



Case report

Management of incision failure during small incision lenticule extraction because of conjunctivochalasis



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ABSTRACT

Purpose: We report a case of incision failure during small incision lenticule extraction (SMILE) and its management.**Observations:** The incision could not be made using the femtosecond laser because of a redundant conjunctiva, so it was instead done manually using a diamond knife. The lenticule was successfully separated and extracted. Three months after the procedure, the uncorrected distance visual acuity was 20/20 and no complication was observed.**Conclusions and importance:** This case demonstrates that the conjunctiva should be carefully examined before SMILE. If a complication occurs because of conjunctivochalasis, it can be resolved with proper management without compromising the patient's visual acuity.© 2017 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Small incision lenticule extraction (SMILE) is a new, flapless, minimally invasive procedure that can correct myopia and myopic astigmatism using a VisuMax® (Carl Zeiss Meditec, Jena, Germany) femtosecond laser.¹ Numerous studies have reported that SMILE is effective, safe, and yields predictable results, so this procedure has gained wide acceptance.^{1–3} However, there are several possible complications specific to the femtosecond laser including suction loss, interface haze, anterior chamber bubbles, black spots during the creation of the lenticule, and blockage of the laser by an opaque bubble layer.^{4–6} Although these potential complications occur infrequently, they present a challenge to the surgeon.

Conjunctivochalasis is characterized by the existence of excess fold of conjunctiva located between the globe and the lid margin.⁷ It usually does not affect corneal refractive procedures because they only involve the cornea. However, the peripheral cornea is sometimes covered by redundant conjunctiva that affects SMILE because it relies on a suction system. We report a case involving blockage of SMILE by redundant conjunctiva that required manual incision.

2. Case report

A 37-year-old female visited our clinic for treatment of visual problems. She had a history of dry eye and had used soft contact lenses for 10 years. Her preoperative manifest refractions were sphere, −2.25; cylinder, −0.75; and axis, 80° in the right eye, and sphere, −2.5; cylinder, −0.5; and axis, 90° in the left eye. The automated keratometry readings were 44.25 diopters (D) at 155° and 44.75 D at 65° in the right eye, and 44.5 D at 5° and 44.75 D at 95° in the left eye. The preoperative uncorrected distance visual acuity (UDVA) was 20/200 and the corrected distance visual acuity (CDVA) was 20/20 in both eyes. The patient underwent a preoperative examination including specular microscopy (NONCOM ROBO-CA; Konan Medical, Tokyo, Japan), anterior segment optical coherence tomography (OCT) (Visante OCT®; Carl Zeiss Meditec, Dublin, CA, USA), posterior segment OCT (Cirrus™ OCT; Carl Zeiss Meditec), and dual Scheimpflug analysis (GALILEI; Ziemer Ophthalmic Systems, Port, Switzerland). Ultrasound pachymetry showed a central corneal thickness of 564 μm in the right eye and 566 μm in the left eye. No corneal abnormalities were detected during the preoperative evaluation, and the patient had no history of ocular injury.

Both eyes were treated on the same day by the same surgeon (CYT) using a VisuMax® 500 kHz femtosecond laser (Carl Zeiss Meditec). The laser settings included a cut energy of 180 nJ and a

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spacing of 4.5 μm . The lenticule diameter was 6.6 mm, the cap diameter was 7.5 mm, and the intended cap thickness was 110 μm in both eyes. The intended lenticule thicknesses were 66 μm and 67 μm , and the expected residual corneal beds were 388 μm and 389 μm in the right and left eyes, respectively. The incision was 2.0 mm long in both eyes. The target refractive corrections were $-2.25-0.75 \times 80^\circ$ and $-2.5-0.5 \times 90^\circ$ for the right and left eyes, respectively. SMILE was performed as previously described.¹ Although the SMILE procedure in the left eye was performed without any difficulty, the conjunctiva blocked the laser in the right eye. After confirming that the laser failed to cut the cornea, the incision was performed manually using a diamond knife. The surgeon created an incision to 1/4 the depth of the cornea. The lenticule was separated and successfully extracted through the incision (Fig. 1). After the procedure, the patient was treated with 0.5% moxifloxacin (Vigamox; Alcon, Hünenberg, Switzerland) for 7 days, and 0.1% fluorometholone (Oculmetholone; Samil Pharmaceutical Co., Ltd., Seoul, Republic of Korea) and preservative-free hyaluronic acid lubricating drops (0.1% Hyalein Mini; Santen Pharmaceutical Co., Ltd., Osaka, Japan) for four weeks.

One week after the procedure, the UDVA was 20/25 and 20/20 in the right and left eyes, respectively. After three months, the UDVA and CDVA were 20/20 and 20/18, with $0-0.25 \times 90^\circ$ in the right eye, and 20/18, 20/18, with $+0.25-0.25 \times 90^\circ$ in the left eye, respectively. The patient complained of eye pain after injection of the right eye on the first day after the procedure, but there were no complaints after several days. Fig. 2 shows dual Scheimpflug images of the right eye taken preoperatively and three months after

surgery. No complications such as keratitis, ectasia, or opacification were observed during the follow-up period. The patient was satisfied with her uncorrected vision, and did not complain of dryness or pain.

3. Discussion

Conjunctivochalasis is a condition of ocular which involves a loose conjunctiva increases while downgaze.⁷ Reported causing factors are as follows: aging, ocular movement, ocular surface inflammation, and delayed tear clearance.⁷⁻¹⁰ Suspected causing factors are mechanical and inflammatory factors, however it is not clear that what causes conjunctivochalasis.^{7,9} Most patients with conjunctivochalasis are asymptomatic, especially if the condition is mild. In symptomatic patients, the symptoms include dryness, a foreign body sensation, injection, and eye pain.⁷⁻¹⁰ Conjunctivochalasis status is not important when examining patients who require refractive correction because almost all patients who undergo refractive procedures are young, and the procedures are performed on the cornea. However, there are some patients with conjunctivochalasis who want refractive correction. Wearing contact lenses is an important risk factor for conjunctivochalasis, and conjunctivochalasis-induced dry eye or foreign body sensations can be a cause of contact lens intolerance, which is a possible reason for patients to request refractive correction.¹¹ In our case, the patient's mild conjunctivochalasis was not detected preoperatively. It was noticed on slit-lamp examination during the follow-up, and the surgeon did not pay close attention to the conjunctiva covering the

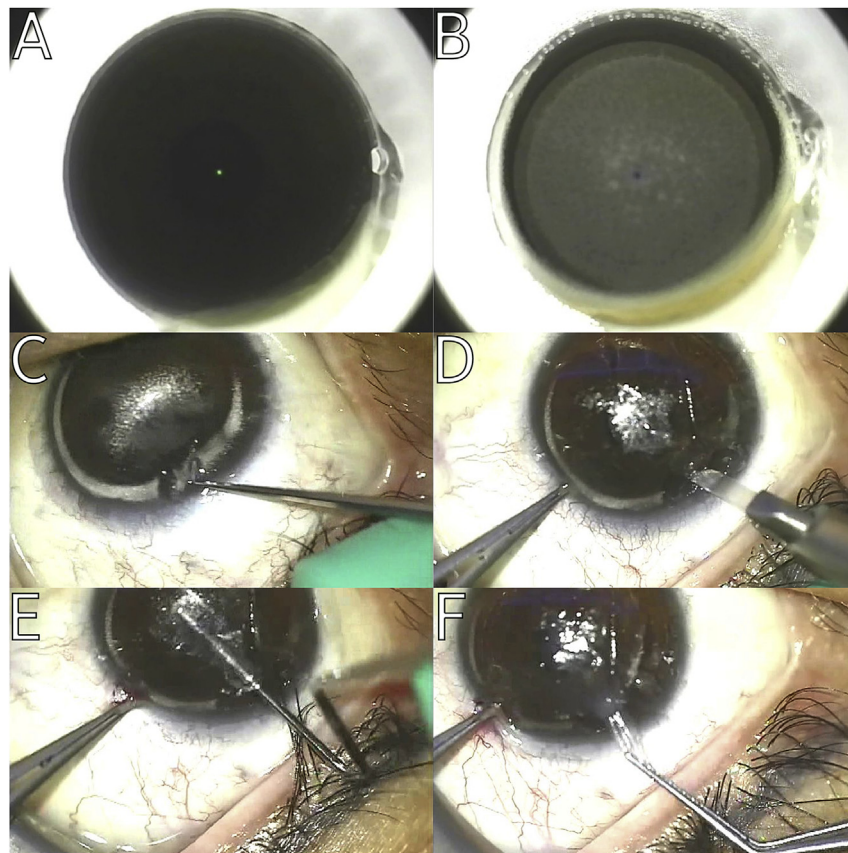


Fig. 1. (A) Redundant conjunctiva covered the peripheral cornea from 4 o'clock to 7 o'clock when suction was used. (B) The conjunctiva prevented laser treatment, and no incision was made. (C) The surgeon tried to find the incision, then confirmed its absence. (D) The incision was made manually using a diamond knife. (E, F) The lenticule was separated and successfully extracted.

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