Wavefront-guided LASIK yields impressive outcomes in treating hyperopic and mixed astigmatism

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WAVEFRONT-GUIDED CustomVue® (VisX) LASIK treatment for hyperopic and mixed astigmatism provides stable and predictable refractive outcomes along with high levels of quality vision according to the results of a multicentre study presented at the XXII Congress of the ESCRS.

The trial was conducted at six private and academic-based ophthalmology clinics. The hyperopic astigmatism cohort included 112 eyes of 56 subjects; 86 eyes of 44 patients underwent treatment for mixed astigmatism. All eyes were targeted for emmetropia, said study investigator Douglas D. Koch MD, Cullen Eye Institute, Baylor College of Medicine, Houston, Texas.

At nine month’s follow-up, UCVA was 2/20 or better in 79% of eyes treated for hyperopic astigmatism. Moreover, patient satisfaction with vision was extremely high and improved in many respects compared with preoperative values. Safety was excellent with only a single eye losing two lines of BSCVA, he reported.

Six-month follow-up data were available for the mixed astigmatism cohort, and the results showed that UCVA was 20/20 or better in 62% of eyes while 96% achieved UCVA of 20/40 or better. Again, no eyes lost more than two lines of BSCVA and only a single eye (1.2%) lost two lines.

“Patients have been delighted with their results, and I am sufficiently excited about the outcomes achieved with respect to accuracy and quality of vision that I think wavefront-guided LASIK now stands as a real competitor to refractive lens exchange as a procedure for treating the presbyopic hyperope. There are some exciting new pseudophakic implants on the horizon that will be able to provide both near and distance correction. As the IOL technology continues to evolve, however, I would consider wavefront-guided LASIK a wonderful option for serving the needs of the hyperopic presbyope,” said Dr. Koch.

The 56 subjects treated for hyperopic astigmatism had a mean age of 52 years, ranging from 21 to 63 years. Preoperative mean values for sphere, cylinder, and MRSE were 2.0 D, 0.7 D, and 2.4 D respectively. Among 107 eyes seen at six months, rates of 20/20, 20/25, and 20/40 or better UCVA at that visit were 70%, 88%, and 97%. Outcomes were even better at nine months when the corresponding values for proportions of patients reaching those levels of UCVA were 79%, 93%, and 99%, respectively.

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“The six-month UCVA data compare very favourably with the outcomes in the VisX FDA trial of conventional LASIK for the treatment of hyperopic astigmatism and can be explained by the optically superior ablation profile of the wavefront-guided treatment. With conventional LASIK, the percentages of patients who achieved UCVA of 20/20 or better or 20/25 or better at six months were more than 20% lower than the rates associated with the CustomVue treatment,” Dr. Koch said.

The refractive outcomes were stable. At one month, mean MRSE was 0.0 D, and it ranged between 0.06-0.15 D at the three, six, and nine month visits. MRSE changed less than dioptre in 98% of eyes between the third and sixth post-op months.

Predictability analyses showed that at six months, MRSE was within 0.5 D in 95% of eyes while 83% were within 0.5 D.

Results from satisfaction surveys administered at baseline and after six months showed marked increases in the proportion of patients who described themselves as “very satisfied” or “satisfied” with both vision at night and vision at night with glare. Preoperatively, just about half of patients were satisfied or very satisfied with their vision at night and just over one-third were satisfied or very satisfied with their vision at night with glare. At six months after surgery, those satisfaction levels rose to 78% and 69%, respectively, due to reductions in the proportions of patients who were somewhat or very dissatisfied.

“The patients treated for mixed astigmatism had a mean age of 41 years. Their mean preoperative values were -1.68 D for sphere, +2.98 D for cylinder, and -0.19 D for MRSE. The six-month analyses showed that among 84 eyes seen at one month, 67% were seeing 20/20 or better, 85% had achieved 20/25 or better, and UCVA was 20/40 or better in 94% of eyes. All of the treated patients were seen at three months, and 73 eyes were evaluated at six months, and the UCVA results remained similar at those visits.

Preoperative spherical error was nearly eliminated, with mean values of 0.04 D and 0.09 D at three and six months, while cylinder remained stable at about 0.60 D at both of those visits. Refraction accuracy at six months was high. With very few exceptions, sphere and cylinder were within 0.5 D of target values in all eyes, while MRSE was within 1.0 D of target in 86% of eyes and within 0.5 D in 66%.

Preoperatively, most patients (71%) were generally satisfied with their overall visual clarity, but at six months after surgery this value rose to 84%. The proportions of patients who were satisfied/very satisfied with vision at night rose from 54% preoperatively to 88% at six months after surgery, and there was a particularly dramatic increase in satisfaction with vision at night with glare. While only 38% of patients were satisfied/very satisfied preoperatively, at six months 88% reported those levels of satisfaction.

“The high levels of satisfaction with quality of vision in these hyperopic patients undergoing excimer laser treatment is a striking new finding.”

The safety analysis showed BSCVA was the same or better in 75% of eyes and there were no ongoing adverse events reported at six months or later.

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