

## Successful Treatment of a Patient with Retinal Arterial Macroaneurysm with Intravitreal Ranibizumab Injection: Case Report

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### Abstract

**Purpose:** To present the effect of intravitreal ranibizumab (Lucentis®) therapy in a patient suffering from symptomatic retinal arterial macroaneurysm.

**Methods:** Case report. A 67-year-old female patient was diagnosed with retinal macroaneurysm of the superior temporal artery with serous macular detachment and hemorrhage. Intravitreal monthly three 3 injection of ranibizumab was initiated to the patient. Her best-corrected visual acuity and morphological data were evaluated by optical coherence tomography and fluorescein angiography.

**Results:** Best-corrected visual acuity improved from 1/10 at baseline to 3/10 at 3-month follow-up and maintained stable throughout 12 months. Central retinal thickness measured by optical coherence tomography decreased from 678 µm at baseline to 248 µm with the resolution of serous detachments after the 3<sup>rd</sup> injection. Almost complete reabsorption of the hard exudates was also observed after the 3<sup>rd</sup> injection.

**Conclusion:** Intravitreal ranibizumab injection may be effective in the treatment of serous macular detachment associated with retinal macroaneurysms.

**Keywords:** Retinal Macroaneurysm; Intravitreal Injection; Ranibizumab

### Introduction

Retinal arterial macroaneurysms (RAM) are focal, fusiform or saccular dilation of retinal arterial branches particularly temporal branches of the central retinal artery [1,2]. RAM most commonly develops in women with hypertension, dyslipidemia and atherosclerosis aged between 50 and 80 years. RAM usually occurs in the first three orders of the arterial tree, where the perfusion pressure is high and frequently occurs at arteriovenous crossings. Although the majority of the cases result with spontaneous involution, bleeding, chronic macular edema, serous retinal detachment, and subretinal and preretinal hemorrhage are major causes of vision loss [3]. Although the most popular treatment modality of RAM is laser photocoagulation directed towards the lesion or the surrounding tissue [4], current treatment options include intravitreal injection of anti-vascular endothelial growth factor (VEGF) drugs. Inhibition of VEGF can prevent the formation of abnormal blood vessels and VEGF-induced vascular permeability [5]. We present a rare case of an exudative retinal macroaneurysm, which was successfully treated with intravitreal ranibizumab injection.

### Case Presentation

A 67-year-old woman presented with vision loss and metamorphopsia in her OD (right eye) for at least 3 weeks. Her medical history

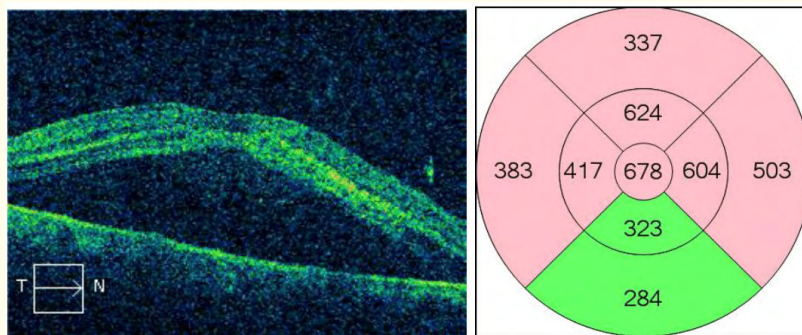
was positive for well-controlled type 2 diabetes with a 10-year duration as well as hypertension. Her best-corrected visual acuity (BCVA) was 10/10 in her OS (left eye) and 1/10 in her OD (right eye). Slit-lamp biomicroscopy was unremarkable and intraocular pressures were 19 mmHg bilaterally. Fundoscopy revealed yellowish round foveal lesion surrounded by macular edema, hard exudates and retinal hemorrhage (Figure 1a). Fluorescein angiography (FA) showed typical features of a saccular arterial macroaneurysm, and total filling in the middle phase and late diffusion in the superior retinal arterial branche (Figure 1b). Optical coherence tomography (OCT) showed foveal neurosensory detachment and central retinal thickness (CRT) was measured as 678  $\mu\text{m}$  (Figure 2a). After obtaining the written consent for the off-label use of intravitreal ranibizumab, the patient was scheduled for 3 monthly doses (0.5 mg of ranibizumab) in his OD. After the third injection, her BCVA improved to 3/10, and the macroaneurysm and OCT findings showed features of regression. Central macular thickness decreased to 248  $\mu\text{m}$  after the 3<sup>rd</sup> injection (Figure 2b). Almost complete reabsorption of the hard exudates was observed after the 3<sup>rd</sup> injection (Figure 3).



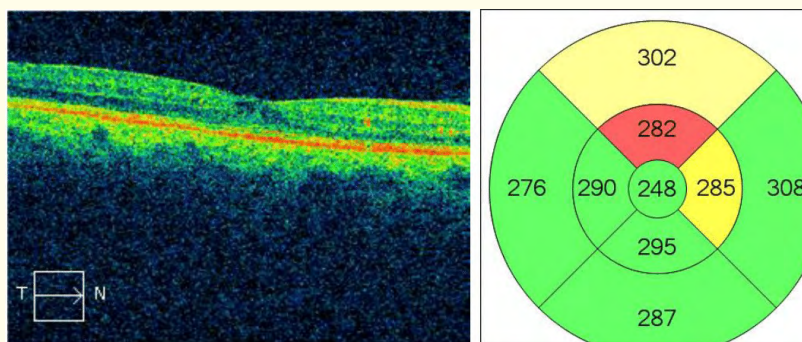
**Figure 1a:** Fundus image shows a retinal macroaneurysm in the superior temporal branches of the central retinal artery with macular edema and surrounding hard exudates.



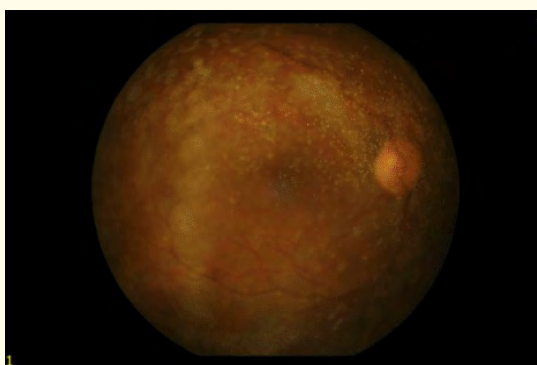
**Figure 1b:** Fluorescein angiography shows homogenous and almost a total filling of the macroaneurysm in the middle phase.



**Figure 2a:** Optical coherence tomography demonstrates presence of subretinal fluid and retinal edema.



**Figure 2b:** Optical coherence tomography showing the regression in the subretinal fluid in after the 3<sup>rd</sup> injection.



**Figure 3:** Fundus photography following three intravitreal ranibizumab injections showing resolution of the retinal hemorrhages and edema

After the end of month 12 the BCVA improved to 5/10, her fundus and OCT findings remained stable and did not show a recurrence within 1 year. No adverse effects occurred in the context of anti-VEGF therapy.

### Discussion

The most common of the occurrence of retinal macroaneurysms is within the first 3 bifurcations of the central retinal artery and generally result with gradual thrombosis, fibrosis and involution [1,2]. Unless fovea is effected by edema, serous retinal detachment or hard exudates, general approach to RAM is to observe and wait. Laser photocoagulation is associated with many complications, including enlargement of the laser scar, choroidal neovascularization, and subretinal fibrosis [4]. Despite the closure of the RAM with laser is the traditional treatment option, current approach to RAMs has changed in favour of anti-VEGF injection. Pichi., *et al.* [6] found that intravitreal injection of bevacizumab is an effective therapy for complex RAM, leading to rapid improvement in BCVA and central retinal thickness [6]. In addition, Cho., *et al.* reported that intravitreal bevacizumab injection likely hastens resolution of macular edema and hemorrhage secondary to RAM [7]. Wenkstern., *et al.* showed the effect of intravitreal ranibizumab (Lucentis®) therapy in a patient suffering from retinal macroaneurysm. After the initiation of therapy with two intravitreal ranibizumab injections followed by focal argon laser coagulation surrounding the retinal macroaneurysm, RAM closed leading to a resolution of the associated macular edema [8].

We preferred anti-VEGF treatment as the first line therapy instead of laser fotocoagulation because of the severe serous macular detachment. Regression of the macroaneurysm with the resolution of the serous detachment and normalization of the central retina thickness, apart from some residual exudates were obtained after the 3<sup>rd</sup> intravitreal injection of ranibizumab. Visual acuity improved from 1/10 to 3/10 after 3 months and 5/10 after 12 months. In our patient VEGF inhibition might actively have closed the involved pathologically permeabilized retinal artery and hence have caused a decrease in leakage and in CRT.

Underlying pathology in macroaneurysm is localized ischemia caused by focal embolic damage of the arterial wall and VEGF-associated increased permeability and dilatation of the retinal artery [9]. Ranibizumab (Lucentis®) has shown to reduce vascular permeability in choroidal neovasculariation due to AMD [10] as well as in pathological capillaries in diabetic macular edema [11] and in macular edema due to retinal vein occlusion [12].

As a conclusion, intravitreal ranibizumab may be effective in the treatment of macular edema associated with exudative macroaneurysms. The success of anti-VEGF therapy in macroaneurysm regression may be due to inhibition of VEGF-associated increased permeability and dilatation of the arterial wall [6].

### Conflict of Interest

The authors declare no conflict of interest.

### Funding

None.

### Bibliography

1. Pitkanen L., *et al.* "Retinal arterial macroaneurysms". *Acta Ophthalmologica* 92.2 (2014): 101-104.
2. Moosavi RA., *et al.* "Retinal artery macroaneurysms: clinical and fluorescein angiographic features in 34 patients". *Eye (London)* 20.9 (2006): 1011-1020.
3. Rabb MF., *et al.* "Retinal arterial macroaneurysms". *Survey of Ophthalmology* 33.2 (1988): 73-96.

4. Meyer JC, et al. "Laser therapy versus observation for symptomatic retinal artery macroaneurysms". *Graefes Archive for Clinical and Experimental Ophthalmology* 253.4 (2015): 537-541.
5. Zweifel SA, et al. "Intravitreal anti-VEGF therapy for retinal macroaneurysm". *Klinische Monatsblätter für Augenheilkunde* 230.4 (2013): 392-395.
6. Pichi F, et al. "Intravitreal bevacizumab for macular complications from retinal arterial macroaneurysms". *American Journal of Ophthalmology* 155.2 (2013): 287-294.
7. Cho HJ, et al. "Intravitreal bevacizumab for symptomatic retinal arterial macroaneurysm". *American Journal of Ophthalmology* 155.5 (2013): 898-904.
8. Wenkster AR and Petersen H. "Intravitreal ranibizumab in retinal macroaneurysm". *Graefes Archive for Clinical and Experimental Ophthalmology* 248.11 (2010): 1667-1670.
9. Lewis RA, et al. "Acquired arterial macroaneurysms of the retina". *British Journal of Ophthalmology* 60.1 (1976): 21-30.
10. Rosenfeld PJ, et al. "Ranibizumab for neovascular age-related macular degeneration". *New England Journal of Medicine* 355.14 (2006): 1419-1431.
11. Chun DW, et al. "A pilot study of multiple intravitreal injections of ranibizumab in patients with center-involving clinically significant diabetic macular edema". *Ophthalmology* 113.10 (2006): 1702-1712.
12. Pieramici DF, et al. "Ranibizumab for the treatment of macular edema associated with perfused central retinal vein occlusions. Ranibizumab in vein occlusion". *Ophthalmology* 115.10 (2008): e47-e54.

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