



# Clinical three-dimensional conformal radiotherapy research using repeated computed tomography scans for field reduction in older non-small-cell lung cancer patients

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**ABSTRACT.** This study investigated the curative and toxic effects of three-dimensional conformal radiotherapy (3D-CRT), using repeated CT scans for field reduction in older non-small-cell lung cancer (NSCLC) patients. 3D-CRT was administered to 36 older patients with NSCLC, and irradiation fields included the primary lesion and metastatic lymph nodes. After CT localization scanning, images were fed into a treatment planning system to delineate the gross tumor volume (GTV)1 and prepare Plan 1. After the DT50 (dose of the tumor is 50 Gy) increased from 50 Gy in 25 fractions to 54 Gy in 27 fractions, secondary CT localization scanning was performed to delineate GTV2 and prepare Plan 2; radiotherapy was administered continuously. When the DT

increased to 60-65 Gy, tertiary CT scanning was performed to prepare another plan. The field was reduced to boost irradiation to the residual target volume until the total DT increased to 68-74 Gy. Compared with GTV1, the median absolute volume regression and median relative regression amounts for GTV2 were 68.85 cm<sup>3</sup> and 31.17%, respectively ( $Z = -2.673$ ,  $P = 0.021$ ). There were 8 cases of complete remission (22.2%), 20 of partial remission (55.6%), 7 of stable disease (19.4%), and 1 of progressive disease (2.8%). The total effectiveness rate was 77.8% and the 1- and 2-year survival rates were 63.9 and 27.8%, respectively. Radiation esophagitis and radiation pneumonia, the main toxic side effects, were tolerable. 3D-CRT, using repeated CT scans for field reduction in older NSCLC patients, could increase the local control and survival rates and relieve the toxic radiotherapy side effects.

**Key words:** Non-small-cell lung cancer; Repeated CT scans; Three-dimensional conformal radiotherapy; Field reduction increment; Older patient; Treatment result