ISSN 2307-8960 (online)

World Journal of *Clinical Cases*

World J Clin Cases 2023 March 16; 11(8): 1669-1887

Published by Baishideng Publishing Group Inc

World Journal of Clinical Cases

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RESPONSIBLE EDITORS FOR THIS ISSUE

NAME OF JOURNAL
World Journal of Clinical Cases

ISSN
ISSN 2307-8960 (online)

LAUNCH DATE
April 16, 2013

FREQUENCY
Thrice Monthly

PUBLICATION DATE
March 16, 2023

World Journal of Clinical Cases

Submit a Manuscript: https://www.f6publishing.com

World J Clin Cases 2023 March 16; 11(8): 1788-1793

DOI: 10.12998/wjcc.v11.i8.1788

ISSN 2307-8960 (online)

CASE REPORT

Combined hamartoma of the retina and retinal pigment epithelium: A case report

Qing Ren, Ning Han, Rui Zhang, Ruo-Fan Chen, Peng Yu

Specialty type: Medicine, research and experimental

Provenance and peer review: Unsolicited article; Externally peer reviewed.

Peer-review model: Single blind

Peer-review report's scientific quality classification

Grade A (Excellent): 0
Grade B (Very good): 0
Grade C (Good): C
Grade D (Fair): D
Grade E (Poor): 0

P-Reviewer: Laddha UD, India; Lee WJA, Taiwan

Received: October 22, 2022
Peer-review started: October 22, 2022
First decision: January 3, 2023
Revised: January 19, 2023
Accepted: February 21, 2023
Article in press: February 21, 2023
Published online: March 16, 2023

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Abstract

BACKGROUND

Combined hamartoma of the retina and retinal pigment epithelium (CHRRPE) is a rare congenital benign tumor which is commonly monocular. Typical CHRRPE comprises slightly raised lesions at the posterior pole, with proliferation membrane often leading to vascular distortion. In severe cases, macular edema, macular hole, retinal detachment or vitreous hemorrhage may occur. Patients with atypical clinical manifestations are prone to misdiagnosis by inexperienced ophthalmologists.

CASE SUMMARY

A 33-year-old man reported onset of right eye blurred vision for one week prior. Anterior segment and intraocular pressure were normal in both eyes. Left eye fundus photography was normal. Right eye ophthalmoscopy showed vitreous hemorrhage and off-white raised retinal lesions below the optic disc. Proliferative membranes on the lesion surfaces resulted in superficial retinal detachment and tortuosity and occlusion of peripheral blood vessels. A horseshoe-like tear in the temporal periphery was surrounded by retinal detachment. Optical coherence tomography revealed retinal thickening at the focal site with structural disturbance indicated by high reflectance. Right eye ultrasound showed retinal thickening at the lesion, stretching and uplifting of the proliferative membrane, with moderately patchy echo at the optic disc edge. Cytokines and antibodies were detected in vitreous fluids during the operation to rule out other diseases. Fundus fluorescein angiography (FFA) at postoperative follow-up led to final diagnosis of CHRRPE.

CONCLUSION

FFA is helpful in diagnosing retinal and retinal pigment epithelial combined hamartoma. In addition, other cytokine and etiological tests facilitate further differential diagnosis to rule out other suspected diseases.

Key Words: Combined hamartoma of the retina and retinal pigment epithelium; Ocular toxoplasmosis; Fundus fluorescein angiography; Vitreous hemorrhage; Retinal tears; Case report

Core Tip: Combined hamartoma of the retina and retinal pigment epithelium(CHRRPE) is a rare benign retinal tumor, especially in atypical cases with vitreous hemorrhage and retinal hole, and is likely to be misdiagnosed by inexperienced young doctors. Fundus fluorescein angiography is instructive when diagnosis is difficult, and some etiological tests can also help to identify other inflammatory diseases. This article provides an example of diagnosis to aid young doctors' reflection and learning.

Citation: Ren Q, Han N, Zhang R, Chen RF, Yu P. Combined hamartoma of the retina and retinal pigment epithelium: A case report. *World J Clin Cases* 2023; 11(8): 1788-1793
URL: https://www.wjgnet.com/2307-8960/full/v11/i8/1788.htm
DOI: https://dx.doi.org/10.12998/wjcc.v11.i8.1788

INTRODUCTION

Combined hamartoma of the retina and retinal pigment epithelium (CHRRPE) typically occurs in retinopathy with a very mild elevation of the optic disc or with a tightly attached hyperplastic membrane. Retinal blood vessels are often distorted or even occluded by traction of fibrous membrane, and the macula may be displaced through a macular hole[1]. In the present case, an off-white lesion was found below the optic disc during specialist physical examination, and vitreous hemorrhage. Temporal retinal tear exist independently. We report a rare case of CHRRPE with independent retinal breaks.

CASE PRESENTATION

Chief complaints

A 33-year-old male presented to our hospital reporting impaired vision in his right eye.

History of present illness

The patient reported no accompanying symptoms such as headache or eye pain and had no known disease. He denied rheumatic immune disease; infectious diseases such as tuberculosis and acquired immunodeficiency syndrome were excluded by routine examination after admission.

History of past illness

Unremarkable.

Personal and family history

The patient denied a family history of genetic disease, had no history of pet feeding, eating raw meat, working in a farm or slaughterhouse, and no family history of Toxoplasma infection. His parents were not consanguineous.

Physical examination

No anterior segment abnormalities were found on slit lamp examination. Under the ophthalmoscope, vitreous hemorrhage and off-white raised retinal lesions were observed below the right optic disc. Proliferative membranes on the lesion surfaces resulted in superficial retinal detachment and tortuosity and occlusion of peripheral blood vessels. A horseshoe-like tear in the temporal periphery was surrounded by retinal detachment.

Laboratory examinations

On ophthalmic examination, the patient's best corrected visual acuity was 20/40 in the right eye and 20/20 in the left eye, and intraocular pressure was 14 mmHg in the right eye and 15 mmHg in the left eye (1 mmHg = 0.133 kpa). The patient underwent vitrectomy on his right eye on January 5, 2022. During the procedure, vitreous fluid was collected to test for the following pathogenic microorganisms: Bacteria, viruses, fungi, parasites and other pathogens (including mycobacterium and mycoplasma/chlamydia). Test results were negative. Other cytokines and antibodies were detected in vitreous fluids

(Table 1). Interleukin (IL)-10 and IL-6 were in the normal range, with only a slight increase in IL-8, excluding uveitis. Basic fibroblast growth factor (which can stimulate cell mitosis and promote collagen production in fibrocytes) and its receptors are present in proliferative vitreoretinopathy, proliferative membranes and vascular endothelial cells. In this case, increased BEGF content in vitreous fluid corresponds to the formation of proliferative film on the lesion surface. Vascular endothelial cell adhesion molecules are associated with blood-eye barrier breakdown, and moderately elevated titers indicate moderate intraocular tissue edema.

Imaging examinations

Fundus photography of the right eye showed vitreous hemorrhage and off-white elevated retinal lesions just below the optic disc, with irregular edges protruding into the vitreous cavity. Proliferative membranes observed on the surface of the lesions had resulted in superficial retinal detachment and tortuosity and occlusion of peripheral blood vessels. A horseshoe-like tear about 1 disc diameter in size was seen in the temporal peripheral retina, surrounded by a small area of retinal detachment (Figure 1A). Optical coherence tomography revealed retinal thickening at the focal site with retinal structural disturbances indicated by areas of high and low reflectance (Figure 1B). Color ultrasound of the right eye showed retinal thickening at the lesion, stretching and uplifting of the proliferative membrane, moderate strength patchy echo at the edge of the optic disc, and sound shadow behind the echo (Figure 1C). Twelve days after the surgery, fundus fluorescein angiography (FFA) was performed and revealed vascular lesions of about 1.5 disc diameters below the optic disc of the right eye, with surrounding pigment disorder and atrophy, twisted blood vessels below the optic disc and fluorescence leakage. Indocyanine green angiography (ICGA) showed persistently low fluorescence below the optic disc (Figures 1D and E). These features led to the diagnosis of CHRRPE.

FINAL DIAGNOSIS

CHRRPE.

TREATMENT

CHRRPE is a congenital benign retinal tumor which grows slowly and generally does not require treatment in the absence of ocular symptoms. In the present case, due to the superficial retinal detachment caused by the formation of anterior retinal membrane, accompanied by vitreous hemorrhage and retinal tears, right eye vitrectomy combined with silicon oil tamponade was performed on January 5, 2022. Intraoperatively, the proliferative membrane on the surface of the lesion was removed and the final stage of the procedure was to fill with silicone oil, which is essential to allow time for chorioretinal adhesions to form after laser treatment. There were no adverse events during or after surgery.

OUTCOME AND FOLLOW-UP

The patient was reexamined two weeks after surgery and examination showed good retinal reduction and sealing of the original retinal tears. Regular reexamination was arranged and silicone oil was removed from the eye as appropriate.

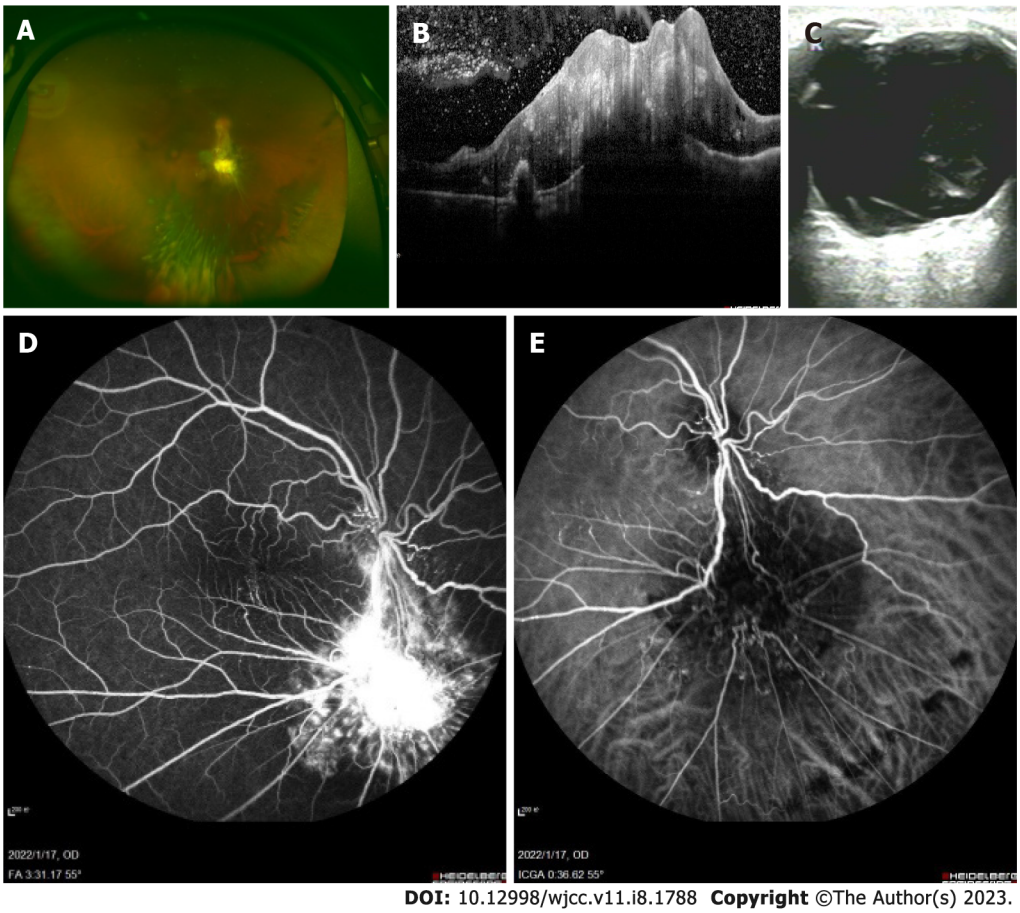
DISCUSSION

CHRRPE was first reported by Gass[2] in 1973 and tends to occur in children, but has also been reported in young people or the elderly[3,4]. It usually occurs in one eye and is rarely associated with systemic disease, but a few cases may be associated with type II or type I neurofibromatosis[5]. The common symptoms of CHRRPE are painless vision loss and strabismus, but it may be symptomless and detected only on fundus examination, depending on the lesion location[6,7]. In the present case, the patient was hospitalized due to painless vision loss caused by vitreous hemorrhage, and an off-white lesion was found below the optic disc during specialist physical examination. Typical CHRRPE commonly manifests as mild elevation of the retina at the optic disc or posterior pole, with a layer of proliferative membranes tightly attached to the surface. Retinal blood vessels are often distorted by traction of the fibrous membrane, and the macula may be displaced through macular holes. Vascular leakage, also caused by traction of the fibrous membrane, is a rare occurrence which results in macular edema, retinal detachment, and even vitreous hemorrhage[8]. Retinal tears are an important cause of vitreous

Table 1 Results of cytokine test in vitreous fluid

No.	Test item	Result	U	Reference range	T
1	TB-IgG	0.24	S/CO	< 1	-
2	Toxoplasma IgG	1.01	IU/mL	< 4	-
3	IL-10/IL-6	0.05	-	< 1	Cytometric bead array
4	VEGF	1.0	pg/mL	0-40.0	Cytometric bead array
5	BFGF	13.4	pg/mL	< 1.0	Cytometric bead array
6	IL-6	26.7	pg/mL	0-50.0	Cytometric bead array
7	IL-10	1.3	pg/mL	0-5.0	Cytometric bead array
8	VCAM	3034.1	pg/mL	200-1000	Cytometric bead array
9	IL-8	63.6	pg/mL	0-20.0	Cytometric bead array

TB-IgG: Tuberculosis-immunoglobulin G; IL: Interleukin; VEGF: Vascular endothelial growth factor; BFGF: Basic fibroblast growth factor; VCAM: Vascular cell adhesion molecule.



DOI: 10.12998/wjcc.v11.i8.1788

Figure 1 Imaging photos. A: Fundus photography findings. Off-white swelling lesions below the optic disc; horseshoe-like tear in the temporal peripheral retina; B: Optical coherence tomography findings. Retinal thickening at the focal site with structural disturbances in the retina featuring areas of high and low reflectance; C: Color ultrasound. Thickening of the retina at the lesion, stretching and uplifting of the proliferative membrane, and sound shadow behind the moderate strength patchy echo; D: Fluorescein angiography. Twisted blood vessels below the optic disc and fluorescein leakage; E: Indocyanine green choroidal angiography. Persistent low fluorescence below the optic disc.

hemorrhage and are mainly horseshoe shaped and located in the superior temporal quadrant[9,10], consistent with the present case findings. During surgery in this case, we observed that vascular occlusion was caused by traction of the proliferative membrane on the surface of the lesion, no bleeding was observed during the removal of the membrane, and there was no significant correlation between the temporal retinal tear and the lesion below the optic disc. The patient was considered to have

spontaneous retinal tears complicated by CHRRPE, and vitreous hemorrhage originated from the former. The FFA manifestations were typical of CHRRPE. In the early stage of angiography, the choroidal background fluorescence was weak and obscured, particularly in highly pigmented areas. The retinal vessels in the lesion area were clearly tortuous and deformed, while other vessels appeared normal. Due to telangiectasia, microhemangioma and vascular permeability changes in the lesion area, fluorescein leakage may occur in the late stage of angiography. As a result, the lesion area shows high fluorescence, while the pulled vessels around the lesion show no apparent fluorescein leakage[6]. In the present case, FFA after surgery showed vascular lesions with a diameter of about 1.5 disc below the right optic disc, peripheral retinal pigment disorder and atrophy, twisted blood vessels under the optic disc, with obvious fluorescence leakage in the late stage. ICGA showed persistently low fluorescence below the optic disc. Cytokines and antibodies in the vitreous were detected during the operation to exclude inflammatory diseases.

CONCLUSION

For CHRRPE with atypical clinical manifestations. In addition to the examination of vitreous fluid, aqueous humor antibodies, detailed inquiry about the past living and working environment, FFA and ICGA are also important auxiliary means. In this case, the vascular occlusion around the lesion was determined to be related to anterior retinal membrane traction, the retinal hiatus in the temporal side was considered to be spontaneous, and the vitreous hemophore was also caused by the hole.

FOOTNOTES

Author contributions: Han N provided patient information and operated on him; Yu P designed the study; Zhang R and Chen RF collected the examination information; Ren Q wrote the manuscript and revised it as required.

Informed consent statement: Written informed consent was obtained from the patient's for publication of this case report.

Conflict-of-interest statement: All the authors report no relevant conflicts of interest for this article.

CARE Checklist (2016) statement: The authors have read the CARE Checklist (2016), and the manuscript was prepared and revised according to the CARE Checklist (2016).

Country/Territory of origin: China

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S-Editor: Wang JJ
L-Editor: A
P-Editor: Wang JJ

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