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Long-Term Follow-Up of Intravitreal Bevacizumab in Retinal Arterial Macroaneurysm: A Case Report

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Key Words

Bevacizumab (Avastin®) · Retinal macroaneurysm · Anti-VEGF therapy · Macular edema

Abstract

Purpose: To present the long-term effect of intravitreal bevacizumab (Avastin®) therapy in a patient suffering from retinal arterial macroaneurysm.

Methods: Case report of a 72-year-old female diagnosed with retinal macroaneurysm in the superior temporal artery leading to macular edema. Functional and morphological data at baseline, 4 weeks, 2 months, and 13 months following treatment with two consecutive intravitreal bevacizumab injections are presented.

Results: Best-corrected visual acuity improved from 20/160 at baseline to 20/20 at the 3-months follow-up and remained stable through 13 months of follow-up. Central retinal thickness measured by optical coherence tomography decreased from 364 µm at baseline to 248 µm at the 13-months follow-up. No ocular or systemic side effects were detected.

Conclusions: Intravitreal bevacizumab therapy may lead to resolution of macular edema associated with retinal macroaneurysm and consequently visual improvement. This treatment may promise a long-lasting effect but warrant further investigation in larger series.

Case Report

A 72-year-old female patient with hypertension and diabetes presented with visual disturbance OD. Best-corrected visual acuity (BCVA) was 20/160 OD and 20/20 OS. In both eyes, anterior segment examination was unremarkable. Funduscopy OD showed subretinal fluid and retinal hemorrhage in the superior temporal arcade with associated macular edema (ME), and few small intraretinal hemorrhages inferior to the macula, with no ME OS ([fig. 1a](#)).

Based on fluorescein angiography and indocyanine green, the diagnosis of leaking retinal macroaneurysm OD and inactive macroaneurysm + mild nonproliferative diabetic retinopathy OS was confirmed (fig. 1b–e). Central retinal thickness (CRT) OD was measured by optical coherence tomography (OCT, SD-OCT Cirrus, Zeiss) as 364 μm (fig. 1f).

Due to the location of the macroaneurysm OD, direct laser therapy was omitted in fear of closing the artery. After written consent for off-label use of intravitreal bevacizumab (Avastin®) was obtained, an injection (1.25 mg in 0.05 ml) was applied to the patient's right eye.

At 4 weeks following the injection, BCVA OD improved to 20/32. Retinal hemorrhage was reduced and CRT decreased to 328 μm . However, the hard exudates were more prominent. A second bevacizumab injection was performed 4 weeks after the first one. Four weeks after the second injection, the retinal hemorrhages and ME almost completely resolved (fig. 2a). Three months following the first injection, the ME had completely resolved, BVCA improved to 20/20 and CRT was 242 μm . These findings remained stable after 6 and 13 months (fig. 2b) of follow-up.

Discussion

Acquired retinal macroaneurysms are localized fusiform or round dilatations of retinal arterial branches [1, 2]. Current treatment options include observation and direct laser coagulation [3, 4]. The use of intravitreal injection of vascular endothelial growth factor (VEGF) inhibitors, such as ranibizumab or bevacizumab, is an effective treatment modality in neovascular age-related macular degeneration [5], ME due to diabetes [6, 7] or vein occlusion [8].

Focal embolic damage to arterial walls is thought to cause retinal macroaneurysm. As a result, localized ischemia with VEGF-associated increased permeability and dilatation of the artery occurs and causes ME and hard exudates [2]. Anti-VEGF drugs can prevent the formation of abnormal blood vessels and counteract VEGF-induced vascular permeability. They might actively close the involved permeabilized retinal artery and normalize the vessel wall by localized inhibition of VEGF. So far, there are only 3 reports on retinal macroaneurysm treated with intravitreal bevacizumab [9, 10]. After a follow-up of 6 weeks to 8 months, BCVA increased in all patients, and no adverse effects were observed.

In our patient, following the bevacizumab injection there was a reduction of ME with visual improvement, lasting 13 months. The therapy was well tolerated without adverse events. The observed beneficial effect of anti-VEGF therapy in macroaneurysms warrant further investigation. This treatment option should be considered when laser therapy is inappropriate or not working, or in patients in whom there is evidence of extensive ME.

Disclosure Statement

The authors have no financial support and no proprietary interest.

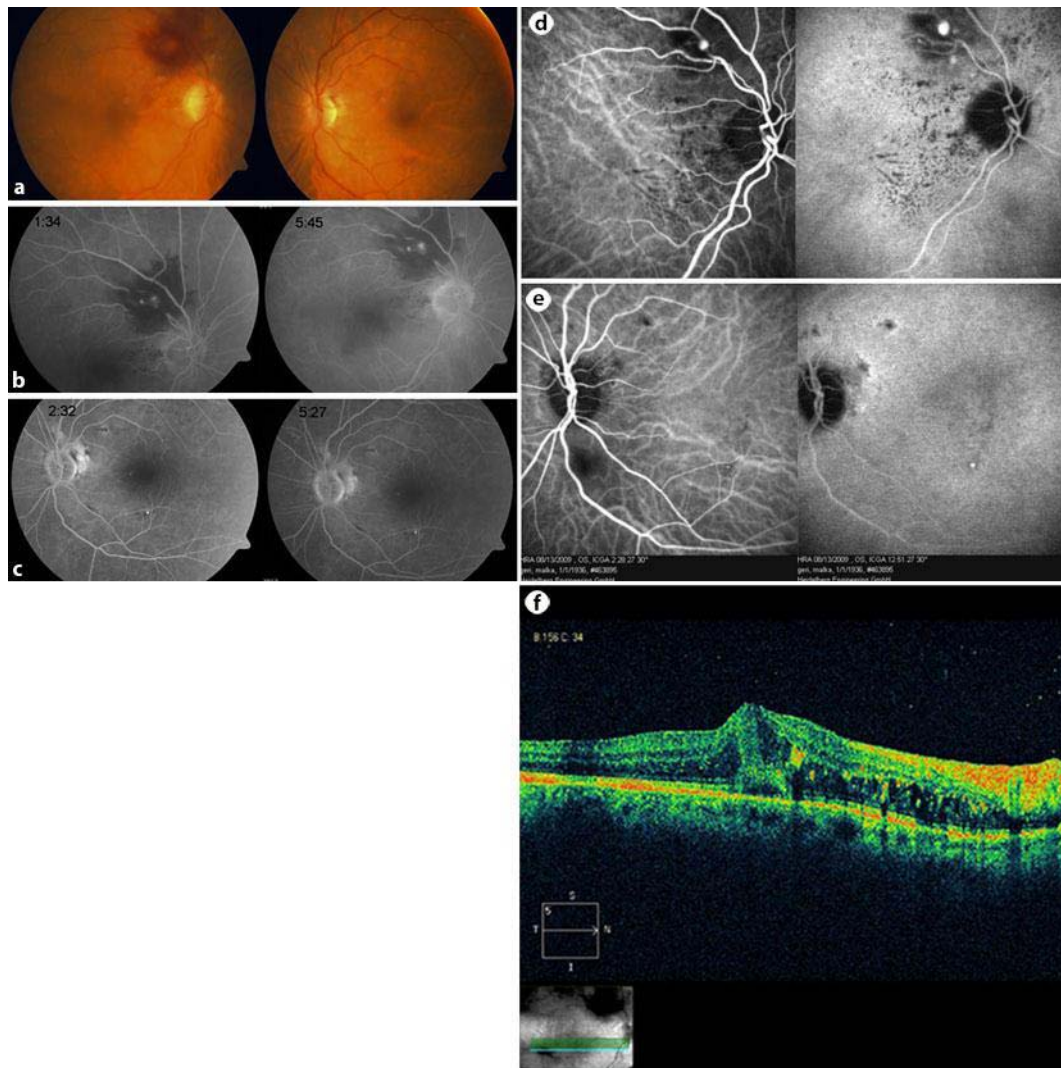


Fig. 1. **a** Fundus examination of the right eye showed subretinal fluid and retinal hemorrhage in the superior temporal arcade with associated macular edema, and normal attached peripheral retina. In the left eye, few small intraretinal hemorrhages inferior to the macula, flat macula with no edema and normal attached peripheral retina were identified. **b, c** Fluorescein angiogram showing a hyperfluorescent spot with late leakage consisted with macroaneurysm within a larger area of blocked hypofluorescence OD (**b**) and a small retinal macroaneurysm OS (**c**). **d, e** Indocyanine green nicely demonstrates the superotemporal macroaneurysm OD (**d**) and the inferotemporal macroaneurysm OS (**e**). **f** Pre-treatment OCT (SD-OCT Cirrus by Zeiss) demonstrates subretinal fluids, originating from the macroaneurysm with associated subfoveal fluid, retinal edema and intraretinal lipids. CRT OD is 364 μm .

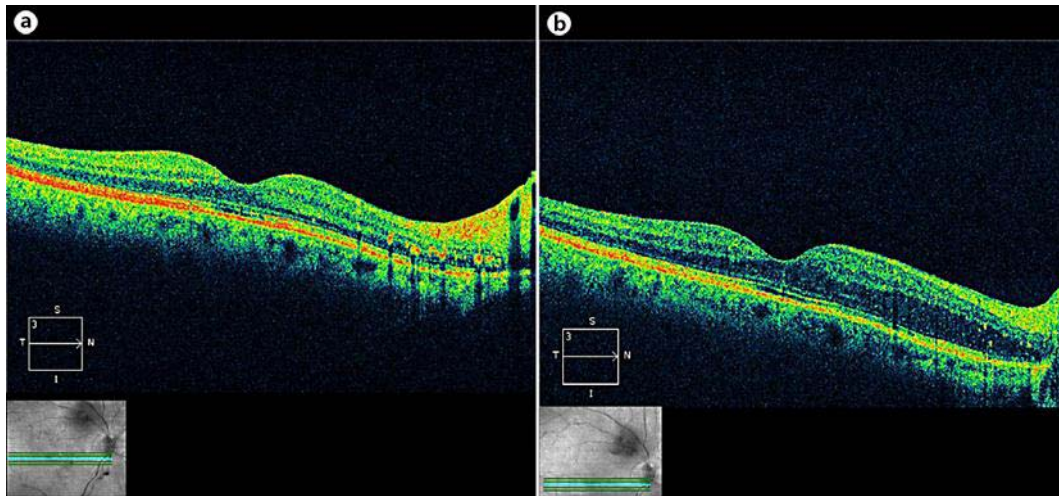


Fig. 2. **a** OCT performed 1 month following 2 IVT bevacizumab injections demonstrating normal foveal contour OD, complete resolution of subretinal and intraretinal fluids. Note the disappearance of the previously seen intraretinal lipids. **b** OCT performed at the last follow-up visit, 13 months following 2 IVT bevacizumab injections demonstrating stable, normal foveal contour, and a CRT of 248 μm .

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