



NAVIGATING THE CARE OF PATIENTS WITH PHAKIC IOLS



Fundamental information for optometrists who wish to offer a comprehensive approach to surgical vision correction.

BY JASON SCHMIT, OD

The options available for surgical vision correction today are amazing. We may hear most often about people undergoing LASIK surgery, but not everyone is a candidate for this option. For a practicing comprehensive refractive surgery specialist, having the ability to provide the best surgical option for each patient's specific needs is paramount. Options now include laser vision correction (with PRK, LASIK, or SMILE), refractive lens exchange, and phakic IOL implantation.

In the United States there are two basic models of phakic IOL: the iris-supported anterior chamber

Verisyse (Johnson & Johnson Vision) and the posterior chamber Visian ICL (Staar Surgical), which is available in myopic monofocal and toric versions.¹

I have experience with both the Visian ICL—sometimes referred to by its earlier trade name, the Implantable Collamer Lens—and the Verisyse IOL, but will confine my remarks in this article to the Visian only. In this discussion, I will review the OD's role in managing the annual care needed for Visian ICL patients in a clinical setting.

WHO IS A CANDIDATE?

Realistically speaking, laser vision correction is practical for patients with

a normal corneal thickness (> 500 μm), normal corneal topography, average keratometric values between 40.00 and 48.00 D, hysteresis measurement greater than 9, no ocular surface disease, and refractive error of between +4.00 and -8.00 D, relative to pachymetry.² For patients whose measurements fall outside of those parameters, and who wish to decrease their dependence on glasses and contact lenses but are still prepresbyopic or in early presbyopia, phakic IOLs can be a great option.

The implantation of an ICL into the ciliary sulcus of phakic eyes generally imposes risks similar to those for cataract surgery with IOL implantation in the capsular bag. However, because phakic IOL patients typically are highly myopic and still have the crystalline lens in place, and because the ICL sits in a different position than a cataract IOL, there are additional risks, including cataract formation, narrowing of the angle, pupillary block, increase in IOP, and retinal detachment.¹

YEARLY REVIEW

There are a number of things that should be reviewed annually in every patient implanted with a Visian ICL. Let us examine each of these briefly below.

Vision

Checking vision in a patient with an ICL is the same as with any other

TEN THINGS TO REVIEW ANNUALLY IN EVERY PATIENT IMPLANTED WITH A VISIAN ICL

- 1 VISION
- 2 IOP
- 3 ENDOTHELIAL CELL COUNT
- 4 LENS VAULT
- 5 PERIPHERAL IRIDOTOMY PATENCY
- 6 ANTERIOR CHAMBER ANGLE WIDTH
- 7 ULTRASOUND BIOMICROSCOPY
- 8 CRYSTALLINE LENS ASSESSMENT
- 9 ANTERIOR CHAMBER ASSESSMENT
- 10 FUNDUS EXAMINATION

patient. Just keep in mind that phakic IOL patients have a greater chance of developing cataract earlier than the general population. In the Visian Toric ICL FDA clinical study, six of 210 eyes developed cataract within 12 months of implantation. In the FDA clinical study of the Visian ICL for myopia management, 45 of 334 eyes developed a cataract within 5 to 7 years.³

IOP

Because the ICL sits in the ciliary sulcus and behind the pupil, it can potentially block the flow of aqueous into the anterior chamber.⁴ See the section on peripheral iridotomy (PI) patency.

Endothelial Cell Count

The degree of endothelial cell loss varies with aging. In the FDA study of the Visian ICL for Myopia, 11% of patients at 5 to 7 years after surgery had more than 30% endothelial cell loss (Table).³

Lens Vault

The distance between the crystalline lens and the phakic IOL is the vault. The space between the two structures can be estimated relative to corneal thickness using an optic section. Ideally, they should be the same, referred to as 1+ vault. If the vault is 75% of the corneal thickness, then the vault is $\frac{3}{4}$ +. There is steady axial growth of the crystalline lens of

about 25 μ m per year, and this may be responsible for reduction of the vault over time.⁵

In markets outside the United States, the Visian is available with an Aquaport design (a 0.36-mm hole in the center of the optic to facilitate aqueous flow). With this design a PI is not required before surgery, and an increase in ICL vault was seen due to the constant aqueous pushing force.⁴

PI Patency

Using retroillumination, the clinician should see a red reflex through the PI, typically at 11:00 and 1:00 o'clock. PIs are placed before surgery to facilitate aqueous flow and prevent pupillary block glaucoma.

TABLE. Endothelial Cell Density at 5 to 7 Years in FDA Study of Visian ICL³

AGE (YEARS)	MINIMUM ECD-ACD ≥ 3.0 MM	MINIMUM ECD-ACD ≥ 3.2 MM	MINIMUM ECD-ACD ≥ 3.5 MM
21-25	3,875 cells/mm ²	3,800 cells/mm ²	3,250 cells/mm ²
26-30	3,425 cells/mm ²	3,375 cells/mm ²	2,900 cells/mm ²
31-35	3,025 cells/mm ²	2,975 cells/mm ²	2,625 cells/mm ²
36-40	2,675 cells/mm ²	2,625 cells/mm ²	2,350 cells/mm ²
41-45	2,350 cells/mm ²	2,325 cells/mm ²	2,100 cells/mm ²
> 45	2,075 cells/mm ²	2,050 cells/mm ²	1,900 cells/mm ²

Abbreviations: ACD, anterior chamber depth; ECD, endothelial cell density

Angle Width

The ICL footplates should rest in the ciliary sulcus. Instead, they can rest on the ciliary body, leading to narrowing of the anterior chamber angle. The ciliary muscle thickens naturally with age, and this can result in a late forward shift of the ICL.⁴ The angle width can be measured using the Van Herick grading system or with Scheimpflug tomography imaging on the Pentacam (Oculus Optikgeräte).

Ultrasound Biomicroscopy

Ultrasound is helpful to identify the position of the phakic IOL in the posterior chamber. Ideally, the ICL should vault forward but not cause excessive contact with the posterior surface of the iris, which can lead to pigment dispersion.

Crystalline Lens Assessment

The lens should be assessed for premature cataract formation due to shallow ICL vault or lens touch.

Anterior Chamber Assessment

It is important to look for pigment dispersion syndrome caused by the ICL touching the posterior iris.

Fundus Examination

Because typically these patients were highly myopic, they still have the same long axial length. An annual dilated fundus exam is required to watch out for signs of retinal detachment.

SEIZE THE OPPORTUNITY

Having a good understanding of phakic IOLs is fundamental for

optometrists who wish to offer a comprehensive approach to surgical vision correction. Phakic IOL patients enjoy being able to see without glasses and contact lenses. Many of these patients may have been told in the past that they were not candidates for surgery.

ICLs are fun to manage, and what's more, complications are rare. The need for annual checkups creates lifelong patients for your practice, and knowing the ins and outs of phakic IOL management will elevate your status among patients and peers as a comprehensive optometrist in refractive surgical eye care. ■

1. Summary of safety and effectiveness data. Visian Toric ICL (Implantable Collamer Lens) — P030016/S001PMA. Updated October 4, 2018.

2. Are you a candidate for LASIK? 5 guidelines you should know. American Refractive Surgery Council. April 22, 2018. americanrefrativesurgerycouncil.org. Accessed August 29, 2019.

3. STAAR Surgical. Visian Toric ICL (Implantable Collamer Lens) for Nearsightedness with Astigmatism. Facts you need to know about STAAR Surgical's Visian Toric ICL Surgery. 2017.

4. Eissa SA, Sadek SH, El-Deeb MW. Anterior chamber angle evaluation following phakic posterior chamber collamer lens with CentraFLOW and its correlation with ICL vault and intraocular pressure. *J Ophthalmol*. 2016;2016:1383289.

5. Trindade F. Proper ICL vaulting important. *Ocular Surgery News Europe/Asia-Pacific Edition*. November 2000.

AT A GLANCE

- ▶ Phakic IOLs can be an option for patients desiring refractive surgery who fall outside the criteria for corneal refractive surgery.
- ▶ For patients with phakic IOLs, annual reviews are an important way to ensure ocular health.
- ▶ Risks to watch for include IOP elevation and cataract development.

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