Comparative trials favour customised over conventional LASIK

Nadja Geipert in Lisbon

CUSTOMISED LASIK treatment produces better vision and induces less high-order aberrations than conventional LASIK treatment, reported researchers at the XXIII annual Congress of the ESCRS.

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Kjell Gunnar Gundersen MD PhD

In one study, Norwegian researchers randomly assigned 20 patients to receive either conventional LASIK surgery or a CustomCornea® (Alcon) procedure. The surgeons based the conventional LASIK ablation parameters on manifest refractions and used Ladarwave wavefront measurements in the customised group.

At twelve months follow-up, 90% of eyes in the customised group achieved a UCVA of 1.0 or better compared to only 70% of eyes in the conventional treatment group. Moreover, the patients treated with the CustomCornea approach had a significantly higher efficacy index (postoperative UCVA/preoperative BCVA) at around 1.0, compared to 0.9 for the conventional treatment group said Kjell Gunnar Gundersen MD PhD, Privatsy Kehuset, Maugesund, Norway.

In terms of safety, the CustomCornea treated patients gained an average of one line and the conventional LASIK treated group gained 0.5 of a line at six months’ follow-up. In addition, at all postoperative visits the CustomCornea group had higher safety indices (postoperative BCVA/preoperative BCVA) and gained more lines. This difference reached significance at the six months visit.

Predictability and stability were very good within both groups, showing a slight trend towards regression in the conventional group, Dr Gundersen noted. At 12 months the mean SE was -0.13 for the Custom group and -0.37 for the conventional group. At 12 months 92% of Custom Cornea eyes were within ± 0.50D and 83% within ± 0.25D, compared to 82% and 70% in the conventionally treated group, respectively.

“After six and 12 months the post-op refractive results were slightly tighter for the CustomCornea group,” he said.

In addition, contrast sensitivity was superior in the CustomCornea group at all frequencies under both normal and glare light conditions. In fact, the custom treated group achieved approximately the same contrast sensitivity under glare conditions as the conventional group did under normal light conditions.

The superior contrast sensitivity in the custom cornea group was paralleled by a lower induction of aberrations. At six months’ follow-up, the eyes treated with standard LASIK had mean increases in higher order aberrations of 140% and 42% increases in spherical aberration and coma. The CustomCornea treated eyes, on the other hand, had only a 25% increase in higher order aberrations and only a 27% increase in spherical aberration and coma. The CustomCornea treated eyes, on the other hand, had only a 25% increase in higher order aberrations and only a 27% increase in spherical aberration and coma.

Furthermore, 12 months after surgery the aberrations in the conventionally treated patients continued to increase but decreased in the customised treated group.

“The significant higher line gain, superior contrast sensitivity and lower induction of higher order aberrations lead me to prefer customised treatments for my patients,” he added.

The differences between the two groups increased with the longer observation time, said Dr Gundersen.

In a second study 17 patients received LASIK treatment with standard LASIK with the Ladar (Alcon) system in the other eye. The surgeons used a 6.5mm ablation zone and a 1.25mm radius transition zone.

Three months after surgery the mean uncorrected visual acuity was 1.23 in both groups, with no difference in their mean postoperative spherical equivalent. All patients reached an uncorrected visual acuity of 20/25. However, 23.6% in the customised group reached 20/12.5 vision, compared to only 11.8% in the conventional group, reported Luca Vigo MD, Milan, Italy.

Approximately half of the patients who received customised LASIK gained one line of best-corrected visual acuity and 17.6% gained two lines. Of the patients who received conventional LASIK gained one line and 29.4% gained two lines.

One month after the procedure, the eyes treated with conventional LASIK had average spherical aberrations of 0.5 compared with 0.29 in the patients treated with customised LASIK. The conventional LASIK group also had a higher average of higher order aberrations, 0.76 compared to 0.56 in the customised LASIK group. However, this difference in aberrations between the two groups had decreased after three months.

Two patients received customised LASIK re-treatment in the eye that was originally treated with conventional LASIK because of visual symptoms. Several patients stated that they preferred the eye that was treated with the customised laser.

Dr Vigo commented that custom ablation versus conventional ablations remains a controversial issue. The older versions of the excimer laser were less sophisticated and difficult to use when it came to registration and centration. CustomCornea is an improved technology that produces better quality of vision and patient satisfaction, he said.

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