

## Gradual diminish of post Lasik corneal ectasia with a rigid gas permeable lens

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**Abstract:** Corneal ectasia following Laser in situ keratomileusis (Lasik), a known complication can only be treated with the use of rigid gas permeable contact lens, penetrating keratoplasty or corneal cross-linking surgery. A 29 years old Chinese male was diagnosed with corneal ectasia in the right eye several months after bilateral Lasik and was fitted with a rigid gas permeable contact lens in our center. During weeks and months of following visits, the ectasia gradually diminished to protrusion-free corneal shape with the aided visual acuity of 20/25 by the 9.5 months' time. Patient's cornea however did return to its ecstatic state in about 1 week once the rigid lens was ceased to wear as a test of corneal stability. During the follow up visit in 5 years later, although without the trace of ectasia, a steeper base curve of rigid lens was needed for a better fitting pattern, suggesting the cornea had protruded further even under the event of lens wear. The rigid lens seems to have a temporary reverse influence on patient's ectasia condition following Lasik. [ David Chao-Kai Chang, John Ching-Jen Hsiao. **Gradual diminish of post Lasik corneal ectasia with a rigid gas permeable lens.** *Life Sci J.* 2012, 9(4):5793-5795] (ISSN:1097-8135). <http://www.lifesciencesite.com>.863

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### 1. Introduction

Corneal ectasia is progressive steepening and thinning of the cornea after excimer laser corneal refractive surgery that reduces uncorrected and often best spectacle-corrected visual acuity.<sup>1</sup> Management of keratectasia requires the use of rigid contact lenses or penetrating keratoplasty.<sup>2</sup> In this paper, we fitted a rigid gas permeable contact lens on a patient with post Lasik ectasia in his right eye. During the course of following visits, the ectasia was gradually diminished by our daily wear rigid lens. To our surprise, by the 9.5 months' time, the ectasia disappeared completely and there was no sign of any corneal protrusion remains. To test the stability of cornea, patient was told to cease lens wear for 1 week. The ectasia returned when patient came back at 7<sup>th</sup> day follow up. In view of the return of ectasia, the patient was instructed to continue wearing of the same lens until a steeper design of rigid lens was fitted 5 years later.

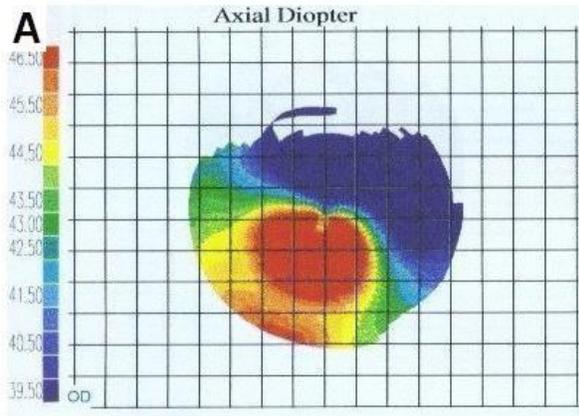
### 2. Material and Methods

Best corrected visual acuity was done by using Topcon phoropter. Documenting ectatic condition was done by Dicon topographer (Paradigm Medical, USA) and keratometry reading via Topcon keratometer. Contact lenses used were traditional tri-curve rigid gas-permeable lens.

### 3. Results

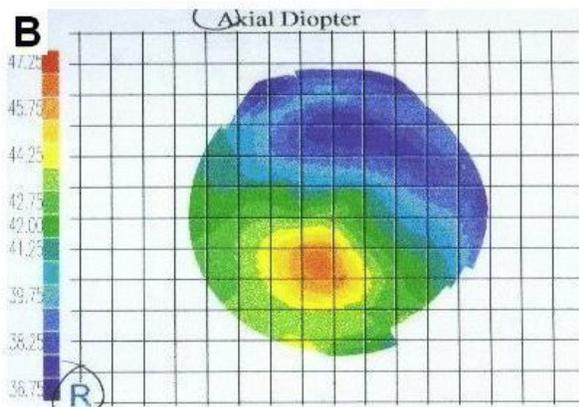
A 29 years old Chinese male with unremarkable health condition had a Lasik refractive surgery done to his both eyes. The pre-operation manifest refraction was  $-4.25 - 2.00 \times 042$  in the right eye, and  $-4.50 - 0.25 \times 175$  in the left eye. Both eyes had the corrected vision of 20/20. The keratometric values were 43.25@029/45.50@119 in the right eye and 43.00@165/44.00@075 in the left eye. Corneal pachymetries (Orbscan) were 557  $\mu\text{m}$  in the right eye and 550  $\mu\text{m}$  in the left eye. Surgery was performed with the VisxStar S4 excimer laser. During the post operation follow-ups, the unaided acuities were 20/20 OD and 20/20 OS for 1 week and 3 week-time. At 10-week follow up visit, the acuity was 20/40 OD and 20/20 OS. At the 15-week follow up visit, the patient had noticed significant worsen of his OD vision. The acuity was 20/400 OD and still 20/20 OS. Corneal topography was taken (Fig. 1) and confirmed corneal ectasia for his right eye. Keratometry readings were 42.25@039/44.00@129. After many trial fitting lenses, the first rigid lens with parameters 7.95/9.8/-7.25 giving an acuity of 20/40- was ordered and given to the patient. After a couple of days of lens adaptation, due to unacceptable lens sensation, a second steeper rigid lens with 7.85/9.8/-3.75 was given to patient to wear as a fitting trail. The patient returned 1 week

later. The patient was pleased with sensation and the corrected vision of the trial lens which gave a visual acuity of 20/30 with an over refraction of -0.50 only. A topography map and keratometry (42.75@015/43.00@105) were performed and both showed a less ectatic condition than in the previous visit. The patient was told to continue wearing the same lens until next follow up visit.



**Fig. 1. Corneal ectasia found at 15 weeks after LASIK surgery, before rigid lens fitting.**

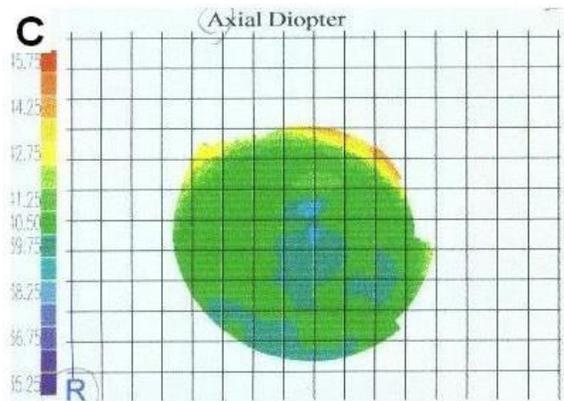
At the follow up visits of 3 weeks, and 4 months (Fig. 2), corneal topography maps continued to show reduced protrusion although no much change were found on Keratometry readings. At 9.5 months post RGP treatment follow up visit, the patient's Ks were 43.25@165/44.25@075, over refraction was +0.75D, and VA was 20/25-. Manifest spectacle refraction was -2.75 -0.75 x 120 giving an acuity of 20/25. A topographic map (Fig. 3) showed no remaining trace of corneal ectasia.



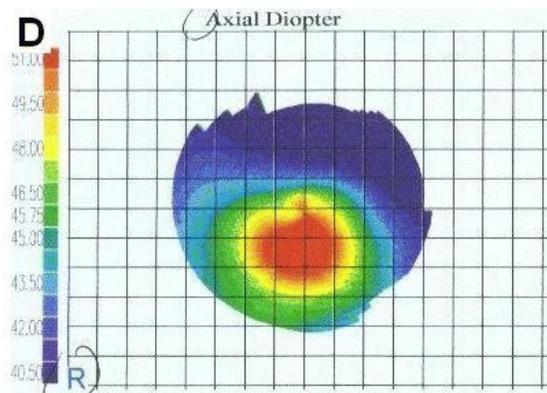
**Fig. 2. Four months post rigid lens treatment.**

The patient was then told to stop wearing the rigid lens as a test of corneal stability. Without too much delay, the patient's right cornea returned to its

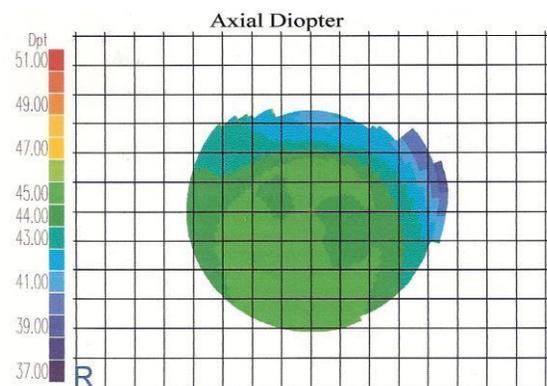
ectatic state in the region where the protrusion had previously presented (Fig. 4). Ks were 47.75@015/48.75@115, and manifest refraction was -6.50 -2.00 x 059, giving an acuity of 20/50. This indicates that the patient's corneal shape is not stable and it requires a rigid lens to help maintaining its curvature. The patient was instructed to resume lens wear.



**Fig. 3. 9.5 months post rigid lens treatment.**



**Fig. 4. 1 week after cease of rigid lens wear**



**Fig. 5. 5 years post rigid lens treatment.**

At the follow up visit of 5 years later, although still no trace of corneal ectasia on the topography map (Fig. 5), the patient's corneal curvature had steepened and was refitted with a steeper base curve of rigid lens for a better fitting pattern. The new lens design was 7.60/9.8/-5.00.

## 5. Conclusion

Corneal ectasia after LASIK represents a unique alteration in corneal integrity that presents as progressive inferior corneal steepening, an increase in myopia, an increase in astigmatism loss of uncorrected visual acuity, and often loss of BCVA.<sup>6</sup> In views of corneal curvatures changes in our patient's post Lasik ectatic eye, we conclude that the use of rigid gas permeable contact lens may help to restrict, slow down or reverse the corneal protrusion following Lasik surgery.

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## References

1. Randleman JB, Woodward M, Lynn MJ. Risk Assessment for Ectasia after Corneal Refractive Surgery. *American Academy of Ophthalmology* 2008; 115:37-50.
2. Geggel HS, Talley AR. Delayed onset keratectasia following laser in situ keratomileusis. *J Cataract Refract Surg.* 1999 Apr; 25(4):582-6.
3. Binder PS. Ectasia after laser in situ keratomileusis. *J Cataract Refract Surg.* 2003 Dec; 29(12):2419-29. Review.
4. Toshino A, Uno T, Ohashi Y, Maeda N, Oshika T. *J Cataract Refract Surg.* Transient keratectasia caused by intraocular pressure elevation after laser in situ keratomileusis. 2005 Jan; 31(1):202-4.
5. Choi HJ, Kim MK, Lee JL. Optimization of contact lens fitting in keratectasia patients after laser in situ keratomileusis. *J Cataract Refract Surg.* 2004 May; 30(5):1057-66.
6. Randleman JB, Russell B, Ward MA, Thompson KP, Stulting DR. Risk Factors and Prognosis for Corneal Ectasia after LASIK. *American Academy of Ophthalmology* 2003; 110:267-275.

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