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CORRESPONDENCE

Modified enhanced vitreous imaging modality of spectral domain optic coherence tomography

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To the Editor:

Posterior vitreous structures are visualized using conventional enhanced vitreous imaging modality of spectral domain optic coherence tomography (EVI SD-OCT) [1] and swept-source OCT (SS-OCT) [2]. SS-OCT can clearly show posterior precortical vitreous pockets (PPVP), the primary pathogenic event in idiopathic macular hole formation [3].

Here, we introduce a modified EVI SD-OCT (mEVI-OCT) based on Spectralis OCT2 (Heidelberg Engineering, Heidelberg, Germany). This novel simple modification combines vitreous and choroidal images with retinal image into one image.

The mEVI-OCT images were obtained under high resolution with a 55° or 30° raster. A 55° raster increases the field depth better than a 30° raster. The retinal layers are positioned in the lower third of an image to obtain an imaging depth that penetrates into the vitreous. Scans are obtained by switching from focusing on the retina to the vitreous by turning the dial slowly, about 1.0–2.0 diopters counterclockwise while scanning. After 75% of the frames have been completed, the enhanced depth imaging (EDI) function is activated to finish the remaining 25%. The mEVI-OCT images are developed after maximizing the contrast in the images to visualize the posterior vitreous, retina, and choroid in detail, including the premacular bursa or PPVP, Cloquet's canal, prevascular vitreous fissures, cisterns, and choroidal–scleral interface (Figs. 1 and 2), which were not inferior to SS-OCT previously [2, 4].

A possible mechanism of mEVI-OCT is that for 75% of the frames, the zero-delay line is displaced into the vitreous, resulting in vitreous imaging with high resolution. The EDI function guarantees that the deep choroid visualization is less susceptible to sensitivity roll-off [5], completing the remaining 25% frames.

Compared with the conventional EVI mode [1], mEVI-OCT has a larger field depth because of the 55° raster and can better visualize deep choroids owing to its EDI function in the last 25% of the frames. Unlike the long wavelength in SS-OCT [2–4], the mEVI-OCT signal is less attenuated by the fluid in the anterior chamber and vitreous and has a higher inherent axial resolution. Although we could not compare between SS-OCT and mEVI-OCT in the same patient, mEVI-OCT is still promising based on our current data.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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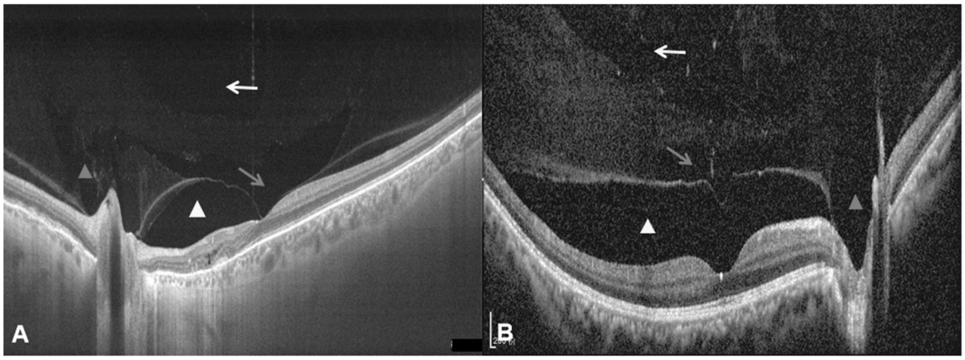

Fig. 1 Comparison of the vitreous structure visualization between swept-source optic coherence tomography (SS-OCT) and modified enhanced vitreous imaging OCT (mEVI-OCT). a SS-OCT of the left eye clearly showing the vitreous macular traction (yellow triangle), the premacular bursa or posterior precortical vitreous pocket (PPVP; red arrow), cisterns (yellow arrow) above the PPVP, and Cloquet's canal at the disc (red triangle). **b** mEVI-OCT of the right eye of another patient clearly showing posterior vitreous detachment (yellow triangle), the premacular bursa or PPVP (red arrow), cisterns (yellow arrow) above the PPVP, and Cloquet's canal at the disc (red triangle). Both SS-OCT and mEVI-OCT can detect posterior vitreous structures.

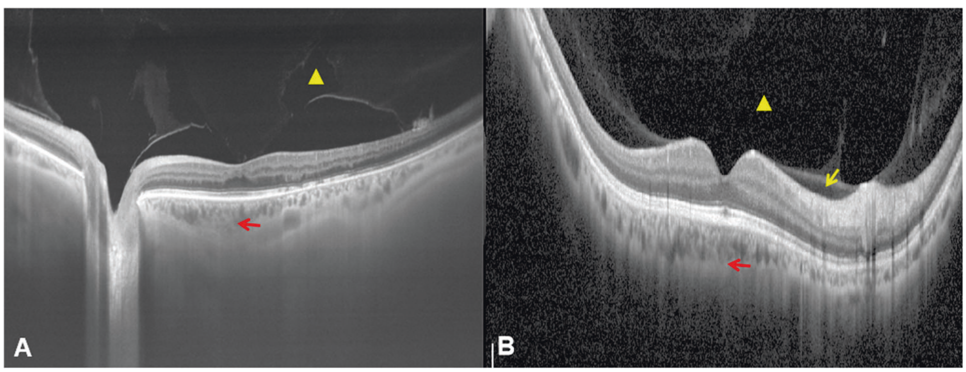

Fig. 2 Comparison of the deep choroid visualization between swept-source optic coherence and modified enhanced vitreous imaging OCT (mEVI-OCT). a SS-OCT of the left eye showing a posterior precortical vitreous pocket (PPVP; yellow triangle) and a distinct choroidal vasculature and choroidal-scleral interface (red arrow). **b** mEVI-OCT of the right eye of another patient showing a larger PPVP (yellow triangle), clear prevascular vitreous fissures (yellow arrow), and choroidal vasculature and choroidal-scleral interface (red arrow) in high resolution.

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