Corneal wavefront-guided LASIK very effective in eyes with highly irregular corneas

Dr Mehta noted that one group of patients heretofore neglected in the field of refractive surgery are those with a high degree of unilateral higher order aberrations, a condition he calls “corblyopia”.

“The term ‘corblyopia’ refers to corneal amblyopia, where the eye seems normal and has normal corneal topography but is significantly aberrated on corneal wavefront analysis. In such cases BCVA is typically between 6/12 and 6/36 and cylinder is 2.5 D or more.”

Dr Mehta noted that his findings raise the question of whether all anisometropic amblyopes should undergo corneal wavefront analysis to see if they might benefit from laser correction of their higher order aberrations. Also unanswered is the question of what the youngest age should be for patients undergoing such procedures.

“The concept of optical path difference is the keystone of this whole exercise. It is the ‘rule of 3′. For every three microns of distortion on the corneal surface there is one micron of corneal wavefront error.”

**Good results in Post-PK and post-RK eyes**

Dr Mehta has also conducted a trial using corneal wavefront-guided treatment of 60 eyes with high amounts of aberrations following penetrating keratoplasty and radial keratotomy. The study showed that after one month’s follow-ups 15 eyes (25 per cent) gained three lines of BCVA, while 42 eyes (70 per cent) gained two lines and three patients gained four lines. In addition, the patients’ corneal aberration RMS decreased by 41 per cent to 56 per cent. Furthermore, 40 per cent had a postoperative cylinder less than 1.0 D.

As an example of the kind of results that can be achieved with corneal wavefront-guided LASIK in eyes that have undergone penetrating keratoplasty, Dr Mehta described the case of a patient who underwent the procedure five years after receiving a corneal graft.

The patient had a pre-operative sphere of -4.0 D and a cylinder of -5.0 D and a BCVA of 6/12. At one month’s follow-up the treated eye had a plano sphere, only half a dioptre of astigmatism and a UCVA of 6/6.

Dr Mehta noted that the rationale behind using corneal wavefront-guided LASIK in eyes that have undergone penetrating keratoplasty is that approximately eight per cent to 20 per cent of eyes have significant irregular astigmatism that cannot be satisfactorily managed with glasses or contact lenses.