

Optical Coherence Tomography Angiography Findings in Sclerochoroidal Calcification

Ileana M. Nieves-Martínez*, Víctor M. Villegas*†, Stephen G. Schwartz†

Optical coherence tomography angiography (OCT-A) is a modern non-invasive imaging technique that may aid in the evaluation of retinal diseases through the assessment of chorioretinal vasculature. The literature regarding OCT-A in sclerochoroidal calcification is scarce. We present the case of a 57-year-old female who was referred to the clinic due to an atypical choroidal lesion in the right eye. OCT-A showed an apparent decrease in the vascular flow of the choroidal/choriocapillaris layers and an apparent increase in the vascular flow of the deep retinal layers. A mass-effect may be seen in OCT-A en face imaging that may create artifactual vascular flow pattern. This case reports the first OCT-A findings of sclerochoroidal calcification.

Key words: Optical coherence tomography angiography; sclerochoroidal calcification

Optical coherence tomography angiography (OCT-A) is a modern non-invasive imaging technique that may aid in the evaluation of retinal diseases through the assessment of chorioretinal vasculature (1-3). The use of OCT-A in pathologies such as diabetic retinopathy, age-related macular degeneration, and retinal vascular occlusions has been previously established. However, the literature regarding OCT-A in sclerochoroidal calcification is scarce.

Sclerochoroidal calcification is typically an incidental, asymptomatic, subretinal lesion found on routine funduscopic examination of elderly Caucasian individuals (4). These lesions are most commonly found in the superior temporal mid-periphery area along the superior or inferior vascular arcades, or both (5,6). Upon initial clinical evaluation, sclerochoroidal calcification may be hard to differentiate from choroidal osteoma, amelanotic choroidal melanoma, or choroidal metastasis (4).

Choroidal melanoma is the most common primary intraocular tumor in adults and is asymptomatic in 10% of patients. Small choroidal melanomas may be difficult to differentiate from benign lesions on funduscopic examination. Choroidal metastases most commonly originate from breast cancer in females and lung cancer in males. Funduscopic evaluation of these patients presents as creamy yellow unifocal or multifocal tumors that may be uni- or bilateral. Choroidal osteomas are benign ossifying tumors that appear as elevated yellow-white choroidal masses. Choroidal osteomas typically cause vision loss due to complications such as choroidal neovascularization (4). The differential diagnosis of sclerochoroidal calcifications includes vision and life-threatening conditions; OCT-A may be useful to help in the differentiation of these lesions.

The purpose of this report is to illustrate OCT-A characteristics associated with sclerochoroidal calcification. The Cirrus 5000 with AngioPlex (Zeiss, Jena, Germany) was used for imaging, without any subsequent image modification or processing.

Case Report

A healthy 57-year-old female was referred to our institution due to an atypical choroidal nevus lesion of the right eye (OD). Best-corrected visual acuity was 20/20 in each eye and the examination was normal except for a juxtapapillary, perivascular, subretinal, amelanotic mass OD (Figure 1A). B-scan ultrasonography showed a shallowly elevated dome-shaped hyperechoic lesion with an acoustic shadow located inferior to the papilla consistent with a calcified lesion measuring 2.98 x 2.66 x 0.72 mm in height. (Figure 1B).

OCT (Heidelberg Engineering, Germany) evaluation showed a scleral mass-effect that displaced the inner choroidal layers (Figure 2). OCT-A (6mm x 6mm) was performed and showed an increased vascular flow signal in the deep retinal layer. A decrease in vascular flow was seen in the choroidal and choriocapillaris layers (Figure 3). No abnormal pattern was present in the superficial retinal layer. The diagnosis of sclerochoroidal calcification was made based on the clinical, ultrasound, and OCT findings. The patient has been monitored for three years with stable findings and no changes or progression of the lesion.

Discussion

OCT-A provides the means to evaluate the distinct vascular plexuses of the retina and choroid in great detail without the use of invasive techniques (7). An advantage of OCT-A, when

*Department of Ophthalmology, University of Puerto Rico, San Juan, PR; †Bascom Palmer Eye Institute, University of Miami Miller School of Medicine, Miami, FL, USA

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Address correspondence to: Víctor M. Villegas, MD, 900 NW 17th St, Miami, FL 33136. Email: v.villegas@med.miami.edu

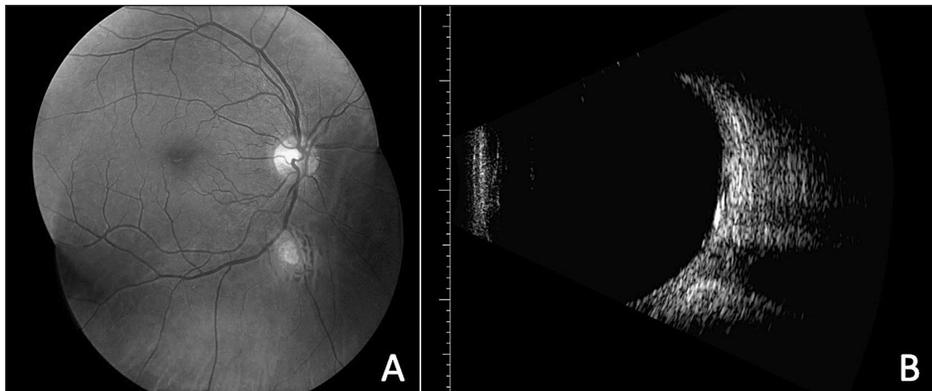


Figure 1. (A) Fundus photography right eye shows a perivascular, subretinal, amelanotic mass. (B) Ultrasonography of the right eye. B-scan showing a slightly elevated dome shape hyperechoic lesion with an acoustic shadow.

compared to other imaging techniques such as fluorescein angiography and indocyanine green angiography, is the cross-sectional evaluation of the distinct vascular plexus, which delineates the en face depth location of the vascular pathology (8).

A previous study demonstrated through enhanced depth imaging OCT that sclerochoroidal calcifications are mostly localized to the sclera and display thinning or absence of the choroid with an irregular surface contour (9). Sclerochoroidal calcification may theoretically cause compression of large choroidal vessels that could potentially compromise blood flow to the outer retina (10). However, this has not been demonstrated clinically.

OCT-A findings of our subject demonstrated an apparent decrease in vascular flow in both the choroid and choriocapillaris plexus, and an apparent increase in vascular flow in the deep retinal layers. The apparent increased signal in the deep retinal layer may be secondary to the mass-effect of the sclerochoroidal calcification on the retinal architecture

and subsequent artifactual imaging of the choriocapillaris and inner choroidal plexus in the area of the deep retinal layer. This artifact may be present in other choroidal tumors and must be taken into consideration when reviewing en face imaging (11).

Most cases of sclerochoroidal calcification are found incidentally on fundoscopic evaluation. In patients that are evaluated and finally diagnosed with sclerochoroidal calcification, the most common referral diagnosis reported has been choroidal metastasis and choroidal melanoma (4). Various choroidal tumors have been associated with a dense vascular network in the retinal layer and choroid capillary layers (12). Sclerochoroidal calcification shows decrease in vascular flow in the choroidal layers, which may aid in the diagnosis. It is important to recognize artifactual en face mass-effect changes to avoid misdiagnosis. This case reports the first OCT-A findings of sclerochoroidal calcification. Future studies may evaluate the difference in OCT-A between sclerochoroidal calcification and other choroidal tumors.

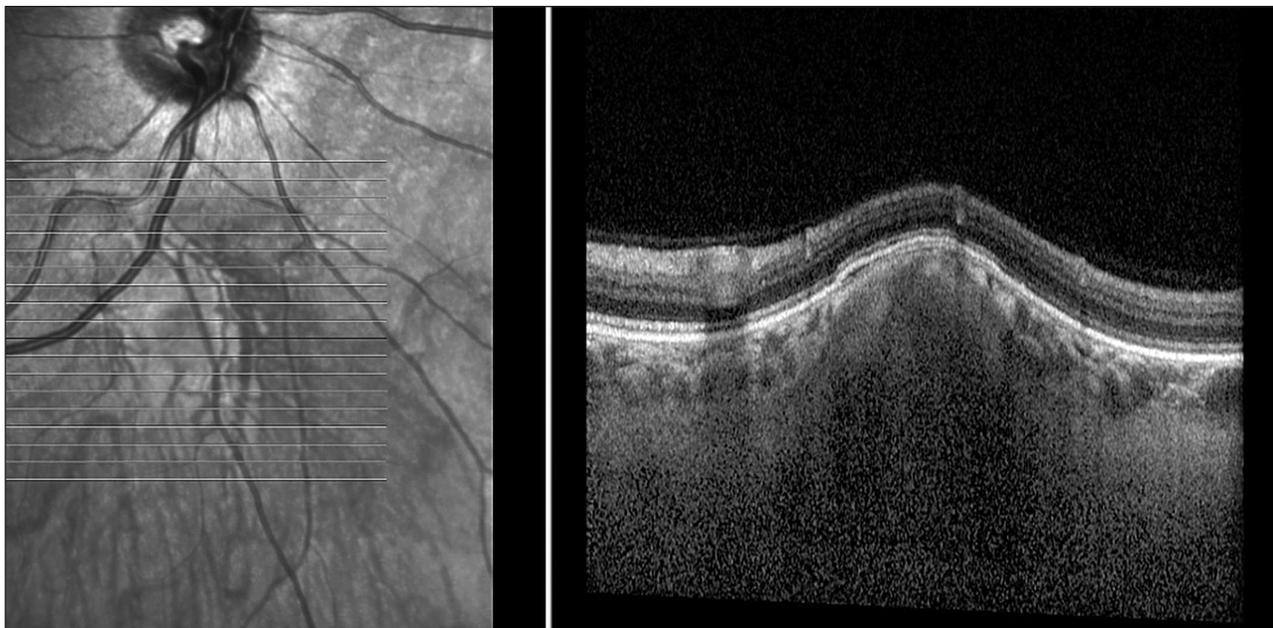


Figure 2. Optical coherence tomography shows the mass effect of sclerochoroidal calcification.

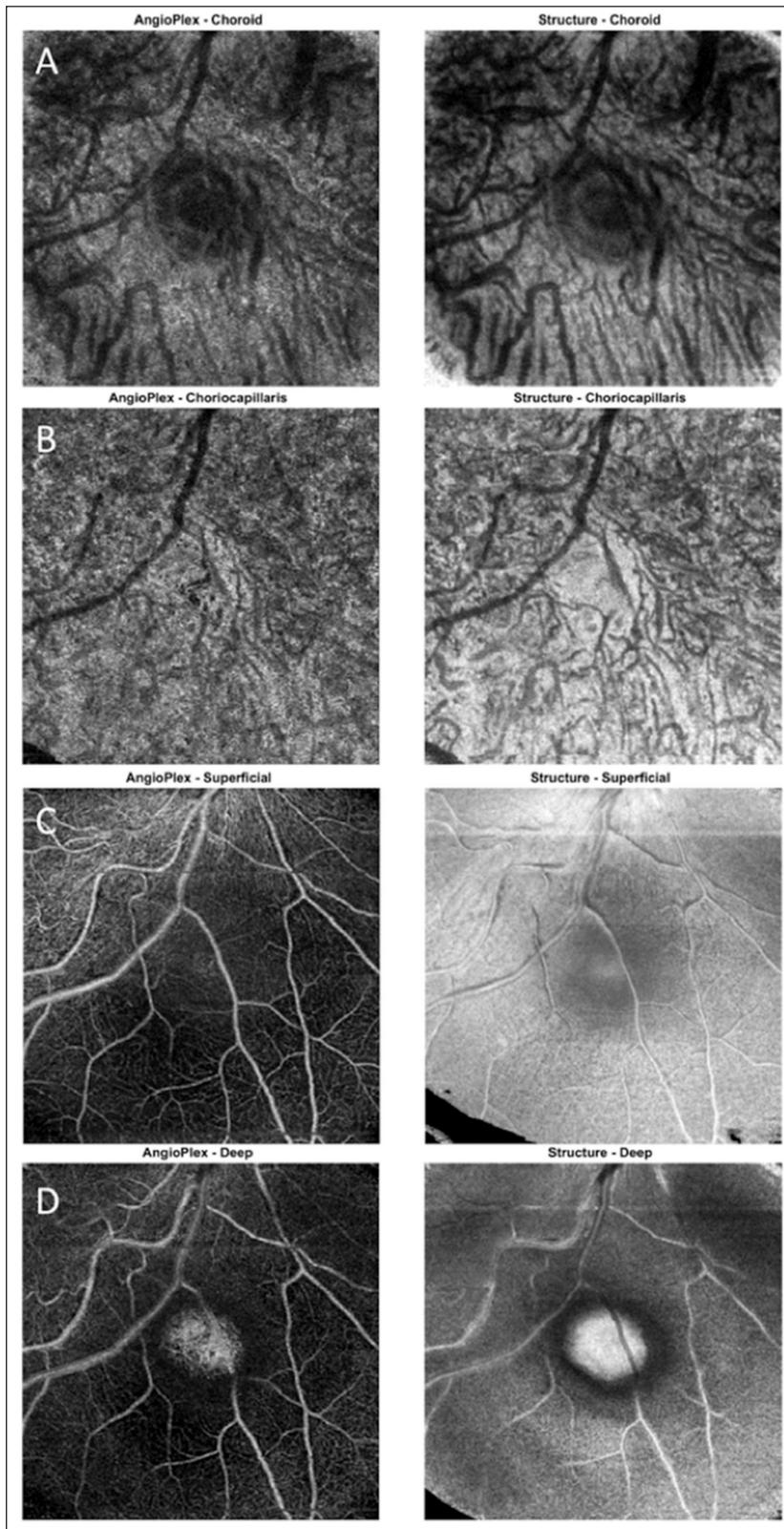


Figure 3. AngioPlex OCT-A 6mm x 6mm of the right eye (A) Choroidal plexus layer showing decreased vascular flow signal. (B) Choriocapillary plexus layer showing decreased vascular flow signal. (C) Superficial retinal plexus layer showing a normal vascular flow signal. (D) Deep retinal plexus layer showing increased vascular flow signal.

At this moment, sclerochoroidal calcification continues to be a clinical diagnosis that is confirmed with ultrasound. The importance of OCTA in the differentiation of sclerochoroidal calcification from similar lesions is not clearly understood. This case shows that despite compression and thinning of the inner choroid shown in OCT images no change in vascular density is seen on OCTA. Additional studies that evaluate OCTA are needed to better delineate the anatomical and flow characteristics of the vasculature in sclerochoroidal calcification and similar lesions.

Resumen

La angiografía por tomografía de coherencia óptica (OCT-A, por sus siglas en inglés) es una técnica de imagen moderna, no invasiva, que puede ayudar en la evaluación de enfermedades de la retina a través de la evaluación de la vasculatura corioretiniana. La literatura científica con respecto a OCT-A en calcificaciones esclerochoroidales es escasa. En este reporte de caso presentamos a una fémina de 57 años que fue referida a la clínica debido a una lesión coroidal atípica en su ojo derecho. Las imágenes de OCT-A demostraron una disminución aparente en el flujo vascular de las capas coroidales/coriocapilares y un aumento aparente en el flujo vascular de las capas profundas de la retina. Se puede ver un efecto de masa en OCT-A en la imagen “en face” que puede crear un artefacto en el patrón de flujo vascular. Este caso reporta los primeros hallazgos de OCT-A de calcificación esclerochoroidal.

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