

AbstractID: 13328 Title: In Vivo Measurements for Proton Therapy using a Glass Dosimeter

Purpose: The purpose of this study was to measure the dose distributions near the superficial using a glass dosimeter for proton therapy plans with a varying separation between the target volume and the surface of 3 patients. **Method and Materials:** All measurements were performed in clinical proton beam at National Cancer Center in Korea. The proton therapy test cases were planned using the Varian Eclipse proton treatment planning system. *In vivo* surface dosimetry for proton therapy was performed for 3 patients. For all patients, the surface doses were measured for delivers using dosimeters (glass dosimeter, TLD) placed on the patient's surface. A model GD-301 glass dosimeter and FGD-1000 automatic reader were used. In the one case of our patient that GTV was defined from the superficial, the surface dose was 189 cGy, and the case that GTV was defined by the expansion from the surface by 5 mm, it was 138 cGy. **Results:** The results of glass dosimeter were substantially higher than the TLD result. The doses measured by the glass dosimeter indicated that the proton therapy Eclipse treatment planning system overestimates superficial doses by $7.4 \pm 1.9\%$. The TLD dose test case was 168 ± 2.44 cGy, as compared to the calculated dose of 190 ± 4.54 cGy. The calculated and measured doses for the clinical cases where the target volume extends to the surface of the patient indicate that the target will be underdosed without the use of bolus. **Conclusion:** Given the results of the glass dosimeter and TLD-100 measurements, the calculated doses on the surface of the patient are typically overestimated between 4% and 15%. As such, it is recommended that bolus be added for these clinical cases. We also believe that the glass dosimeter has considerable potential to be used for *in vivo* patient proton dosimetry.