Multiple Temporal Lamina Cribrosa Defects in Myopic Eyes with Glaucoma and Their Association with Visual Field Defects

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PURPOSE: To investigate characteristics of lamina cribrosa (LC) defects in myopic eyes with open-angle glaucoma (OAG) using spectral-domain (SD) optical coherence tomography (OCT).

DESIGN: Cross-sectional study.

PARTICIPANTS: One hundred thirty-three eyes with OAG and 83 eyes without OAG, with axial length of 24 mm or more.

METHODS: Serial enhanced depth imaging SD OCT B-scans of the optic disc were acquired and reviewed for LC defects (diameter, ≥100 μm) and large pores (diameter, 60-100 μm). The numbers and locations of LC defects and large pores in each eye were assessed. In eyes with OAG, factors related to the number of LC defects were evaluated, as well as the association between the locations of LC defects and visual field (VF) defects (e.g., paracentral scotoma [PCS] and superior or inferior hemifield defects).

MAIN OUTCOME MEASURES: Numbers and locations of LC defects and large pores.

RESULTS: In myopic eyes with and without OAG, the average numbers of LC defects were 3.8 and 0.8 and numbers of large pores were 1.9 and 1.6, respectively. In both groups, LC defects and large pores were located predominantly at the temporal periphery. Among eyes with OAG, the number of LC defects was relatively high in the eyes with greater optic disc tilt angle and worse mean deviation of the VF (both P < 0.001). The number of temporal LC defects and tilt angle were associated with presence of PCS, whereas the number of inferior and superior LC defects and torsion direction were associated with presence of superior and inferior VF defects.

CONCLUSIONS: Myopic eyes with OAG exhibited LC defects and large pores at similar locations as those without OAG, but in greater numbers, suggesting that these focal alternations of the LC in myopic eyes may evolve into larger defects when glaucoma develops in the eye. The number of LC defects, which was related to the optic disc tilt angle, was associated significantly with glaucomatous VF defects in both severity and location. This suggests that myopia may influence glaucomatous VF defects through optic disc tilt by way of an increased number of LC defects at the temporal periphery.

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