AngioVue OCTA Case Series: Non-Exudative (Quiescent) CNV

OCT angiography reveals non-exudative CNV in AMD patients

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Quiescent choroidal neovascularization ("quiescent CNV") refers to the formation of new blood vessels in AMD patients during a period when the disease is otherwise stable or in regression. It differs from "normal" exudative CNV in that fine capillaries and looped blood vessels are absent, and anastomoses are rarely seen; thus, in quiescent CNV the new vessels are more arterialized (thicker, more rigid and less tortuous). Quiescent CNV may represent mature vessels with competent endothelial cell junctions – but also may be a precursor to exudative CNV (1). Indeed, 25 percent of quiescent CNV cases develop exudative AMD within four years. Furthermore, quiescent CNV is rather common: the annual incidence in fellow eyes of wet AMD cases is 4-19 percent (2), and prevalence in early-intermediate AMD cases is 11-27 percent (3). Identification and monitoring of quiescent CNV therefore should be a routine component of AMD management.

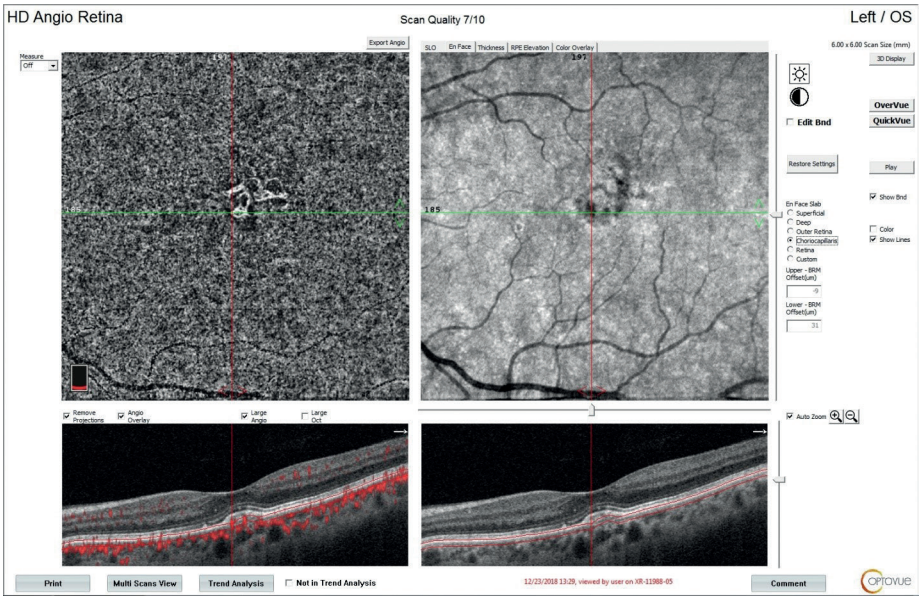

Figure 1: OCT-B scans reveal a double-layer sign but do not show intra-retinal edema or subretinal fluid; by contrast, OCT-A reveals quiescent CNV with clear flow in the foveal area.

Unfortunately, while CNV is diagnosed by detecting its exudative consequences (that is, by finding intra-retinal edema or sub-retinal fluid with spectral-domain OCT, or by detecting dye leakage with conventional fluorescein angiography), quiescent CNV, by contrast, is more problematic. It is not always detectable by SD-OCT (4), and fluorescein angiography (FA), while more sensitive to quiescent CNV, is invasive, time-consuming and associated with side effects. Diagnosis is further complicated by the vague and variable symptoms associated with quiescent CNV: some patients are asymptomatic, while others complain of metamorphopsia or difficulty in reading.

Now, however, OCT-A – by combining the advantages of FA and OCT and eliminating their disadvantages – has revolutionized our approach to identifying disease and monitoring progression and treatment response. Unlike fluorescein angiography, OCT-A is safe, non-invasive and three-dimensional; and, unlike conventional OCT it can – by analyzing the signal decorrelation between multiple B-scans – detect erythrocyte movement. Thus, OCT-A enables physicians to both visualize structural aspects of retinal/choroidal tissues and also observe blood flow through those tissues. This should, in theory, assist the diagnosis of quiescent CNV and guide decisions regarding its clinical management. Indeed, OCT-A is said to quickly detect quiescent CNV lesions beneath apparently unsuspicious retinal pigment epithelium (RPE) elevations and drusen (5). But does OCT-A live up to this promise in real-world practice?

In our experience: yes. Indeed, we have a number of case studies supporting the utility of OCT-A in the diagnosis of quiescent CNV. The following example is illustrative. In brief, a 67-year-old female patient presented to our practice in Cairo complaining of blurred vision in the left eye, and consequent reading difficulty. Our examination indicated a BCVA of 0.3; an IOP of 17 mmHg; and nuclear sclerosis. Fundus examination revealed RPE changes in the foveal area; subsequent OCT B-scans revealed the double-layer sign – localized RPE elevation in the fovea – which is an indicator of type 1 CNV. The B-scans also revealed the presence of pachychoroidal vessels. There was, however, no evidence of intra-retinal edema or sub-retinal fluid. Subsequent investigation with OCT -A, however, showed the patient to have quiescent, non-exudative CNV, with definite flow in the foveal area (Figure 1).

It is important to remember that so-called "quiescent" CNV can enlarge over time and contribute to local loss of retinal sensitivity and consequent visual distortion (metamorphopsia) (4). OCT-A can measure the flow area and detect vessel growth in these silent CNVs – which is a risk factor for conversion into frank "exudative" CNV. So, by detecting quiescent CNV that would otherwise have been missed, OCT-A can significantly improve patient management: it gives an explanation for the vague complaints of these patients, it provides a baseline for subsequent follow-up, and it more clearly defines the area for monitoring. To date, the technique is remarkably successful: quiescent CNV is detected with high sensitivity (81.1 percent) and specificity (100 percent) (6). OCT-A therefore seems likely to remain a key tool in quiescent CNV detection and AMD management for the foreseeable future.

References

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