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CASE REPORT

Intravitreous injection of conbercept for bullous retinal detachment: A case report

Xiao-Li Xiang, Yi-Hong Cao, Ting-Wang Jiang, Zheng-Ru Huang

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Abstract

BACKGROUND

Diffuse retinal pigment epitheliopathy (DRPE) associated with bullous retinal detachment is a severe variant of DRPE that is frequently misdiagnosed and often improperly treated.

CASE SUMMARY

A 36-year-old female patient complained of "painless vision decline in the left eye with obscuration for 10 d". Slit-lamp microscopic fundus examination revealed white-yellow subretinal exudates in the posterior pole in both eyes, retinal detachment with shifting subretinal fluid in the left eye, and no retinal hiatus. Fundus fluorescein angiography revealed multiple subretinal leakage foci and localized hypofluorescent lesions with patched hyperfluorescence. There was fluorescence leakage in the retinal vessels in the retinal detachment area and occluded blood vessels in the lower and peripheral areas. Indocyanine green angiography revealed multifocal lamellar hyperfluorescence in the middle stage and low fluorescence in the retinal detachment area in the late stage. Retinal anatomical reduction significantly improved with intravitreal conbercept injections.

CONCLUSION

Intravitreal injection of conbercept can anatomically reattach the retina in patients with bullous retinal detachment.

Key Words: Bullous retinal detachment; Conbercept; Diffuse retinal pigment epitheliopathy; Bullous central serous chorioretinopathy; Case report

Core Tip: The study patient exhibited a considerable improvement in retinal anatomical reduction after intravitreal injections of conbercept. Nevertheless, due to the the macular area destruction, we observed unsatisfactory improvement in best-corrected visual acuity. Based on the study findings, intravitreal injection of a vascular endothelial growth factor inhibitor may be a considered potent therapeutic option for cases of bullous retinal detachment of diffuse retinal pigment epitheliopathy. This treatment is uncomplicated and harmless and precludes adopting complex surgical techniques associated with high risk of complications.

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INTRODUCTION

Bullous retinal detachment is an extremely rare manifestation of diffuse retinal pigment epitheliopathy (DRPE) or chronic central serous chorioretinopathy (CSCR). It is difficult to treat and can eventually result in loss of vision due to irreversible retinal damage[1-2]. The clinical features of this disease include multiple serous vesicular retinal detachments at the posterior pole and the periphery of the fundus. Multiple retinal detachments often fuse into one large retinal detachment and are located below because of gravity and fluid accumulation. This disease is very easily misdiagnosed and is, thus, often treated improperly, which leads to rapid deterioration of the patient's condition, resulting in permanent visual damage or even blindness[1-3].

Herein, we report a case of bullous retinal detachment with retinal reattachment after vitreous injection of conbercept.

CASE PRESENTATION

Chief complaints

A 36-year-old female patient complained of "painless vision decline in the left eye with dark shadow covering for 10 d".

History of present illness

Ten days previously, she had a feeling of decreased vision with dark shadow covering in her left eye.

History of past illness

The patient neither had a history of ocular trauma or surgery nor a family history of ocular diseases. She denied any history of systemic disorders or sojourns in the epidemic-stricken area and was not receiving any medication at the time.

Personal and family history

The patient had a 14-year-old daughter with type 1 diabetes mellitus combined with diabetic cataracts.

Physical examination

On her first visit to our department, her best-corrected visual acuity (BCVA) was 20/30 in the right eye and 20/100 in the left eye. Slit-lamp microscopic examination revealed no inflammatory signs in the anterior chamber (Figure 1A and B) or vitreous in either eye. Dilated fundus examination revealed white-yellow subretinal exudates in the posterior pole in both eyes, corrugated inferior bullous retinal detachment with shifting of subretinal fluid, and no retinal hiatus (Figure 1C and D).

Laboratory examinations

Laboratory tests, such as routine blood tests, infectious diseases, blood biochemistry, and tumor indicators, were normal. The results of chest computed tomography and electrocardiogram were also normal.

Imaging examinations

Ophthalmic B-scan ultrasonography confirmed a bullous retinal detachment in the left eye (Figure 1F). B-scan ultrasonography of the right eye revealed normal findings (Figure 1E). Optical coherence

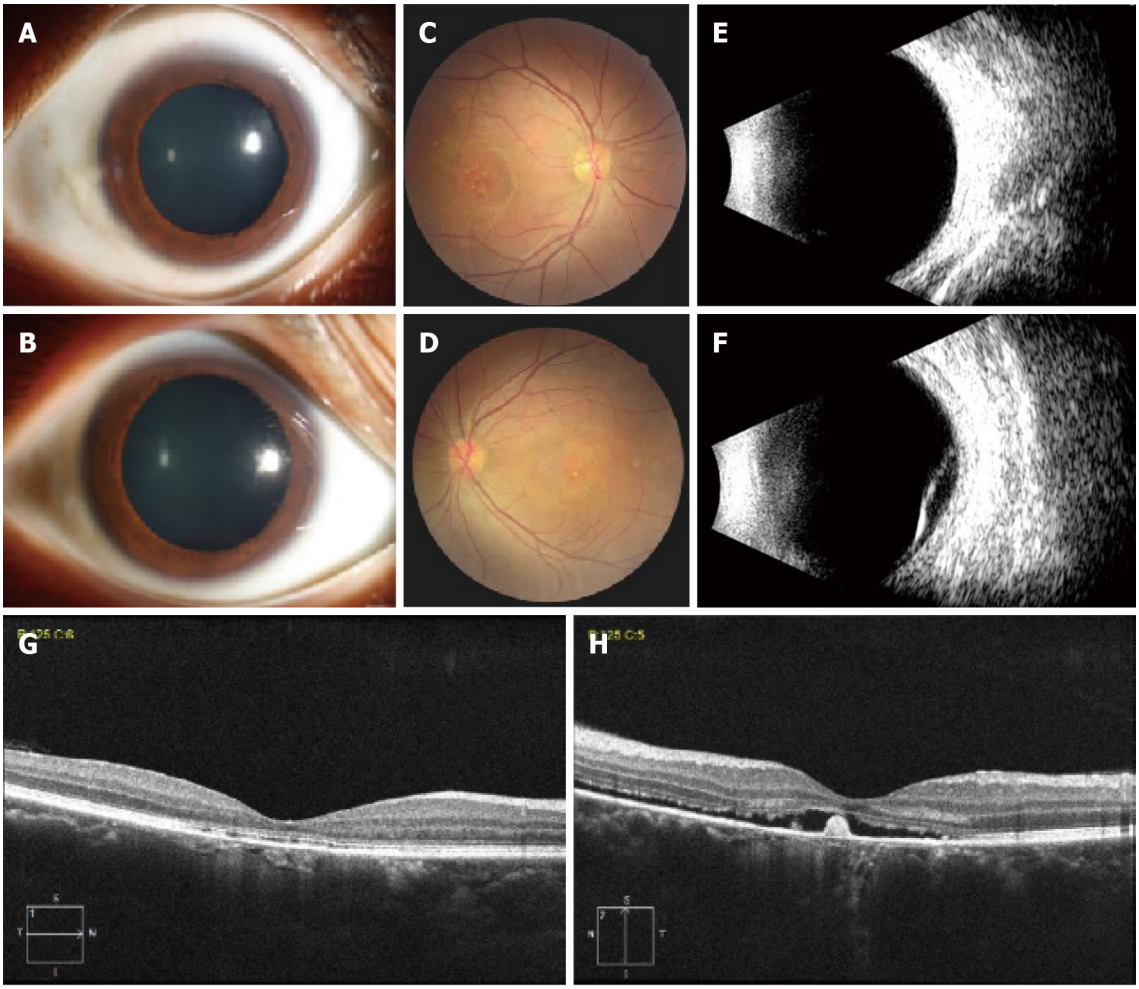

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Figure 1 Anterior segment and fundus photograph, ophthalmic B-scan ultrasonography, and optical coherence tomography examination of the patient. A: The anterior segment of the right eye is normal (dilated); B: The anterior segment of the left eye is normal (dilated); C: Fundus photograph shows white-yellow subretinal exudates in the posterior pole of the right eye; D: Fundus photograph of the left eye shows inferior exudative retinal detachment with subretinal exudation (fibrin) inferior to the macula; E: B-scan ultrasonography of the right eye is normal; F: B-scan ultrasonography confirms the bullous retinal detachment in the left eye; G: Optical coherence tomography (OCT) shows a discontinuous band of retinal pigment epithelium in the right eye; H: OCT shows neurosensory detachment at the fovea, with some hyperreflective material suggestive of fibrin in the left eye.

tomography (OCT) showed a discontinuous band of retinal pigment epithelium in the right eye (Figure 1G) and neurosensory detachment at the fovea with some hyperreflective material suggestive of fibrin in the left eye (Figure 1H). Fundus fluorescein angiography (FFA) revealed multiple patchy leakage foci in the retina, with localized low fluorescence damage and patchy high fluorescence. Retinal vascular fluorescence leakage was observed in the retinal detachment area. Some retinal vessels in the non-detachment area showed slight leakage, and the optic disc exhibited slight leakage in the late stage (Figure 2A-H). Indocyanine green angiography (ICGA) showed multifocal flakes with high fluorescence in the middle stage and low fluorescence in the retinal detachment area in the late stage (Figure 2I-P). FFA and ICGA of the right eye were also abnormal (Figure 3).

FINAL DIAGNOSIS

Based on the abovementioned clinical, laboratory, and imaging findings, the patient was diagnosed with DRPE complicated by bullous exudative retinal detachment.

TREATMENT

Treatment consisted of intravitreal injections of conbercept (0.05 mL/0.5 mg) under sterile conditions. Topical corticosteroids were not advised, and follow-up commenced without any other specific

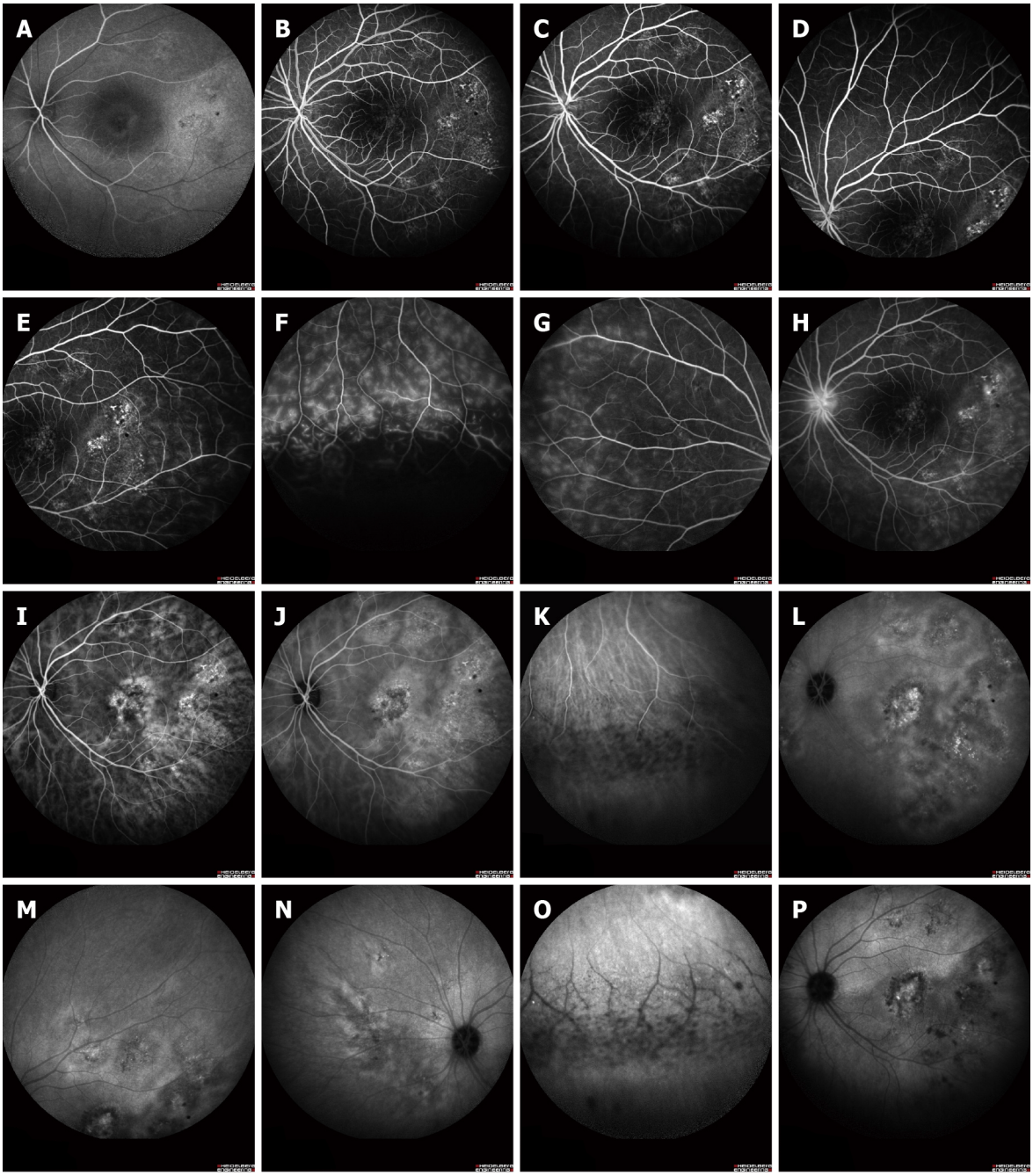

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Figure 2 Fundus fluorescein angiography and indocyanine green angiography photograph of the left eye. A-H: Fundus fluorescein angiography (FFA) revealing multifocal and diffuse leakage and hyperpermeable retinal vessels of the left eye; A: Early FFA angiograms; B-E: Middle FFA; F-H: Late FFA; I-P: Indocyanine green angiography (ICGA) revealing hyperpermeable and dilated choroidal vessels and multifocal and diffuse leakage of the left eye; I-J: Early ICGA; K-N: Middle ICGA; O-P: Late ICGA.

interventions. According to the BCVA and OCT results, reinjection was administered as needed. The patient received a second injection of the same dose 1 mo after the first injection. Eventually, the patient received two injections.

OUTCOME AND FOLLOW-UP

One month after the first injection, the BCVA in the left eye was 20/100; however, fundus examination showed reduced neurosensory detachment, and OCT indicated that the subretinal fluid volume was reduced (Figure 4A). One month after the second injection, her BCVA increased to 20/50. The subretinal fluid was almost completely absorbed; however, a small amount of fluid was still visible in the central fovea of the macula, under which a highly reflective signal could be observed (Figure 4B and C). Six

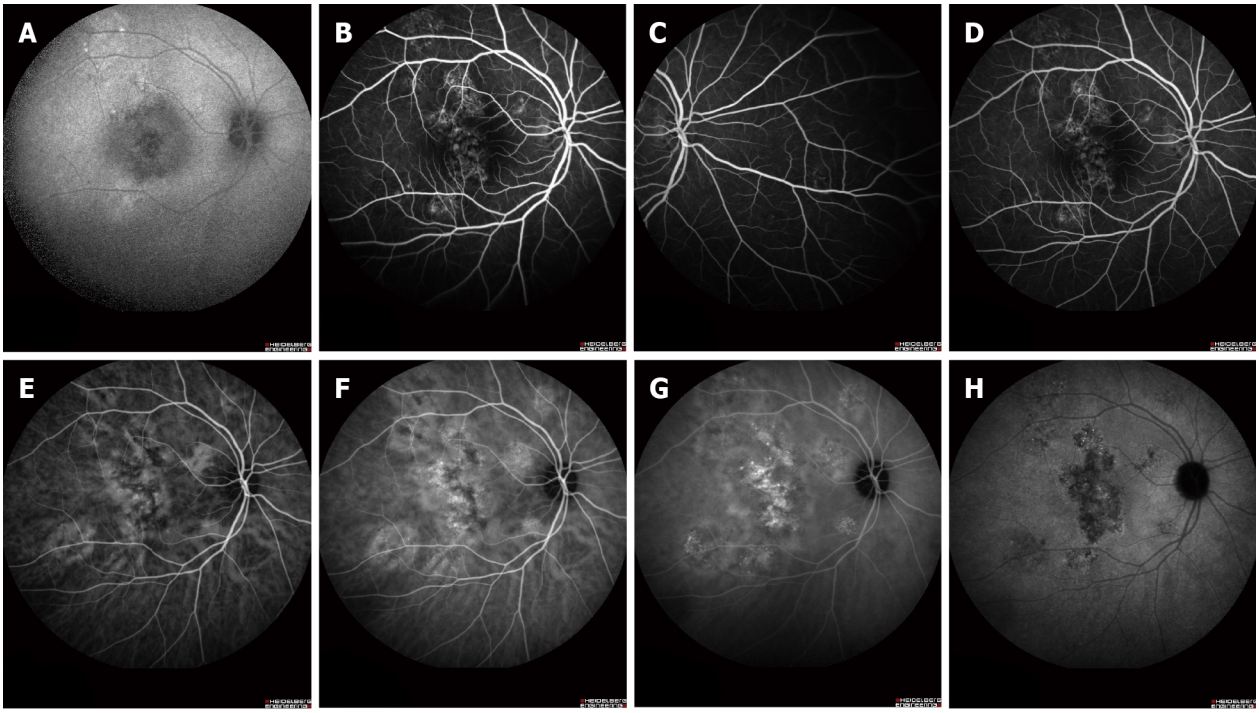

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Figure 3 Fundus fluorescein angiography and indocyanine green angiography revealing some areas of transmission hyperfluorescence and dilated choroidal vessels of the right eye. A: Fundus autofluorescence; B-D: Middle and late fundus fluorescein angiography; E-H: Early and late indocyanine green angiography.

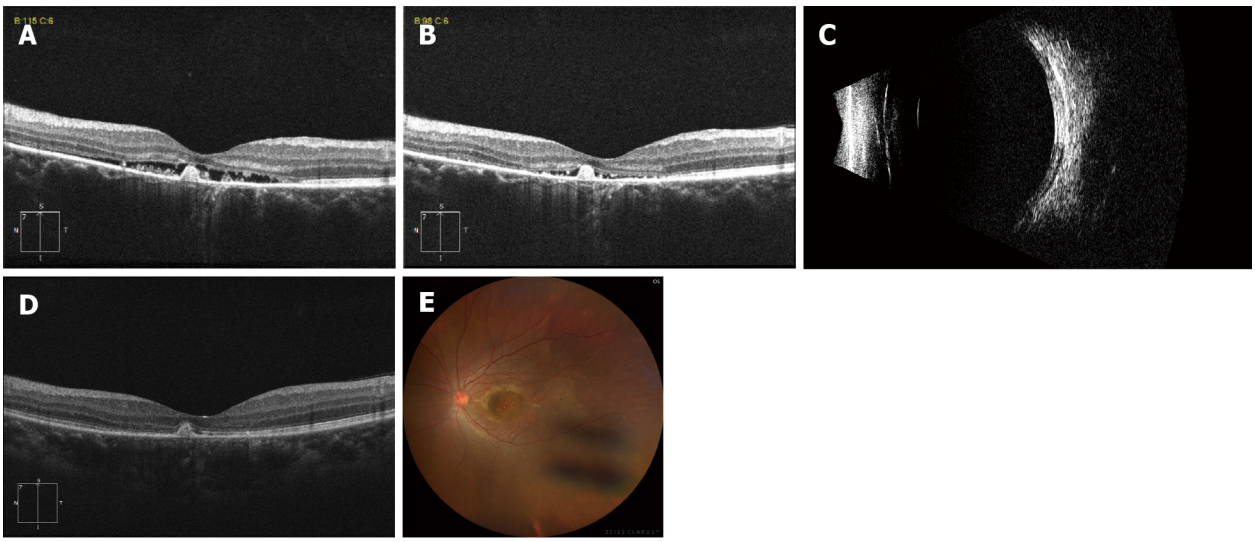

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Figure 4 Examination images after the first and second intravitreal injections of conbercept. A: Optical coherence tomography (OCT) showing a decrease in subretinal fluid with persistence of hyperreflective subretinal fibrin 1 mo after the first injection; B: OCT revealing a small amount of subretinal fluid with persistence of hyperreflective subretinal fibrin 1 mo after the second injection; C: B-scan ultrasonography revealing clear resolution of bullous retinal detachment 1 mo after the second injection; D: OCT revealing resolution of subretinal fluid with persistence of the hyperreflective subretinal fibrin 6 mo after the second intravitreal injection of conbercept; E: Fundus photograph of the left eye shows total resolution of the exudative detachment with subretinal exudation (fibrin) at the posterior pole 6 mo after the second intravitreal injection of conbercept.

months after the second injection, her BCVA was 20/50, and the subretinal fluid was completely absorbed (Figure 4D and E).

DISCUSSION

We describe a case of intravitreal injection of conbercept that cured bullous retinal detachment. After two intravitreal injections, the patient exhibited retinal reattachment. DRPE is the idiopathic form of central serous chorioretinopathy (CSC), which has a poorer prognosis than typical CSC[1]. As a unique type of exudative retinal detachment, bullous retinal detachment is an atypical manifestation of CSC[4], also known as bullous central serous chorioretinopathy (bCSCR). Tsukahara and Uyama[5] further detailed the pathogenesis of this disease as follows: increased choroidal vascular permeability alters RPE, thereby damaging RPE outer blood-retina barrier. Subsequently, fibrinogen and protein leak out, and subretinal exudation occurs. DRPE associated with bullous retinal detachment is frequently misdiagnosed[2]. Differential diagnoses include rhegmatogenous retinal detachment or exudative detachment, such as Vogt-Koyanagi-Harada disease, posterior scleritis, metastatic tumors, uveal effusion syndrome, and other disorders. This condition is aggravated by the use of steroids. Incorrect treatment can cause the condition to worsen rapidly, leading to permanent visual impairment and even blindness[2]. The correct diagnosis of DRPE may prevent complications from the misuse of corticosteroids, as well as unnecessary surgery and vision loss.

The current patient had a normal axial length and no evidence of uveitis, ciliochoroidal detachment, or ocular signs was observed. Intraocular tumors and choroidal detachment were excluded using B-type ultrasonography. Prolonged retinal detachment may manifest as vascular leakage in the area of detachment on FFA, and because the subretinal fluid changes with position, the upper retina may also show slight vascular leakage, with slightly higher fluorescence around the optic disc. ICGA indicated primary choroidal hyperpermeability with secondary retinal pigment epithelium dysfunction in both eyes. Although this patient complained of reduced visual acuity in one eye, changes in the retinal pigment epithelium (RPE) were visible in both eyes on FFA and ICGA. Scholars in Japan have reported the average age of onset of DRPE to be 43.1 years[6]. Similarly, Chinese scholars reported that the average age was 40.5 ± 6.7 years, and the male-to-female ratio was 5:1[3]. The present study patient was 36 years old, which was within the age range reported in the literature.

Choroidal vascular dysfunction is an important feature of DRPE pathophysiology[7]. DRPE is characterized by the dilation of vessels in the outer layer of the choroid, atrophy of the inner layer of the choroid, and thick choroidal features with high choroidal permeability[7,8]. Laser photocoagulation and/or photodynamic therapy[3,9,10] are potential treatment options for patients with threatened visual acuity[11]. Vitrectomy and internal drainage of the subretinal fluid have also been reported as treatment options for retinal detachment in DRPE[12]. Intravitreal injection of anti-vascular endothelial growth factor (VEGF) is also considered[13]. Anti-VEGF drugs are used for treating such diseases because of their anti-permeability characteristics, which reduce the high permeability of choroidal blood vessels[14,15]. To date, there has been only one case report of treatment of bCSCR with intravitreal injection of anti-VEGF without clinical improvement[16]. The patient was treated unsuccessfully with intravitreal bevacizumab (1.25 mg) and ranibizumab (0.5 mg) followed by successful treatment with reduced fluence photodynamic therapy[16]. Ranibizumab and bevacizumab are derived from a murine monoclonal antibody[15].

We selected the anti-VEGF agent, conbercept, which is a recombinant fusion protein with different chemical structure and pharmacological properties from other anti-VEGF drugs. Conbercept is fused by VEGF receptors 1 and 2 to the Fc portion of human immunoglobulin G1 that blocks VEGF-B, placental growth factor, and all VEGF-A isoforms[15]. We proposed the potential efficacy of conbercept in bullous retinal detachment, considering its anti-permeability properties in decreasing choroidal vascular hyperpermeability. The current patient demonstrated a significant improvement in retinal anatomical reduction following intravitreal injections of conbercept. However, because of the destruction of the macular area, there was limited improvement in BCVA.

Stress events may be predisposing factors for bullous retinal detachment[16,17]. The stress factor was observed in this case. Ultimately, we performed binocular cataract phacoemulsification and intraocular lens implantation for the patient's daughter free of charge and recommended that they visit the ophthalmology clinic on a regular basis. At the time of the final follow-up, the ocular conditions of both the patient and her daughter were stable.

CONCLUSION

In conclusion, we describe a case of intravitreal injection of conbercept that cured the bullous retinal detachment of DRPE. This case suggests that intravitreal injection of a VEGF inhibitor may be a considered therapeutic option for patients with bullous retinal detachment of DRPE. This treatment is safe and simple, avoiding the need for complex surgical techniques with high risk of complications. However, our conclusion is based on a single case report with no long-term outcomes. Therefore, a larger case series and longer follow-up periods are needed to further explore such treatment.

FOOTNOTES

Author contributions: Xiang XL, Cao YH, and Huang ZR contributed to conception and design; Xiang XL, and Jiang TW contributed to data collection and collation; Xiang XL contributed to manuscript writing; Huang ZR contributed to definition of intellectual content, data interpretation and final review of the manuscript; all authors have read and approved the final manuscript.

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