Long-Term Survival after Pneumonectomy for Pulmonary Carcinosarcoma

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Abstract

Pulmonary carcinosarcoma is a rare tumor and the prognosis of patients with carcinosarcoma is assessed as unfavorable. We report a patient with rapid growing carcinosarcoma with good survival after the total resection of the tumor. The patient was a 49-year-old man who complained of working dyspnea. Chest CT showed a 10×6×11-cm tumor in the left lung. A transcutaneous ultrasound-guided needle biopsy revealed it as a malignant lung tumor with sarcomatous features. We performed left pneumonectomy via a median sternotomy and a left anterior thoracotomy. The tumor was histologically diagnosed as pulmonary carcinosarcoma and additional chemotherapy was given with cisplatin and ifosfamide. Four years postoperatively, the patient is currently alive without any recurrence.

Keywords: Pulmonary Carcinosarcoma; Surgical Resection; Prognosis

Introduction

Pulmonary carcinosarcoma is an rare malignant neoplasm accounting for 0.1% to 0.4% of all malignant lung neoplasms predominantly in elderly men who are heavy smoker [1]. It is characterized by an admixture of both epithelial and mesenchymal elements. The tumor tends to be large and has a poor prognosis due to the tendency to metastasize at distant sites and the high rate of local recurrence [2]. Few published cases describe patients who survive long-term after treatment. Clinical characteristics, preoperative diagnostic methods, and prognostic factors are still not completely understood. Since chemotherapy and radiotherapy are not so effective, complete surgical removal with negative margins may provide a long survival period [3]. In this case report, we report a rare case of rapid growing pulmonary carcinosarcoma in a patient who remains disease-free 4 years after pneumonectomy.

Case Report

A 49-year-old man came to our hospital with a complaint of working dyspnea. He had a 30 pack-year smoking history and had no major medical conditions. Chest radiograph demonstrated a large left-sided pulmonary mass (Figure1B). The tumor was evidently fast-growing because it had not been detected on a chest X-ray taken 5 months previously (Figure1A). Enhanced computed tomography confirmed the presence of a left upper lobe lung mass, 10×6×11-cm in size, compressing the mediastinum and the chest wall (Figure2). Bronchial fiberoscopy showed that the left main bronchus was suppressed by huge tumor but there was no abnormal findings such as internal invasion. A transcutaneous ultrasound-guided fine needle biopsy revealed it to be an undifferentiated malignant tumor composed mainly of low-grade spindle and round cells with myxomatous degeneration. Surgical treatment was considered to be necessary because the efficacy of chemoradiotherapy was unclear and was not considered helpful for this case. The patient underwent surgery in the supine position with right-sided double lumen tube lung isolation. Initial thoracoscopy of the left thoracic space revealed that the tumor arose from the left upper lobe and invaded the thymus and pericardium. Pneumonectomy was required for complete resection as the upper lobe mass had been considered to invaded to left main pulmonary artery and across the fissure into the lower lobe. The tumor was exfoliated from the chest wall, and the left main pulmonary artery and left pulmonary veins were resected within the pericardial space (Figure3). Left pneumonectomy and combined resection of the thymus and pericardium were performed via median sternotomy and left anterior thoracotomy at the 3rd intercostal space. The pericardial defect was repaired by Gore-Tex soft tissue patch. The operative time was 335 minutes, and intraoperative blood loss was 531mL.
Figure 1.
A. A chest radiograph 5 months previously, the tumor had not been detected.
B. A Chest X-ray on admission showed -11×10cm tumor in the left lung.

Figure 2. Computed tomography showed -11×6×10cm contrast-enhanced tumor occupying the upper left thoracic space.
The chest tube was removed on postoperative day 1, and the patient was uneventfully discharged. The gross pathology findings of the left lung showed the solid tumor with central necrotic and hemorrhagic areas (Figure 4).

The pathologic examination revealed the tumor to be composed of squamous cell carcinoma and sarcomatous component (Figure 5A,B) and the tumor was diagnosed as pulmonary carcinosarcoma. The postoperative stage was pT4N1M0, StageIIIA. Postoperatively, the patient received 3 courses of systemic chemotherapy consisting of cisplatin and ifosfamide. After 4-year follow-up, neither tumor recurrence nor systemic metastasis was observed on repeated CT scans.

Discussion

Pulmonary carcinosarcoma is a rare malignant neoplasm composed of carcinomatous and sarcomatous components. The prognosis is generally unfavorable owing to the high rate of local recurrence and the tendency of the tumor to metastasize to distant sites. Depending on the case series, reported median survival times for patients with pulmonary carcinosarcoma are 3-12 months, respectively [4-6]. The preoperative diagnosis of pulmonary carcinosarcoma is difficult due to the composition of the different histopathological structures and the difficulty of detecting every structures with biopsy. Koss and colleagues suggested that pulmonary carcinosarcoma occurs as 2 distinct clinicopathologic types. A central endobronchial type that is...
generally slow-growing and involves a cough and hemoptysis like other endobronchial tumors, and a peripheral invasive type that often presents as a large mass and is fast-growing and characterized by early metastatic spread and a poor clinical outcome [7]. In the present case, the tumor could be categorized as the peripheral invasive type owing to its location and rapid progression. The treatment strategy for pulmonary carcinosarcoma has not been established because of its rarity. Petrov and colleagues reported that surgical resection was the first choice of treatment if curative resection was deemed possible and that complete resection with negative margins may provide long-term survival [8]. However, the tumor tends to be so large that the surgical manipulation is often difficult. Therefore, the surgical approach had to be well considered dependent on the case. In the present case, the lateral approach was considered unfavorable for manipulation of the pulmonary vessels because the tumor covered the entire left hilum. Because of the difficulty in achieving resection using conventional posterolateral thoracotomy, we adopted a median sternotomy and a left anterior thoracotomy at the 3rd intercostal space. Hemi-clamshell thoracotomy or rib-cross thoracotomy could be considered as an optional approach [9]. There has been no established consensus regarding adjunctive therapy for patients with pulmonary carcinosarcoma. Theoretically, chemotherapy regimens, one of which may be effective for lung cancers and the other that targets sarcomas, can be applied [10]. In our case, a combination regimen was empirically chosen in to target both the epithelial (cisplatin) and mesenchymal component (ifosfamide).

**Conclusion**

We reported the resected case of a 49-year-old man with rapid growing pulmonary carcinosarcoma. Although carcinosarcoma of the lung has a poor prognosis, surgical resection, even by pneumonectomy, may provide a long term survival. We consider that surgery and chemotherapy for pulmonary carcinosarcoma need to be assessed by accumulation of more cases.

**References**


