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# Update on Indocyanine Green Angiography

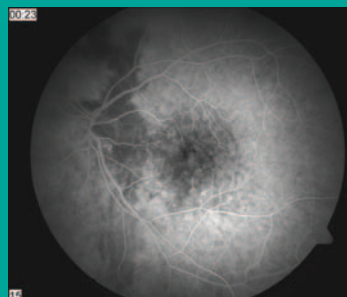
## HOW OFTEN SHOULD YOU EXPECT TO REPEAT ANTI-VEGF (VASCULAR ENDOTHELIAL GROWTH FACTOR-A) THERAPY?

### Case Presentation

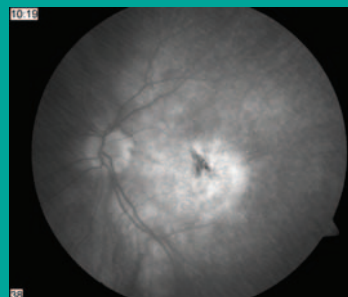
A 73 year old female presented with subacute vision loss. Examination revealed 20/100 vision, intraretinal hemorrhage and retinal thickening. Fluorescein angiography revealed occult choroidal neovascularization (CNV). Optical coherence tomography (OCT) confirmed CNV and retinal thickening.



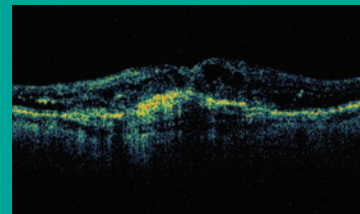
Color Fundus Photograph



Early-phase Fluorescein Angiogram



Late-phase Fluorescein Angiogram



Optical Coherence Tomography (OCT)

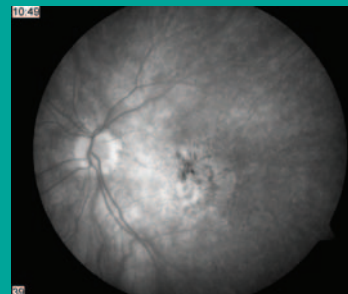
She was treated with anti-VEGF therapy. Within one month, good anatomic improvement was observed and vision increased to 20/50.



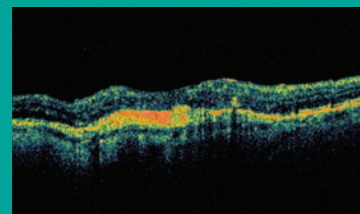
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Early-phase Fluorescein Angiogram



Late-phase Fluorescein Angiogram

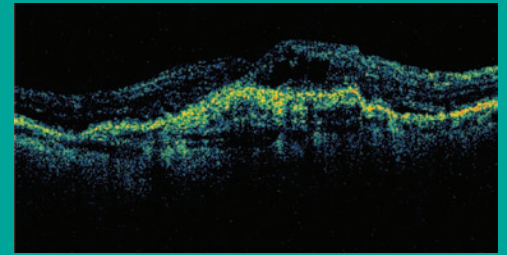


Optical Coherence Tomography (OCT)

## Clinical Course

The patient returned one month later (2 months after the initial anti-VEGF therapy) with recurrent leakage and decreased vision.

High speed video (ICG) indocyanine green (IC-GREEN<sup>®</sup>, Akorn, Inc.) was performed using the Heidelberg Retina Angiograph (HRA). The ICG angiogram revealed a definite CNV with a mature vascular complex. A prominent feeder vessel (red arrow) perfused moderately large arterioles within the vascular complex (dotted line). The patient required monthly anti-VEGF therapy to control the leakage, and the high speed video ICG angiography features did not change in response to the treatment.



Optical Coherence Tomography (OCT)



High Speed Video ICG Angiography

## Commentary

In a recent study, responses to anti-VEGF therapy were shown to fall into three categories: 15% demonstrate long term response to the initial induction; about 50% require intermittent injections every three to four months; but about 35% require monthly injections. Some of the eyes requiring frequent repeat injections demonstrated retinal angiomatous proliferation (RAP); however, other poorly classifiable subtypes of neovascular age-related macular degeneration (AMD) also fell into this category.

We have observed with high speed video ICG angiography that chronic CNV often develop a mature vascular complex characterized by a prominent feeder artery and relative large arterioles within the CNV. In these lesions, hemodynamic decompensation due to high blood flow often contributes to leakage. CNV with mature vascular complexes are often resistant to anti-VEGF therapy. High speed video ICG angiography can identify this CNV subtype and more frequent anti-VEGF injections may be required. One caveat: frequent anti-VEGF therapy may result in significant blood levels of the drug, possibly increasing risk of cardiovascular complications. For these lesions, adding combination therapy of photodynamic therapy (PDT) plus anti-VEGF therapy may provide improved duration of leakage control with less frequent anti-VEGF injections.