Journal Article Review

Optic Disc Margin Anatomy in Patients with Glaucoma and Normal Controls with Spectral Domain Optical Coherence Tomography

Alexandre S.C. Reis, Glen P. Sharpe, Hongli Yang, Marcelo T. Nicolela, Claude F. Burgoyne, Balwantray C. Chauhan

Ophthalmology 2012 Apr;119(4):738-47
PMID: 22222150

Summary

Purpose

To characterize optic nerve head (ONH) structures detected with spectral domain optical coherence tomography (SD-OCT) and determine how these structures relate to the clinically observed optic disc margin.

Methods

Thirty eyes with open-angle glaucoma and 10 healthy age-matched control eyes were imaged with the SPECTRALIS® SD-OCT. These eyes also had optic disc stereophotographs taken with a fundus camera. Each photograph was aligned to its complementary infrared image, which was extracted from the SD-OCT scan, to render a "registered photograph". Customized software was used to align the 2-dimensional "registered photograph" with simultaneous structures in the corresponding SD-OCT B-scan. The SD-OCT structure coinciding with the clinical optic disc margin, identified in the optic disc stereophotograph, was indicated.

Discussion

The authors propose that "What the clinician identifies as the margin in a single optic disc is rarely a single structure." The clinical optic disc margin may correspond to A) the innermost edge of Bruch's membrane, B) somewhere on Bruch's membrane with underlying border tissue, or C) border tissue alone. In fact, most commonly, the clinically identified disc margin corresponds to two or all three of these SD-OCT detected structures. Such findings suggest that "The discordance between these two landmarks may influence the accuracy of clinical neuroretinal rim tissue assessment".

Conclusions

- "The anatomic basis for the human optic disc margin is complex and can be highly variable within individual eyes and between different eyes."
- The clinically identified disc margin is often some segment of Bruch's membrane and border tissue and less frequently Bruch's membrane opening or border tissue alone.
- "The location where Bruch's membrane terminates is potentially the most consistent site from which to quantify the neuroretinal rim."