Microvasculature Dropout in Advanced Primary Open Angle Glaucoma

Huiyuan Hou, MD, PhD; Sasan Moghimi, MD; Robert N Weinreb, MD*

Department of Ophthalmology, Hamilton Glaucoma Center and Shiley Eye Institute, University of California, United States.

*Corresponding Author(s): Robert N Weinreb
Department of Ophthalmology, Hamilton Glaucoma Center and Shiley Eye Institute, University of California, San Diego, 9500 Gilman Drive, La Jolla, CA 92093-0946, United States.
Tel: +858 534 8824, Fax: +858 534 1625; Email: rweinreb@health.ucsd.edu

Received: Oct 29, 2020
Accepted: Nov 25, 2020
Published Online: Dec 02, 2020
Journal: Journal of Clinical Images
Publisher: MedDocs Publishers LLC
Online edition: http://meddocsonline.org/
Copyright: © Weinreb RN (2020). This Article is distributed under the terms of Creative Commons Attribution 4.0 International License

Clinical image description

The case is from the longitudinal Diagnostic Innovations in Glaucoma Study (DIGS) [1] which was approved by the Institutional Review Boards of the University of California San Diego. Written informed consent was obtained.

This is a 63-year-old male with his right eye diagnosed as Primary Open Angle Glaucoma (POAG). He underwent a complete ophthalmologic examination, Visual Field (VF) testing by standard automated perimetry, Spectral-Domain optical coherence tomography imaging and Optical Coherence Tomography Angiography (OCTA) imaging. The exam and imaging showed typical features of advanced POAG: diffuse retina nerve fiber defect and excavation of optical nerve head (ONH), superior and inferior rim thinning; the VF mean deviation was -28.53 dB; parapapillary Retina Nerve Fiber Layer (RNFL) thickness was 64 µm (94-100 µm in healthy eyes generally [2]. OCTA imaging of ONH (Figure 1) showed extensive microvasculature loss in the superficial retinal layer (from the internal limiting membrane to the RNFL posterior boundary) and large vessels were unaffected (Figure 1A), en face image showing sparse microvasculature as an enlarged dark area among bright large vessels; (Figure 1B), 3D view of remaining large vessels extending from the surface of the thin superficial retina). The whole image capillary density was 30.4%, while vessel density (including large vessels) was 40.4%.

This case illustrates well the microvasculature impairment in glaucoma [3] and the retention of large vessels that are not involved in the pathophysiology. It provides rationale for excluding large vessels from image analysis of studies that examine the ONH vasculature in glaucoma. Large vessels have higher impact in advanced disease as they comprise a larger proportion of vessel density in advanced disease compared to earlier stages of glaucoma [4].

Figure 1: Optical coherence tomography angiography images of optical nerve head in an advanced glaucoma eye. (A) en face image; (B) 3D view.

Acknowledgements

Supported in part by National Eye Institute R01 EY029058 and an unrestricted grant from Research to Prevent Blindness (New York, NY).

References


