

Effect of Focal Lamina Cribrosa Defect on Glaucomatous Visual Field Progression

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OBJECTIVE: To evaluate the association between focal, structural defects of the lamina cribrosa (LC) and glaucomatous visual field (VF) progression.

DESIGN: Retrospective, observational study.

PARTICIPANTS: A total of 169 patients with glaucoma (169 eyes) with a range of glaucomatous damage.

METHODS: Serial horizontal and vertical enhanced-depth imaging optical coherence tomography (EDI OCT) B-scans of the optic nerve head were obtained from patients with glaucoma with 5 or more prior Humphrey 24-2 VFs (Carl Zeiss Meditec, Inc, Dublin, CA). The EDI OCT scans were reviewed for the presence of focal LC defects (laminar holes or disinsertions with a diameter $>100\ \mu\text{m}$). The VF progression was defined as having ≥ 2 significantly progressing test points (with a slope calculated using pointwise linear regression \cdot PLR], worse than $-1.0\ \text{dB/year}$ at PMAIN OUTCOME MEASURES: The relationship between focal LC defects and the rate and risk of VF progression.

RESULTS: Mean age and VF MD at the time of EDI OCT were 69 ± 12 years and $-11.49\pm 6.87\ \text{dB}$, respectively. Sixty eyes (36%) progressed according to PLR criteria. Progression was more common in eyes with, rather than without, focal LC defects ($38/81$ eyes \cdot 47%] vs. $22/88$ eyes \cdot 25%], $P = 0.003$). Among the evaluated parameters, the presence of focal LC defects, disc hemorrhage, higher mean follow-up IOP, greater number of VFs, and longer follow-up period were significantly associated with VF progression in the multivariable analyses (odds ratios, 2.90, 4.66, 1.22, 1.25, and 1.27, respectively; $P = 0.010$, $P = 0.002$, $P = 0.002$, $P = 0.002$, $P = 0.002$).

CONCLUSIONS: Focal LC defects are strongly associated with glaucomatous VF progression, and eyes with focal LC defects tend to progress faster than those without.

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