J Turgut Ozal Med Cent 2017;24(1):88-90
CASE REPORT DOI: 10.5455/jtomc.2016.05.062

Keratitis which is developed after keratoconus treatment with corneal cross-linking process, its causes and treatment approach: a case report

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Abstract

A keratoconus patient, which is 17 years old male, is treated with corneal cross-linking process for his right eye. Two in the superior and two in the inferior, totally four corneal keratitis foci have been seen after post-operation first day controls. The superior eyelid meibomitis has been determined after detailed examination. It was thought that the keratitis foci developed because of this process. The patient hospitalizated and his treatment are reorganized. Corneal keratitis foci became smaller, corneal epithelial defects totally cicatrized after 6 days treatment and the patient was discharged. On the follow-ups, keratitis foci were recurred by a minimal nephelions. As a result, although cross-linking process of keratoconus treatments are less invasive than the other methods; bacterial keratitis can be seen in the presence of predisposing factors. Meibomitis can lead to the development of bacterial keratitis as in our case.

Keywords: Keratoconus; Corneal Cross-Linking Treatment; Bacterial Keratitis; Meibomitis.

Öz

Keratokonus tanısı ile sağ gözüne korneal Cross-linking tedavisi uygulanan 17 yaşında erkek hasta ameliyat sonrası 1. gün kontrolünde korneada 2 adet süperiorda, 2 adet inferiorda olmak üzere 4 adet keratit odağı izlendi. Yapılan ayrıntılı muayenede üst kapakta meibomit olduğu saptandı. Keratit odaklarınında buna bağlı geliştiğini düşünüldü. Hastaya yatış verilerek tedavisi yeniden düzenlendi. Tedavinin 6. gününde keratit odaklarının küçüldüğü, epitel defektinin tamamen kapandığı tespit edilerek hasta taburcu edildi. Takiplerde keratit odaklarında minimal nefelyon oluştuğu izlendi. Sonuç olarak, Cross-linking tedavisi keratokonus tedavisinde diğer yöntemlere göre daha az invaziv olsa da işlem sonrası predispozan faktörler varlığında bakteriyel keratit görülebilmektedir. Bizim olgumuzda da olduğu gibi kapaklarda meibomit olması bakteriyel keratit gelişimine neden olabilmektedir.

Anahtar Kelimeler: Keratokonus; Korneal Cross-Linking Tedavisi; Bakteriyel Keratit; Meibomit.

INTRODUCTION

Keratoconus, which is a non-inflammatory ectatic corneal disorder, causes progressive apical thinning and 'cone-like' shape of the cornea (1). Keratoplasty may be needed about 20 percent of the patients due to severe vision loss (2). Nowadays, it has been reported that riboflavin is activated by UV-A induced collagen cross-linking leads to a long-term increase in biomechanical rigidity which remains stable over time (2).

In this report, we demonstrate a case that is keratoconus patient which has microbial keratitis after the CCL treatment.

Received: 19.07.2016
Accepted: 04.12.2016

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CASE

The 17-year-old male patient, who was sent to our clinic, has had vision decrease for one year. The patient examination; best-corrected vision acuity was 7/10 on the right eye and 5/10 on the left eye, manifest refractions were respectively -9.50 (-3,75 α 45) and -3.25 (-3.00 α 100). Topographical keratometry values were K1:50.90/ K2:53.20 on the right eye and K1:45.70/ K2:49.10 on the left eye.

On biomicroscope examination both eyes were normal. The intraocular pressures were 11 mm Hg on the right eye and 13 mm Hg on the left eye. The fundus examinations were bilaterally normal. The central corneal thicknesses were 396 µ on the right eye and 429 µ on the left eye, the thinnest corneal thickness values were respectively 374 µ and 407 µ. First of all, we planned hypo-osmolar CCL treatment on the right eye, then standard CCL treatment on the left eye. Detailed information about the treatment was given to the patient and a written approval form was received. In the

2017;24(1):88-90
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operating room, before the operation, we dropped 0.5% proparacaine HCl ophthalmic solution to provide anesthesia of ocular surface. Eyelids and the conjunctiva were cleaned with 5% povidone-iodine. The right eye was then closed with a sterile cover and eyelids were opened with eye speculum. Corneal epithelium was mechanically scraped and debrided under the microscope about 8 mm diameter.

We dropped riboflavin, which is 10 ml of 20% dextran that contains 10 mg riboflavin-5-phosphate, on the deepitelium area of the cornea in every three minutes for thirty minutes. After setting the UV-A device parameters, we continued to drop riboflavin every three minutes and applied UV-A at the same time for thirty minutes. At the end of the procedure, a topical antibiotic was dropped and the bandage contact lens was placed. Topical moxifloxacin and artificial tears eight times a day was started and the patient was discharged. Post-operative examination on the first day; best-corrected vision acuity was 2/10, on biomicroscope examination, conjunctiva was mildly hyperemic and two in the superior and also two in the inferior, in total four corneal keratitis foci was seen (Figure 1/A).

During the detailed examination of the patient, it was observed that there was extensive meibomitis in the lower and upper lid. We thought that keratitis foci occurred because of meibomitis so contact lens was removed. Corneal scrape sample was taken and sent to microbiology for culture and gram staining. The patient was hospitalized and the treatment changed to topical moxifloxacin hourly, topical fusidic acid three times a day, artificial tears six times a day, oral doxycycline 100 mg tablet two times a day. There wasn't any proliferation in the culture. On the 6th day of treatment keratitis foci were reduced, the epithelial defect was completely closed, and no fluorescein dye involvement was detected (Figure 1/B).

The patient was discharged with current treatment. It was found that meibomitis was regressed and improved on follow-up at week 1, month 1 and month 3, and minimal nephelions were found in the localization of keratitis foci. At the 6th month's examination, best-corrected vision acuity was 3/10, manifest refraction was -8,75 (-4,75 α 53), topographical keratometry values were K1:48,20/ K2:51,60 on the right eye.

The central corneal thickness was 375 µ, the thinnest corneal thickness value was 366 µ on the right eye.

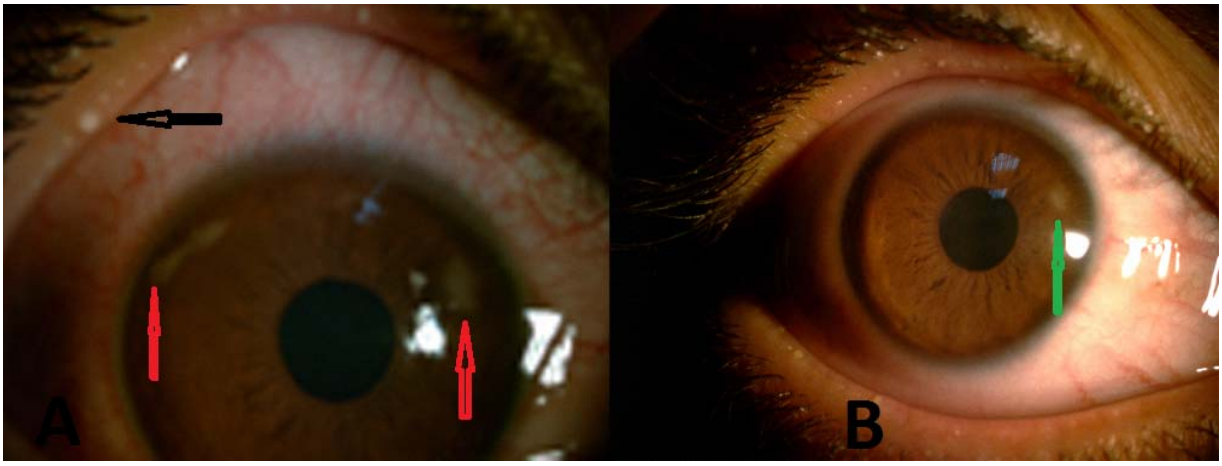

Figure 1. A) Black Arrow; Meibomitis focus, Red Arrow; Foci of keratitis in the cornea B) Green Arrow; Cornea after Keratitis healing - nephelion

DISCUSSION

In recent years, many studies have been done about CCL treatment in keratoconus disease. They have shown that CCL treatment blocks the disease progression and preserves the patient's vision. CCL treatment is minimally invasive, safe and performed easily with minimal complication. Today, it is reported that CCL treatment, which is performed with riboflavin and UV-A, induces collagen cross-linking leads to a long-term increase in biomechanical rigidity which remains stable over time (2). Hypoosmolar CCL is done with hypoosmolar riboflavin in cases with a central corneal thickness less than 400 µ to protect endothelial cells from the possible damage of UV-A thanks to increasing corneal thickness. It is reported that the most common complications of CCL treatment are ,,6 % sterile corneal infiltrates, 2.9% visual loss, 2.8% central corneal scar (3). Staphylococcal toxins are responsible for sterile corneal infiltrates. Microbial keratitis is a rare complication of CCL so the differential diagnosis of microbial keratitis and sterile corneal infiltrate should be performed. Although extensive pain, severe vision loss, an epithelial defect on the lesion, corneal edema and anterior chamber reaction are mostly seen in microbial keratitis, the milder form of these findings and symptoms may be also observed in sterile corneal infiltrates. Particularly, when a lesion locates in the peripheral cornea, multiple lesions, a clear zone between lesion and limbus, the absence of corneal edema around the lesion and minimal corneal epithelial

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defect on the lesion, it is thought as sterile corneal infiltrate. Limited numbers of microbial keratitis cases have been reported in the literature. In some cases, Escherichia coli, (4) Staphylococcus epidermidis (5), Herpes simplex virus (6), Acanthamoeba (7), Pseudomonas aeruginosa (8), Fusarium solani (9), Streptococcus salivarius (10) have been found to be the causative agent. In the majority of reported microbial keratitis cases have been used steroid or nonsteroid drops that can trigger infection. In our case, we performed the CCL treatment in sterile operating room conditions after used 5% povidone-iodine for the lid and ocular surface cleaning. At the end of the operation, topical moxifloxacin was dropped and bandage contact lens placed. Steroid or nonsteroid drops were not used postoperatively.

In the majority of cases in the literature, keratitis occurs within the first six days. In our case, it occurred postoperative first day when the corneal epithelium wasn't completely closed. Staphylococcus aureus and Staphylococcus epidermidis are the most frequent bacteria in conjunctival and lid flora (11). So, the cause of this keratitis case may be related to intraoperative or early postoperative contamination. However, the absence of corneal epithelium which is an important barrier for microorganisms and intensive upper and lower lid meibomitis are matters to be considered a risk factor for keratitis.

In summary, before the CCL treatment, detailed lid examination is absolutely necessary. Some measures should be taken to minimize the risk of keratitis, for instance; preoperative eyelash hygiene should be done, conjunctiva and lid should be cleaned with povidone iodine, eyelash should be closed with a sterile cover, contact lens should place at the end of treatment under the sterile conditions and stay until corneal epithelial defect closure, postoperative antibiotic prophylaxis should continue

It was presented as a poster in 49th National Ophthalmology Congress of TOA. Istanbul, Turkey, 4-8 November 2015.

REFERENCES

1. Kok YO, Tan GF, Loon SC. Review: keratoconus in Asia. Cornea 2012;31(5):581-93.
2. Wollensak G. Croslinking treatment of progresive keratoconus new hope. Crosslinking treatment of progressive keratoconus: new hope. Curr Opin Ophthalmol 2006;17(4):356-60.
3. Koller T, Mrochen M, Seiler T. Complication and failure rates after corneal crosslinking. J. Catract Refract Surg 2009;35(8):1358-62.
4. Pollhammer M, Cursiefen C. Bacterial keratitis early after corneal crosslinking with riboflavin and ultraviolet-A. J Cataract Refract Surg 2009;35(3):588-9.
5. Perez-Santonja JJ, Artola A, Javaloy J, Alio JL, Abad JL. Microbial keratitis after corneal collagen crosslinking. J Cataract Refract Surg 2009;35(6):1138-40.
6. Kymionis GD, Portaliou DM, Bouzoukis DI, Suh LH, Pallikaris AI, Markomanolakis M. et al. Herpetic keratitis with iritis after corneal crosslinking with riboflavin and ultraviolet A for keratoconus. J Cataract Refract Surg 2007;33(11):1982-4.
7. Rama P, Di Matteo F, Matuska S, Paganoni G, Spinelli A. Acanthamoeba keratitis with perforation after corneal crosslinking and bandage contact lens use. J Cataract Refract Surg 2009;35(4):788-91.
8. Sharma N, Maharana P, Singh G, Titiyal JS. Pseudomonas keratitis after collagen crosslinking for keratoconus: case report and review of literature. J Cataract Refract Surg 2010;36(3):517-20.
9. Salvador Garcia-Delpech S, Dı´az-Llopis M, Udaondo P, Salom D. Fusarium keratitis 3 weeks after healed corneal cross-linking. J Refract Surg 2010;26(12):994-5.
10. Zamora KV, Males JJ. Polymicrobial keratitis after a collagen cross-linking procedure with postoperative use of a contact lens: a case report. Cornea 2009;28(4):474-6.
11. Coşkun M, Altıntaş AGK, Simavlı H, Anayol MA, Toklu Y, Çelikbilek N. ve ark. Normal Konjonktival Floranın Analizi ve Florokinolonlar ile Penisilin Turevlerine Karşı Antibiyogram Duyarlılığının İncelenmesi. Glokom-Katarakt 2007;2:167-70.