Case Report

A Resected Case of Pulmonary Carcinosarcoma

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The patient was a 78-year-old man with a history of smoking 5 or 6 cigarettes per day for 40 years. A chest X-ray taken during a medical checkup demonstrated a mass shadow in the right lower lung field. The patient was diagnosed with squamous cell carcinoma by bronchoscopic brushing cytology. A right lower lobectomy and a lymph node dissection were performed under a diagnosis of squamous cell carcinoma of the lung (cT2N0M0, stage IB). Gross examination of the resected specimen demonstrated an ovoid, irregularly bordered, yellowish-white tumor, 8 cm in diameter, containing a necrotic cavity. Histopathological examination showed diffuse proliferation of spindle-shaped tumor cells intermingled with areas of well-differentiated squamous cell carcinoma with definite keratinization. Areas of cartilage and bone were observed in the spindle-cell components of the tumor. These findings led to a diagnosis of carcinosarcoma (pT2N0M0, stage IB). The patient developed multiple intrapulmonary metastases 5 months after surgery and died of respiratory failure 10 months later. Herein we report a rare surgical case of lung carcinosarcoma. (Ann Thorac Cardiovasc Surg 2010; 16: 190–193)

Key words: pulmonary carcinosarcoma, surgery

Introduction

Carcinosarcoma is a rare tumor, accounting for 0.1%–0.3% of all lung cancers.[1)] It is reported that the mean age of patients with pulmonary carcinosarcoma is about 65 years; males who are heavy smokers more frequently develop this tumor than light smokers or nonsmokers. It arises from the central airway in two-thirds of patients, and it exhibits the morphology of polypoid airway lesions.[2)] We herein report a rare surgical case of pulmonary carcinosarcoma arising from the peripheral airway.

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Case Report

A 78-year-old man presented with cough in March 2001 and hemosputum in September 2001. In October 2001 he was found to have an abnormal shadow on a chest X-ray during a routine health checkup and was referred to our hospital for further evaluation. He had undergone coronary artery bypass grafting for exertional angina in 2001. His smoking history was 5 or 6 cigarettes per day for 40 years. He was 152 cm tall and weighed 40.1 kg (88 lb). There were no palpable superficial lymph nodes, and except for the chief complaints described above, he was in good health.

Blood chemistry data were unremarkable except for an elevated LDH level of 303 U/l (normal range, 101–210 U/l) and an elevated CRP level of 11.6 mg/l (normal level, below 0.4 mg/l). Tumor markers SCC (normal range, 0–2 ng/ml), SLX (normal range, 0–38 U/ml), and NSE (normal range, 0–10 ng/ml) were slightly elevated, to 6.0 ng/ml, 42.3 U/ml, and 10.4 ng/ml, respectively, but the CEA level was normal. Chest X-ray showed a well-defined mass, 8 cm in diameter, in the right lower lung field (Fig. 1). The mass contained a cavity with air-fluid level formation. Chest CT demonstrated a well-defined tumor of soft-tissue density, 6.2 × 5.9 × 8.0 cm, in the right basal

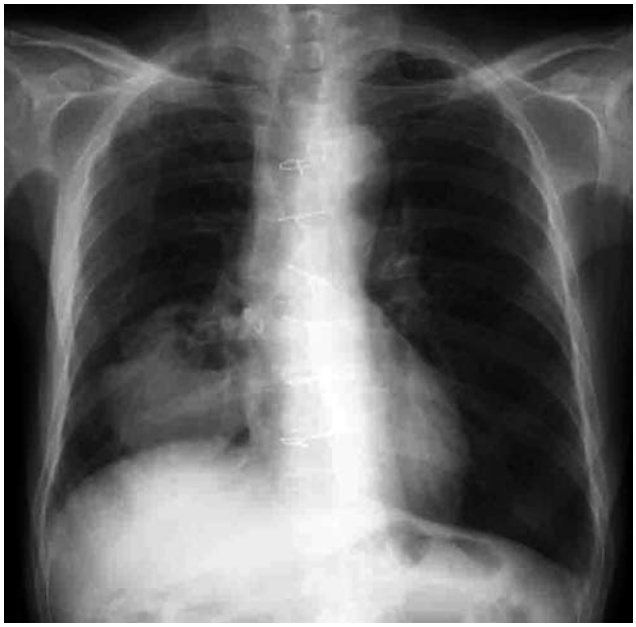

Fig. 1. A chest roentgenogram demonstrated a mass shadow in the right lower lung field.

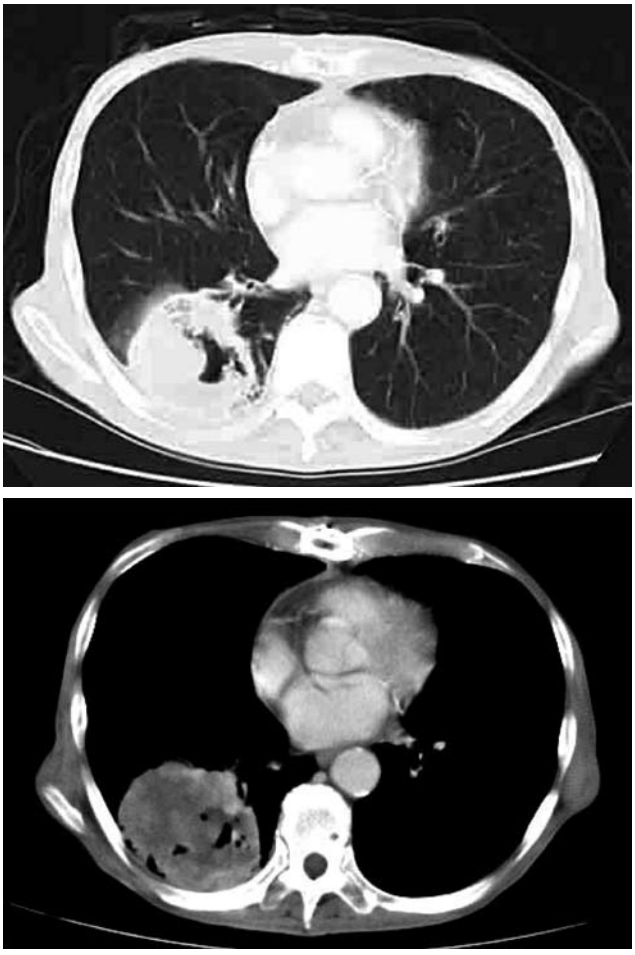

Fig. 2. Chest computed tomography demonstrated a well-defined tumor with a cavity in the right basal segment. **A**: lung window setting; **B**: mediastinal window setting

A

B

segment (Fig. 2). The tumor had a 4-cm cavity containing a small amount of fluid. There were no other nodule-associated densities nor any marked enlargement of either the mediastinal or the hilar lymph nodes.

The bronchoscopic examination showed obstruction of $B^{10}a$ by compression; however, the tumor was not grossly visible. It was diagnosed as squamous cell carcinoma by bronchoscopic brushing cytology. Head and abdominal CT scans and bone scintigraphy detected no sign of distant metastases. Because the lung function test and blood gas analysis showed no abnormalities, we judged that the patient would tolerate surgery. A right lower lobectomy and a lymph node dissection (ND2a) were performed under a diagnosis of squamous cell carcinoma of the lung (cT2N0M0, stage IB) in December, 2001. The tumor was 8 cm in diameter, ovoid shaped, irregularly bordered, and yellowish white, and it showed areas of necrosis and hemorrhage (Fig. 3). A histopathologic examination showed diffuse proliferation of spindle-shaped tumor cells intermingled with areas of well-differentiated squamous cell carcinoma with definite keratinization (Figs. 4A, 4B). Areas of cartilage and bone were observed in the spindle-cell components of the tumor (Figs. 4C, 4D). These findings led to a diagnosis of carcinosarcoma (pT2N0M0, stage IB). There were no definitive polypoid airway lesions. The patient received no postoperative chemotherapy. He developed multiple intrapulmonary metastases 5 months

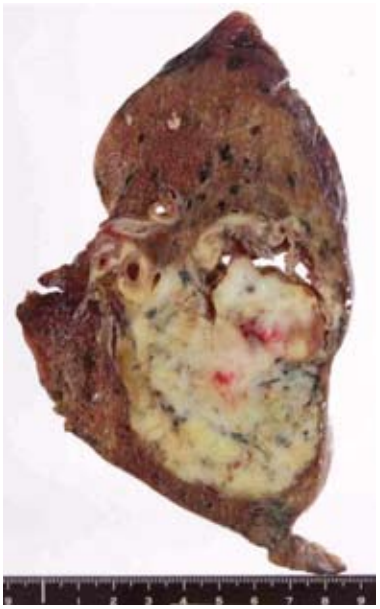

Fig. 3. On gross examination, the tumor measured 8 cm in diameter, and the cut surface of the excised mass was mostly yellowish tan. The mass demonstrated a necrotic cavity.

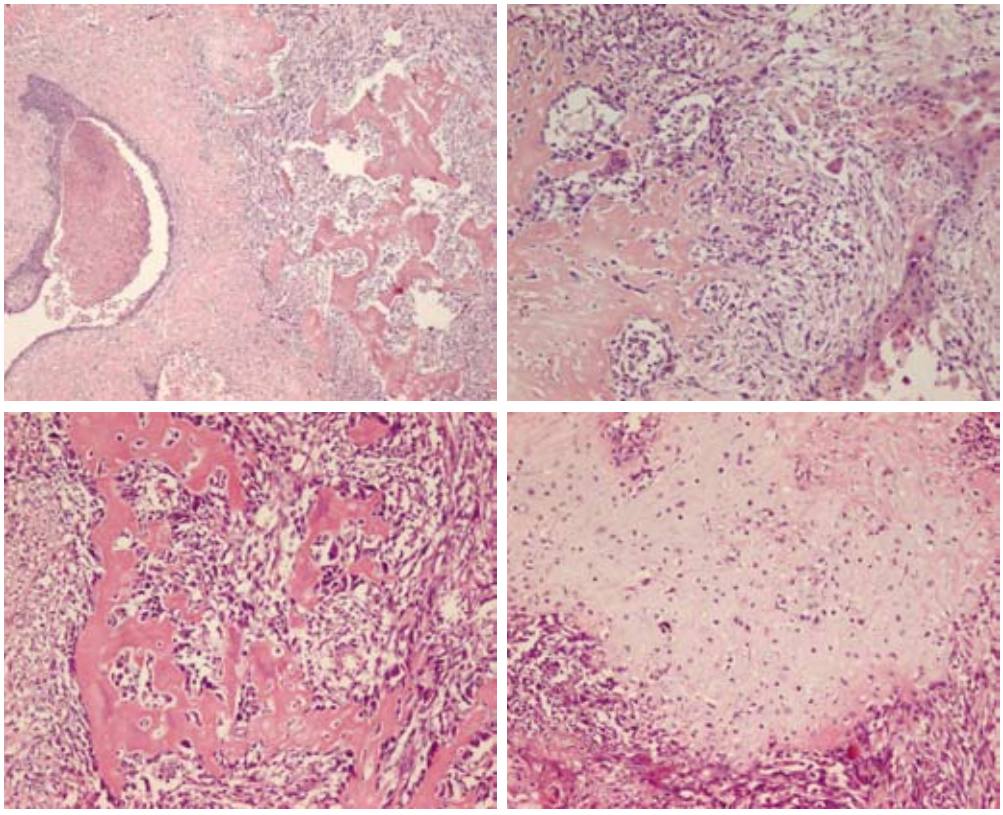

Fig. 4.

A, B: Histology of the tumor demonstrated a mixture of squamous cell carcinoma, spindle cell component, and heterologous elements of bone and cartilage (hematoxylin and eosin stain; **A:** low magnification view; **B:** high magnification view).

C, D: Histology of the tumor demonstrated heterologous elements such as cartilage and bone (hematoxylin and eosin stain; high magnification view).

A	B
C	D

after surgery and died of respiratory failure 10 months later. No autopsy was performed.

Discussion

Pulmonary carcinosarcoma is a rare malignant tumor containing epithelial and mesenchymal components, and reportedly accounts for 0.1%–0.3% of all lung cancers.[1] The male: female ratio is approximately seven with a mean and median age of approximately 65 years.[2] A strong association with smoking history has been noted. Most lung carcinosarcomas exceed 5 cm in diameter, and some lesions as large as 15 cm or more have been reported.[2] Moore classified lung carcinosarcomas according to the site of origin into endobronchial and peripheral types arising from the central and peripheral bronchi, respectively.[3] Lung carcinosarcoma arises from the central airway in two-thirds of patients and exhibits the morphology of polypoid airway lesions.[2] Metastases are common and can be carcinomatous, sarcomatous, or both. Survival of patients with pulmonary carcinosarcoma is reported to be poor, with a 5-year survival rate of 21.3%.[2]

The most frequent epithelial component is reported to be squamous cell carcinoma, followed by adenocarcinoma and adenosquamous carcinoma[4]; sarcomatous elements most frequently include rhabdomyosarcoma, chondrosarcoma, osteosarcoma, or combinations of these elements.[5] In this patient, the carcinomatous component was squamous cell carcinoma, and the sarcomatous component showed heterologous differentiation into osteosarcoma and chondrosarcoma, leading to a diagnosis of carcinosarcoma. The proposed pathogenesis of carcinosarcoma includes (1) malignant transformation of hamartoma, (2) simultaneous malignant transformation of epithelial elements and stroma, (3) malignant transformation of cancer-derived stroma, (4) sarcomatous change of carcinoma, and (5) carcinomatous change of

sarcoma. The prevailing theories suggest that a single stem-cell lineage exhibits multipotency and differentiates across germ layers into both epithelial and mesenchymal lineages,[6] or that metaplasia of carcinoma into sarcoma cells occurs.[7] The ideal therapy is thought to be surgical resection; adjunctive irradiation and chemotherapy seem to have little beneficial effect.[8]

In conclusion, we report a rare surgical case of lung carcinosarcoma.

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