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Case report

Two cases of epithelial ingrowth after small incision lenticule extraction

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A B S T R A C T

Purpose: To report two cases of epithelial ingrowth after small incision lenticule extraction (SMILE) successfully treated without lifting the corneal cap.
Observations: A 34-year-old woman and a 37-year-old man who both had undergone bilateral SMILE procedures earlier at another institution, developed visually significant epithelial ingrowth into the interface pocket with an incisional tear. In both patients, the interface pocket was meticulously irrigated with a balanced salt solution to facilitate separation of the epithelial ingrowth from the interface. After that, the epithelial ingrowth was manually scraped using a blunt spatula, and removed from the pocket using 27-gauge vitreous forceps. 10–0 nylon sutures and soft bandage contact lenses were placed for 1 week. The best spectacle-corrected visual acuity improved to 20/16 or more 1-month postoperatively. No significant complications occurred.
Conclusions and importance: SMILE with incisional tear may cause epithelial ingrowth, resulting in significant visual disturbance. This can be successfully treated with meticulous surgical debridement of the corneal epithelium, even without lifting the corneal cap.

1. Introduction

Small incision lenticule extraction (SMILE) has gained popularity as an effective means of correcting myopia and myopic astigmatism. Epithelial ingrowth is a rare postoperative complication after SMILE, possibly caused by the 2- to 3-mm corneal incision made for the removal of the refractive lenticule. We present herein two cases in which severe epithelial ingrowth, necessitating surgical debridement without lifting the cap, occurred after SMILE, resulting in significant visual disturbance.

2. Case report

2.1. Case 1

A 34-year-old woman who had undergone bilateral SMILE 2 months earlier at another eye clinic was referred to our hospital complaining of blurred vision in the left eye. The manifest refraction was 0.5, −3.0 × 175, with an uncorrected visual acuity (UCVA) of 0.2 and a best spectacle-corrected visual acuity (BSCVA) of 0.4 on the initial visit. The slit-lamp examination showed a marked presence of visually significant epithelial ingrowth into the interface pocket and a trace of a cap incision at 12 to 2 o'clock with an incisional tear at 10 to 12 o'clock in that eye (Fig. 1A). Anterior segment optical coherence tomography revealed epithelial nests within the anterior stroma (Fig. 1B). Corneal topography demonstrated resultant irregular astigmatism and focal steepening over the area of epithelial ingrowth. Other ophthalmic examinations gave unremarkable results. After obtaining informed consent, we performed epithelial removal without lifting the cap. The interface pocket was meticulously irrigated with a balanced salt solution to facilitate separation of the epithelial ingrowth from the interface. After that, the epithelial ingrowth was manually scraped using a blunt spatula, and removed from the pocket using 27-gauge vitreous forceps. Two 10–0 nylon sutures were placed, and a soft bandage contact lens was worn for 1 week. The patient was treated topically with steroidal and antibiotic medications for 2 weeks. At 1 month after epithelial removal, the manifest refraction improved to 0.5, −1.0 × 180, with an UCVA of 1.2 and a BSCVA of 1.5, postoperatively. No recurrent epithelial ingrowth occurred during the 6-month observation period.

2.2. Case 2

A 37-year-old man who had undergone bilateral SMILE 2 weeks earlier at another eye clinic was referred to our hospital complaining of blurred vision in the right eye. The manifest refraction was −1.5, with an UCVA of 0.3 and a BSCVA of 0.6. The slit-lamp examination showed a presence of visually significant epithelial ingrowth into the interface pocket and a trace of a cap incision at 10 to 12 o'clock with an incisional tear at 12 to 2 o'clock in that eye (Fig. 1C and D). Similar to the first case, we performed epithelial removal and postoperative treatment. At 1-month postoperatively, the manifest refraction was −1.75, with an

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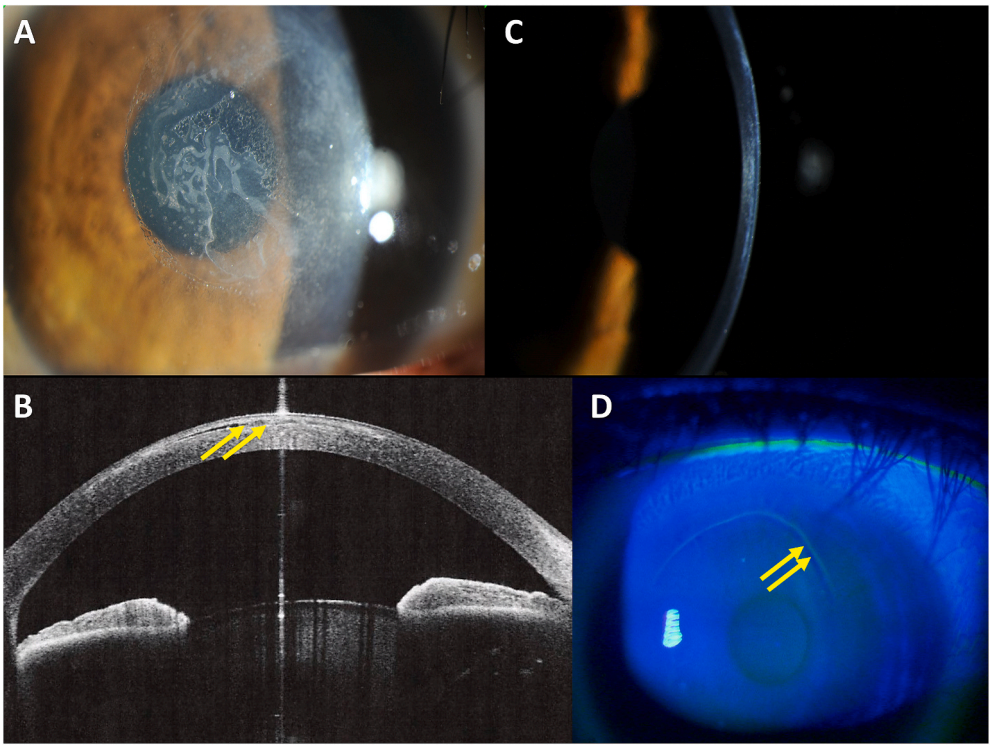

Fig. 1. A) Visually significant epithelial ingrowth into the interface pocket in Case 1. B) Corneal epithelial nests within the anterior stroma in Case 1. C) Corneal epithelial nests within the anterior stroma in Case 2. D) Corneal fluorescein staining showing an incisional tear at 12 to 2 o'clock in Case 2.

UCVA of 0.3 and a BSCVA of 1.2. Although a mild myopia of −1.75 D remained, the patient did not wish to receive any additional surgery. No epithelial ingrowth was seen at the 3-month postoperative visit.

3. Discussion

Since SMILE does not require the creation of a corneal flap, unlike laser in situ keratomileusis, epithelial ingrowth is recognized as a rare postoperative complication. Thulasi et al.[1] presented a first case of epithelial ingrowth after SMILE, who was recalcitrant to other measures, and successfully treated with a hydrogel ocular sealant. We should be aware that interface epithelial ingrowth is a potential complication after SMILE, even without the creation of a corneal flap. Considering the fact that a trace of an incisional tear was found in both cases, an incisional tear may be one of the possible risk factors of this corneal disorder after SMILE. Ramirez-Miranda et al.[2] demonstrated that cap rupture was found in 7/160 (4.4%) eyes undergoing SMILE. Wang et al.[3] stated that abrasion at the incision was found in 5/3004 (0.17%) eyes after SMILE, and that the possible risk for tearing the corneal cap at the edge of incision is increased when the incision is smaller than 2.0 mm. Titiyal et al.[4] described that side-cut tears occurred in 4/100 eyes (4%) during the initial learning curve of SMILE. It is recommended that the spatula should be used in a gentle manner, and that a bandage soft contact lens should be worn to avoid the occurrence of epithelial ingrowth, when a large abrasion at the incision occurred intraoperatively.

In this series, we successfully performed epithelial removal by using a blunt spatula and 27-gauge vitreous forceps, without lifting of the cap. Our case reports also emphasize the importance of the management of epithelial ingrowth after SMILE. We did not enlarge the incision, nor did we lift the corneal cap in these cases. We also placed sutures with a soft bandage contact lens for one week, in order to prevent corneal epithelium from reinvasion into the stromal pocket.

4. Conclusions

In summary, our case series showed that even SMILE, which does not require the creation of a corneal flap, can cause epithelial ingrowth, resulting in significant visual disturbance, and that this corneal disorder can be treated by meticulous surgical debridement of corneal epithelium, even without lifting the corneal cap.

Patient consent

We received informed consent from the patients for the publication of these case reports and any accompanying images.

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Declaration of competing interest

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ajoc.2020.100819.

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