Abstract ID: 16176  Title: Dosimetric Effects of Vacuum Bag, Body Positioning System and Accelerator Treatment Couch for Lung Cancer Radiotherapy

Purpose: To study the effect of vacuum bag, body positioning system and accelerator treatment couch on the dosimetry of lung cancer radiotherapy.

Methods: Ten patients with central lung cancer treated with radiotherapy were enrolled in this study, using Varian Eclipse treatment planning system delineated three different regions of dose calculation on CT images of each patient. Only the contours of patients’ surface were delineated on the first group CT images; contours of vacuum bag and body positioning system were added on the second group CT images; then contours of accelerator treatment couch were added on the third group CT images. Same plans were designed on each patient’s three group CT images respectively, and named plan1, plan2, plan3. The dose of target and organs at risk and the number of MUs were analyzed.

Results: The maximum, minimum, mean dose to target and the target volume receiving prescription dose have no statistically significant differences among three group plans. No statistically significant differences were observed in the maximum dose of spinal cord between plan1 and the other plans. Compared with plan2, the maximum dose of spinal cord increased 3% in plan3 (p=0.008). No statistically significant differences were observed in the mean dose of heart and ipsilateral lung among three plans. For the volume receiving more than 20 Gy (V20) of ipsilateral lung, plan3 and plan1 showed the highest and lowest values respectively, significant differences were observed between any two plans. Compare to plan1, the plan2 and plan3 statistically significantly increased the maximum, minimum and mean dose of subcutaneous 5mm and 10mm regions of the patients’ back, and the plan3 performed more obviously. Compared to plan1, the MUs of plan2 and plan3 increased 2% and 5% respectively (p<0.005).

Conclusions: Vacuum bag, body positioning system and accelerator treatment couch would affect the dose of radiotherapy plans, we should consider these factors when designing plans, and correct the dose if necessary.