ALL-LASER LASIK appears to provide better biomechanical stability and quicker visual recovery for refractive surgery patients than PRK, a new comparison study suggests.

Imola Ratkay-Traub MD, PhD performed PRK or IntraLASIK with the Schwind Keratome 2F broadbeam excimer laser (Schwind-Eye-Tech-Solutions) on a group of 300 eyes. Another group of 150 eyes underwent either PRK or IntraLASIK, using the Mel 70 Excimer flying spot laser (Zeiss-Meditec). Patients were treated for myopia ranging from -1 D to -10 D.

One month postoperatively, 60 per cent of the Schwind IntraLASIK patients had an uncorrected visual acuity of 20/20 or better and 84 per cent were 20/30 or better. By comparison, 29 per cent of eyes in the PRK group achieved UCVA of 20/20 or better; 60 per cent with 20/30 or better; and no patients were worse than 20/40.

In the second group, one month after the procedure, 94 per cent of the Mel 70 IntraLASIK patients had a postoperative UCVA of 20/20, with 95 per cent of patients 20/30 or better. Among PRK eyes, 77 per cent achieved 20/20, with 93 per cent achieving 20/30 or better.

Comparing cumulative UCVA three months after PRK, Dr Ratkay-Traub showed that the Mel 70 produced significantly better visual acuity than the Schwind laser. The difference was less in the IntraLASIK group, but the Mel 70 still performed better than the Schwind in those eyes, she said.

IntraLASIK produced better mean uncorrected acuity at three months compared with PRK. The difference in favour of IntraLASIK was about five per cent in each group, she reported.

Dr Ratkay-Traub said there were no buttonhole flaps or infections, no significant epithelial defects, decentered flaps, or foreign body under the flap associated with IntraLASIK. She noted four cases of diffuse lamellar keratitis and three cases of photophobia. There were no eyes with irregular astigmatism or loss of BCVA and flap thickness was uniform.

PRK was associated with greater pain, and a higher incidence of halos and haze. This was particularly true among patients with more than six dioptres of myopia. The incidence of postoperative dry eye was similar in both groups.

Visual recovery was slower with PRK, requiring one week before patients could drive compared to one day with IntraLASIK.

PRK-treated eyes also required longer steroid use, and experienced problems with intraocular pressure increases, Dr Ratkay-Traub observed.

“Three years ago I performed 50 per cent PRKs and 50 per cent LASIK in my practice. In 2005, I did 90 per cent IntraLASIK and only 10 per cent PRK. IntraLase continues to bring rapid innovation to femtosecond laser technology and focuses on biomechanical stability of the cornea for LASIK as well as therapeutic procedures,” she commented.

She explained that the biomechanical stability between LASIK with IntraLase and LASIK was about the same. The biomechanical effect of LASIK with IntraLase is equivalent to that of surface ablation, she asserted.

Jorge Allo MD was curious as to whether she felt that results allowed her to choose a preferred laser, now that there was a viable alternative. Dr Ratkay-Traub noted in response that the results were about the same in low and moderate myopic eyes.

She said that although only two years of follow up data were available at this point, the higher myopes were likely to do better and achieve higher stability in the long run with IntraLASIK. She cautioned that long-term results are still required.

She noted that when using the 15kHz femtosecond laser, she used higher energy. First-day results were therefore unsatisfactory, and it seemed at first that a traditional laser was better after all. After changing to a lower energy for the next 50 cases and upgrading the laser, Dr Ratkay-Traub affirmed that the results were excellent.

Dr Ratkay-Traub emphasised that the IntraLase femtosecond laser platform has continued to improve. The repetition frequency has increased from 2.5-6 kHz to 15, 30, and finally 60 kHz. The flap cutting time has decreased 240 seconds to 17 seconds. Cutting impulse energy began at 5mJ, and decreased to 3.5, 2.0, and is now lower than 1.0 mJ. Finally, the surface is much smoother with the 30 kHz laser, compared to the standard microkeratome or the 15 kHz laser, she said.

mola.ratkay@donkanyar.net

Stefanie Petrou Binder MD in London

“Reichert’s ORA provides clinically useful measurements of corneal viscoelastic properties which may be helpful in identifying eyes at risk of developing ectasia pre-operatively. A better understanding of ORA measurement signals may yield even more useful information,” Dr Shimmyo added.

Greek study has similar findings

Another study, presented at the Athens meeting by Gerasimos Kopsinis MD, supported Dr Shimmyo’s findings regarding the ability of the Ocular Response Analyzer to detect changes in corneal biomechanics that occur after LASIK.

This prospective study showed that corneal hysteresis as measured with the ORA was significantly reduced following LASIK in 37 eyes of 37 patients, said Dr Kopsinis, Athens Greece.

The patients in the study had a mean pre-operative spherical equivalent of -5.04 D (range: -1.5 to -10.25D). All underwent standard LASIK with the Carriazo pendular microkeratome and Schwind Esiris refractive platform. The mean flap thickness was 115.24 microns and the mean ablation depth was 80.6 microns.

At one month’s follow-up corneal hysteresis was significantly lower in all eyes, with a mean of 8.23 mmHg, compared to a pre-operative mean of 10.59mmHg (p<0.001). The mean corneal resistance factor was also significantly reduced at 7.46 mmHg, compared to pre-operative mean of 10.95 mmHg (p<0.001). This reduction of corneal hysteresis was correlated with the ablation depth.

At three months’ follow-up, the mean hysteresis appeared to recover, rising to 8.52 mmHg, although the corneal resistance factor fell slightly to 7.41 mmHg. Another interesting finding of study was that the ORA’s IOPcc measurement was significantly lower after LASIK (p<0.001).

Pre-operatively the IOPcc was 16.8 mmHg, while at one month’s follow-up it was 15.05 mmHg and at three months it was 13.88 mmHg.

Dr Kopsinis noted that this finding is in contrast with the Reichert’s data, which indicates that IOPcc remains stable or slightly decreased after LASIK. However, his study is in accord with a paper by Jay Pepose MD and associates that was published in the January 2007 issue of the American Journal of Ophthalmology.

“Corneal hysteresis might prove to be a useful tool in evaluating the corneal biomechanical changes induced by refractive surgery and possibly in setting cut-off points for refractive surgery candidates. Eyes with lower than average corneal hysteresis may be at risk of developing corneal disorders in the future,” he added.

mshimmyo@aol.com
gkopsinis@athenovision.gr