

IJC RECAP: CANALOPLASTY, LIGHT-ADJUSTABLE LENSES, AND DROPLESS CATARACT SURGERY

Innovation Journal Club explores recently published and presented data around innovations in eye care with a focus on how they might shape real-world practice.



In the *Innovation Journal Club* (IJC) series on Eyetube.net, host I. Paul Singh, MD, of The Eye Centers of Racine & Kenosha in Wisconsin, interviews leading experts from across eye care subspecialties about emerging innovations and technologies that may prove influential to the real-world practice of ophthalmology. The series is editorially independent (supported by advertising from multiple companies), which allows the discussions to be broad in scope and candid in presentation. The following is a summary of three episodes in which Dr. Singh spoke with Damien F. Goldberg, MD, about a study comparing canaloplasty to trabecular micro-bypass stenting; John F. Doane, MD, FACS, about the clinical performance of two models of light-adjustable lenses; and Cathleen M. McCabe, MD, about dropleless cataract surgery.

COMPARING CANALOPLASTY AND A TRABECULAR MICRO-BYPASS STENT

WITH DAMIEN F. GOLDBERG, MD



In this episode, Dr. Goldberg discussed interim results from the ongoing VENICE study, which compares canaloplasty outcomes with the STREAMLINE Surgical System (New World Medical) and iStent *inject W*

(Glaukos) in patients with primary open-angle glaucoma.¹

The randomized, multicenter, controlled trial evaluated safety and efficacy outcomes in 72 eyes. Following pre- and post-medication washout visits, one



eye per subject were randomized on a 1-to-1 basis to either STREAMLINE (n = 35) or iStent *inject W* (n = 37) following phacoemulsification. Eligible patients were evaluated on day 1 and week 1, and at months 1, 3, and 6 for IOP, number of IOP-lowering medications, and adverse events.

Results demonstrated an initial pressure response from both technologies on day 1 postoperatively, which remained the same for about a year (Figure 1).¹ When examining medication use at 6 months, about 81% of STREAMLINE patients were able to taper off their medication, with iStent *inject W* patients exhibiting equally effective results at about 78% (Figure 2).¹

Safety data showed that adverse events were generally mild and self-limited. In this population of patients:

- Two eyes (one STREAMLINE, one iStent *inject W*) had early mild corneal edema with transiently elevated IOP; each resolved with short-term use of topical therapeutics.
- One eye (STREAMLINE) had late corneal edema with elevated IOP, which resolved with short-term use of topical therapeutics.
- Two eyes (one STREAMLINE, one iStent *inject W*) had early elevated IOP; each resolved without sequelae after paracentesis tap and topical medications.
- Four eyes (STREAMLINE) had cell and flare 4 to 9 weeks after surgery; these were deemed unrelated to the STREAMLINE device or surgery.
- One eye (STREAMLINE) had blood in the angle at postoperative day 1.
- One eye (iStent *inject W*) had mild cystoid macular edema, which resolved with topical treatment.

Overall, these interim findings demonstrated comparable IOP and medication reduction between STREAMLINE canaloplasty and iStent *inject W* implantation when combined with phacoemulsification.

Results: IOP Response

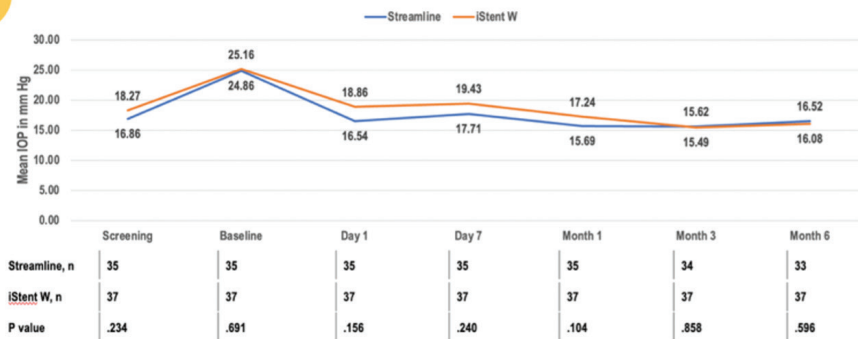


Figure 1. Comparative measurements of IOP response collected from screening to 6 months postoperatively.



Results: Medication Use

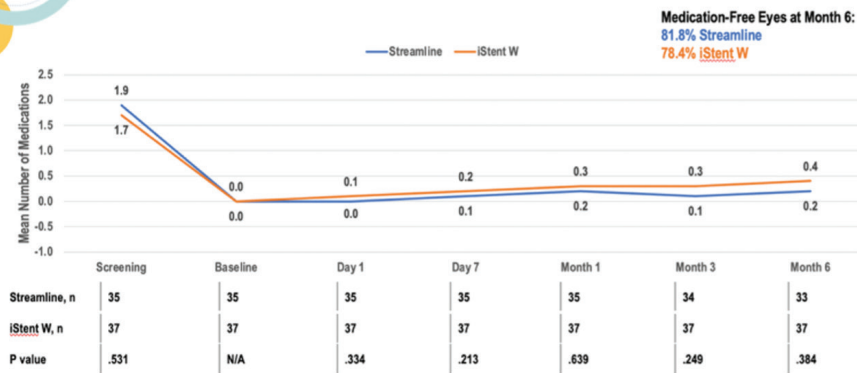


Figure 2. Result data comparing topical medication use between STREAMLINE and iStent patients at 6 months.

“We’re going to keep following these patients to see what [else we can learn],” said Dr. Goldberg. “It’s great that we have several technologies that seem to work well, and we can offer these patients a new type of technique for pressure reduction.”

1. Goldberg DF, Orlich C, Flowers BE, et al. A randomized controlled trial comparing

STREAMLINE canaloplasty to trabecular micro-bypass stent implantation in primary open-angle glaucoma. *Clin Ophthalmol.* 2024;18:2917-2928.

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COMPARING THE CLINICAL PERFORMANCE OF TWO LAL MODELS

WITH JOHN F. DOANE, MD, FACS



Cataract surgery continues to evolve with the introduction of new IOL technology and advanced diagnostics. However, despite these developments, many patients still experience postoperative refractive surprise. In this episode, Dr. Doane discussed the benefits of light adjustable lenses (LALs) and highlighted trial data on the clinical performance of two models of the light adjustable lens: LAL and LAL+ (RxSight).

The key advantage of LALs is that they are adjustable monofocal IOLs that can be “tuned” postoperatively with UV light. With the LAL platform, patients are not locked into a refractive outcome immediately postoperatively; instead, patients can trial their new vision in real-world scenarios

and then return to their surgeon for further refinement.

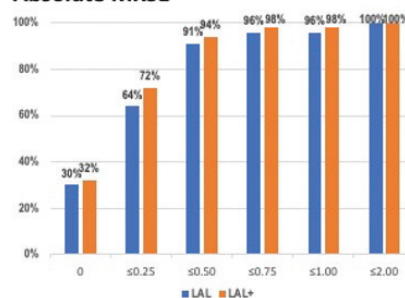
“That’s where it becomes customizable, each eye for each patient,” said Dr. Doane, “and that’s where the art (and fun) of what we do comes about.”

While the two models of LALs are quite similar, the “Plus” version (LAL+) has a modified aspheric anterior surface that slightly extends depth of focus before any light treatments—whereas the original LAL does not.

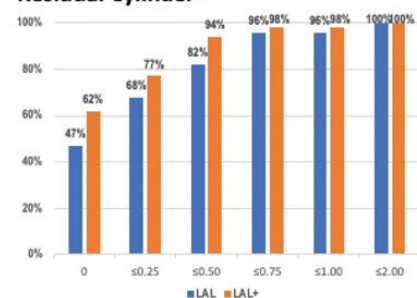
During the episode, Dr. Doane shared results from a study comparing the clinical performance of the LAL to the LAL+. In the prospective, nonrandomized, nonmasked, multicenter study, 50 and 100 patients were implanted bilaterally with the LAL and LAL+, respectively.¹ Outcome measures included subjective manifest refraction; monocular and binocular best-corrected distance, intermediate, and near visual acuities; and binocular uncorrected best focus acuity at differing contrast levels. Results demonstrated that 91.1% and 93.5% of LAL and LAL+ eyes had a mean refractive spherical equivalent (MRSE) within 0.50 D of target, respectively (Figure 1). Notably, the LAL+ provided patients increased intermediate and distance vision compared to the base LAL model, thus confirming the benefits of the modified aspheric anterior surface (Figure 2).



Absolute MRSE*



Residual Cylinder†



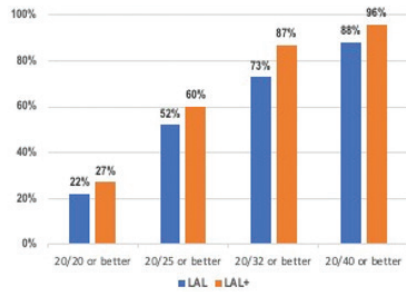
* LAL, n = 56, mean = 0.263 D
LAL+, n = 107, mean = 0.237 (P = .532)

† LAL, n = 100, mean = 0.888
LAL+, n = 200, mean = 0.183 (P = .008)

Figure 1. Concluding data comparing the predictability of MRSE after adjustment and residual refractive cylinder between the two lenses.

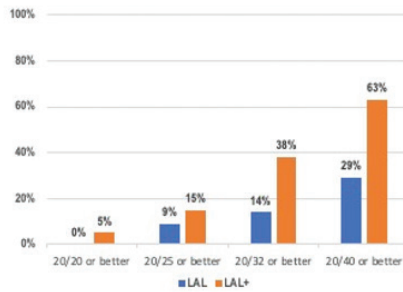


Monocular DCIVA*



* LAL, n = 100, mean = 0.175 logMAR
LAL+, n = 200, mean = 0.131 logMAR (P = .008)

Monocular DCNVA†



† LAL, n = 100, mean = 0.432 logMAR
LAL+, n = 200, mean = 0.306 logMAR (P = .000)



Figure 2. Comparative data demonstrating the cumulative distribution of distance-corrected intermediate VA and distance-corrected near VA between LAL and LAL+ eyes.

The data showed that both the LAL and LAL+ lenses achieved excellent refractive and binocular visual outcomes at distance, intermediate, and near. The broadened depth of focus of the LAL+ was clinically evident and led to less anisometropia.¹ This study further demonstrates the unique therapeutic approach for refractive cataract patients as they can select and adjust their refraction according to their visual goal.

1. Doane J, Newsom TH, Slade S, et al. Clinical data registry comparing outcomes of two light adjustable lenses. *J Cataract Refract Surg*. Published online ahead of print June 17, 2025.

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Results from a recent study, in which subconjunctival delivery of triamcinolone acetonide was added to intracameral phenylephrine 1.0%/ketorolac 0.3% and intracameral moxifloxacin, offers evidence that truly dropless surgery is not only feasible, but is preferred by patients.¹ According to Dr. McCabe, dropless cataract surgery addresses several challenges patients face with self-administering drops, including cost concerns, physicality needed to implement the drops, and remembering to use them.

“The expectations our patients have [regarding recovery] have been elevating every year. Our patients are younger, they’re more active, they want to get back to their normal lifestyle as quickly as possible,” said Dr. McCabe. “That’s one reason why I think a dropless regimen is so important, because it gives patients a better quality of vision after surgery by maintaining the health of the ocular surface.”

The randomized, prospective, multicenter study enrolled 187 eyes of 94 patients. One eye was randomized as the control (perioperative topical eye drops), while the contralateral study eye received intracameral phenylephrine 1.0%/ketorolac 0.3% and moxifloxacin, and subconjunctival triamcinolone acetonide). The primary endpoint of the trial was the proportion of patients with inflammation on day 8 (Figure).

EXAMINING DROPLESS VERSUS STANDARD-OF-CARE REGIMENS FOLLOWING CATARACT SURGERY

WITH CATHLEEN M. MCCABE, MD



Dropless cataract surgery, or the use of intracameral nonsteroidal anti-inflammatory drugs and intracameral antibiotics at the time of the operation, has long been touted as a more patient-friendly option compared to having patients self-administer drops during the postoperative healing period. Previously, however, surgeons had no way of delivering a depot nonsteroidal medication at the time of surgery, meaning that patients undergoing dropless surgery would still have to use at least one drop postoperatively.



Primary Endpoint:

Proportion of eyes with inflammation on day 8

	Dropless Regimen		Topical Regimen	
	n	%	n	%
Day 1	65	69.1	58	61.7
Day 8	8	8.9	7	7.7
Day 15	0	0	1	0.1



Figure. Primary endpoint data demonstrating the proportion of dropless regimen versus topical regimen patients with inflammation on day 8.



Secondary endpoints included: mean change in central subfield thickness (no statistically significant difference); number of eyes with cystoid macular edema (no statistically significant difference); patient-reported outcomes (no statistically significant difference); and overall patient satisfaction with the postoperative regimen, where the patients' preference for the dropless regimen was statistically significant.

Overall, there were few adverse events in either study arm and no statistically

significant difference in the proportion of eyes with intra- and postoperative complications (dropless regimen: 37; topical regimen: 40). Of note (and related to the primary endpoint), there were 2 eyes that experienced rebound inflammation requiring rescue therapy (dropless regimen: 1 at day 30 [deemed unrelated to the study]; topical regimen: 1 at day 30 [treated and resolved by day 90]). ■

1. McCabe CM, Singh IP, Shafer BM. Cataract Surgery Complication Rates: Preoperative NSAID, Intracameral Phenylephrine/Ketorolac, and Subconjunctival Steroid vs. Topical Drops. Presented at: American Society of Cataract and Refractive Surgery meeting; April 25-28, 2025; Los Angeles.

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