

Journal Article Review

The new Bruch's membrane opening – minimum rim width classification improves optical coherence tomography specificity in tilted discs

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Background and Purpose

Tilted discs present problems for spectral-domain optical coherence tomography (SD-OCT) assessment of glaucomatous parameters such as neuroretinal rim, retinal nerve fiber layer thickness (RNFLT), and macular ganglion cell measurements. This study evaluated the ability of the SPECTRALIS® Glaucoma Module Premium Edition (GMPE) parameters to correctly classify healthy subjects with tilted discs, based on the available reference database. The study also compared this false positive (FP) rate of classification with the ganglion cell analysis (GCA) classification generated by the Zeiss Cirrus® OCT.

Methods

The study included 50 eyes from 30 healthy subjects with tilted discs that had no other ocular pathology, as determined by a comprehensive ophthalmologic examination. The investigators defined a tilted disc by evaluating the optic nerve with a fundus image and calculating an index of tilt <0.8 , which they reported as the minimum disc diameter divided by the maximum. Patients underwent SPECTRALIS GMPE imaging to define BMO-MRW and RNFLT, and Cirrus macular cube imaging for GCA. For each device, FP rates were defined as scans that had parameters with results outside normal limits when compared to the device's reference database.

Discussion

SPECTRALIS BMO-MRW had an overall FP rate of 8% (four patients). The BMO-MRW was also more specific than RNFLT on the SPECTRALIS system (FP = 70.9%), but RNFLT measurements have been shown to generate FP results for tilted disc eyes on many commercial devices. The Cirrus GCA had an overall FP rate of 50% when using the deviation map as diagnostic tool and 30% when applying the sector map.

Conclusions

Tilted discs are a common confounding factor in SD-OCT glaucoma parameters, resulting in misclassification of healthy eyes. These parameters are compared to reference databases consisting of mainly planar discs, and thus can cause diagnostic inaccuracies. The SPECTRALIS Glaucoma Module Premium Edition by Heidelberg Engineering offers the BMO-MRW optic nerve head parameter which can help accurately assess eyes with tilted discs in order to correctly differentiate glaucomatous from healthy eyes. Such a parameter can aid clinicians in their clinical diagnosis of glaucoma when assessing eyes with tilted discs.