

AMD and Imaging

Ocular Imaging in the CATT

BY GLENN J. JAFFE, MD

The CATT evaluated the equivalency of bevacizumab (Avastin, Genentech) and ranibizumab (Lucentis, Genentech) in 1208 patients with neovascular age-related macular degeneration (AMD), and compared the efficacy and preservation of visual acuity of a monthly injection schedule to an as-needed (prn) injection schedule.¹ Both the inclusion criteria and the treatment protocol required imaging with fluorescein angiography (FA) and time-domain optical coherence tomography (TD-OCT).

OCT IMAGING PROTOCOL

The CATT study included eyes with previously untreated choroidal neovascularization (CNV) due to AMD. Active CNV was determined by leakage as seen on FA and of fluid within or below the retina, or below the retinal pigment epithelium (RPE), as seen on TD-OCT.

Every 28 days for the first year of the study, TD-OCT was performed to determine whether there were signs of persistent active CNV, as reflected by intraretinal fluid (cysts), subretinal fluid, or sub-RPE fluid. Ophthalmologists at each clinical center made decisions to retreat patients in the prn groups based on OCT images that showed fluid, decreased visual acuity, new or persistent hemorrhages, or leakage on fluorescein angiography (performed at the discretion of the ophthalmologist). An OCT Reading Center was established to determine the outcome measures, which included the change in fluid and foveal thickness on OCT.

PRACTICAL USE OF IMAGING

The evaluation of whether intraretinal, subretinal, or sub-RPE fluid is present is standard practice for many retina specialists. When deciding whether my patients with AMD require anti-VEGF therapy, I routinely order FA, color fundus photography, and OCT on the first visit so that I can use these as reference points for comparison with future imaging studies.

OCT imaging was a very important part of the CATT study because it was not just used to determine inclu-

(Continued on page 55)

Greater Efficiency With OCT

BY JAMES D. PALMER, MD

The evolution of optical coherence tomography (OCT) over the past few years has changed the way ophthalmologists view the eye. The development of spectral-domain (SD) OCT, which has faster scan times and higher resolution images, as well as larger data pools for increased reproducibility, has transformed the OCT into an essential tool, especially for retina specialists.

I have found that not only do my patients and my practice benefit from the objective data available for the diagnosis of retinal conditions, but also that I can save time in my large private practice by using SD-OCT.

MAXIMIZING TESTING EFFICIENCY

My practice has a significant number of patients with age-related macular degeneration (AMD) who receive regular injections of anti-VEGF therapy. Although clinical trials have shown this therapy to be effective, it requires the patients to be monitored frequently and regularly, and this can create quite a burden for the physician. In most cases, monitoring in clinical trials includes a dilated

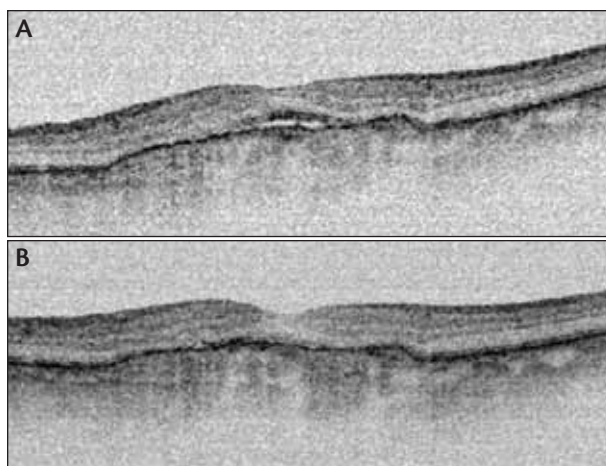


Figure 1. Asymptomatic subretinal fluid found on OCT-only visit indicating a need for anti-VEGF retreatment. Visual acuity was 20/25 (A). Resolution of subretinal fluid 1 month following anti-VEGF retreatment. Visual acuity remains at 20/25 (B).

(Continued on page 55)

(Jaffe, continued from page 54)

sion in the study, but it was also the primary method used to determine whether retreatment should be given in the prn groups. The study protocol directed that treatment with anti-VEGF should be given if any evidence of fluid was seen on OCT.

To apply the successful CATT study results in the clinic, it would be necessary to follow a monthly treatment regimen, and obtain OCT images only when clinically indicated, or to obtain OCT images on a monthly basis, and to treat according to the CATT-defined prn protocol.

Another popular approach to treatment is that of “treat and extend.” A treat-and-extend approach extends the intervals between treatments based on the results of the previous treatment and also relies on OCT findings.

WILL SD-OCT MAKE A DIFFERENCE?

At the beginning of the CATT study, all investigators used TD-OCT, as that was the imaging modality available to all of the investigators. For the second year of the study, the majority of investigators have opted to transition to

spectral-domain (SD) OCT. A CATT substudy is under way to determine if treatment decisions will differ based on the use of TD-OCT vs SD-OCT. This will represent the first time that TD-OCT has been compared with SD-OCT in a large prospective randomized clinical trial; thus, we are eager to see the results.

In my practice, OCT is a critical part of my decision-making process, both at the time of diagnosis and during follow-up for my patients with AMD, as it is with most other retinal diseases. OCT is a quick and non-invasive procedure, the images are relatively easy to obtain, and they provide vital information for the clinician. ■

Glenn J. Jaffe, MD, is a Professor of Ophthalmology in the Vitreoretinal Service and is Director of the Duke Reading Center at Duke University Eye Center, Durham, NC. Dr. Jaffe is a Retina Today Editorial Board member. He may be reached at jaffe001@mc.duke.edu.



1. The CATT Research Group. Ranibizumab and bevacizumab for neovascular age-related macular degeneration. *N Engl J Med*. 2011; 364:1897-1908.

(Palmer, continued from page 54)

fundus exam and an SD-OCT scan on each visit.

I have found, however, that SD-OCT imaging is highly sensitive to detecting recurrences of AMD or fluid that are apparent before any loss of visual acuity. Subretinal fluid or cystic edema in the retina is visible earlier in some cases in SD-OCT images than with a fluorescein angiogram. Because of this, I have developed a system in which my patients undergo testing at alternate visits. For example, on every other visit I perform a fully dilated fundus examination, and at alternate visits patients undergo SD-OCT imaging and visual acuity testing, both of which are performed by a technician and do not require my presence. I then review all scans afterward to check for any abnormalities. This system not only helps with my schedule, but also patients prefer the efficiency of not having to have their eyes dilated at every visit.

It is important to note, however, that it is difficult to see small hemorrhages with OCT. In my experience, however, it is rare that these small hemorrhages are the sole indicators of neovascular activity—cystic edema and/or subretinal fluid is usually also present.

SUMMARY

I have 6 offices and use a variety of SD-OCT machines including the Cirrus HD-OCT (Carl Zeiss Meditec), Spectralis (Heidelberg), and RTVue (Optovue).

Figures 1 and 2 show RTVue images that I used to guide retreatment. Overall, I have found that SD-OCT's noninva-

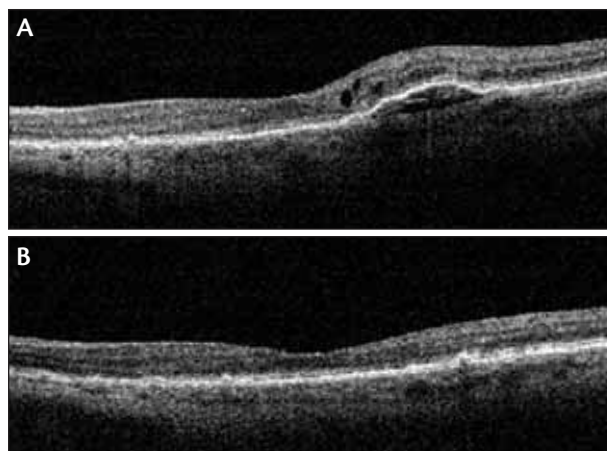


Figure 2. Asymptomatic cystic edema found on OCT-only visit indicating a need for anti-VEGF retreatment. Visual acuity was 20/40 (A). Resolution of cystic edema 1 month following anti-VEGF retreatment. Visual acuity is unchanged at 20/40 (B).

sive nature, the simplicity of its operation for technicians, and the excellent quality of the scans that it produces have improved my overall practice efficiency while maintaining my ability to provide the best care for my patients. ■

James D. Palmer, MD, is a retinal specialist at Northern California Retina Vitreous Associates. He may be reached at +1 650 988 7480; or via email at palmerjdp@gmail.com.

