Evaluation of choroidal thickness changes accompanied by acute intraocular pressure drops in patients with glaucoma surgery using enhanced depth imaging optical coherence tomography

Kazuhiko Mori, Yu Ishida, Haruna Yoshikawa, Kaori Tada, Yuko Maruyama, Hideki Koizumi, Yoko Ikeda, Morio Ueno, Noriko Koizumi, Shigeru Kinoshita

1Department of Ophthalmology, Kyoto Prefectural University of Medicine, Kyoto - Japan, 2Department of Biomedical Engineering, Faculty of Life and Medical Sciences, Doshisha University, Kyoto - Japan

Purpose: To evaluate the choroidal thickness (ChT) changes accompanied by the acute intraocular pressure (IOP) drops after laser suturelysis in patients who received trabeculectomy, using enhanced depth imaging optical coherence tomography (EDI-OCT).

Methods: This study was conducted as an observational case series. A total of 41 eyes from 33 cases (18 females and 15 males; mean age 69.1 ± 10.0 years) who needed laser suturelysis after trabeculectomy during the period of May 2009 to November 2011 at University Hospital in Kyoto Prefectural University of Medicine were enrolled. Laser suturelysis was performed in the early post operative period to increase the filtration through the scleral flap. The IOP measurement with Goldmann applanation tonometer and OCT imaging were performed before and right after the laser suturelysis. OCT images were obtained by positioning a spectral-domain OCT device (3D-OCT Mark II and 3D-OCT FA Plus; Topcon Corporation, Tokyo, Japan) close enough to the eye to obtain an inverted representation of the fundus without pupil dilation. The ChT under the fovea in each image was measured by independent observers, and statistically compared in before and after the laser suturelysis when the IOP drastically drops, using paired t-test.

Results: No cases developed hypotonic complications such as choroidal detachment or hypotonic maculopathy during the observation periods. The mean IOP dropped significantly from 15.7 ± 4.0 mmHg to 8.0 ± 3.9 mmHg after the laser suturelysis, while the mean ChT under the fovea increased significantly from 231.4 ± 54.3 micrometer to 249.3 ± 62.8 micrometer. The correlation between ChT increments and IOP drops was significant (r = -0.4789, p < 0.0001).

Conclusions: Choroidal thickness changes dynamically depending on the intraocular pressure after the glaucoma surgery.

This study is submitted to the 2012 ARVO meeting.