Wavefront optimised LASIK achieves predictable and accurate results in hyperopes

Roibeard O'hEineachain in Lisbon

WAVEFRONT-optimised LASIK with the Wavelight Allegretto laser can achieve excellent outcomes for both low and high hyperopia with good long-term refractive stability, Charles R. Moore MD, Houston, Texas, told the XXIII Congress of the ESCRS

Dr Moore presented the long term results of 550 consecutive patients who underwent Wavefront optimised hyperopic LASIK in an FDA trial and had a follow-up of six months to fours years.

The patients in the study were between 23 to 78 years old and had from +.50 to +6.0D hyperopia and +.25 to +5.0D of cylinder. All underwent LASIK with the Allegretto Wave Laser. The ablations were targeted for distance in two-thirds of eyes and for near in the remaining eyes.

After a follow-up period of six months to fours years, 95.4% achieved uncorrected visual acuities of 20/40 or better; 65.8% achieved 20/20 and 29.4% achieved 20/16. Predictability was also good with 71.9% within 0.5D of the attempted correction and 90.2% with in 1.0D. In terms of safety, best-corrected visual acuity lost one line and 1.5% lost two lines.

Better outcomes than reported with conventional LASIK

Dr Moore noted that the long term results with the Wavelight Allegretto laser compare more favourably with those reported in five-year retrospective follow-up study of patients who underwent hyperopic LASIK with the Summit broad beam laser *(Marshall et al, Ophthalmology 2005)*.

The authors of the retrospective study cautioned against hyperopic corrections over 3.0 D., as they deemed the long-term stability uncertain, because of a high incidence of regression. None of the patients in that study achieved uncorrected acuity of 20/16, 40% achieved 20/20 and only 58.1% were within 1.0 D of target refraction at final follow-up.

"In terms of stability, Allegretto Wave hyperopic treatments resulted in less regression than reported in that study and the postoperative quality of vision results were superior in all respects. The Wavefront-optimised platform also achieved excellent outcomes for both low and high hyperopia."

Dr Moore attributed the superior outcomes achieved with the Wavelight laser to its 6.5mm to 7.0 mm optical zone and adjustable blend zone, its wavefront optimisation and its 0.095 flying spot. The machine also has an extremely fast eye tracker with a 6.0 millisecond response time and built-in-slit-lamp, which allows the surgeon to identify any interface irregularities at the conclusion of each procedure.

The 200MHz laser used in the FDA trial treats 1.0 D of refractive error every 10 seconds. The average ablation time in the study was less than 30 seconds. However, the 400 MHz model on the Wavelight Allegretto laser, now available in Europe, can cut ablation time in half, he noted.

He added that while in the FDA trial he was not able to treat patients with angle kappa decentrations of five degrees from the visual axis, he currently routinely uses the Wavelight laser's special capabilities to decentre the ablation for angle kappa in eyes where there is more than four degrees of variation.

Special considerations for treating hyperopes

Dr Moore emphasised that it is important to keep in mind the ways in which hyperopic patients differ from myopic patients, Most are over 50 years of age and most have not had to wear spectacles before the onset of presbyopia, in addition as most hyperopes are somewhat older and tend to watch rather than participate in sports, a high percentage prefer at least one eye to be corrected for near rather than distance.

Furthermore, most hyperopes have a more risk-adverse personality than myopic patients and many have been told that they are not candidates for refractive procedures. Nevertheless, hyperopes are much less demanding and have lower expectations than myopes.

The special surgical considerations in hyperopic patients, includes their large angle kappa relative to myopes and a higher incidence of ocular surface problems, Dr Moore said. He also stressed the importance of having a very dependable micro-keratome. He recommended making flaps that are 9.5 mm in diameter and less than 100 microns in thickness.

He noted that a slight temporary myopic overcorrection is necessary to compensate for the regression that occurs in the early postoperative 30 days. Patients should therefore be advised preoperatively that they will have to wear glasses for some activities for the first one or two postoperative months, and rarely for up to one year.

"You must warn patients that there is a possibility of some keratometric regression, although the larger optical zone decreases regression and patient satisfaction has been very high"

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