

# Update on the Thinoptx IOL

This lens technology should work well with microincisional cataract surgery.

BY JOHN D. HUNKELER, MD

The increasing interest in microincisional cataract surgery and lens implants are related. The procedure offers exquisite intraoperative control, which enhances safety and efficiency. The adaptation to phacoemulsification accelerated in the 1980s upon the approval of foldable lens implants, which could be inserted through incisions measuring 3.5 to 4.0 mm. A similar boost to the adoption of microincisional cataract surgery should occur with the approval of IOLs that can fit through a 1.5-mm incision. One such IOL that has received CE Marking is the Thinoptx Ultrachoice 1.0 lens (Thinoptx, Abingdon, VA).

## LENS DESIGN

The ideal lens implant should duplicate the human adult crystalline lens of an emmetropic eye. The Thinoptx

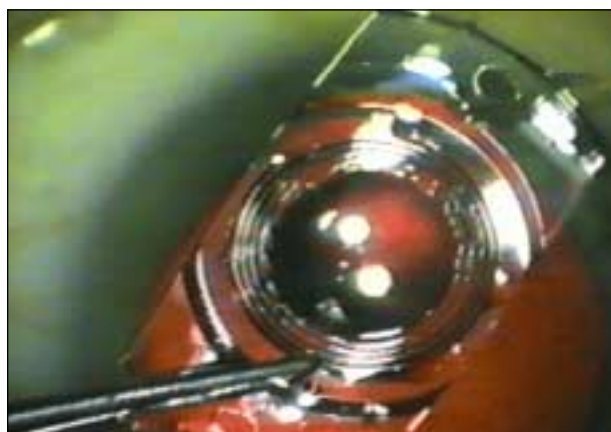


Figure 1. The plate haptic of the Thinoptx lens functions like a C-loop lens.

“This lens can be rolled into a configuration allowing insertion through an incision of less than 1.5 mm.”

Ultrachoice 1.0 approaches this goal. The thin lens theory<sup>1</sup> predicts that such an IOL will decrease the amount of an eye's optical aberrations, as evidenced by a reduction in aberrations such as sphere and coma. Further, some anterior movement of the lens implant within the capsular bag during efforts of accommodation has been observed by investigators,<sup>2,3</sup> including Lovisolo,<sup>4</sup> who used ultrasound (Artemis 2; Ultralink LLC, St. Petersburg, FL) in his study.

Although the Thinoptx Ultrachoice 1.0 lens implant is designed for in-the-bag placement after microincisional cataract surgery, the IOL may be placed through a larger incision after coaxial phacoemulsification, if so desired. The implant has a 5.5-mm spherical optic, and each of five spherical optical zone steps is 50  $\mu$ m in height, thus creating a central optical zone that is only 300 to 400  $\mu$ m thick. This lens can be rolled into a configuration allowing insertion through an incision of less than 1.5 mm. The customized thin-roller insertion system rolls the lens and allows syringe-insertion of the implant through the small incision. Because the rolled, 50- $\mu$ m edge of the plate haptic guides the IOL through the incision, no cartridge (such as is used with current foldable lens implants) is needed.

The plate haptic design has four foot plates that are 50  $\mu$ m thick (Figure 1). The overall diagonal length is 11.2 mm. The acrylic lens material is 18% hydrophilic, and the 50- $\mu$ m

## OUTCOMES WITH THE THINOPTX IOL

Using the lens as part of microincisional cataract surgery.

BY L. FELIPE VEJARANO, MD, AND ALEJANDRO TELLO, MD

We, the authors, have achieved good results in 64 eyes with Vejarano's Safe Chop technique<sup>1,2</sup> for microincisional cataract surgery and the Thinoxyl Ultrachoice 1.0 rollable IOL (Thinoxyl, Abingdon, VA) (Figure 1).

Fifteen of the eyes we treated had hypermature white cataracts, seven had hypermature brunescens cataracts, 37 had between 2+ and 3+ nuclei, and five had posterior subcapsular cataracts. Mean follow-up was 5.9 months.

Patients' preoperative BCVAs ranged from light perception to 20/40, and 40.7% of the eyes had count-fingers vision or worse. Postoperative UCVA was 20/40 or better in 34.7% of patients at 1 day, 56.1% at 1 week, 65.5% at 1 month, 74.2% at 3 months, and 84.7% at 6 months. Moreover, at 6 months postoperatively, 36.5% of eyes saw J3 monocularly without correction, and 80% achieved J3 binocularly without correction. BCVA was 20/40 or better in 89.1% of eyes at 1 day and 95.3% of eyes at 6 months postoperatively. Four eyes had pre-existing maculopathy.

When measuring the amplitude of accommodation via



**Figure 1.** The surgeon must use the teardrop fenestration located in the plate haptic as a guide for ensuring proper IOL placement within the capsular bag; the narrow end of the teardrop should point in a clockwise direction. The smooth surface of the IOL must face posteriorly.

the push-up method, the average values were 2.30, 1.90, 2.12, and 2.50 D at 1 week, 1 month, 3 months, and 6 months, respectively. Measured with trial lenses, accommodation was 2.00, 1.60, 1.55, and 1.90 D at these visits. The intended residual refractive error, according to biometry using an A constant of 118.94, was -0.32 D.

Two eyes developed capsular distention syndrome with a myopic shift that required Nd:YAG anterior capsulotomy, and one eye developed posterior capsular opacification requiring Nd:YAG posterior capsulotomy.

The Thinoxyl IOL may be inserted through a 1.5- to 1.7-mm incision. The lens is an excellent alternative for microincisional phacoemulsification (Figure 1).

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2. Vejarano LF. Some Latin-American surgeons waiting for MICS to evolve. *Ocular Surgery News* (worldwide and Latin American editions). 2004;22:12:11-15.

edge surrounding the implant reduces the presence of dysphotopsia, glare, or reflection. Further, the 50- $\mu$ m tips curl into the peripheral capsular bag for excellent centration and fixation.

## EXPERIENCE WITH THE LENS

The first Ultrachoice 1.0 rollable lens was inserted in August 2001, and several international surgeons are working with the IOL, including Jorge Alió, MD, PhD, of Alicante, Spain; Matteo Piovella, MD, of Monza, Italy; and José Güell, MD, PhD, of Barcelona, Spain. Patients receiving the lens have achieved excellent uncorrected distance vision and minimal aberrations. Surgeons have also reported better uncorrected near vision than anticipated: approximately 1.50 D of accommodation accompanying axial forward movement of the lens under miotic stimulation.<sup>2,3</sup>

## STATUS AND FUTURE OF THE LENS

Prior to July of this year, US surgeons' experience with the Thinoptx lens was limited to five procedures on five eyes in December 2002 by Kenneth Hoffer, MD, of Santa Monica, California, and me. These procedures were performed outside of the US. The FDA clinical trials commenced in July 2004. Dr. Hoffer implanted three eyes with UCVA's of 20/20 or better at 4 days postoperatively and a mean refractive error of -0.33 D. The FDA clinical trial will proceed in the usual fashion, with the technology evaluated at multiple centers according to the appropriate protocol.

The future for the Thinoptx Ultrachoice 1.0 lens implant is excellent. Perhaps some additional flexibility and movement will allow greater levels of accommodation, and the company is considering designing a multifocal version of the IOL. Evaluation of an anterior chamber phakic IOL design is also planned. I believe that the Thinoptx Ultrachoice 1.0 IOL is currently the most promising alternative for lens implantation during microincisional cataract surgery. ■

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