

Optic pit-like maculopathy in a patient without any detectable disc anomalies

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Abstract:

Macular schisis is the splitting of the inner retinal layers at macula, with or without associated detachment. The acquired form of macular schisis is frequently associated with optic disc pit maculopathy, although it could be accompanied by several conditions such as tractional maculopathies, cystoid macular edema, veno-occlusive disease, and shaken baby syndrome. However, a small number of cases of retinoschisis without optic disc pit have been reported elsewhere. Here, we present a patient with acquired macular schisis without high myopia and optic disc abnormality in funduscopic examination and imaging. Macular optical coherence tomography of her left eye revealed schisis of the inner and outer retinal layers and subretinal fluid and choroidal thickness of 426 μm (pachychoroid). Although the optic disc of this patient appeared normal, the probable presumption is that small junctions existed between the macular neuroretinal tissue and the vitreous cavity. Further studies are required to survey the other probable mechanisms of retinoschisis without optic pit with more subjects.

Keywords:

Optic disc pit, Macular schisis, maculopathy, Optic disc pit maculopathy, inner retina

INTRODUCTION

Macular schisis refers to the separation of retinal inner layers in the central macular region, with or without associated detachment. The secondary form of macular schisis is frequently presented with optic disc pit maculopathy, tractional maculopathies, veno-occlusive disease, cystoid macular edema, and shaken baby syndrome.^[1]

Optic disc pit is a congenital malformation of the optic disc that can be accompanied by a maculopathy, with an incidence of 25%–75% which causes visual deterioration. Optic disc pits usually occur unilaterally and sporadically. Optic disc pit maculopathy is characterized by intraretinal and/or subretinal fluid at the macula with fluid originating from an unclear source. There are few reports of rare patients who suffered from retinoschisis without optic disc pit.^[2,3] In this case report study, we report a 59-year-old patient who had retinoschisis without an optic disc pit.

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CASE REPORT

A 59-year-old woman was referred to our clinic in May 2018, complaining of diminished vision in her left eye from 5 months before. Her ocular history was remarkable for primary open angle glaucoma with controlled intraocular pressure in her right eye from 2 years before. She used an eye drop timolol twice a day in her right eye. On examination, the best corrected visual acuity of the right and left eyes were 9/10 and 2 m counting fingers, respectively. On refraction, both eyes had –2D cylindrical astigmatism without spherical errors.

Anterior segment examination showed mild cataract of both eyes. Funduscopic examination revealed only a large cup in her right eye (0.8 cup/disc ratio), retinoschisis, and serous retinal detachment at the macula in left eye. The cup/disc ratio of her left eye was 0.3, and no disc anomalies such as optic disc pit or coloboma were visualized. In addition, no intraocular inflammation was observed in the anterior and posterior segment examination.

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Macular OCT demonstrated inner and outer retinal layers' schisis and macular detachment. In addition, partial detachment of the posterior hyaloid was noted. Macular OCT of her right eye was normal [Figures 1 and 2].

Fluorescein angiography (FA) showed hypofluorescence of the macular region that was surrounded by a well-delineated hyperfluorescent ridge at late phase but with no dye leakage. The left eye showed a well-demarcated hypofluorescence of the macular region on indocyanine green that corresponded to the

FA hypofluorescent area of the macular lesion [Figures 3 and 4]. All these findings were compatible with macular schisis and detachment.

DISCUSSION

Retinoschisis refers to large retinal splitting including several cystic spaces at the macula with or without associated detachment. The occurrence of macular schisis with visual impairment in adulthood is mostly associated with optic pit maculopathy.^[4] The prevalence of optic pit is 1/11,000, and the optic pit maculopathy is mostly accompanied by congenital optic disc pit.^[5] The source of fluid is not completely understood. The origin of fluid is thought to be the vitreous fluid entering the subretinal space through defects in the optic nerve head.^[1]

In our study, we described a patient with macular schisis in the absence of any optic disc anomalies in either fundoscopic examination or imaging. This rare scenario has been reported previously,^[2,3,6,7] proposing that even with an apparent normal

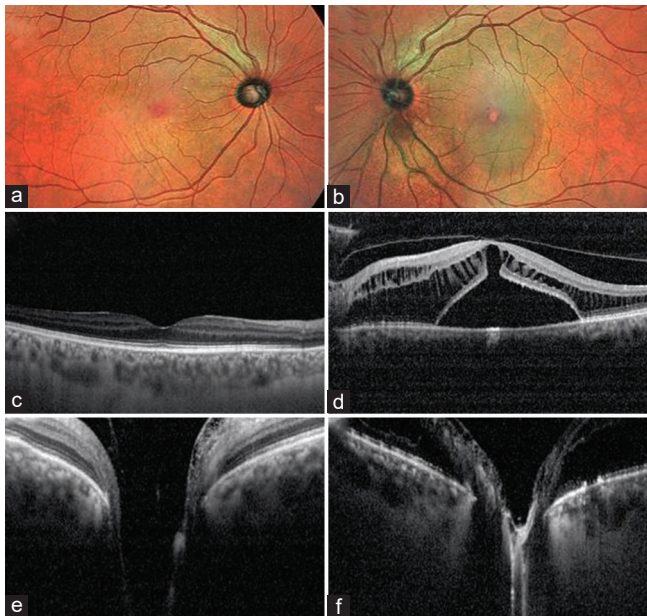


Figure 1: (a) Fundus photograph of the right eye showing large cup to disc and normal retina. (b) Fundus photograph of the left eye showing serous detachment of the retina at the macula site. (c) Optical coherence tomography imaging of the right eye, no pathologic finding. (d) Optical coherence tomography imaging of the left eye showing subfoveal subretinal fluid and macular schisis. (e) Optical coherence tomography imaging of the right optic nerve head showing large cup with no defect. (f) Optical coherence tomography imaging of the left optic nerve head showing no pit, defect or coloboma

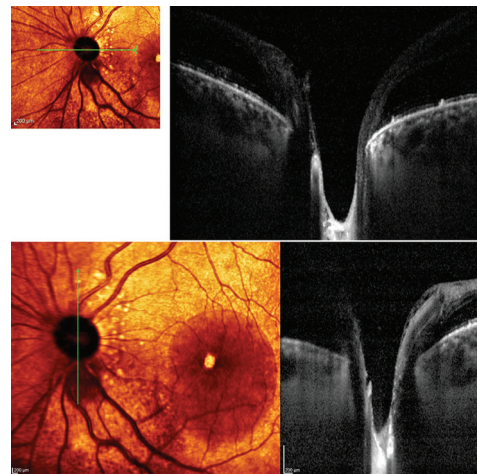


Figure 2: Infrared and optical coherence tomography images of left optic nerve head (horizontal and vertical sections) showing no pit, defect, or coloboma

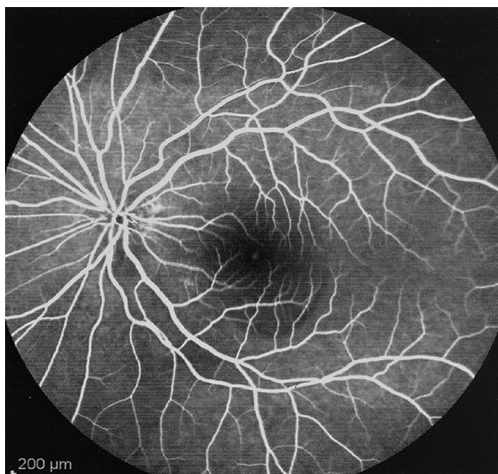


Figure 3: Fluorescein angiography imaging of the left eye showing hypofluorescence of macular region with no dye leakage

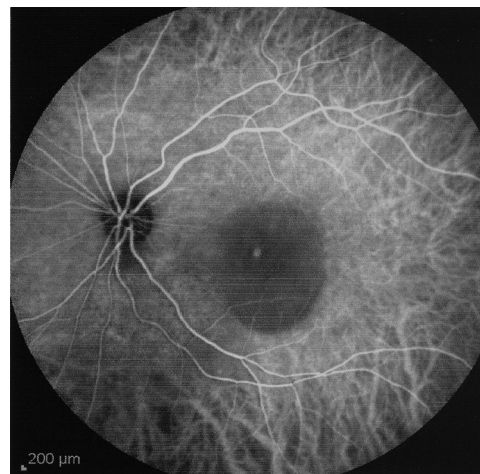


Figure 4: Indocyanine green angiography imaging of the left eye showing hypofluorescence area at macula

optic nerve heads, there was a discernible connection between the macular neuroretinal tissue and the vitreous cavity.^[3] This connection could be generated by an undetectable hole in the thin tissue of the optic cup or displacement of the optic nerve head and its surrounding retina caused probably by several different factors, including the pulse and changes in the intracranial pressure due to shifts in posture.^[6]

Previously, macular schisis and detachment associated with acquired expanded optic nerve head cups and glaucoma were reported.^[8-10] Zumbro *et al.* supposed that the main mechanism was the leakage of fluid from the vitreous through a small undetectable hole in the thin tissue of the cup of a glaucomatous eye or small coloboma that was hidden.^[9] Our patient had a history of glaucoma in her right eye and used antiglaucoma medication. One presumption of retinoschisis onset in her eye could be the thin tissue of the disc cup which can predict probable glaucoma in the future.

Similar to optic pit maculopathy, several treatment approaches were proposed for retinoschisis.^[2] Spaide *et al.* investigated the vitrectomy for maculopathy without optic pit. Their results revealed that pars plana vitrectomy with the internal limiting membrane peeling and fluid–air exchange might be effective for the treatment of maculopathy without a discernable optic disc pit.^[6] Hotta reported that gas tamponade may be essential to increase the success chance of vitrectomy for this condition.^[7]

A recent study has showed that lamina cribrosa (LC) abnormalities could be followed by peripapillary and macular retinoschisis in glaucoma and pachychoroid (abnormal and permanent increase in the choroidal thickness and dilated choroidal vessels) situations.^[11] It would be presumed that pachychoroid diseases are directly contributed to the development of undetectable LC changes and subsequent retinoschisis. However, there is no general agreement on the accompaniment of development of retinoschisis and pachychoroid disease and glaucoma in patients without any visible optic disc anomalies.

In conclusion, further studies are required to study the mechanism of retinoschisis without optic pit and successful treatment with more subjects.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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