

Management of Post Laser *In Situ* Keratomileusis Ectasia with Simultaneous Topography Guided Photorefractive Keratectomy and Collagen Cross-Linking

George D. Kymionis¹, Dimitra M. Portaliou^{*1}, Vasilios F. Diakonis¹, Alexandra E. Karavitaki¹, Sophia I. Panagopoulou¹, Mirko R. Jankov II² and Efehan Coskunseven³

¹*Institute of Vision and Optics University of Crete, Greece*

²*LaserFocus – Centre for Eye Microsurgery, Belgrade, Serbia*

³*Dunya Eye Hospital, Istanbul, Turkey*

Abstract: A thirty-nine year old man was referred to our institute due to progressive decreased visual acuity five years after bilateral Laser *in situ* Keratomileusis (LASIK). Topography revealed signs of post – LASIK ectasia. Patients' left eye was treated with simultaneous Topography Guided Photorefractive Keratectomy (PRK) followed by Corneal Collagen Cross Linking (CXL). Twelve months after the combined procedure both uncorrected distance visual acuity (UDVA) and corrected distance visual acuity (CDVA) showed significant improvement while topographic findings revealed an improvement of the astigmatic pattern. All higher order aberrations showed a significant decrease twelve months postoperatively. Combined topography guided PRK and corneal cross linking could represent an alternative treatment for post – LASIK ectasia.

Keywords: Post, LASIK ectasia, topography, guided PRK, CXL.

INTRODUCTION

Keratectasia is the condition in which the cornea progressively thins and steepens resulting in the production of myopia, irregular astigmatism and loss of corrected distance visual acuity (CDVA) lines. This corneal entity has been reported extensively, mainly after Laser *in Situ* Keratomileusis (LASIK) [1]. There are several parameters such as high myopic corrections, thin corneas and residual corneal bed thickness less than 250 μm , which represent major risk factors for this condition [2].

Therapeutic solutions include spectacle correction, rigid gas permeable contact lenses and intrastromal corneal ring segments [3] in order to achieve adequate visual rehabilitation. Lamellar or penetrating keratoplasty [4] are considered the ultimate solution when all other choices have failed to provide a functional visual acuity.

Corneal Collagen Cross linking (CXL) is a relatively new technique used for the stabilization of ectatic disorders [5,6]. The objective of this technique is the increase of corneal strength and stability by inducing cross links at the corneal stroma [7].

In this case report, we present a patient with post – LASIK ectasia that underwent simultaneous Topography Guided PRK and CXL in the left eye.

CASE REPORT

A thirty-nine year old man was referred to our institute complaining about progressive decreased visual acuity five years after bilateral LASIK. Attempted correction was -1.00 / -2.00 x 20 and -1.25 / -2.50 x 160 in the right and left eye respectively. Pre-LASIK corneal thickness was 543 μm and 550 μm while flap thickness was 193 μm and 180 μm in the right and left eye respectively. At the time of the examination, uncorrected distance visual acuity (UDVA) was 20/40 (Snellen) in the right and 20/100 in the left eye and corrected distance visual acuity (CDVA) was 20/32 (manifest refraction -1.00 -1.50 x 45) for the right eye and 20/40 (manifest refraction +0.50 -4.00 x 125) for the left eye. Topographic findings (Topolyzer, Wavelight, Erlangen, Germany) were consistent with post – LASIK ectasia in both eyes. Keratometry readings were 39.30 x 38 / 40.75 x 128 in the right eye and 37.76 x 139 / 42.29 x 49 in the left eye.

The patient could not achieve functional visual acuity with spectacle correction due to the irregular shape of the cornea. Additionally, the patient had contact lens intolerance.

Patient was advised to undergo simultaneous Topography Guided PRK and CXL treatment in the left eye first (Fig. 1).

TOPOGRAPHY CUSTOMIZED PRK PROCEDURE

PRK was performed before the CXL treatment. The surgical procedure was conducted under sterile conditions. The patient's eye was anesthetized with proparacaine 0.5% (Alcaine). We applied a customized ablation on top of the LASIK flap (T-CAT software, Wavelight, Erlangen, Germany). The epithelium was removed by Transepithelial Phototherapeutic Keratectomy (t-PTK). The t-PTK ablation

*Address correspondence to this author at the Institute of Vision and Optics (IVO), University of Crete, Medical School, 71003 Heraklion, Crete, Greece; Tel: +302810371800; Fax: +302810394653; E-mail: mimi24279@gmail.com