Case report

EJO European Journal of Ophthalmology

European Journal of Ophthalmology
1–5

DOI: 10.1177/1120672120934390
journals.sagepub.com/home/ejo
SAGE

Optical coherence tomography angiography in quiescent choroidal neovascularization associated with choroidal nevus: 5 years follow-up

Gilda Cennamo[1], Daniela Montorio[2], Federica Fossataro[2], Lidia Clemente[2], Raffaella Carandente[2] and Fausto Tranfa[2]

Abstract

Purpose: To report a case of quiescent choroidal neovascularization (CNV) associated with choroidal nevus using optical coherence tomography angiography (OCTA) during 5 years follow-up.

Methods: Observational case report.

Results: A 53-year old woman was referred our department with diagnosis of choroidal nevus. At 1 year follow-up, fundus autofluorescence revealed hyper/hypoautofluorescent area, infrared image showed hyperreflective area and enhanced depth imaging OCT presented a shallow pigment epithelium detachment without exudation or hemorrhage. Fluorescein angiography and indocyanine green angiography suspected the presence of CNV. Finally, OCTA confirmed a quiescent CNV with an increased flow area of the vascular lesion without any changes in best-corrected visual acuity. At 20 months and 5 years follow-up, the CNV remained quiescent showing no clinical activity on structural SD-OCT and no changes in CNV morphology on OCTA.

Conclusion: This case shows the features of quiescent CNV secondary to choroidal nevus after long-term follow-up. OCTA represents a valid imaging technique that allows to identify the CNV and to monitor its progression over time.

Keywords
Choroidal nevus, OCT angiography, EDI-OCT

Date received: 7 January 2020; accepted: 25 May 2020

Introduction

Choroidal nevus is the most common intraocular benign tumor that can be identified in 6.5% of eyes, as a flat or elevated well-defined brown-to-gray mass deep to the retina.[1]

This lesion can occasionally cause severe loss of visual acuity or scotoma due to secondary changes in the overlying retina and retinal pigment epithelium (RPE) including foveal edema, subretinal fluid, RPE detachment, and proliferation of choroidal neovascularization (CNV).[2]

Histological and clinical features of CNV secondary to choroidal nevus were first described by Gass in 1967 and previous studies reported that the CNV occurred in <1% of choroidal nevi.[3,4]

Multimodal imaging with multicolor and infrared images, fundus autofluorescence (FAF), fluorescein angiography (FA), indocyanine green angiography (ICGA), enhanced depth imaging-optical coherence tomography (EDI-OCT) allow to better characterize the lesion and eventually confirm the presence of the CNV.[5] Moreover, the use of optical coherence tomography angiography (OCTA), a non-invasive

[1]Eye Clinic, Department of Public Health, University of Naples Federico II, Naples, Italy
[2]Department of Neuroscience, Reproductive Sciences and Dentistry, University of Naples Federico II, Naples, Italy

Corresponding author:
Gilda Cennamo, Department of Public Health, University of Naples Federico II, Via S. Pansini 5, Naples 80133, Italy.
Email: xgilda@hotmail.com

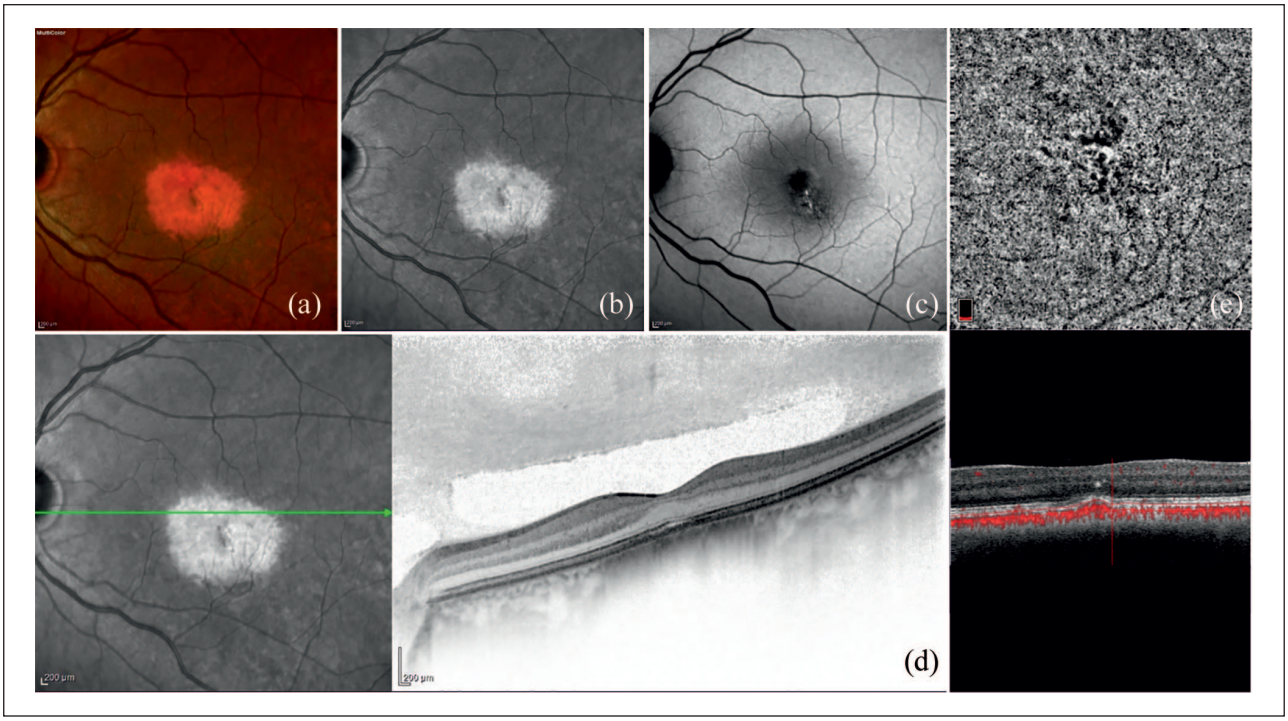

Figure 1. Multimodal imaging of the macular choroidal nevus in left eye at baseline. (a) Multicolor image shows an orange-yellow lesion with smooth margins. (b and c) Infrared image and fundus autofluorescence reveal hyperreflective and hypoautofluorescent area corresponding to the lesion, respectively. (d) Enhanced depth imaging (EDI)-OCT displays a highly reflective band within the choriocapillaris with a posterior shadow at the level of the lesion in macular region. (e) Optical coherence tomography angiography at the level of choriocapillaris does not show any choroidal neovascular network.

imaging technique, can be helpful for visualization and monitoring retinal and choroidal vascular networks.[6]

We report a case of a patient with macular choroidal nevus, complicated by CNV, focusing on diagnosis and a long follow-up.

Case report

A 53-year-old woman presented a decreased visual acuity in left eye in October of 2014. She reported absence of previous ocular and systemic diseases. Best-corrected visual acuity (BCVA) was 20/20 in the right eye and 20/32 in the left eye; the anterior segment and intraocular pressure did not show any alteration. In left eye the fundus examination presented a pigmented mass located in macular area.

A-scan and B-scan ocular ultrasonography with an AVISO-S Echograph (Quantel Medical, Clermont-Ferrand, France) revealed the presence of macular choroidal nevus, excluding the presence of choroidal melanoma. The B-scan ultrasound showed in macular region a solid flat lesion that presented high reflectivity at A-scan ultrasound.

Multimodal imaging of choroidal nevus was performed with multicolor image showing an orange-yellow lesion with smooth margins located in the macular region while infrared image presented hyperreflective area and FAF revealed hypoautofluorescent area corresponding to RPE irregularities of the nevus (Figure 1(a)–(c)).

EDI-OCT (Spectralis HRA + OCT; Heidelberg Engineering, Heidelberg, Germany) displayed a highly reflective band within the choriocapillaris with a posterior shadow at the level of the lesion in macular region (Figure 1(d)).

OCTA images were acquired with the Angiovue System (Optovue RTVue XR Avanti, Optovue, Inc., Freemont, CA, USA), which is based on the split-spectrum amplitude decorrelation algorithm (SSADA). We analyzed the choriocapillaris layer, defined as vascular signal, by performing a 3×3 mm scan over the macular region, manually segmented 30 µm below the RPE-Bruch's membrane-complex. The patient did not show any CNV in the choriocapillary segmentation at OCTA (Figure 1(e)).

At 1 year follow-up, the patient had no changes in BCVA. Multicolor and infrared images did not show any changes of the lesion with respect to baseline while FAF revealed hyper/hypoautofluorescent area and EDI-OCT presented a little pigment epithelium detachment (PED) at the level of the choroidal nevus and changes in inner retina/outer retina junctions, without subretinal/intraretinal fluid (Figure 2(a)–(d)). The patient underwent FA and ICGA examinations that showed in macular region an

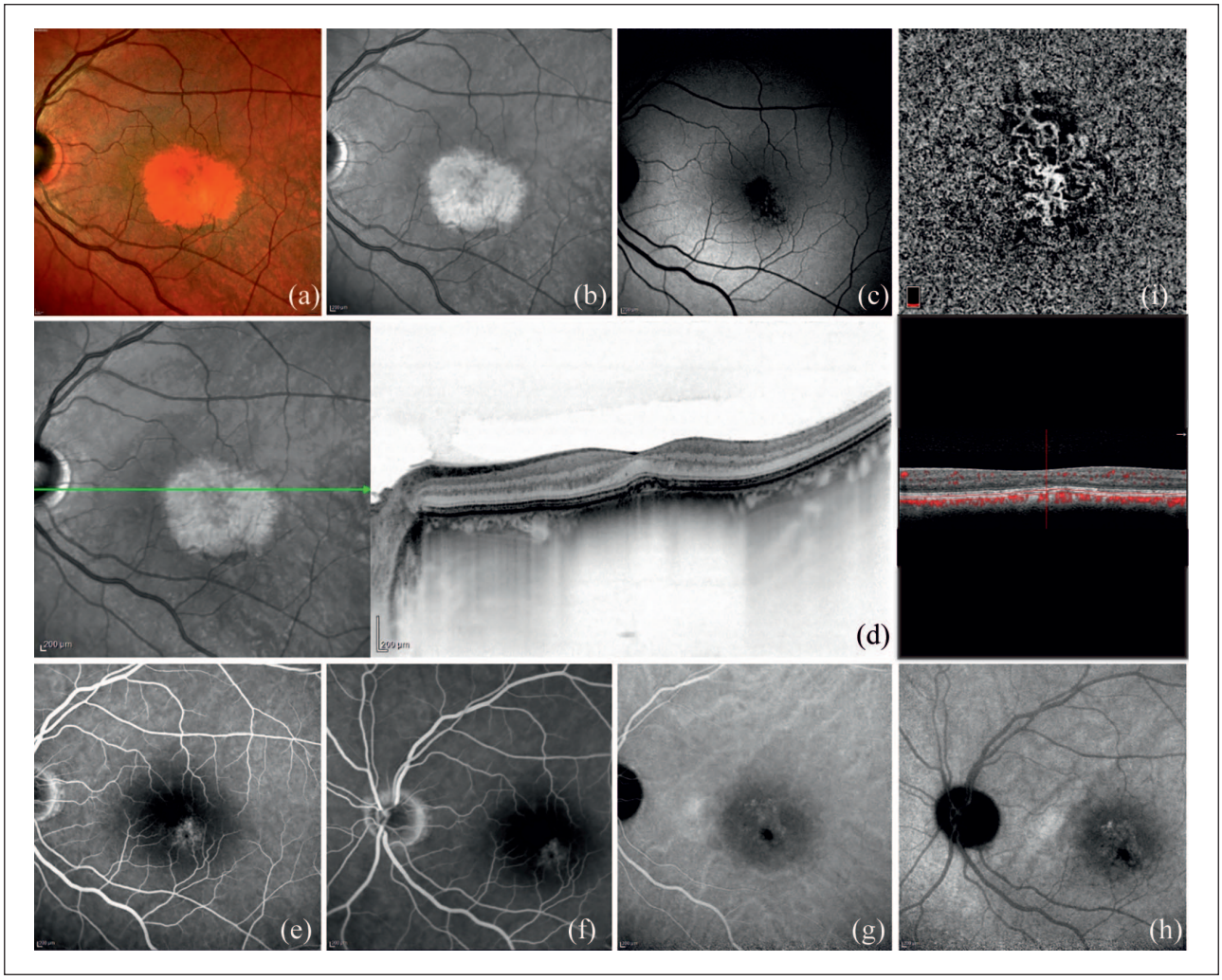

Figure 2. Multimodal imaging of the quiescent choroidal neovascularization (CNV) associated with macular choroidal nevus in left eye after 1 year follow-up. (a) Multicolor image shows an orange-yellow lesion with smooth margins. (b and c) Infrared image and fundus autofluorescence reveal hyperreflective and hyper/hypoautofluorescent area corresponding to the lesion, respectively. (d) Enhanced depth imaging (EDI)-OCT shows a little pigment epithelium detachment (PED) at the level of the lesion with alterations in inner retina/outer retina junctions and without subretinal/intraretinal fluid. (e and f) Fluorescein angiography in the early and late phases shows an irregular hyperfluorescence in macular region corresponding to CNV. (g and h) Indocyanine green angiography displays in the early and late phases an hypocyanescence, that represents the area of the choroidal nevus, with a central hypercyanescence corresponding to CNV. (i) Optical coherence tomography angiography image of the choriocapillaris segmentation reveals the presence of quiescent CNV that appeared as a tangled vascular network with few branches.

irregular hyperfluorescence and hypocyanescence with a central hypercyanescence corresponding to a CNV (Figure 2(e)–(h)). OCTA image at the level of the choriocapillaris revealed the presence of a quiescent CNV that appeared as a large tangled hyperreflective lesion with well-defined margin and few branches (Figure 2(i)).

During the follow-up at 20 months and 5 years, the patient had not changes in BCVA, the CNV remained quiescent showing no clinical activity on structural SD-OCT and OCTA images presented no changes in CNV morphology (Figures 3 and 4).

Signed informed consent for patient information and images to be published was provided by the subject.

Discussion

To our knowledge, this is the first reported case of a quiescent CNV associated with macular choroidal nevus during a long-term follow-up (5 years) investigated by means of multimodal imaging.

Quiescent CNV represents a recently described entity in the setting of age-related macular degeneration (AMD) that shows absence of intraretinal/subretinal exudation on repeated SD-OCT for at least 6 months.[6]

The OCTA plays an increasing role in the detection and monitoring of these lesions demonstrating high sensibility and specificity.[7]

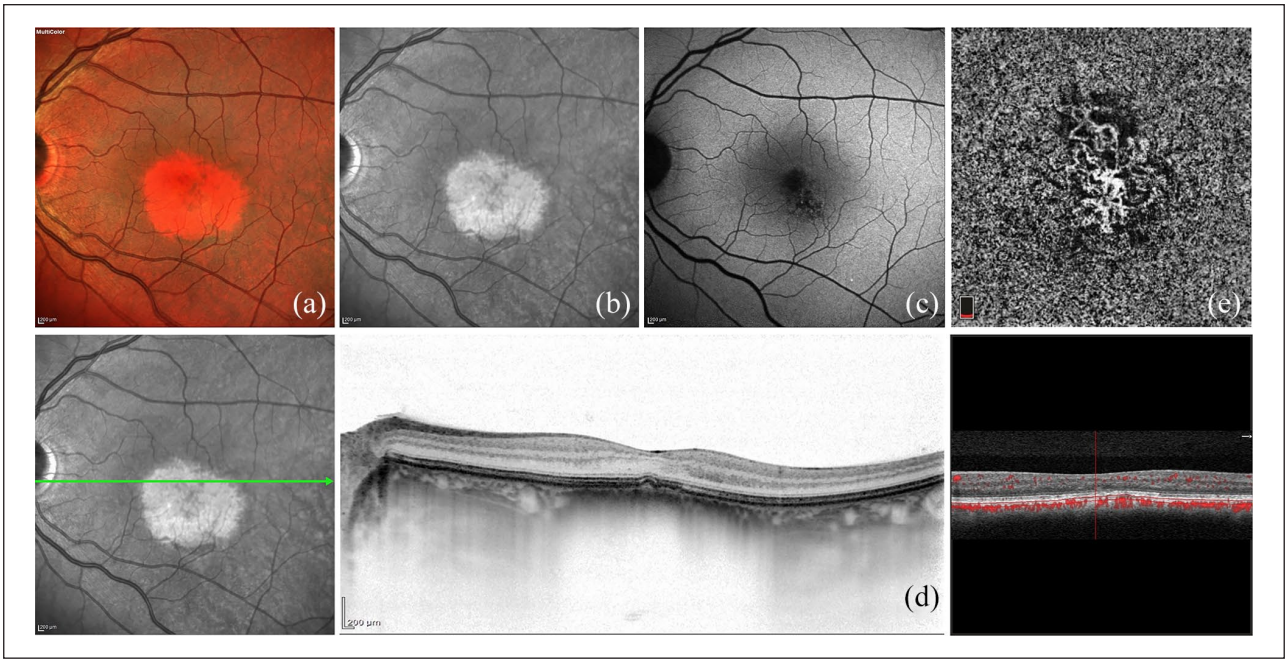

Figure 3. Multimodal imaging of the quiescent choroidal neovascularization (CNV) associated with macular choroidal nevus in left eye after 20 months follow-up. (a) Multicolor image shows an orange-yellow lesion with smooth margins. (b and c) Infrared image and fundus autofluorescence reveal hyperreflective and hyper/hypoautofluorescent area corresponding to the lesion, respectively. (d) Enhanced depth imaging (EDI)-OCT shows a little pigment epithelium detachment (PED) at the level of the lesion with alterations in inner retina/outer retina junctions and without subretinal/intraretinal fluid. (e) Optical coherence tomography angiography image of the choriocapillaris segmentation reveals the presence of quiescent CNV that appeared as a tangled vascular network with few branches.

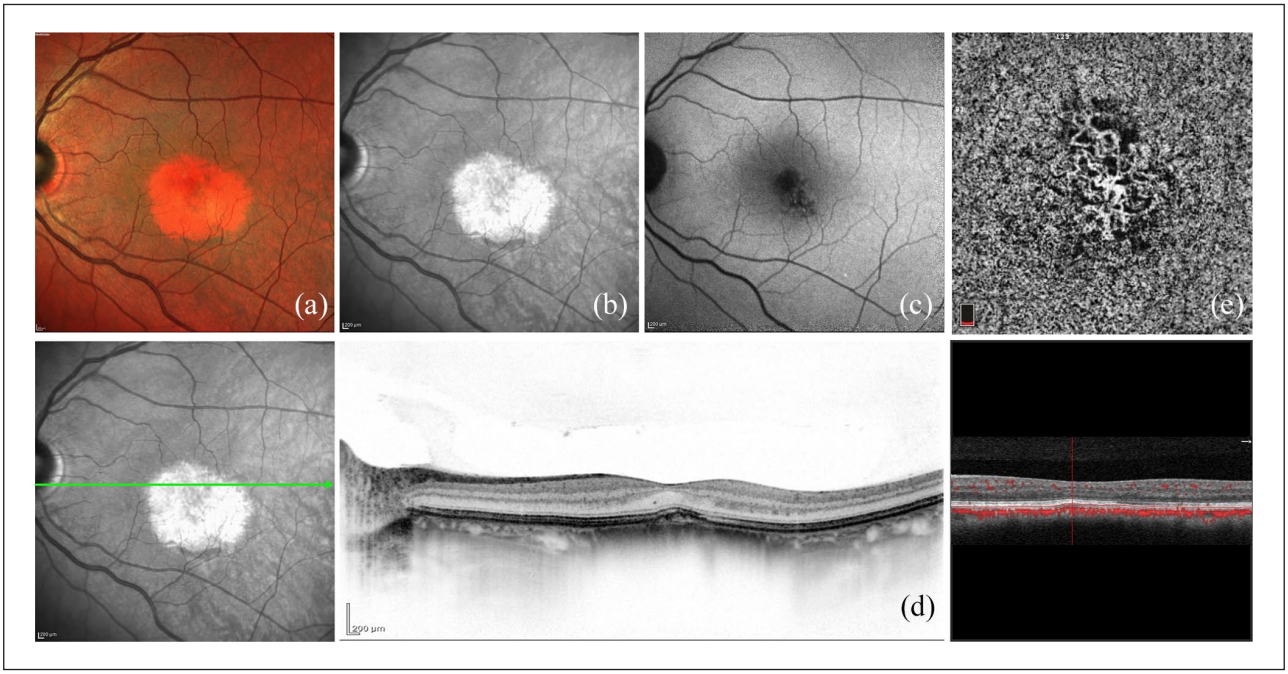

Figure 4. Multimodal imaging of the quiescent choroidal neovascularization (CNV) associated with macular choroidal nevus in left eye after 5 years follow-up. Multicolor image (a), infrared image (b), fundus autofluorescence (c), enhanced depth imaging (EDI)-OCT (d), and optical coherence tomography angiography (e) show no changes respect to previous visits (Figures 2 and 3).

According to previous studies, Pellegrini et al. in a series of choroidal nevus associated with different type of CNV reported that the main localization of the nevus was the macular region pointing out the possible major incidence of CNV overlying nevus in this zone.[4,5]

Multimodal imaging and in particular the OCTA allowed to identify the features of the active CNV, showing its size and the shape.[5,8]

Our case reported the presence of a quiescent CNV after a long-term follow-up probably due to the alteration and disruption of the RPE-Bruch membrane complex overlying the nevus.[9]

The localization of the quiescent CNV in macular region highlights the importance of an early and precise diagnosis.

Unlike FAG-ICGA that revealed only an hyperfluorescent/hypercyanescent area overlying choroidal nevus, suggesting a CNV, OCTA is able to detect vascular features of the neovascular choroidal network and to analyze their changes over time.

Therefore, an accurate evaluation of choroidal nevus, using multimodal imaging, is advisable, particularly when the lesion is located in the posterior pole.

Indeed, the combination of different imaging techniques allows to disclose the presence of CNV associated with choroidal nevus in order to eventually start a prompt treatment to preserve visual acuity.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iDs

Gilda Cennamo https://orcid.org/0000-0003-4253-1929
Daniela Montorio https://orcid.org/0000-0003-1423-9621

References

1. Shields JA and Shields CL. *Intraocular tumors: an atlas and textbook*. 2nd ed. Philadelphia, PA: Lippincott, Williams & Wilkins, 2008.
2. Gonder JR, Augsburger JJ, McCarthy EF, et al. Visual loss associated with choroidal nevi. *Ophthalmology* 1982; 89(8): 961–965.
3. Gass JDM. Pathogenesis of disciform detachment of the neuroepithelium. VI. Disciform detachment secondary to heredodegenerative, neoplastic and traumatic lesions of the choroid. *Am J Ophthalmol* 1967; 63:689-711.
4. Chiang A, Bianciotto C, Maguire JI, et al. Intravitreal bevacizumab for choroidal neovascularization associated with choroidal nevus. *Retina* 2012; 32(1): 60–67.
5. Pellegrini M, Corvi F, Say EAT, et al. Optical coherence tomography angiography features of choroidal neovascularization associated with choroidal nevus. *Retina* 2018; 38(7): 1338–1346.
6. Carnevali A, Cicinelli MV, Capuano V, et al. Optical coherence tomography angiography: a useful tool for diagnosis of treatment-naïve quiescent choroidal neovascularization. *Am J Ophthalmol* 2016; 169: 189–198.
7. Carnevali A, Sacconi R, Querques L, et al. Natural history of treatment-naïve quiescent choroidal neovascularization in age-related macular degeneration using OCT angiography. *Ophthalmol Retina* 2018; 2(9): 922–930.
8. Cicinelli MV, Iuliano L, Rabiolo A, et al. Optical coherence tomography angiography of polypoidal neovascularization associated with choroidal nevus. *Eur J Ophthalmol* 2017; 27(1): 9–12.
9. Waltman DD, Gitter KA, Yannuzzi L, et al. Choroidal neovascularization associated with choroidal nevi. *Am J Ophthalmol* 1978; 85(5): 704–710.