

PRK trumps LASIK in long-term outcomes for hyperopia

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in Paris

PHOTOREFRACTIVE keratectomy (PRK) may produce better long-term refractive stability than LASIK in hyperopic patients, data from two new British studies suggest.

David O'Brart MD conducted two studies of refractive stability in hyperopic patients, one involving LASIK, the other PRK. He will present the results at the XXII annual ESCRS Congress in Paris. Both studies were conducted in the Department of Ophthalmology, St. Thomas' Hospital, London, UK.

In the LASIK study, 26 patients (40 eyes) with hyperopia underwent LASIK, using a Moria LSK One microkeratome to cut a flap with a nasal hinge and a Summit SVS Apex Plus Excimer laser with an optical zone of 6.5 mm and a blend zone of 1.5 mm. Only simple hyperopia was treated with no astigmatic correction. All eyes had a follow-up of five years.

The mean age at time of surgery was 51 years, ranging from 32 to 64 years. The preoperative mean spherical equivalent was +3.8 D. The mean attempted LASIK correction was +3.4 D. At five years post-op, the mean spherical equivalent (SE) was +0.84D (range -0.375 to +3.375D) with 62.5% of eyes

within one dioptre of the intended correction.

For corrections up to +3.0D, 76% of eyes were within one dioptre of the intended correction, compared to only 40% of eyes for corrections between +4.0 D to +6.0 D. A statistically significant reduction of refractive correction was found between six months and five years postoperatively, with 60% of eyes 24 eyes experiencing an increase in hyperopia of +0.5 D or more and 33% of eyes showing an increase of +1.0D or more.

Uncorrected visual acuity was improved in 95% of eyes at five years and was better than 20/40 in 85% of eyes and 20/25 or better in 70%. Best spectacle corrected visual acuity was unchanged or improved in 85%.

Best-corrected acuity was reduced by one line in 15% of eyes at five year's follow-up. No eyes lost more than one line of BSCVA. Clinically insignificant interface debris was present in two eyes. One eye had persistent microstriae. No eyes developed corneal ectasia.

Dr. O'Brart concluded that LASIK appears to be a safe and moderately effective procedure for the correction of low degrees of hyperopia, cautioning,

"There is, however, an increase in hyperopia over five years of follow-up, which is more than

would be expected with the physiological increase with age and long-term stability of hyperopic LASIK refractive corrections are therefore uncertain."

In the second study, Dr. O'Brart carried out a long-term (mean 7.5 years), prospective follow-up study to evaluate refractive stability and safety of excimer laser hyperopic PRK (H-PRK).

Twenty-one patients of an original cohort of 43 who participated in one of the first clinical trials to investigate the efficacy of H-PRK, underwent detailed clinical assessment at a mean follow-up of 91 months (7.5 years). Patients underwent H-PRK with a Summit Technology Apex Plus Excimer laser (6.50 mm optical zone, 1.5mm blend zone). The mean pre-operative SE was +4.7 dioptres, ranging from +2D to +7.50D.

Patients were allocated to one of four treatment groups based on their preoperative refraction: +1.5, +3.0, +4.5 or +6.0D. Patients in each group received an identical treatment and therefore emmetropia was not the primary aim, Dr. O'Brart noted.

With long-term follow-up, the refractive correction remained stable with a mean difference in spherical equivalent refraction between one year and 7.5 years of +0.28D. At 7.5 years, the mean SE was +0.83D. Sixty-seven per-

cent of eyes undergoing corrections of mild-to-moderate hyperopia of +1.5 and +3.0D were within one dioptre of the predicted correction. Predictability was poorer with +4.5 and +6.0D corrections with only 40% of eyes within one dioptre of the expected refraction.

A majority of eyes, 87.5%, achieved an improvement in unaided near and distance acuity. Best spectacle corrected visual acuity was unchanged or improved from pre-operative values in 62.5% of eyes. Two eyes lost two lines of best-corrected acuity, which in one case was attributable to cataract formation over the follow-up period.

No eyes showed any disturbance of central corneal transparency. A peripheral ring of haze, 6.5 mm in diameter, appeared in most eyes at one month post-operatively. Its intensity was maximal at six months and then diminished with time. In 25% of eyes, remnants of the haze ring were still evident at 7.5 years. Sub-epithelial iron rings measuring 6.5 mm in diameter were evident in 70% of eyes.

Dr. O'Brart concluded that in H-PRK refractive stability achieved at one year was maintained up to 7.5 years with no evidence of hyperopic shift, diurnal fluctuation or late regression.

Peripheral corneal haze decreased with time but was still evident in a number of eyes at the last follow-up visit.

Dr. O'Brart's study reflects the longest follow-up data available for hyperopic LASIK and for hyperopic PRK in the UK, and possibly Europe.

"I also have a very large database of LASEK for hyperopia, which is showing excellent results, especially with large optical zone treatments using flying spot lasers," Dr. O'Brart told *EuroTimes*.

Dr. O'Brart told *EuroTimes* that he was strongly opposed to the use of phakic IOLs for hyperopic patients, because of their shallow anterior chambers. He allowed that there was some role in the presbyopic patient for multi-focal, or even some of the accommodative IOLs.

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