

REFRACTIVE CONSIDERATIONS FOR SUPRACILIARY SURGERY

Surgically induced astigmatism
tracks the corneal incision
rather than the implant.



BY REENA GARG, MD

Supraciliary glaucoma surgery augments uveoscleral outflow through an ab interno clear corneal microincision and is frequently combined with phacoemulsification. Potential refractive errors may be caused by two distinct processes: (1) a transient change from early hypotony and (2) a sustained shift mediated by axial length (AL) changes. Because supraciliary surgery uses no scleral flaps, sutures, or bleb, surgically induced astigmatism tracks the corneal incision rather than the implant. The effect is akin to that of microincisional cataract surgery alone if the wound is constructed in a similar fashion.¹

CASE PRESENTATION

A patient with mild to moderate primary open-angle glaucoma on three topical medications presented with a visually significant cataract and an IOP of approximately 24 mm Hg.

The patient underwent uncomplicated phacoemulsification through a temporal clear corneal microincision and placement of a

Light Adjustable Lens (LAL; RxSight) in the bag, followed by ab interno supraciliary outflow enhancement with bio-reinforcement using the AlloFlo system (Iantrek). Their visual acuity, IOP, and refraction with spherical equivalent were monitored for 3 months (Tables 1–3).

Postoperatively, the IOP decreased to 15 mm Hg. As the IOP normalized, a modest hyperopic shift in spherical equivalent emerged that was consistent with AL shortening, but the amount of refractive cylinder was essentially unchanged. A slight, transient hyperopic shift occurred during the first week of low IOP and

persisted through postoperative month 1. In response, light treatments were performed to fine-tune the LAL toward an emmetropic result.² The patient's target visual acuity was achieved 1 month after surgery. Their refraction was slightly more hyperopic than the target, a difference attributable to the postdecompression AL change, and this discrepancy was also addressed with a light treatment of the LAL.

DISCUSSION

With supraciliary glaucoma procedures, surgically induced astigmatism is driven by the incision,

TABLE 1. IOP MEASUREMENTS

	IOP (mm Hg)
Baseline	24
Day 1	9
Week 1	12
Month 1	15
Month 2	14
Month 3	14

TABLE 2. THE PATIENT'S BCVA

	BCVA
Baseline	20/80
Day 1	20/60
Week 1	20/40
Month 1	20/20
Month 2	20/25
Month 3	20/20

TABLE 3. THE PATIENT'S SUBJECTIVE DISTANCE MANIFEST REFRACTION	
	Manifest Refraction
Preoperative	-1.25 +1.50 x 180°
Week 1	+1.00 +0.25 x 81°
Month 1	+0.75 +0.25 x 80°
Month 2 (second light treatment)	+0.25 D sphere
Month 3 (lock-in completed)	Plano +0.25 x 65°

not the glaucoma device. A soft, porous supraciliary implant should not add a measurable amount of astigmatism.^{1,3,4}

A common concern regarding the use of supraciliary devices is the potential myopic shift, as was observed with the CyPass MicroStent (Alcon; no longer available). An advantage of the LAL is the ability to make refractive adjustments postoperatively—in this case, to address an IOP-dependent hyperopic shift.

The timing of biometry affects its predictability. Capturing measurements at elevated IOPs increases the risk of a hyperopic surprise.⁵⁻⁹

Early hypotony temporarily degrades visual quality. The condition

peaks within a week of surgery and typically resolves by approximately 2 months. The final refraction should be deferred until the IOP and corneal shape stabilize.²

The predictable but variable hyperopic drift that accompanies a sustained IOP reduction has long been the hidden cost of combined glaucoma and cataract surgery. With appropriate planning and counseling, patients can have highly successful outcomes. ■

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REENA GARG, MD

- Visionary Eye Doctors, Maryland and Washington, DC
- ragarg927@gmail.com
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