Case Report

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Association Between Myelinated Nerves Fiber Layer and Choroidal Folds: A Case Report

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Citation Rezaei L, Nazarian M. Association Between Myelinated Nerves Fiber Layer and Choroidal Folds: A Case Report. Case Reports in Clinical Practice. 2023; 8(5): 194-197.

Running Title Myelinated Nerve Fiber Layer and Choroidal Fold

Article info:
Received: September 11, 2023
Revised: September 20, 2023
Accepted: October 15, 2023

Keywords:
Myelinated nerve fiber layer; Choroidal folds; Association

ABSTRACT

This study aims to present an unusual combination of choroidal folds and a myelinated nerve fibre layer. The right eye of a 45-year-old male had been experiencing vision loss for the past six months.

An ophthalmic examination revealed a distinct peripapillary white striated patch with feathered borders approximately two disc diameters in size at the nasal pole of the optic disc in both eyes. Choroidal folds involving the macula were also observed in the right eye. This is the first report of an association between a myelinated nerve fiber layer (MNFL) and choroidal folds.

Introduction

The Myelinated Nerve Fiber Layer (MNFL) is an abnormal extension of myelination anterior to the lamina cribrosa. On the neurosensory retina, they appear as white patches with frayed borders. Typically, patients with MNFL are asymptomatic [1]. MNFL can occur in conjunction with a variety of ocular abnormalities, including optic disc drusen [2], myopia, amblyopia, strabismus [3], optic nerve hypoplasia [4], and keratoconus. Systemic diseases such as Alagille syndrome, Klippel-Trenaunay syndrome, and neurofibromatosis have all been linked to MNFL [4]. However, given its known prevalence, determining whether a true association exists is difficult.

Choroidal folds are parallel lines or striae that usually appear in the eye's posterior pole. Light and dark lines are visible on examination, which are caused by stretching and compression of the RPE. Choroidal folds can be either unilateral or bilateral. Some ocular disorders have been linked to choroidal folds, including posterior scleritis, hypotonia, hyperopia, choroidal naevi and tumour, optic nerve drusen, thyroid eye disease

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(TED), central serous chorioretinopathy, idiopathic intracranial hypertension or secondary pseudotumor cerebri syndrome, and orbital cellulitis [5].

To the best of our knowledge and based on previous studies, no link has been found between MNFL and choroidal folds. As a result, we decided to report this case involving MNFL and Choroidal folds.

Case Report

A 45-year-old man was referred to an ophthalmology clinic due to blurring vision in his right eye that had been occurring for the previous 6 to 12 months. He was not currently on any systemic medications and had no significant prior ocular or medical history. The best corrected visual acuity (BCVA) in the right eye was 9/10 and 10/10 in the left eye (Refraction OD: -1.00 -0.75*160 OS: -1.50 -0.50*80). Ocular movement was complete in all gaze directions. Examination of the pupil and anterior segment revealed no abnormalities or cell growth. The intraocular pressure (IOP) in the right and left eyes were 15 mmHg and 13 mmHg, respectively.

During a fundus examination, Myelinated Nerve Fiber Layer (MNFL) was discovered in both eyes. The cup to disc ratio (CDR) was 0.2 in the right eye, and the nasal pole of the optic disc had a tuft of myelinated nerve fibers. The patient's left eye had a CDR of 0.3, and white patches on the retinal surface were found to encircle the optic disc and obscure the borders and vessels of the optic nerve head. In the right eye, there were also horizontal choroidal folds that involved the macula (see Figure 1). Optical Coherence Tomography (OCT) and fluorescein angiography were also performed.

The right eye's fundus fluorescein angiography (FFA) revealed the typical alternating hyperfluorescent and hypofluorescent lines (see Figure 2).

OCT exposes the underlying choroid as well as the corrugated and wavelike appearance of the hyporreflective line corresponding to the retinal pigment epithelium (RPE) (see Figure 3).

Discussion

The Myelinated Nerve Fiber Layer (MNFL) was initially described in 1986. It is estimated that 1% of individuals have MNFL, which is bilateral in 7% of cases. The etiology of myelinated nerve fibers is unknown. The majority of MNFL diagnoses are incidental, found in asymptomatic children or adults [6].

During the eighth month of pregnancy, the myelination of the visual pathway travels anteriorly from the lateral geniculate body (LGB) to the globe, terminating postnatally at the level of the lamina cribrosa. The lamina cribrosa prevents oligodendrocyte progenitor cells from migrating, causing the myelination process to stop at this level. MNFL has aberrant retinal ganglion cell histology and fewer retinal ganglion cells overall compared to nearby locations. Within the myelinated retinal patch, there is no evidence of inflammation. The retina surrounding a myelinated RNFL patch is normal. Retinal myelination can be acquired under specific circumstances, such as surgical procedures (optic nerve fenestration) or optic nerve abnormalities (optic disc drusen and chronic papilledema). Additionally, MNFL regression has been linked to conditions such as multiple sclerosis, glaucoma, retinal artery occlusions, and Behçet's disease. MNFL should be distinguished from other diseases because it is a

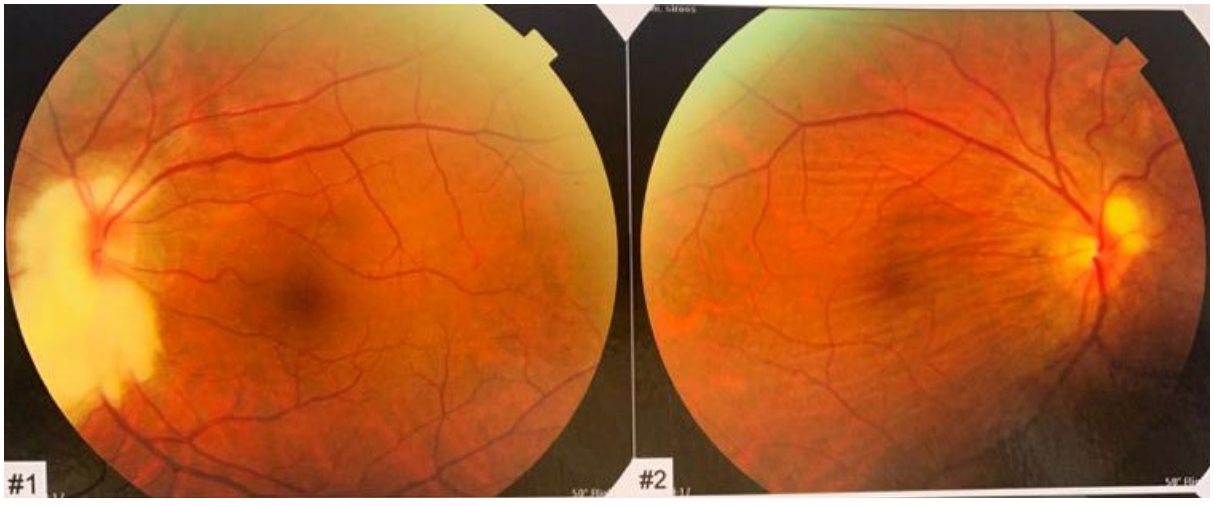

Fig. 1. fundus photograph

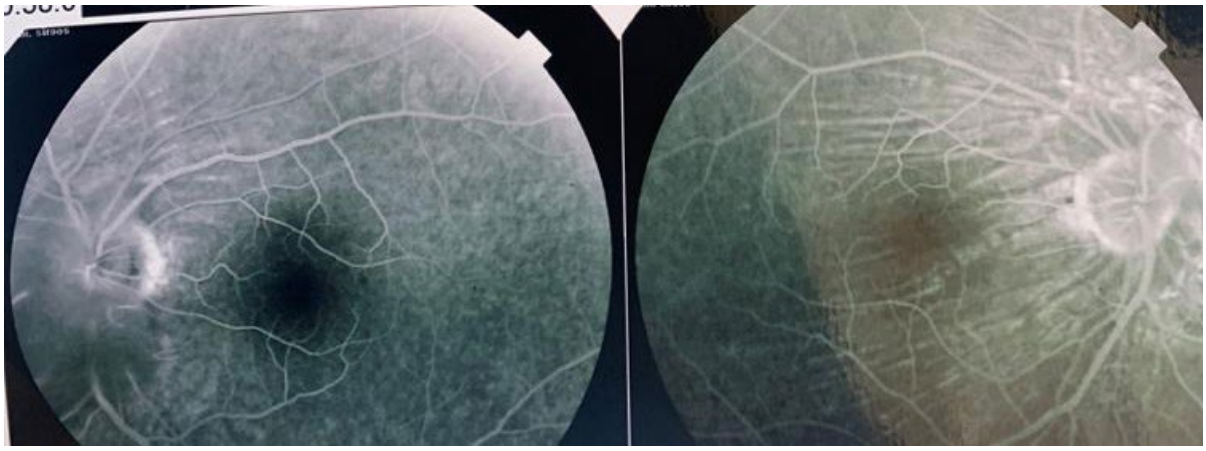

Fig. 2. Fluorescein angiography

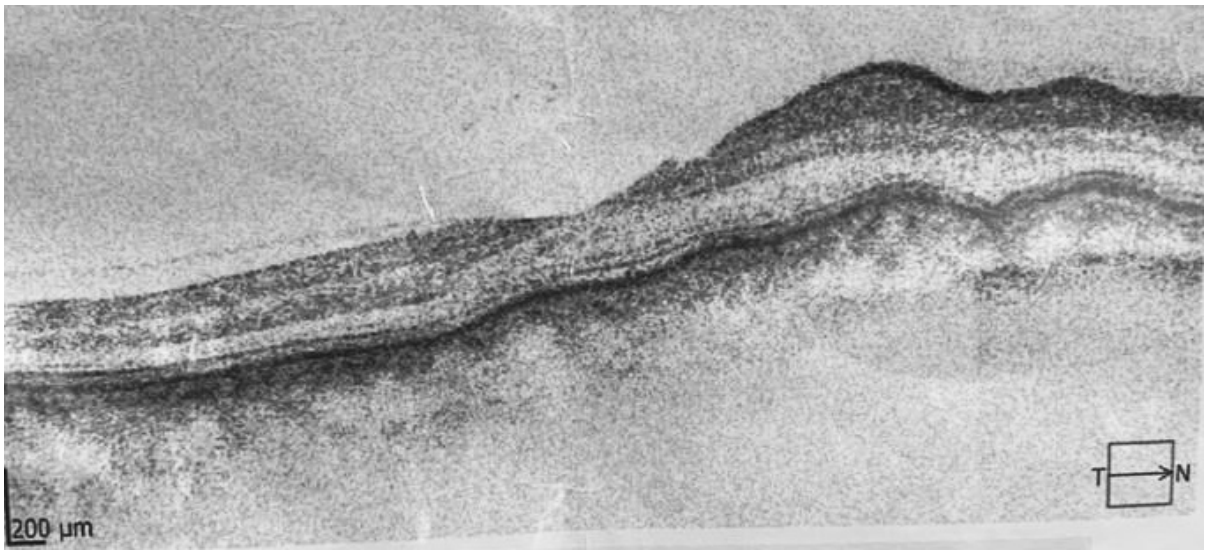

Fig. 3. Macular Oct right eye

benign condition. The main goal of MNFL therapy is the treatment of accompanying conditions such as myopia, anisometropia, amblyopia, and strabismus [1].

The first choroidal fold was identified in a patient with papilledema in 1884. Typically, these folds do not extend past the equator. These folds could enlarge over time. Patients with idiopathic choroidal folds are typically presbyopic males who are asymptomatic. Although the specific pathophysiology of choroidal folds is uncertain, the following causes have been proposed:

- Hypotony that could cause choriocapillaris congestion and choroidal thickening
- Scleral deformation in the presence of orbital masses
- Sclera shrinkage as a result of chronic inflammation
- Due to thin sclera, young myopes have low scleral rigidity
- Choroidal neovascularization

Patients are mostly asymptomatic; however, they may complain of metamorphopsia or impaired vision [5]. Although the patient in this case had a single choroidal fold, neither a systemic nor an ocular disease could be found to account for it. To the best of our knowledge, no link has been found between MNFL and choroidal fold. For the first time, we find a link between MNFL and choroidal fold. Additionally, we were unable to uncover a reason for this, and it could simply be a coincidence.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this article.

Funding

No funding was received to assist with the preparation of this manuscript.

Conflict of Interests

The authors have no conflict of interest to declare.

Declaration of patient consent

The authors confirm that they have obtained all necessary permissions from the patient(s) for the publication of their photos and other clinical data in the journal. The patient(s) have been informed that their names and initials will not be published, and while every effort will be made to protect their privacy, complete anonymity cannot be guaranteed. This is an essential step in ensuring ethical compliance in the publication of clinical data.

References

[1] Ramkumar HL, Verma R, Ferreyra HA, Robbins SL. Myelinated Retinal Nerve Fiber Layer (RNFL): A Comprehensive Review. Int Ophthalmol Clin. 2018;58(4):147-56. https://doi.org/10.1097/IIO.0000000000000239

[2] Duru I, Savides RP. Unilateral progressive myelinated retinal nerve fibres in an asymptomatic adult with optic nerve head drusen. Can J Ophthalmol. 2018;53(4):e136-e8. https://doi.org/10.1016/j.jcjo.2017.10.023

[3] Moradian S, Karim S. Unilateral myelinated retinal nerve fiber layer associated with axial myopia,amblyopia and strabismus. J Ophthalmic Vis Res. 2009;4(4):264-5. Link

[4] Ali BH, Logani S, Kozlov KL, Arnold AC, Bateman B. Progression of retinal nerve fiber myelination in childhood. Am J Ophthalmol. 1994;118(4):515-7. https://doi.org/10.1016/S0002-9394(14)75805-2

[5] Bagnis A, Cutolo CA, Corallo G, Musetti D, Nicolò M, Traverso CE. Chorioretinal folds: a proposed diagnostic algorithm. Int Ophthalmol. 2019;39(11):2667-73. https://doi.org/10.1007/s10792-019-01083-y

[6] Rao R, Turkoglu EB, Say EAT, Shields CL. Clinical Features, Imaging, and Natural History of Myelinated Retinal Nerve Fiber Layer. Retina. 2019;39(6):1125-32. https://doi.org/10.1097/IAE.0000000000002106