

Bilateral Corneal Thinning Post-Photorefractive Keratectomy Secondary to Untreated Staphylococcal Blepharitis

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1. Abstract

Photorefractive keratectomy (PRK) has been shown to be an effective surgical treatment for ametropic conditions. However, PRK is associated with potential side effects which include glare, halos, dry eye, haze, and corneal infection. This report focused on the continued management and documentation of an unusual presentation of infectious keratitis secondary to previously untreated blepharitis in a 29-year-old healthy Caucasian male. He underwent bilateral PRK one month prior and was formally diagnosed with non-resistant staphylococcus aureus keratitis in both eyes. His uncorrected visual acuity was in the normal range in both eyes (OU). Examination revealed inferior arc-shaped corneal thinning. Anterior segment photography and corneal topography were performed on both eyes, and he was diagnosed with resolving staphylococcus keratitis with persistent inferior thinning OU. The present report documents the management and, more importantly, unusual appearance of peripheral arc-shaped corneal thinning secondary to PRK treatment of eyes with previously undetected and untreated staphylococcus blepharitis.

2. Introduction

Photorefractive keratectomy (PRK) has been used to correct ametropias (including myopia, hyperopia, and astigmatism) for over 25 years [1]. It has also been shown in large scale studies to be safe and effective [2]. However, PRK is not without risk of side effects, and the most alarming and serious may be infectious keratitis [3-5]. Infectious keratitis has also been specifically shown to occur in young, healthy patients [6]. However, the author is not aware of a case of infectious keratitis after PRK resulting in arc-shaped peripheral corneal thinning. That is the subject of the current case report.

3. Case Presentation

A 29-year-old healthy Caucasian male presented on referral from a local urgent care center with a “possible corneal infection” in both eyes. He was one month status post (s/p) PRK and reported developing a bilateral keratitis one week s/p PRK. He had undergone gram staining and was formally diagnosed with non-resistant staphylococcus aureus keratitis in both eyes (OU).

After several follow-ups with several medication changes, he was being treated with bacitracin ointment twice a day (BID) OU, fluorometholone suspension once a day (QD) OU, and methylcellulose ointment at least four times per day (QID) OU. His uncorrected visual acuity was 20/20- in right (OD) and left (OS) eyes. He was experiencing no symptoms but was concerned about persistent conjunctival injection OU. Slit lamp examination revealed mild, diffuse conjunctival hyperemia OU, corneal subepithelial infiltrates superiorly OD, trace superficial punctate keratitis OU, and inferior arc-shaped corneal thinning (without infiltrates) extending from approximately four to seven o'clock OU. The corneal thinning was determined clinically to be about 10% based on a biomicroscopic optic section. Anterior segment photography was performed on both eyes, and the overall quiet appearance is documented in Figure 1.

Neither optical coherence tomography (OCT) nor Scheimpflug imaging were available at the clinic where the patient was seen. Corneal topography was then performed as a surrogate and is shown in Figure 2. It is clear from the images that the arc-shaped thinning is within the PRK laser ablation zone and consistent with the shape of the lower lid. This appearance is also consistent with the patient's report that the PRK surgeon told him he had a lid infection, and that the referring provider should have treated it first.

The present treatment regimen (i.e., bacitracin ointment) was partly to manage blepharitis, which was not appreciated clinically at the present visit.

As there were minimal signs other than the area of corneal thinning, he was diagnosed with resolving staphylococcus keratitis with persistent thinning OU and resolved blepharitis OU. He was instructed to continue the medications as prescribed. He was also scheduled for a three-day follow-up but unfortunately was lost to our follow-up.

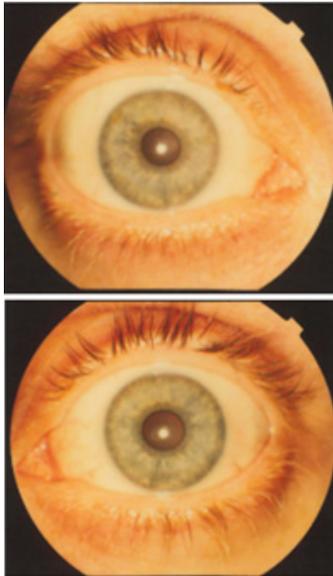


Figure 1: Anterior segment photographs showing the overall quiet appearance of the right (top) and left (bottom) eyes.

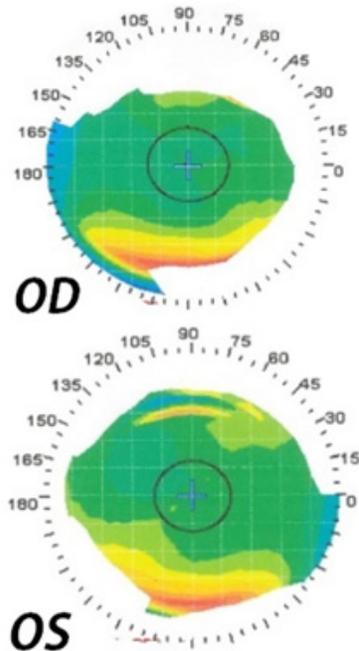


Figure 2: Corneal topography images of right (top) and left (bottom) eyes. The cooler colors (blue and green) represent flatter areas, while the warmer colors (yellow and red) represent steeper areas. The thinning is represented by the very steep (“red”) areas seen inferiorly.

4. Discussion

Mild complications from PRK are common and vary, but the incidence of infectious keratitis is less than 0.25% [7, 8]. The present case is typical of post-PRK infectious keratitis (i.e., occurred within 7 days and cultured as a non-resistant Staph species [5,8]); however, the arc-shaped corneal thinning is novel and does not appear in the current literature. Further, there also appears to be no documented case of infectious keratitis s/p PRK with a presumed etiology of untreated staphylococcal blepharitis.

Figure 2 shows corneal topographic images of the present case one-month s/p PRK. Most myopic human corneas are prolate ellipses, meaning that the steepest curvature is at the corneal apex (i.e., central) which progressively flattens toward the limbus or corneal periphery [9]. However, the overall shape in the present case is typical of a myopic cornea post-PRK, where the central corneal portion is flatter [10]. The unique feature of the current case is the arc-like corneal thinning inferiorly in both eyes. Currently, there are no post-PRK reports of the same.

Differential diagnoses include corneal dellen, and peripheral infectious or sterile ulcers. Dellen (first described by Fuchs in 1929 [11]) are more “dimple” shaped, usually occur nearer the corneal limbus, and mostly result from cataract, strabismus, or trabeculectomy surgery [12-14]. They are also accompanied by more significant inflammatory signs [11]. Infectious ulcers would also be accompanied by significant inflammation and sub-epithelial infiltrates, not seen here. Sterile (or non-infectious) ulcers are more related to dry eye syndrome or exposure keratopathy [15], not consistent with the present patient’s history. However, sterile ulcers also result from staphylococcal hypersensitivity, which is certainly possible and also not able to be ruled out in the present case.

5. Conclusion

While the long-term outcome of this case is unknown, the most important lesson learned is for primary eyecare providers to ensure the health of the entire anterior segment (eyelids, lashes, and conjunctiva) prior to referring for any corneal refractive procedures.

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