

To advertise contact us today:  
888-949-6753, fax 609-275-1717,  
email: [eyeworld@eyeworld.org](mailto:eyeworld@eyeworld.org)

Table of Contents	Index to Advertisers	Calendar of Events	Classified & Marketplace	Multimedia Theatre	Guest Register	Ophthalmology Links	SEARCH	Editorial Board	How to Contribute	Publishing Statement
-------------------	----------------------	--------------------	--------------------------	--------------------	----------------	---------------------	--------	-----------------	-------------------	----------------------

## Innovation Spotlight

# *Laser treatment designed to reverse presbyopia*

by **Diane Angelucci** Correspondent

*Laser procedure reported to reverse presbyopia without visual regression.*

Patients nearing mid-life may be reluctant to have laser in-situ keratomileusis. "These patients reject LASIK, since they feel they are paying a great deal of money simply to change from one pair of glasses for distance correction only to wear another pair after LASIK for near correction," said Craig F. Beyer, DO, clinical instructor, Department of Ophthalmology, University of Colorado School of Medicine, and medical director, Beyer Laser Associates, Boulder.

Laser presbyopia reversal (LAPR) may solve this problem. "Once LASIK is performed and emmetropia results, LAPR would be performed, making patients truly nondependent upon eyewear for distance and near," he said.

LAPR is performed with the SurgiLight (Orlando, Fla.) IR-3000 infrared laser (3  $\mu$ m), which incorporates a beam-shaping delivery unit and scanning mechanism. The conjunctiva is opened mechanically, and the laser is used to make eight excisions in the sclera



**Fiberoptic probe used for the LAPR procedure**



**SurgiLight IR-3000 laser**

outside the optical zone in a spoke-like pattern. The excisions are approximately 2.5 mm long and 400 to 500  $\mu\text{m}$  deep, depending on limbal thickness measurements taken before surgery.

Raymond P. Gailitis, MD, of the Center for LASIK in Margate, Fla., who has worked with J.T. Lin, PhD, the procedure's inventor, examined patients in Caracas, Venezuela, and was impressed with their recovery after surgery. "It seems to be fairly quick," he said, adding that patients had good close vision 1 to 2 days after surgery and minimal discomfort. "I was very impressed with both their distance and near vision," said Gailitis, who may participate in the U.S. clinical trial expected to start mid-year. "In fact, I was kind of wowed by it."

Todd L. Beyer, DO, medical director, System Optics, Tallmadge, Ohio, was so encouraged by patients' results in Caracas, that he chose to have the procedure himself in the Bahamas. "I thought it was relatively safe, had no effect on distance vision, was simple to perform — it wasn't so surgeon-dependent that I'd be nervous about the skill of the surgeon with this procedure — and the patients all had some effect," he said.

After surgery, he had a foreign-body sensation for a few days and his eyes remained red for about a month. His subjective change in accommodation was approximately 1.25 D. Although he was J5 before surgery, 3 weeks after surgery he could read J2 with both eyes and J3 with each eye individually at 14 inches. Although he generally continues to read J2, in bright light he can read J1. "For everyday activities, it's a huge difference, just going shopping, reading a magazine, writing in my charts," he said.

### *Clinical trials*

Lin, who is also president, chief executive officer, and chairman of SurgiLight, reported results from a study of 70 eyes at the International Society of Refractive Surgery Fall 2000 World Refractive Surgery Symposium. Patients between the ages of 42 and 65 were treated in trials in Venezuela and Argentina. LAPR was performed in one eye and repeated 1 to 4 months later in the second eye. Patients had near vision of J6 to J7 before surgery, but within 2 weeks after surgery, accommodation increased by 1 to 2.5 D, with further improvement within 2 weeks to 2 months. Distance vision remained the same. Although postoperative near vision ranged from J3 to J1, each eye had better vision when both eyes were used. Almost no visual regression occurred up to 18 months after surgery.

Clinical trials will begin soon in the United States and Europe. Lin hopes the procedure will be approved by the Food and Drug Administration within 2 to 3 years.

In March, Surgilight received permission from the U.S. Patent and Trademark Office to patent this technology. The patent includes laser spectra ranging from ultraviolet to infrared, as well as the use of scanning devices and fiber-coupled lasers. The company has filed a continuation-in-part application to expand claims and has six patents pending that cover a range of laser spectra and devices used to correct presbyopia and laser beam reshaping techniques.

### *Benefits*

Although LAPR is based on the theory that the lens becomes larger with age, inhibiting accommodation, no one is sure how the procedure improves near vision or why regression does not occur. Lin theorizes that troughs remaining after excision become filled with subconjunctival tissue within 12 to 24 hours and the tissue remains. "That subconjunctival tissue is more flexible than the original scleral tissue," he said.

The procedure offers a number of advantages. "Unlike other surgical presbyopia treatments, in LAPR there is no need for suturing any type of implants to the sclera, thus avoiding their potential complications or side effects," said Oscar Mallo, MD, who performs the surgery and is a staff member of CIREX and in private practice in Buenos Aires, Argentina.

In addition, because the infrared laser partially coagulates blood vessels as it removes tissue, it makes a very clean excision of tissue, Gailitis said.

### *Potential drawbacks*

Possible risks include severe ocular hypotony, infection, and scleral perforation. "Extreme caution must be applied in cases of thin sclera," Mallo said.

Kenneth J.A. Rodgers, MD, who practices in Nassau, Bahamas, said each of the three patients on whom he performed LAPR had increased dryness a few days after surgery. In addition, "one patient described minimal distortion of vision on day 1 postoperatively, but this cleared by day 2," he said.

Because the conjunctival peritomy may cause subconjunctival hemorrhages, researchers are evaluating a transconjunctival approach to minimize bleeding and shorten the procedure, which now takes approximately a half-hour.

In addition, "since the sclera is weakened, studies will be required to determine whether this procedure places eyes at greater risk to rupture following blunt trauma," said Craig Beyer, who may be participating in the U.S. clinical trial.

Furthermore, because the excisions are transparent and expose the bluish hue from the uvea, some patients may have a long-term cosmetic problem, he said.

It is suspected that patients with glaucoma, cataracts, uveitis, dry eyes, and collagen vascular disease will be excluded from receiving the procedure, as well as those who have had cataract surgery. The procedure also may be contraindicated in diabetics with cataracts or significant diabetic retinopathy.

“To date, most of the results have been obtained through small private clinics outside the United States,” Craig Beyer said. “Larger, controlled clinical trials are beginning in Europe and soon within the United States. At this point, I’m sure we’ll get a better understanding of the risks and be able to quantify the benefits.”

*Drs. Lin and Gailitis have a financial interest in this technology.*

---

#### Contact Information

**Craig Beyer:** 303-499-2020, fax 303-527-3664

**Todd Beyer:** [ToddBeyer@aol.com](mailto:ToddBeyer@aol.com)

**Gailitis:** 800-736-8558, fax 954-974-6122

**Lin:** 407-482-4555, fax 407-482-0505

**Mallo:** +54-11-432-67353, fax +54-11-480-38664

**Rodgers:** 242-323-7997, fax 242-325-1647

