SELÇUK TIP DERGİSİ
SELCUK MEDICAL JOURNAL
DOI:http:/dx.doi.org/10.30733/std.2025.01803
Selcuk Med J 2025;41(1): 49-51

OPEN

OLGU SUNUMU / CASE REPORT

Infectious Keratitis After Small-Incision Lenticule Extraction: First Reported Case From Türkiye

KKLE Sonrası Enfeksiyöz Keratit: Türkiye'den Bildirilen İlk Olgu

Serhat Ayla[1], Necip Kara[2]

[1]Şırnak State Hospital, Department of Ophthalmology, Şırnak, Türkiye
[2]Ulucanlar Eye Education and Research Hospital, Department of Ophthalmology, Ankara, Türkiye

ÖZET

Amaç: Türkiye'de küçük kesiden lentikül ekstraksiyonu (KKLE) sonrası gelişen ilk enfeksiyöz keratit olgusunu bildirmektir. KKLE, femtosaniye lazer ile korneada stromal bir lentikül oluşturularak ve bu lentikülün küçük bir kesiden çıkarılmasıyla yapılan bir lazer refraktif prosedürdür.

Olgu: 22 yaşında erkek bir hasta, KKLE'den 15 gün sonra sağ gözünde keratit gelişmesi nedeniyle kliniğimize yönlendirilmiştir. Hasta, sağ gözünde şiddetli ağrı, görme kaybı ve ışığa hassasiyet (fotofobi) şikayetleri ile başvurmuştur. Muayenesinde konjonktival enjeksiyon, yaygın korneal ödem ve santral ile parasantral bölgede yoğun infiltratif lezyonlar saptanmıştır. Güçlendirilmiş antibiyotiklerle ampirik tedaviye rağmen durumun ilerlemesi üzerine tedaviye antifungal ajanlar eklenmiştir. Revize edilen tedavi sonrasında hastanın semptomlarında belirgin bir iyileşme görülmüş ve bir aylık takip sürecinde korneal ödem ile epitel defektleri tamamen düzelmiştir. Alınan kültür örneklerinin sonuçları negatif olmasına rağmen, antifungal tedaviye yanıt verilmesi fungal bir etiyoloji olasılığını düşündürmüştür.

Sonuç: Bu olgu, KKLE sonrası kültür negatif enfeksiyöz keratit vakalarında fungal patojenlerin göz önünde bulundurulması gerektiğini vurgulamaktadır. Benzer vakalarda hızlı müdahale ve tedavinin revizyonu önemli bir rol oynamaktadır.

Anahtar Kelimeler: Refraktif cerrahi, küçük kesiden lentikül ekstraksiyonu, enfeksiyöz keratit

ABSTRACT

Objective: To report the first documented case of infectious keratitis following small-incision lenticule extraction (SMILE) surgery in Türkiye. SMILE is a laser refractive procedure designed to correct refractive errors by creating a stromal lenticule with a femtosecond laser, which is then removed through a small incision.

Case: A 22-year-old male patient presented to our clinic with keratitis in the right eye, which developed 15 days after undergoing SMILE surgery. The patient reported severe pain, decreased vision, and sensitivity to light (photophobia) in the affected eye. Examination findings included conjunctival injection, diffuse corneal edema, and dense infiltrative lesions in both the central and paracentral cornea. Initial empirical therapy with fortified antibiotics was ineffective as the condition progressed, leading us to add antifungal agents to the treatment regimen.: Following the revised treatment approach, the patient experienced significant relief from symptoms, with a marked resolution of corneal edema and epithelial defects within one month. Although culture results from corneal scrapings were negative, the patient's favorable response to antifungal treatment suggested a possible fungal etiology.

Conclusion: This case highlights the importance of considering fungal pathogens as potential culprits in culture-negative infectious keratitis following SMILE surgery. Prompt intervention and careful adjustment of empirical therapy play a critical role in managing similar cases effectively.

Keywords: Refractive surgery, small incision lenticule extraction, infectious keratitis

Geliş Tarihi/Received: 30 November/Kasım 2024 **Kabul Tarihi/Accepted:** 21 February/Şubat 2025 **Yayın Tarihi/Published Online:** 22 March/Mart 2025

INTRODUCTION

Small-incision lenticule extraction (SMILE) is a laser refractive procedure designed to correct refractive errors by creating a stromal lenticule with a femtosecond laser, which is then removed through a small incision. SMILE is increasingly recognized worldwide as a safe alternative to existing corneal refractive surgery techniques. Infectious keratitis is a rare complication of the SMILE procedure, with an incidence rate of 0.3% reported in the literatüre (1). Only five cases with microbiological evidence have been documented (2-6). This report presents a case of culture-negative infectious keratitis following SMILE.

CASE

A 22-year-old male patient was referred to our clinic with keratitis in the right eye, which developed 15 days after undergoing SMILE. The patient reported severe pain, decreased vision, and photophobia in the affected eye. He had no history of systemic illness or contact lens use but resided in a rural area, which could

Sorumlu Yazar/Corresponding Author: Serhat Ayla, Şırnak State Hospital, Department of Ophthalmology, Şırnak, Türkiye
e-mail: serhataylaa@gmail.com

Atıf yapmak için/ Cite this article as: Ayla S, Kara N. Infectious Keratitis After Small-Incision Lenticule Extraction: First Reported Case From Türkiye. Selcuk Med J 2025;41(1): 49-51

Disclosure: *Author has not a financial interest in any of the products, devices, or drugs mentioned in this article. The research was not sponsored by an outside organization. Author has agreed to allow full access to the primary data and to allow the journal to review the data if requested.*

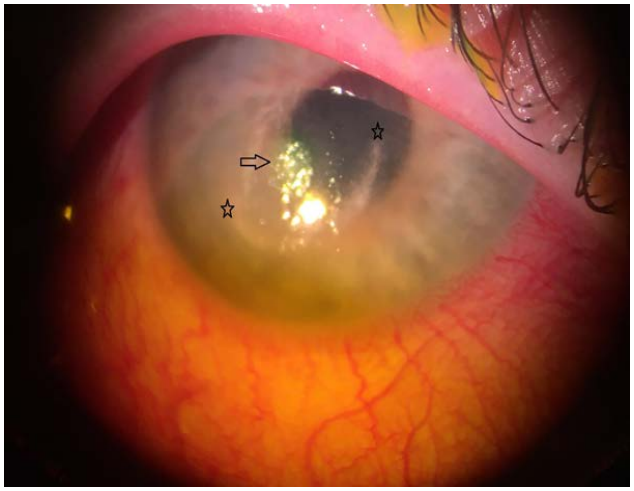

Figure 1. Shows the lesions at the time of presentation. The arrow indicates the central lesion, while the stars mark the starting and ending points of the arc-shaped lesion.

be considered a risk factor for infection. Postoperatively, the patient had been using ofloxacin eye drops (4x1), dexamethasone eye drops (4x1), and artificial tears (4x1).

On examination, visual acuity in the right eye was limited to hand movements. Slit-lamp examination revealed conjunctival injection, diffuse corneal edema, and two dense infiltrative lesions in the central cornea, measuring 2x1.5 mm and extending in an arc from the central to the paracentral area (Figure 1). Additionally, there were multiple punctate infiltrates and epithelial defects surrounding the lesions. A 4+ anterior chamber reaction was observed, without hypopyon. Corneal scrapings were collected under sterile conditions from

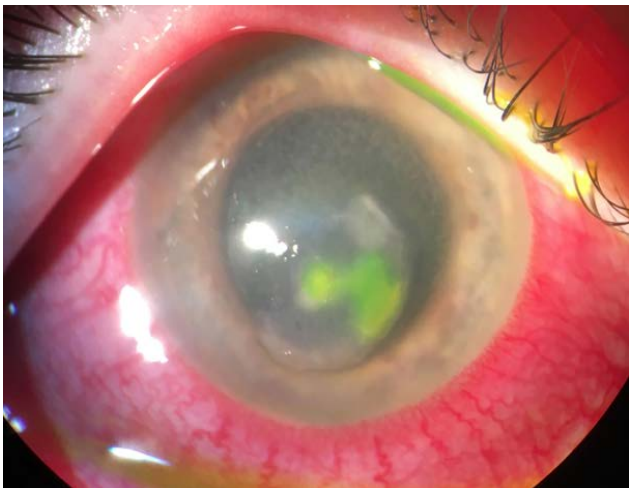

Figure 3. Shows the anterior segment photograph one day after the addition of fortified antifungal treatment.

Figure 2. Shows the enlargement of keratitis and the presence of hypopyon on the first day after treatment.

the interface rather than the corneal surface for culture and direct microscopic examination, followed by irrigation with fortified antibiotics (amikacin, clarithromycin, vancomycin). The patient's previous medications were discontinued, and empirical therapy with fortified amikacin (40 mg/ml), clarithromycin (10 mg/ml), vancomycin (50 mg/ml), and cyclopentolate eye drops (2x1) was initiated.

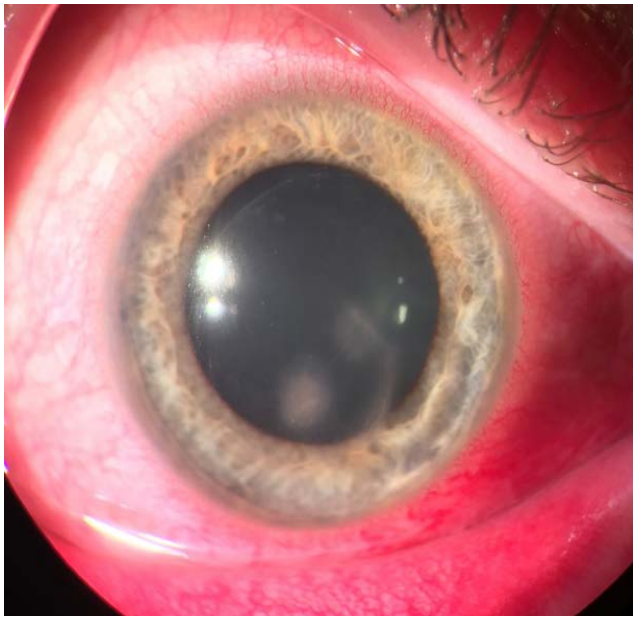

Figure 4. Shows the healing of the lesions with scarring at the follow-up one week later.

Figure 5. Shows the depth of the scar on anterior segment OCT taken at the first month.

On the first day of follow-up, hypopyon was detected, and the size of the lesions had increased (Figure 2). Due to the progression of keratitis, the treatment regimen was modified to include fortified liposomal amphotericin-B (5 mg/ml) and voriconazole (10 mg/ml) eye drops every hour. On the subsequent day, the hypopyon had resolved, and there was a reduction in corneal edema, infiltrate density, and epithelial defect size (Figure 3). The patient reported significant relief from symptoms. Fortified amikacin, clarithromycin, and vancomycin drops were discontinued, and daily follow-up continued.

By the end of the first week, peripheral punctate infiltrates and corneal edema had resolved, with a significant reduction in the epithelial defect size at the site of the keratitis focus. The keratitis areas were healing with scarring (Figure 4), and uncorrected visual acuity improved to 0.2. There were no signs of active keratitis. Culture results from the samples taken before empirical therapy remained negative. The current treatment continued without cyclopentolate drops. At the 1-month follow-up, the corneal edema and epithelial defect had fully resolved, uncorrected visual acuity improved to 0.6, and a stromal scar was observed. Figure 5 shows an anterior segment OCT image depicting the depth of the scar.

DISCUSSION

Infectious keratitis is a rare but vision-threatening complication following refractive surgery. Various causative agents have been identified in post-LASIK infectious keratitis, with early infections primarily attributed to gram-positive bacteria, and late-onset infections often involving atypical mycobacteria and fungi (7). Predisposing factors include excessive surgical manipulation, disruption of the epithelial barrier/delayed epithelial healing postoperatively, and intraoperative contamination (8). SMILE is the latest addition to the field of refractive surgery. Only a few cases of culture-positive infectious keratitis after SMILE have been reported in the literature, with only one case attributed to a fungal pathogen (5). To our knowledge, no cases, either culture-positive or culture-negative, have been reported from Türkiye. The management of infectious keratitis following SMILE poses challenges due to the difficulty in obtaining adequate corneal scrapings from deep-seated infiltrates. Rapid diagnosis and appropriate treatment require a high degree of suspicion regarding potential causative agents. Our case is the first report of infectious keratitis after SMILE in Türkiye. Based on the literature, empirical antibiotic therapy was initiated, but treatment was quickly adjusted following progression, leading to successful infection control. Although cultures were negative, the dramatic response to antifungal therapy suggests that fungal pathogens should always be considered in similar cases.

Conflict of interest: *The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.*

Financial conflict of interest: *Author declares that he did not receive any financial support in this study.*

Address correspondence to: *Serhat Ayla, Şırnak State Hospital, Department of Ophthalmology, Şırnak, Türkiye*
e-mail: *serhataylaa@gmail.com*

REFERENCES

1. Moshirfar M, McCaughey MV, Reinstein DZ, et al. Small-incision lenticule extraction. J Cataract Refract Surg 2015;41:652–65. doi: 10.1016/j.jcrs.2015.02.006.
2. Chan TC, Chow VW, Jhanji V. Collagen cross-linking with photoactivated riboflavin (PACK-CXL) for bacterial keratitis after small incision lenticule extraction (SMILE). J Refract Surg 2017;33:278–80. doi:10.3928/1081597X-20170126-01.
3. Chehaibou I, Sandali O, Ameline B, et al. Bilateral infectious keratitis after small-incision lenticule extraction. J Cataract Refract Surg 2016;42:626–30. doi: 10.1016/j.jcrs.2016.03.024.
4. Liu HY, Chu HS, Chen WL, et al. Bilateral non-tuberculous mycobacterial keratitis after small incision lenticule extraction. J Refract Surg 2018;34:633–6. doi: 10.3928/1081597X-20180827-01.
5. Sachdev GS, Diwan S, Sachdev MS. Unilateral fungal keratitis after small-incision lenticule extraction. JCRS Online Case Rep 2019;7:11–3. Doi: 10.1016/j.jcro.2018.08.003
6. Huang S, Sun MT, Gupta A. Unilateral Streptococcus pneumonia microbial keratitis after small-incision lenticule extraction. J Cataract Refract Surg 2020;8(2). Doi: 10.1097/j.jcro.0000000000000013
7. Chang MA, Jain S, Azar DT. Infections following laser in situ keratomileusis: An integration of the published literature. Surv Ophthalmol 2004;49:269–80. doi: 10.1016/j.survophthal.2004.02.007.
8. Solomon R, Donnenfeld ED, Holland EJ, et al. Microbial keratitis trends following refractive surgery: Results of the ASCRS infectious keratitis survey and comparisons with prior ASCRS surveys of infectious keratitis following keratorefractive procedures. J Cataract Refract Surg 2011;37:1343–50. doi: 10.1016/j.jcrs.2011.05.006.