

Management of a corneal perforation due to resistant peripheral ulcerative keratitis by repeated tectonic patch grafting combined with conjunctival resection

Dirençli periferik ülseratif keratite bağlı kornea perforasyonunun konjonktival rezeksiyon ile kombine tekrarlanan tektonik yama grefti ile yönetimi

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ABSTRACT

Tectonic graft patching and conjunctival resection is one of the effective treatment modalities in especially resistant peripheral ulcerative keratitis patients with corneal perforation additional to topical and systemic immunosuppressive treatment. A 44-year-old female patient with a 10-year history of rheumatoid arthritis, was referred to our clinic with peripheral corneal perforation. Her visual acuity was at the level of hand movement perception in the left eye. Slit-lamp examination revealed full-thickness circular area of 3x3 mm diameter peripheral ulcerative keratitis with corneal perforation. Tectonic patch grafting was performed. Two weeks later, because of small melting area at the inferior part of the graft with iris incarceration, an additional cornea-scleral graft transplantation was performed. Due to the immune nature of the peripheral ulcerative keratitis, limbal conjunctiva at the perforation site was also resected. Fourteen months after the re-grafting, there was no recurrence. Best corrected visual acuity (BCVA) was 5/10 log MAR in the left eye.

Keywords: Conjunctival resection; peripheral ulcerative keratitis, tectonic patch grafting.

ÖZ

Dirençli kornea perforasyonu olan periferik ülseratif keratit hastalarında, tektonik greft yama ve konjonktival rezeksiyon, topikal ve sistemik immünsüpresif tedaviye ek olarak, etkili tedavi yöntemlerinden biridir. On yıldır romatoid artrit öyküsü olan 44 yaşında kadın hasta periferik kornea perforasyonu ile kliniğimize sevk edildi. Görme keskinliği sol gözde el hareketlerini algılayacak düzeydeydi. Yarık lamba muayenesinde medial periferik ülseratif keratit ve korneal perforasyon saptandı. Tektonik yama grefti uygulanan hastanın iki hafta sonraki kontrolünde greftin alt kısmında erime alanı olması ve iris inkareresyonu gelişmesi nedeniyle ilave kornea-skleral greft nakli yapıldı. Periferik ülseratif keratitin immun yapısı nedeniyle, perforasyon bölgesindeki limbal konjonktiva da rezekte edildi. 2 yıllık takipte nüks izlenmedi. En iyi düzeltilmiş görme keskinliği sol gözde 5/10 LogMAR idi.

Anahtar Sözcükler: Konjonktival rezeksiyon; periferik ülseratif keratit, tektonik yama grefti.

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INTRODUCTION

Peripheral ulcerative keratitis (PUK) is defined as the progressive thinning of the peripheral corneal stroma caused by limbal vasculitis (1). It is characterized by crescent-shaped inflammation of mostly inferior limbus, accompanied by an epithelial defect, may remain indolent or cause advanced melting and corneal perforation. Several autoimmune conditions have been linked to PUK, including rheumatoid arthritis (RA), Wegener's granulomatosis, large vessel vasculitis, lichen planus, pyoderma gangrenosum, autoimmune hepatitis. Systemic collagen vascular diseases such as RA are responsible for approximately half of all noninfectious PUK cases (2).

We present the management of resistant peripheral ulcerative keratitis (PUK) with corneal perforation with repeated tectonic patch grafting combined with conjunctival resection.

Case report

A 44-year-old female patient with a history of rheumatoid arthritis for 10 years, was referred to our clinic with corneal perforation due to peripheral ulcerative keratitis. According to her medical history, RA status was under controlled with systemic immunosuppression therapy (subcutaneous methotrexate 15 mg weekly).

Her visual acuity was at the level of hand movement perception in the left eye and 10/10 in the right eye. Slit-lamp examination of the left eye revealed medial PUK with corneal perforation. (Figure-1A) Anterior chamber was shallow. Inferonasal descemetocoele, approximately 3x3 mm in size, with no signs of infectious infiltration and accompanied by full-thickness stromal perforation with iris plug was observed. Anterior segment examination of the right eye and fundus examination of both eyes were normal. Bandage contact lens, oral tetracycline 100 mg twice, oral lansoprazole, 0.5% moxifloxacin drops and autologous serum eight times a day, dorzolamide, timolol and 0.2% brimonidine drops twice a day were administered before surgical intervention.

Corneal tectonic patch grafting was performed. (Figure-1B) The host bed is first prepared by clearing the adjacent and overlying necrotic tissue and renewing the descemetocoele margins. Depending on the size and shape of the defect, a lamellar, customized crescentic patch donor graft

was transplanted. The recipient bed was irrigated with balanced salt solution and the graft sutured to its margins with interrupted 10-0 nylon sutures. Systemic immunosuppression was maintained postoperatively along with topical tobramycin and dexamethasone drops 8 times a day, and 0.05% cyclosporine drops 4 times a day.

At the follow-up postoperative 2 weeks, BCVA in the left eye was 2/10 log MAR with Snellen chart. In the anterior segment examination, the graft was in place, the sutures were stable. However, a small melting area with iris incarceration was observed at the inferior part of the graft, close to the limbus. (Figure-1C-D) The intraocular pressure was found to be hypotonic. An additional surgical intervention was planned. Due to the immune nature of the PUK, limbal conjunctiva at the perforation site was also resected and supplementary patch graft transplantation was performed. The scleral part of the second patch graft was positioned to the sclera at the conjunctival excision area to obtain a limbal barrier, an extending part was sutured to the cornea, over the previous graft. No extra pathology was observed in the postoperative first day and monthly controls. (Figure-1E-F)

Fourteen months after the re-grafting, the sutures and graft were stable, the anterior chamber depth was fair, and there was no recurrence. (Figure-1G) Intraocular pressure was 11 mm/hg and BCVA was 5/10 log MAR in the left eye.



Figure-1. Preoperative slit lamp examination demonstrates medial PUK with corneal perforation (A). Graft and sutures appear to be stable on the first day after tectonic patch grafting (B). Postoperative second week, slit lamp examination reveals melting area at inferior part of the graft (C-D). Slit lamp examination shows graft in place on first day of second tectonic grafting with conjunctival resection (E). No recurrence is observed at the first (F) and 9 months (G) of the operation.

DISCUSSION

The triggers of corneal perforation can be categorized as either traumatic-nontraumatic or infectious-noninfectious causes. PUK located in nontraumatic, non-infectious category with an inflammatory etiology (3). The peripheral cornea has unique properties that facilitate the effects of systemic reactions, such as close conjunctival lymphoid tissue, anterior ciliary artery (unlike the avascular central cornea) supply, tighter collagen bundles (storing immune complexes), and greater thickness presence (4, 5). Therefore, management of inflammation after mechanical repair is important when PUK is combined with corneal perforation. In the present case, while the systemic and topical immunosuppressive therapy was insufficient, conjunctival resection was added to the surgical intervention to reduce inflammation.

Interruption of the rich vascular supply results with necrosis and ulceration which may cause corneal perforation. Perforations can be effectively treated with a variety of methods, depending on the size and location. The main therapeutic purpose is to provide tectonic support with various options such as tissue adhesives, bandage contact lenses, amniotic membrane transplantation, penetrating keratoplasty, or patch grafts. In cases of large paracentral or peripheral perforation and thinning, considering complications such as graft rejection and development of secondary glaucoma, small patch

grafts can be used for the globe stabilization (6, 7). The use of a tectonic graft also eliminates the necrotic stroma, which secretes collagenase-like enzymes causing stromal degradation (8). In the present case, a patch graft suitable for the size of the corneal defect was transplanted for tectonic purposes.

Although perilimbal conjunctival resection, which is an old treatment method, is an effective method to control inflammation in PUK, it is neglected and not used frequently today (9). The value of this surgical method is thought to reduce the effects of immune complex sources, inflammatory cells and collagenolytic activity in the limbal conjunctiva. Thus, it induces healing of deep, non-infiltrative ulcers associated with RA (10). In the present case, conjunctival resection surgery which was combined with patch graft transplantation was performed because the inflammation was resistant and caused recurrent perforation.

CONCLUSION

In conclusion, corneal surgeons should keep in mind that conjunctival resection is one of the effective treatment modalities in especially resistant PUK patients with corneal perforation additional to immunosuppressive treatment and perforation management surgery.

Conflict of interest: The authors declared no conflict of interest.

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