amount of pressure against the wound during delivery.

Today, my standard incision sizes are 2.0 mm for routine cases and 2.6 mm for more complicated surgeries (eg, eyes with pseudoexfoliation, brunescent nuclei, weak zonules, and subluxated lenses). I feel that the larger size gives me maximum safety and control with difficult maneuvers. For routine surgery, however, I feel that a 2.0-mm incision maintains stable fluidics in the eye, is always watertight at the end of surgery, and induces less corneal astigmatism. With smaller incisions that require stabilization of the globe, I think the AutoSert IOL Injector is a valuable tool.

SURGICAL BENEFITS OF AUTOMATED IOL INSERTION

Because I was unable to apply countertraction to the pressure of passing the lens through a 2-mm incision with the MONARCH Injector, there was a brief moment where I would experience less control than I wanted over the implantation process. During this time, as long as the patient kept his or her eye fixated on the microscope's light, the forward pressure on the globe from the distal end of the cartridge would permit the IOL to be injected. However, if the patient looked downward, it could complicate the implantation. With the AutoSert IOL Injector, I have complete control throughout the implantation process. I can use both hands to better manage the globe's movement and rotation, and I can give the IOL's insertion more attention. That is the clinical difference I find with the AutoSert Injector.

CLINICAL EXPERIENCE

My staff and I compared the incisions and outcomes of 30 eyes that received IOLs implanted with the MONARCH Injector to 30 eyes implanted with IOLs via the AutoSert Injector through 2.0-mm incisions. On average, the incisional

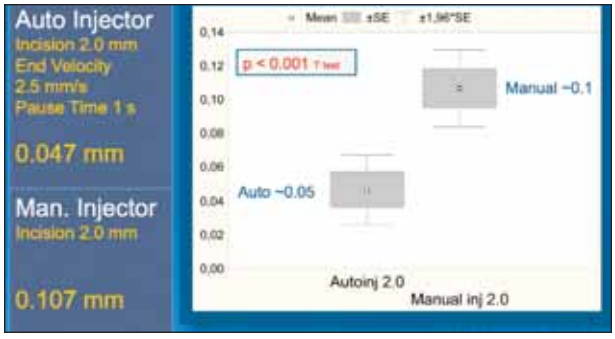

Figure 2. This chart compares the stretch of a 2.0-mm corneal incision between using a manual MONARCH Injector versus the AutoSert Injector at a velocity of 2.5 mm/sec.

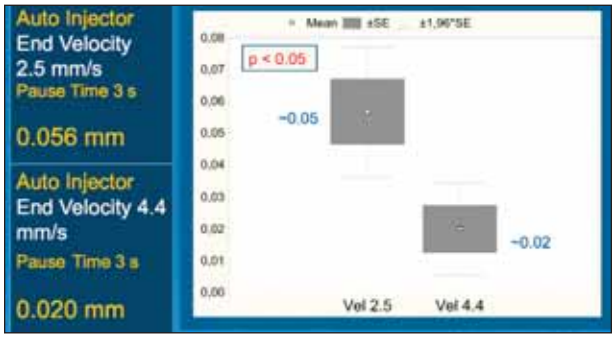

Figure 3. This chart shows the stretch of the corneal incision using the AutoSert Injector at a velocity of 2.5 mm/sec versus 4.4 mm/sec.

stretch with the AutoSert Injector was 0.05 mm versus 0.11 mm with the MONARCH injector (Figure 2). When we tried using the AutoSert Injector at a maximum velocity (4.4 mm/sec) through a 2.0-mm incision, the incisional stretch was only 0.02 mm (Figure 3). Based on these findings, I continued to operate the AutoSert Injector at 4.4 mm/sec with a pause time of 1 to 3 seconds.

The pause time occurs just before the IOL leaves the cartridge. The pause is intended to allow the lens to better adapt to the cartridge. I found no difference in incisional stretch between pause times. Initially, I disliked the pause time with the AutoSert Injector because it was a new experience. I did not like any interruption to IOL insertion. Now, I appreciate the pause and incorporate this time when I use the AutoSert Injector. I use this time to perform a final check before I advance the IOL to see that I have positioned the cartridge with the right amount of pressure on the globe and at the appropriate angle with respect to the wound, and that the eye is not rotating. This pause time allows me to divide the IOL's insertion into three rhythmic parts whereby I can anticipate and prepare for each step: the placement of the cartridge with the AutoSert Injector at the wound and the initiation of the IOL's insertion, the pause time that I described above for any final adjustments, and the injection of the IOL.

TABLE 1. WOUND STRETCH PER INJECTOR

Incision Size	Average Wound Stretch IOL Insertion		
	AutoSert Pause: 1 sec Insert velocity: 2.5 mm / sec	AutoSert Pause: 3 sec Insert velocity: 4.4 mm / sec	MONARCH
2.0 mm	0.047 mm	0.020 mm	0.107 mm
1.8 mm	0.140 mm	-	-

My staff and I found that handling the cartridge and the attachment to the AutoSert Injector was essentially the same as when using the MONARCH injector. In our OR, the overall time from loading the IOL in the cartridge to its arrival in the eye was approximately 13 seconds longer with the AutoSert Injector, which we found acceptable given the advantages we experienced using it.

We also compared 1.8-mm versus 2.0-mm incisions with the AutoSert IOL Injector. On average, the incisional stretch was 0.14 mm with 1.8-mm incisions compared to 0.05 mm with 2.0-mm incisions (at the medium speed setting). The final difference in wound size, therefore, was 0.1 mm (Table 1).

Because I experience better fluidics with the nanosleeve at 2.0-mm incisions compared to 1.8-mm incisions, and the difference in the final wound size is relatively small, I currently prefer the 2.0-mm concept.

CONCLUSION

I felt there was little-to-no learning curve for using the AutoSert Injector and its footpedal operation; I only had to adapt to its ergonomics. Again, the primary advantage I found to this device was that it frees up my other hand. It does require some additional time on the part of the surgical staff for setting up and sterilizing the handpiece, but I felt that the benefits for the surgeon and patient were worth it. The AutoSert Injector quickly became part of the OR routine. In short, I feel that the AutoSert Injector definitely has a place in my practice for microincisional surgery. I look forward to gaining more clinical experience with the AutoSert Injector and its advantages for wound integrity and induced astigmatism. ■

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