

THORACIC RADIOTHERAPY FOR MEDIASTINAL NODAL RECURRENCE

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Summary: Radiotherapy has been used to treat loco-regional recurrences located at various intra-thoracic sites, but long-term survival of these patients has been rarely observed. We report herein a lung adenocarcinoma patient with loco-regional recurrence, who was successfully treated with high-dose radiotherapy. The patient could survive with no evidence of recurrence 5 years after thoracic irradiation. It is probably safe to administrate high-dose radiotherapy for some loco-regional recurrent patients with favorable prognostic factors such as good PS, no body weight loss. Further studies will be required to define a favorable subset of patients most likely to benefit from an aggressive approach.

Key words: *Non-small cell lung cancer; Loco-regional recurrence; Radiotherapy*

Introduction

Although surgery is the standard treatment for non-small cell lung cancer (NSCLC), unfortunately loco-regional recurrence of NSCLC occurs in 13 % to 50 % of patients (3, 4, 6, 7, 8, 10, 14). Loco-regionally recurrent NSCLC has been treated with radiotherapy, with reported median overall survival of nearly one year (3, 4, 6, 7, 8, 10, 14). We herein describe a successful treatment for NSCLC with postsurgical mediastinal lymph node recurrence by thoracic irradiation.

Case report

A 71-year-old man complicated of cough for over two months. Chest radiograph and CT scan revealed a tumor in the lower lobe of the left lung. Hilar and mediastinal lymph node adenopathy was not observed. He was referred to our hospital for further examination and treatment. Physical examination was unremarkable and his performance status (PS) was evaluated as one. Laboratory data including tumor markers were normal. As the tumor had heterogeneous density with irregular-shaped margin on CT scan, lung adenocarcinoma was suspected. But a definitive diagnosis could not be made by transbronchial biopsy. Although his minimal impairment of his lung function, video-assisted thoracic surgery was selected intra-operative diagnosis was adenocarcinoma. Subsequent left lower lobectomy with nodal dissection was performed based on the intra-operative histologic diagnosis. The final pathological diagnosis was adenocarcinoma, measuring 13 x 12 x 8 mm, and metastatic ipsilateral hilar node was histologically identified.

Pathological tumor stage was proved to be T1N1M0. The patient had an uneventful postoperative course and was discharged. He was followed up at our outpatient department without any additional adjuvant therapy. Although he had no signs and symptoms, follow up chest CT scan, which was performed without contrast enhancement of his allergic reaction at the first time of chest CT scan, revealed left pre-tracheal lymph node recurrence developed six months after the surgery (Fig. 1). The patient had no body weight loss and his PS was zero at this time. Brain MRI, bone scan and CT of the abdomen showed no other distant metastasis. The patient was recommended additional therapy such as surgery, chemotherapy, or chemo-radiotherapy, but he wanted to receive radiotherapy. Clinical target volume (CTV) was included both supraclavicular fossa, both hilum region and subcarinal region to 5 cm below carina. Planning target volume (PTV) added 1 cm to CTV all around directions. PTV was irradiated using anteroposterior and posterioranterior port dose of 46 Gy. After then PTV was shrieked to pre-tracheal node area using oblique port. The total dose of radiotherapy was delivered 70 Gy using 10 MV photon. Disappearance of the recurrent mediastinal node was confirmed on subsequent CT scan, and the patient was followed up again at our outpatient department. He is still alive and well with no evidence of recurrence 5 years after thoracic irradiation (Fig. 2).

Discussion

Surgical resection is the treatment of choice for early stages of NSCLC, including sometimes patients with selected stage IIIA disease. Analysis of the patterns of failure

shows that loco-regional recurrence of NSCLC after surgical resection occurs in 13% to 50% of patients (3, 4, 6, 7, 8, 10, 14). Loco-regional recurrences usually divide into chest wall/pleural, parenchymal, bronchial stump, and mediastinal lymph node recurrences. Several previous authors evaluated favorable prognostic factors in loco-regional recurrent NSCLC patients after curative surgery (4, 7, 14). Emami et al reported that the best indicators for long-term survival were the interval from initial surgery to first recurrence and tumor response to radiation therapy (4). Jeremic et al evaluated favorable prognostic factors in NSCLC patients with loco-regional recurrence after curative surgical resection (7). In their univariate analysis, there was a significant difference in survival between high-dose and low-dose radiotherapy groups. They showed that age, extent of initial surgery, time from initial surgery to documented recurrence were not found to influence survival in the high-dose radiotherapy group, but good PS, female gender, and no body weight loss were also favorable prognostic factors in patients treated with high-dose radiotherapy (7). In their patients, initial staging significantly influenced survival and patients with initial stage I did significantly survive longer than those with either initial stage II or initial stage IIIA. In addition, recurrent staging also influenced survival and in a similar manner as initial staging did (7). On the contrary, Shaw et al found no influence of either initial or recurrent staging on treatment outcome (14). In our patient, initial staging was stage IIA and recurrent stage was evaluated as stage IIIA, but the recurrence was observed only in ipsilateral pre-tracheal lymph node. He had good PS and no signs and symptoms, and no body weight loss at the time of initial diagnosis as well as recurrence. Early detection of single station mediastinal lymph node metastasis might have certain clinical significance.

Recently, Kelsey et al described patterns of failure after resection of NSCLC and implications for postoperative radiation therapy volumes (9). Even if postoperative thoracic radiotherapy has been widely used as adjuvant treatment, the clinical benefit in this treatment after surgical resection in NSCLC has poorly evaluated (1). Moreover, few studies have reported technical aspects of irradiation for loco-regional recurrence of postoperative NSCLC. As above mentioned, clinical benefit of high-dose irradiation, 60Gy (8) or more (11), has been evaluated. Some authors have indicated that the omission of elective nodal treatment has no relationship with significant amount of failure in lymph node regions (2, 5, 11, 12, 13, 15). Tada et al reported that the prescribed dose was 60 Gy in 30 fractions over 6 weeks (16). The radiation field contained the ipsilateral hilar lymph nodes and the mediastinal lymph nodes, respectively, and the radiation field contained the recurrent tumor and margins of more than 20 mm (16). Kagami described that radiotherapy for loco-regional recurrences of NSCLC after complete surgery was an effective treatment modality in terms of improved survival and palliation (8). A randomized study from Italy demonstrated that carefully delivered

postoperative radiation therapy by use of three-dimensional treatment planning improved local control and overall survival (17). In this study, the average field size was 6.5 X 7 cm. In our patient, CTV was included both supraclavicular fossa, both hilum region and subcarinal region to 5 cm below carina. PTV added 1 cm to CTV all around directions. Although our patient recurred 6 months after the surgical resection, the patient had above-mentioned several favorable factors as previously indicated (4, 7, 14). Therefore, the patient could survive with no evidence of recurrence 5 years after thoracic irradiation.

In summary we showed the effectiveness of curative, high-dose radiotherapy in the treatment of loco-regional recurrent NSCLC after curative resection. It is probably safe to administrate high-dose radiotherapy for some loco-regional recurrent patients with favorable prognostic factors such as good PS, no body weight loss. It warrants further studies that may help define a favorable subset of patients most likely to benefit from an aggressive approach.



Fig. 1: Follow up chest CT scan revealed left pre-tracheal lymph node recurrence due to tumor cell implantation developed 6 months after the surgery.



Fig. 2: A chest CT scan 5 years after the thoracic irradiation, which shows no evidence of local recurrence.

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