AbstractID: 2531 Title: In Vivo Dosimetry Using Diodes Detector for External Photon Treatments of Head and Neck Cancers

PURPOSE:

In vivo dosimetry is a tool to ensure the accuracy of delivery of the radiation treatments. By in vivo dosimetry, the incidence of errors could be monitored. Based on experiment results, we want to establish an in vivo dosimetry standard protocol.

MATERIAL AND METHODS:

Measurements of entrance and exit doses were performed with diodes on patients' surface. After obtained entrance and exit doses, we used transmission curve to derive midline dose. Before entrance and exit dose measurements, we need to measure the calibration factor for diode reading to dose and, correction factors for nonstandard SSDs and field sizes. Measurements were made for 6MV photon fields (Varian 2100C/D machine). The detectors were VeriDose 30-472 (5-11MV) diodes. The midline dose was calculated by our hand calculation system without inhomogeneous correction.

RESULTS:

The total field number for patient measurements was 204. Before measuring in vivo doses, we delivered these fields to a plastic water phantom. Comparisons between phantom results and midline doses measured by the ionization chamber show the mean relative discrepancy was 0.184% with 0.5% corresponding SD. The mean relative discrepancy between midline doses measured by diodes and planning target doses from prescription for patient measurements was -1.08% and SD was 3.09%. If we averaged two opposed beams dose, the standard deviation of reletive error will be 2.35%. Further, we corrected our estimated dose by inhomogeneous correction depth which was averaged by two opposed beams measurements, the mean and standerd deviation we obtain was -0.16%(1.39%).

CONCLUSION:

After phantom and patient studies, we conclude that in vivo dosimetry is a practical way to inspect dose accuracy.