

Long-Term Survival With Salvage Surgery in Persistent Lung Cancer

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ABSTRACT

Objective: Our study presents a case with locally-advanced non-small cell lung cancer (NSCLC) having salvage pneumonectomy due to persistent disease.

Case Description: A 46-year old man with stage IIIB (cT4N3M0) NSCLC received 39Gy (13x3Gy) thoracic radiotherapy after neoadjuvant chemotherapy. Partial response was obtained after radiotherapy. Chemotherapy was continued after radiotherapy. At 28th month of follow-up without treatment, isolated local progression was detected. The patient underwent right pneumonectomy and mediastinal lymph node dissection revealing ypT2aN0 adenocarcinoma. After adjuvant chemotherapy, he's disease-free at 88 months after salvage surgery.

Conclusion: In selected patients, salvage surgery seems to provide increased survival causing acceptable morbidity and mortality.

Key words: Lung cancer, radiotherapy, salvage surgery

INTRODUCTION

Local recurrence (LR) after radical chemoradiotherapy (CRT) in locally-advanced non-small cell lung cancer (NSCLC) occurs in about one-third of patients and is the most important cause of death (1). Treatment options for these patients are controversial. Re-irradiation, systemic therapy, and salvage surgery (SS) are among treatment options. SS may be considered in selected patients (2). Our study presents a case with locally-advanced NSCLC having salvage pneumonectomy due to persistent disease following radiotherapy (RT) and chemotherapy (C). The informed consent was obtained from the patient.

CASE DESCRIPTION

In November 2007, a 46-year-old man was admitted to the hospital with a history of cough and sputum. A mass (5x4.5 cm) in the right upper lobe causing atelectasis and multiple mediastinal lymph nodes (LN) were detected. Bronchoscopic biopsy showed poorly-differentiated NSCLC. The case was evaluated as having stage IIIB (cT4N3M0) disease. It was decided to start treatment with neoadjuvant C because of the large field size for RT due to N3 disease and the limited respiratory reserve.

Thoracic CT performed after 4 cycles of neoadjuvant cisplatin+gemcitabine, showed <50% response in the primary tumor and mediastinum. Then, a total dose of 39 Gy (3Gy/fraction/day) RT was delivered in April 2008. Thoracic CT following RT showed primary tumor regression and stable mediastinal disease. C was continued with single agent gemcitabine. In March 2009, a total of 9 cycles of gemcitabine was completed with minimal regression in primary tumor. After two years of follow-up, chest CT demonstrated primary tumor progression. PET-CT showed dimensional and metabolic progression of the primary tumor (SUVmax: 17.8) and newly developed right lower paratracheal (SUVmax: 5.2) and interlobar (SUVmax: 3.3) metastatic LNs. The patient was evaluated as having progressive disease (cT2N2M0). However, metastasis wasn't observed in the right paratracheal LN in mediastinoscopic biopsy. Pulmonary function tests revealed that FEV1 was 2.2 lt (59%), FVC was 3.84 lt (84%), FEV1/FVC was 57%, and DLCO was 37.7 mL/mmHg/min.

At 28th month of follow-up without treatment, isolated local progression (LP) was detected. SS was decided at the multidisciplinary meeting. The patient underwent right pneumonectomy (RP) and mediastinal LN dissection (MLND)

(totally 10 LNs from 4th, 7th, 8th, 9th mediastinal stations and hilar station) in July 2011. Pathology report revealed 3.5x3.5x3 cm acinar pattern predominant adenocarcinoma (ypT2aN0) containing lymphovascular invasion with clear surgical margins.

Four cycles of adjuvant docetaxel were administered after SS. Follow-up examination and tests are being regularly performed and he's disease-free at 88 months after SS.

DISCUSSION

Salvage surgery is a feasible treatment in locally-advanced NSCLC with previous CRT and is typically accepted as surgery performed 2–3 months after treatment (3–5). There are few published data about surgery after radical CRT. In these studies, low survival, high morbidity and mortality rates are usually reported (3–4). Salvage surgery has been generally investigated in retrospective series. Thus, at present, the effectiveness of SS hasn't been defined very well (3–6).

It's suggested that especially young patients with good performance and cardiorespiratory function should be evaluated for SS in the presence of isolated LR or residual disease after radical RT/CRT (6). Similarly, surgery was decided as salvage treatment in our case with isolated LP due to his relatively young age, high performance score, and suitable pulmonary function tests.

The progression was first detected in CT in our patient. In addition, the existence of viable tumor cells was supported with PET-CT, thus biopsy wasn't considered necessary. The rates of pneumonectomy in studies including more than 20 patients are 42–59% (3–5). Because of the location of recurrent disease in our case, RP was applied. Baumann et al. reported 24 patients who underwent SS because of LR after radical RT/CRT. Twenty-five lung resections were performed. Three-year OS was 47%. The patients whose residual or recurrent disease was detected using PET-CT showed a trend for significant increase in PFS and OS compared to the patients with CT. Also, high morbidity (58%) and mortality rates (4%) were reported (3). Casiraghi et al.'s study included 35 patients evaluated for SS after definitive CRT. Twenty-nine patients were eligible for surgery. Major complication and mortality rates were 25.7% and 6%, respectively. Two-year DFS and OS were 25% and 38%, respectively. Prolonged survival was found in patients with complete resection (5). Yang et al. investigated the results of 31 patients who had lobectomy after definitive RT/CRT (4). The complication rate was 48%. Two-year OS and RFS rates were 53% and 30%, respectively. Only residual disease was found as a significant negative prognostic factor (4).

In most of the series, the median period between RT/CRT and SS is <10 months, however, it's occasionally very late as 39 months (3–5). In our case, this period is also 39 months. Tissue hypovascularisation develops in the region of radiation fibrosis a few months after RT. Thus, intraoperative vascular injury could make SS even more dangerous. However, any severe morbidity due to SS wasn't observed in our case. This issue can probably be explained by relatively less amount of mediastinal fibrosis due to the absence of

concurrent CRT at the beginning, and the relatively low EQD2_(3Gy) of RT. The median OS after SS is 13–32.5 months in various series (3–5). Our case is disease-free at 83 months after SS without severe morbidity. In NSCLC, the biological behavior of isolated LR/progression is less malignant compared to distant recurrence. For this reason, effective local treatment performed in isolated LR/progression has the potential to obtain long-term disease control and increased OS. In our patient eligible for RP+MLND, SS enabled us to obtain effective local control and cure.

CONCLUSION

Salvage surgery is a valuable treatment option for isolated LR/progression in NSCLC patients who weren't eligible for surgery at diagnosis. In selected patients, SS provides increased survival with acceptable morbidity and low mortality.

Informed Consent: Written informed consent was obtained from patient who participated in this study.

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