Lasik for high myopia – does it have a bad reputation?

Stefanie Petrou Binder MD
Refractive surgeons may want to revisit the idea of using LASIK to treat higher degrees of myopia, following the release of 10-year data indicating good safety and low regression over time.

Jorge Alio MD and colleagues conducted a 10-year retrospective analysis of patients operated for high myopia. The study included a total of 196 eyes of 118 consecutive patients with myopia or myopic astigmatism greater than -100. All underwent LASIK surgery with a V-I-S-X 20/20 excimer laser using the same 302 software.

“The long-term results were much better than we predicted, with 63 per cent of eyes demonstrating an increase in best-corrected visual acuity after 10 years. Nevertheless, we set an upper limit for LASIK today at a spherical equivalent value of -12 D, in cases in which we have adequate pachymetry and no problems with the topography,” said Jorge Alio MD, chairman and director of the VISSUM Ophthalmic Institute in Alicante, Spain.

The average patient age was 33 years. The average spherical equivalent in the study eyes was -13.95 D, ranging from -10.0 to -24.5 D. Dr Alio did not attempt to correct the more extreme cases, like -240, but attempted to at least reduce the amount of anisometropia in anisometric eyes, and therefore included these eyes in the study as well.

The main outcome measures were corneal power measured, uncorrected and corrected visual acuities, and the refractive error. Dr Alio performed follow-up examinations at three months, and one, two, five, and 10 years following surgery. Patients attended every step of the follow-up.

Predictability data at three months showed that 28 per cent of eyes were within 0.5 D of the attempted correction and 46 per cent were within 1.0 D. At 10 years, 30 per cent were within 0.5 D and 42 per cent were within 1.0 D.

Low regression at 10 years
Regression was not as high as expected after 10 years in these patients, suggesting that this is a stable procedure, Dr Alio observed. A majority of patients, 70 per cent, gained lines, ranging from one to seven lines of improvement. Another 20 per cent neither gained nor lost lines, with the remaining patients losing from one to eight lines.

Emanuel Rosen MD of Manchester, England, noted that gaining four to six lines was an interesting outcome for these highly myopic patients.

“It simply has to do with the rate of myopia. Some of the patients who gained four to six lines of BCVA had a preoperative spherical equivalent of -16 D, for instance. LASIK produced a kind of magnification in these eyes coming from the refraction, and this is exactly what we see here,” Dr Alio observed.

The safety rating was 1.21 in the group as a whole, so in spite of the fact that some patients lost lines of visual acuity, safety really was more than acceptable, he noted.

Efficacy after 10 years was 0.77, which was quite acceptable when dealing with myopes with very high spherical equivalents, he said. Uncorrected and best-corrected visual acuities remained stable in this group of patients over time. There was a slight trend toward minimal regression in the uncorrected group, which was not statistically significant.

Corneal stability, as measured by the change in curvature, demonstrated stability in the long term, as well.

Dr Alio noted minimal complications. Ten years after LASIK in this series of eyes, he had only two cases of corneal ectasia, which were stable, he said. One case appeared after one year of surgery and the other after two years from surgery, clearly relating these cases of ectasia to the normal history of keractasia. These eyes were stable using glasses or contact lenses to correct their residual refractive error.

According to the session moderator Patrick Condon MD of Waterford, Ireland, it was conceivable that the cases of ectasia came about as a result of forme fruste keratoconus or even from too thick, deep LASIK flaps, as opposed to being directly related to the high myopia itself.

Dr Alio concurred that the patients were operated on before the implications of modern corneal topography were clear. Both cases were eyes that should not have had LASIK, at the time, he said. They both had asymmetrical astigmatism and would be contraindicated for LASIK today. It was clearly a case of poor patient selection, he explained.

Other complications, such as cataract, myopic maculopathy, retinal detachment and choroidal neovascularisation, occurred as they do in any myopic population.

In spite of the positive results, Dr Rosen wondered whether anyone would want to treat highly myopic eyes with LASIK.

Dr Alio noted that LASIK was originally devoted to the correction of high myopic errors before the recent knowledge on corneal biomechanics was available. He admitted that he no longer treats high myopia, drawing the line at spherical equivalents of -12 D, and only in cases in which he has adequate pachymetry and no problems with the topography.

“Nonetheless, myopic regression positively correlated with the magnitude of the achieved correction, and its rate seems to slow down with time. Treatments for under correction and/or regression seem to be safe and do not increase the rate of regression,” he noted.

Recent advances in corneal profiles and technologies should be taken into account when comparing these results with those of more recent procedures. LASIK, with adequate patient selection, may have a role today in the correction of high myopia, Dr Alio added.


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