Commentary: Comparison of standard and innovative wide field optical coherence tomography images in assessment of vitreoretinal interface in proliferative diabetic retinopathy: A pilot study

Recent developments in spectral domain optical coherence tomography (SD-OCT) have improved image resolution, image acquisition, scan rate, and scan length, resulting in a dramatic improvement to the understanding of vitreoretinal interface, posterior vitreous cortex, and intraretinal changes. Conventional SD-OCT scans give a maximum of 9416 ± 410 microns and 9437 ± 374 microns in the horizontal and vertical scan, respectively. The DRI OCT Triton plus (Topcon, Tokyo, Japan) and PLEX ELITE 9000 (Carl Zeiss Meditec, Dublin, CA) are recent commercially available swept source wide-field OCT systems, capable of producing a 12 mm scan that allows the entire optic disk to be imaged with the macula. Heidelberg Spectralis wide-field imaging provides a 55° field-of-view, capturing macula, optic nerve head, and areas beyond the vascular arcade in a single OCT scan. Using the Raster scan, it is possible to scan up to the mid periphery; therefore, we can visualize the entire area without any quadrant loss. However, technology comes with a price tag, and these equipment, although they provide a high-resolution and good quality scan, are not within the reach of most practicing vitreo retina specialists and institutions.

In this context, various innovations have evolved over the years. The two most interesting and useful techniques are the montage image of SD-OCT and extended field imaging (EFI) to OCT. Montage images merging multiple images with various software was first described way back in 2012 to understand the vitreoretinal relationships in eyes with macular hole. The same authors later described in extensive detail the technique of montage OCT, and they described the normal features in OCT seen in the retina and choroid up to the mid periphery. In this technique, to obtain the OCT images, from the macula to the periphery, they used planimetric fixation points beyond the central fixation in each quadrant, and to obtain the very peripheral images of the SD-OCT device was tilted with a corresponding fixation of the eye. Montaging was subsequently done using a specific picture editing software. The resolution and pictures obtained were of very good quality. Recently,
Further innovation in montage imaging was described using the Heidelberg Spectralis, where the scan length reached a maximum of 27 mm, much beyond the equator and reaching the retinal periphery. However, although montage imaging is quite effective and can get good high-resolution scans, it has two drawbacks:

1. The technique is cumbersome and time-consuming and may not be put to use on a routine basis.
2. The technique also faces difficulties for eyes in which the media may be a little hazy because of peripheral lenticular changes, thereby, precluding good image quality of peripheral OCT scans.

EFI is the second innovation that allows imaging of the retina and vitreoretinal interface beyond the conventional posterior pole and macula. This was initially described by using a 20D lens over a trial frame. A very simple technique, it increased the scan width to $13,610 \pm 843$ microns in the horizontal scan and $14,802 \pm 701$ microns in the vertical scan.\(^\text{10}\) The EFI scan could acquire the entire optic disk and macula extending to the vascular arcade.

The present article titled “Comparison of standard and innovative wide-field optical coherence tomography images in assessment of vitreoretinal interface in proliferative diabetic retinopathy” describes an EFI technique using a 90D lens.\(^\text{11}\) Unlike the 20D lens, which is placed in a trial frame and is, thereby, very stable, this technique involves holding the 90D lens in front of the eye to be imaged. The authors have not described the scan length that they could acquire but have detailed the expansion length compared with the standard scan. The scan quality and the pictures taken appear to be very good. Considering that it is a simple innovation, it can be put to practice in routine clinics and can be utilized to a certain extent with conventional SD-OCT scans.

Having explained the various techniques available to acquire wide-field OCT scans, the question arises as to what is its application in clinical practice? Current literature has explored vitreoretinal relationships in specific diseases like a macular hole, proliferative diabetic retinopathy, and Vogt–Koyanagi–Harada syndrome. It would be interesting to use the wide-field imaging systems in eyes with peripheral vitreoretinal diseases, such as Coats disease and FEVR, and also to understand vitreoretinal relationships in eyes with peripheral lattice degeneration, especially in symptomatic eyes. This will go a long way in understanding the progression of such diseases and may help in devising new strategies in the management of such diseases.

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| DOI: 10.4103/ijo.IJO_2129_20 | |

**Cite this article as:** Anantharaman G, Indurkhya S. Commentary: Comparison of standard and innovative wide field optical coherence tomography images in assessment of vitreoretinal interface in proliferative diabetic retinopathy: A pilot study. Indian J Ophthalmol 2021;69:102-3.