Case Report

Bilateral Photic Maculopathy Following Pterygium Excision: Spectral Domain Optical Coherence Tomography Findings

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Abstract

Purpose: To report high resolution spectral domain optical coherence tomography (SD-OCT) findings in a case with bilateral photic maculopathy and resultant central scotoma following pterygium excision.
Case Report: A 38-year-old man with a history of pterygium excision complained of visual disturbance and annoying central scotoma in both eyes. Although he had subtle funduscopic and angiographic changes, SD-OCT precisely showed disruption of the photoreceptors inner segment/outer segment in the foveal center.
Conclusion: Phototoxic macular damage following ocular surgeries may be diagnosed with difficulty due to subtle funduscopic findings. SD-OCT is a precise imaging in revealing characteristic retinal alterations in different foveal injuries. Ophthalmologists should be aware of the possibility of photic maculopathy following various ophthalmic operations including pterygium surgery.

Keywords: Microscope-induced Retinopathy; Pterygium Excision; Spectral Domain Optical Coherence Tomography

J Ophthalmic Vis Res 2016; 11 (4): 436–438.

INTRODUCTION

Exposure to an intense light source such as the operating microscope may result in phototoxic retinal injury.[1] Operating microscope-induced retinopathy has been reported following extracapsular cataract extraction, phacoemulsification, penetrating keratoplasty, vitrectomy[1] and pterygium excision.[2]

Spectral domain optical coherence tomography (SD-OCT) is useful in revealing characteristic retinal alterations in various foveal injuries. In this report, we present high resolution SD-OCT findings in a case with operating microscope-induced bilateral photic maculopathy following uncomplicated pterygium excision.

CASE REPORT

A 38-year-old man was admitted to our clinic complaining of visual disturbance and annoying central scotoma in both eyes, with a history of pterygium surgery with conjunctival autograft of the right and left eyes at a 4-week interval respectively, 12 months earlier. According to his operation reports, the procedure was done using an injection of lidocaine 2% under the pterygium bed and additional aliquots in the area of the donor site while supplemental nasal oxygen had also been utilized. The pterygium excision and autograft was completed in 30-35 minutes. Coaxial illumination of a Topcon OMS-610 microscope (Topcon Corporation, Japan) from a 50-watt halogen bulb fitted with ultraviolet filters was used during the entire procedure. Two weeks after the operation of the left eye, the patient experienced bilateral central scotoma in his visual field but because of unremarkable fundus examination his symptom was not taken serious and the scotoma persisted

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Received: 21-02-2015 Accepted: 12-06-2015

Access this article online

Quick Response Code:

Website: www.jovr.org

DOI: 10.4103/2008-322X.194143

without any change. He had no history of medical diseases or systemic medication use. He had previously experienced no hazardous light exposure except during his recent pterygium surgery. The refractive error was 0.50 diopter of astigmatism in each eye and corrected visual acuity was 20/30. Detailed fundus examination showed subtle bilateral central foveal pigment stippling which correlated with a small hypofluorescent spot in fluorescein angiography. The SD-OCT study disclosed preserved foveal contour and a normal vitreoretinal interface with a disruption of the hyper-reflective layer of the photoreceptors' inner segment-outer segment (IS-OS) in both eyes [Figures 1 and 2].

DISCUSSION

Photic maculopathy has been well documented in sun-gazing[3] and it is also reported in different ocular surgeries particularly in the setting of anterior segment procedures.[1] In contrast to coaxial light, oblique illumination contributes minimally to retinal injury.[1] Although duration threshold to produce a phototoxic lesion by coaxial light has been estimated to be as short as 7.5 minutes, it depends on illumination intensity, media clarity, pupil size, immobility of the eye with retrobulbar anaesthesia during surgery, use of photosensitizing agents and the use of supplemental oxygen.[4-6]

In the present case, use of coaxial light for surgical field illumination during entire procedure, clear ocular media, no corneal coverage during operation and utilization of supplemental oxygen were predisposing factors to photic maculopathy.

The SD-OCT disclosed loss of the hyper-reflective IS-OS layer of the central fovea in both eyes manifesting as a cyst like lesion under the fovea. These findings were comparable to previously reported SD-OCT findings in solar maculopathy.[3]

Unilateral photic maculopathy following pterygium excision has previously been reported in a 27-year-old woman with retrobulbar anaesthesia[2]. Herein, we present SD-OCT findings of bilateral photic maculopathy following pterygium excision; the operations were done under local anaesthesia.

Knox Cartwright et al[7] have reported recovery of photic maculopathy induced visual scotoma during 6-12 months following prolonged exposure to the operating microscope light; however the symptoms of our patient persisted for one year following injury. Although our case had no significant funduscopic or angiographic findings, SD-OCT precisely localized the main site of retinal damage correlating with patient's symptoms.

In summary, ophthalmologists could encounter photic maculopathy following a variety of ophthalmic operations including pterygium surgery. During the operation, minimal utilization of coaxial microscopic light, corneal covering and minimal use of supplemental oxygen in young patients could reduce the risk of photic maculopathy.

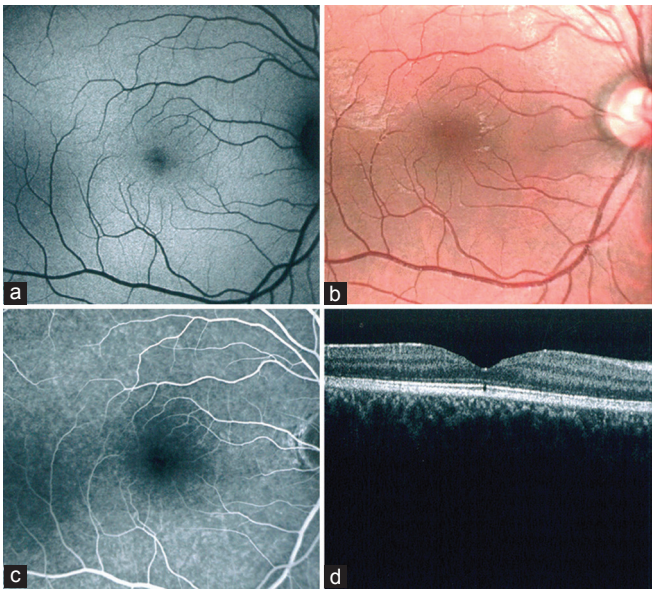

Figure 1. (a) Fundus autofluorescence, (b) fundus photography, (c) fluorescein angiography, and (d) SD-OCT imaging of the right eye. Small region of central foveal pigment stippling is shown on the color fundus photography which is compatible with a tiny hypofluorescent spot in the autofluorescence and fluorescein angiography imagings. SD-OCT shows disruption and loss of the hyper-reflective inner segment-outer segment layer under the fovea.

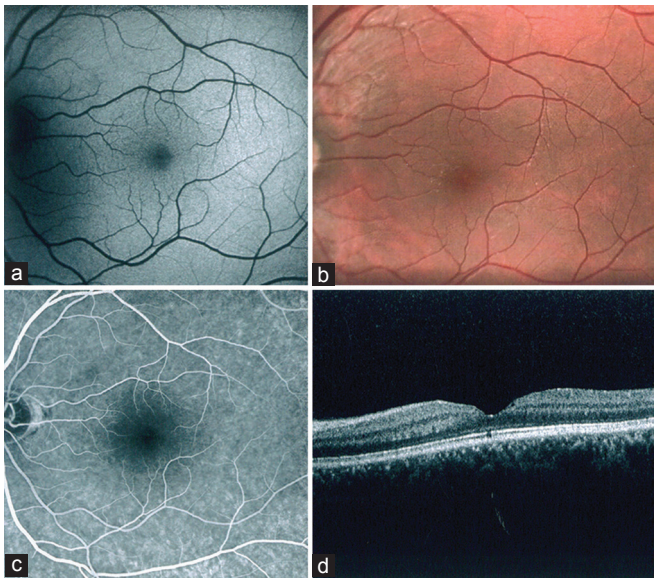

Figure 2. (a) Fundus autofluorescence, (b) fundus photography, (c) fluorescein angiography, and (d) SD-OCT imaging of the left eye. Small region of central foveal pigment stippling is shown on the color fundus photography which is compatible with a tiny hypofluorescent spot in the autofluorescence and fluorescein angiography Imagings. SD-OCT shows disruption in the inner segment-outer segment layer under the fovea.

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How to cite this article: Jabbarpoor Bonyadi MH. Bilateral photic maculopathy following pterygium excision: Spectral domain optical coherence tomography findings. J Ophthalmic Vis Res 2016;11:436-8.

Source of Support: Ophthalmic Research Center, Shahid Beheshti University Of Medical Sciences. **Conflict of Interest**: None declared.