Advancing OCT Algorithmic Standardization

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Neovascular exudative AMD (wet AMD) continues to rank as a top reason to visit eye care specialists, and the early identification of this disease has important prognostic implications for patients.¹ Advancements in optical coherence tomography (OCT) imaging have surpassed other modalities in the ability to detect the earliest development of wet AMD and prompt treatment initiation, in spite of lack of inter- and intradevice standardization.²,³ Zhang et al.⁴ present a novel, automated way to detect changes at the border where choroidal neovascularization (CNV) first affects the retina. They use a technique that presents an automated method capable of segmenting the outer retinal-subretinal (ORSR) layer with a disrupted outer retina in wet AMD scans with one of the most widely used commercial OCT devices. In addition to improvements in efficiency of the treatment algorithm that patients undergo, this methodology has direct commercial applications and may benefit an even broader audience than makes up IOVS.

The following study⁴ proposes a fully automated method of quantifying thickness of the ORSR layer from clinical OCT scans of patients with CNV secondary to wet AMD. In this study, 23 patients with clinically significant CNV underwent OCT imaging, yielding 23 independent macular-centered volumetric scans obtained from all eyes. Optical coherence tomography volumes were analyzed using both a standard approach and a three-dimensional (3D) graph-search method with an adaptive cost function. Using the standard segmentation approach, 1 of 23 was graded generally accurate, while 22 of 23 segmentations were graded failures; however, with the proposed 3D approach, 21 of 23 segmentations were graded generally accurate, 2 of 23 were graded local segmentation inaccuracies, and none were graded failures. These results illustrate the efficacy of a fully automated 3D method for ORSR layer segmentation in OCT of patients with wet AMD, thereby having the potential to facilitate the management of patients who have diseases that cause macular edema.

References