

The dose escalation in external beam radiotherapy of lung malignancies was evaluated. Stereotactic body frame with vacuum pillow has been used as the method for fixation of the patients. There are indicators mounted on the body frame which are visible on CT images. The indicators provide an external noninvasive reference system for target localization. The diaphragmatic movements are limited to 1 cm by using a diaphragm control which applies pressure on the abdomen below the ribs.

CT studies of the patient fixed within the frame were obtained for treatment planning. Seven to nine individually shaped stationary beams were used to obtain conformity of the dose distribution with the irregular target volume. Dose planning was made according to the principle used in stereotactic radiosurgery of intracranial targets. Treatment dose is prescribed to the periphery of the planning target volume(PTV). The central portion of the tumor usually received 50% higher dose compared to the periphery of the PTV by a planned inhomogeneous dose distribution.

CT examination of the patient was made right before the initial treatment in order to verify the reproducibility of the target in the stereotactic system as well as monitor any tumor movement. The reproducibility of the target using the body frame was found to be within 5mm by repeating CT studies throughout the treatment course.

In the initial studies patients were given 4000 cGy in 10 fractions. Clinical results, evaluation of the body frame and possible further dose escalation will be discussed.