

Correcting Pseudophakic Distance and Near Vision

Case report on a new multifocal ACIOL.

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Presbyopic correction has become a driving force in middle-aged and post-IOL patients' decisions to seek correction of their reading vision. This demand is spurring innovative designs in IOLs that can correct phakic and pseudophakic presbyopia. This article shares a case report on one of these, the Vision Membrane phakic multifocal ACIOL (VM; not available in the US; Vision Membrane Technologies, Inc., Carlsbad, CA).

CLINICAL OVERVIEW

An 82-year-old female received a single-vision PCIOL after routine phacoemulsification in her left eye. Eight months later, her right eye had a BCVA of 20/25, a plano refraction, and minimal nuclear sclerosis. The PCIOL was well positioned in her left eye, which had a BCVA of -7.00 D sphere = 20/25. The patient's near vision at 40 cm was 20/100 OD without correction and 20/100 OS with -7.00 D sphere. The patient, a Mother Superior, complained of anisometropia with her +3.00 D readers and expressed a desire to read her prayer books with both eyes.

TREATMENT

The VM multifocal ACIOL (Figure 1) has a constant thickness of 600 μ m for all dioptric powers. The lens uses sophisticated diffractive optics to create both distance and near dioptric power. Its haptics function quite differently from the compression-based models of earlier pseudophakic ACIOLs. Most of the VM's vault is inherent to the curved optic and is not created by compressing the IOL's haptics. The footplates exert only enough force



Figure 1. The Vision Membrane multifocal ACIOL.

against the trabecular meshwork to keep the IOL in its proper location.

Because the patient's left eye had a PCIOL, there was no obstacle to implanting the VM into the anterior chamber (Figure 2A). Dr. Castillejos inserted a lens with a distance power equal to that of a -7.00 D spectacle lens and a +2.50 D add (corrected for intraocular implantation) in her left eye without complication through a 3-mm incision using an injector (Figure 2B and C).

RESULTS

One day postoperatively, the patient expressed satisfaction with her surgical outcome (Figure 3). Her left eye had a UCVA of 20/25 and a BCVA of -0.25 sphere = 20/25. The near vision in her left eye was 20/25 uncorrected at an extended reading range of 30 to 40 cm. Dilating the pupil produced no change in her distance or near visual acuity, which has remained constant for 6 weeks.

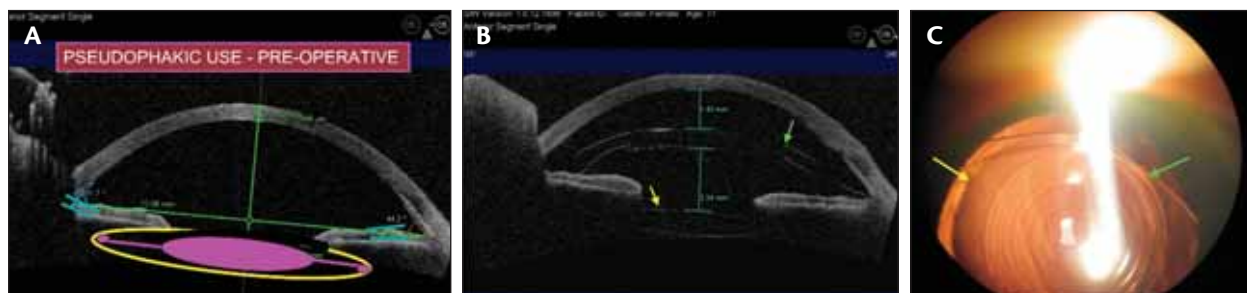


Figure 2. Before the implantation of the VM multifocal ACIOL, imaging with the Visante OCT device demonstrated an extremely deep anterior chamber. The diagram of a PCIOL is added for emphasis (A). After the IOL's implantation, the Visante OCT shows that both the VM IOL (green arrow) and the single-vision PCIOL (yellow arrow) are well situated in the eye (B). A photograph taken through a dilated pupil shows the VM ACIOL (green arrow) and the single-vision PCIOL (yellow arrow) (C).

DISCUSSION

This case represents the first use of a phakic multifocal ACIOL to correct pseudophakic ametropia and presbyopia (the term *pseudophakic presbyopia* is not physiologically correct but well describes the condition of poor near vision after IOL implantation for the correction of distance vision).

The VM's multiorder diffractive optics (designed by Apollo Optical, Rochester, NY) provide the patient with a near UCVA of 20/25 at 30 to 40 cm. This range is equivalent to the near vision provided by reading glasses with an add of +2.50 to +3.30 D. This is the first report, to our knowledge, of a multifocal IOL with such an extended depth of field. Because the patient is pseudophakic and has the same visual acuities at distance and near with both a physiologic and a dilated pupil, the effective add power is certainly produced by the IOL's design rather than a pseudoaccommodative phenomenon such as the pupillary diameter.

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The design and success of modern phakic IOLs should not be equated with older ACIOLs. Preoperatively, the Visante OCT (Carl Zeiss Meditec, Inc., Dublin, CA) provides the surgeon with the diameter of the anterior chamber so that the proper sizing of the ACIOL is consistent and the force exerted against the trabecular meshwork is minimal. Because the thickness and length of the VM multifocal ACIOL is the same for all powers of correction, both the size of the incision and the surgical technique for the lens' insertion are standardized.



Figure 3. Seated next to Dr. Castillejos, the patient was able to read 1 day postoperatively.

An IOL such as the VM multifocal IOL allows the surgeon to correct distance and near visual function simultaneously in essentially all normal eyes, whether or not they are phakic or pseudophakic with a single-vision PCIOL. Based on this case, phakic and pseudophakic eyes with a distance refraction close to plano can benefit from a plano/+2.50 D add VM multifocal IOL. For phakic patients, it is unnecessary to remove the crystalline lens. Their ability to accommodate is preserved, and the ACIOL implant can be easily removed if need be for future cataract/IOL surgery. ■

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