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Case Report

Intravitreal Aflibercept in Recalcitrant Radiation Maculopathy due to External Beam Radiotherapy for Nasopharyngeal Cancer: A First Case Report

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Keywords

Aflibercept · Radiation maculopathy · Optical coherence tomography

Abstract

Purpose: To present the safety and efficacy of intravitreal aflibercept (Eylea) in a patient with radiation maculopathy secondary to external beam radiotherapy for nasopharyngeal cancer unresponsive to other therapeutic options. **Methods:** A 73-year-old female presented with decreased visual acuity in both eyes 18 months after completing 47 external beam cycles of radiation for nasopharyngeal cancer. On presentation, her best corrected visual acuity was 6/60 in the right eye and counting fingers from 1 meter in the left eye. She received 5 bevacizumab injections in the right eye and 7 bevacizumab injections in the left eye over the last year without any improvement. A treatment with intravitreal injections of aflibercept was recommended in both eyes. **Results:** The patient received 3 intravitreal aflibercept injections (2 mg/0.05 mL) in each eye every 4 weeks. The visual acuity improved from 6/60 to 6/12 in the right eye and from counting fingers to 6/36 in the left eye. Biomicroscopy showed less exudates, hemorrhages, and microaneurysms. Optical coherence tomography revealed reduced central retinal thickness in both eyes after 1–3 intravitreal aflibercept injections. **Conclusion:** Intravitreal aflibercept should be regarded a safe and effective treatment in patients with recalcitrant macular edema due to radiation maculopathy.

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Introduction

Radiation retinopathy is a sight-threatening complication resulting from the irradiation of ocular, orbital, periorbital, facial, nasopharyngeal and cranial structures for therapeutic purposes [1]. Its incidence is ranging from 36.4% after irradiation of nasopharyngeal cancer to over 85.7% after irradiation of eye and orbit [2]. The main abnormality of radiation damage is endothelial cell injury, primarily in capillaries, followed by capillary closure, subsequent retinal ischemia and fibrovascular proliferation [3]. The clinical signs are similar to those in diabetic retinopathy with microaneurysms, hemorrhages, exudates (soft and hard), cotton wool spots, vascular abnormalities such as venous beading and sheathing, neovascularization, telangiectasias, vitreous hemorrhage, preretinal hemorrhage and tractional detachment.

Case Presentation

A 73-year-old woman presented to our service complaining of decreased vision in both eyes. She had a history of nasopharyngeal cancer 3 years ago, for which she was treated with chemotherapy and radiotherapy. She totally received 47 cycles of external beam irradiation. The total accumulated radiation dose was 40 Gy. Eighteen months after completing her radiation therapy, she was complaining of reduced vision in both eyes. A diagnosis of radiation maculopathy was made and she received 5 bevacizumab injections (1.25 mg/0.05 mL) in the right eye and 7 in the left eye without any improvement. On presentation, her best corrected visual acuity was 6/60 in the right eye and counting fingers from 1 meter in the left eye. Ophthalmoscopy revealed cystoid macular edema and microangiopathy with intraretinal hemorrhages, hard exudates, and microaneurysms in the posterior pole of both eyes. A treatment with intravitreal injections of aflibercept (Eylea) was recommended. The patient was informed that the therapy was off-label and she signed a relevant consent form. The patient received 3 intravitreal aflibercept injections (2 mg/0.05 mL) in each eye every 4 weeks. Before each injection, the patient was undergoing examination including central retinal thickness (CRT) measurement by optical coherence tomography. CRT before treatment was 636 μ m in the right eye and 709 μ m in the left eye (Fig. 1a, b).

After the third intravitreal aflibercept injection, the CRT reduced to 209 μ m in the right eye and 427 μ m in the left eye (Fig. 2a, b). The best corrected visual acuity after the third injection improved to 6/12 in the right eye and 6/36 in the left eye.

Discussion

Radiation-induced macular edema can be treated with laser photocoagulation with very good results especially in the short term [4, 5]. Photodynamic therapy is also a therapeutic option with promising results in terms of visual acuity improvement and hard exudates reduction [6]. Intravitreal corticosteroids such as triamcinolone acetonide and dexamethasone were also used in the past with beneficial effect [7, 8]. Finally, the macular edema due to radiation retinopathy can be treated with intravitreal anti-VEGF injections. Bevacizumab and ranibizumab were used extensively in the past with reported efficacy [9, 10]. In our case report, this is the first time intravitreal aflibercept injections were used to treat macular edema due to radiation maculopathy. The patient was treated initially with intravitreal

bevacizumab injections. As the central retinal thickness was not reduced significantly and the best corrected visual acuity was the same, we recommended intravitreal aflibercept injections. Aflibercept is a fully human recombinant fusion protein which is licensed for the treatment of age-related macular degeneration, central and branch retinal vein occlusion and diabetic macular edema. After 3 aflibercept injections in each eye, the visual acuity improved significantly in both eyes and also the central retinal thickness was reduced as evidenced by optical coherence tomography. Given that no serious side effects were observed, aflibercept should be regarded as a treating option for macular edema due to radiotherapy. To our knowledge, this is the first case report showing the safety and efficacy of intravitreal aflibercept injections in recalcitrant macular edema due to radiation maculopathy.

Statement of Ethics

The patient has given her informed consent.

Disclosure Statement

The authors declare that there is no conflict of interest regarding the publication of this paper.

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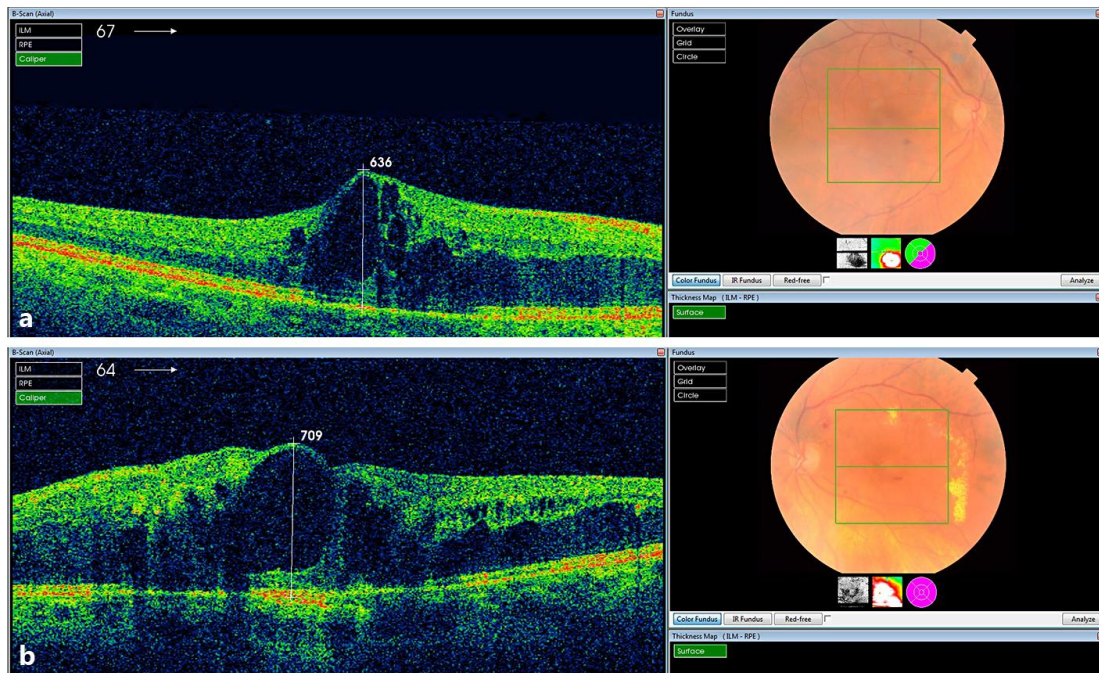


Fig. 1. Central retinal thickness of the right eye (a) and left eye (b) as documented by optical coherence tomography at presentation – before treatment with intravitreal aflibercept.

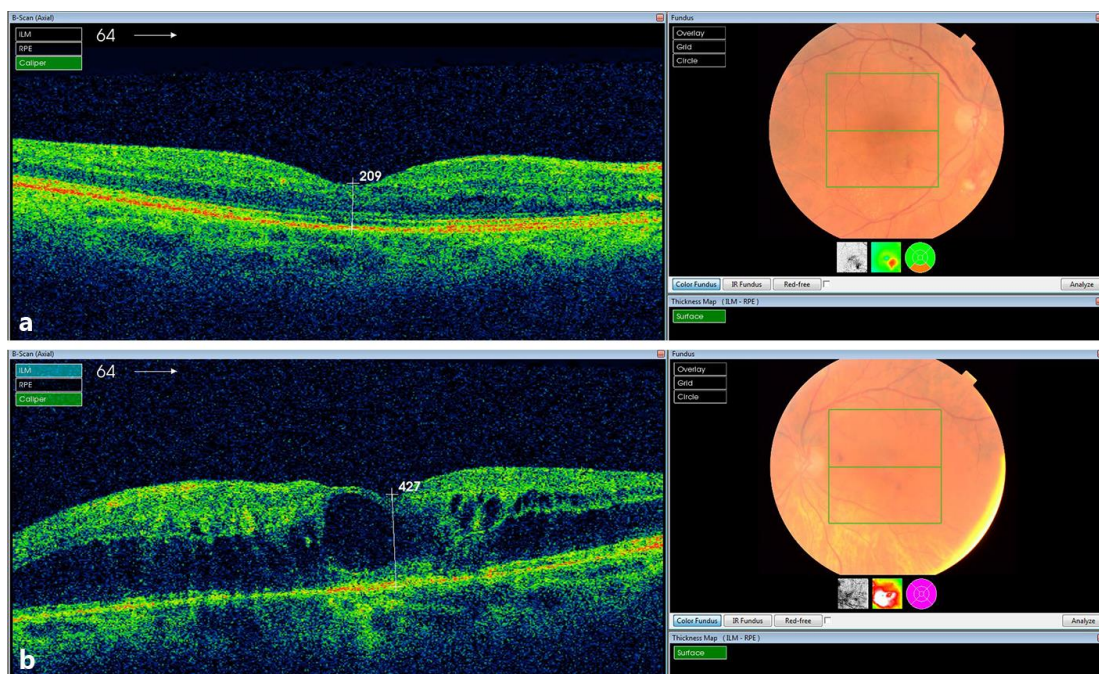


Fig. 2. Central retinal thickness of the right eye (a) and left eye (b) as documented by optical coherence tomography after treatment with 3 intravitreal aflibercept injections in each eye.