

# The Precision of an Excimer Laser for Glaucoma Treatment

Early treatment with ELIOS can reduce patients' medication burden for years.<sup>1</sup>



## INTRODUCTION

By Iqbal Ike K. Ahmed, MD, FRCS

The paradigm in glaucoma care is to prescribe topical medications as a first-line therapy for primary open-angle glaucoma,<sup>2</sup> but issues with compliance, adherence, and lack of 24-hour IOP control can limit their effectiveness.<sup>3-6</sup> Today, treatment must go beyond traditional topical therapies, and we've begun to turn a new page. Thanks to technology, glaucoma treatment is now in our hands rather than our patients', and the effect is more durable.

I often say this: Glaucoma is only young once. We have one chance to alter the course of disease by treating mild to moderate disease early. Rather than being reactive and

waiting, we must become proactive with safer technologies, addressing adherence and intervening earlier and more aggressively in the right patients and at the right time. This idea of interventional glaucoma addresses compliance and adherence and can enrich patients' quality of life, help them achieve sustainable IOP control, and improve the natural history of the disease.

Elios Vision offers a novel approach to glaucoma management, combining cutting-edge technology with a patient-centric approach to potentially reshape how we address glaucoma. In the following excerpts, surgeons summarize their talks given during ELIOS' symposium at the 2023 World Glaucoma Congress.

1. Riesen M, Funk J, Töteberg-Harms M. Long-term treatment success and safety of combined phacoemulsification plus excimer laser trabeculostomy: an 8-year follow-up study. *Graefes Arch Clin Exp Ophthalmol*. 2022;260(5):1611-1621.
2. Whitson JT. Glaucoma: a review of adjunctive therapy and new management strategies. *Expert Opin Pharmacother*. 2007;8(18):3237-3249.
3. Djalafari F, Lesk MR, Harasymowycz PJ, et al. Determinants of adherence to glaucoma medical therapy in a long-term patient population. *J Glaucoma*. 2009;18(3):238-243.
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## ELIOS: TIPS FOR A FAST LEARNING CURVE

By Alice Grise-Dulac, MD

Elios Vision is taking a breakthrough approach to surgical glaucoma management. Unlike traditional methods, ELIOS is an implant-free procedure that uses a highly precise nonthermal excimer laser to restore natural outflow. The laser creates 10 microchannels (210- $\mu$ m diameter) through the trabecular meshwork at the time of cataract surgery (Figure 1). In my opinion, this innovative procedure holds great promise to address open angle glaucoma.

To embark on a swift learning curve with the ELIOS procedure, focus on the following five key steps.

**No. 1: Visualization.** A clear view of the angle structures is crucial. Ensure patient comfort by using techniques to relax them.

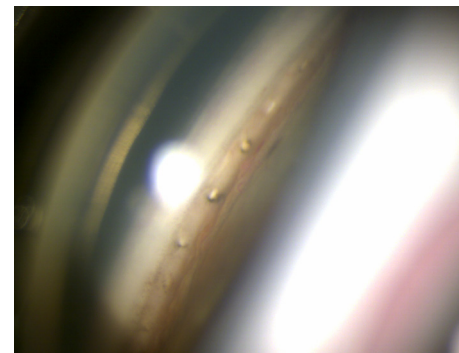
Tilt the microscope toward you and the patient's head away from you to visualize the angle.

**No. 2: Preparation and calibration.** Before surgery, prepare the patient and calibrate the probe.

**No. 3: Surgical technique.** Given the use of topical anesthesia, patient movement is possible. Create a relaxed environment for both you and the patient.

**No. 4: Strategic treatment initiation.** Initiate treatment laterally for effective results. Target the opposite side of the incision and engage the trabecular meshwork with the probe, ensuring the bevel is correctly positioned. Space each microchannel one probe width apart. Clear reflux if required to ensure good visualization.

**No. 5: Optimize postoperative results.** I like to add a steroid at the end of surgery and prescribe one to patients for a few weeks after surgery.



Courtesy of Elios Vision

Figure 1. Microchannels are created in the trabecular meshwork during the ELIOS procedure.

By embracing these steps, the learning curve for this technology can be remarkably short.

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## LONG-TERM EXPERIENCE WITH THE ELIOS LASER

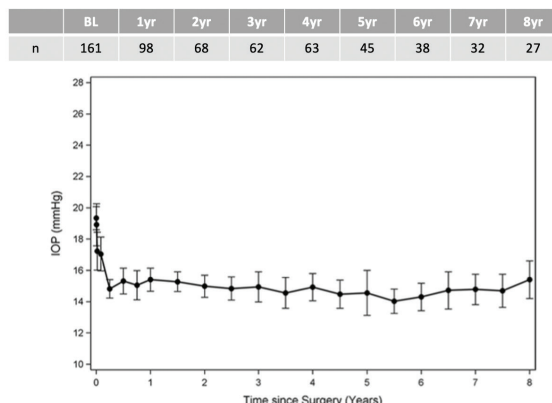
By Anselm Juennemann, MD

I have performed more than 200 ELIOS cases in the last few years, and in my experience, the treatment provides a stable reduction of IOP—a mean of about 15 mm Hg—and a reduction

in medication burden. My objective outcome for patients treated with ELIOS is threefold: a reduction of IOP, a reduction of medications, and an improvement in quality of life.

## Combined Phaco-ELIOS Long-Term Data: 8 years - Success

- IOP
  - Baseline: 19.3 + 4.8
  - 8yr: 15.4 + 3.2
  - 8yr: >20% IOP reduction
- Meds
  - Baseline: 2.3 + 1.2
  - 8yr: 2.1 + 1.2
- 3.7% secondary surgery rate



Riesen M, Funk J, Töteberg-Harms M. *Graefes Arch Clin Exp Ophthalmol* 2022; 260:1611-1621

Figure 2. Eight-year data on combined ELIOS and phacoemulsification demonstrates success of the procedure.

A body of real-world and prospective studies with up to 8 years of follow-up show that the ELIOS procedure can provide a significant reduction of IOP (range, 29–43%) and a clinically meaningful reduction in medications.<sup>1</sup> Also important is the low evidence of severe adverse side effects.

In a retrospective study of patients with primary open-angle glaucoma or secondary open-angle glaucoma who had undergone combined cataract and ELIOS surgery, the mean IOP reduction was more than 20% after 8 years. Additionally, patients went from a mean of 2.3 medications preoperatively to 2.1

after 8 years (Figure 2). A secondary surgery was needed to keep the IOP stable in only 3.7% of patients.<sup>1</sup>

The intraoperative complications—capsular rupture and anterior vitrectomy—were related to cataract surgery. The postoperative complications included corneal edema and Descemet folds, which was probably related to the use of the endo-probe, which is no longer used for the ELIOS procedure. Hyphema and IOP spikes occurred in about 10% of cases.

In conclusion, this is an effective procedure that works to reduce IOP and the medication burden on patients. This is extremely important to patients, who emphasize their quality of life improves drastically after treatment.

1. Riesen M, Funk J, Töteberg-Harms M. Long-term treatment success and safety of combined phacoemulsification plus excimer laser trabeculostomy: an 8-year follow-up study. *Graefes Arch Clin Exp Ophthalmol*. 2022;260(5):1611-1621.

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## RATES OF STRUCTURAL PROGRESSION FOUR YEARS AFTER THE ELIOS PROCEDURE

By Antonio Moreno-Valladares, MD, PhD

Glaucoma treatment consists of two pillars: preserving the patient's quality of life and avoiding blindness. This requires not only a reduction in IOP but the ultimate goal of controlling disease progression.

We have performed more than 200 ELIOS procedures, most of which were combined with phacoemulsification. A retrospective

review of our first 77 eyes with mild (n = 50), moderate (n = 10), or severe (n = 9) primary open-angle glaucoma and at least 4 years of follow-up indicated a 35% mean reduction in IOP. More importantly, 75% of patients were medication-free at 4 years. Only four eyes required a filtering surgery in subsequent years following treatment. Compared with the medicated preoperative IOP, there was a 20% reduction in IOP and a 1.35 reduction in medications at 4 years. For me, these are the sort of results our patients need.

Moreover, we observed structural changes on OCT and found that retinal nerve fiber layer thickness slope flattens to values comparable to age-related decline.

IOP reduction could be nonspectacular compared with trabeculectomy, but the disease is well-controlled without the need for a bleb.

Given our results, I believe the ELIOS procedure is an effective way to control early stage glaucoma and can be conveniently integrated into cataract surgery.

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## CONCLUSION

By Keith Barton, MD, FRCP, FRCS

Earlier surgical intervention will play an increasing role in glaucoma management over the next several years. According to data from Market Scope, by 2027, the number of MIGS procedures is projected to double. Additionally, evidence for combined

phacoemulsification and MIGS is growing.<sup>1</sup> Technologies like ELIOS can help us to expand the treatment base of physicians who offer MIGS and take advantage of the benefits of combined procedures. Lastly, long-term outcomes are increasingly important as patients live longer with the disease. ■

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