Swept-Source OCT Angiography Identifies Choroidal Neovascularization Arising From a Choroidal Nevus

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ABSTRACT: Swept-source optical coherence tomography angiography (SS-OCTA) was used to diagnose choroidal neovascularization (CNV) arising from a choroidal nevus. A 61-year-old woman initially presented with submacular hemorrhage. She was diagnosed with neovascular age-related macular degeneration (AMD) and received three injections of bevacizumab (Avastin; Genentech, South San Francisco, CA). At a follow-up visit, SS-OCTA showed that the CNV appeared to arise from an adjacent choroidal nevus. This is the first report of using SS-OCTA to diagnose CNV associated with a choroidal nevus masquerading as neovascular AMD.


INTRODUCTION

The occurrence of subretinal fluid and hemorrhage in association with a retinal pigment epithelial detachment (PED) on optical coherence tomography (OCT) has been considered a sign of neovascular age-related macular degeneration (AMD), polypoidal choroidal vasculopathy, or central serous chorioretinopathy with associated choroidal neovascularization. Prompt treatment with inhibitors of vascular endothelial growth factor (VEGF) is recommended. We present a case of a hemorrhagic PED associated with type 1 macular neovascularization (MNV) that was originally diagnosed as neovascular AMD, but the MNV was subsequently found to arise from a choroidal nevus.

CASE REPORT

A 61-year-old woman presented to the emergency room complaining of a gray spot in the vision of her left eye for 1 day. Her visual acuity (VA) was 20/20 in the right eye and 20/25 in the left eye. Fundus exam showed a few fine drusen in the right macula and a submacular hemorrhage and a choroidal nevus in the left eye. Spectral-domain OCT (SD-OCT) of the left eye showed a retinal PED with adjacent subretinal fluid (Figure 1). The patient was diagnosed with non-neovascular AMD in the right eye and neovascular AMD in the left eye. She received an intravitreal injection from the Department of Ophthalmology, Bascom Palmer Eye Institute, University of Miami Miller School of Medicine, Miami (AN, FZ, EHM, JROD, GG, FJR); and the Department of Ophthalmology, Tianjin Medical University General Hospital, Tianjin Medical University, Tianjin, China (FZ).

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of bevacizumab (Avastin; Genentech, South San Francisco, CA) in the left eye and was followed monthly by an outside ophthalmologist for the next 5 months. She received two additional bevacizumab injections at the second and third month after the first injection. At each follow-up visit, SD-OCT showed a PED without subretinal fluid. She returned to our clinic for a second opinion 6 months after she originally presented. Her VA remained stable. Fundus exam of the left eye showed a PED without subretinal fluid or blood and a choroidal nevus. Swept-source OCT angiography (SS-OCTA) showed a dendritic-like subfoveal type 1 neovascular complex that appeared to arise from the choroidal nevus (Figure 2). The patient was observed at this visit.

**DISCUSSION**

Although fluorescein and indocyanine green angiography would have been useful to fully characterize the neovascularization when the patient presented, the OCT structural images clearly showed the presence of a PED with fluid suggesting the diagnosis of type 1 MNV and anti-VEGF therapy was initiated. Although the diagnosis of type 1 MNV secondary to AMD seemed reasonable at the initial presentation given the presence of fine drusen in the other eye, the true diagnosis was revealed when the patient returned for follow-up and SS-OCTA was performed. In retrospect, the following findings were unusual for neovascular AMD. First, the patient was relatively young for having late neovascular AMD. Second, the

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**Figure 1. Initial presentation.** (A) Color fundus image of the right eye showing a few fine drusen. (B) Color fundus image of the left eye showing a submacular hemorrhage and a choroidal nevus (arrow). (C, D) Spectral-domain optical coherence tomography B-scan image through the fovea showing a retinal pigment epithelial detachment with adjacent subretinal fluid.
patient presented with a VA of 20/25 in the presence of a submacular hemorrhage. Despite these atypical findings, neovascular AMD seemed more likely than a hemorrhagic neovascular lesion associated with a PED arising from a choroidal nevus. However, establishing the appropriate diagnosis is important when prognosticating about long-term VA expectations, the possibility of fellow eye involvement, and the appropriate choice of drugs that would be covered by an insurance carrier. Fortunately, in Florida, all insurance carriers cover bevacizumab for the diagnosis of MNV.

MNV associated with choroidal nevi are rare events. When they arise, these lesions may behave differently than MNV associated with AMD. In a report by Papastefanou et al. on nine eyes with juxtafoveal MNV associated with fluid, five had VA of 20/40 or better. Four of those eyes did not require treatment during the follow-up period, implying that even a juxtafoveal lesion with fluid in selected cases can be closely observed with OCT monitoring. These fea-
tures are not typical for neovascular AMD, but more consistent with the good VA shown by our patient. Recent reports have demonstrated features of MNV associated with choroidal nevi. Of note, the flow image shown in our current report is superior to the images shown in these previous studies. From a technical standpoint, the better image quality is most likely due to our boundary specific demarcation of the MNV and the superior image quality associated with SS-OCTA compared with SD-OCTA for the visualization of type 1 MNV.

In summary, MNV associated with a choroidal nevus can masquerade as neovascular AMD. The correct diagnosis was easily and noninvasively achieved with the use of SS-OCTA.

REFERENCES