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RESPONSE TO LETTER

Femtosecond-Assisted Laser in situ Keratomileusis with de novo Flap Creation Following Previous Microkeratome Laser in situ Keratomileusis [Response to Letter]

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Dear editor

The authors would like to thank the editor for sharing the perspective and thoughtful insight from the readership.

The femtosecond laser settings used in this study were derived from previous studies in which the energy and spot separation parameters were configured to produce a flap which separates and lifts similar to a microkeratome flap. These designated settings have already been shown to be safe and effective for flap creation in more tenuous scenarios as in the setting of previous radial keratotomy[1,2] and in the presence of corneal scarring.[3] Under these femtosecond laser settings, the surgeon is able to visibly see the separation of the stromal tissue during the creation of the flap which opens up a large potential space. This newly created intrastromal space is the path of least resistance for gas bubbles to collect rather through radial keratotomy incisions or old LASIK flaps, thereby minimizing the risk for vertical gas breakthrough. Creating a flap anterior to an existing flap still runs the risk of leaving a rim of tissue in the periphery similar to the way creating a flap on an eye with existing radial keratotomy has potential to "pizza pie" old incisions open during the flap retraction. But using flap settings that lift with minimal manipulation mitigates this risk.

Our excimer laser platform using the Alcon EX500 has a maximum optic zone of 6.5 mm for hyperopic ablations which fits comfortably within the 9.0 mm flap diameter. The blend zone does not photoablate beyond 9.0 mm in a clinically meaningful way. In addition, the theoretical concern that Davis et al[4] reported in 2002 regarding photoablating in planes different from the original has not been substantiated over the last 20 years. Modern excimer laser techniques using topography-guided ablations as done in many of the patients in our study can improve visual outcomes beyond techniques from times past. Reporting higher order aberration outcomes would have strengthened the quality of our study.

Our surgeon preference during this procedure is a 30-degree side cut because it allows for a more horizontal motion with the instrumentation used to retract the flap. A 90-degree side cut requires a more vertical motion with the femtosecond flap retractor in order to lift the flap which is more traumatic in our hands and is not

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necessary with a femtosecond flap that is created to lift more like a microkeratome flap. We suspect that the risk of epithelial ingrowth increases when the surgeon must puncture through the epithelium and perform a more vigorous dissection through the stroma in order to lift the flap, as is the case with conventional femtosecond laser settings. In this instance, the 90-degree cut may provide an improved wound closure compared to a 30-degree angle. However, we have demonstrated that the femtosecond laser settings reported in our study allow for creation of a flap that retracts with almost no manipulation or displacement of epithelium as typically required to lift a femtosecond flap with standard settings. Epithelial ingrowth remains an important complication that surgeons must always consider on all eyes with a previous flap, regardless of which refractive procedure or technique is employed for retreatment.

Disclosure

This study was presented at the 2017 ASCRS meeting during a paper session. The authors report no conflicts of interest in this communication.

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