To the Editor:

For patients with non-small cell lung cancer (NSCLC) classified as stage I using the tumor-node-metastasis (TNM) staging system (T1N0M0 or T2N0M0), the standard treatment is complete resection of the affected lobes and associated lymph nodes. However, lung cancer is usually inoperable in elderly patients, mostly because of their poor performance status. In general, resection of these early-stage tumors, typically by lobectomy, has been associated with three-year and five-year survival rates ranging from 60% to 80%.\(^1,2\)

Unfortunately, significant complications have been associated with lobectomy in elderly patients or in those with medical comorbidities, such as limited pulmonary reserve and cardiovascular disease.\(^3-6\) With the popularization of CT screening, lung cancers have been increasingly detected at an early stage.\(^7\) Stereotactic radiation therapy (SRT) has become one of the standard treatment options for patients with stage I lung cancer, mainly in patients with inoperable NSCLC.\(^7,8\) Following irradiation, radiation pneumonitis frequently occurs. On chest X-rays or chest CT scans, physicians often have difficulty in distinguishing between the recurrence of lung cancer and radiation pneumonitis. Another tool that has been used in the detection of lung cancer recurrence is 18F-fluorodeoxyglucose positron emission tomography/CT (FDG-PET/CT). We have found significantly elevated standardized uptake values (SUVs) in patients with recurrent lung cancer, compared with those who had no disease progression. To our knowledge, this is the first report demonstrating the efficacy of FDG-PET/CT in patients with post-SRT recurrence of lung cancer. Here, we report the cases of two such patients.

We retrospectively reviewed the cases of all patients receiving SRT for the treatment of lung cancer at the Kameda Medical Center, in Kamogawa, Japan, between April of 2005 and March of 2011. The characteristics of the patients are shown in Table 1. There were a total of 28 patients (20 males and 8 females). The median age was 77 years (range, 59-88 years). All of the patients were classified as having stage IA lung cancer. Comparing the pre-SRT and post-SRT values, we found that there was a significant decrease in the SUV for the primary lesion (8.0 vs. 2.2; p < 0.001). During the follow-up period, 2 of the patients experienced recurrence, as evidenced by the finding that their SUVs had increased significantly over the values obtained in the immediate post-SRT period (Table 2). In those 2 patients, there was subsequent clinical and pathological confirmation of the recurrence of the lung cancer.

The first patient was a 69-year-old man with stage IA NSCLC who was submitted to SRT. The tumor was inoperable because of the poor health status of the patient. The total SRT was 50 Gy in five doses. Prior to SRT, FDG-PET/CT revealed an SUV of 12.6 and a tumor with a diameter of 21 mm. After SRT, the SUV decreased to 4.78, although the size of the tumor increased to 29 mm due to radiation pneumonitis. The radiated lesion could not be appropriately evaluated, because of the scar produced by irradiation. Therefore, we performed FDG-PET/CT every four months. During the follow-up period, the SUV rose to 18.44 and transbronchial lung biopsy was performed. The biopsy confirmed the suspicion of the recurrence of adenocarcinoma.

The second patient was a 76-year-old man who was diagnosed as having stage IA squamous cell lung carcinoma. He suffered from COPD and had a history of heavy smoking. Although he was, at his level of pulmonary function, a candidate...
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Here, we have reported two cases of recurrent cancer that were successfully diagnosed by FDG-PET/CT, thereby demonstrating that it can be a useful tool in the follow-up of patients having undergone SRT. Additional cases should be examined in order to corroborate our findings.

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