



TOPOGRAPHIC CHANGES IN THE OPTIC NERVE HEAD OVER TIME IN CHRONIC EXPERIMENTAL GLAUCOMA EVALUATED BY SCANNING LASER TOMOGRAPHY

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Purpose: To measure the time course of topographic changes in the optic nerve head in glaucomatous monkey by scanning laser ophthalmoscopy (Heidelberg Retina Tomograph: HRT).

Methods: Chronic intraocular pressure (IOP) elevation was induced by laser trabeculoplasty in one eye of eleven cynomolgus monkeys. In 5 from 11 monkeys, optic disc parameters were measured by a HRT 12 weeks after the laser treatment, and in the remainder of 6 monkeys, changes in the optic disc parameters were measured before the first laser treatment and then 1, 3, 4, 5, 6, 8, 10, 12, 14 and 16 weeks after that. At the end of the experiments, each eye was enucleated and retinal cross sections were prepared for histological analysis.

Results: In the laser treatment eyes, IOP was persistently elevated to over 30 mmHg during the experiment period and their elevations were statistically significant as compared with those in the fellow eyes. The HRT parameters except for the disc area changed in time-dependent manner, and were depending on persistent IOP elevation during 16-week period. However, changes of parameters reached almost maximum within first 4 weeks after laser treatment. HRT parameters showed highly significant correlations with the retinal nerve fiber layer thickness ($p < 0.002$) at 1.5 disc diameter from the center of the disc measured based on histological retinal sections.

Conclusions: Topographic changes in the optic nerve head reached almost maximum within 4 weeks after IOP elevation in cynomolgus monkeys. HRT parameters showed highly significant correlations with nerve fiber layer thickness in histological retinal sections.