AbstractID: 13469 Title: Dosimetric Evaluation of Heterogeneity Correction Algorithm for Proton Therapy

Purpose: The purpose of this study was to evaluate the accuracy of heterogeneity correction algorithm provided with Eclipse treatment planning system for proton therapy using the head and neck phantom. **Method and Materials:** The heterogeneity head and neck phantom for proton therapy quality assurance (QA) was housed in a custom-designed package for efficient evaluation of the measured doses using the different materials and various dosimeters (pinpoint type ionization chamber, TLD-100, glass dosimeter). Before the measurement, we performed a dosimetric test of the glass dosimeter with respect to reproducibility, linearity, fading, angular dependence and dose-distribution (Bragg peak curve, Spread-out Bragg curve) for proton therapy beam. All measurements were performed in clinical proton beam at National Cancer Center in Korea. The accuracy of proton therapy dose calculations with pencil-beam algorithms (Varian Eclipse) were also investigated with respect to measurements used in head and neck phantom in the presence of heterogeneities. **Results:** The differences for pencil-beam dose calculation algorithm and measured dose with glass dosimeter was 7.0% in average target doses. Ionization chamber experiments showed approximately 5.0% better agreement than the glass dosimeter. The results of glass dosimeter were substantially higher than the TLD result. **Conclusion:** Our results show that accurate measurements of the heterogeneity region improve the accuracy of the dose calculation algorithms predicted by the treatment planning system. We also investigate that the glass dosimeter has considerable potential to be used for proton dosimetry.