Effect of regression of enlarged neck lymph nodes on radiation doses received by parotid glands during intensity-modulated radiotherapy for head and neck cancer

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摘要

Abstract

Objectives: The regression of enlarged neck lymph nodes during intensity-modulated radiotherapy (IMRT) may increase actual radiation doses to the parotid glands of patients with head-and-neck cancer. We investigated the changes in the lymph nodes volume during IMRT and the effect of these changes to the parotid gland doses. Methods: Ten head and neck cancer patients with enlarged neck lymph nodes were enrolled in this study. Computed tomography (CT) imaging was repeated to evaluate the change in lymph nodes volume after initial 45 Gy, and the second part of IMRT (21 Gy) was then replanned to reflect the change of nodal tumor volume. The dosimetric benefit of parotid sparing with replanning was compared with that of no replanning. Results: The enlarged neck lymph nodes in all patients pushed the parotid glands outward in pretreatment CT images. After 45 Gy of IMRT, nodal regression caused the parotid glands to shift inward into the high-dose area. When compared with those without replanning, we found modification of IMRT plan after 45 Gy significantly reduced radiation dose to parotid glands (mean reduction of 2.95 ±1.10 Gy to the left and 3.23 ± 1.37 Gy to the right, respectively; $P < 0.001$). Conclusions: Excessive parotid gland doses secondary to the regression of enlarged neck nodes could be mitigated by replanning after 45 Gy. However, recontouring of large lymph nodes that regress during therapy has a risk of under-dosing extracapsular extension of lymph node metastases. Therefore, recontouring should be done with extreme caution