LASEK best for hyperopia

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in Paris

LASEK appears to be a good option for the treatment of low to moderate hyperopia, reported David O’Brart MD at the XXII Congress of the ESCRS. Dr O’Brart, consultant ophthalmologist at St Thomas’ Hospital in London, presented his long-term hyperopia results for PRK and LASIK and also outlined his medium term results for LASEK. This evidence led Dr O’Brart to conclude that LASEK appears to provide the best outcomes for hyperopia up to +4.5 D, although the technique requires a large optical zone (7.0 mm or greater).

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“In terms of predictability, these results are probably better than anything I have ever seen in hyperopic laser refractive surgery treatments, with an extremely good safety profile and excellent visual outcomes,” Dr O’Brart told EuroTimes.

Dr O’Brart conducted a prospective pilot study with 45 patients (68 eyes), treated with LASEK between November 2002 and July 2004. The mean age of patients was 54.7 years, ranging from 24 to 78 years. Pre-operative mean spherical equivalent was +2.19 D, ranging from 0 to +4.25 D, while mean pre-operative cylinder was -0.79D, ranging from 0 to -5.0 D.

Patients underwent LASEK with a Schwind ESIRIS excimer laser with a large optical zone of 7.0 mm and a 1.0 mm transition zone in every case. He used a 15% alcohol solution with 20 second application. The LASEK correction was +2.25 D, ranging from +0 to +4.25 D.

In most eyes (96%), the surgeon obtained an intact epithelial flap. There was an adherent flap in one eye and loose flaps in two eyes.

At one week, best-corrected acuity was 20/40 or better in 90% of eyes. By one month, best spectacle corrected visual acuity (BSCVA) was unchanged or better in 93% of eyes. At the six and twelve month follow-up visits, 98% of eyes were within one dioptre of the intended correction, while 88% were within 0.5 D.

At the six-month follow-up and thereafter, two eyes gained two lines of BSCVA, 11 gained one line and 28 eyes showed no change. Two eyes lost one line of Snellen decimal equivalent BSCVA. No eyes lost more than one line.

Among 45 patients with astigmatism, mean preoperative cylinder was -1.19 D. Following surgery, the mean cylinder was -0.38 D. Vector analyses demonstrated a mean 109% correction.

The mean spherical equivalent in 25 eyes for whom 12-month data were available was +0.15 D, ranging from -0.5 D to +1.0 D. Uncorrected acuity in that subgroup was 20/20 or better in 80% of patients, with all eyes achieving 20/40 or better. Analysis of complications showed no axial corneal haze in any eye, with a peripheral ring of faint haze 7.0 mm in diameter in seven percent of eyes after between six and 12 months follow-up. There were recurrent erosions at one to two months in two eyes, three percent of the total, which settled completely on topical lubricant medication.

Dr O’Brart concluded that LASEK for hyperopia provided good refractive and visual outcomes with very few complications. He speculated that improved outcomes with the Schwind ESIRIS Laser might be due to the large diameter optical zone and the smoother ablation profile achievable with scanning spot technology. He believes that hyperopic LASEK results with the ESIRIS laser appear to be very favourable compared to published outcomes with LASIK and PRK.

”LASEK with large diameter optical zone treatments (7.0 mm or greater) achieves very favourable outcomes for the correction of hyperopia up to +4.5 D hyperopia. I believe that one of the reasons that excimer laser hyperopic treatments have been rather disappointing in the past is that treatments have been conducted with optical zones that are too small.”

”The use of small optical zones will have a greater propensity to the induction of higher-order aberrations, especially as many hyperopes have a large angle kappa often requiring the treatment to be decentred from the entrance pupil centre. This can result in a significant loss of post-operative visual performance, especially as (unlike myopic treatments) there are no benefits in terms of post-operative retinal magnification.”

”However, with large optical zone treatments (7.0 mm or greater) virtually the whole cornea is treated and centration along the exact line of sight although important is less crucial. In addition in myopic treatments we know the large optical zone corrections (6.0 mm or greater) are more predictable, safer and more stable than smaller diameter (5.0 mm or less) treatments.”

”This has not been investigated in hyperopia, but the results of my pilot study strongly suggest much better outcomes in terms of predictability and visual performances with larger optical zone treatments.”

Dr O’Brart is building up a database with LASEK for hyperopia to match the long-term data he has for PRK and LASIK. Currently he has 30 months of follow-up LASEK data for treatment of hyperopia.

In two long-term studies into LASIK and PRK for hyperopia he found PRK was the best performer of the two in terms of long-term stability. Dr O’Brart said he opposed the use of phakic IOLs in hyperopia. “I think it’s a bad idea, because you generally have a small, shallow anterior segment, which will get increasingly shallow with advancing age. If you put a phakic lens in the posterior chamber it will have a very high change of damaging the lens and cause cataract. If you put in the anterior chamber there is a definite risk of glaucoma, from pigment dispersion, and endothelial damage.”

For corrections greater that +4.5 D, Dr O’Brart believes that glasses and contact lenses are by far the best solution. For some presbyopic patients, he believes a clear lens extraction with an accommodative IOL implantation can be appropriate. In those with pre-existing cataract multifocal lenses can be considered.

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