Introduction

Pulmonary pleomorphic carcinoma (PC) is rare, with an incidence rate ranging from 0.1% to 0.3% of all lung cancers. Pulmonary PC has a more aggressive clinical course and worse prognosis than other types of non-small cell lung cancers (NSCLCs). Early recurrence is common, and effective adjuvant treatment is necessary to improve prognosis. A few serial case reports on PC have been published, but PC showing rapid growth has rarely been reported.

Case Report

A 46-year-old man was admitted to the medical unit of our hospital in May 2011 with lung abscess. Several antibiotics were administered for 2 weeks, but his condition did not improve. F18-fluorodeoxyglucose positron emission tomography revealed high uptake in the right lung, stomach, and pancreas. CT-fluoroscopic lung biopsy was performed, and a diagnosis of pleomorphic carcinoma was made. His performance status worsened each day, and the lung tumor grew within 1 month. In addition, sudden severe abdominal pain and tenderness developed 10 days after lung biopsy. He was diagnosed with gastrointestinal perforation, and he underwent surgery. However, he died 2 weeks after the surgery. Autopsy revealed the presence of an enormous tumor in the right lung and multiple metastases in the stomach, duodenum, intestine, bilateral kidneys, pancreas, gallbladder, right adrenal gland and thyroid.

Keywords: lung cancer, pleomorphic carcinoma, gastrointestinal metastases, intestinal perforation
Koh H, et al.

The patient admitted to smoking four packets of cigarettes per day for 27 years. He occasionally drank alcohol and did not use illicit drugs.

Physical examination revealed a temperature of 38.4°C, blood pressure of 92/60, pulse of 92 beats/min, and an oxygen saturation level of 97% in ambient air. Examination of the palpebral conjunctiva indicated anemia. Breath sounds diminished in the right upper lung field. The results of other general physical and detailed neurological examinations were normal. Laboratory tests revealed a leukocyte count of 15,530/µl, with 85% neutrophils. Hemoglobin, hematocrit, and C-reactive protein levels were 6.8 g/dl, 21.2%, and 13.37 mg/dl, respectively. Although NSE level was slightly elevated, tests for other tumor markers such as CEA, SCC, CYFRA, SLX, and ProGRP were negative. Cultures for blood, sputum, and urine showed no growth. Tests for urinary antigens for Streptococcus pneumoniae and Legionella were also negative. Electrocardiography revealed a sinus rhythm and no other abnormal findings. Chest X-ray revealed a large mass with a cavity occupying the right upper lung field (Fig. 1A). An initial diagnosis of lung abscess was made, and several antibiotics were administered. Despite antibiotic treatment for 2 weeks, the patient’s condition, including laboratory data and chest X-ray, did not improve. To determine the cause of the mass in the lung, F18-fluorodeoxyglucose positron emission tomography (FDG-PET) was performed, revealing high uptake in the right lung, stomach, and pancreas (Fig. 1B). The standardized uptake value (SUV) of the lung, stomach, and pancreas were 21.18, 11.35, and 12.38, respectively. Secondary, bronchoscopy was performed, but transbronchial lung biopsy was difficult due to severe bronchial stenosis. Computed tomography (CT)-fluoroscopic lung biopsy was therefore performed. Microscopic examination of the lung biopsy specimen revealed large polygonal malignant tumor cells with eosinophilic cytoplasm, varying in size and shape;
Rapidly Progressing Pleomorphic Carcinoma

hyperchromatic nuclei; and numerous multinucleated giant tumor cells. Necrosis was also detected (Fig. 1C). Based on these findings, a diagnosis of PC was made. Although chemotherapy was considered, the patient’s general condition worsened each day (performance status: 4). Chest X-ray, 1 month, after admission showed rapid progression of the lung tumor (Fig. 1D). Sudden severe abdominal pain and tenderness developed 10 days after the lung biopsy. Abdominal CT led to a diagnosis of gastrointestinal perforation. Emergency surgery revealed intestinal

Fig. 2  (A) Macroscopic features of resected intestinal tumor, which caused central perforation. (B) Microscopic examination demonstrated large polygonal malignant tumor cells with eosinophilic cytoplasm similar to that of lung biopsy (HE, original magnification, × 400).

Fig. 3  Macroscopic features of the autopsy specimen. Arrow show metastatic tumors. (A) Large tumor in the right lung; (B) multiple metastases in the stomach; (C) multiple metastases in the intestine. Microscopic features at autopsy. (D) Large polygonal malignant tumor cells with eosinophilic cytoplasm, varying in size and shape, which were consistent with PC (HE, original magnification, × 400). (E) Tumor cells stained strongly with pankeratin (original magnification, × 400).
tumor as the cause of central perforation (Fig. 2A). Microscopic analysis of the surgical specimen demonstrated large polygonal malignant tumor cells with eosinophilic cytoplasm similar to those of the lung biopsy specimen (Fig. 2B). Best supportive care was recommended, and the patient was moved to the hospice ward of our hospital. Death occurred 2 weeks after the surgery, which had been performed 49 days after admission. Macroscopic features of the autopsy specimen showed a large tumor in the right lung (Fig. 3A) and multiple metastases in the stomach (Fig. 3B), duodenum, intestine (Fig. 3C), bilateral kidneys, pancreas, gallbladder, right adrenal gland, and thyroid. Microscopic analysis of the autopsy specimen showed large polygonal malignant tumor cells with eosinophilic cytoplasm, varying in size and shape, which were consistent with PC (Fig. 3D and 3E).

Discussion

PC is a poorly differentiated NSCLC, namely squamous cell carcinoma, adenocarcinoma, or large cell carcinoma. It contains at least 10% spindle cells and/or giant cells, or more commonly, a mixture of these cell types. Spindle cells and giant cells are often associated with other more common histological subtypes of lung carcinoma, supporting the concept that lung cancers are derived from a pluripotent stem cell that can exhibit differentiation into any potential combination (spindle cell, giant cell, squamous cell, small cell, and adenocarcinoma). Spindle cell and giant cell subtypes are most frequently found to coexist.3–6) PC is considered to be rare, with an incidence rate ranging from 0.1% to 0.3% of all lung cancers. The male:female ratio of PC varies from 3:1 to 4:1, with the median age of presentation being 59 years.21 Chest X-ray shows PC as round or oval masses, often lobulated, and usually located at the lung periphery. However, chest X-ray fails to reveal any characteristic features of PC that help in discriminating it from other primary lung malignancies. Chest CT can provide some clues into the presence of PC. A central low attenuation area is depicted within the tumor, which aggressively invades adjacent structures such as the chest wall or the pleura. Central low attenuation areas corresponding to regions of central necrosis are also frequently observed.31

PC has a tendency to grow rapidly and invade adjacent structures in the early stage. According to Ito, et al.,41 recurrence after surgical treatment is common, and systemic metastases are frequently observed. In addition, response to chemotherapy is poor. The median survival time of the 22 patients enrolled in that study was 213 days. The median survival time of the 7 patients who did not undergo surgical treatment was 118 days. A few cases of PC showing rapid growth have been reported.3–6) Wakisaka, et al.31 reported a case in which local recurrence and multiple metastases were found only 45 days after surgery. The patient died 67 days after the surgery. Fujioka, et al.6) described a case of PC that grew rapidly within 1 month, necessitating surgery. In their case, the tumor was 50 × 30 mm on the first visit, but it had increased to 65 × 50 mm within 1 month on chest CT. In our case, the tumor increased in size from 95 × 80 mm to 125 × 110 mm within 1 month on chest CT.

In general, lung cancer metastasis to the stomach is very rare. Ioncica, et al.7) reported a rare case of PC metastasis to the stomach and pancreas at first diagnosis. In our case, FDG-PET revealed high uptake in the stomach, but esophagogastroduodenoscopy was not performed because of poor performance status at the time of diagnosis. Aokage, et al.8) reported two cases of resected gastric metastasis of pulmonary PC in which long survival times were recorded. After resection, these patients with gastric metastasis survived for 4–5 years with no other evidence of metastasis. They speculated that resection of gastric metastasis following pulmonary PC resection may be indicated if the metastasis is solitary. Furthermore, some cases of gastrointestinal perforation caused by metastatic PC have been reported.9,10) In most cases, intestinal perforation was detected, but perforation also occurred in the colon11) and appendix.12)

Kaira, et al.13) reported epidermal growth factor receptor (EGFR) mutation in 3 (18%) of 17 patients in whom a carcinomatous element of adenocarcinoma was observed. In one patient treated with gefitinib, stable disease was achieved. This patient’s overall survival was 8 months. The two other patients who were not treated with gefitinib survived 1 month and 5.5 months, respectively. In another report,4) EGFR mutation was positive in 1 of 22 patients who received gefitinib as second-line therapy. The pathological subtype was adenocarcinoma with spindle cells, and partial response was achieved. EGFR mutation in our case was negative; therefore, no gefitinib was administered.

Conclusion

PC is a rare lung neoplasm with poorer prognosis than other NSCLCs. The clinicopathological character-
istics of PC are still not well known. Therefore, more cases of PC should be reported to establish optimal management.

Acknowledgement

We thank Dr. Morimoto, Dr. Sasakura, and Dr. Kase for their contributions to the surgery.

Disclosure Statement

The authors have no conflicts of interest to declare.

References