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## Abstract

The aim of this study is to elucidate the association between the distributions of microaneurysms detected by en face optical coherence tomography angiography (OCTA) and diabetic macular edema (DME). The study design was a retrospective chart review of 27 patients (33 eyes) with DME. The eyes were scanned using OCTA (6 x 6 mm) and spectral-domain (SD) OCT macular cube. Each of the images of the capillary plexus was overlaid onto the image of the topographic map, and the densities of the microaneurysms were measured by ImageJ software. The association between the distribution of microaneurysms and macular edema was evaluated. For microaneurysms in areas with and without edema,  $77.3 \pm 8.1\%$  of these microaneurysms were located in the deep capillary plexuses (DCP). However, in areas of edema where the retinal thickness was more than 400  $\mu\text{m}$ ,  $91.3 \pm 9.1\%$  of the microaneurysms were found in the DCP. This difference was statistically significant ( $P < 0.001$ ). In the macular edema area, there was a significantly higher density of microaneurysms in the DCP compared to the superficial capillary plexuses ( $1.71/\text{mm}^2$  vs.  $0.17/\text{mm}^2$ ,  $P < 0.001$ ). There was also a significant correlation between the macular volume and the density of microaneurysms in the DCP in edema ( $r = 0.63$ ,  $P < 0.001$ ). According to these results, our study demonstrated a high proportion of microaneurysms in the DCP, as well as a novel association between the distributions of microaneurysms detected by OCTA and DME. Results also indicated that microaneurysms located in the DCP contribute to the pathogenesis of DME.