HIGH MYOPIA
New excimer lasers push the limits for high myopia treatments
by Dermot McGrath in Abu Dhabi

Improved surgical techniques and advances in laser technology mean that high myopia should no longer be considered an automatic contraindication for LASIK procedures, according to Jorge Alio MD, PhD.

“There is no doubt that LASIK in high myopia is a challenge, but perhaps it is time to reconsider the real limits for safe treatments which have traditionally been set at around -8.0 D. The thinking was that the refractive outcomes beyond this limit are neither adequately predictable nor stable and also involved an increased risk of corneal ectasia. However, the reality is that we have no recent publications on this issue, and specifically no evidence that deals with the newest sixth-generation excimer lasers,” Dr Alio, chairman and director of the VissUM Ophthalmic Institute in Alicante, Spain, told delegates attending the World Ophthalmology Congress.

Furthermore, Dr Alio’s own clinical experience, including several studies looking at LASIK outcomes in high myopia, suggest that the safety limit with today’s lasers may be closer to -12.0 D or -13.0 D than the current recommendation of -8.0 D.

“With the latest generation small beam flying spot lasers, LASIK in high myopia seems to be a safe and predictable procedure. It does not induce significant aberrations and provides excellent quality of retinal image. In our practice, we currently prefer LASIK to phakic IOLs in patients up to -13.0 D when the anatomic conditions are adequate,” he said.

While improvements in excimer laser technology have made it possible to consider treating high myopia with LASIK for patients over -10 D, another factor to be borne in mind is the lack of a fail-safe alternative to laser ablation, said Dr Alio.

“We have to remember that refractive intraocular surgery in high myopes is affected by more frequent and more severe complications than LASIK. In refractive lens exchange, for instance, we have intraoperative complications such as vitreous loss in two per cent to four per cent of patients after conventional phacoemulsification, and retinal detachment also remains a known risk. For phakic IOLs, there are still issues with endothelial cell loss for anterior chamber IOLs, and pupillary block may be a problem in about one per cent of our posterior chamber IOL patients. Cataract can also be induced in about one per cent of these cases,” he said.

While LASIK also suffers from intraoperative complications, many of these were associated with earlier generation lasers, said Dr Alio. “Problems such as the risk of ectasia and degraded quality of retinal image compared to phakic or pseudophakic IOLs are much less of an issue today,” he said.

For high myopia treatments, Dr Alio said that he uses the Amaris (Schwind eye-tech-solutions) laser system, which offers a very high ablation speed with advanced eye tracking, rotation balance and cyclotorsion control. He also highlighted the ability of the laser to vary the fluence during the treatment, with higher energy applied in the first 80 per cent of the ablation to produce a faster treatment and lower energy in the last 20 per cent to ensure precise treatment with reduced speed.

“There is a large decrease in the ablation of tissue per dioptre by controlling energy delivery. We have the capability to control the thickness of the cornea intraoperatively via OCT to avoid surprises. We can also measure in real time the thickness of the stroma remaining after making the flap and the thickness of the stroma at the end of the treatment. Another advantage for high myopia treatments is the possibility to centre the treatment on the corneal vertex, which is a stable point in the optics of the eye, as well as the possibility to use large optical and transition zones,” he said.

Looking at the published data for LASIK in high myopia, Dr Alio cited his own recent retrospective study of 51 eyes of 32 patients with high levels of myopia or myopic astigmatism treated using the Schwind Amaris and a femtosecond laser for flap creation.

That study showed high predictability, with 84 per cent of eyes within ±0.50 D of emmetropia and 90 per cent of eyes within 1.0 D. Efficacy was also impressive, said Dr Alio, with an average improvement of 15 LogMAR lines in uncomplicated distance visual acuity three months after surgery. Best corrected distance visual acuity remained unchanged or improved in 98 per cent of eyes at three months postoperatively, with only one eye losing one logMAR line of corrected distance visual acuity.

Dr Alio noted that while the treatment did result in a limited but statistically significant induction of primary spherical aberration and coma, he said that the increase was still within acceptable limits and did not seem to impact on the patients’ quality of vision. He added that LASIK enhancement was required during the follow-up period in only four eyes (7.8 per cent).

Summing up, Dr Alio said that the new excimer lasers used in combination with the femtosecond laser for flap creation are pushing the limits of both myopic and hyperopic LASIK without compromising safety.