—Case Reports—

Cystoid Macular Edema Associated with Omidenepag Isopropyl in Phakic Eyes after Laser Iridotomy: A Case Report

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Decreased vision and cystoid macular edema (CME) developed in phakic eyes of a patient who underwent laser iridotomy after changing the glaucoma eye drops from carteolol 2% long-acting ophthalmic solution to omidenepag isopropyl 0.002%. CME completely disappeared at approximately 2 months after discontinuation of omidenepag isopropyl in conjunction with the use of bromfenac sodium 0.1%.
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Key words: omidenepag, glaucoma, laser iridotomy, cystoid macular edema, CME

Introduction

Glaucoma is a leading cause of irreversible visual function loss[1,2]. At the present time, the only reliable treatment is the use of intraocular pressure (IOP) reduction therapy, which has been shown to slow the progression of visual field defects[1,3]. Antiglaucoma eye drops are generally started as the first treatment for primary open-angle glaucoma (POAG)[1]. In contrast, laser iridotomy (LI) or cataract surgery have been the standard first-line treatment for primary angle-closure glaucoma (PACG) and primary angle-closure (PAC)[1,4]. However, if the IOP remains high after LI or cataract surgery, then antiglaucoma eye drops are started[1].

Although prostaglandin F2α analogs (PGF2α) have been widely used as a first-line treatment for glaucoma[1], a new antiglaucoma eye drop, omidenepag isopropyl 0.002% ophthalmic solution (omidenepag, EYBELIS®; Santen Pharmaceutical Co., Ltd., Osaka, Japan), which is a selective prostaglandin E2 receptor 2 (EP2) agonist, became available for the treatment of glaucoma and ocular hypertension (OHT) in Japan starting in 2018[5–10]. A previous study reported that omidenepag was not inferior to latanoprost 0.005% for the reduction of IOP in patients with OHT or POAG[7]. Moreover, omidenepag has also been shown to have few cosmetic problems such as deepening of the upper eyelid sulcus, or any increase of the iris pigmentation and eyelash changes of the so-called prostaglandin-associated periorbital syndrome, unlike that observed for PGF2α[5–10]. However, it has been reported that cystoid macular edema (CME) was a rare but serious side effect of omidenepag, similar to that seen for PGF2α. Interestingly, this complication was reported only in pseudophakic eyes[5], and so far, there have been no cases of CME reported in phakic eyes.

In the following report, we describe a PACG patient with a history of LI who developed CME in both eyes at 4 months after changing from carteolol 2% long-acting ophthalmic solution (carteolol LA) to omidenepag eye drops.

Case Report

A 59-year-old Japanese woman was referred to our hospital for treatment of PACG in both eyes. She had no history of systemic diseases and was not taking any systemic drugs. At her first visit, corrected visual acuity was 20/20 in both eyes, with an IOP of 14 mmHg in the right eye and 12 mmHg in the left eye. Both eyes had been treated with tafluprost ophthalmic solution 0.0015% by a previous doctor. The axial length was 24.01 mm in the right eye and 23.91 mm in the left eye. Slit lamp exami-

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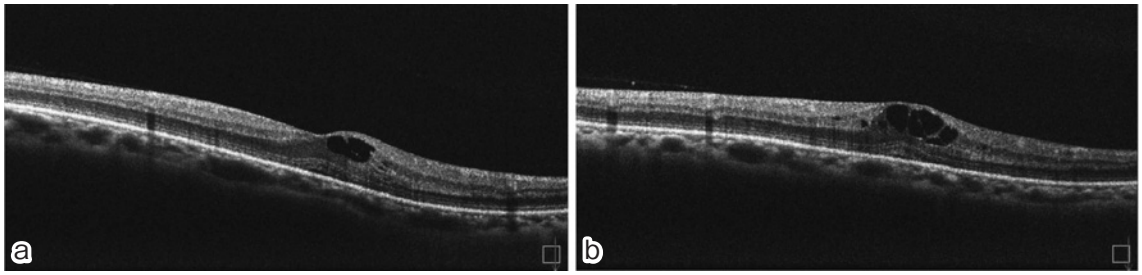

Fig. 1 a (right eye) and b (left eye): Cross-sectional OCT images of both eyes demonstrated the presence of CME at 4 months after the instillation of omidenepag.

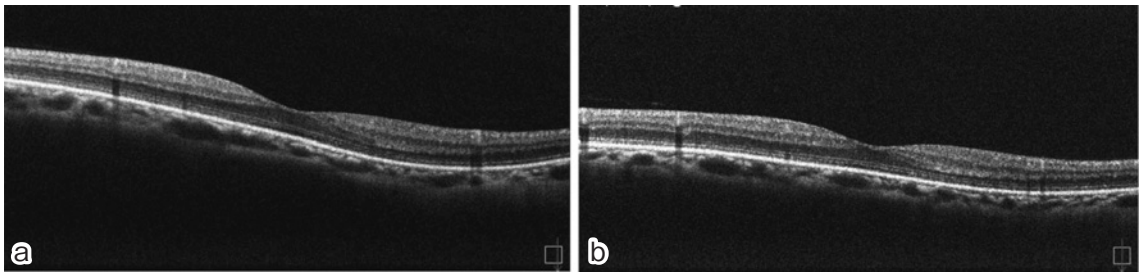

Fig. 2 a (right eye) and b (left eye): The CME completely disappeared at approximately 2 months after discontinuation of omidenepag in conjunction with the use of bromfenac sodium 0.1%.

nation revealed the presence of a shallow anterior chamber (Van Herick grade 1) in both eyes. Her anterior chamber depth was 2.2 mm in the right eye and 2.3 mm in the left eye. Gonioscopy revealed a narrow angle and a superior functional angle closure in both eyes. There was also a family history, with her mother having acute PAC. Based on these findings, LI was recommended and she subsequently underwent LI in both eyes. After undergoing the LI procedure, she used latanoprost ophthalmic solution 0.005% eye drops once per day each night in both eyes for 2 months, with the latanoprost then changed to carteolol LA once per day each night in both eyes. However, her IOP did not reach the target IOP (< 18 mmHg) with the use of either eye drop. At 6 months after the LI, carteolol LA was changed to omidenepag once per day each night in both eyes. At approximately 2 months after changing the eye drop, her IOP was 16 mmHg in the right eye and 14 mmHg in the left eye. At approximately 4 months after changing the eye drop, she reported blurred vision in both eyes. Her corrected visual acuity was 20/25 in both eyes, while the IOP was 21 mmHg in the right eye and 17 mmHg in the left eye. Optical coherence tomography (OCT) demonstrated the presence of bilateral CME (**Fig. 1**). Based on these findings, we decided to discontinue the omidenepag in conjunction with adding the use of bromfenac sodium 0.1% hydrate twice per day. As a result, 2 months later the CME completely disappeared (**Fig. 2**). Subsequently, her corrected visual acuity was restored to 20/20 and her IOP was 18 mmHg in both eyes.

Discussion

Omidenepag is a selective prostaglandin EP2 receptor agonist with a non-prostaglandin structure that reduces the IOP by increasing the outflow facility and the uveoscleral outflow[5,9]. It has been previously reported that the IOP-lowering effect of omidenepag was comparable to that observed for latanoprost 0.005% in patients with OHT or POAG[5,7]. Therefore, omidenepag can be used as a first-line drug in the management of glaucoma, similar to that for PGF2α. However, the side effects of conjunctival hyperemia, corneal thickening, and punctate keratitis were reported to occur at a slightly greater rate for omidenepag as compared to latanoprost in the multicenter, open-label, phase 3 RENGE study[5]. Moreover, macular edema including CME occurred in 4.7% of patients treated with omidenepag. All eyes with CME were reported to be pseudophakic[5].

It has been pointed out that prostaglandin analogues may be associated with pseudophakic CME[10] and a previous study reported that prostaglandin analogues had no statistically significant effect on the blood-aqueous barrier of phakic eyes with POAG or OHT[10]. However, in discordance with the previous report, CME occurred in the

phakic eyes treated with omidenepag in our patient. We speculate that this could be associated with the history of LI in this patient.

LI is the standard treatment for PAC and PACG. Although LI may cause blood-aqueous barrier breakdown[11], CME has rarely developed after LI[12]. However, the instillation of omidenepag after the LI could lead to the breakdown of not only the blood-aqueous barrier but also the blood-retinal barrier, and thus, consequently induce CME.

In summary, our phakic patient who underwent LI developed CME after the instillation of omidenepag. This indicates that caution must be taken when using omidenepag after LI, even in phakic eyes.

Conflict of Interest: All authors have declared no conflicts of interest.

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