



Case report

Arterial macroaneurysm of the optic disc

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ABSTRACT

Purpose: We present fundus and spectral domain optical coherence tomography findings of a patient with an arterial macroaneurysm of the optic disc.

Observations: An 87-year-old woman presented with blurry vision and was found to have a retinal arterial macroaneurysm on the optic disc. Spectral domain optical coherence tomography revealed abnormal saccular arterial dilatation on the disc with an elongation anteriorly and superficial prepapillary hemorrhages. After 2 months, aneurysm thrombosed spontaneously without any visual consequences.

Conclusions and importance: Spectral domain optical coherence tomography can be used for the diagnosis and follow up of optic disc arterial macroaneurysms. Our case documents the natural history and unique spectral domain optical coherence tomography appearance of an optic disc arterial macroaneurysm.

1. Introduction

Retinal arterial macroaneurysms (RAM) are mostly observed in the posterior pole, especially along the first three order of arterial bifurcations and arteriovenous crossing sites where the flow rate is higher. However, macroaneurysms can occasionally be observed on the cilioretinal artery or the optic nerve head.^{1,2} Systemic hypertension, age and female gender are the main risk factors of RAM.^{3,4} The diagnosis can be made based on the clinical findings. Fluorescein angiography, indocyanine green angiography and spectral domain optical coherence tomography (SD-OCT) findings can support the diagnosis.⁵

Here we describe the natural history, fundoscopic appearance and SD-OCT findings of a patient with a RAM of the optic disc, thrombosed spontaneously during follow-up.

1.1. Case report

An 87-year-old woman was referred for the evaluation of blurry vision and optic disc hyperemia in the left eye. She had history of systemic hypertension and stroke. Visual acuity was 20/20 with correction in both eyes. Examination of the right eye revealed mild hypertensive retinopathy. Examination of the left eye revealed mild hypertensive retinopathy, posterior vitreous detachment and a RAM of the optic disc with mild prepapillary hemorrhage (Fig. 1). The lesion expanded in size and demonstrated increased filling during systole of the cardiac cycle, which was observed via biomicroscopic fundus examination (Fig. 2). SD-OCT of the optic disc demonstrated abnormal

saccular dilatation of the artery in the center of the optic disc (Fig. 3). Evaluation of the macula with biomicroscopy and SD-OCT showed no signs of intraretinal or subretinal fluid, exudates or hemorrhage. Observation was elected for the patient. Two months after her first visit, patient's blurry vision resolved in the left eye and her visual acuity remained at 20/20 in both eyes. Fundus examination revealed complete resolution of the aneurysm and resolution of the prepapillary hemorrhages (Figs. 1 and 3). SD-OCT demonstrated thrombosed lumen of the aneurysm in the center of the optic disc (Fig. 3).

2. Discussion

Although the RAMs are well described in the literature, macroaneurysms of the optic disc are rare.³ The diagnosis of a RAM is mostly based on the clinical findings. However, if RAM is located at an atypical location, such as optic disc, and complicated with hemorrhage, the differential diagnosis includes mass lesions of the disc, including granulomatous and neoplastic diseases.⁶

Most common complications of RAM include retinal hemorrhages, retinal exudates and vitreous hemorrhage. Diagnosis may be challenging in cases with extensive overlying exudates and retinal hemorrhages.⁴ RAM may be asymptomatic and found incidentally in routine ophthalmic examination. Treatment options for the RAM include yellow dye laser treatment of the aneurysm, argon laser for perianeurysmal retina and intravitreal injection of anti-vascular endothelial growth factors for visual recovery if macular edema exists. However, RAMs on the optic disc mostly involute without any intervention and

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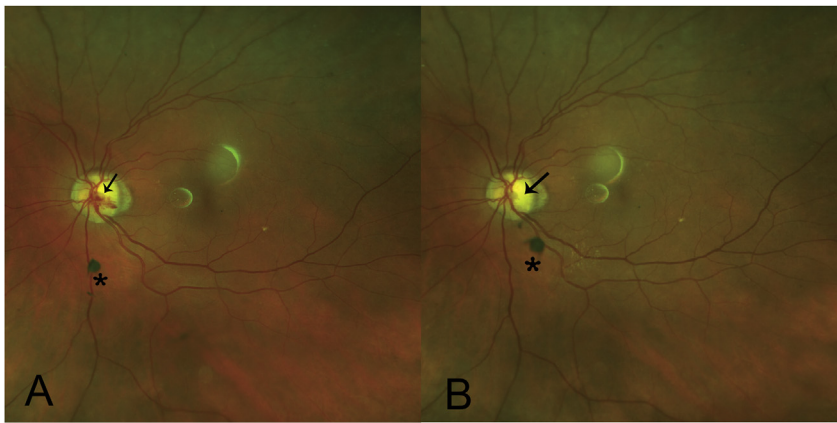


Fig. 1. (A) Fundus photograph of the left eye showing retinal arterial macroaneurysm and mild hemorrhage on the optic disc (arrow) and posterior vitreous detachment (asterisk). (B) Fundus photograph of the left eye at the 2 month follow-up visit showing resolution of retinal arterial macroaneurysm without any hemorrhage on the optic disc (arrow) and posterior vitreous detachment (asterisk). Circular and semi-circular densities are photographic artifacts of the macula.

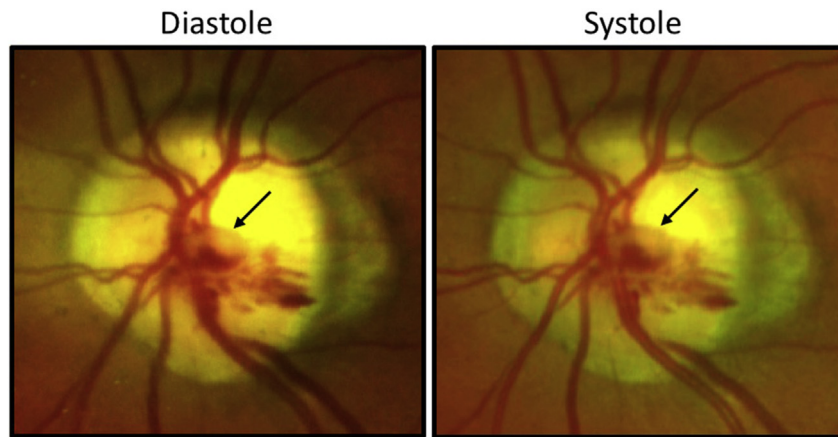


Fig. 2. Optic disc photographs of the left eye in systole and diastole of the cardiac cycles. Note the subtle increase in the filling of RAM during systole (arrows).

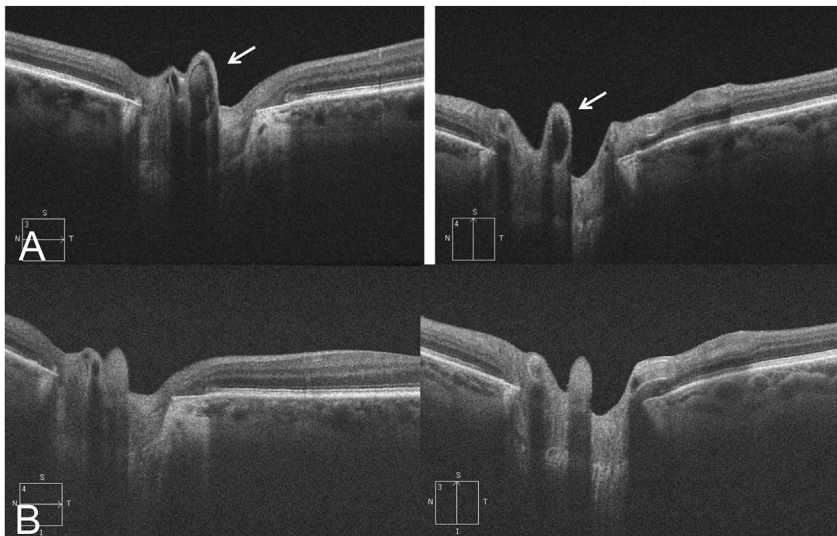


Fig. 3. (A) Horizontal and vertical SD-OCT section demonstrates a saccular dilatation of the artery with an enlarged lumen located in the center of the optic disc extending anteriorly (arrow). Hyporefectivity of the lumen in vertical section indicates incomplete filling of the macroaneurysm. (B) Horizontal and vertical SD-OCT sections at the 2 month follow-up visit demonstrates the thrombosed arterial lumen located in the center of the optic disc extending anteriorly (arrow). Hyperreflectivity of the lumen in both sections indicates thrombosed macroaneurysm.

treatment is only required for symptomatic and complicated cases.⁷ Our case demonstrates the SD-OCT characteristics of RAM on the optic disc found in a patient with mild visual changes that did not affect visual acuity. Other investigators have previously reported SD-OCT characteristics of RAMs located elsewhere in the fundus, including the macula.⁵ Largest series by Goldenberg and colleagues described the typical morphological patterns of RAMs by SD-OCT in 12 patients.⁵ None of those cases were associated with the optic disc. Rahimy et al.⁷ described multimodal imaging findings including SD-OCT of a case of

ruptured macroaneurysm on the disc with thrombosis. Nagai et al. reported a case of optic disc macroaneurysm treated with posterior sub-tenon's kenalog injection with pre- and post-treatment SD-OCT images.⁸ To our knowledge, the unique SD-OCT appearance of an intact optic disc arterial macroaneurysm pre and post-spontaneous thrombosis has not been previously reported.

3. Conclusions

This case demonstrates the natural history of an optic disc RAM. Close observation revealed spontaneous thrombosis, which was captured by SD-OCT imaging.

Patient consent

Consent to publish the case report was not obtained. This report does not contain any personal information that could lead to the identification of the patient.

Disclosures

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Conflicts of interest

The following authors have no financial disclosures; CO and CGB.

Authorship

All authors attest that they meet the current ICMJE criteria for

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References

1. Giuffre G, Montalto FP, Amodei G. Development of an isolated retinal macroaneurysm of the cilioretinal artery. *Br J Ophthalmol*. 1987;71:445–448.
2. Moosavi RA, Fong KCS, Chodpar A. Retinal artery macroaneurysms: clinical and fluorescein angiographic features in 34 patients. *Eye*. 2006;20:1011–1120.
3. Rabb MF, Gagliano DA, Teske MP. Retinal arterial macroaneurysms. *Surv Ophthalmol*. 1988;33:73–96.
4. Panton RW, Goldberg MF, Farber MD. Retinal arterial macroaneurysms: risk factors and natural history. *Br J Ophthalmol*. 1990;74:595–600.
5. Goldenberg D, Soiberman U, Loewenstein A, Goldstein M. Heidelberg spectral-domain optical coherence tomographic findings in retinal artery macroaneurysm. *Retina*. 2012;32:990–995.
6. Brown GC, Weinstock F. Arterial macroaneurysm on the optic disk presenting as a mass lesion. *Ann Ophthalmol*. 1985;17:519–520.
7. Rahimy E, Doyle BC, Brown GC. Ruptured retinal arterial macroaneurysm on the optic disk. *Retin Cases Brief Rep*. 2017;11:12–14.
8. Nagai N, Ohta Y, Izumi-Nagai K, et al. Sneddon's syndrome with optic disc macroaneurysm and macular edema successfully treated with subtenon steroid injection. *Acta Ophthalmol*. 2016;94:e517–e519.