

# Macular Dystrophy in a Post LASIK Patient

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## Abstract

LASIK (Laser Assisted In situ keratomileusis) is the most commonly performed refractive surgery worldwide. A detailed pre operative and post operative evaluation of the anterior and posterior segment is a must. A 35 year old male patient with a history of LASIK surgery done 13 years back presented to us with complaint of painless, progressive diminution of vision in both eyes from past 2 years. Dilated retinal examination showed bulls eye maculopathy in both eyes. Macular OCT showed gross reduction in central foveal thickness. ERG showed marked reduction in photopic responses suggestive of a cone dystrophy. Treatment aims at alleviating the symptoms and use of low vision aids. Genetic counselling may be of benefit for affected individuals and their families.

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**Keywords:** LASIK, Bulls eye maculopathy, cone dystrophy, genetic counselling.

## Introduction

LASIK is the most popular and commonly performed refractive surgery worldwide.<sup>1</sup> Along with anterior segment, a detailed evaluation of the posterior segment is a must on follow up visits to rule out any retinal lesions such as degenerations, dystrophies, maculopathy etc; as these can occur irrespective of any procedure performed.

## Case Report

A 35 year old male patient came to us with a history of LASIK surgery done 13 years back in both eyes for a power of -7.0D sphere. Patient was comfortable with his vision after surgery and had no complaints for 11 years, after which he noticed blurring of vision in both eyes (more in the left eye). UCVA was 6/18p and 6/24p in right and left eye respectively. Subjective refraction was -1.00D sph / -0.50 cyl@ 160 (6/18, N8) in the right eye and -0.50D cyl@ 50 (6/18p, N10) in the left eye. Patient did not give any history of similar complaints in the family.

Slit lamp examination showed well apposed flap with clear interface in both the eyes. Intraocular pressure was within normal limits. Retinal examination revealed healthy optic disc with CDR (Cup disc ratio) of 0.3. Macula showed fine retinal pigment epithelial (RPE) alterations mimicking 'Bulls eye maculopathy' and periphery of the retina had adequately barraged lattice degeneration in multiple quadrants in both eyes. These findings were suggestive of some form of retinal dystrophy. Colour vision of the patient was evaluated and revealed Red - Green colour deficiency. Patient was subjected to further investigations.

## Investigations

Both eyes corneal topography (Pentacam) showed good central flattening with no signs of ectasia. Macular OCT in both eyes showed gross reduction in central foveal thickness (CFT) suggestive of foveal thinning. Both eyes ERG showed marked reduction in photopic responses suggestive of a cone dystrophy.



Figure 1: Fundus photo of Right eye showing Bulls eye maculopathy



Figure 2: Fundus photo of left eye showing Bulls eye maculopathy

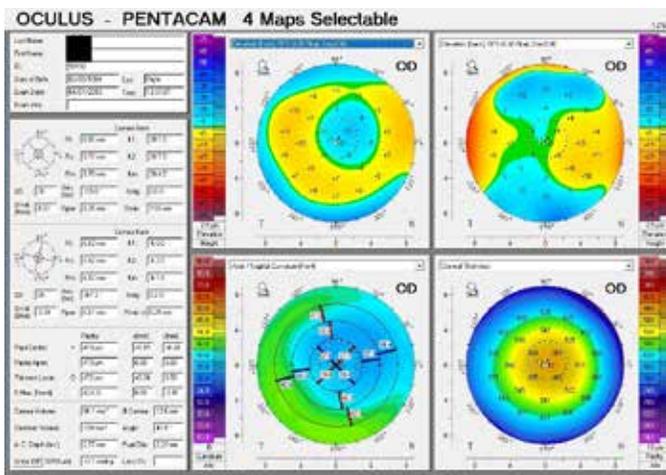


Figure 3: Pentacam of Right eye showing good central flattening

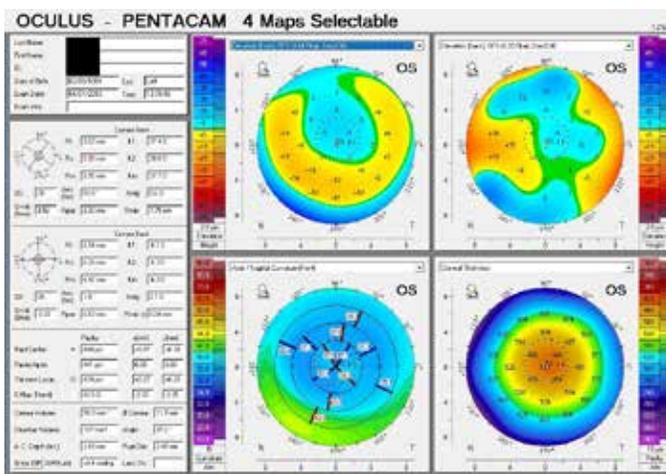


Figure 4: Pentacam of Left eye showing good central flattening

**Discussion**

Cone dystrophy is a rare genetic disorder with onset in teenage or late adult life. It affects the cone cells of the retina. It is inherited as an autosomal dominant, autosomal recessive or X-linked recessive trait.

The 6 identified genes involved predominantly in cone dystrophy are CACNA2D4, CNGB3, PDE6, PDE6H (Autosomal recessive) and OPN1LW, OPN1MW (X-linked). 4 genes involved in combined cone – rod dystrophy are GUCA1A (Autosomal dominant), ABCA4, CNGA3 (Autosomal recessive) and RPGR (X-linked).<sup>2</sup>

**Types of Cone dystrophy:**

1. Stationary cone dystrophy: It usually presents at birth or early childhood and symptoms tend to remain stable.
2. Progressive cone dystrophy: In this the symptoms slowly become worse over time.<sup>3</sup> The age of onset, progression and severity of cone dystrophy can vary greatly from one person to another. Symptoms include decreased visual acuity, colour vision defects, photophobia and decreased sensitivity in the central visual field.<sup>3,4</sup>

Retinal examination may show a symmetric bull’s-eye pattern of macular atrophy or more severe atrophy,

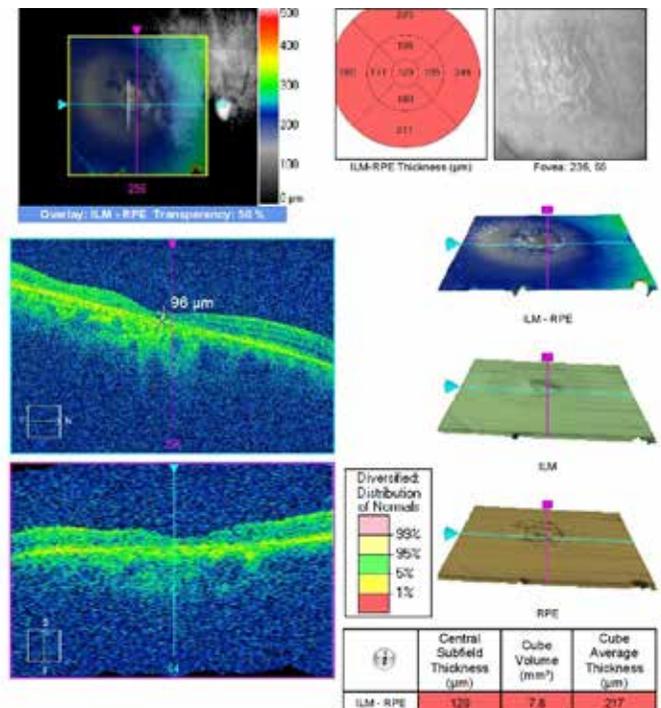


Figure 5: OCT macula of right eye showing foveal thinning

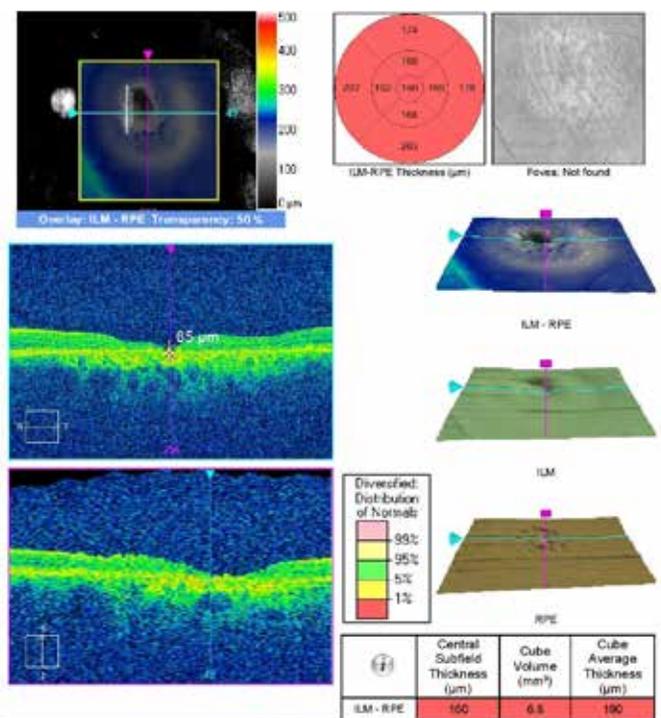


Figure 6: OCT macula of left eye showing foveal thinning

such as demarcated circular macular lesions. Visual field examination shows central scotoma. Diagnosis is made by an abnormal or non-recordable photopic ERG which is characterised by marked reduction of the photopic a-wave and 30 Hz flicker response. The 30 Hz flicker reduced response is highly suggestive of reduced cone function.<sup>5</sup> Pattern ERG is also reduced in cone dystrophy and also acts as a point of differentiation between pure macular dystrophy

and cone dystrophy.<sup>6</sup>

Similar cases of cone dystrophy have been reported earlier in patients who have undergone LASIK surgery. None of the cases report direct correlation between the LASIK surgery and cone dystrophy. It is purely a genetic condition and LASIK surgery is not associated with the onset or progression of the disease.<sup>7,8</sup>

There is no specific cure for cone dystrophy. Treatment aims at alleviating the symptoms which includes use of dark glasses to reduce photophobia and use of low vision aids like stand magnifiers in advanced cases to assist reading and for other activities. Possible future treatments may include: gene therapy, stem cell therapy, and retinal implants.<sup>9,10</sup> Genetic counselling may be of benefit for affected individuals and their families.

### Conclusion

Gradual, painless loss of vision in a post LASIK patient is a rare encounter in daily practice, the reason is usually a pathology in the cornea like regression or ectasia. However it is necessary to do a thorough evaluation to rule out the rare circumstances in which the cause could arise from the retina to avoid unnecessary speculation and intervention.

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