Using the latest generation femtosecond laser to create a reverse 140-degree side cut significantly improves flap stability, reduces the incidence of dry eye and corneal irritation and delivers greater visual outcomes in LASIK procedures, according to a study presented here.

“The inverted bevel-in reverse side-cut angle is designed to provide better wound healing for enhanced biomechanical stability of the post-LASIK cornea, as well as increased flap adhesion postoperatively for optimal wound healing,” Allon Barsam MA, FRCOphth told delegates attending the XXIX Congress of the ESCRS.

Dr Barsam’s study evaluated corneal sensation and the signs and symptoms of dry eye in eyes receiving either a 30-degree side cut or a 140-degree reverse side cut in bilateral femtosecond flap formation with LASIK.

Discussing the rationale behind the study, Dr Barsam, a corneal, cataract and refractive surgery fellow at Ophthalmic Consultants of Long Island in Rockville Centre, New York, noted that a basic neurosurgical premise of repairing a severed nerve is to optimise the apposition of the two sides of the severed nerve.

“Corneal sensation is vital for maintaining epithelial integrity. Corneal nerves are cut during LASIK and result in a temporary reduction of corneal sensation,” he said.

By contrast, Dr Barsam said that the 140-degree reverse side cut that is now possible with the fifth-generation Intralase femtosecond laser (AMO) and similar to what might be achieved previously with a microkeratome and postulated that these flaps might not bed down so perfectly and result in an increased distance that the nerve needs to travel in order to eventually regenerate,” he said.

Dr Barsam’s multicentre, randomised, observer-masked study included 49 patients who had a horizontal corneal flap created in both eyes using the Intralase 150 kHz femtosecond laser using a nasal hinge set at an arc length of 30-degrees. All flaps were 8.5mm round and 110 microns in depth and energy levels were standardised for the planar cut and the side cut. One randomly selected eye of each patient received a 30-degree side cut and the other eye received a 140-degree side cut when creating the flap. Each patient applied the same post-LASIK, open-label treatment medications to both eyes.

Six months after surgery, the uncorrected visual acuity (UCVA) was found to be 20/15 or better in 38.9 per cent of eyes with the 140-degree side cut and 25 per cent of eyes with the 30-degree side cut. The figures for those attaining UCVA of 20/20 or better were 91.7 per cent in the 140-degree cut group and 72.2 per cent in the 30-degree cut group. Changes in best-corrected visual acuity (BCVA) showed that 5.6 per cent lost up to one line of vision in the 140-degree group compared to 22.2 per cent in the 30-degree cut group, while 38.9 per cent gained one line in the 140-degree cut group compared to 25 per cent for the 30-degree cut group.

Corneal sensation was also found to be significantly lower in the 30-degree side cut eyes than in the 140-degree cut eyes in three of the five areas tested. Schirmer’s and tear break-up tests were also significantly better for the 140-degree treated eyes compared to the 30-degree cut treated eyes.

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Allon Barsam MA, FRCOphth

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