Customised LASIK system safe and predictable in correction of myopic astigmatism

Roibeard O’Hineachain in Barcelona

Nidek’s NAVEX customised ablation system can correct myopic astigmatism with a high degree of accuracy and predictability, according to the results of a preliminary study presented by Ermanno Scerrati MD, Frosinone, Italy at the 8th ESCRS Winter Refractive Surgery Meeting.

The study involved 10 eyes of five patients who underwent LASIK with the NAVEX system for the correction of myopic astigmatism with a mean preoperative spherical equivalent of -2.84 D, Dr Scerrati said.

At three month’s follow-up UCVA was 20/15 or better in six eyes and 20/20 or better in three eyes and 20/25 or better in one eye. The mean postoperative spherical equivalent was +0.4 D.

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“The accuracy and predictability of the NAVEX system was excellent both for higher values of myopia or for lower ones and there was little tendency to overcorrection,” Dr Scerrati said.

In addition, best-corrected visual acuity improved by one line in six eyes and remained unchanged in the remaining eyes. Furthermore, OPD Scan analysis showed that the mean total RMS of the overall refractive error decreased from preoperative value of 4.194 microns to 1.108 microns at three months follow-up, a reduction of 74%. There was also a 7% reduction in the mean RMS value, which fell from a preoperative value of 0.188 microns to 0.175 microns.

The patients in the study had a mean age of 35.5 years and myopic astigmatism with a mean SE of -2.84 D. In all eyes Dr Scerrati used a Nidek MK2000 microkeratome to create a 160 micron thick LASIK flap with a nasal hinge.

The NAVEX system captures each patient’s refractive wavefront and corneal topography data and converts them into a combined refractive power map, Dr Scerrati noted. The system also includes software that calculates the precise customised algorithms to guide the ablation of the EC-5000CX excimer laser.

Using one instrument, the OPD-scan wavefront abberrometer and topographer, the NAVEX system provides an objective measurement of refractive error and wavefront aberrations using dynamic skiascopic technology. The system also provides corneal topography measurements with Placido rings.

Using a total of 1440 infrared beams the OPD scan obtains a wavefront map by measuring the time it takes for each ray to pass through the entire optical system. The topographer provides information regarding the corneal component of the wavefront profile and also acts as a failsafe mechanism for detecting corneal irregularities.

The NAVEX system’s Final Fit software takes the wavefront and topographic data from the OPD scan to produce a customised ablation algorithm for the NIDEK EC-5000 excimer laser. The ablation profile has separate spherical, cylindrical and irregular components. The laser has a 1.0 mm Gaussian beam and an optical zone that can range from 4.5 mm to 6.5 mm and a transition zone that can extend to 10.0 mm.

“Customised ablation with Nidek NAVEX system is stable, predictable, efficient and safe. In addition, there was a significant decrease in the RMS total, which means an increase in the quality of vision,” Dr Scerrati said.

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