Combined Posterior Phakic Intraocular Lens and SMILE in a Patient With High Myopia

Bioptics is defined as a sequential method of treating large and complex refractive errors aiming to improve stability and predictability by the combination of refractive techniques with different mechanisms of action.

The Visian Implantable Collamer Lens (ICL; STAAR Surgical, Monrovia, CA) is a foldable phakic lens designed to correct myopia up to -18 diopters. Previous studies have demonstrated remarkable results showing corrected visual acuity improvement and preservation, with minimal intraoperative and postoperative complications. The small incision lenticule extraction (SMILE) procedure performed with the Visumax 500-kHz femtosecond laser (Carl Zeiss Meditec, Jena, Germany) creates an intrastromal refractive lenticule that is manually dissected and extracted entirely through a small incision rather than creating a flap, reducing some of the side effects caused by LASIK. We describe the combination of the placement of a phakic intraocular lens and SMILE procedure in a patient with myopia and astigmatism.

A 26-year-old woman presented to our institution for consultation for surgical refractive correction. Her uncorrected distance visual acuity was 20/500 in the right eye and 20/600 in the left eye. The manifest refraction was -22.25 -1.25 × 90 with a CDVA of 20/25 in the right eye and -15.75 -1.25 × 175 with a CDVA of 20/20 in the left eye. A Visian toric ICL V4c was implanted in both eyes under topical anesthesia.

Five months after the implantation, the manifest refraction was -2.50 -0.75 × 30 with a CDVA of 20/25 in the right eye and +0.50 -0.25 × 146 with a CDVA of 20/20 in the left eye. Scheimpflug topography was performed before the SMILE procedure was offered to correct the residual myopia in the right eye and was performed as previously described (Video 1 [available in the online version of this article], Figures A1-A2).

After a 3-month follow-up, the manifest refraction was plano -0.25 × 90 with a CDVA of 20/25 in the right eye and +0.25 sphere with a CDVA of 20/10 in the left eye. Postoperative topography showed flattening of the cornea (Figures A3-A4).

The use of bioptics has become a valuable option for young patients who years ago had no option other than the use of eyeglasses or contact lenses. Improved predictability and safety is making this type of refractive strategy more popular.

The decision to choose the SMILE procedure was based on the fact that SMILE has a much higher tensile stromal strength and that the anterior-most stromal lamellae, which are known to be the strongest, remain intact with this technique. Other possible advantages are less nerve disruption and a faster recovery of the sub-basal nerves. The SMILE procedure required eye fixation with suction, and disruption of the wound or movement of the Visian toric ICL V4c could have been a concern for the surgeon, but the platform provided mild limbal suction, the wound did not gape, and the Visian toric ICL V4c remained in place.

We believe we have described a new bioptics therapeutic strategy for patients with high refractive errors not amenable to single treatment.

REFERENCES

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Dr. Ramirez-Miranda is a speaker for Carl Zeiss Meditec, Jena, Germany. The remaining authors have no financial or proprietary interest in the materials presented herein.

doi:10.3928/1081597X-20150424-05