The use of improved aspheric ablation profiles and larger optical zones means that LASIK can now be proposed as a safe and predictable method to correct hyperopia in patients with or without astigmatism up to 6.0 D, reports Diego de Ortueta MD, FEBO.

“Up to around 2004 the recommendation was that patients with greater than 4.0 D of hyperopia should not be treated with LASIK due to problems of regression and induced aberrations. Since then the situation has evolved considerably thanks to the latest aspheric ablation profiles and optical zones in the range of 6.5mm which take the preoperative K reading into account. Better centration techniques using iris recognition and pupil centroid shift compensation have played a part in improving outcomes,” he said.

Dr de Ortueta, in private practice at the Aurelios Augenzentrum, Recklinghausen, Germany, told delegates attending the World Ophthalmology Congress that the broad goal of hyperopic LASIK is to increase the curvature of the cornea without inducing aberrations and ensuring that the change remains stable over time.

He noted that regression was one of the main problems associated with first-generation hyperopic LASIK treatments, but is far less of an issue today.

“This was often due to paracentral epithelial hyperplasia during wound healing or fibrosis and was associated with the use of small optical zones. The recommendation now is to use an optical zone of 6.5mm in order to cover the mesopic pupil, and with smoother transition zones, as an abrupt step may cause compensatory healing responses after surgery and lead to regression,” he said.

The improved stability of hyperopic LASIK treatments using larger optical zones and improved ablation profiles is reflected in the scientific literature, said Dr de Ortueta. He cited a study by Kezirian et al in 2008 that looked at the long-term outcomes of 127 patients treated for up to 6.0 D of hyperopia with the Allegretto Wave (Alcon).

“The four-year results with the Allegretto Wave for hyperopia showed stability of the manifest refraction spherical equivalent within 1.00 D in 94 per cent of eyes. Regression of effect of more than 1.0 D was seen in just six out of 127 eyes or 4.7 per cent and progression of effect was seen in two out of 127 or 1.6 per cent,” he said.

Another study by Waring et al. in 2008 looking at hyperopic LASIK with the NIDEK EC-5000 excimer laser also showed impressive stability in 293 eyes up to six months postoperatively, said Dr de Ortueta.

Furthermore, Dr de Ortueta’s own results in 2010 of 66 consecutive eyes of 37 patients treated for hyperopic astigmatism with the Schwind Esiris excimer laser showed that postoperatively 92 per cent of eyes were within 0.50 D after three months, 83 per cent after 12 months, and 72 per cent after 36 months.

In order to reduce induced aberrations associated with hyperopic LASIK, Dr de Ortueta said it was important to ensure that the ablation centre is shifted to the cornea vertex normal rather than the traditional pupil centre.

Summing up, Dr de Ortueta said that the latest aspheric ablation profiles generated by optimised algorithms, allied to better registration and centration techniques, are all helping to deliver more precise and effective results.