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Case Report

Long-term Follow-up of Optic Disc Pit Maculopathy Treated with Laser Photocoagulation: A Case Report

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Abstract

This report describes a case of optic disc pit maculopathy treated successfully with laser photocoagulation. Optical coherence tomography (OCT) was used to assess the optic nerve and the macular area. Green laser photocoagulation was performed in an arcuate pattern to manage the macular edema. Eighteen months later, OCT showed complete regression of the macular edema. Fifty months after the laser treatment, visual acuity remained 20/20. The results of an Amsler grid test were negative and the macular area was visualized as normal. Slit-lamp laser photocoagulation is a minimally invasive technique that should be considered as a first-line treatment option in patients with optic pit maculopathy who retain their visual capacity.

Keywords: Green laser, metamorphopsia, minimal invasive treatment, optical coherence tomography, optic disc pit.

Introduction

Optic disc pit (ODP) is a rare, congenital anomaly with an incidence of 1 in 11.000 individuals that typically appears as a circumscribed, discolored (often gray), oval-shaped depression of the optic disc (1). It is thought to arise due to an incomplete closure of the fetal fissures affecting the lamina cribrosa; a herniation of dysplastic retinal tissue becomes a collagen-rich excavation extending toward the subarachnoid space (2). Most cases are asymptomatic, though significant visual deterioration may be observed when maculopathy occurs, a complication detected in 25% to 75% of patients with ODP (3). ODP maculopathy (ODP-M) is a clinical entity, which presents with serous detachment, cystic degeneration, and changes to the retinal pigment epithelium, and is characterized by the accumulation of intraretinal and/or subretinal fluid (3).

Several theories have been proposed to explain the origin of the fluid seen in ODP-M. Possibilities reported include the vitreous body, the choroid, cerebrospinal fluid, and leakage from blood vessels at the site of the ODP (1).

There are no universally accepted guidelines for the treatment of ODP-M; however, laser photocoagulation, vitrectomy, gas tamponade and/or inner limiting membrane (ILM) peeling, macular buckling surgery, and recently, autologous platelet injection after pars plana vitrectomy, are among the

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therapeutic interventions used in clinical practice (4).

This case of ODP-M was successfully managed with laser photocoagulation.

Case Report

A 66-year-old male patient presented at the outpatient service complaining of blurred vision in his right eye. A full ophthalmological examination was performed. His uncorrected visual acuity (UVA) was 20/20 in both eyes, but the results of an Amsler grid test were positive in the right eye. The intraocular pressure (IOP) was 35 mmHg in the right eye (OD) and 15 mmHg in the left eye (OS). No abnormalities were observed in the anterior segment. A dilated fundus examination disclosed a glaucomatous optic disc with an estimated cup to disc ratio of 0.8 and retinal elevation from the optic disc to the foveola in the OD. Optical coherence tomography (OCT) revealed an optic pit with serous detachment of the retina in the OD. Treatment with a prostaglandin analogue to be administered in a dose of one drop once daily was introduced and a 6-month follow-up program was suggested. On re-examination 6 months later, the UVA was found to be unchanged and the IOP in the OD was 13 mmHg. However, the patient mentioned a significant worsening of the metamorphopsia symptoms that affected his daily life activities. OCT showed a progression of intraretinal fluid toward the foveola. To address the deterioration of the clinical picture, 14 burns with a green laser were performed in an arcuate pattern (60–27 mW of energy and spot size of 50μm) (Fig. 1) at the temporal side

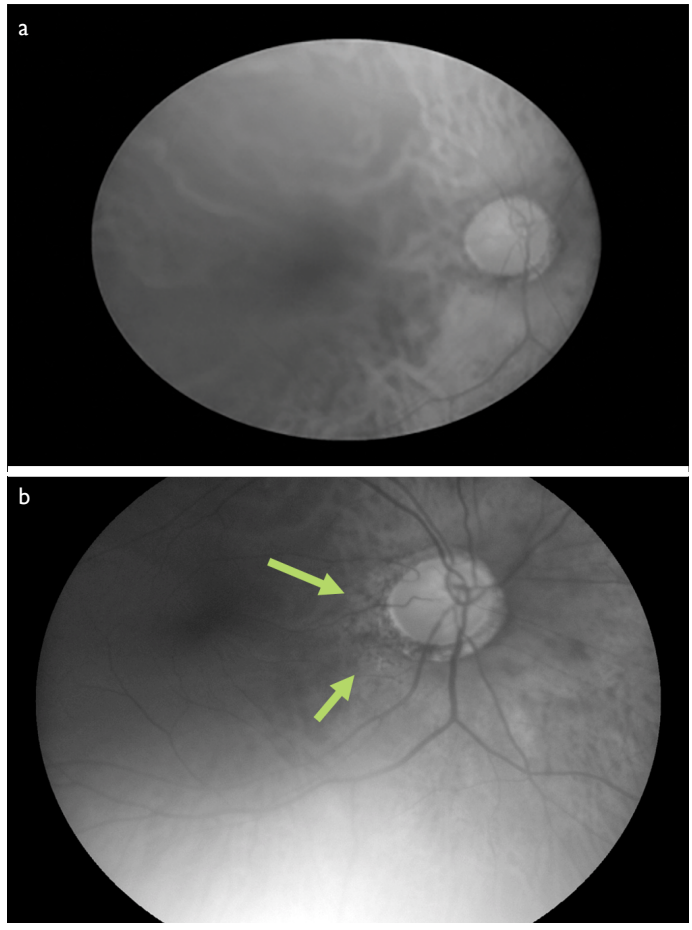

Figure 2. (a) Infrared fundus photograph of the right eye before laser photocoagulation. **(b)** Infrared fundus photograph of the right eye after laser photocoagulation showing the laser scars on the temporal side of the optic disc (green arrows).

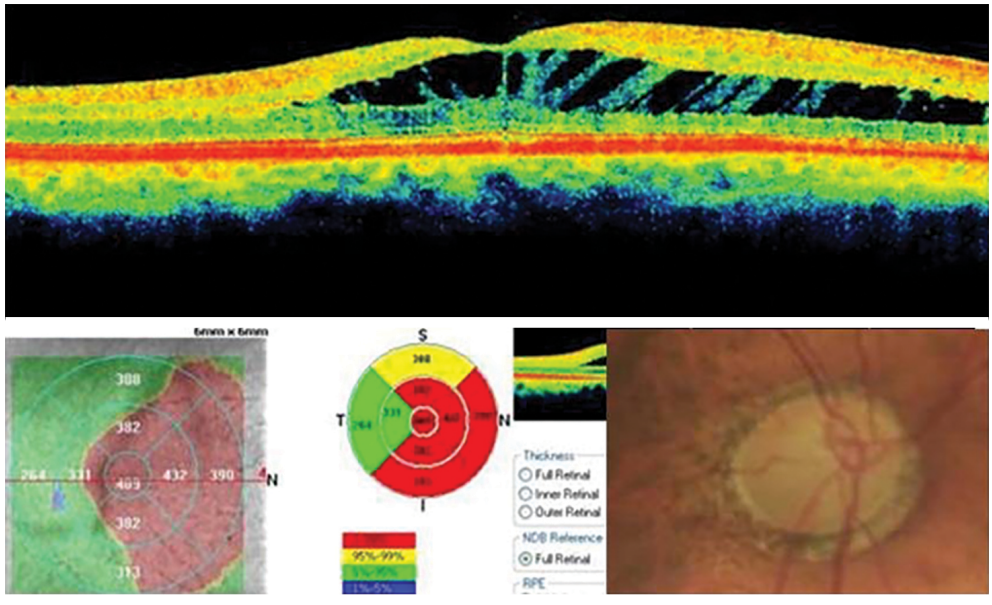

Figure 1. Optical coherence tomography images of the right eye showing fluid in the outer nuclear layer of the retina and a color fundus photograph of the right optic disc indicating the presence of an optic disc pit.

of the right optic disc (Fig. 2). Eight months later, it was observed that the macular edema had improved, and 18 months after the treatment, no fluid was detected on OCT. Fifty months after the laser treatment, the UVA remained 20/20, an Amsler test was negative, there were no subjective complaints of metamorphopsia, the IOP was normal, and complete regression of the macular edema was visible on OCT (Fig. 3).

Discussion

ODP is one of several congenital cavitary anomalies with a similar impact on visual capacity. ODP is characterized by isolated cavitations, usually located on the temporal side of the optic disc. Related maculopathy occurs in 2 steps: intraretinal pooling of fluid and consequent retinoschisis, and extension of the fluid in the subretinal layers through an outer break (3,5).

Although spontaneous resolution has been reported in approximately 25% of cases, the general visual prognosis is poor. Steel et al. (6) conducted a retrospective study of 134 eyes to evaluate the risk factors associated with poor vision in patients with ODP-M. The researchers found that extension of the edema beyond the vascular arcades and the presence of both subretinal fluid and outer retinal layer fluid were among the primary determinants for poor visual acuity.

Different treatment options for ODP-M have been proposed; however, the efficacy of each therapeutic intervention seems to be controversial. Pars plana vitrectomy with laser treatment, gas tamponade, and/or ILM peeling is the most used surgical procedure, with a reported success rate of approximately 50% (5). Pneumatic retinopexy with an intravitreal gas tamponade with or without laser application is another therapeutic option with encouraging outcomes (7). Scleral buckling is a newer surgical approach with satisfactory long-term visual and anatomical outcomes proposed by Theodossiadis et al. (8).

Slit-lamp laser photocoagulation is an initial, minimally invasive treatment options for the management of ODP-M. Laser spots applied to the temporal side of the peripapillary area are used to create chorioretinal adhesion, which interrupts circulation of the fluid into the subretinal space (9).

According to the available literature data, the efficacy of laser treatment is controversial; some published reports demonstrate full absorption of fluid and reattachment of the retina after laser photocoagulation, while other reports note low success rates and severe perimetrical defects (9).

In our case, the macular edema completely resolved following laser treatment, and the disturbing metamorphopsia was eliminated. The patient's visual capacity remained consistent for the follow-up period of 50 months, with no signs of macular edema. Inferotemporally, there was a significant retinal nerve fiber layer (RNFL) loss detected during follow-up. However, temporally, there was no loss of RNFL seen where laser photocoagulation was applied. The inferotemporal RNFL loss may have been a result of advanced glaucoma (Fig. 4). In conclusion, given that slit-lamp laser photocoagulation is a minimally invasive technique, it should be considered as a first-line option, particularly in patients who have maintained their visual acuity despite macular edema.

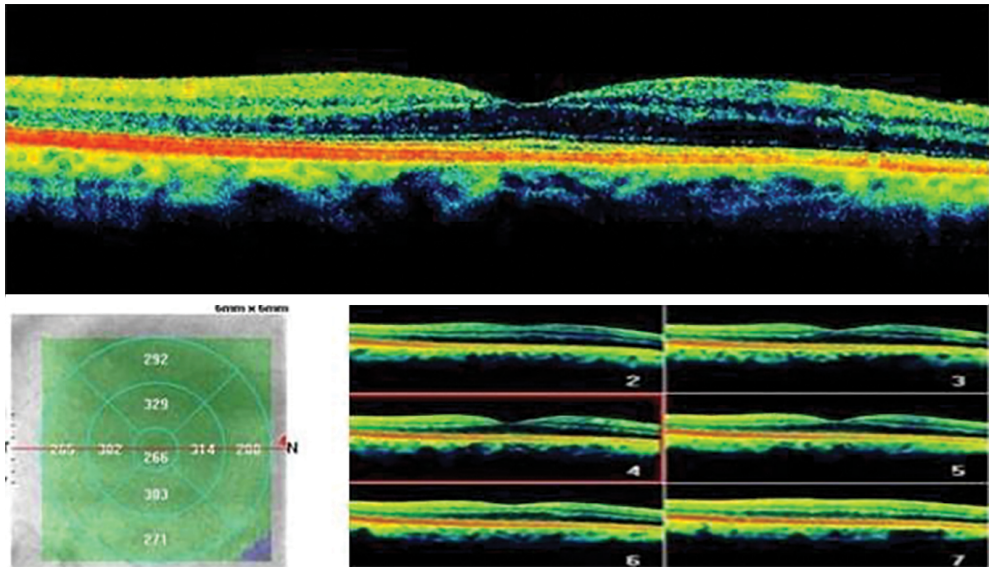

Figure 3. Optical coherence tomography images of the right eye 50 months after the laser photocoagulation treatment.

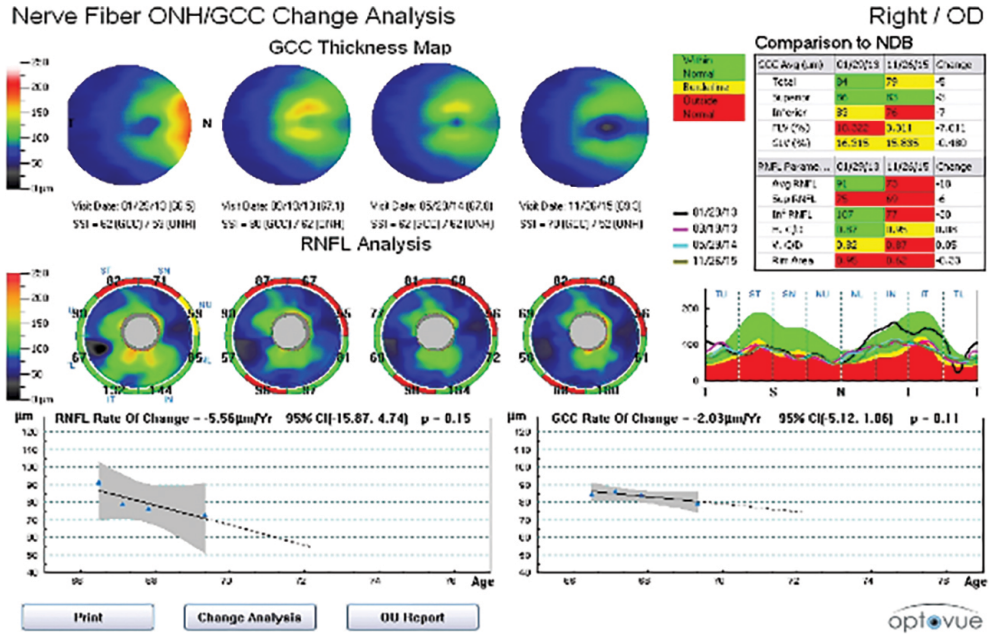

Figure 4. Nerve fiber optic nerve head/ganglion cell complex analysis of the right eye.
GCC: Ganglion cell complex; NDB: Normative database; RNFL: Retinal nerve fiber layer

Disclosures

Informed consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

Authorship Contributions: Involved in design and conduct of the study (ST); preparation and review of the study (DD, IP, AP, CM, EKP); data collection (EKP, CM, AP).

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