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Case Report
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A Case of Atypical Presentation of Multiple Transient White Spot Syndrome

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Abstract

Multiple evanescent white dot syndrome (MEWDS) was firstly proposed by Jampol et al. [1] in 1984 as a new ophthalmic condition, which is a rare ophthalmic condition characterized by transient deep retinal and retinal pigment epithelium (RPE) lesions. It is a rare ophthalmic disease characterized by transient deep retinal and retinal pigment epithelium (RPE) lesions, with acute onset in one eye, but may involve both eyes. The disease occurs in young myopic women aged 9-44 years old [2], with no racial or genetic predisposition, and is self-limiting to a certain extent, starting to recede 1-2 weeks after the onset of the disease and recovering within 3 months. MEWDS has a variety of signs and symptoms, including haziness of vision, aqueous humor, flashing lights, dark shadows in front of the eyes, and loss of central vision, and funduscopic examination reveals multiple white or yellow-white punctate foci, etc., [3]. With the popularization and promotion of modern imaging technology, the diagnosis of typical MEWDS is relatively easy through multimodal imaging, but a small number of atypical MEWDS (especially in early stage or mild cases) does not have significant vision loss, and there are no characteristic white or yellow-white dotted foci in funduscopic examination, which is easy to miss or misdiagnose, and the clinical diagnosis should be highly valued. We found a case of atypical MEWDS with 'lack of characteristic white dots', which is reported as follows.

Keywords: Multiple evanescent white dot syndrome, Retinal pigment epithelium, Optical coherence tomography

Abbreviations

MEWDS: Multiple Evanescent White Dot Syndrome; RPE: Retinal Pigment Epithelium; FFA: Fundus Fluorescein Angiography

Case Presentation

The patient is a 17-year-old female student. She came to the ophthalmology clinic on 2024.11.05 with the complaint of darkening of vision in the right eye, which was more pronounced when she looked at white walls, and several dark shadows in front of her eyes for 5 days. The patient had no significant change in vision, no eye pain or other ocular discomfort, had been wearing lenses for 8 years (myopia), and had recently been under pressure from school, tired, staying up late (going to bed at 12:00 p.m. and waking up at 6:00 a.m.), and had allergies, and denied any other medical history. Ophthalmological examination: visual acuity: right eye 0.1 (-8.5D/-2.5D*10°) → 1.0, left eye 0.1 (-5.25D/-3.0D*180°) → 1.0. There was no obvious abnormality in the anterior segment of both eyes, the pupils of both eyes were centered, equidistant and rounded, and had sensitive light reflexes; there was no obvious clouding of the vitreous body and inflammatory cells; the borders of the optic nerve papillae of both eyes were clear, and the arcs of atrophy of the choroid could be seen on the temporal side of the optic disc.

Laboratory and imaging results: routine blood tests, hepatitis B, syphilis, AIDS, tuberculosis T-spot, biochemistry: uric acid 346.13 μmol/L ↑ (normal range 142.8-339.2 μmol/L), and other related test results were normal; chest CT: nodules in the middle lobe of the right lung, which was

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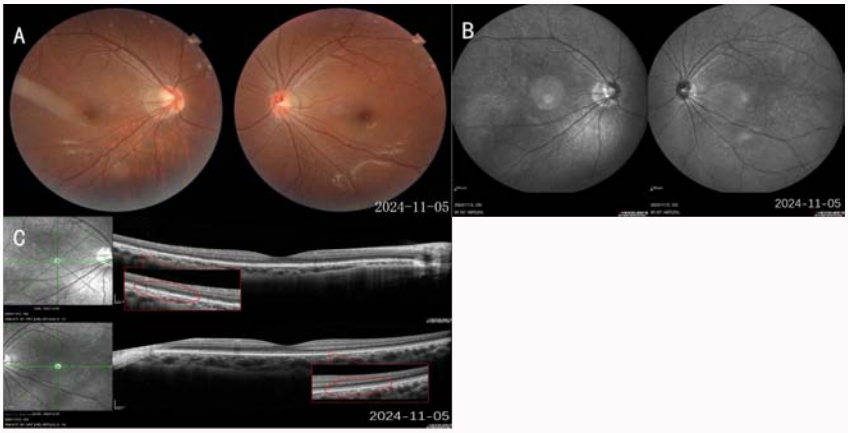

Figure 1: The choroidal atrophy arc was visible on the temporal side of the optic disc, which was more obvious in the right eye; there were no obvious foci in the posterior pole of the retina in both eyes (Figure 1A). Fundus autofluorescence (FAF): several spots of strong fluorescence were seen in the posterior pole of the right eye, and no obvious abnormality was seen in the left eye (Figure 1B). OCT: The outer retinal chimeric band and ellipsoid band structure of the right eye is disordered and interrupted. Varying-sized accumulations of highly reflective substances are observable, with the base located in the RPE layer and the tip pointing towards the inner retina. Some extend to the outer nuclear layer and outer plexiform layer. No obvious abnormalities are found in the retinal layers of the left eye (Figure 1C).

similar to that examined 1 year ago. The patient was advised to pay attention to rest, and no medication was given 2024.11.19. The patient felt that the darkening of vision in the right eye had improved.

Diagnosis

With the development of ophthalmic imaging technology and the assistance of multimodal imaging, the diagnosis of MEWDS is relatively easy, the main points of which [3,4]: (1) Young myopic women aged 9-44 years old; (2) Acute onset of monocular, but may also involve both eyes; (3) Self-limiting, starting to recede 1-2 weeks after the onset of the disease, and recovering within 3 months; (4) Decreased visual acuity, blurred vision, watery sensation, flashing light, black shadow and other symptoms; (5) Fundus examination may find multiple white or white dot-like lesions in the posterior pole of the retina. (6) FAF: strong fluorescence of different sizes in patches near the optic disc and the posterior pole, or inhomogeneous diffuse fusion of strong fluorescent foci. (7) Fundus fluorescein angiography (FFA): early stage, scattered point-like strong fluorescence can be seen faintly, and in the middle and late stages, strong fluorescence can be seen consistent with the spontaneous fluorescence of the site, with blurred boundaries, arranged in a wreath, and there is no leakage of fluorescein; (8) Indocyanine green angiography (ICGA): early stage, choroidal background fluorescence is normal, and there is no abnormality of the morphology of the large and medium-sized blood vessels. In early stage, the background fluorescence of the choroid was normal with no abnormality in the morphology of large and medium vessels, but in the middle and late stages, the periphery of the optic disc, the macula and the peripheral choroid showed multiple scattered dot-like weak fluorescent lesions of varying sizes, some of which were fused to form a small patch, which corresponded to the strong fluorescent foci in the FAF and FFA examinations; (9) The outer layer of the macula was seen to be disrupted or disrupted in the spectral domain optical coherence (SD-OCT) examination, which showed that the retinal structure was disorganized or disrupted. The retinal structure is disturbed or interrupted, the ellipsoid band is disturbed or interrupted, the chimeric band is disturbed, and the outer nuclear layer shows the accumulation of strong reflective material of different sizes, which is conical or dome-shaped, with the base in the RPE layer and the tip pointing to the inner retina, and can extend to the outer nuclear layer and the outer plexiform layer. With 5 out of 1 to 6 definite diagnoses, it is easy to miss or misdiagnose clinically.

Diagnostic points of the disease: (1) Young myopic women; (2) Darkening of vision in one eye, obvious whitewashed wall, and several dark shadows in front of the eyes; (3) Several spots of strong fluorescence at the posterior pole on FAF, and disappearance of spontaneous strong fluorescence with gradual recovery of the disease; (4) SD-OCT revealed that the lesions in the affected eye were mainly located in the outer layer of the retina, with structural disorders and interruptions of chimeric and elliptical bands, and the morphology of conical or dome-shaped, small or large. The structure of the chimeric and ellipsoidal bands was disturbed and interrupted, and the shape was cone or dome shaped, with the accumulation of strong reflective substances of different sizes, the base of which was located in the RPE layer and the tip of which pointed to the inner retina. (5) Gradual improvement of the disease, which basically resolves spontaneously in about 1 month. In this case, there were no multiple white or yellowish-white dot-like foci at the posterior pole of the retina, which is an atypical manifestation of MEWDS [5].

Discussion

Etiology and pathogenesis of MEWDS

The etiology of MEWDS is unknown and may be related to exertion, viral infection, vaccination [6-8] or autoimmune response. Most researchers [9,10] believe that MEWDS is a disease of the outer layers of the retina and the RPE, because MEWDS lesions are localized in the outer retina by SD-OCT, and show structural disorders and interruptions of the chimeric and ellipsoidal bands, with a conical or dome-shaped lesion and accumulation of strong reflective substances of different sizes, with their bases located in the RPE layer and their tips pointing to the inner retina, which may extend to the outer nuclear layer and the inner retina. The base of the lesion is located in the RPE layer, with the tip pointing to the inner retina, which may extend to the outer nuclear layer and outer plexiform layer [11]. Further studies found that these strong reflective accumulations may be caused by lipofuscin migration from damaged RPE cells into the outer retina, or by photoreceptor cell debris shedding and accumulating in the outer retina [12-14]. Because lipofuscin is an incompletely digestible

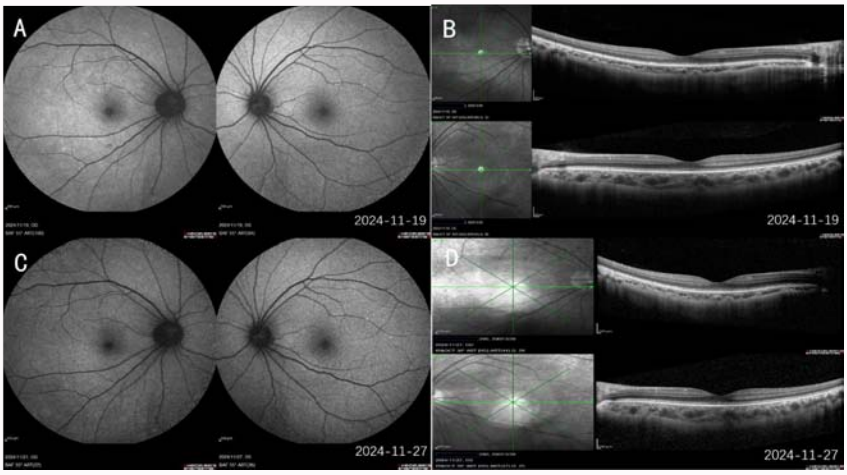

Figure 2: FAF: Strong fluorescence in the posterior pole of the right eye was reduced, and that of the left eye was (-) (Figure 2A). OCT: Compared with 2024.11.05, the structural disorders of the chimeric and ellipsoidal bands of the outer retina of the right eye had improved, and the strong reflective material was reduced compared with that of the previous time, and the structure of the retinal layers of the left eye did not show any obvious abnormality. The patient was also found to be in the right eye. No obvious structural abnormalities were observed in the left eye (Figure 2B). Prednisone tablets 30 mg were given at 8 am every morning for 7 consecutive days. 2024.11.27 Patient complained of further improvement in darkening of vision in the right eye. 2024.11.27 Patient complained of further improvement in darkening of vision in the right eye. 2024.11.27 FAF: A little bit of dot-patchy strong fluorescence was seen in the posterior pole of the right eye, and the left eye did not have any obvious abnormality (Figure 2C). 2024.11.28 OCT: The structure of the outer layer of the right eye's retina, the chimeric band, and elliptical band were basically normal, and some accumulation of strong reflective material was still seen, and the left eye (-) (Figure 2D).

end product formed by the RPE continuously phagocytosis of photoreceptor terminal detached disc membranes, and the FAF of MEWDS patients in the acute phase showed strong fluorescence in the form of dots and flakes, and the spontaneous strong fluorescence disappeared after recovery [15]. Combining SD-OCT and FAF examination, it can be found that the strongly fluorescent lesions on FAF are closely related to the lesions in the ellipsoidal band of SD-OCT, and are consistent with the size, morphology, and location of the punctate strong fluorescence of FAF. Some studies have also speculated that MEWDS may be a non-specific inflammatory disease of the choroid, and the investigators found that the patients showed non-specific choroidal thickening in the acute phase [16,17]. In conclusion, the pathogenesis of MEWDS may be due to increased lipofuscin, excessive shedding of photoreceptors, dysfunction of the RPE and non-specific inflammation of the choroid, in which RPE dysfunction may be the main factor.

Differential diagnosis

The atypical presentation of MEWDS needs to be differentiated from the following diseases [3,18,19]. (1) Acute posterior multifocal placoid pigment epitheliopathy (APMPPE), which develops in both eyes and is preceded by a history of colds or prodromal manifestations, with multiple rounded, flattened, yellowish-white lesions at the level of the retinal pigment epithelium, which may fuse into large sheets. In the first case, there are multiple rounds, flat, yellowish-white lesions at the level of retinal pigment epithelium, which may merge to form a large sheet-like lesion, and plasma retinal detachment may occur. (2) Multifocal choroiditis and panuveitis (MCP), common in myopic women, bilateral involvement, multiple round or oval yellowish-white foci at the level of the retinal pigment epithelium and the choroid, and anterior chamber inflammatory reaction (anterior chamber flashing, anterior chamber inflammatory cells) in about half of the patients. (3) Acute retinal pigment epithelitis (ARPE), which is more common in males, has foci of darkly pigmented spots surrounded by a halo of depigmentation. FFA presents as weakly fluorescent spots surrounded by a ring of strong fluorescence [17].

Treatment

MEDWS is a self-limiting disease and requires no treatment. Small doses of oral glucocorticoids can be administered in the early stages to facilitate greater restoration of photoreceptor integrity. For mild cases, patients can be followed up for observation; when visual acuity loss is obvious, visual field damage is severe, and other primary optic neuropathy is excluded, small-dose glucocorticoids can be given orally for a short period of time as appropriate. Complications of this disease are rare, but a few may be complicated by CNV, and the prognosis of visual function is good after appropriate anti-inflammatory and anti-VEGF treatments. In this case, the patient was given 30 mg prednisone tablets orally for a short period of time (about 1 week) after analyzing the condition, and the lesion subsided relatively quickly.

Reflections

MEWDS lesions are diversified, clinically typical MEWDS is easy to diagnose, but atypical manifestations of MEWDS are easy to miss/misdiagnose, so it is necessary to fully grasp the knowledge of MEWDS, and make full use of very effective non-invasive examinations such as FAF and SD-OCT, which can also be applied to judge the clinical efficacy and to further clarify the diagnosis. Our patient in this case had an atypical presentation with only visual abnormalities and no significant decrease in visual acuity. On fundus color photography, there were no multiple white or yellow-white dot-like lesions in the posterior pole of the retina. If the condition is not pursued carefully, or if there is insufficient knowledge of this type of disease and tests such as FAF and SD-OCT are not performed, the diagnosis can easily be missed or misdiagnosed. Although the disease is self-limiting, if recurrent episodes occur and inflammation is not effectively controlled, it will eventually lead to visual function impairment, and close clinical follow-up is required.

Author Contributions

Case collection and article writing by Xin Bao Zheng; Review of manuscript by Wen Ru Su and Song Guo Zheng; Return visits

and history taking by Qi Jia Zhang, Jin Yan Shen, Ming Fang Li, Lu Yun Wu, and Fan Yang; Critical guidance and modifications by Yong Wang Zhao. All authors have read and agreed to the published version of the manuscript.

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