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Non small cell lung cancer within the small cell lung cancer radiotherapy field after 11 years

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Summary

A 71-year-old male was diagnosed with a non-small cell lung cancer (NSCLC) within the radiotherapy field that was used for the treatment of a small cell lung cancer (SCLC) 11 years ago. At the initial diagnosis in 1996 the patient had limited-stage SCLC located in the right upper lobe of the lung with mediastinal involvement. He received 4 cycles of chemotherapy and then mediastinal radiotherapy. With a complete response after chemoradiotherapy he was given prophylactic cranial radiotherapy. After 11 years of disease-free period a new mass in left lower lobe of the lung was detected. Bronchoscopic biopsy showed second lung cancer with epidermoid histology. Although the incidence of a second lung cancer is higher in SCLC survivors, this is a unique case in the literature with second NSCLC developing in the previously irradiated side of limited-stage SCLC.

Key words: non small lung cancer, radiotherapy, secondary carcinoma, small cell lung cancer, survival

Introduction

SCLC has poor prognosis with 3 months median survival if left untreated. Although this tumor is highly sensitive to chemotherapy and radiotherapy [1,2], early metastasis and recurrences are common even after therapy.

Five-year survival rate ranges between 2 and 4% among all patients, whereas it is 25% in those with limited-stage SCLC [2]. Long-term survival is rare in SCLC and is generally complicated with second tumors.

The patient presented herein had been treated with radiotherapy for SCLC 11 years ago and developed a NSCLC (squamous cell) in the radiotherapy portal area.

Case presentation

A 71-year-old male with a history of smoking for 40 pack/years had been admitted to the hospital in 1996 with dyspnea, cough, neck edema and venous fullness (vena cava superior syndrome, VCSS). Chest X-ray revealed a large mass of the right lung and widened mediastinum (Figure 1A). Cranial and abdominopelvic CT and bone scanning were normal. A biopsy taken from the mediastinal mass through mini thoracotomy showed SCLC (Figure 2A). With the diagnosis of limited-stage SCLC, he received 3 cycles of chemotherapy with cisplatin 75 mg/m^2, day 1, plus etoposide 80 mg/m^2, days 1-3 every 3 weeks. Clinical complete response was observed after 3 cycles and concurrent chemoradiotherapy was applied afterwards. Chemotherapy consisted of cisplatin 50 mg/m^2, day 1, plus etoposide 50 mg/m^2, days 1-3 every 3 weeks. Radiotherapy was given to the mediastinal area with linear accelerator (4 MV photons) at conventional fraction sizes of 2 Gy to a total dose of 46 Gy. One month after complete response to the combined modality therapy (Figure 1B), prophylactic cranial irradiation was delivered.

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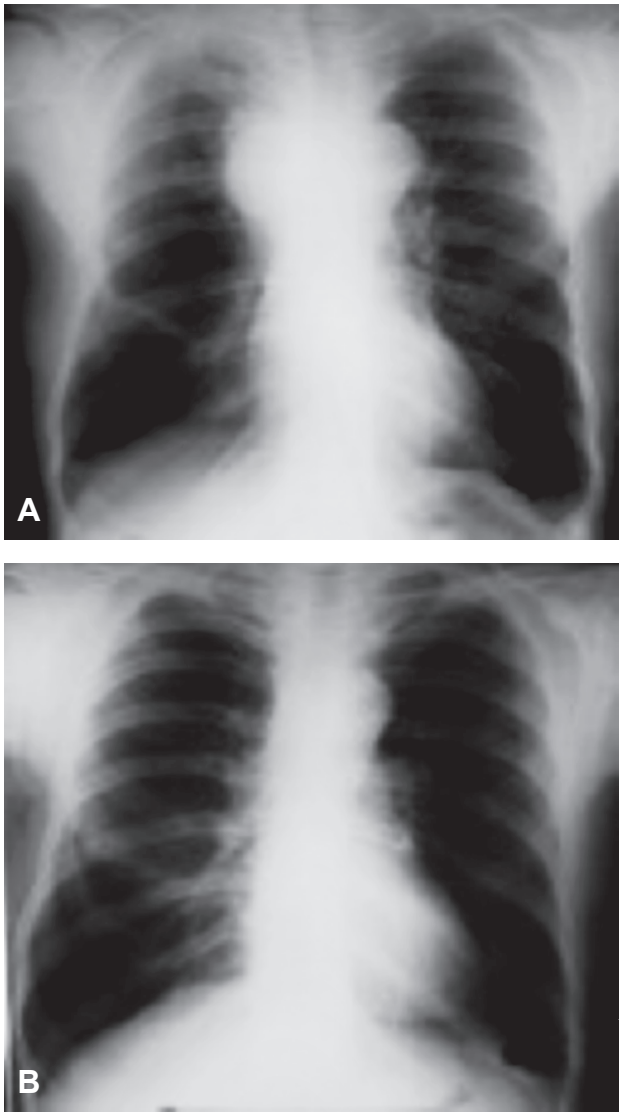

Figure 1. A: Large right superior mass and widened mediastinum; **B:** Complete response after combined modality therapy.

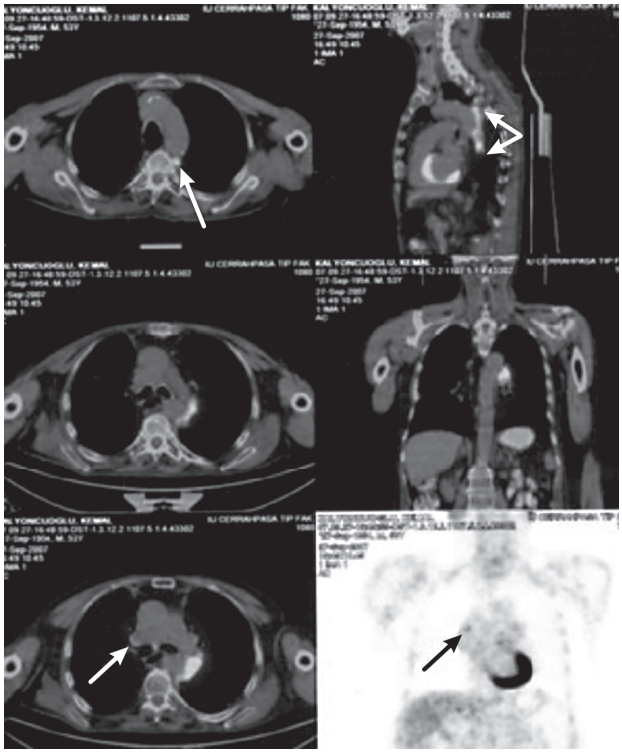

Figure 3. PET-CT showing a large mass at 5-8 thoracic vertebrae level surrounding the aorta (arrows).

During routine follow-up from September 1996 to November 2007, no pathologic findings were identified. PET-CT was performed because of back pain in November 2007 and a large mass at the 5-8 thoracic vertebrae level which surrounded the aorta was detected (Figure 3). Bronchoscopic biopsy from the mass seen in the left lower lobe (Figure 4) showed squamous cell carcinoma (Figure 2B).

With a diagnosis of NSCLC in the previous radiotherapy field the patient started chemotherapy with cisplatin and docetaxel.

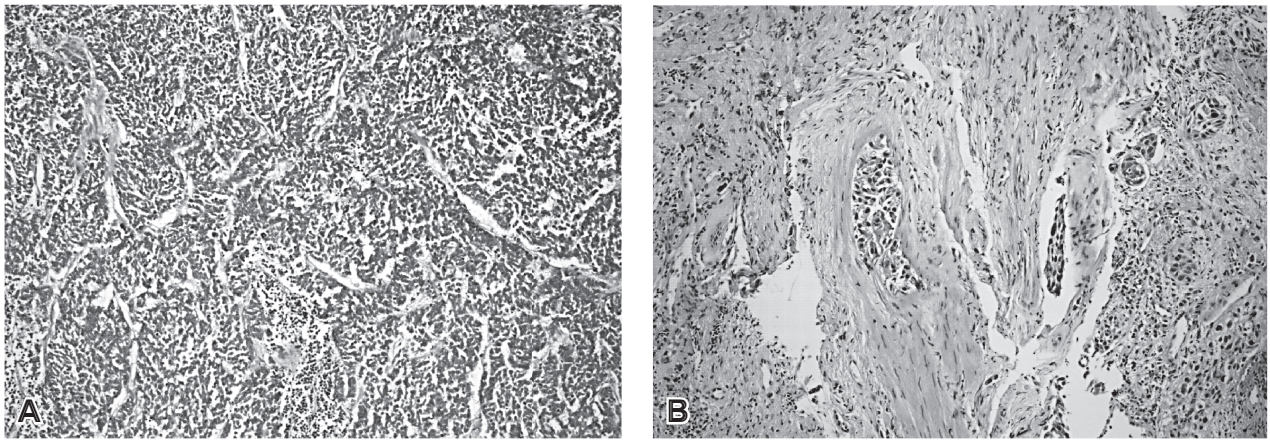

Figure 2. A: Small cell carcinoma metastasis to a lymph node 11 years ago (H&E ×100). **B:** Lung parenchymal infiltration by non-small cell lung cancer in lymphatic channel (H&E ×100).

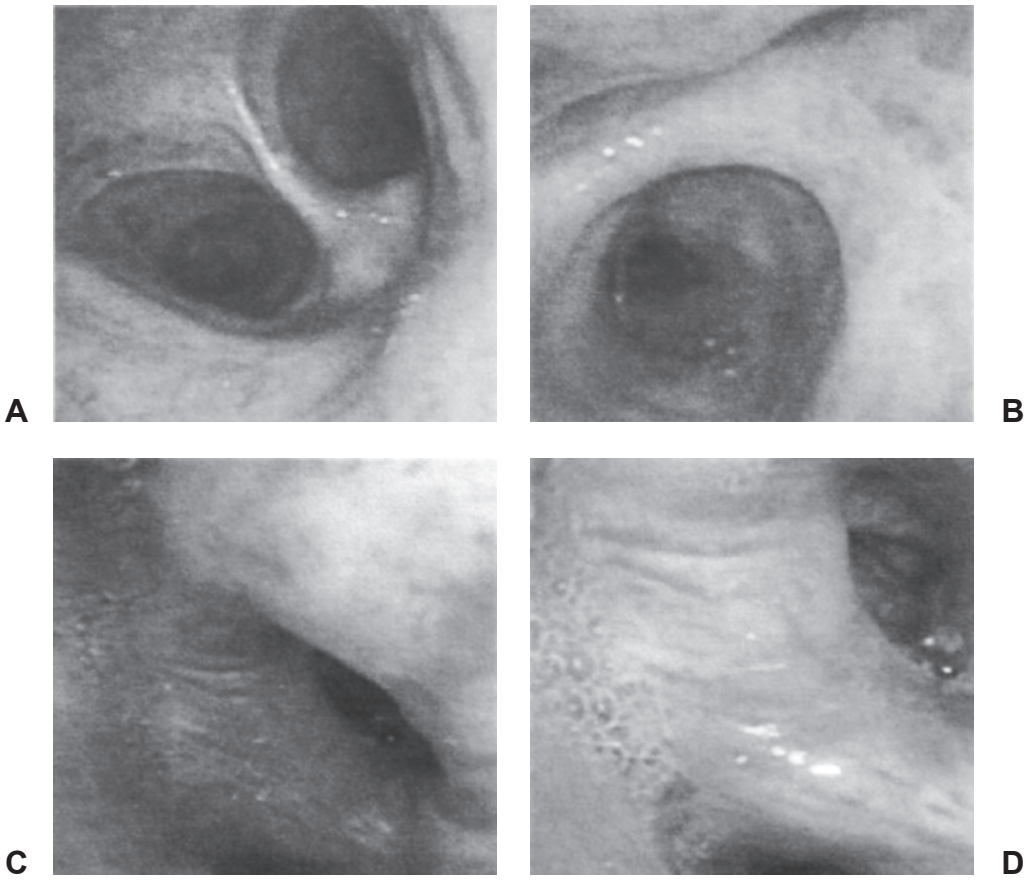

Figure 4. Tracheal carina (**A**), right tracheobronchial angle (**B**), left interlobar carina (**C**), left lower bronchus (**D**) showing mass in the left lower lobe.

Discussion

In the USA 40,000 patients were diagnosed with SCLC in 2006. SCLC constitutes 20-25% of all lung cancers and only 1/4 of SCLCs are diagnosed as limited disease [3].

Clinical stage, performance status, age, gender and presence of any paraneoplastic syndrome are the clinical prognostic factors [4,5], whereas good performance status and limited disease are associated with better survival [6].

SCLC is known to have poor prognosis in general and disease recurrence is usually seen 1.5 years after completion of therapies. Besides, survival of more than 10 years can rarely be seen [2]. The case reported by Kitamoto et al. is one of these patients who had a survival of more than 10 years [7].

In the study where Heyne and colleagues evaluated 466 patients with SCLC, 395 of them either died or relapsed in the first 2 years. According to this study, 3- and 5- year survival rates were 8 and 6%, respectively [8].

Long term survival is very rare in SCLC and generally accompanied with disease relapse or second malignancies. With prolonged survival, the risk of second malignancy development is 10.3% per year, histology is usually squamous cell carcinoma and generally develops in the same lung [9].

Lassen et al. reported a 20% risk of second malignancy among 1,714 unselected SCLC patients [10]. In another study the actuarial risk of second malignancy in 8 years was 50.3% [8].

The 5-year survival of 314 SCLC patients (226 male, 88 female) was 5.7% (18 patients) in the study of Szcepec and co-workers and only 2 patients showed 7-year disease-free survival. One of them had a new lesion that overlapped the previous cancer site. Four patients developed NSCLC in different sites from SCLC after 3-11 years [6].

Another publication revealed second NSCLC in 6 patients of 14 SCLC patients. Interestingly, the new lesion occurred in the same place of the first cancer in 3 of these 6 cases [8].

A SCLC case reported by Riquet et al. was suc-

cessfully operated after developing adenosquamous cancer following 6 years of disease-free survival [9].

An unusually presentation is the existence both SCLC and NSCLC in the same tumor [11,12]. In such a case including small cell, squamous cell and adenocarcinoma, each component metastasized to different lymph nodes [13].

It must be kept in mind that SCLC, which is known to have poor prognosis, can rarely have a long-term survival and in the few patients with prolonged survival the second malignancy risk is increased.

Our case is unique with 11 years of disease-free survival. Besides, it is unique because the second malignancy developed in the previous radiotherapy field and different lung.

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