FAITS CLINIQUES

Successful Management of Unilateral Subepithelial Corneal Infiltrates with Phototherapeutic Keratectomy

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Abstract

Background Phototherapeutic keratectomy (PTK) is a safe and effective procedure for the treatment of superficial corneal pathology

Purpose We aimed to highlight the use of PTK for the treatment of subepithelial corneal infiltrates (SCI). hototherapeutic keratectomy (PTK) is a safe and effective procedure for the treatment of superficial corneal pathology

Case description A 68-year-old man presented for a blurred vision of the right eye (RE), 1 year after a healed episode of epidemic keratoconjunctivitis (ECK). In the RE, Best corrected visual acuity (BCVA) was reduced to 20/70, Slit lamp examination showed multiple central SCI. Left eye (LE) examination showed no abnormalities. PTK was indicated with an optic zone of 8mm and a treatment depth of 90 µm. At 1-month post PTK, BCVA was 20/32, and we noted a total resolution of SCI with clear cornea

Conclusion PTK is a promising, minimally invasive extraocular alternative to lamellar or penetrating keratoplasty with shorter duration of follow-up, in cases with SCI with satisfactory refractive and visual outcomes.

Introduction

Subepithelial corneal infiltrates (SCI) have been reported to follow epidemic keratoconjunctivitis (EKC) during the inflammatory phase. They compose viral antigens and lymphocytes because of a delayed immune response in the corneal stroma. Adenoviral persistent SCI lead to an irregular corneal surface, subepithelial opacity which compromises optical quality causing a blurred vision, astigmatism, photophobia, glare, and halos [1]. Phototherapeutic keratectomy (PTK) is an excimer laser based surgical procedure widely performed by corneal surgeons to treat anterior corneal lesions by superficial corneal ablation [2]. This procedure was proposed to treat adenoviral SCI causing a decrease of visual acuity as an alternative to lamellar or penetrating keratoplasty

Purpose

To report a case of unilateral persistent SCI consecutive to EKC successfully managed with PTK with satisfactory refractive and visual outcomes.

Case report

A 68-year-old man with no medical history, with ophthalmic history of bilateral episode of EKC symptomatically treated, presented for a blurred vision of his right eye (RE), 1 year after the healed episode of ECK. In the RE, Best corrected visual acuity (BCVA) was reduced to 20/70, anterior segment examination showed multiple central SCI and a cortical cataract (**Fig1**).

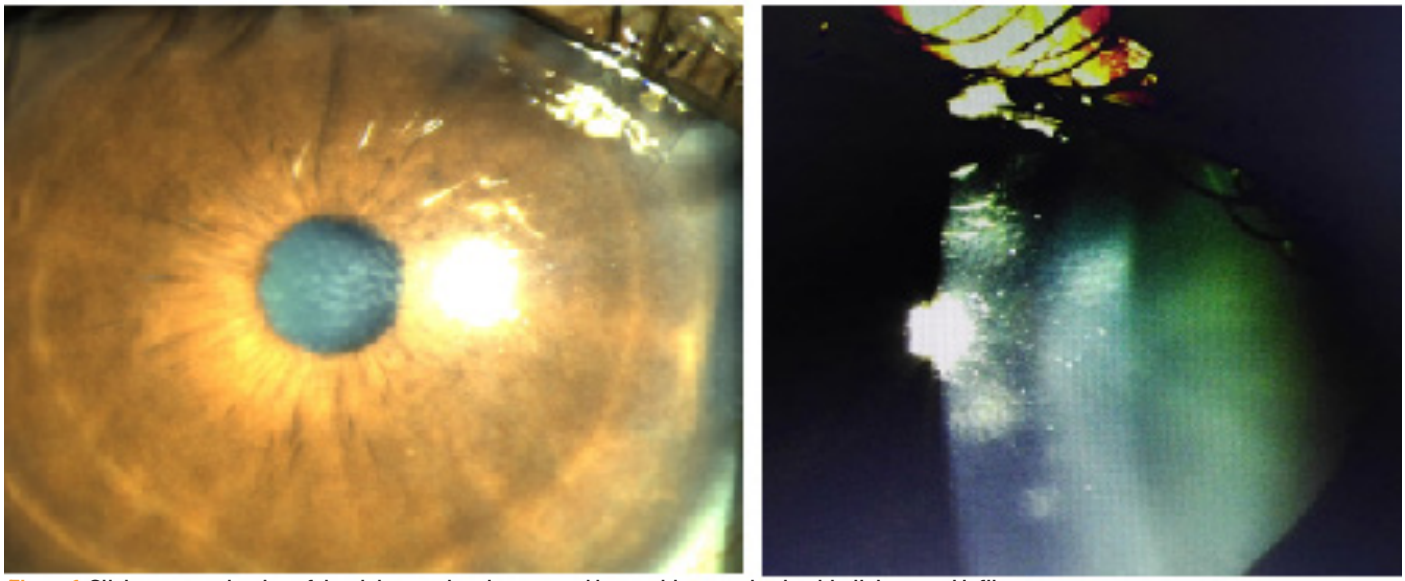

Figure 1. Slit lamp examination of the right eye showing corneal haze with central subepithelial corneal infiltrates

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Fundus examination was normal. In the left eye (LE), BCVA was 20/20 and slit lamp examination was within normal with no corneal infiltrates. Anterior segment optical coherence Tomography (AS-OCT) showed in the RE, anterior stromal hyperreflective patchy lesions reaching a depth of 85 µm, with an intact Bowman's layer and a uniform epithelial thickness (**Fig2**), and no abnormalities in the LE. Corneal thickness was 513 µm. PTK was indicated with an optic zone of 8 mm and a treatment depth of 90 µm. At 1-month post PTK, BCVA was 20/32, and we noted a total resolution of SCI with clear cornea. AS-OCT confirmed the disappearance of hyperreflective lesions with a regular epithelial surface (**Fig3**). At 2 months post PTK, the patient developed a corneal haze which responded well to steroids. At 1-year of follow-up, BCVA remained stable at 20/32 with no abnormalities at the slit lamp examination

Figure 2. Anterior segment optical coherence tomography (6mm section) on the right eye showing anterior stromal hyperreflective patchy lesions (yellow arrows), with an intact Bowman's layer and a uniform epithelial thickness

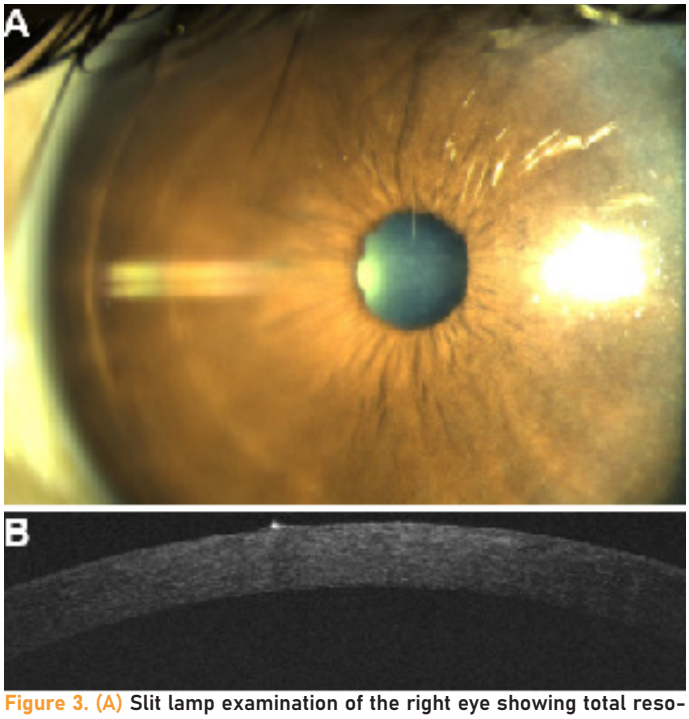

Figure 3. (A) Slit lamp examination of the right eye showing total resolution of subepithelial corneal infiltrates after Phototherapeutic Keratectomy (B) Anterior segment optical coherence tomography showing a regular epithelium with normal homogenous corneal stroma after Photo therapeutic Keratectomy

Discussion

Conjunctival infection caused by adenovirus is the most widespread external ocular infection throughout the world. Nearly 10 days after symptoms appearance, keratitis may lead to the formation of SCI, which may develop and persist for months or even years. Some ophthalmologists might prefer to prescribe topical corticosteroid drops for patients with acute EKC. Considering the adverse effects of topical corticoid therapy, subepithelial infiltrates treatment should be reserved for cases where visual acuity is significantly impaired [3]. Topical steroid treatment is usually efficient for SCI, however, when discontinued, SCI can recur [4]. Depending on their number and location in the cornea, SCI can induce a decrease in visual acuity, photophobia, halo, and foreign body sensation. Studies have shown that PTK treatments in corneal scars due to adenoviral infections improve visual acuity [1,5]. PTK is indicated for anterior corneal lesions that occupy no more than an anterior third of the corneal stroma.

The corneal ablation with PTK should be limited to anterior third of the corneal stroma and leave a minimum residual stromal bed thickness of 250µm [2].

AS-OCT allows for accurate localization of corneal lesions and their depth in the cornea to decide whether PTK might be safe and effective. Use of AS-OCT for surgical planning and follow-up helps to accurately measure lesion dimensions, predict ablation depth and refractive outcomes, and confirm complete lesion removal. This procedure has some complications including induced hyperopia and irregular astigmatism, corneal haze, recurrence of the causative pathology, and corneal thinning and exceptionally keractasia. However, earlier postoperative recovery, repeatability of the procedure, and ability to control the depth of corneal ablation make PTK a promising, minimally invasive extraocular alternative to lamellar or penetrating keratoplasty with shorter duration of follow-up, in cases with anterior corneal lesions [7].

The efficacy of the procedure varies with the nature, the depth and the location of the corneal lesions, planning of the procedure, patients' complaints and refractive status of the eye [8].

Conclusion

To conclude, PTK is an interesting alternative to corneal graft surgery in anterior corneal lesions. In SCI caused by EKC, PTK results are very encouraging with a resolution of the infiltrates and a notable improvement in the quality of vision. Main complications are hyperopic shift, corneal haze, ectasia and relapse of the disease.

References

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