Brief Reports

Transitory Haze in Surface Ablation and Epithelial Flap Retention

Determinants of early onset haze were retrospectively explored in patients who had been undergone laser-assisted sub-epithelial keratectomy (LASEK) in a private eye clinic. The technique included creating an epithelial flap following 20 seconds exposure to 20% alcohol. 'Optimized' ablation profile was used by Allegretto laser (Wavelight Technologie). Following repositioning of the flap, a single-brand bandage contact lens was used. For eyes with a spherical equivalent of more than 3 diopters, intraoperative mitomycin C (MMC) was used for 20-30 seconds. Patients were visited at day 1, day 4, week 3, month 3, month 6, and year 1 postoperatively.

Candidates included 130 patients (260 eyes), of whom 62% were female. Mean age was 29.0±10 years and baseline range of spherical equivalent was -11.50 to +5.75 (absolute mean 3.50) diopters. The epithelial flap was lost in 36 eyes (28%). Transitory haze was observed in 29 cases (21.5%), all of which had retained their epithelial flap; none of the epithelial flap lost eyes showed haze (P<0.004). Gender, age, MMC usage, and pre-existing astigmatism were not associated with transitory haze (P-values: 0.652, 0.575, 0.815, and 0.248 respectively). Haze was resolved in all of the eyes. No case of classic haze was noted.

Contrary to the current concept that the epithelial flap acts as a biologic contact lens and controls wound healing in surface ablation,[1,2] in the current series, loss of epithelial flap seems to have had a protective effect in (transitory) haze formation.[3,4]

Wound healing in surface ablation involves epithelial regeneration,[5] anterior stromal response to excimer laser,[6] and its exposure to tear and open sky. This is being modified by topical agents (alcohol for epithelial dehiscence,[7] intraoperative MMC[8] and postoperative steroids, nonsteroidal anti-inflammatory drugs (NSAIDs), and antibiotics,[8,9] bandage contact lens, ambient ultraviolet radiation,[10] diet,[11] and a retained epithelial flap. Haze is a result of extra activity of keratocytes, abnormal glycosaminoglycans deposition, and collagen disarray.[12] A metaplasia to myofibroblast is also described.[5] This opacity normally resolves with remodeling in the anterior stroma. It is suggested that preservation of an epithelial flap creates a biologic dressing for the wound and controls stromal response through a barrier function avoiding WBCs and their cytokines to interact with keratocytes.[13]

'Haze' is now considered a heterogeneous entity covering first-days postoperation subepithelial granular appearance of anterior stroma and epithelial plaques (specially when topical NSAIDs are applied); early onset/transitory haze within early postoperative weeks; and late onset (classic) haze 3-6 months following the surgery. These involve different pathobiologic processes.

In conclusion, the conventional concept of protective effect by the epithelial flap may not be always applicable; it might be hypothesized that dead epithelial cells induce higher inflammatory response. Alcohol exposure time determines the viability ratio in the epithelial flap[14] so higher alcohol exposure time may paradoxically result in higher haze formation[7] in which case, losing the epithelial flap may be more desirable.

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