AbstractID: 3377 Title: Clinical implementation of an eye fixing and monitoring system with head mount display

Purpose: A system to non-invasively fix and monitor eye by a head mounted display (HMD) with a CCD camera for stereotactic radiotherapy (SRS) of uveal melanoma has been developed and implemented clinically.
Method and Materials: The eye fixing and monitoring system consists of a HMD showing patient a screen for fixing eyeball, a CCD camera monitoring patient's eyeball, and an immobilization mask. At first, patient's head was immobilized with a mask. Then, patient was instructed to wear HMD, to which CCD camera was attached, on the mask and see the given reference point on its screen. While patient stared at the given point in order to fix eyeball, the camera monitored its motion. Four volunteers and one patient of uveal melanoma for SRS came into this study. For the volunteers, setup errors and the motion of eyeball were analyzed. For the patient, CT scans were performed, with patient's wearing HMD and fixing the eye to the given point. To treat patient under the same condition, daily CT scans were also performed before every treatment and the motion of lens was compared to the planning CT.
Results: Setup errors for four volunteers were within 1 mm and the motion of eyeball was fixed within the clinically acceptable ranges. For the patient with uveal melanoma, the motion of lens was fixed within 2 mm from daily CT scans.
Conclusion: An eye fixing and monitoring system allowed immobilizing patient as well as monitoring eyeball and was successfully implemented in the treatment of uveal melanoma for SRS.

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