Case Report

Corneal Topograph-guided Laser Subepithelial Keratomileusis (LASEK) Corrects Decentered Ablation after Laser in Situ Keratomileusis (LASIK): A Case Report

Jing Zhang, Huihui Luo, Keming Yu*
Zhongshan Ophthalmic Center, Sun Yat-sen University, Guangzhou 510060, China

Abstract

Purpose: Corneal topograph-guided laser subepithelial keratomileusis (LASEK) can effectively correct decentered ablation occurring post laser in situ keratomileusis (LASIK) and to enhance our understanding and diagnosis of decentered ablation following LASIK.

Methods: Previous studies in the relevant literature are reviewed, and a case report is provided.

Results: A patient with high myopia undergoing LASIK in both eyes presented with distorted vision in the left eye, which interfered with the vision in the right eye and caused blurred vision in both eyes. The patient was unable to see objects with both eyes. After receiving corneal topography-guided LASEK, the signs of distorted vision in the left eye and bilateral blurred vision were significantly alleviated, and the patient could see objects with both eyes simultaneously.

Conclusion: Clinical ophthalmologists should be aware of the occurrence of decentered ablation after LASIK. Corneal topography-guided LASEK is an efficacious tool for correcting decentered ablation. (***Eye Science 2012; 27:202-204***)

Keywords: decentered ablation; corneal topograph-guided; LASEK; LASIK

Introduction

In recent years, laser in situ keratomileusis (LASIK) has been more frequently utilized in clinical practice because of its high efficacy and safety. However, the incidence of surgical complications should be considered. After excimer laser corneal refractive surgery, multiple symptoms, including decreased UCVA and BCVA, glare, monodiplopia, irregular astigmatism, and ocular higher-order aberration increase, thus indicating the possibility of decentered ablation, which seriously affects the visual quality and surgical efficacy of patients. This study reported one case with decentered ablation following LASIK.

Case report

In January 2009, a highly myopic male patient aged 23 years underwent LASIK in another hospital. Preoperative refraction measurements were as follows: OD: -9.00-0.75×85 (0.8), OS: -11.00-0.75×40 (0.8^{-}). The patient had distorted vision in the left eye after surgery, which interfered with the visual acuity of the right eye. Visual field and fundus OCT, ultrasound biomicroscope (UBM), and visual evoked potential (VEP) showed normal results. In October 2010, he received brain MRI in the local hospital, which showed no abnormality. Subsequently, the symptom of distorted vision was exacerbated, and bilateral blurred vision occurred. The patient had to cover the left eye to see objects. He was admitted to our hospital in January 2011. The eye examination revealed the following: naked visual acuity was OD 0.9, OS 0.6; retinoscopy optometry was OS: -0.25 (0.6 +); subjective optometry was -0.5-1.0 ×15 (1.0 +). Fundus fluorescein angiography (FFA), OCT, and synoptophore showed no significant abnormality in the left eye. Corneal topography indicated decentered ablation in the left eye (Figure 1A and 1B). Corneal curvature K1 and K2 were 36.5D and 36.2D, respectively. The diameter of the pupil was 6.6 mm under dark background. The central corneal thickness was 462 μm measured by ultrasound A. The diagnosis was decentered ablation was noted in the left eye after LASIK. The recommended treatment was corneal topograph-guided LASEK

DOI: 10.3969/j.issn.1000-4432.2012.04.010
* **Corresponding author**: Keming Yu, E-mail: yukeming66@126.com

(MEL-80 excimer laser, Zeiss, Germany), which was performed to enhance surgical efficacy in the left eye. The ablation pattern was designed according to corneal topograph-guided software (Figure 2A and 2B). Corneal topography-guided LASEK was conducted to correct decentered ablation after LASIK. Corrected refractive index of LASEK was -0.25-0.75×15. Corneal ablation depth was 45 μm. Compound tobramycin and dexamethasone eye drops were administered 4 times daily for a week. Artificial tears were given 4 times daily. Re-examination at one month postoperative showed that naked visual acuity was 0.9 (OS), corneal epithelia were healed and had become transparent. Postoperative corneal

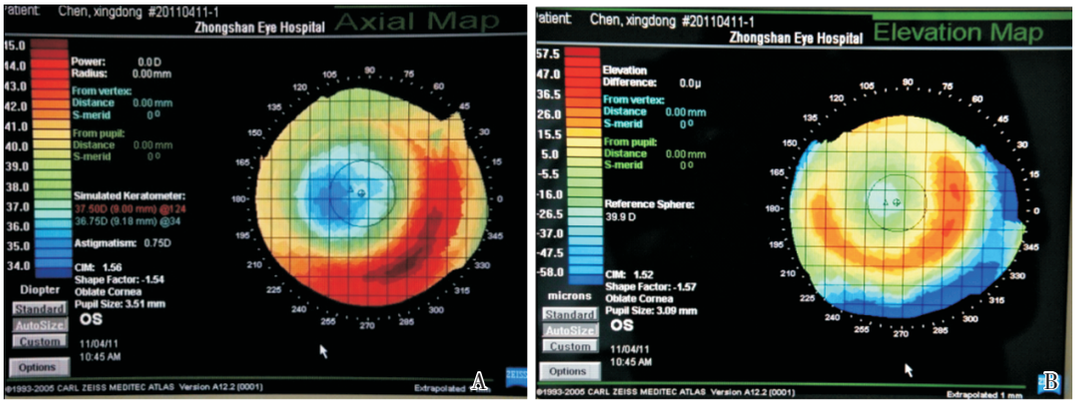

Figure 1 Corneal topography of the left eye: A and B denote curvature and elevation maps respectively, both showing signs of decentered ablation

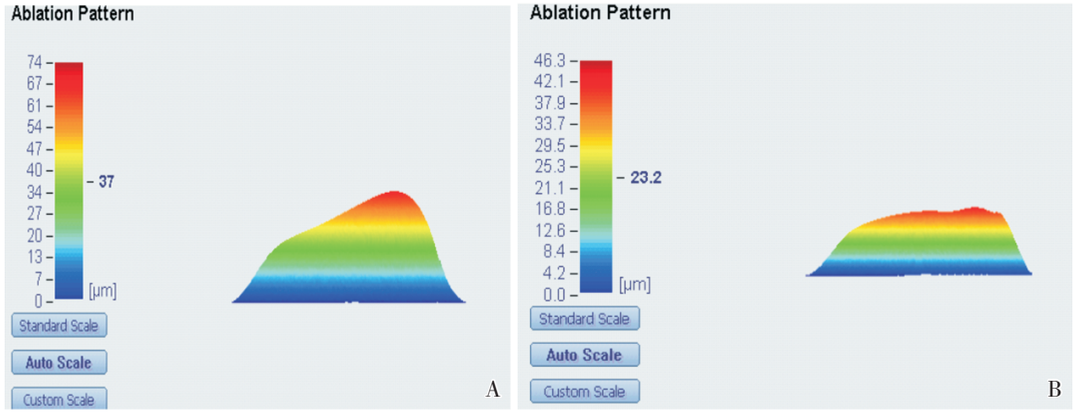

Figure 2 Corneal topography (OS) at a side view before and after surgery: A and B denote expected simulation maps before and after surgery, respectively.

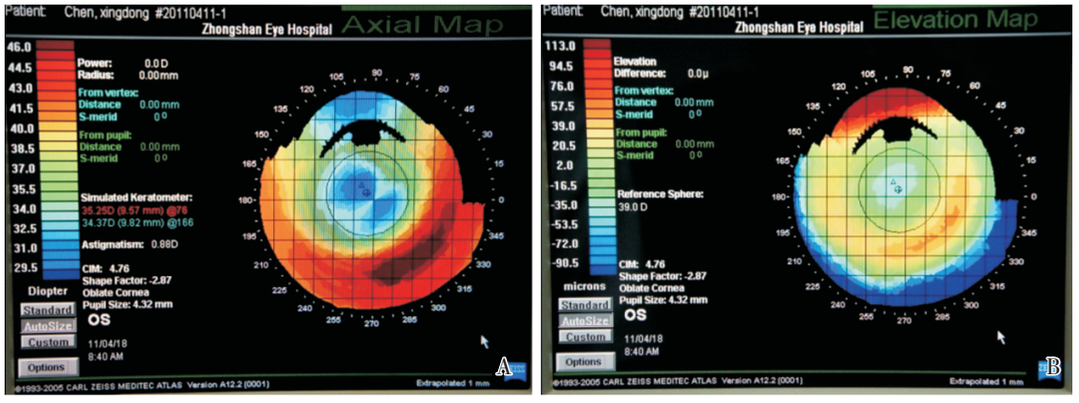

Figure 3 Corneal topography of the left eye after surgical correction: A and B denote curvature and elevation maps, respectively, showing the correction of decentered ablation.

topography revealed that the symptom of decentered ablation was effectively corrected. The patient reported that the distorted vision in the left eye was apparently alleviated, bilateral vision confusion disappeared and he could see objects with both eyes simultaneously without covering the left eye.

Discussion

Decentered ablation is a complication after LASIK. It is probably caused by either the patient's lack of cooperation or tracking failure of laser machine[1]. Because of decentered ablation, the decentered lens may lead to the prism effect and other aberrations, which cause discomfort in the patients[2,3]. The patient in this study presented with distorted vision and bilateral vision confusion, and he was unable to see objects with two eyes simultaneously. Limited test tools and insufficient understanding of decentered ablation after LASIK led to delayed diagnosis and treatment, causing severe pain in the patient.

Previous studies found that corneal topography-guided LASEK is an efficacious tool in correcting decentered ablation after LASIK[4,5]. This surgery is applied mainly to correct decentered ablation, a relatively big central island after LASIK, or corneal deformation induced by corneal transplant and IOL implantation[6-8]. In this case, corneal topography-guided LASEK was efficacious in correcting a decentered ablation that was a post-LASIK complication. The surgery significantly improved the patient's visual acuity and eliminated the symptom of bilateral vision confusion caused by the left eye, indicating that whether or not irregular shapes of cornea are present, they should be considered first in the diagnosis of distorted vision occurring after LASIK. To avoid misdiagnosis and missed diagnosis, surgeons should perform corneal topography and visual acuity tests for patients with relevant symptoms or complaints. In addition, this study also demonstrated that post-LASIK corneal irregularities could be corrected by corneal topography-guided personalized ablation.

References

1 Maldonado MJ, Nieto JC, Pinero DP. Advances in technologies for laser-assisted in situ keratomileusis (LASIK) surgery. Expert Rev Med Devices, 2008, 5(2): 209–229.

2 Reinstein DZ, Archer TJ, Gobbe M. Combined corneal topography and corneal wavefront data in the treatment of corneal irregularity and refractive error in LASIK or PRK using the Carl Zeiss Meditec MEL 80 and CRS-Master. J Refract Surg, 2009, 25(6): 503–515.

3 Liu XY, Li SY. Progression of excimer laser individual ablation guided by corneal topography. International Journal of Ophthalmology, 2009, 9(10): 1949–1951.

4 Song DL, Zhong Y, Shi W, et al. Topography guided customized ablation on irregular astigmatism and higher order aberration. Recent Advances in Ophthalmology, 2009, 29(7): 522–525.

5 McAlinden C, Moore JE. Retreatment of residual refractive errors with flap lift laser in situ keratomileusis. Eur J Ophthalmol, 2011, 21(1): 5–11.

6 Ou JI, Manche EE. Topographic centration of ablation after LASIK for myopia using the CustomVue VISX S4 excimer laser. J Refract Surg, 2007, 23(2): 193–197.

7 Fan R, Di YL, Qiu Y, et al. Ablation induced decentration in post-LASIK eyes. Chinese Journal of Optometry Ophthalmology and Visual Science, 2011, 13(1): 17–22.

8 Wu L, Zhou X, Ouyang Z, et al. Topography-guided treatment of decentered laser ablation using LaserSight's excimer laser. Eur J Ophthalmol, 2008, 18(5): 708–715.