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Kyoto University
Long-term efficacy and safety of anti-VEGF therapy in retinitis pigmentosa: a case report

Manabu Miyata*, Akio Oishi, Maho Oishi, Tomoko Hasegawa, Hanako Ohashi Ikeda and Akitaka Tsujikawa

Abstract

Background: Retinitis pigmentosa (RP), a neurodegenerative disease, is occasionally accompanied by choroidal neovascularization (CNV) and cystoid macular oedema. It is presently treated with repeated intravitreal injections of anti-vascular endothelial growth factor (VEGF) agents. However, there are concerns regarding long-term inhibition of VEGF by the use of these agents, especially in cases involving neurodegenerative diseases, since VEGFs have a neuroprotective effect. Currently, there are no reports on the long-term safety of anti-VEGF therapy in patients with RP.

Case presentation: In this report, we describe the case of a 56-year-old female patient with CNV associated with RP who was treated with anti-VEGF therapy for 8 years. She had autosomal dominant RP with a heterozygous PRPH2 mutation (c.410G > A) and complained of metamorphopsia in her left eye. Examinations revealed CNV with serous retinal detachment. She was treated with as-needed injections for 2 years; however, she experienced a recurrence. Therefore, we switched to a bimonthly regimen that was continued for 6 years. In total, the patient received 34 injections of various types of anti-VEGFs over 8 years. No recurrences were noted during that time, and we have not detected any negative effects concerning the progression of visual field loss in comparison with the fellow eye.

Conclusions: No negative effects related to the progression of visual field loss were observed during continuous treatment with anti-VEGF agents for 8 years in our patient.

Keywords: Retinitis pigmentosa, Anti-VEGF therapy, Choroidal neovascularization, Long-term, PRPH2

Background

Retinitis pigmentosa (RP) causes progressive vision loss due to the degeneration of rod and cone photoreceptors [1]. The disease is occasionally accompanied by choroidal neovascularization (CNV) [2], which is presently treated with repeated intravitreal injections of anti-vascular endothelial growth factor (VEGF) agents. However, VEGFs have a neuroprotective effect [3]; for example, loss of VEGF-A from the retinal pigment epithelium damages the choriocapillaris, which leads to photoreceptor dysfunction [4]. Therefore, there are concerns regarding long-term inhibition of VEGF, particularly in patients with neurodegenerative diseases such as RP. If not for these concerns, the frequency of use of anti-VEGF therapy for cystoid macular oedema (CME) secondary to RP would increase because of its effectiveness [5, 6]. However, there are no reports on the long-term efficacy and safety of anti-VEGF therapy for patients with RP. Herein, we present the case of a patient who had CNV associated with RP that was treated with anti-VEGF for 8 years.

Case presentation

A 56-year-old woman who had autosomal dominant RP with a heterozygous PRPH2 mutation (c.410G > A) complained of metamorphopsia in her left eye. Her best corrected visual acuity (BCVA) had declined from 1.0 (20/20) to 0.4 (20/50). Further examination revealed CNV with serous retinal detachment (Fig. 1). She was treated with as-needed injections for 2 years; however, she experienced a recurrence during which her vision deteriorated to 0.2 (20/100). Therefore, we switched to a bimonthly regimen that continued for 6 years. No recurrence was noted during that time, and her left visual
acuity remained 0.2 (20/100). In total, the patient received 34 anti-VEGF injections in 8 years (bevacizumab × 2, pegaptanib × 2, ranibizumab × 11, aflibercept × 19, in that order).

The patient’s central visual field was assessed using the mean deviation (MD) value on a Humphrey field analyser with a 10–2 SITA standard program (Carl Zeiss Meditec, Inc., Dublin, CA). The MD values decreased similarly in both eyes (Fig. 2). The slope of the MD values during the 8-year treatment period was −0.68 dB/year in the right eye (without CNV) and −0.32 dB/year in the left eye (with CNV). Although her peripheral visual field loss was noted to have progressed based on Goldmann perimetry tests, her visual field in the left eye was preserved even after 8 years (Fig. 1). No serious adverse events were observed during treatment.

**Discussion**

A previous case report demonstrated the effectiveness of a single injection of anti-VEGF (bevacizumab) for CNV cases associated with sectoral RP [7]. However, there was no information on the long-term outcome of
and obtained similar results. Overall, long-term anti-VEGF therapy did not induce rapid progression of central or peripheral visual field loss in our patient with RP showed no negative effects, especially concerning the progression of visual field loss in comparison with the fellow eye. The outcome in our case suggests that long-term administration of an anti-VEGF agent for CNV and CME in patients with RP is likely to be safe, and hence, clinicians can consider this treatment option.

Conclusions
Continuous anti-VEGF therapy for 8 years for one eye in our patient with RP showed no negative effects, especially concerning the progression of visual field loss in comparison with the fellow eye. The outcome in our case suggests that long-term administration of an anti-VEGF agent for CNV and CME in patients with RP is likely to be safe, and hence, clinicians can consider this treatment option.

Abbreviations
BCVA: best corrected visual acuity; CME: cystoid macular oedema; CNV: choroidal neovascularization; MD: mean deviation; RP: retinitis pigmentosa; VEGF: vascular endothelial growth factor

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Availability of data and materials
All relevant findings in the patient described here are included in this report.

Authors’ contributions
MM, AO, MO, and TH performed the clinical examinations in this case. HI and TA drafted the manuscript. All authors read and approved the final manuscript.

Ethics approval and consent to participate
This study was approved by the institutional review board at Kyoto University Graduate School of Medicine, Kyoto, Japan. All study protocols adhered to the tenets of the Declaration of Helsinki. The patient provided written informed consent for the publication of the case.

Consent for publication
The patient provided written informed consent for the publication of the case.

Competing interests
The authors declare that they have no competing interests.

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