Commentary: Ectasia after keratorefractive surgery: An ounce of prevention is worth a pound of cure

Ectasia after LASER vision correction (LVC) procedure is a rare complication leading to loss of best-corrected visual acuity (BCVA) due to progressive thinning and steepening of the cornea. This can be a nightmare for both the patient as well as the surgeon.

The various risk factors that have been studied are: younger age, high manifest refraction spherical equivalent (more ablation depth), a thin cornea (lesser than 500 µm), anterior topographic irregularities, high posterior elevation float (>15 µm at the thinnest point), an Ectasia Risk Score higher than 3, low residual stromal bed thickness (RSB), high percent tissue thickness alteration (PTA), etc.[1-3]

As the burden of disease is more in young adults, every effort should be made to prevent the occurrence of ectasia by conscientiously looking at the risk factors in each eye prior to performing keratorefractive surgery. With the evolution of our understanding of the disease over the years, major attempts have been made to develop advanced screening strategies. As a result, the actual incidence of ectasia has decreased from the relatively high level of 0.66% reported by Pallikaris in 2001,[4] down to 0.033% in 2018.[5]

An "ideal" prevention strategy would be an individualized enhanced ectasia screening model integrating objective data that assesses corneal structure and biomechanical impact from the procedure as well as the long-term stresses on the cornea due to eye rubbing, intraocular pressure (IOP), extraocular muscles actions, eyelid blinking,[6] and possibly hormonal influences.

Artificial intelligence (AI) and pattern recognition algorithms have been developed[7] to have a significant role in screening ectasia, e.g., Tomographic and Biomechanical Index (TBI),[8] the Pentacam Random Forest Index (PRFI),[9] and the recent Ectasia Susceptibility Score (ESS).[10] For developing such algorithms, it is necessary to have clinical data to train and validate the AI models in different populations.

In the current study,[11] ectasia was found to occur in 40 eyes after performing LASIK (Microkeratome and Femto-second), PRK, and SMILE. It was bilateral in more than 53% cases. The 8 eyes with no identifiable risk factors may be re-evaluated and pertinent clinical history of eye rubbing or allergy or hormonal imbalance may be included to make the study more useful, as these factors are now being considered as possible risks. Inclusion of such parameters might help in creating a more supportive database in Indian eyes for the development of more accurate Ectasia prediction tools and, hence, avoidance of LVC in susceptible eyes.

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