

A ten years follow-up case of bilateral idiopathic multifocal retinal pigment epithelium detachments with rhegmatogenous retinal detachment and a literature review

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Dear Editor,

I am Dr. Yun Li, from the Department of Ophthalmology, the 2nd Xiangya Hospital of Central South University, Changsha, Hunan Province, China. We write to present a case of idiopathic multifocal serous retinal pigment epithelial detachments (RPEDs). This study has been performed in accordance with the Declaration of Helsinki and was approved by the Ethics Committee of the 2nd Xiangya Hospital of Central South University. Written informed consent for publication of photographs was obtained from the patient.

Idiopathic multifocal serous RPEDs is a very rare bilateral retinal disorder with striking clinical features, unknown causes, and limited knowledge of its natural history and clinical variant. We report an otherwise healthy middle-aged male presented with a typical pattern of bilateral multifocal RPEDs, who developed bilateral choroidal neovascularization (CNV) and sub-macular hemorrhage during the ten-year follow-up, together with unusual complications of severe vitreous hemorrhage and rhegmatogenous retinal detachment (RRD).

A 42-year-old male was admitted because of sudden vision loss in the left eye for 20d on Feb. 1, 2010. His ocular,

medical, and family histories were unremarkable. His best-corrected visual acuity (BCVA) was hand move (HM)/30 cm OS and 20/20 OD. Ophthalmoscopy revealed an unusual pattern of hundreds of slightly elevated yellowish, translucent, well-defined serous RPEDs of different sizes at the posterior pole and mid-periphery in the right eye and dense vitreous opacity in the left (Figure 1A). Some of the RPEDs tend to confluent, the retina between lesions appears to be normal. B ultrasonography implied a hemorrhagic retinal detachment in the macular area beneath the vitreous hemorrhage. Other ocular, systemic physical examinations and lab workups are unremarkable. Multiple serous RPEDs could be confirmed on optical coherence tomography (OCT; Figure 1B), fluorescein angiography (FA), and indocyanine green angiography (ICGA; Figure 1C) in the right eye.

The patient underwent standard three-port pars plana vitrectomy, the vitreous sample was sent for histopathologic examination. During surgery, a superonasal retinal tear and shallow RRD were identified and managed. Silicone oil was selected. After surgery, OCT (Figure 1B), the FA and ICGA (Figure 1C) revealed almost identical lesions in the left eye as the right eye, which coincide with bilateral multiple serous RPEDs. On multifocal electroretinogram (mfERG), reduced peaks were spotted in both eyes (Figure 2), FA+ICGA revealed a CNV in the macular area under the dense submacular hemorrhage (Figure 1C).

The patient had silicone oil removal with the BCVA 20/200 in the left eye and 20/20 in the right after surgery. And he was followed up every 6-12mo for 3y. After that, the patient refused the routine hospital checkup but reported a stable vision of both eyes in the telephone follow-up.

In July 2020, the patient came back complaining of blurring of his right eye. On examination, his right eye showed dense submacular hemorrhage almost identical to the left eye 10 years ago. BCVA was 20/50 OD and HM/20 cm OS because of dense nuclear cataract (Figure 3A). OCT confirmed multiple serous and hemorrhagic RPE, interestingly, a pachychoroid, double-layer signs, high-peaked RPEDs with notch very similar

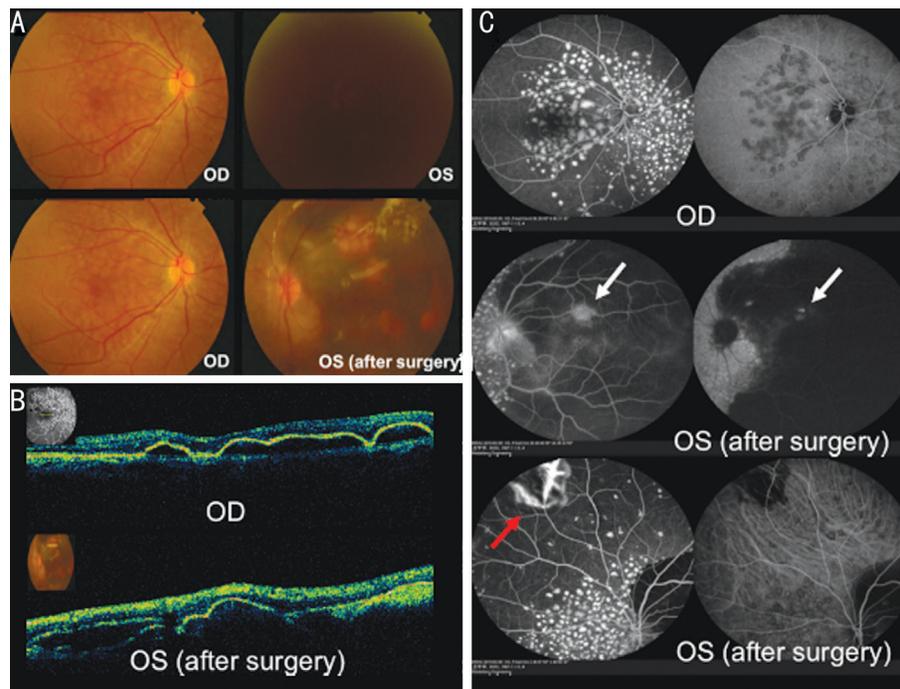


Figure 1 Clinical examination results of this patient A: Fundus photography showed hundreds of serous RPEDs at the posterior pole and mid-periphery in the right eye and dense vitreous opacity in the left eye; B: OCT images showed multiple hyporeflective spaces posterior to a smooth, elevated RPE layer (serous RPEDs) in both eyes; C: In the right eye, several hundreds of hyperfluorescence were detected in early-phase FA and late leakage (on left). ICGA disclosed multifocal persistent hypofluorescence (on right); FA and ICGA of the left eye 3d after surgery. Hyperfluorescence dots on FA and corresponding hypofluorescence points on ICGA on nasal side (undetached area) of left eye simulate the appearance of right eye. A superior nasal retinal tear was marked on red arrow and a suspicious choroid neovascularization lesion was labeled by white arrow.

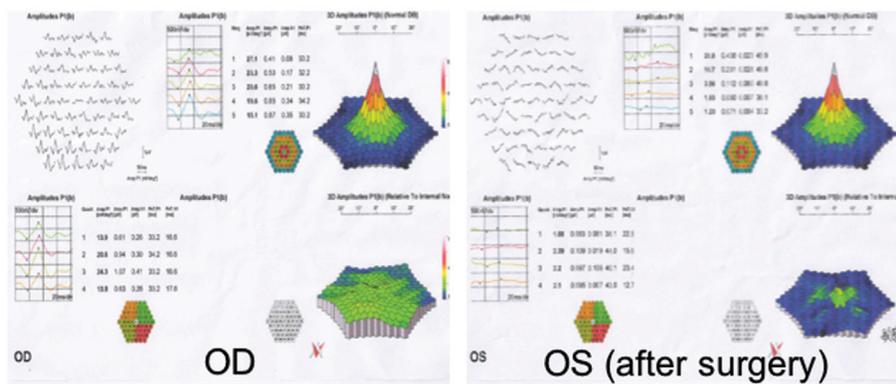


Figure 2 mfERG responses were reduced in the central area of both eyes in our patient The RPE in the macular area may be predominantly affected by this disease. Reduced mfERG responses in the central area may indicate secondary degeneration of the sensory retina in the macular area.

to the polypoidal choroidal vasculopathy (PCV) were also spotted (Figure 3B). FA and ICGA showed a hot spot under the hemorrhage (Figure 3C). The left fundus was not able to check because of the dense nuclear cataract. The patient refused our advice of intravitreal anti-vascular endothelial growth factor (VEGF) therapy in the right eye and cataract surgery in the left eye. The macular lesions in our case resemble PCV in angiography and OCT imaging, and in some scans, the choroid seems thick. We speculated that the neovascularization in our case was a secondary localized complication, followed by the

Bruch's membrane break secondary to the widespread RPEDs. Its initial pathogenesis might be related to the pachychoroidal spectrum diseases.

We searched the literature using the terms “idiopathic” and “RPEDs” in PubMed by Feb. 15, 2020. The literature review retrieved only a few case reports.

Gass *et al*^[1] described the first three patients with multiple symmetrically-distributed RPEDs in both eyes. They found that unlike the relatively few RPEDs may occur in idiopathic central serous chorioretinopathy as well as patients with

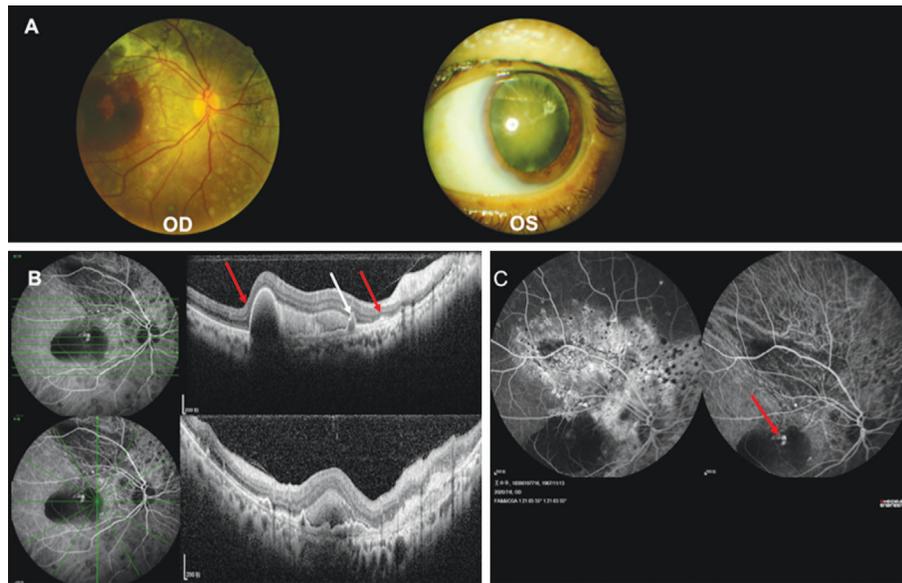


Figure 3 Ten years later, the follow-up clinical examination results of this patient A: His left eye which was performed PPV surgery before now showed a nuclear cataract, and his right eye was experiencing several patchy hemorrhages in the posterior pole. B: OCT images showed multiple detachments and hemorrhages. Double-layer signs (red arrow) and the high peak of RPEDs with a notch (white arrow) were spotted. C: FA and ICGA showed a hot spot under the hemorrhage.

idiopathic central serous chorioretinopathy–like fundus changes, these three patients had larger numbers of RPEDs. In case 1, neovascularization was also confirmed just like the left eye in our case, its origin was speculated to be secondary to the defect in the adherence of the retinal pigment epithelium (RPE) to the Bruch’s membrane.

Xuan *et al*^[2] reported a 32-year-old woman with bilateral multiple small RPEDs, which is confirmed by OCT and FA. She denied any medical history or family history of ocular disease or receiving any medication. Several subretinal hemorrhages were found in the posterior pole of the right eye and her BCVA was 20/70 in the right eye and 20/20 in the left eye.

Another case of a 47-year-old female was reported by González-Escobar *et al*^[3] who presented with a bilateral idiopathic multiple RPED in a routine visit. She had a personal history of hyperlipidemia, asthma, and stable angina pectoris without visual signs. After a six-month follow-up visit, she exhibited a stable BCVA of 20/25 OD and 20/20 OS.

Göncü and Ozdek^[4] reported 2 otherwise healthy middle-aged women with bilateral multifocal RPEDs. A 45-year-old woman complained of blurred vision in both eyes with BCVA 20/25 in the right and 20/32 in the left. Fundus examination detected countless round-shaped lesions. OCT showed multiple isolated elevations related to an empty area overlying hyperreflective RPE band which refers to the multiple serous RPEDs. In particular, in the left eye next to the fovea area, there was a large hemorrhagic RPED. While no evidence of CNV was discovered in FA and in the next 9-month follow-

up, no obvious change was found. Another 49-year-old woman with no vision complaints was found a widespread round, greyish lesions on the post-pole area to the equatorial area in both eyes. OCT confirmed multiple serous RPEDs in both eyes. Ocular and systemic history, physical examination, and laboratory tests revealed nonspecific results. This patient made no progress during the next 12mo follow-up.

Kenro *et al*^[5] reported a 45-year-old man with a sudden, large blind spot in his left eye. Fundus examination disclosed many serous RPEDs at the post-pole spreading to the equator. In the left eye, CNV was found in the parafoveal area with a subretinal hemorrhage. The mfERG responses were reduced in the central area of both eyes which may indicate secondary degeneration of the sensory retina in the macular area.

All the cases of idiopathic multiple RPEDs reported so far were listed in Table 1, which shows highly consistent demographic and clinical features. All 8 cases were adults aged around 40y and no gender preponderance. They were all systemically healthy and lack of ocular complications and comorbidities except for the bilateral multiple RPEDs. Patterns of the RPEDs are strikingly characteristic, consisting of dozens to hundreds of well-defined, similar-sized serous RPEDs at the posterior pole and mid-periphery, some might confluent to become larger. A relatively stable natural history and good prognosis were reported in those patients.

CNV is the only reported complication that put a threat to the visual prognosis. In 1953, the first case reported underwent enucleation due to mass subretinal hemorrhage raising suspicion of choroidal melanoma, providing the only

Table 1 Demographic & clinical features of RPEDs reported by far

Case	Reference	Gender	Age (y)	Eye	Initial VA	Examinations presented	Treatment	Follow-up	Outcome	Final VA
1	Gass <i>et al</i> ^[1]	F	43	Left	---	A large elevated pigmented lesion in the macula	Enucleation	Lost	Microscopic examination: multiple RPEDs, sub-RPE neovascularization	Lost
2	Gass <i>et al</i> ^[1]	M	44	Both	R: 20/16 L: 20/20	Multiple RPEDs	No	13mo	Unchanged	R: 20/16 L: 20/20
3	Gass <i>et al</i> ^[1]	F	45	Both	R: 20/30 L: 20/30	Multiple RPEDs	No	8mo	Two large central RPEDs in the right eye had fused to form a larger single one. The large central RPED in the left eye had resolved	R: 20/80 L: 20/30
4	Xuan <i>et al</i> ^[2]	F	32	Both	R: 20/60 L: 20/20	Several subretinal hemorrhages noted in the posterior pole in the right eye and RPEDs in both eyes	No	Lost	Lost	Lost
5	González-Escobar <i>et al</i> ^[3]	F	47	Both	R: 20/20 L: 20/20	Multiple RPEDs	No	9mo	Small RPED persisted in the macula in right eye and no variations in left eye. VA remained at 0.8 in right eye and 1 in left eye	R: 20/25 L: 20/20
6	Göncü and Özdek ^[4]	F	45	Both	R: 20/25 L: 20/32	Innumerable small, round-to oval-shaped translucent lesions at the macula and to a lesser extent nasal to the optic nerve in both eyes. In the left eye, a large hemorrhagic RPED extends into the fovea	No	9mo	Examination of the fundus did not find any change except from the partial regression of the hemorrhagic RPED left eye	R: 20/25 L: 20/25
7	Göncü and Özdek ^[4]	F	49	Both	R: 20/20 L: 20/20	Well-circumscribed round grayish lesions located mainly on the posterior pole up to the equatorial area in both eyes	No	12mo	Remained asymptomatic without any change	R: 20/20 L: 20/20
8	Koide <i>et al</i> ^[5]	M	45	Both	R: 20/16 L: 20/20	Many slightly yellowish, serous RPEDs at the posterior pole extending to the equator. A subretinal hemorrhage was also present with a parafoveal CNV in the left eye	Laser on CNV	12mo	After the CNV was treated, the subretinal hemorrhage decreased in size. The 1-year follow-up examination showed that the lesions and the mfERGs were unchanged.	R: 20/16 L: 20/16

pathological view of this disease so far. The contralateral eye was described as “normal” probably because of the unavailability of ophthalmic examination technology like OCT.

In all the previous reports, idiopathic multifocal RPEDs patients seem to have a good prognosis with no evidence of other ocular or systemic complications or comorbidities. But after a follow-up of 10y, our case developed bilateral vision-threatening complications like macular CNV and submacular hemorrhage, RRD secondary to vitreous hemorrhage, and posterior vitreous detachment. The concept of pachychoroidal spectrum diseases was first proposed in 2013^[6]. The spectrum of this disease includes four disease groups: pachychoroidal choroidal pigment epithelial lesion (PPE), central serous chorioretinopathy (CSC), pachychoroidal CNV and PCV. The morphological changes of these lesions in the choroid have common characteristics, namely, increased choroidal thickness and vasodilation. With the chronic development of the disease, focal choroidal capillary atrophy and deep choroidal vessels

grow inward gradually. The pathogenesis of this disease can be a possible explanation for our patient. Besides, our patient and another case^[5], also showed reduced mfERG responses in the central area in both eyes, which also implies degeneration of the sensory retina.

In brief, our 10y follow up of the idiopathic RPEDs patient showed us very different clues on its possible pathogenesis and prognosis, it reminds us that this rare entity might need more prudent and long-term observations.

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Conflicts of Interest: Shi W, None; Li Y, None.

REFERENCES

- Gass JD, Bressler SB, Akduman L, Olk J, Caskey PJ, Zimmerman LE. Bilateral idiopathic multifocal retinal pigment epithelium detachments in otherwise healthy middle-aged adults. *Retina* 2005;25(3):304-310.
- Xuan Y, Liu W, Xu G, Zhang Y, D Singh A. Diagnostic and therapeutic challenges. *Retina* 2019;39(6):1230-1232.

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- 3 González-Escobar AB, González de Gor-Crooke JL, López-Egea-Bueno MA, García-Campos JM. Multiple retinal pigment epithelial detachments: a case report. *Arch Soc Esp Ophthalmol* 2014;89(5):194-198.
- 4 Göncü T, Ozdek S. Idiopathic multiple tiny serous retinal pigment epithelial detachments: report of 2 cases and review of the literature. *Optom J Am Optom Assoc* 2011;82(9):556-562.
- 5 Koide K, Suto K, Hikoya A, Toshiba T, Hotta Y. Bilateral multifocal retinal pigment epithelial detachments associated with abnormal multifocal electroretinograms. *Jpn J Ophthalmol* 2009;53(5):556-558.
- 6 Cheung CMG, Lai TYY, Ruamviboonsuk P, Chen SJ, Chen YX, Freund KB, Gomi F, Koh AH, Lee WK, Wong TY. Polypoidal choroidal vasculopathy. *Ophthalmology* 2018;125(5):708-724.