

Visualization of fine retinal networks through higher optical resolution OCTA

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PURPOSE

Optical Coherence Tomography Angiography (OCTA) image quality is heavily influenced by the resolution of the scanning optics. We conducted a clinical study to analyze the effects of increased optical resolution in the visualization of small retinal features

METHODS

- A PLEX® Elite 9000 OCTA system (ZEISS, Dublin, CA) was modified by incorporating a retractable lens with high numerical aperture (NA) into its optical path.
- The lens reduced the geometrical spot size of the beam at the retinal plane from 20 to 12µm.
- Normal and diseased eyes were imaged using two scan patterns:
 - Pattern 1: 2.25x2.25mm field of view (FOV) with 7.5 µm lateral pixel spacing and 300 B-scans, repeated 4 times (retractable lens IN)
 - Pattern 2: 2.25x2.25mm FOV, with 10µm lateral pixel spacing and 300 B-scans, repeated 4 times (retractable lens OUT)

RESULTS

- 20 eyes were imaged in this study. In all cases the angiographic appearance of capillary networks in the superficial and deep plexus layers was superior when using higher optical resolution
- Skeletonization of higher resolution images resulted in better vessel connectivity, which may result in more accurate quantification metrics

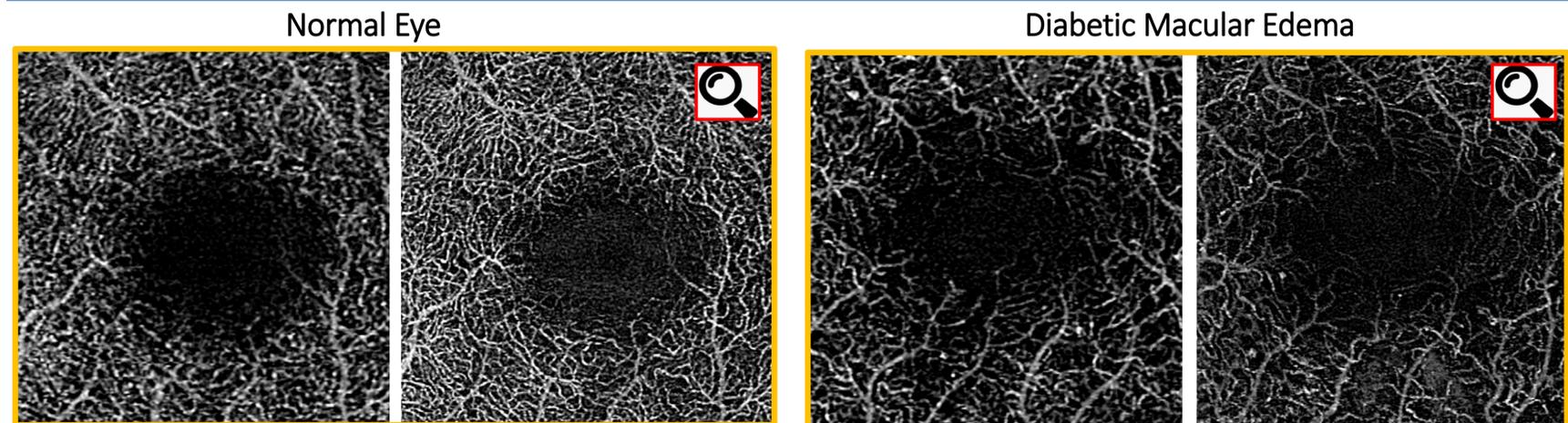
CONCLUSION

Our study shows that increasing optical and sampling resolution provides more anatomically accurate vessel network images. Such improvement could prove valuable when assessing small abnormalities such as microaneurysms and vessel tortuosity, as well as provide more reliable vessel quantification.

SUPERFICIAL RETINAL LAYER



DEEP RETINAL LAYER



SKELETONIZATION FOR ACCURATE QUANTIFICATION

