

## Case Report

# BILATERAL CORNEAL ECTASIA AFTER PRK WITH BOWING POSTERIOR CORNEAL FLOAT AS THE ONLY PREOPERATIVE POSITIVE TOPOGRAPHIC FINDING - CASE REPORT

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### ABSTRACT

**Purpose:** To alert ophthalmologists of the possibility of iatrogenic corneal ectasia following PRK in cases with bowing posterior corneal float in otherwise normal topography.

**Methods:** Clinical case report of bilateral standard PRK for low myopia, with retrospective analysis of corneal topography, visual acuity and corneal thickness.

**Results:** Corneal ectasia occurred bilaterally after PRK. Retrospective analysis of preoperative videokeratography indicated the existence of high posterior corneal elevation.

**Conclusion:** This article is the first case report of a bilateral corneal ectasia after PRK for low myopia in patients with normal placido topography. Even if there is no direct proof to demonstrate whether posterior corneal elevation or thin cornea was the risk factor responsible for the evolution of keratoconus, the safety of the PRK procedure in patients with isolated posterior elevation must be considered.

**Keywords:** Ectasia, PRP, Keratoplasty

### Introduction

Keratoconus and keratoconus-suspect are contraindication to photorefractive keratectomy (PRK). [1] Keratoconus is a well-defined corneal pathology with well-established topographic findings. Keratoconus suspect has unclarified different clinical and topographic findings. [2-4] Abnormal corneal topography ranges from suspicious to frank keratoconus or pellucid marginal degeneration or forme fruste keratoconus. Suspicious topography includes: asymmetric bowtie with less than 1.0 diopter difference, [5] significant skewed radial axis or localized inferior steepening of more than one diopter but less than 1.4 inferior-superior value (I-S). [6,7]

Keratoconus suspect used to be described as localized inferior steepening on placido corneal topography, [8,9] more than 1.4 I-S value [5] or slight bowing of posterior corneal surface on the elevation topography. [10] We report a case with bilateral corneal ectasia after uneventful PRK in a patient with low myopia with normal placido corneal topography and high posterior corneal float elevation and thin cornea.

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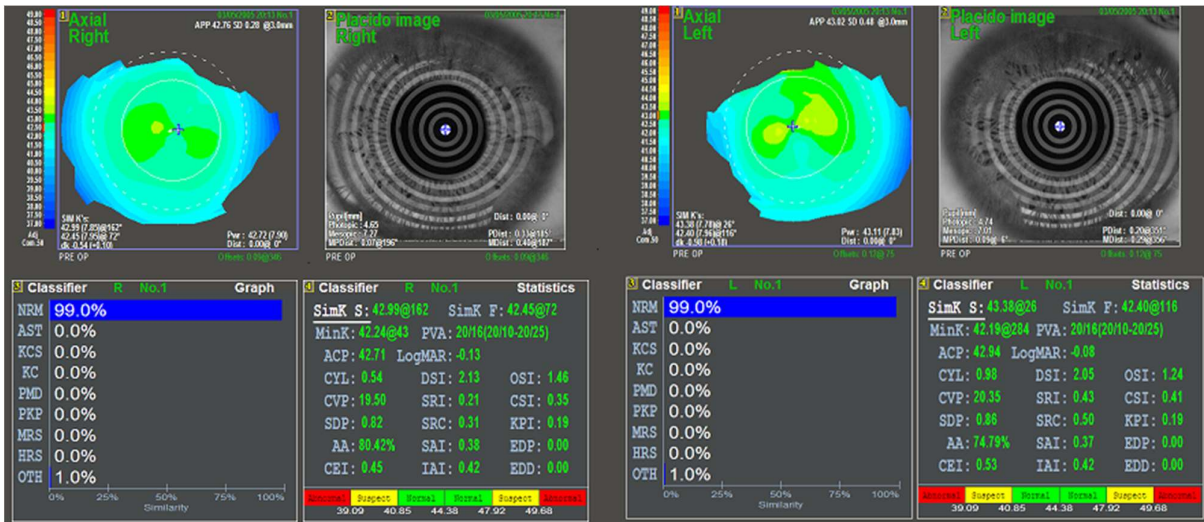
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**Case report**

A 23-year-old man underwent photorefractive keratectomy for low myopia in May 2005. He had not worn soft contact lens before because of intolerance. Ocular history was unremarkable. Family history was negative for ocular disorder. Uncorrected visual acuity was (UCVA) 20/100 in the right eye and 20/160 in the left eye. Best corrected visual acuity (BCVA) was 20/20 in both the eyes with manifest refraction of (-2.25 -1.0 X 85) in the right eye and (-2.0 -1.25 X 100) in the left eye. Refraction was stable over the last 2 years according to the patient. Preoperative ultrasonic central corneal thickness was 466 μm and 460 μm in the right and the left eyes, respectively. Central simulated keratometry was 42.99D/42.45D in the right eye and 43.38D/42.40D in the left eye. Preoperative corneal topography obtained with OPD-scan II (NIDEK Co., Ltd.) was within normal and was classified as normal based on the Placido topography analysis by the OPD-scan II Corneal Navigator neural-network software (NIDEK) (Figure 1). Elevation maps obtained with the Orbscan II scanning-slit topographer/tomographer (Bausch & Lomb, Rochester, NY) showed normal axial map and normal anterior

elevation map. Posterior elevation map showed 6.67 mm/50.6D with a differential of 0.033 mm in the right eye and 6.60 mm/51.10D with a differential of 0.038 mm in the left eye (Figure 2). Bilateral PRK was performed using the EC-5000 excimer laser (NIDEK). The attempted correction was (-2.25 -1.0 X 85) in the right eye and (-2.0 -1.25 X 100) in the left eye. The optical zone diameter was 6.5 mm with 7.5 mm transition zone, the calculated total ablation depth was 59.1 μm in the right eye and 59.2 μm in the left eye. He had an uneventful postoperative course. Six months after surgery, his UCVA was 20/20 in both the eyes with manifest refraction of (0.00 -0.75 X 70) in the right eye and (-0.25 -0.25 X 110) in the left eye. BCVA was 20/16 in both eyes. Four years later he was referred back to us, his UCVA was dropped down to 20/200 in both the eyes, slit-lamp examination showed marked corneal thinning with deep apical scarring, he was elected for penetrating keratoplasty in both the eyes. Corneal topography showed the picture of advanced keratoconus (Figure 3). One year after surgery, UCVA was 20/30, manifest refraction was -1.25 -0.75 X70 with 20/22 BCVA.



**Figure 1:** Preoperative corneal topography and corneal navigator classifying corneal topography as normal

**Discussion**

Suspicious topography is well established as an absolute contraindication for LASIK. [1] but being a contraindication to PRK is not certain based on the variable outcomes available in the literature. Guedi et al, [11] reported a series of 62 eye with form fruste keratoconus that underwent uneventful PRK without development of corneal ectasia over a five-year follow

up, while the first reported case of corneal ectasia after PRK reported by Malecze et al, [12] had a preoperative Placido topography showing only a skewed radial axis. Most reported corneal ectasia after PRK [11-17] were subjectively diagnosed to have a form of suspicious topography. In all the previously mentioned reports, abnormal Placido topography with or without the

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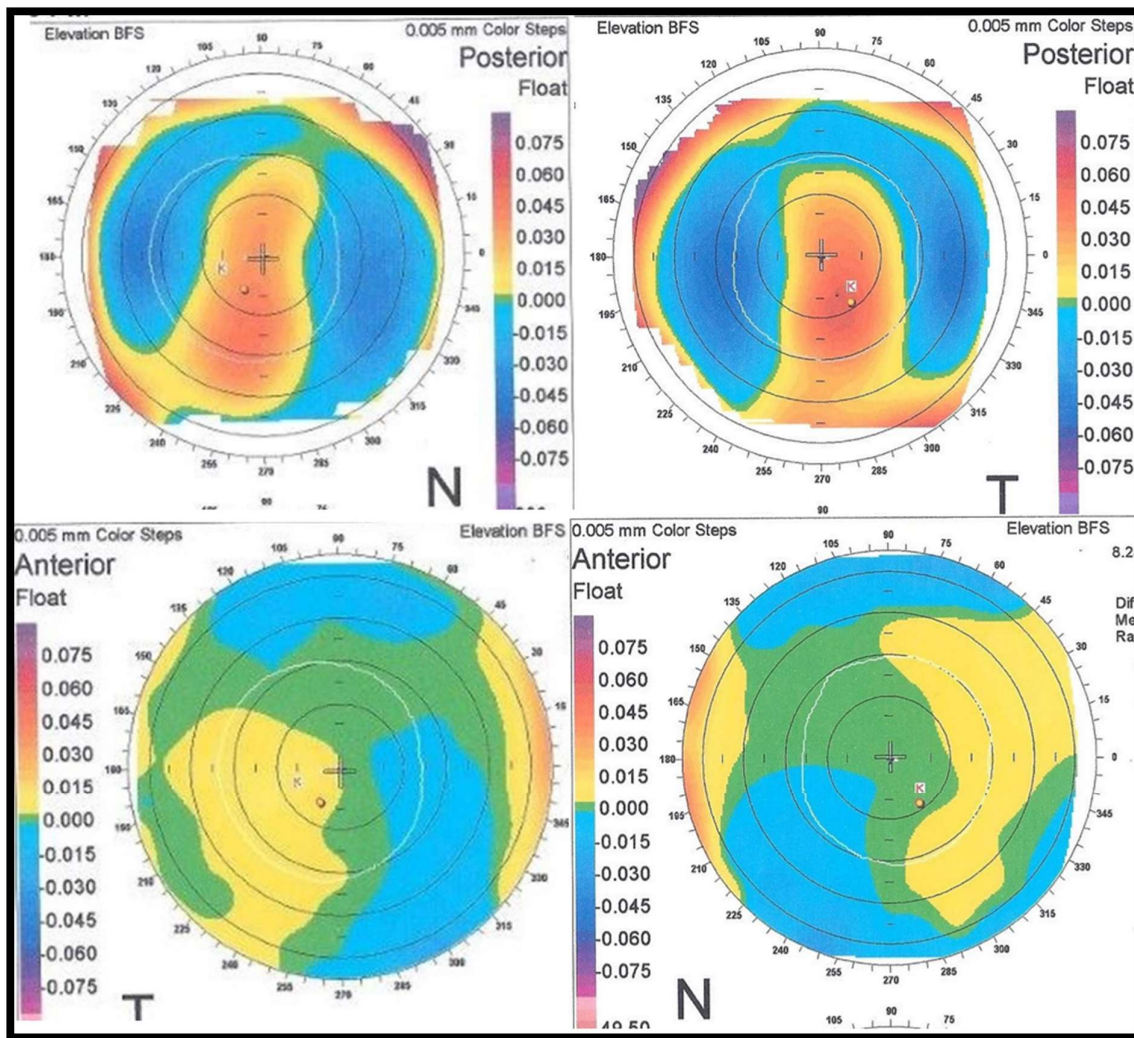
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**Figure 2:** Posterior corneal float (up) and anterior corneal float (down).

presence of posterior elevation were the criteria based upon the preoperative diagnosis of keratoconus suspect or forme fruste keratoconus. Preoperative posterior corneal elevation, alone without any other placidotopography abnormality was never been reported as a reason of iatrogenic corneal ectasia after PRK. This is the first case report of such occurrence. Another factor in this case which may contribute to the occurrence of corneal ectasia, is the preoperative thin cornea, yet the treated myopia was relatively compatible with such thickness. Although the placido topography in this case is not that ideally normal pattern, yet still not showing any criteria of being abnormal, such as radial axis skewing, asymmetric bowtie, or high I-S value as shown in the corneal navigator. Moreover the truncated bowtie in our

case which may raise some suspicion was irrelevant to the area of high posterior elevation which may be falsely assuring to surgeons. Also it is not included under any of the described criteria of suspicious topography. The importance of this case is showing that posterior elevation alone without the presence of abnormal placido topography may be valid reason not to have PRK even in low myopia, the same is applied to truncated bowtie even though symmetrical, might be still a risk factor for developing corneal ectasia after PRK. Even if there is no direct proof to demonstrate whether factor responsible for the evolution of keratoconus, the safety of the PRK procedure in patients with isolated posterior elevation must be considered.

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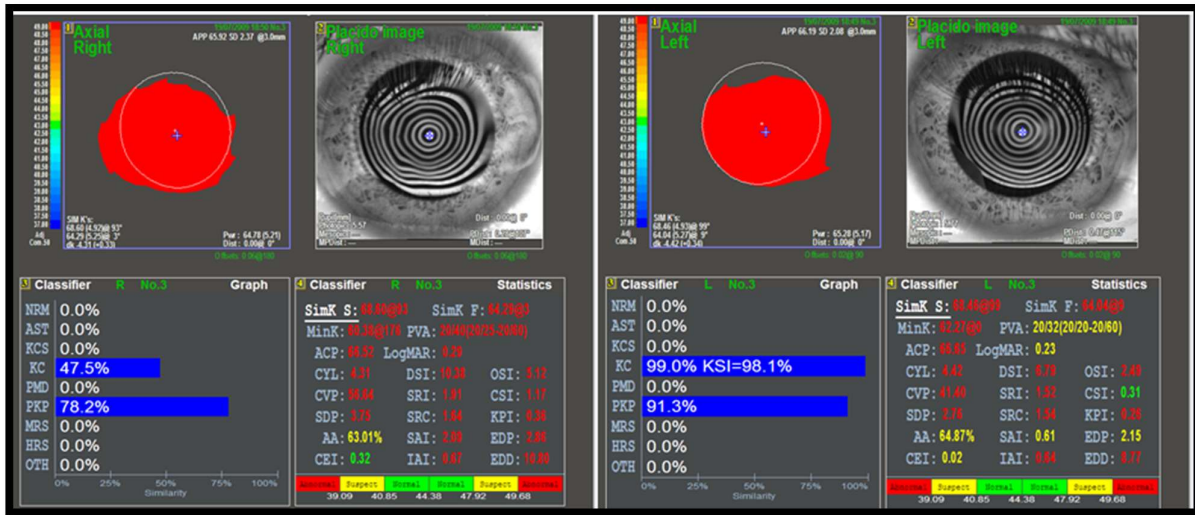


Figure 3: Severe advanced corneal ectasia in both eyes

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