

Case Report

A Case of Birdshot Chorioretinopathy following Varicella Zoster Virus-Induced Progressive Retinal Necrosis in the Contralateral Eye

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Keywords

Acute retinal necrosis · Birdshot chorioretinopathy · Progressive outer retinal necrosis · Varicella zoster virus

Abstract

Birdshot chorioretinopathy is an immune-mediated ocular inflammatory disease of the retina. We report a case of birdshot chorioretinopathy in one eye following progressive retinal necrosis caused by varicella zoster virus (VZV) in the contralateral eye. A 79-year-old female patient complained of decreased vision due to anterior chamber inflammation and vitreous opacity in the left eye starting 10 days earlier. Acute retinal necrosis was suspected and polymerase chain reaction analysis was performed using the anterior chamber aqueous. VZV DNA was detected, and antiviral drugs and steroids were systemically administered together with local therapy. As retinal necrotic changes and retinal detachment gradually developed, vitrectomy and silicone oil tamponade were performed. Despite these procedures, retinal necrosis gradually progressed. Eventually, extensive retinochoroidal atrophy resembling progressive outer retinal necrosis was observed. Two years and 4 months after onset, anterior chamber inflammation and white spots of the retina started to appear in the right eye. The number of white spots gradually increased all around the retina, regardless of systemic treatment with acyclovir and prednisolone. The fundus findings seemed consistent with birdshot chorioretinopathy. Diseases exhibiting white dots in the retina, such as sarcoidosis, were excluded. Ss-OCT examination revealed destruction of the layer structure mainly in the outer layers of the retina and a section of a white dot revealed that the retina appeared to be pulled into the RPE. To the best of our knowledge, this is the first report of birdshot chorioretinopathy in one eye after the onset of VZV-induced retinal necrosis in the contralateral eye.

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Introduction

Birdshot chorioretinopathy is an immune-mediated inflammatory disease characterized by white spots in the deep layer of the retina. Here, we report a case of birdshot chorioretinopathy in one eye following progressive retinal necrosis caused by varicella zoster virus (VZV) in the contralateral eye.

Case Presentation

A 79-year-old female visited our hospital with the complaint of floaters and decreased vision due to anterior chamber inflammation and vitreous opacity in the left eye starting 10 days earlier. Her best corrected visual acuities were 0.9 and hand motion in the right and left eye, respectively. The patient was suspected to have acute retinal necrosis and polymerase chain reaction analysis was performed using anterior chamber aqueous. VZV DNA was detected. Antiviral drugs (acyclovir 250 mg/day) and steroids (prednisolone 20 mg/day) were administered systemically and betamethasone and mydriatic agents were administered locally. As retinal necrotic changes along with retinal detachment gradually developed (Fig. 1a), vitrectomy and silicone oil tamponade were performed (Fig. 1b). Despite these procedures, retinal necrosis gradually progressed. Eventually, extensive retinochoroidal atrophy resembling progressive outer retinal necrosis [1] was observed (Fig. 2). Her left eye lost sight. No notable abnormalities had been observed in the right eye up to 2 years 4 months after onset (Fig. 3a). Subsequently, anterior chamber inflammation, vitritis, and white spots

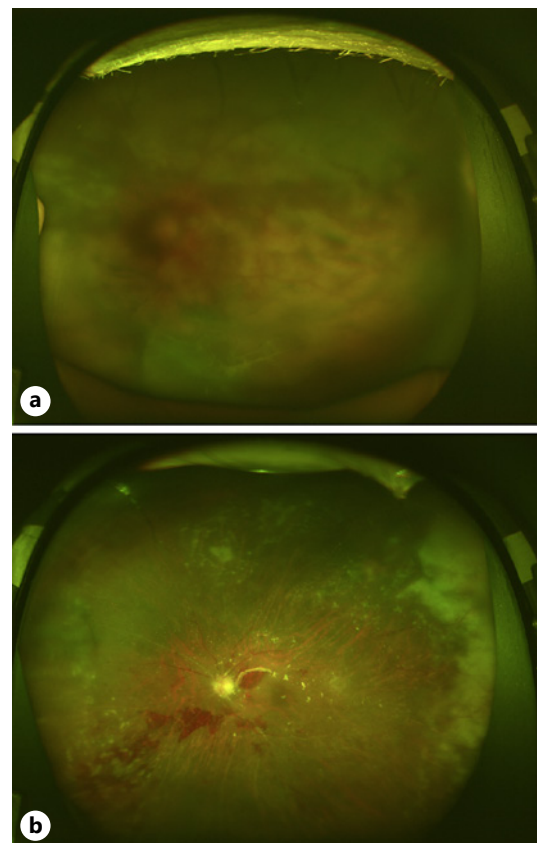


Fig. 1. Fundus photograph of the left eye. **a** One week before vitrectomy. Vitreous opacity and necrotic changes are observed. **b**. One week after vitrectomy. Most major retinal vessels are sheathed and the optic disc is pale.

Fig. 2. Fundus photograph of the left eye at present. Retinal necrotic changes are observed widely and extensively.

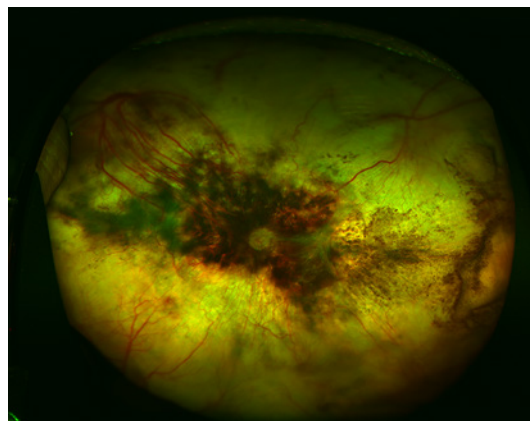
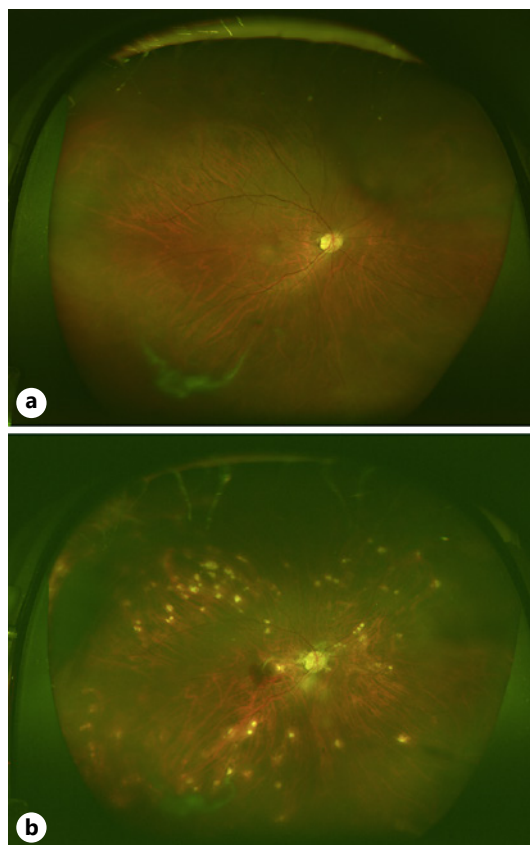


Fig. 3. Fundus photograph of the right eye. **a** Six months before the appearance of white dots in the retina. Note the lack of abnormal findings. **b** One year after the appearance of the white dots. Note that the white dots are distributed evenly on the peripheral retina and the macula.



of the retina started to appear in the right eye. Treatment with betamethasone eye drops suppressed the anterior chamber inflammation. However, the number of white spots gradually increased all around the retina despite systemic treatment with acyclovir and prednisolone. The fundus findings ultimately appeared to be consistent with birdshot chorioretinopathy [2] (Fig. 3b) 1 year after the detection of white spots. HLA-A29 [3] typing had not been examined, because HLA typing cannot be used to diagnose uveitis under the Japanese health insurance system. Diseases exhibiting white dots in the retina, such as sarcoidosis, were excluded by whole body findings, blood examinations, including angiotensin-converting enzyme and soluble interleukin-2 receptor analyses, and radiological examinations. Additionally, antinuclear

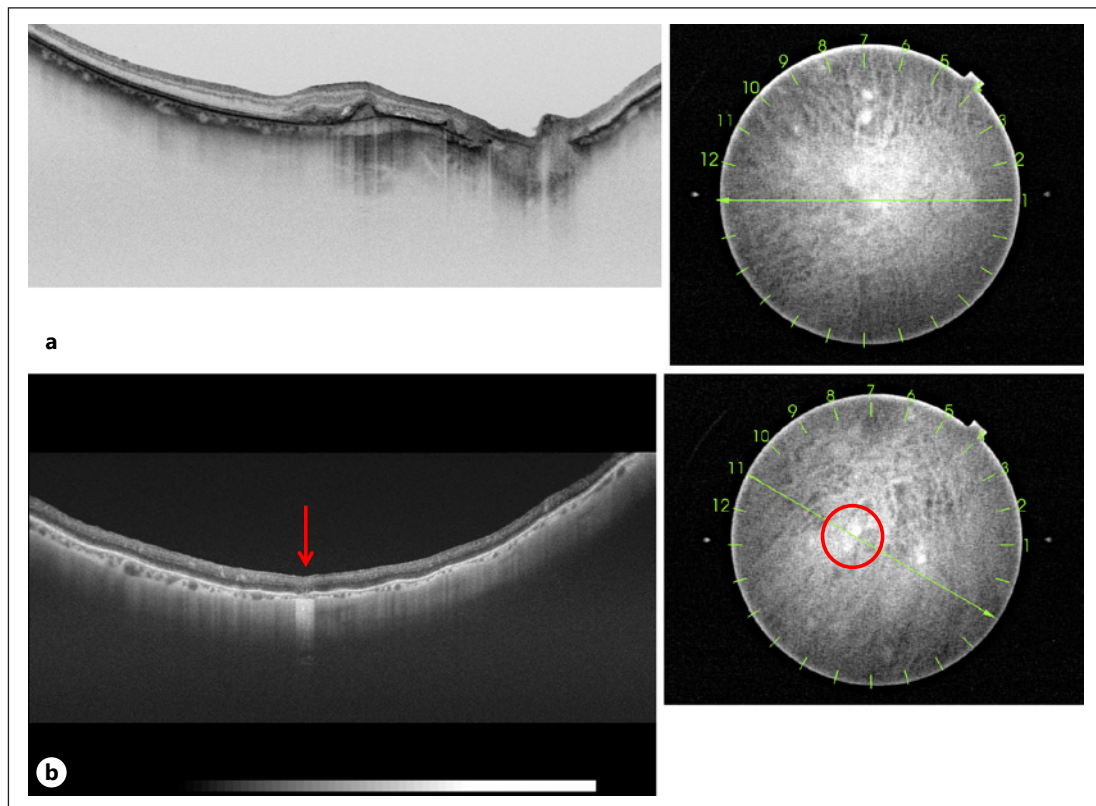


Fig. 4. Ss-OCT findings of the right eye. **a** Horizontal section of the retina revealed remarkable destruction of the structures of the outer retina later. **b** Section of a white dot. The circle indicates the site of this white dot. The arrow indicates the section of this white dot. Note that the retina seemed to be pulled into the RPE.

antibody tests were performed and data were boundary values. Other diseases exhibiting white dots in the retina were less likely in this case because the lesions radiate out from the optic nerve in a shotgun fashion. Ss-OCT examination revealed that destruction of the layer structure occurred mainly in the outer layers of the retina (retinal pigment epithelial layer and photoreceptor layer) (Fig. 4a). A section of a white dot revealed that the retina seemed to be pulled into the RPE (Fig. 4b). Finally, her right-best corrected visual acuity decreased to 0.03.

Discussion and Conclusions

To the best of our knowledge, there are no prior reports of birdshot chorioretinopathy in one eye after the onset of VZV-induced retinal necrosis in the contralateral eye. Among ocular immune-related diseases, Vogt-Koyanagi-Harada disease is well characterized. Vogt-Koyanagi-Harada disease, which mainly targets the choroid [4], does not primarily affect the retina. The retina is the site of immunological privilege. However, in cases of VZV-induced retinal necrosis such as progressive outer retinal necrosis, the immune system may be sensitized to the retinal antigens released due to the destruction of the retina. The outer layer of the retina, where self-antigens such as arrestin-3 are present, may then be attacked by the immune system as target antigens.

In summary, this case has demonstrated that damage caused by VZV-induced retinal necrosis can induce white dot syndromes, such as birdshot chorioretinopathy. Careful follow-up for the possibility of developing birdshot retinopathy is thus warranted for patients with VZV-induced retinal necrosis.

Statement of Ethics

This retrospective review of patient data did not require ethical approval in accordance with local/national guidelines. Written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images.

Conflict of Interest Statement

There is not any conflict of interest to declare.

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Authors Contributions

Atsuki Fukushima, Toshihiko Nagasawa, and Hitoshi Tabuchi evaluated the findings of patients and collected data. Atsuki Fukushima wrote the manuscript.

Data Availability Statement

All data generated or analysed during this study are included in this article. Further enquiries can be directed to the corresponding author.

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