

## AUTHORS

**AUTHORS (LAST NAME, FIRST NAME):** Moreira Neto, Carlos A.<sup>1, 2</sup>; Rebhun, Carl B.<sup>1</sup>; Ploner, Stefan B.<sup>3</sup>; Moulton, Eric M.<sup>3, 1</sup>; Novais, Eduardo A.<sup>2</sup>; Alibhai, A. Yasin<sup>1</sup>; Schottenhamml, Julia<sup>3</sup>; Louzada, Ricardo<sup>1</sup>; Waheed, Nadia<sup>1</sup>; Witkin, Andre J.<sup>1</sup>; Baumal, Caroline R.<sup>1</sup>; Duker, Jay S.<sup>1</sup>; Fujimoto, James G.<sup>3</sup>; Ferrara, Daniela<sup>1</sup>

### **INSTITUTIONS (ALL):**

1. Ophthalmology, Tufts University, Boston, MA, United States.
2. Ophthalmology, Universidade Federal de Sao Paulo, Sao Paulo, Brazil.
3. Department of Electrical Engineering and Computer Science, and Research Laboratory of Electronics,, Massachusetts Institute of Technology, Boston, MA, United States.

**Commercial Relationships Disclosure (Abstract):** Carlos Moreira Neto: Commercial Relationship: Code N (No Commercial Relationship) | Carl Rebhun: Commercial Relationship: Code N (No Commercial Relationship) | Stefan Ploner: Commercial Relationship: Code N (No Commercial Relationship) | Eric Moulton: Commercial Relationship: Code N (No Commercial Relationship) | Eduardo Novais: Commercial Relationship: Code N (No Commercial Relationship) | A. Yasin Alibhai: Commercial Relationship: Code N (No Commercial Relationship) | Julia Schottenhamml: Commercial Relationship: Code N (No Commercial Relationship) | Ricardo Louzada: Commercial Relationship: Code N (No Commercial Relationship) | Nadia Waheed: Commercial Relationship(s);MVRF:Code F (Financial Support) ;Janssen, Regeneron, Genentech, Ocudyne:Code C (Consultant) ;Optovue, Nidek, Carl Zeiss Meditec:Code R (Recipient) | Andre Witkin: Commercial Relationship: Code N (No Commercial Relationship) | Caroline Baumal: Commercial Relationship(s);Allergan:Code S (Non-remunerative) ;Genentech:Code S (Non-remunerative) | Jay Duker: Commercial Relationship(s);Carl Zeiss Meditec, OptoVue, and Topcon Medical Systems Inc.:Code C (Consultant) | James Fujimoto: Commercial Relationship(s);Optovue Inc.:Code I (Personal Financial Interest) ;Royalties from intellectual property owned by MIT and licensed to Carl Zeiss Meditec Inc., Optovue Inc.:Code P (Patent) | Daniela Ferrara: Commercial Relationship(s);Genentech:Code E (Employment)

**Study Group:** (none)

## ABSTRACT

**TITLE:** Analysis of Polypoidal Choroidal Vasculopathy Using Swept Source Optical Coherence Tomography Angiography with Variable Interscan Time Analysis

### **ABSTRACT BODY:**

**Purpose:** Optical coherence tomography angiography (OCTA) has been used to evaluate vascular lesions associated with polypoidal choroidal vasculopathy (PCV), but OCTA does not provide information about blood flow speed or turbulence. Recently, a novel OCTA algorithm termed variable interscan time analysis (VISTA) displays blood flow speed information in a color coded map of retinal vasculature. The aim of this study is to utilize VISTA to evaluate PCV lesions.

**Methods:** Seven eyes of 7 patients with a previous diagnosis of PCV were enrolled in this study. Volumetric OCTA of the retinal vasculature was obtained with a prototype 400kHz, 1050nm swept-source OCT (SS-OCT) system. The acquired OCT volumes were centered on the area containing the branch vascular network (BVN) and polyps as determined by indocyanine green angiography (ICGA). OCTA-VISTA was applied to the OCTA projections and the resulting blood flow speed information was mapped on a color-coded display.

**Results:** Five female and 2 male patients were evaluated. The mean age  $\pm$  SD was  $70 \pm 9$  years. SS-OCTA enabled detailed *en face* visualization of the BVN and polyps in 6 eyes. One eye showed motion artifact blocking the visualization of BVN and polyps. In one eye ICGA highlighted only one polyp and an adjacent area that demonstrated blocking due to hemorrhage. *En face* SS-OCTA of the same region revealed multiple clustered polyps. VISTA-OCTA color-coded images showed faster flow in the periphery of polyps and slower flow in the center of each polyp in five eyes (Figure 1). In two eyes, VISTA-OCTA was unable to provide more information than OCTA alone.

**Conclusions:** OCTA is useful in the identification of polyps in PCV and may provide insight into the disease process. VISTA-OCTA showed turbulent flow in the polyps, with the center showing slower flow than the periphery. In one case, *en face* OCTA was superior than ICGA in identifying polyps, suggesting that multimodal imaging with ICGA and OCTA may be more sensitive in detecting polyps in PCV lesions compared to ICGA on its own.

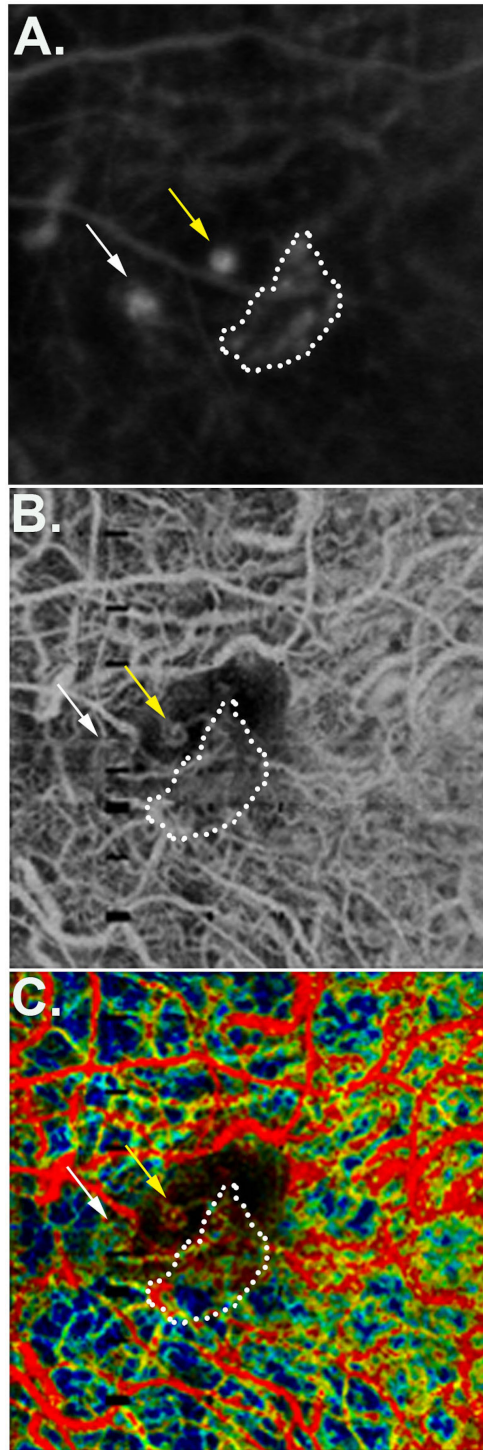


Figure 1: A) ICGA of a PCV lesion cropped to a 3x3mm area. B) Corresponding OCTA. C) OCTA-VISTA of the same area. Arrows indicate two polyps. BVN is delineated by dashed line. Note turbulent flow inside the polyps. In OCTA-VISTA images, blue corresponds to slower, green to intermediate and red to faster blood flow.

## DETAILS

**PRESENTATION TYPE:** #1 Paper, #2 Poster

**CURRENT REVIEWING CODE:** 2560 imaging: posterior segment, clinical - RE

**CURRENT SECTION:** Retina

**Clinical Trial Registration (Abstract):** No

**Other Registry Site (Abstract):** (none)

**Registration Number (Abstract):** (none)

**Date Trial was Registered (MM/DD/YYYY) (Abstract):** (none)

**Date Trial Began (MM/DD/YYYY) (Abstract):** (none)

**Grant Support (Abstract):** Yes

**Support Detail (Abstract):** National Institutes of Health: 5-R01-EY011289-28 Air Force Office of Scientific Research: FA9550-15-1-0473, FA9550-10-1-0551

## TRAVEL GRANTS and AWARDS APPLICATIONS

**AWARDS:** ARVO and ARVO Foundation Travel Grants|ARVO / Alcon Early Career Clinician-Scientist Research Award|ARVO Members-in-Training Outstanding Poster Award

## AFFIRMATIONS

**Affirmations:** Affirmation that submission of this abstract has been approved by the Principal Investigator.

**Affirmations:** Affirmation that abstract data/conclusions have not been published; not redundant with other submissions from same investigators.

**Affirmations:** Affirmation to reveal essential structure, novel compound elements, or identify new gene compounds.

**Affirmations:** Affirmation of compliance with ARVO's Statement for Use of Human Subjects and/or Declaration of Helsinki.

**Affirmations:** Affirmation of compliance with ARVO policy on registering clinical trials.

**Affirmations:** Affirmation to pay Annual Meeting's full registration fee.

**Affirmations:** Affirmation to present same work as abstract submission.

**Affirmations:** Affirmation of copyright transfer from each author to ARVO, or certification of public domain abstract.

**Affirmations:** Affirmation of compliance with ARVO's Statement for Use of Animals.