ASCRS 2013 REVIEW
Moving to a future of financial challenge and technology advances
by Howard Larkin in San Francisco

Tough economic times along with government mandates to insure all US residents and use of electronic medical records are affecting every US ophthalmologist. But eye care technology continues to advance, and the profession is rising to the challenges, presenters told the 2013 Symposium of the American Society of Cataract and Refractive Surgery.

These are confusing and complex times in ophthalmology,” said incoming ASCRS president Eric D Donnenfeld MD. More government intervention, electronic medical records and increasing patient expectations are among the issues US ophthalmologists face.

ASCRS is addressing these challenges head on with new educational programmes, Dr Donnenfeld said. These include a new residents mentoring programme to help ensure ophthalmologist are trained in advanced technologies including toric and presbyopia-correcting intraocular lenses (IOLs) and laser refractive procedures. New education programmes are also under way in glaucoma and corneal surgery. New content is delivered online through a revamped ASCRS website (www.ascrs.org).

“There is extraordinary greatness in our profession. Cataract and refractive surgery have never been safer or more effective,” Dr Donnenfeld said. “We are all bound by the passion to advanced surgery, to improve the vision and quality of life for our patients and to abolish all forms of blindness. With dedication and perseverance, together we can accomplish these noble goals.”

Accommodating IOLs emerge

Accommodating IOLs, including dual optics, liquid optics, injectable lenses and even liquid crystal electronic devices, are becoming a reality, said Nick Mamalis MD in the 2013 ASCRS Binkhorst Lecture. Range of accommodation and long-term function and biocompatibility are major development questions now being examined.

Indeed, Louis D ‘Skip’ Nichamin MD, medical director of the Laurel Eye Clinic, Brookville, Pennsylvania, US, reported in a separate session that four patients in South Africa were implanted with the first foldable model of a fluid-based accommodative IOL as the meeting opened. The patients were doing well, but it was too soon to test their visual acuity and accommodation with the Fluidvision IOL, though patients implanted with an earlier non-foldable version of the lens in 2009-2010 achieved good distance vision and an average 5.0 D of accommodation using the push-down test, in line with PowerVision’s design parameters for the lens. Dr Nichamin is a scientific advisor for PowerVision.

Light adjustable lenses and new materials that could improve lens efficiency are also in development, said Dr Mamalis. “The future is bright in the area of intraocular lenses and in providing our patients with the best possible vision. I am excited to see what we will be talking about 20 years from now.”

Femto-cataract surgery maturing

Advances in femtosecond laser lens fragmentation are dramatically reducing the amount of ultrasound energy needed to remove cataracts of nearly all types, according to several presenters.

In his last 200 femto-cataract cases, 91 per cent required no phacoemulsification energy at all, said H Burkhard Dick MD PhD, University Eye Hospital, Bochum, Germany. That’s down from 41 per cent in an early comparable group of 200 patients in which 41 per cent needed no phaco, and an intermediate group of 200 in which 62 per cent needed none. The reductions were statistically significant.

Improved lens fragmentation grids and surgical techniques led to the first improvement, while refinements of phaco probe tips and machine settings, and surgical instruments contributed to the second gain, Dr Dick said. All groups included consecutive patients with cataracts grade 1 through 4 and pupils of 6.0mm or more operated by a single surgeon. Mean LOCS-III grades for the groups were 3.5 for the early and 3.4 for the intermediate and late groups.

Pavel Stodulka MD, PhD of Gemini Eye Clinic, Czech Republic, reported success removing grade 1 to 3 cataracts without any ultrasound at all using a twin laser approach. After femtosecond laser lens fragmentation a coaxial photolysis laser probe was used in place of a phaco probe. In 10 eyes, a mean of 35 probe laser pulses were required to remove cataracts, and a mean endothelial cell loss of 6.8 per cent were observed. Dr Stodulka believes that laser probes are viable for cataracts up to grade 3, but questioned their use for harder nuclei.

Retinal restoration

At the innovators session, Daniel V Palanker PhD of Stanford University, US, presented a photovoltaic retinal prosthesis that could restore vision to the blind. Multiple modules of 0.8 x 1.2mm in size are implanted in the subretinal space in place of lost photoreceptors, providing thousands of pixels, compared with 60 in current implant devices.

The photovoltaic array is also completely wireless, each pixel converts light shining on it into electric current to stimulate the nearby neurons. However, the device requires brighter than typical ambient light, so a set of video goggles displays the incoming images using pulsed near-infrared light projected into the eye. In vitro, the device elicited signals in retinal ganglion cells similar to those produced by normal retina in response to light, and has produced cortical signals in rats with both normal and degenerated retinas, Dr Palanker said.

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