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CASE REPORT

Metachronous Lung Cancer in the Opposite Lung in a Patient with Long-survival Small Cell Lung Carcinoma

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ABSTRACT

Aim: Small Cell Lung Cancer (SCLC) is an aggressive disease that accounts for 14% of all lung cancers. It is known that the risk of developing a second primary tumor is high in cured SCLC. Here, we aimed to present metachronous cancer that developed in the contralateral lung at the 11th year in our case of small cell lung cancer, which was fully cured. A 52-year-old female patient at the time of diagnosis received chemoradiotherapy with a diagnosis of limited-stage small cell lung cancer in the left lung 14 years ago. At the 11th year of follow-up, segmentectomy was performed because of the detection of Stage1 lung adenocarcinoma in the contralateral lung. She is in the 3rd year postoperatively without any problem. Patients with long survival should be carefully evaluated for metachronous lung cancer in their controls. It should not be forgotten that curative treatment of second primary tumors that can be detected in the early period will positively affect the survival of the patients.

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Introduction

Small Cell Lung Cancer (SCLC) is an aggressive disease that accounts for about 14% of all lung cancers. About 31000 new cases are diagnosed annually in the United States (1). The five-year survival rate is less than 7%, and most patients survive 1 year or less after diagnosis. In comparison with non-small Cell lung cancers (NSCLC), the time of rapid doubling of the NSCLC is characterized by early and widespread metastases (2). SCLC is divided into two groups as limited and widespread stage by Veterans Administration Lung Study Group (VALSG), and 65% of them are advanced stage (AS-SCLC) and 35%arelimited stage (LS-SCLC) diseases at the time of diagnosis (3-5).

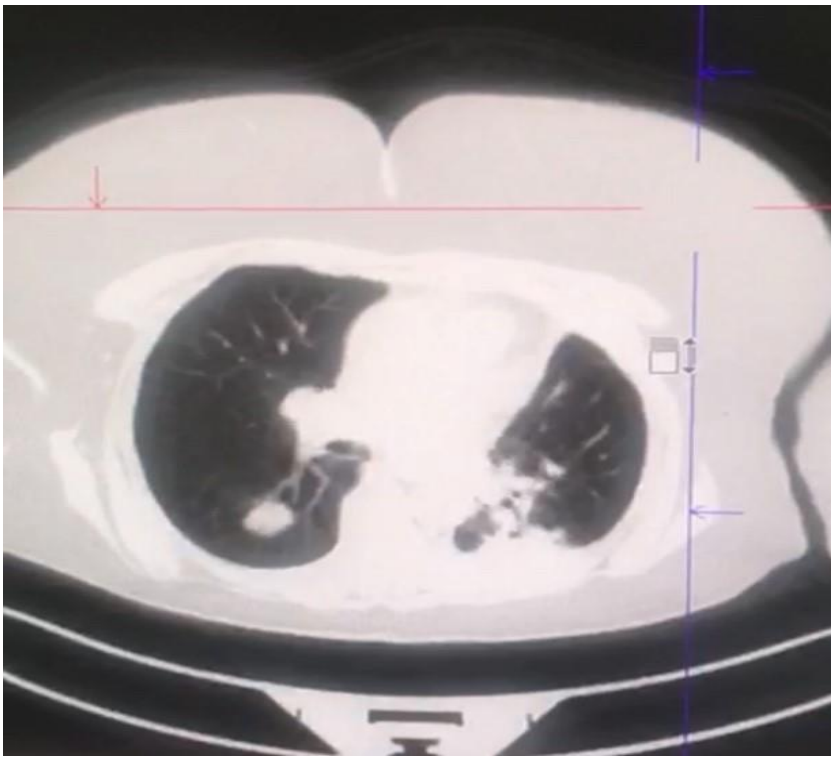
Patients with a limited stage (cancer limited to the thorax in a single radiation field) are treated with simultaneous chemoradiotherapy, while patients with advanced stage chemotherapy are the first-line treatment. Clinical studies have shown the importance of conducting simultaneous chemoradiotherapy in a limited-stage disease that radiotherapy should be performed at an early stage, preferably with the first cycle chemotherapy (6-8).

It is known that the risk of developing a second primary tumor is high in SCLC that has been cured. It has been reported that this risk increases by upto30% in two-year survival after treatment (9). Here, we aimed to present metachronous cancer that developed in the contralateral lung at the 11th year in our case of small cell lung cancer, which was fully cured.

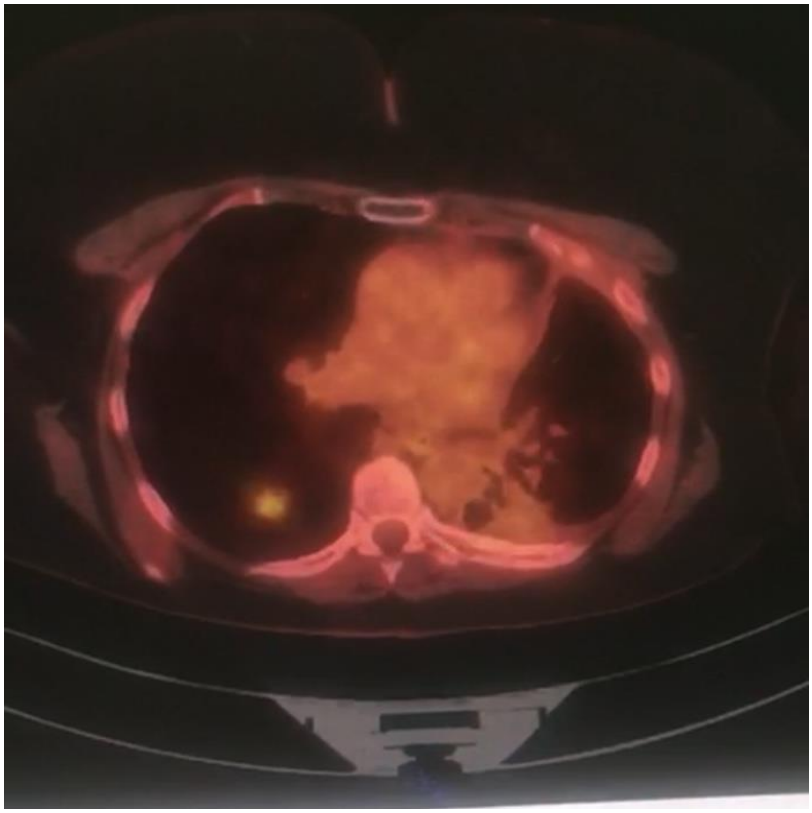
Case Presentation

Our female patient, who was 52 years old, Eastern Cooperative Oncology Group (ECOG) performance status 1 at the time of diagnosis, was referred for the detection of mass appearance on the lung radiograph taken at the center where she was admitted due to a cough complaint that had been going on for 1month. She had a history of smoking 25 packs/year on her resume. A chest tomography taken in September 2007 revealed a mass located in the upper lobe of the left lung, and as a result of a biopsy, she was diagnosed with small cell lung cancer. Cranial MRI, abdominopelvic CT and bone scintigraphy performed for staging purposes did not detect metastases and chemotherapy (cisplatin-etoposide) was started in the patient who was diagnosed as a limited stage. With the second cycle, thoracic radiotherapy (RT) was started. A total of 6 courses of chemotherapy and simultaneous radiotherapy (54Gy) were performed. The patient's radiotherapy was completed in February 2008.

Prophylactic cranial irradiation (PCI) (200cGyx15fx) was applied to the patient who received acomplete response in the control examinations after chemoradiotherapy. The patient who was followedup after treatment was checked every 3 months for the first 2 years, then every 6 months and once ayear after 5 years. PET-CT was performed due to the detection of a nodular mass lesion with a lobular contour of 21x17 mm in the superior segment of the lower lobe of the right lung on Thorax CT taken in January 2019 (Picture1). A malignant-looking hypermetabolic (SUV max: 5.6) lesion with a diameter of 22x18 mm was detected in the superior segment of the lower lobe of the right lung (Picture2). Segmentectomy was performed in April 2019. Adjuvant therapy was not applied to the patient who was reported as adenocarcinoma as a result of pathology. Recurrence and metastasis were not detected in the last follow-up examinations of the patient in 2022.



Picture1. Nodular mass lesion with a lobular contour of 21x17 mm in the superior segment of the lower lobe of the right lung (CT image)



Picture2. Nodular mass lesion with a lobular contour of 22x18 mm in the superior segment of the lower lobe of the right lung (PET- CT image)

Discussion

In studies conducted to determine the prognosis in patients with small cell lung cancer, it has beensuggested that stage, performance status, age, gender, weight loss, ALP and LDH levels affect the prognosis. Advanced age, male gender, poor performance score (ECOG 3,4), high LDH and ALPlevels were evaluated as poor prognostic factors in limited stage patients (10). None of the poorprognostic factors listed here were present in our patient. Our female patient with ECOG 1 underwent simultaneous chemoradiotherapy and PCI. It has been shown in many studies that simultaneous treatment and early initiation of radiotherapy have better local control rates (11, 12).

According to Yildirim et al. in the study in which 52 patients with limited stage of SCLC were evaluated, it was found that simultaneous administration of chemoradiotherapy, initiation of radiotherapy within the first 3 months after diagnosis, and performing PCI improved the prognosis (13). In a meta-analysis published in 2007, it was shown that there is a two- and five-year survival advantage with the initiation of radiotherapy within the first 30 days after the onset of CT (14).

In another study, the importance of the time duration between the first day of chemotherapy and the last day of radiotherapy was evaluated and the concept of SER (Start of any treatment until and of radiotherapy) was introduced. Five-year overall survival was found to be statistically higher in patients with less than 30 days of this period. It has been stated that accelerated proliferation of tumor clonogenic cells during treatments is one of the causes of failure, especially in tumors with rapid proliferation, it will be more effective to complete radiotherapy within two to three cure chemotherapy sessions (15).

Another important issue in small-cell lung cancer is the development of brain metastases. In the firsttwo years, about 50% of patients develop brain metastases. Frequent observation of brain metastases in this group and the inability of chemotherapy to prevent brain metastases due to the blood-brain barrier have raised PCI. It was found that the incidence of brain metastases decreased significantly in patients undergoing PCI and provided a 5.4% survival advantage (16). In our case, PCI was performed simultaneously after chemoradiotherapy and cranial metastasis did not develop during follow-up, which positively affected the prognosis.

The risk of developing another primary NSCLC is 7-16 times higher in patients with a diagnosis of NSCLC, whose survival is more than two years, compared with people without cancer (17). One ofthe important reasons that increases the risk is smoking, and it has been proven that most patients whodevelop a second primary lung tumor at follow-up do not quit smoking after the first tumor treatment (18). It should be ensured that patients are evaluated from this point of view at outpatient clinic check-ups and receive the necessary assistance. It is known that genetic factors and treatment applied to the primary tumor (such as CT-RT) also increase the risk of secondary primary cancer (19).

Metachronous lung cancers have a worse prognosis than primary lung cancer. Survival depends on thestage of the tumor and the curative nature of the surgery performed. At the same time, the fact that thedisease-free period is long in metachronous tumors and the tumor cell type is different is also an indicator of a good prognosis. In our patient, after a long disease-free process, another primary tumor of a different histological type developed (20).

As a result, as with all cancers, regular follow-up of patients should be performed after lung cancer

treatment, and metachronous should be carefully evaluated for lungcancer at outpatient check-ups. Itshould be noted that curative treatment of second primary tumors that can be detected at an early stage will positively affect the survival of patients.

References

1 American Cancer Society. Cancer Facts & Figures 2014. Atlanta, GA: American Cancer Society; 2014.

2. Aberle DR, DeMello S, Berg CD, et al. Results of the 2 incidence screenings in the National Lung Screening Trial. N Engl J Med. 2013; 369: 920- 931.

3.Siegel Rebecca, L.,& Miller Kimberly, D. (2019). Jemal Ahmedin. Cancer statistics, 2019. CA: a cancer Journal for clinicians, 69(1), 7-34.

4.Gazdar, A. F.,Bunn, P. A., &Minna, J. D. (2017). Small-cell lung cancer: what we know, what we need to know and the path forward. Nature Reviews Cancer, 17(12), 725-737.

5. Rudin, C. M., & Poirier, J. T. (2017). Shining light on novel targets and therapies. Nature reviews Clinical oncology, 14(2), 75-76.

6.Spiro, S. G., James, L. E., Rudd, R. M., Trask, C. W., Tobias, J. S., Snee, M., &Hackshaw, A. K. (2006). Early compared with late radiotherapy in combined modality treatment for limited disease small-cell lung cancer: a London Lung Cancer Group multicenter randomized clinical trial and meta-analysis. Journal of clinicaloncology, 24(24), 3823-3830.

7. De Ruysscher, D., Pijls-Johannesma, M., Bentzen, S. M., Minken, A., Wanders, R., Lutgens, L., ... & Lambin, P. (2006). Time between the first day of chemotherapy and the last day of chest radiation is the most important predictor of survival in limited-disease small-cell lung cancer. J Clin Oncol, 24(7), 1057-1063.

8. Fried, D. B., Morris, D. E., Poole, C., Rosenman, J. G., Halle, J. S., Detterbeck, F. C., ... & Socinski, M. A. (2004). Systematic review evaluating the timing of thoracic radiation therapy in combined modality therapy for limited-stage small-cell lung cancer. Database of Abstracts of Reviews of Effects (DARE): Quality-assessed Reviews [Internet].

9. Heyne, K. H., Lippman, S. M., Lee, J. J., Lee, J. S., & Hong, W. K. (1992). The incidence of second primary tumors in long-term survivors of small-cell lung cancer. Journal of clinicaloncology, 10(10), 1519-1524.

10. Foster NR, Mandrekar SJ, Schild SE, et al. Prognostic factors differ by tumor stage for small cell lung cancer: a pooled analysis of North Central Cancer treatment group trials. Cancer 2009; 115:2721-2731.

11. Takada M, Fukuoka M, Kawahara M, Sugiura T, Yokoyama A, Yokota S, et al. Phase III study of concurrent versus sequential thoracic radiotherapy in combination with cisplatin and etoposide for limited-stage small cell lung cancer: results of the Japan

Clinical Oncology Group Study 9104. J Clin Oncol 2002;20(14):3054–60.

12. Murray N, Coy P, Pater JL, Hodson I, Arnold A, Zee BC, et al. Importance of timing for thoracic irradiation in the combined modality treatment of limited stage small-cell lung cancer. The National Cancer Institute of Canada Clinical Trials Group. J Clin Oncol 1993;11(2):336–44.

13. Yildirim, H. C., Ergen, Ş. A., Tiken, E. E., Zalova, G., Turna, H., Öksüz, D. Ç., & Dĩnçbaş, F. Ö. (2015). Limited stage small cell lung cancer: Treatment results and prognostic factors. Turkish Journal of Oncology, 30(4).

14. De Ruysscher, D., Pijls-Johannesma, M., Vansteenkiste, J., Kester, A., Rutten, I., & Lambin, P. (2006). Systematic review and meta-analysis of randomised, controlled trials of the timing of chest radiotherapy in patients with limited-stage, small-cell lung cancer. Annals of oncology, 17(4), 543-552.

15. De Ruysscher, D., Pijls-Johannesma, M., Bentzen, S. M., Minken, A., Wanders, R., Lutgens, L., & Lambin, P. (2006). Time between the first day of chemotherapy and the last day of chest radiation is the most important predictor of survival in limited-disease small-cell lung cancer. J Clin Oncol, 24(7), 1057-1063.

16. Arriagada, R., Le Chevalier, T., Riviere, A., Chomy, P., Monnet, I., Bardet, E., ... & Laplanche, A. (2002). Patterns of failure after prophylactic cranial irradiation in small-cell lung cancer: analysis of 505 randomized patients. Annals of oncology, 13(5), 748-754.

17. Smythe WR, Estrera AL, Swisher SG, Merriman KW, Walsh GL, Putnam JB Jr, et al. Surgical resection of non-small cell carcinoma after treatment for small cell carcinoma. Ann Thorac Surg 2001;71(3):962-6

18. Richardson, G. E., Tucker, M. A., Venzon, D. J., Linnoila, R. I., Phelps, R., Phares, J. C., ... & Johnson, B. E. (1993). Smoking cessation after successful treatment of small-cell lung cancer is associated with fewer smoking-related second primary cancers. Annals of Internal Medicine, 119(5), 383-390.

19. Kelley, M. J., Nakagawa, K., Conrad, N. K., LeRiche, J., Murray, N., Lee, J. S., ... & Johnson, B. E. (1996). Genetic analysis of second primary lung cancers in patients surviving small cell lung cancer. Clinical cancer research, 2(7), 1103-1105.

20. Battafarano, R. J., Force, S. D., Meyers, B. F., Bell, J., Guthrie, T. J., Cooper, J. D., &Patterson, G. A. (2004). Benefits of resection for metachronous lung cancer. The Journal of Thoracic and Cardiovascular Surgery, 127(3), 836-842.