En face enhanced depth imaging optical coherence tomography of polyoidal choroidal vasculopathy

Oudy Semoun MD, Florence Coscas MD, Gabriel Coscas MD, Eric Souied MD, PhD.
Department of Ophthalmology, Centre Hospitalier Intercommunal de Créteil, University Paris-Est, Créteil, France
Centre Ophthalmologique de l'Odeon, Paris, France

INTRODUCTION

Polyoidal choroidal vasculopathy (PCV) is an acquired chronic choroidal vasculopathy, distinct from more typical choroidal neovascularization.

Fluorescein angiography and indocyanine green angiography (ICGA) and Optical Coherence Tomography (OCT) findings in PCV have been largely described.

Enhanced depth imaging (EDI-OCT) has been shown to reliably image the full thickness of the choroid. A new approach to EDI-OCT imaging, called “En face OCT,” combined SD-OCT with transverse confocal analysis and produced simultaneous longitudinal (B-scan) and transverse (En face) images of the macular area with high retinal correspondence.

Our purpose was to analyze retinal and choroidal changes in polyoidal choroidal vasculopathy using En face enhanced EDI-OCT.

METHODS

Thirty consecutive patients presenting with PCV were included in this retrospective and descriptive study at the Centre Hospitalier Intercommunal de Créteil (Créteil, France).

This study was performed in accordance with the French biobehavioral legislation and in agreement with the Declaration of Helsinki for research involving human subjects. University Paris XI Institutional Review Board approval was obtained for this study. An informed consent was obtained from all patients.

For each patient, a complete ophthalmological examination was performed, as part of their routine clinical work-up. It included fundus examination, standardized ophthalmoscopy (SLO) – FA, SLO-IGA and EDI-OCT over a 10° x 10° area encompassing the PCV lesion (Heidelberg Spectralis, Heidelberg Engineering, Heidelberg, Germany).

The EDI-OCT reconstruction of 127 transverse sections with SD-OCT at 15° intervals, each composed of nine averaged B-scans, provided a virtual optical biopsy through which 496 sections in the central plane resulted in a contour (“En face” OCT image).

En face imaging (Coscas) were compared with indocyanine green angiography (ICGA) images.

Exclusion criteria were any other diagnoses explaining the lesions, high myopia (≤-8 dioptries), presence of angiod streaks and any previous intravitreal therapy. Patients with extreme eye movement or extensive retinal opacities were also excluded from the study.

RESULTS

Thirty eyes of 30 consecutive patients were studied. In all 30 eyes, ICGA and FA allowed visualization of the PCV.

Polyoids were detected easily in all eyes with En face OCT, usually more numerous than with ICGA, showing structures slightly deeper than posterior epiretinal layer, and attached to the posterior face, almost always in a deep pigment epithelial detachment (PED).

Hyperreflective dots were visible in most cases with the retinal layers, associated to a well-defined dark area suggesting neovascular evolution.

The choroidal neovascular layer was easily identified, even when well detected with ICGA. At the Bruch membrane level, polyoids were associated to localized back shadowing and were no more visible at the superficial intrafoveal layer.

Large choroidal vessels were visible, mainly at the polyoidal lesions periphery, and not directly behind.

DISCUSSION – CONCLUSION

En face OCT imaging using SD OCT is an easy, reproducible, non-invasive and effective tool to visualize and to understand retinal and choroidal changes in PCV.

It provides complementary morphological information about the number of polyoids, their ultra-structure and their activity, describes new semiological entities and might substitute other exams in the future, without dye injection.

REFERENCES


CONFLICT OF INTEREST

None declared.