Resolution of Optic Disc Pit Maculopathy with Topical Brinzolamide and Nepafenac: A Case Report and Literature Review

Arshad Mehmood[1] and Muhammad Abdul Rehman Siddiqui[2,3]

[1]*LRBT Tertiary Teaching Eye Hospital, Karachi, Pakistan*
[2]*Department of Ophthalmology and Visual Sciences, Shahzad Eye Hospital, Karachi, Pakistan*
[3]*Department of Ophthalmology and Visual Sciences, The Aga Khan University Hospital, Karachi, Pakistan*

ABSTRACT

Optic disc pit (ODP) is a rare ocular congenital anomaly. Fluid from the optic disc enters retinal layers, causing retinoschisis and inverse lamellar holes. This results in gradual visual loss. Various treatments have been tried in ODP-maculopathy (ODP-M). An early adolescent female presented with distortion and blurry vision in her right eye. Visual acuity was 6/18 in the right eye and 6/6 in the left eye. Clinical examination revealed an ODP at the temporal margin of the disc and an abnormal foveal reflex. Optic coherence tomography of the macula showed an inverse lamellar hole and schisis of various layers. Topical Brinzolamide 1% twice daily and Nepafenac 0.1% thrice daily were initiated. In the next six months, fluid from schisis cavities and the inverse lamellar hole resolved. In this case, the resolution of ODP-M occurred with topical Brinzolamide 1% and Nepafenac 0.1. Therefore, it is advised that medical treatment should be offered before any surgical intervention in such cases.

Key Words: *Optic disc pit maculopathy, Brinzolamide, Nepafenac.*

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INTRODUCTION

Optic disc pit (ODP) is a rare congenital anomaly in which an incomplete closure of embryonic fissure causes an oval depression in the optic disc. Patients with ODPs are usually asymptomatic, but 25 to 75% can develop ODP-maculopathy (ODP-M).[1] ODP-M in these patients can lead to serous detachment, cystic degeneration, and lamellar holes.[1] Although the exact pathogenesis of ODP-M is unknown, vitreous liquefaction, traction, and pressure gradient in the eye are thought to be involved.[2] The source of fluid causing ODP-M may be from the vitreous, cerebrospinal fluid (CSF), blood vessels, or choroid.[2] Only 25% cases of ODP-M resolve spontaneously. Therefore, various treatment modalities may be preferred over conservative management.[1]

CASE REPORT

A 15-year girl presented with a three-month history of decreased vision and metamorphopsia in her right eye. Her medical history and family history were negative for any ocular disorders.

Correspondence to: Dr. Muhammad Abdul Rehman Siddiqui, Department of Ophthalmology and Visual Sciences, The Aga Khan University Hospital, Karachi, Pakistan
E-mail: rehman.siddiqui@gmail.com
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On examination, her best-corrected visual acuity (BCVA) measured with the Snellen chart was 6/18 OD and 6/6 OS. Intraocular pressure measured with Goldman applanation tonometre was 18 mmHg in each eye.

The slit lamp examination of the anterior segment revealed normal eyelids. The cornea in each eye was clear, and the angles were open. The anterior chambers were deep and showed no cells or flare. Irides were flat and brown. Lens was clear. On fundoscopy, the vitreous in each eye was clear with no posterior vitreous detachment (PVD). The fundus in the left eye was normal, while the fundus of the right eye demonstrated a temporal ODP and altered foveal reflex. Swept-source OCT (SS-OCT) was done, which showed a lamellar hole with the intact internal limiting membrane (ILM); intraretinal schisis in the retinal nerve fibre layer (RNFL), ganglion cell layer (GCL), inner plexiform layer (IPL), and inner nuclear layer (INL). The inner segment outer segment (IS-OS) layer was disrupted, but the retinal pigment epithelium was intact (Figure 1). There was no visible communication between the schisis cavities and ODP.

Considering the age of the patient, the authors decided on conservative management. The patient was started on topical Brinzolamide 1% twice daily and topical Nepafenac 0.1% thrice daily. At the six-month follow-up, the SS-OCT showed closure of the inverse lamellar macular hole, the IS-OS layer was restored, and fluid from the intraretinal layers was resolved. Central subfoveal thickness decreased from 386 µm to 219 µm. Intraretinal fluid from retinal layers resolved, but small residual cavities of RNFL schisis were still present and fluid was present in IPL and outer plexiform layer (OPL) (Figure 2).

Table I: Summary of the cases with spontaneous resolution of ODP-M and resolution with the use of carbonic anhydrase inhibitors (CAIs).

Author (year)	Age	Gender	Presenting VA	VA after resolution	Duration for resolution	OCT	Intervention / management	Additional comments
Bayar *et al*.[1] 2017	6	Male	6/9	6/6	6 months	SD-OCT	Observation	Spontaneous resolution of maculopathy
Parikakis *et al*.[3] 2014	63	Female	6/24 Micropsia	6/12	3 years	SD-OCT	Observation	Integrity of IS/OS layer is prognostic for final VA after resolution
Lorusso *et al*.[5] 2020	14	Female	6/60	6/6	3 months	SD-OCT	Observation	Spontaneous resolution of maculopathy after spontaneous PVD
Qi *et al*.[6] 2021	27	Male	6/15	6/9	2 years	SD-OCT	PPV with ILM peel. Topical Dorzolamide 2% Oral Spironolactone	Medications used as adjuncts after surgery
Al-Moujahed *et al*.[8] 2020	56	Male	6/9	6/6	2 years	SD-OCT	Topical Dorzolamide 2%	

SD-OCT; Spectral-domain optical coherence tomography, VA; Visual acuity, PVD; Posterior vitreous detachment.

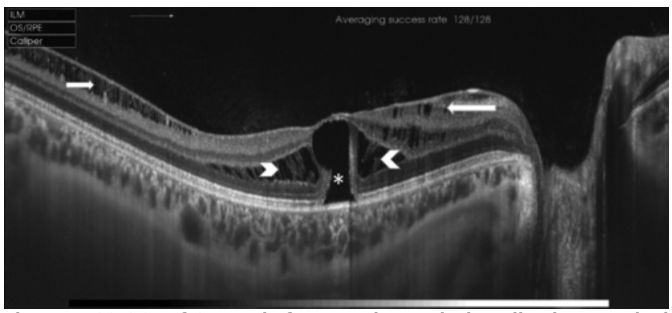

Figure 1: SS-OCT of ODP-M before starting topical medications. Retinal nerve fibre layer (RNFL) schisis (left arrow), schisis of ganglion cell layer (right arrow), schisis of outer nuclear layer (right and left arrowheads), and inverse lamellar hole (asterisk).

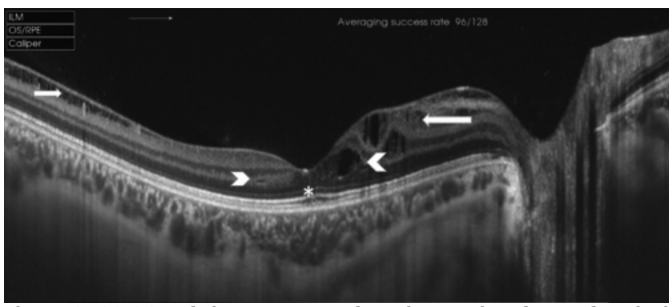

Figure 2: SS-OCT of the same eye after six months of use of topical medications. RNFL schisis has reduced (left arrow), schisis of ganglion cell layer (right arrow), fluid in outer plexiform, and outer nuclear layer (arrowheads). The inverse lamellar hole has closed with the restoration of the ellipsoid layer (asterisk).

BCVA improved to 6/9 in the right eye. The patient was followed up every three months for one year and then six months for another year. After that, medications were tapered and stopped after six months.

DISCUSSION

There are various case reports describing the spontaneous resolution of ODP-M.[1-3] The youngest reported patient with spontaneously resolved ODP-M, which has been was six years of age,[1] and the oldest patient is 63 years.[2] The duration of spontaneous resolution of serous detachment in ODP-M is variable. In some of the cases, BCVA after spontaneous resolution of ODP-M remained poor,[2] but a few cases showed significant recovery of BCVA. Bayar *et al*. reported a case of ODP-M with spontaneous regression of fluid with full anatomical and functional recovery in six months.[1]

As seen in this case, fluid accumulation between retinal layers is a common finding in ODP-M.[1] Four different sources of intraretinal and subretinal fluid have been proposed in the pathogenesis of ODP-M. Firstly, CSF can pass into subretinal or intraretinal layers through ODP.[3] It implies that there is an abnormal communication between ODP and the subarachnoid space of the optic nerve.[3] Matsui *et al*.[4] used SS-OCT to describe direct communication between ODP and subarachnoid space in three cases of ODP-M. Secondly, it has been postulated that the vitreous can pass through ODP into intraretinal and subretinal spaces, causing ODP-M.[5] Furthermore, leaking blood vessels at ODP can be a source of fluid in ODP-M.[2] Moreover, fluid in ODP-M can also originate from the choroid by leaking Bruch's membrane.[2] This particular theory agrees with the use of topical carbonic anhydrase inhibitors (CAIs) and Nepafenac in ODP-M.

Final BCVA after the resolution of fluid in ODP-M depends on certain factors. Improvement in BCVA was most dependent on initial BCVA.[3] Another factor for improvement in BCVA is the time duration for which fluid remained in the subretinal space, causing irreversible changes in outer retinal layers.[3] In this case, resolution of fluid occurred with topical treatment in six months, and BCVA improved from 6/18 to 6/6. Another prognostic factor for final BCVA after the resolution of fluid is the integrity of the IS-OS layer.[3] In this case, the IS-OS layer was intact after the resolution of fluid, which resulted in visual improvement.

Various treatment modalities have been experimented with, but there is no consensus on the ideal.[3,4] Surgical techniques used to treat ODP-M including pars plana vitrectomy (PPV) with or

without ILM peel and laser photocoagulation to the area between ODP and macula have also been tried.[1] Many other techniques, such as macular buckling, retinal fenestration, removal of glial tissue, and the use of amniotic membrane and autologous fibrin to plug the ODP, have all been employed with variable results.[1]

Topical CAIs have been used successfully to treat retinoschisis associated with ODP-M. Qi *et al*. reported a case of ODP-M in which topical Dorzolamide and oral spironolactone were used after vitrectomy with full resolution of fluid.[6] Clinical data suggest that topical Nepafenac is effective in treating post-operative cystoid macular oedema (CME) and diabetic macular oedema (DME).[7] Similarly, topical Nepafenac 0.1% thrice daily was used in this case which resulted in the resolution of ODP-M in six months.

Al-Moujahed *et al*.[8] reported a case of ODP-M in which the use of topical Dorzolamide resulted in the resolution of maculopathy and BCVA improved from 6/18 to 6/6 in two years (Table I). In line with these studies, topical Brinzolamide 1% twice daily was used which resulted in the resolution of intraretinal fluid. However, randomised controlled trials are required to ascertain the efficacy of topical Dorzolamide and Nepafenac for the treatment of ODP-M.

PATIENT'S CONSENT:
Written informed consent was taken from the mother as the age of the patient is less than 18 years.

COMPETING INTEREST:
The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:
AM: Writing and editing of the draft.
MARS: Conception, editing of the draft, formal analysis, reviewing of the draft.
Both authors approved the final version of the manuscript to be published.

REFERENCES

1. Bayar SA, Sezenoz AS, Pinarci EY, Yilmaz G. Spontaneous regression of optic disc pit maculopathy in a six-year-old child. *Turk J Ophthalmol* 2017; **47(1)**:56. doi: 10.4274/tjo.57614.
2. Kalogeropoulos D, Ch'ng SW, Lee R, Elaraoud I, Purohit M, Felicida V, *et al*. Optic disc pit maculopathy: A review. *Asia Pac J Ophthalmol (Phila)* 2019; **8(3)**:247-55. doi: 10.22608/APO.2018473.
3. Parikakis EA, Chatziralli IP, Peponis VG, Karagiannis D, Stratos A, Tsiotra VA, *et al*. Spontaneous resolution of long-standing macular detachment due to optic disc pit with significant visual improvement. *Case Rep Ophthalmol* 2014; **5(1)**:104-10. doi: 10.1159/000362263.
4. Matsui KO, Hirakata A, Inoue M, Akiba M, Ishibashi T. Evaluation of congenital optic disc pits and optic disc colobomas by swept-source optical coherence tomography. *Invest Ophthalmol Vis Sci* 2013; **54(12)**:7769-78. doi: 10.1167/iovs.13-12901.
5. Lorusso M, Zito R, Ferrari LM, Nikolopoulou E, Cicinelli MV, Borrelli E, *et al*. Spontaneous resolution of optic pit maculopathy: An OCT report. *Ther Adv Ophthalmol* 2020; **12**:2515841420950843. doi: 10.1177/2515841420950843.
6. Qi SR, You E, Hebert M, Dirani A. Optic pit maculopathy: Adjunctive treatment using oral spironolactone and topical dorzolamide. *Int Med Case Rep J* 2021; **14**:357-60. doi: 10.2147/IMCRJ.S307057.
7. Giarmoukakis AK, Blazaki SV, Bontzos GC, Plaka AD, Seliniotakis KN, Ioannidi LD, *et al*. Efficacy of topical nepafenac 0.3% in the management of postoperative cystoid macular oedema. *Ther Clin Risk Manag* 2020: **16**:1067-74. doi: 10.2147/TCRM.S271184.
8. Al-Moujahed A, Callaway NF, Vail D, Ludwig CA, Ji MH, Moshfeghi DM. Resolution of optic disc pit–associated macular retinoschisis after topical carbonic anhydrase inhibitor treatment: Report of a case. *Eur J Ophthalmol* 2021; **31(3)**:NP25-8. doi: 10.1177/1120672120904664.