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Evaluation of Choroidal Thickness in Central Serous Chorioretinopathy Using Cirrus HD Optical Coherence Tomography

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Central serous chorioretinopathy; Choroid; Optical coherence tomography; Spectral Fourier Domain

Dear Editor,

We read with great interest the recent article by Imamura et al¹ on choroidal thickness in central serous chorioretinopathy (CSCR) in a recent issue of *Retina*.

OCT² has been a vital tool in describing inner and outer retinal pathology; only recently, however, have choroidal changes been described using OCT owing to improved visualization using enhancing software, such as frame averaging^{3, 4} and de-speckling. Imamura et al described increased choroidal thickness in CSCR using an enhanced depth imaging (EDI) technique with the Heidelberg Spectralis (Heidelberg Engineering, Heidelberg, Germany).^{1, 5} At the New England Eye Center, Tufts Medical Center, Boston, MA, choroidal thickness has been visualized and measured utilizing Zeiss Cirrus HD-OCT, software version 4.5 (Carl Zeiss Meditec, Dublin, CA). The new software generates high definition 1 line raster scans by capturing 20 B-scans at a single location and applying unique Selective Pixel Profiling™ software to the scans to obtain a higher quality image. A review of 23 eyes of 23 patients with CSCR, mean age of 59.7(range, 33 – 84 years), scanned with the high definition 1 line raster scans between November 2009 and January 2010, demonstrated increased choroidal thickness compared to normal eyes. However, of the 23 eyes that were examined, the full choroidal thickness could only be measured in 7 (30.4%) eyes (Figure1). Moreover, even in the eyes in which the choroid/sclera junction could not be very well delineated, particularly in the thickest subfoveal region, increased thickness could be surmised from the widened angle between the choroid/sclera junction and the retinal pigment epithelium (RPE) at the temporal and nasal edges of the image (Figure 2).

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It unclear why the choroid/sclera junction is more obscured in these particular images. The choroid may be so thickened as to lose signal penetration and intensity at the increasing depth due to signal roll-off distal to the zero-delay line. Furthermore, signal degradation could be secondary to fibrin deposition within the serous detachment, densely pigmented RPE, particularly in the younger patients, or due to cataracts in the older patients. An increased number of averaged scans may overcome these barriers for improved visualization at a greater choroidal depth.

Cirrus HD-OCT high definition imaging is another tool available for visualization of the choroid and provides agreement with the finding that the choroidal thickness is increased in CSCR in comparison to normal eyes.

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FIGURE 1. Choroidal thickness visualized using Cirrus high definition 1 line raster scans (A) Color fundus photograph and (B) corresponding OCT images from a 37 year old male with CSCR demonstrating good visualization of choroid/sclera junction and increased choroidal thickness using Cirrus HD-OCT high definition raster scans.

FIGURE 2. (A) Color fundus photograph and (B) Cirrus HD-OCT high definition 1 line raster image from a 75 year old male with CSCR. Black angle drawn on OCT image to demonstrate widening at image boundaries suggesting increased choroidal depth.