



News in Review

A LOOK AT TODAY'S IDEAS AND TRENDS

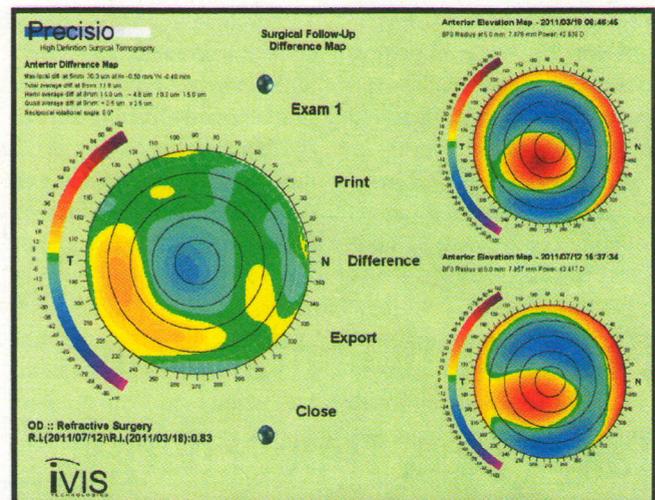
As the Academy Annual Meeting approaches, *EyeNet* brings you a preview of some papers to be presented there. Each paper was chosen by its session chairperson because it either constitutes important news in the field or is illustrative of a trend. Although only five subspecialties are represented below, there also will be paper sessions for intraocular inflammation/uveitis, neuro-ophthalmology, oculoplastics and pediatric ophthalmology. Look for a complete list of papers in the *Final Program* or *Pocket Guide* or at www.aaopt.org/programsearch11.

Refractive Surgery Paper

New Combined Procedure for Keratoconus

With the odds stacked steeply against successful refractive correction, contact lens-intolerant keratoconus was previously treatable only with invasive procedures such as corneal transplantation or intracorneal ring segments. The introduction of

corneal collagen crosslinking (CXL, which is not FDA approved) has slowed or stopped progression of keratoconus by stabilizing the cornea; but many patients, particularly if they are contact lens intolerant, remain visually incapacitated, with extremely high myopia and high astigmatism, said lead author David T. C. Lin, MD, clinical associate professor



CASE HISTORY. A 29-year-old patient with keratoconus. Pre-operative UCVA was counting fingers and BCVA was 20/50. The IVIS treatment was optical zone, 1.67 mm; transition zone, 5.77 mm. Three months after the procedure, UCVA is 20/60, and BCVA is 20/40. Subtraction elevation maps show small optical zone treatment resulting in a large elevation change (blue).

of ophthalmology at the University of British Columbia and medical director at the Pacific Laser Eye Centre in Vancouver, Canada.

Along with other small

studies, however, a Canadian Health Protection Bureau (HPB) trial has obtained promising early results with this patient population. A case series

■ **Topography-Guided Photorefractive Keratectomy for Keratoconus With Simultaneous Collagen Crosslinking Using the IVIS Laser** will be presented during the *Refractive Surgery* paper session, which takes place Sunday, Oct. 23, from 2 to 3:30 p.m., in Room W414cd.

of 12 eyes with six months' follow-up found that 83 percent of eyes had UCVA of 20/40 or better, and 66 percent had improved BCVA following simultaneous topography-guided photorefractive keratectomy (TG-PRK) and CXL using the iVIS laser. Mean astigmatism decreased from -3.25 D preoperatively to -0.95 D. There have been no signs of progression, said Dr. Lin, whose coauthor is Simon P. Holland, MD.

Making a case for the benefits of reducing central astigmatism and spherical aberration in keratoconus patients, Dr. Holland presented an earlier trial showing patients' satisfaction with even a small central optical zone,¹ said Dr. Lin.

"So we brought this concept over to the iVIS by doing a tiny central ablation—regularizing the cornea with the iVIS—and then doing CXL afterward."

A custom-driven platform, the iVIS suite has specific benefits for keratoconus, said Dr. Lin. Using corneal topography maps for every case, the iVIS Precision is able to take up to 50 high-resolution images a second, making it possible to image difficult corneas, even those with extreme cones or keratometry greater than 60 D. In addition to a 1,000-Hz laser that shoots about twice as fast as those 500-Hz systems on the U.S. market, said Dr. Lin, the iVIS includes active cyclo-torsion, allowing the laser to

compensate during surgery and making it much more feasible to treat patients with keratoconus.

Using an all-surface laser, this TG-PRK can bring the central optical zone treatment area down to 1.5 mm to 2 mm, reducing the amount of corneal tissue removed and achieving results with a one-step treatment following epithelial calculations, said Dr. Lin. The iVIS can also perform a concurrent larger transepithelial all-laser debridement, which increases permeability for riboflavin—the first step in the CXL stage—and speeds re-epithelialization.

Dr. Lin said that although thin corneas may limit the depth of treatment, visual improvement is still

sufficient to allow reasonable functioning without correction or with a soft contact lens, if necessary.

"In the past, our contact lens-intolerant keratoconus cases all went on to have corneal transplants," said Dr. Lin, adding that now only one in 300 has needed to go this route.

—Annie Stuart

1 Holland, S. P. and D. T. Lin. Collagen crosslinking for keratoconus with simultaneous topography-guided photorefractive keratectomy. Presented at the Annual Meeting of the American Society of Cataract and Refractive Surgery; March 27, 2011; San Diego, Calif.

Dr. Lin reports no financial interests.

Femtosecond Laser Paper

Phaco With Femtosecond Takes Less Time, Energy

Dense cataracts required half as much total phacoemulsification energy for removal when the hardened nuclei were prefragmented with a femtosecond laser, Hungarian surgeons report.

A research group led by Zoltan Z. Nagy, MD, professor of ophthalmology at Semmelweis University, Budapest, Hungary, compared outcomes after they removed grade 4 nuclear cataracts from 40 eyes. At the Annual Meeting, the researchers will report results after 12 months of follow-up.

The study includes 20

surgeries using only conventional phaco techniques and 20 that were assisted by the LenSx laser.

"We use the laser to presegment the lens into quadrants, reaching no more than 90 percent of the lens thickness," Dr. Nagy said. After this, the surgeon can go in with the phaco head, grasp the nucleus with the aspiration port (pressure: 250 to 300 mmHg) and use an ordinary chopper to finish dividing the nucleus along the lines precut by the laser, he said.

Dr. Nagy said that no phaco energy was required

to complete the segmentation and that total phaco time was 48 percent lower in the laser-assisted procedures than in the conventional phaco surgeries.

He said that the surgeries used 51 percent less total ultrasound energy, expressed as cumulative dissipated energy (Alcon's proprietary measure of phaco energy delivered to the eye).

Dr. Nagy also will report outcomes related to post-operative quality of vision, including IOL centration, higher-order aberrations, Strehl ratios and point-spread function.

"The femtosecond laser will never replace a good

surgeon," Dr. Nagy said. "Because even if the laser cuts the access incisions and the rhexis and prefragments the natural lens, you still need the surgical skill to divide the lens into four quadrants manually, to remove the cortex and then to implant the IOL."

Dr. Nagy's group has led investigations of the LenSx femtosecond laser since 2008. The group has used the laser, which Alcon recently announced its intention to acquire, in more than 600 cataract procedures. —Linda Roach

Dr. Nagy is a consultant to Alcon and LenSx.

■ **Comparison of Conventional and Femtosecond Laser-Assisted Phacoemulsification on Dense Nuclear Cataracts** will be presented during the Femtosecond Laser paper session, which takes place Sunday, Oct. 23, from 10:15 a.m. to 12:15 p.m., in Room W414ab. The Cataract paper session takes place Tuesday, Oct. 25, from 10:15 a.m. to noon, in Room W315.