Multimodal imaging characteristics of quiescent type 1 neovascularization in an eye with angioid streaks

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1. Introduction

Angioid streaks (AS) are characterized by breaks within calcified and thickened elastic fibers of Bruch’s membrane (BM). They appear as reddish-brownish colored radiating lines from the optic nerve towards periphery at the posterior pole, bilaterally. AS are usually associated with some systemic diseases such as pseudoxanthoma elasticum (PE), however they can also be seen as isolated.

Any type of neovascularization (NV), the major cause of AS-associated vision loss, can develop in an eye with AS. Optical coherence tomography angiography (OCTA) is a novel technique that can detect NV, noninvasively. OCTA is thought to be useful tool for early detection and monitoring of type 1 NV lesions even in asymptomatic patients with AS.

Herein, we present the multimodal imaging characteristics including OCTA as well as indocyanine green angiography (ICGA) of quiescent type 1 NV in an asymptomatic eye with angioid streaks.

2. Case presentation

A 67-year-old male patient was admitted to our clinic for routine eye examination. The presence of reddish-brownish colored radiating lines from the optic nerve towards periphery at the posterior pole, bilaterally. AS are usually associated with some systemic diseases such as pseudoxanthoma elasticum (PE), however they can also be seen as isolated.

Any type of neovascularization (NV), the major cause of AS-associated vision loss, can develop in an eye with AS. Optical coherence tomography angiography (OCTA) is a novel technique that can detect NV, noninvasively. OCTA is thought to be useful tool for early detection of NV, as it is able to identify these lesions even in asymptomatic patients with AS, reported by Andreanos et al.

In the presented case, the multimodal imaging characteristics including OCTA as well as indocyanine green angiography (ICGA) of quiescent type 1 NV in an asymptomatic eye with AS were observed.

Conclusions and Importance: In comparison to ICGA, OCTA seems to be an easily repeatable non-invasive imaging tool which enables us early detection and monitoring of type 1 NV lesions even in asymptomatic patients with AS.
quiescent and there was no change in its size (Fig. 2). The images of the left eye were given in Fig. 3.

3. Discussion

We have demonstrated the presence of quiescent type 1 NV in only one eye of a patient with AS before exudative changes occur and documented all multimodal imaging characteristics including OCTA as well as ICGA of this NV lesion.

Just recently, Andreanos et al.5 reported a case of nonexudative choroidal NV in the right eye and active choroidal NV in the other eye secondary to AS detected with the use of OCTA. They defined non-exudative choroidal NV as there was no leakage on FA and no exudation on OCT despite the presence of pigment epithelial detachment (PED). It was localized between the outer plexiform layer and BM on OCTA. Patient was monitored over an eight-month period and there was slight increase in the size of choroidal NV.

In our case, there was no sign of exudation, including PED, on SD-OCT. FA showed the irregular staining pattern of AS, without any leakage throughout all phases. The quiescent type 1 NV lesions have been detected on both OCTA and ICGA. We observed that these two imaging modalities were fully compatible with each other, in terms of both detecting the presence and the localization of NV which was clearly demonstrated between RPE and BM. We did not notice any change in its size over one-year of follow-up.

Gal-Or et al.6 previously reported the presence of active NV using multimodal images including OCTA, in the follow-up of a patient with AS who had previously treated for NV in his fellow-eye. In addition, they indicated that NV is an important reason for blindness in 42–84% of eyes with AS. Cebeci et al.3 showed that any type of NV, including polypoidal choroidal vasculopathy, can develop in eyes with AS.

Even though ICGA is known as a gold standard to diagnose type 1 NV correctly, it is an invasive procedure. Moreover, it is expensive, time-consuming and not repeatable at each follow-up visit. However, OCTA is a fast, safe and non-invasive imaging strategy that can be performed at each visit.

4. Conclusions

Due to these limitations of ICGA, OCTA seems to be an easily repeatable imaging tool which enables us early detection and monitoring of type 1 NV lesions even in asymptomatic patients with AS.

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.

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Conflicts of interest

Dr. Mentes has served as a consultant for Allergan, Bayer and Novartis, Thea Pharma. Dr. Sermet has served as a consultant for Novartis, Allergan and Bayer. Dr. Karaca has no financial disclosures related to this manuscript.
Fig. 2. Small vascular networks (white arrows) are clearly seen in the right eye at choriocapillaris slab of optical coherence tomography angiography (OCTA) at the initial exam (A) and did not show any change in its size at the last exam (B).
Fig. 3. Fluorescein angiography (FA) (A), Indocyanin green angiography (ICGA) (B), spectral domain optical coherence tomography (SD-OCT) (C) images and choriocapillaris slab of optical coherence tomography angiography (OCTA) (D) of the left eye. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)
Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

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