AbstractID: 10492 Title: Interfractional reproducibility of lung tumor position using breath hold

Interfractional reproducibility of lung tumor position using breath hold

Abstract

Purpose:

The purpose of the present work is to quantify the reproducibility of the position of a lung tumor under breath-hold conditions.

Methods and Materials:

Weekly computed tomography (CT) data sets under voluntary breath hold at normal end inspiration and end expiration were acquired for 18 patients with diagnosed non-small cell lung cancer. Gross tumor volumes (GTV) were outlined by a radiation oncologist. The distances between the centers of the GTV and a bony reference landmark were evaluated on a weekly basis, and the standard deviations (SD) of the distances were taken as a metric for assessing tumor position reproducibility.

Results:

The mean SDs for end inspiration were as follows: lat – 0.27±0.12 cm; AP 0.34±0.21 cm; SI 0.42±0.22 cm; distance 0.32±0.18 cm, whereas for end expiration the mean SDs were as follows: lat 0.23±0.10 cm; AP 0.31±-.19 cm; SI 0.38±0.15 cm; distance 0.25±0.11 cm.

Conclusions:

Voluntary breath hold appears to be a reliable method of ensuring reproducibility of lung tumor position. Setup margins used in our present practice of 0.5 cm for kV image-guided patient setups and 0.3 cm for cone-beam CT-guided patient setups appear to be appropriate. Reproducibility under end expiration appears to be slightly better than that under end inspiration but the difference may not be significant.

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