Evaluation of Haze Formation After Thin-flap Microkeratome LASIK for Myopia

Thin-flap LASIK offers the reduced risk of ectasia by leaving sufficient stromal tissue, allowing safer laser ablation and possibly providing the biomechanical stability of surface ablation techniques.

However, laser ablation closer to the Bowman layer may increase the risk of haze formation similar to that created with photorefractive keratectomy. Previous studies reported interface haze formation with thin-flap LASIK. The risk factors for haze formation after thin-flap femtosecond laser–assisted LASIK have been described to have a strong association with ultra thin flap and younger age. Pathogenesis of haze is not clear. It could be related to basement membrane injuries by femtosecond laser–induced photodisruption. The incidence of haze formation after mechanical microkeratome procedures has been demonstrated to be low.

We aimed to evaluate haze formation among corneas of 419 eyes (264 patients) treated by thin-flap microkeratome LASIK for myopia.

All eyes were treated with the Allegretto Wave Eye-Q 400-Hz excimer laser system (WaveLight AG, Erlangen, Germany) and were divided into two groups according to the actual intraoperatively measured flap thickness: 90- to 110-μm group (178 eyes) and <90-μm group (241 eyes). Mean actual flap thickness was 98.70±6.24 μm in the 90- to 110-μm group and 75.43±10.76 μm in the <90-μm group. All flaps were created with the Moria M2 microkeratome (Moria, Antony, France). Intraoperative corneal flap thickness was measured by subtracting the residual stromal bed from the preoperative corneal thickness (subtraction pachymetry).

Before LASIK, all eyes were thoroughly examined including manifest refraction, corrected distance visual acuity (CDVA), slit-lamp microscopy, cycloplegic refraction, corneal topography, and ultrasonic pachymetry. Mean patient age was 27.28±7.44 years. Preoperative spherical equivalent refraction ranged from 0.38 to 12.13 diopters (D). Ablation depth ranged from 11.68 to 148.75 μm. Postoperative assessment included slit-lamp microscopy, uncorrected distance visual acuity (UDVA), and spherical equivalent refraction at 1 week and 1, 3, and 6 months.

No clinically significant interface haze was detected in either study group, which was consistent with the outcome measures regarding efficacy and predictability. Three months postoperatively, UDVA was 20/20 or better in 99.44% of eyes (177/178) in the 90- to 110-μm group and 98.76% of eyes (238/241) in the <90-μm group. Uncorrected distance visual acuity remained nearly the same at 6-month follow-up as did mean spherical equivalent refraction, which was −0.07±0.25 D in the 90- to 110-μm group and 0.01±0.30 D in the <90-μm group (Fig). No flap-related complications were detected in any eyes.

This study reports the absence of haze formation after thin-flap mechanical microkeratome LASIK for myopic correction regardless of the different degrees of treated myopia. This is in agreement with the stable postoperative UDVA and predictable stable refractive outcome.

Mechanical microkeratomes can create thin flaps with excellent visual outcomes and no clinically significant haze.

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REFERENCES
Letters to the Editor

