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*Case Report*

# A case report of pulmonary blastoma confirmed via surgical resection for a massive lung mass

Jin An[1], Yee Hyung Kim[2], Kyu Yeoun Won[3], Ha Yeon Lee[4], Jung Im Kim[5], Sung Wook Kang[1], BokSoon Chang[2]

*[1]Department of Internal Medicine, Graduate School, Kyung Hee University, Seoul, Korea; [2]Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, Kyung Hee University Hospital at Gangdong, School of Medicine, Kyung Hee University, Seoul, Korea; [3]Department of Pathology, Kyung Hee University Hospital at Gangdong, School of Medicine, Kyung Hee University, Seoul, Korea; [4]Division of Hematology-Oncology, Department of Internal Medicine, Kyung Hee University Hospital at Gangdong, Seoul, South Korea; [5]Department of Radiology, Kyung Hee University Hospital at Gangdong, Kyung Hee University College of Medicine, Seoul, Korea*

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**Abstract:** Pulmonary blastoma is a very rare primary lung tumor. We report herein the case of a 54-year-old man with pulmonary blastoma pathologically diagnosed after surgery. He was a heavy smoker and was admitted with dyspnea and coughing. Chest radiography showed a massive pulmonary mass in the left lower lobe and computed tomography scan revealed a 14 cm hypervascular necrotic mass in the same location. A definite pathologic diagnosis could not be obtained using a percutaneous needle biopsy. A left lower lobectomy was subsequently performed and pulmonary blastoma was confirmed following histological examination. The patient received two courses of chemotherapy and radiotherapy for a metastatic brain lesion. In spite of chemoradiotherapy, he had to undergo an operation for newly developed metastatic brain lesion.

**Keywords:** Lung cancer, lung mass, pulmonary blastoma

## Introduction

Pulmonary blastoma is a very rare and aggressive malignant lung tumor. Pulmonary blastoma is histologically composed of both carcinomatous and sarcomatous components [1], and a mixture of epithelial and mesenchymal tissues resembling embryonic lung tissue [2]. It was first described in 1945 by Barrett and Barnard [3, 4]. The concept of pulmonary blastoma was confirmed by Spencer in 1961 because the lesions closely resembled nephroblastomas in appearance [5]. The symptoms of pulmonary blastoma are nonspecific, and include coughing, chest pain, and hemoptysis [6]. Surgery is the standard treatment and the efficacy of adjuvant chemotherapy and radiotherapy has not yet been established [7, 8]. Platinum-based chemotherapy has been used with or without postoperative radiotherapy. The prognosis of pulmonary blastoma is known to be generally poor. The purpose of this report was to present a case of pulmonary blastoma that confirmed via surgical resection for a massive lung mass and received adjuvant chemotherapy.

## Case report

A 54-year-old man presented with a 6-month history of dyspnea and coughing. There was no history of fever, chills, night sweats, or chest pain. He was a heavy smoker. He had no family history.

At admission, physical examination and laboratory test results were within normal limits. Levels of the tumor markers carcinoembryonic antigen (CEA) and squamous cell carcinoma antigen (SCC) were normal. Chest radiography showed a well-circumscribed massive mass in the left mid-lung zone (**Figure 1A**). Computed tomography (CT) scan revealed a 14-cm hypervascular necrotic mass in the left lower lobe (**Figure 1B** and **1C**). Fluorodeoxyglucose-positron emission tomography (FDG-PET) showed uptake in the left lower lung, left lower paratra-

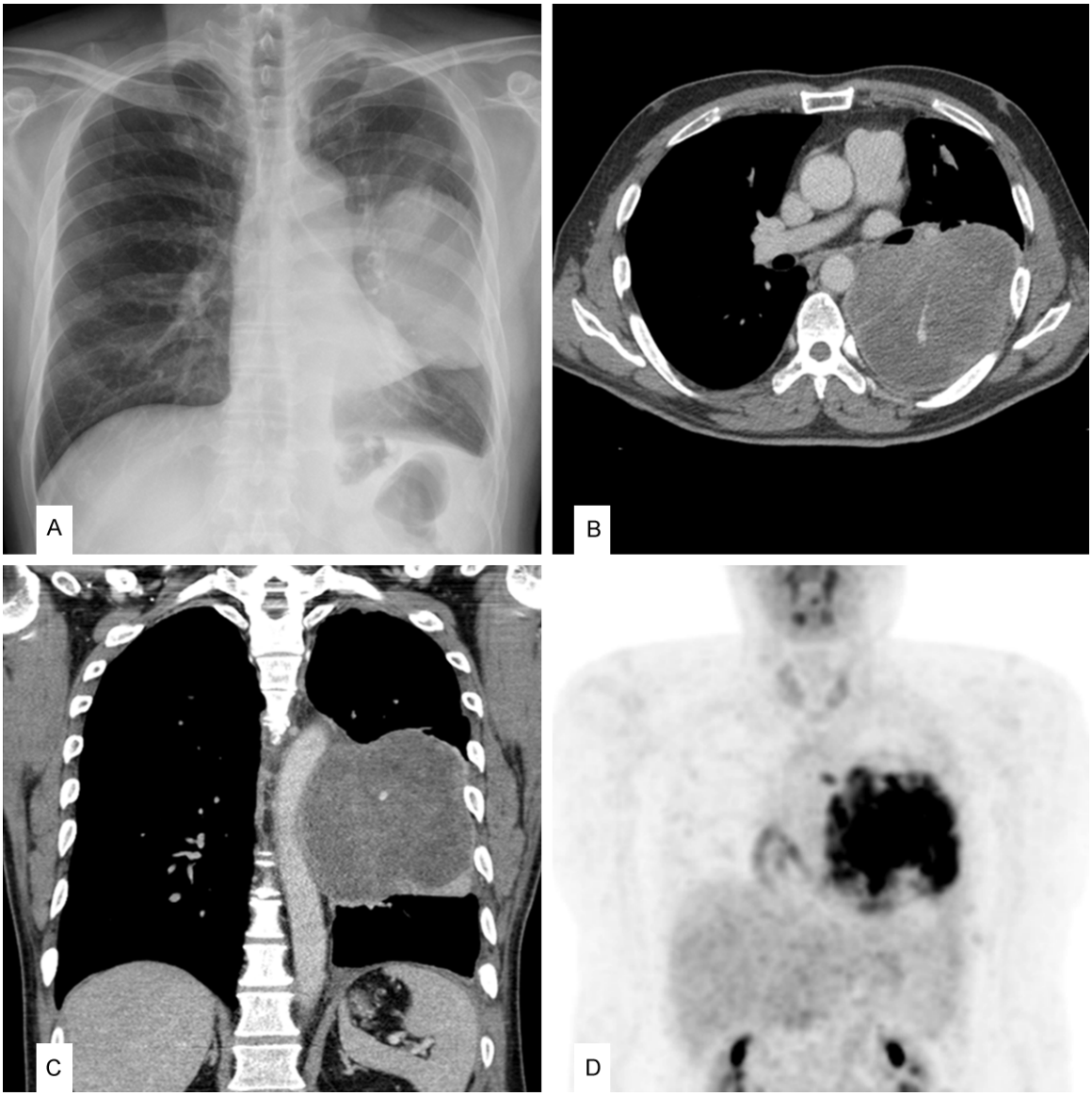


**Figure 1.** Chest image findings of pulmonary blastoma in the lung. Chest radiography showed a well-circumscribed massive mass in the left mid-lung zone with ipsilateral pleural effusion (A). Computed tomography (CT) scan revealed a 14 cm hypervascular necrotic mass in the left lower lobe in axial view (B) and coronal view (C). Fluorodeoxyglucose-positron emission tomography (FDG-PET) showed uptake in the left lower lung, left lower paratracheal lymph node, and left parasternal area (D).

cheal lymph node, and left parasternal area (**Figure 1D**). Abdominal computed tomography (CT) and brain magnetic resonance imaging (MRI) showed no evidence of distant metastasis. A definite pathologic diagnosis could not be obtained using a percutaneous needle biopsy owing to necrotic tissue. Surgical resection was then performed for an accurate diagnosis and treatment of the massive mass, despite the mediastinal lymph nodes metastases. A left lower lobectomy was performed. Pulmonary blastoma was finally confirmed via histological examination, and lymphatic invasion was observed (**Figure 2**). The disease was staged pT3N2M0.

The patient received 2 courses of chemotherapy with adriamycin and cisplatin. Twelve weeks after the last chemotherapy session, the patient complained of left-sided weakness and dizziness. He was diagnosed with intracranial hemorrhage in the right frontal lobe, and a cra-

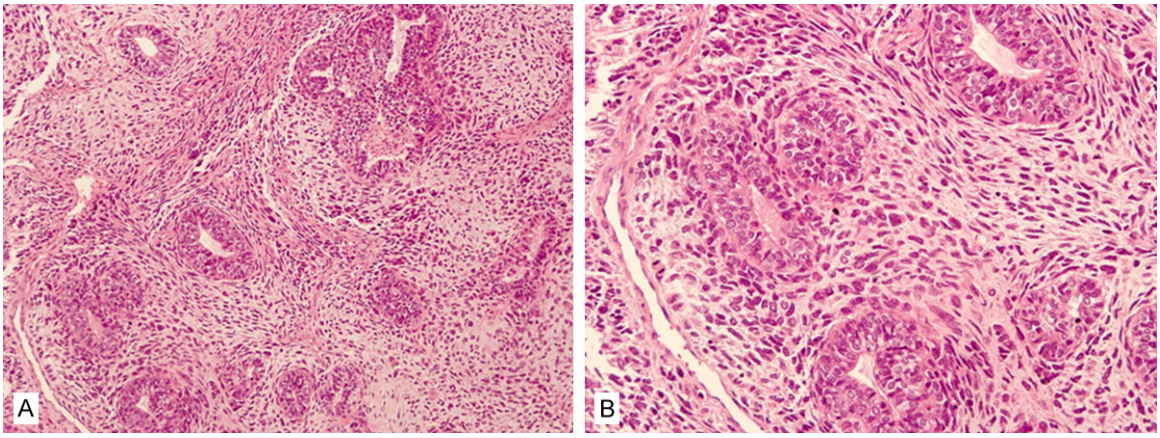


**Figure 2.** Histologic analyses of pulmonary blastoma. Tumor shows areas of epithelial and mesenchymal differentiation. The epithelial component is low-grade fetal adenocarcinoma consisting of branching tubules lined by pseudostratified columnar cells with relatively small and uniform nuclei. The mesenchymal component shows tightly packed primitive oval to spindle cells with a high nuclear to cytoplasmic ratio. Occasional bizarre giant cells are seen. (Hematoxylin & eosin stain, ×100 A and ×200 B).

niotomy was performed. A metastatic lesion from the lung was detected in the brain. He was treated with whole brain radiotherapy (RT) to a dose of 35 Gy in 10 fractions over two weeks. However, his mentality was altered due to a newly developed metastatic brain lesion. After he underwent a brain surgery to remove the metastatic lesion, he regained his consciousness.

## Discussion

Pulmonary blastoma is an uncommon, aggressive neoplasm with distinctive biological behavior. The neoplasm was divided by Koss et al [9] into 3 groups: Classic biphasic pulmonary blastoma characterized by both epithelial and mesenchymal malignant components, monophasic pulmonary blastoma, and pleuropulmonary-blastoma [9, 10]. Classic biphasic pulmonary blastoma is the most common form, especially in adults [9]. In classic biphasic pulmonary blastoma, the average age at diagnosis is 40 years with an increased frequency in males (2:1), and is common among smokers [1]. Our patient was pathologically diagnosed with classic biphasic pulmonary blastoma, which was probably the result of his heavy smoking.

In adults, a pulmonary blastoma tumor presents as a massive chest mass causing hemoptysis, cough, dyspnea, and chest pain. However, up to 40% of patients may be asymptomatic [11]. Our patient, a previously healthy individual, experienced typical symptoms such as recurrent cough and shortness of breath. In classic biphasic pulmonary blastoma, chest radiography is usually helpful and typically shows a well-delimited peripheral or mid-lung circle mass ranging from 1.5 to 13 cm in diameter [12]. In our case, a well-demarcated mass was also observed in the left lower lobe.

It is difficult to confirm the diagnosis because the histogenesis of pulmonary blastoma is unclear [5]. In our case, we could not confirm a histological diagnosis using a percutaneous needle biopsy. A surgical resection was performed for accurate diagnosis and debulking treatment of the massive mass. We suggest that surgical resection is better for an accurate diagnosis than percutaneous needle biopsy in patients with a massive lung mass, because massive lung masses are usually heterogeneous with necrotic tissues.

The therapy of choice for pulmonary blastoma is surgical resection [13]. Further therapeutic measures are chemotherapy and irradiation, either alone or in combination with the primary surgery [14]. Literature regarding the efficacy of adjuvant chemotherapy and radiotherapy is scarce. Our patient received 2 cycles of adriamycin and cisplatin.

In a study of 83 pulmonary blastoma patients, a mean survival duration of approximately 33 months was reported for patients who under-

went surgery [15]. The factors contributing to an unfavorable prognosis are tumor recurrence, biphasic type, metastatic disease on presentation, tumor size over 5 cm, and frequent lymph node involvement [9]. In our case, the decision to initiate adjuvant treatment was based on 3 important prognostic factors: The large size of the tumor on presentation, biphasic type, and lymph node involvement. In our case, lymph node recurrence and brain metastases appeared quickly and had a poor prognosis.

In conclusion, adult pulmonary blastoma is an unusual lung tumor presenting as a large invasive mass. It is important to consider pulmonary blastoma in the case of a rapidly growing massive pulmonary mass, despite its low incidence. Early surgical resection may be helpful for diagnosis and treatment. Diagnosis, treatment, and follow-up must be planned by a multidisciplinary team.

## Disclosure of conflict of interest

None.

**Address correspondence to:** Dr. BokSoon Chang, Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, Kyung Hee University Hospital at Gangdong, School of Medicine, Kyung Hee University, Seoul, Korea. Tel: +82-2-440-6081; Fax: +82-2-440-8150; E-mail: meera.chang@gmail.com

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