

OCULAR SURGERY NEWS 8/1/2004

## Cataract and refractive surgery develop new, gentler approaches

OSN meeting in Naples reviews current technologies and surgical innovations.

Michela Cimberle

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NAPLES — Cataract surgery is increasingly safe and nontraumatic, thanks to advances in phacoemulsification technologies. IOL technology is improving to meet the needs of surgeons performing both microincision and refractive cataract surgery. And options for flap creation and tissue ablation in refractive surgery are expanding with the introduction of new microkeratome and laser options.

These were some of the advances in ophthalmology discussed by the faculty at the Joint Meeting of *Ocular Surgery News*, the Italian Association of Cataract and Refractive Surgery and the International Society of Refractive Surgeons.

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### Cataract surgery

#### Phaco advances

New software and hardware for phacoemulsification systems are helping to minimize mechanical and thermal trauma, whether cataract surgery is done bimanually or with coaxial instrumentation, said one speaker at the meeting.

The WhiteStar system from Advanced Medical Optics, a power-control software upgrade of the Sovereign phacoemulsification system, delivers brief pulses of ultrasound energy interrupted by cooling periods, said Dario Surace, MD, during a live surgery session at the meeting.

“Although the WhiteStar system was originally intended for bimanual, sleeveless microincision phaco, we use it routinely for traditional one-handed phaco, maintaining the advantages of low-ultrasound technology,” Dr. Surace said.

Without changing any of the usual maneuvers, phacoemulsification is carried out “with increased efficacy, in a shorter time and avoiding heat-related complications,” he added.

Another approach is the AquaLase liquefaction technology of the Infiniti Vision System (Alcon), which uses fluid micropulses of heated water to emulsify the lens.

“In my opinion, cool phaco is AquaLase because no ultrasound is used,” said Marcello Prantero, MD, who also operated at the live surgery session.

The system can be used on all but the hardest nuclei, and some additional time is required compared to ultrasound phaco.

“The main problem is aspiration. Since the tip is not vibrating, the fragments are quite easily engaged, but aspiration is slower and slightly more cumbersome,” he said.

#### IOL technology

IOL injectors are becoming a common option for easing implantation of foldable, small-incision IOLs, said Luca Avoni, MD. In introducing the new Svelio IOL (Corneal) for microincision cataract surgery, Dr. Avoni said he compared different types of injectors and cartridges to find the best match for the smallest incision.

“The Svelio IOL has all the best characteristics of the new generation implants, including the square edge to prevent PCO, but it has been designed to be injected through small incisions,” Dr. Avoni said. He found that with a properly selected injector, the lens can be inserted through an incision of 2 mm.

#### Pseudoaccommodative IOLs

Refractive cataract surgery often relies on either multifocal or accommodative IOL implants. A recent innovation is the apodized optic design of the pseudoaccommodative AcrySof ReStor IOL (Alcon), which overcomes the limitations of

other multifocal implants, according to a surgeon at the meeting.

“Reading vision is fully restored in addition to perfect distance vision, without any visual complications like night halos and glare,” said Francesco Carones, MD.

Pseudoaccommodation after cataract surgery with IOL implantation was evaluated by high-frequency ultrasonography with ultrasound biomicroscopy in a study presented by Marina Modesti, MD.

She concluded that some degree of pseudoaccommodation was measurable with all IOLs she examined, not just the accommodative implants. The Corneal 360SE lens had a particularly good performance in this respect, she said.

“In most patients this visible pseudoaccommodation activity has a correlation with visual performance,” she said.

Ultrahigh-resolution optic coherence tomography (UHR-OCT) was described by another speaker as a valuable way for measuring pseudoaccommodation and obtaining cross-sectional images in pseudophakic eyes.

Reijo J. Linnola, MD, demonstrated how UHR-OCT can visualize the anterior segment, the capsular bag and the IOL. The device can be used to measure accommodation and evaluate processes such as PCO formation, capsular bag adhesion around IOLs and lens epithelial cell proliferation with different models and materials, he said.

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## Refractive surgery

### New LASIK technologies

The LaserSoft solid-state laser (Katana Technologies GmbH) was presented as an innovation in corneal refractive surgery, which has been dominated by excimer lasers for many years.

“This laser has a very gentle impact on the cornea. It has reduced thermal effect. Refractive results are very good, and recovery is fast,” said Lucio Buratto, MD, who performed LASIK with the laser.

The eye tracker, he added, is fast and precise. The only drawback is a slightly longer surgical time, due to the small spot size.

“This system is already competitive on the market and is starting a completely new generation of lasers,” Dr. Buratto said.

The IntraLase FS laser and the Hansatome microkeratome (Bausch & Lomb) were described as the two most popular options for LASIK flap creation.

Dr. Buratto, who has used both systems, said he likes using the Hansatome but that he is going to use the IntraLase for refractive lamellar surgery.

Edward E. Manche, MD, said that the IntraLase has potential. It has the precision of computer-controlled technology and the advantage of creating the flap under low vacuum, he said.

He added that initial doubts about the safety of the device were unfounded.

“The only thing I do is use steroids for a slightly longer time, 7 days instead of 4,” he noted.

### Phakic IOLs

Among phakic IOLs, the Phakic Refractive Lens (PRL) from IOLTECH is performing well with a low rate of complications and endothelial cell loss, according to Bo T. Philipson, MD.

“The chances of developing a cataract are a calculated risk,” said Dr. Philipson, who reported on a series of 45 patients with 1 to 3 years of follow-up. He recommended not implanting the lens in patients who drive at night, as it can produce a small amount of glare.

The Corneal I-CARE phakic IOL has now reached 2 years of follow-up. Simonetta Morselli, MD, and Roberto Bellucci,

MD, who have performed 30 of these implants, said that “thanks to the minimally traumatic design and material, the lens fits very well in the eye, without producing any anatomical alterations.” Complications such as angle erosion, pupil distortion, cataract, uveitis and inflammation, which are fairly common with other anterior chamber lenses, have not been seen with the I-CARE, they said.

“In the last five cases, we didn’t even perform iridotomy, but this did not cause any problem thanks to the vaulting of the lens,” the surgeons said.

### **Customized treatments**

Wavefront-guided LASIK with both the LADARWave CustomCornea (Alcon) and the Visx CustomVue software, respectively presented by Dr. Manche and Stephen F. Brint, MD, was said to be safe and effective in reducing higher-order aberrations and enhancing visual quality in patients with prior history of conventional refractive surgery.

Previous treatments with small optical zones, which have induced spherical aberrations and coma, can be improved with the topo-aberrometry-based ORK-W re-treatment program, linking the CSO Eye-top and the Schwind Esiris excimer laser, according to Ugo Cimberle, MD.

“In all cases I have obtained a considerable enlargement of the optical zones and recentration of the treatment,” he said.

Paolo Vinciguerra, MD, introduced a new method for improving re-treatment outcomes, using CSO and Optikon topographic imaging intraoperatively.

“Topographic mapping is performed following the removal of the epithelium in PRK or LASEK or under the LASIK flap so that the customized treatment program can be based on a more lifelike and accurate mapping of corneal morphology,” he said.

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## **Glaucoma**

### **Sclerectomy**

A large series of 400 cases of deep sclerectomy performed on all types of glaucoma was presented by Guido Caramello, MD. Even in complicated cases, the results have been encouraging, he said. In four patients with refractory glaucoma, he implanted the new Sifi T-FLUX permanent implant.

“Preoperatively, these patients had IOP over 40 mm Hg under maximal medical therapy and advanced visual field damage. Anatomical and functional results were remarkable, and the IOP is stable within normal levels without medications,” he said.

Concerns related to the incidence of glaucoma after refractive surgery in moderate-high myopic patients were raised in a study presented by Marco Nardi, MD.

“In the 68 patients included in the study, the prevalence of glaucoma 2 to 3 years after PRK surgery was 5.8%, which is double the incidence reported in unoperated myopic patients,” Dr. Nardi said.

He concluded that further investigation is necessary and recommended that PRK patients should be regularly tested for glaucoma as well as refractive results.

Thomas W. Samuelson, MD, spoke about refractive surgery in glaucoma patients. He said that LASIK might be a safe option for these patients if performed “cautiously, carefully and with complete informed consent.”

“Intraoperatively, I recommend minimum vacuum time and postoperatively a cautious use of steroids, which might otherwise induce IOP spikes,” Dr. Samuelson said.

In case of combined LASIK and trabeculectomy procedure, he recommended performing LASIK first, several days before trabeculectomy. “Otherwise, the microkeratome cut might easily cause damage to the thin, avascular bleb,” he pointed out.

He said constant surveillance is important for these patients. “Treat them as your ICU equivalent,” he said.

**For Your Information**

- Naples '04, the Joint Meeting of *Ocular Surgery News*, the Italian Association of Cataract and Refractive Surgery and the International Society of Refractive Surgeons, was held May 20-22. For information on future meetings, e-mail: [meetingregistration@slackinc.com](mailto:meetingregistration@slackinc.com).

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