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Multizone laser treatment can be used to correct presbyopia

Multifocal pseudoaccommodation is produced by reshaping the cornea using some of the same principles as multifocal IOLs.

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SAN BENEDETTO DEL TRONTO, Italy – A new technique of LASIK multizone ablation may correct presbyopia by producing a multifocal pseudoaccommodation on the cornea, according to a surgeon speaking here.

The principle is the same as is used in some multifocal IOLs, but on a much larger surface and in front of the pupil, on the patient's own cornea, explained Alain Telandro, MD, of Cannes, France. Dr. Telandro spoke here at the Visiva 2002 meeting.

"Multifocal lenses are 6 mm at the most, and the useful optical zone is therefore no more than 4 mm. Pupil size and light conditions affect visual performance, with the well-known problems of poor near vision in bright light and glare and halos at night," Dr. Telandro said.

"My multizone ablation covers a diameter of 10 mm, with a central optical zone for distance vision and successive concentric zones for intermediate and near vision. Smooth and gradual transition zones contribute in producing a very regular corneal profile, with a progressive asphericity resulting in an excellent visual quality and no light diffraction problems," he said.

Postoperative topographic maps of a patient showed a gradual color progression from orange to yellow, dark yellow, green and blue in concentric rings, showing a dramatic change from preoperative green and blue patterns.

The procedure

According to Dr. Telandro, traditional laser refractive surgery in patients of presbyopic age can never provide acceptable results.

Hyperopic eyes can be slightly overcorrected to regain near vision, but the results are often unstable and may present an unsatisfactory compromise. If they are slightly overcorrected, they see better at near, but lose distance vision and become myopic, Dr. Telandro said. Myopic patients, on the other hand, naturally see well at near; after surgery they regain distance vision but lose near vision. A multizone treatment that creates concentric areas of

different curvature on the cornea — and corrects hyperopia, myopia, astigmatism and presbyopia at the same time — may allow laser refractive surgery to be beneficial even as the eye is losing accommodation.

Details on the technique will soon be published by the author, and he declined to give specifics in his presentation.

“What I can say for now is that the final result is an aspheric cornea, with a flatter optical zone in the center for distance vision and a progressive change of curvature towards the periphery for intermediate and near vision. The more you move to the periphery, the more you see at near, and this means that when the pupil becomes larger at night, vision becomes even better,” Dr. Telandro said.

LASIK mandatory

Unlike patients who have undergone surgical correction for presbyopia with scleral bands or sclerectomy, Dr. Telandro’s patients have a nontraumatic postoperative course, he said.

“With LASIK there is no pain, no visual discomfort and an immediate visual recovery. Most patients can read small print as early as 15 minutes after surgery, and all of them can after a rest of 2 to 3 hours. Most can go back to work and drive without problems the day after surgery. None of them complain of halos and glare. If there is a small residual error to correct, it can easily be done after about a month by reopening the flap,” he said.

Dr. Telandro recommended LASIK as the procedure of choice for this type of laser refractive surgery. PRK should be avoided because regression might alter the new curvature of the cornea and hinder the final results, he said, while LASIK prevents re-epithelialization allows the flap to adheres to the underlying corneal shape.

“The main problem with LASIK is that of making a 10-mm flap. I use an IOLTECH Flapmaker microkeratome, which has a flap diameter of 9.5 mm. I leave the suction on a little longer, for about 20 seconds, and the increase in pressure enlarges the cut to 10 mm or more,” he said.

Currently, the Nidek laser is the only one that can be used for optical zones up to 10 mm, Dr. Telandro said. Nidek is now working on a software for customized multizone ablations, according to the company.

Satisfied patients

“I have been working on pseudoaccommodation since 1987. I have been using multifocal IOLs in cataract surgery for many years and now I have this new option for presbyopia,” Dr. Telandro said.

“For patients between 45 and 65 years, with a perfectly clear lens and normal BCVA at distance, I offer the multizone laser treatment. If visual acuity has decreased and the lens has lost some transparency, I propose phacoemulsification with a multifocal implant,” he continued.

Younger ametropic patients, between 30 and 45 years of age, are also offered the option of laser multizone correction.

“I treat the refractive error and, at the same time, I anticipate presbyopic treatment. With myopic patients I measure cycloplegic refraction and do a reading test before treatment, then carry out an average 1.5 D of presbyopic correction,” Dr. Telandro said.

“These patients are usually very satisfied, because, contrary to what happens to those who have been given just a myopic treatment, they are not disturbed by overcorrection the day

after surgery. Straight away they can read, work and have a normal life. They see well at distance, but don't lose near vision," he said.

Dr. Telandro cited the case of one patient, a dentist, who was treated just for myopia in one eye and with the multizone myopic-presbyopic procedure in the other eye.

"[The patient] soon asked to have the multizone treatment in the first eye as well. Now he uses magnification glasses when he works on very small details, as all dentists do, but has a perfect intermediate vision and reads without additional correction," he said.

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