MEDDOCS Open Access Publisher

Journal of Clinical Images

Open Access | Clinical Image

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/

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].

Cite this article: Hou H, Moghimi S, Weinreb RN. Microvasculature Dropout in Advanced Primary Open Angle Glaucoma. J Clin Images. 2020; 3(1): 1076.

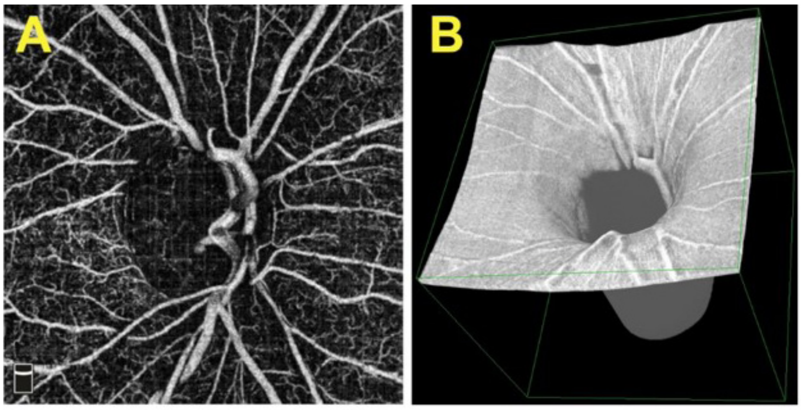

Figure 1: Optical coherence tomography angiography images of optical nerve head in an advanced glaucoma eye. **(A)** en face image; **(B)** 3D view.

Acknowledgements

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

References

1. Sample PA, Girkin CA, Zangwill LM, Jain S, Racette L, et al. The African Descent and Glaucoma Evaluation Study (ADAGES): design and baseline data. Arch Ophthalmol. 2009; 127: 1136-1145.

2. Mwanza JC, Budenz DL, Warren JL, Webel AD, Reynolds CE, et al. Retinal nerve fibre layer thickness floor and corresponding functional loss in glaucoma. Br J Ophthalmol. 2015; 99: 732-737.

3. Moghimi S, Hou HY, Rao HL, Weinreb RN. Optical Coherence Tomography Angiography and Glaucoma: A Brief Review. Asia-Pacific Journal of Ophthalmology. 2019; 8: 115-125.

4. Ghahari E, Bowd C, Zangwill LM, Proudfoot J, Hasenstab KA, et al. Association of Macular and Circumpapillary Microvasculature with Visual Field Sensitivity in Advanced Glaucoma. Am J Ophthalmol. 2019; 204: 51-61.