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Transscleral drainage to treat peripheral exudative hemorrhagic chorioretinopathy caused by retinal pigment epithelial hemorrhage

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ABSTRACT

Purpose: To report a case of peripheral exudative hemorrhagic chorioretinopathy with hemorrhagic retinal detachment and subretinal pigment epithelial hemorrhage treated with transscleral subretinal fluid drainage.
Observations: The patient was a 70-year-old man with a 15-year history of diabetic retinopathy and age-related macular degeneration. During follow-up, he developed a sudden decrease in visual acuity in the left eye. Corrected visual acuity was 20/32 in the right eye and 20/800 in the left eye, and hemorrhagic retinal detachment and subretinal pigment epithelial hemorrhage were observed in the left eye. Pars plana vitrectomy and transscleral drainage of the subretinal hemorrhage and subretinal pigment epithelial hemorrhage were performed. We initially attempted to displace the subretinal pigment epithelial hemorrhage, but the subretinal hemorrhage was also displaced via a retinal pigment epithelial tear located in the temporal macula. The retina was completely reattached, although visual acuity in the left eye remained at 20/400.
Conclusions and Importance: This report describes a surgical technique for hemorrhagic retinal detachment and subretinal pigment epithelial hemorrhage due to peripheral exudative hemorrhagic chorioretinopathy. We believe that transscleral subretinal fluid drainage without intentional retinal tear is a useful and safe method for patients with extensive hemorrhagic retinal detachment.

1. Introduction

Peripheral exudative hemorrhagic chorioretinopathy (PEHCR), first reported by Annesley in 1980,[1] causes vitreous hemorrhage, subretinal hemorrhage (SRH), subretinal epithelial hemorrhage, or exudative lesions similar to those of age-related macular degeneration (AMD); however, the lesions are located in the temporal area between the equator of the eye and the ora serrata. Other conditions similar to PEHCR have been reported under various names, such as massive spontaneous retinal hemorrhage, hemorrhagic peripheral pigment epithelium disease, hemorrhagic detachment of the peripheral retinal pigment epithelium, extramacular disciform lesions, and peripheral choroidal neovascularization. In contrast to AMD, choroidal neovascularization in PEHCR occurs in the temporal quadrants, particularly the temporal inferior quadrant. Therefore, PEHCR is often asymptomatic. We herein report a case of PEHCR that was successfully treated with vitrectomy and transscleral drainage.

2. Case report

A 70-year-old man visited our department to undergo a fundus examination for assessment of diabetic retinopathy in April 2021. His medical history included hypertension, coronary artery bypass surgery, diabetes mellitus, and gastric cancer. He had no family history. In 2011, fluorescein angiography and indocyanine green angiography revealed polypoidal choroidal vasculopathy (PCV) corresponding to the region of pigment epithelial detachment in his left eye. After intravitreal injection of bevacizumab, the pigment epithelial detachment was reduced. In 2018, fluorescein angiography and indocyanine green angiography revealed reactivation and enlargement of the PCV lesion, and photodynamic therapy was therefore performed. After photodynamic therapy, three intravitreal injections of bevacizumab (0.5 mg/0.05 mL) and two intravitreal injections of aflibercept (2 mg/0.05 mL) were performed, and the patient's visual acuity remained between 20/32 and 20/20. In April 2021, the patient's best-corrected visual acuity was 20/32 and 20/800 and intraocular pressure was 13 and 12 mmHg in the right and left eye, respectively. Anterior segment examination of both eyes showed

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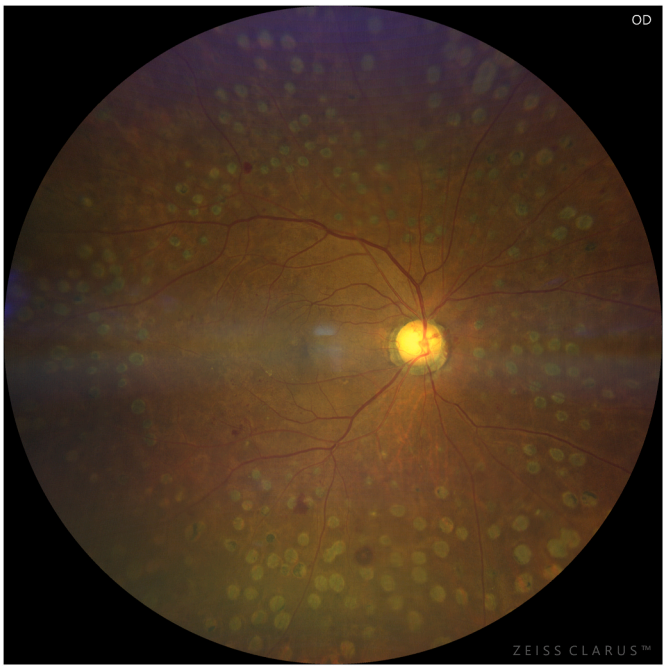

Fig. 1. Right fundus photograph before operation. The fundus examination findings were unremarkable except for diabetic retinopathy.

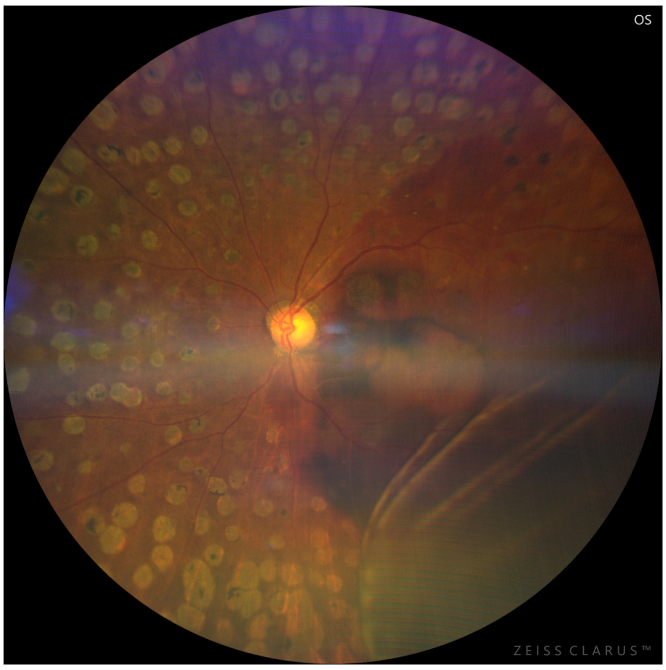

Fig. 2. Left fundus photograph before operation. Fundus examination revealed extensive subretinal hemorrhage in the inferior temporal region.

mild nuclear cataracts. The fundus of the right eye showed no remarkable change except for diabetic retinopathy (Fig. 1). Fundus examination revealed extensive SRH in the inferior temporal region and a small amount of vitreous hemorrhage (Fig. 2). Optical coherence tomography revealed the presence of subretinal pigment epithelial hemorrhage (Fig. 3).

Fluorescein angiography and Indocyanine green angiographys showed a branching network of vessels and polypoidal dilation in the temporal area before treatment (Figs. 4 and 5).

Intravitreal injection of aflibercept was immediately performed in accordance with the protocol for treatment of AMD.

The patient underwent an operation 2 weeks after intravitreal injection of aflibercept, to allow adequate time for any blood clots to lyse before evacuation. After securing one port, phacoemulsification was performed as usual. After the core vitrectomy, perfluorocarbon liquid (perfluoro-n-octane, C_8F_{18}) was injected in the posterior fundus to form a single bubble. The enlarging perfluorocarbon bubble displaced the SRH and subretinal pigment epithelial hemorrhage from the posterior pole to the periphery. The sclerotomy was created using a golf scleral knife in the 5-o'clock direction 11 mm from the corneal limbus, a 2-mm-

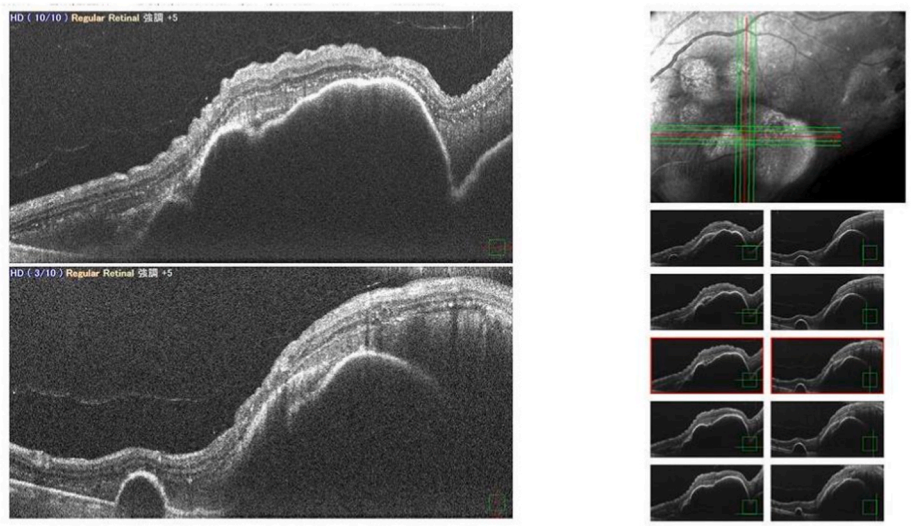

Fig. 3. Left optical coherence tomography (OCT). Optical coherence tomography revealed subretinal hemorrhage and subretinal pigment epithelial hemorrhage.

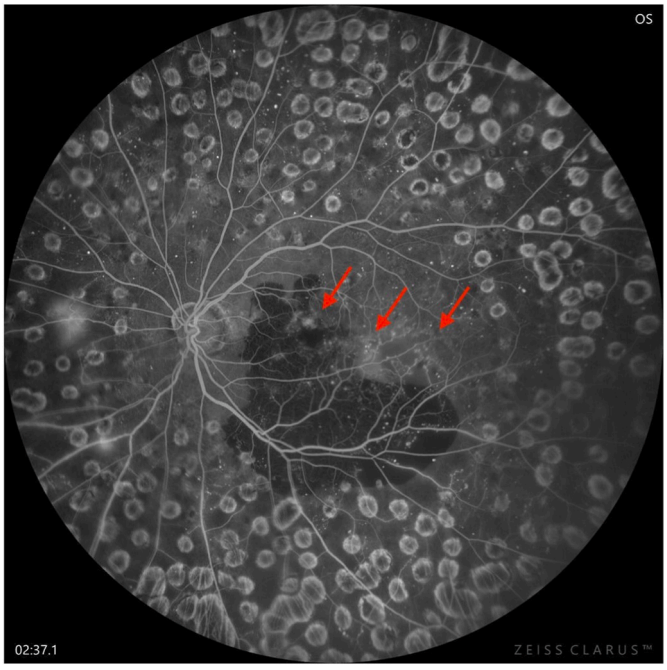

Fig. 4. Fluorescein angiography showed a polypoidal dilation in the temporal area (red arrow) before treatment.

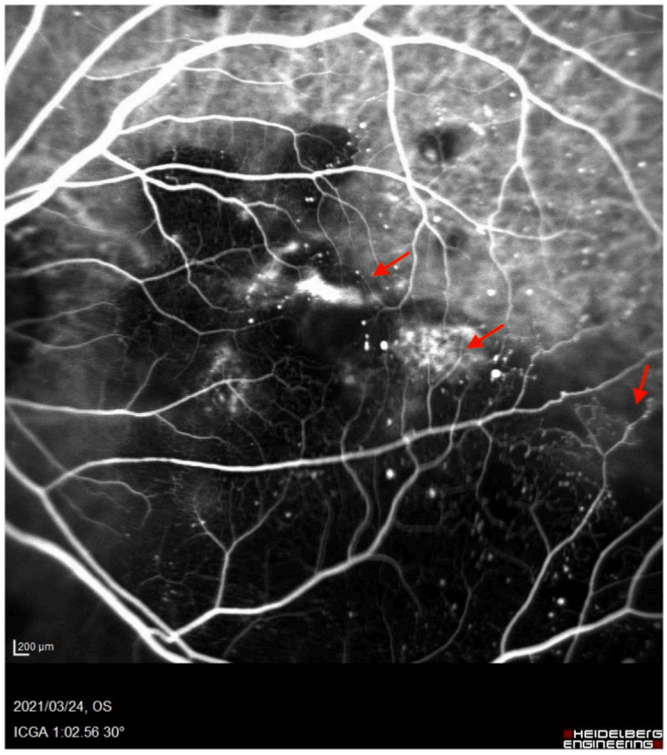

Fig. 5. Indocyanine green angiography showed a branching network of vessels and polypoidal dilation in the temporal area (red arrow) before treatment.

long incision was created in the radial direction, and the choroid was perforated with argon laser photocoagulation (200 mW, 0.2 ms). During scleral indentation to drain subretinal fluid, it was difficult to control if the intraocular pressure is too high or too low, so we set the intraocular pressure to 25 mmHg as usual. An 8-0 silk suture was placed to close the sclerotomy after subretinal fluid drainage. The SRH and subretinal pigment epithelial hemorrhage, dark red in color, were successfully drained through the sclerotomy, and the retina was reattached (Fig. 6). Before completing the operation, octafluoropropane (C_3F_8) gas tamponade was performed. After surgery, ophthalmoscopic examination showed a retinal pigment epithelial (RPE) tear located in the temporal area between the equator and the macula, and the retina was completely reattached (Fig. 7). Three months after surgery, the patient's best-corrected visual acuity of the left eye remained at 20/400 because of macular degeneration.

3. Discussion

Many cases of PEHCR have been reported in Japan.[2] As described by Yannuzzi et al.[3] in 1990, PCV is a subtype of neovascular AMD commonly seen in the Asian population.[4] PCV and PEHCR may be linked pathologies within the same disease spectrum. The prevalence of RPE tears is higher in eyes with PCV than in eyes with neovascular AMD.[4] Table 1 shows the patients' age, sex, complications, lesion side, complications of vitreous hemorrhage, complications of macular lesions, and detection of neovascularization in previously reported cases of PEHCR.[1,5–9] The risk factors for PEHCR include trauma, hypertension, anticoagulation, vascular disease, and diabetes mellitus. Our patient had

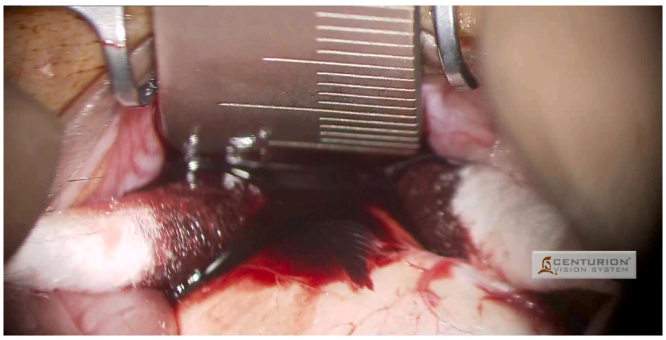

Fig. 6. After scleral incision, transscleral drainage of subretinal hemorrhage and subretinal pigment epithelial hemorrhage were performed.

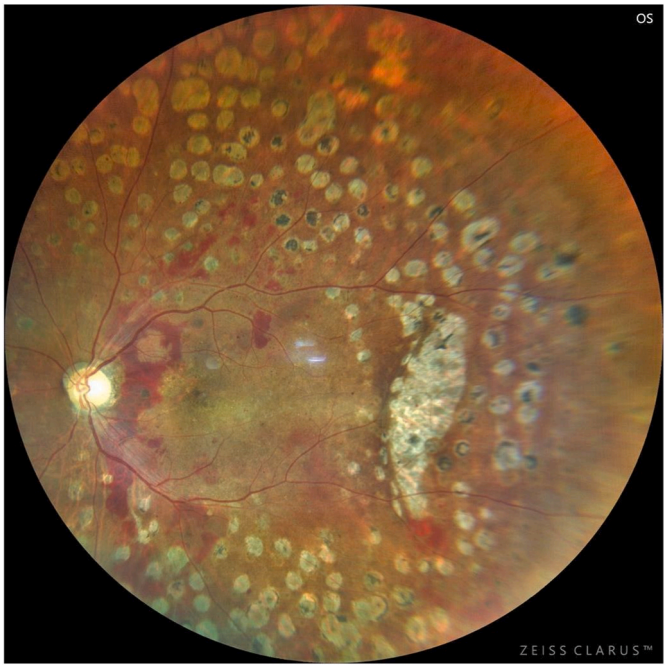

Fig. 7. Left fundus photograph after operation. Retinal pigment epithelial tear located in the temporal area between the equator of the eye and the macula; the reattached retina.

almost all risk factors shown in Table 1. He underwent surgery 2 weeks after intravitreal injection of aflibercept. We attempted to transsclerally drain the SRH and subretinal pigment epithelial hemorrhage in accordance with the report by Liu et al.,[10] who described the usefulness of displacing massive submacular hemorrhage secondary to PCV without an intentional retinal tear. Perfluorocarbon liquid was dropped on the posterior pole to displace the SRH and subretinal pigment epithelial hemorrhage from the posterior pole to the periphery, and transscleral needle drainage was then performed. In our case, not only the subretinal pigment epithelial hemorrhage but also the SRH could be drained from the sclerotomy and choroidal puncture. We believe that SRH may be moved into the subretinal pigment epithelium space via the RPE tear that develops after intravitreal injections of aflibercept and drained from the sclerotomy.

This technique has two advantages. First, the risk of postoperative proliferative vitreoretinopathy is reduced because it is unnecessary to create iatrogenic retinal holes for drainage. Second, there is a lower risk of retinal perforation because a sharp object is not used to penetrate the scleral space (Liu et al.[10] used a 30-gauge ultrathin needle to drain the SRH).

4. Conclusions

In our patient, the retina was successfully reattached without creating Iatrogenic retinal hole. Our technique is simple, and it is associated with lower risk and stress because an iatrogenic retinal hole is not created. We believe our technique may be a useful treatment for PEHCR or PCV with massive SRH and subretinal pigment epithelial hemorrhage.

Patient consent

The patient provided written consent for the publication of the case details.

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CRediT authorship contribution statement

Takahiro Kuraishi: Writing – original draft. **Hajime Kawamura:** Writing – review & editing. **Isao Saito:** Writing – review & editing.

Table 1
Previous reports of peripheral exudative hemorrhagic chorioretinopathy.

Authors (year)	Number of patients (number of eyes)	Average age (y)	Male: female	Complications	Localization of lesions (temporal side: nasal side)	Complications of vitreous hemorrhage, n (%)	Complications of macular lesions, n (%)	Detection of neovascularization
Annesley[1] (1980)	27 (32)	69.9	12:15	HT: 12, DM: 1, HD: 6, CD: 2	31:14	8 (25)	1 (5)	FA: 13
Delaney et al.[5] (1988)	11 (12)	72.4	3:8	HT: 3, DM: 3, HD: 3, MT: 2	11:0	5 (42)	6 (50)	NR
Silva and Brockhurst[6] (1976)	6 (7)	61	4:2	HT: 3	7:0	4 (57)	3 (43)	FA: 1
Orth and Flood[7] (1982)	3 (3)	57	0:3		3:0	3 (100)	0 (0)	FA: 1
Bardenstein et al.[8] (1992)	19 (19)	71.5	4:15	HT: 5, DM: 2, MT: 4	NR	10 (53)	5 (25)	FA: 4
Mantel et al.[9] (2009)	45 (56)	77	15:31	CD: 3	55:11	9 (16)	31 (68.9)	FA: 22, IA: 6

HT, hypertension; DM, diabetes mellitus; HD, heart disease; CD, coagulation disorders; NR, not reported; MT, malignant tumor; FA, fluorescein angiography; IA, indocyanine green angiography.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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