

AbstractID: 7367 Title: Improvement of Localization Accuracy by Using 3D Cone Beam CT for Stereotactic Body Radiation Therapy of Liver, Lung and Spine Lesions

Purpose: To compare treatment isocenter placement based on OBI 2D kV imaging and OBI 3D-CBCT imaging for patients undergoing SBRT, and compare the CBCT based isocenter shifts among liver, lung and spine lesions.

Material and Methods: 119 SBRT fractions were delivered to 40 lesions of 32 patients. The patients were initially localized with 2D orthogonal on-board kV images. 3D on-board CBCT images were then acquired to localize the isocenter for treatment. The shifts from 2D to 3D localization were recorded. Histograms, mean values and standard deviation of the isocenter shifts were calculated.

Results: The isocenter shifts based on the 3D CBCT for all 119 SBRT fractions were 0.27 ± 0.25 cm, 0.19 ± 0.23 cm, and 0.23 ± 0.27 cm in the A-P, C-C, and M-L direction, respectively. The mean values and standard deviations of the magnitudes of the shifts along AP, CC and ML directions were 0.30 ± 0.26 cm, 0.21 ± 0.20 cm, and 0.31 ± 0.35 cm for liver patients, 0.31 ± 0.29 cm, 0.30 ± 0.31 cm, and 0.28 ± 0.33 cm for lung patients, and 0.22 ± 0.21 cm, 0.13 ± 0.16 cm, and 0.18 ± 0.18 cm for spine patients.

Conclusion: CBCT guidance enhances the setup accuracy of SBRT treatment by using 3D anatomical information. Partly supported by Varian Research Grant.