AbstractID: 10946 Title: The development of eye treatment gating system for the proton therapy

Purpose: Proton therapy is suggested as a next generation radiation therapy with their great dose localization performance compared with linear accelerator. Although proton therapy is recommended for eye melanoma treatment due to its excellence in dose localization, the patient positioning system (PPS) is essential since small error in PPS may cause significant damage to the patient. In this study, we developed an automatic real time eyeball tracking and gating system for the treatment of eye melanoma

Method and Materials : A gating system was developed using Labview 8.6 software with GUI based development tool (National Instrument). The real time image for eye movement was taken using CCD camera, which was transferred to the homemade image analysis program. Using the eye gating system, a real time eye ball tracking based on image pattern matching method was realized by comparing a treatment template image used in the treatment planning with a real time image acquired from CCD camera. And generating the gating control TTL trigger signal for the proton beam on and beam off .

Results: Based on the real time image analysis system, we achieved the real time eye ball tracking system with a resolution less than 0.01mm for the eye ball movement which will be used for the treatment of ocular tumor in proton therapy, We can controlled the proton beam on and beam off with a time delay less than 0.1 sec for the eye movement to over range for tolerance value.

Conclusion:. We have developed eye movement gating system for eye treatment proton therapy at our facility. The system will be use for eye movement gated treatment for ocular patient.

Key words: Eye gating system, Proton therapy, Ocular, Eye treatment,