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Can't Read the Fine Print? New Vision Options for Baby Boomers

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CHICAGO—Results of clinical research on new presbyopia treatments now available in Europe–and possibly available soon in the United States–were reported in today's Scientific Program of the 2010 Joint Meeting of the American Academy of Ophthalmology (AAO) and Middle East-Africa Council of Ophthalmology (MEACO). The AAO-MEACO meeting is the world's largest, most comprehensive ophthalmic education conference and is in session October 16 through 19 at McCormick Place, Chicago.

Presbyopia is Inevitable, but Blurry Vision is Not

From age 40 onward our eyes' lenses gradually lose the ability to focus on close-up objects, a condition called presbyopia. By our 50s or 60s, almost everyone experiences blurry near vision, although distance vision often remains good. More than 60 million people in the United States are presbyotic, as are more than 400 million worldwide. Reading glasses are one solution, but many people are interested in glasses-free vision correction. Options now available include a form of LASIK that improves near vision in one eye, called monovision, and intraocular lenses (IOLs) that replace the eyes' natural lenses. Within a few years, several new presbyopia treatments described in today's Scientific Program will likely be available in the U.S.

A Corneal Lens Implant with Built-In Vision Correction

Ioannis G. Pallikaris, MD, University Hospital of Crete, Greece, reported on a new type of micro-lens, the Flexivue, that was implanted in the corneas of 15 patients, who were followed for 12 months post-surgery. In a procedure lasting about 10 minutes, an extremely thin lens was inserted into the cornea (the clear outer structure) of the patient's non-dominant eye through a tiny pocket made with a highly precise femtosecond laser. The specific vision-correcting prescription for each patient was incorporated in the outer area of the lens. After lens insertion, the pocket self-sealed and held the lens in place. On average, treated eye near vision improved from 20/100 to 20/25 without glasses, and distance vision decreased from 20/20 to 20/40. Vision remained stable in both eyes post-surgery in all patients through the follow-up period.

"This corneal lens implant appears to be a safe, effective way to correct presbyopia in people aged 45 to 60," said Dr. Pallikaris. "Ninety-eight percent of patients were satisfied with their vision; 69 percent reported 'excellent' and 30 percent 'good' near vision in our survey. Ninety-two percent said they no longer used glasses."

He said there were no surgery-related complications, but about 15 percent of patients reported glare and/or halos around lights, and some had reduced contrast sensitivity. Distance vision in the implanted eye is less influenced and remains better than it would be when a LASIK monovision procedure corrects for near vision; Dr. Pallikaris called this advantage "smart monovision." Another key advantage is that, unlike LASIK and related refractive surgical procedures, the effects of corneal lens implants can be reversed by lens removal. Dr. Pallikaris was one of the pioneers of LASIK in the early 1990s.

He stressed that proper patient selection is crucial to Flexivue implant success: the candidate should have worn reading glasses for at least one year; patients would be disqualified if they have certain types of astigmatism, lens opacity (cataract) or several other conditions.

Financial disclosure: Dr. Pallikaris states that he is chair of the medical advisory board of Presbia, maker of Flexivue.

Corneal Inlay "Pinhole" Optics Sharpens Near Vision

Corneal inlays work by changing the eye's depth of focus. Clinical trials are underway in the U.S., and the inlay is commercially available in Europe and Asia. Daniel S. Durrie, MD, reported on three years of clinical trial results for 153 patients implanted with either a 5- or 10-micron-thick AcuFocus lens. Both near and distance vision were slightly better in the 5-micron group. Both groups showed improvement in near vision, on average 20/25 in the 10 micron group and 20/20 in the 5 micron group. Distance vision was preserved in the implanted eye.

The procedure involves making a corneal flap as in LASIK, placing a small, donut-shaped inlay in the center of the cornea in the non-dominant eye, then replacing the flap. With the inlay's small-aperture ("pinhole") optics, peripheral light coming into the eye is blocked while central rays are unaffected, resulting in improved near vision. Distance vision is mostly unaffected, but patients may notice a slight difference when they compare their two eyes. Like corneal lenses, inlays' effects can be reversed by removal.

"Results for AcuFocus have remained stable for three years of follow up, and we've seen dramatic improvements in corneal inlays in the past seven years of clinical study," Dr. Durrie said.

Financial disclosure: Dr. Durrie states that he is a clinical investigator for AcuFocus.

Reshaping the Cornea without Breaking the Surface

Perhaps the most surprising cornea-based correction technique among the newcomers is INTRACOR. This technology applies femtosecond laser energy pulses inside the cornea, in the stromal cell layer just under the surface. Unlike LASIK and related surgeries, no tissue is removed. Instead, the pulses cause a biomechanical change in the cornea that shifts its center slightly forward. This improves near vision while maintaining distance vision. Small interior incisions may also be made to correct small degrees of near- or farsightedness. The procedure, done in the non-dominant eye, takes less than half a minute.

Mike P. Holzer, MD, University of Heidelberg, Germany, presented two-year follow-up data on INTRACOR presbyopia correction in 25 patients. Participants showed significant gains in near vision without glasses and maintained good distance vision. Patient satisfaction was high. INTRACOR has generated strong interest in Europe, Asia and South America and is gathering momentum in the U.S.

"The procedure is painless, and because no tissue is removed, the risk of infection is extremely low and the body does not need to mount a strong healing response," Prof. Holzer said. "The cornea is not weakened, as it can be with other types of refractive surgery. Patients' vision improved within hours of the procedure and remained stable over the follow-up period," he added.

Financial disclosure: Prof. Holzer states that he receives consulting fees from Technolas Perfect Vision GmbH.

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