Pulmonary hamartoma and squamous cell carcinoma: a very rare coexistence

Aynı olguda pulmoner hamartom ve skuamöz hücreli akciğer kanseri

Ahmet Önen,[1] Aydın Şanlı,[1] Sami Karapolat,[1] Volkan Karacam,[1] Aydanur Kargı[2]

Departments of [1]Thoracic Surgery and [2]Pathology, Medicine Faculty of Dokuz Eylül University, İzmir

Pulmonary hamartoma is the most frequent benign neoplasm of the lung. Although they are benign, malignant transformation or accompaniment by primary lung cancer may rarely be seen. A 38-year-old woman was admitted with complaints of chronic cough and shortness of breath. A computed tomography scan of the thorax showed a 3x2-cm mass at the lower lobe of the left lung, surrounding the left main bronchus. At thoracotomy, frozen section analysis of the mass revealed malignancy, so a left lower lobectomy was performed. Histopathologic diagnosis was hamartoma and squamous cell carcinoma in situ. The patient was asymptomatic during a year's follow-up.

Key words: Carcinoma, squamous cell; hamartoma/surgery; lung neoplasms/surgery.

Pulmoner hamartomlar oldukça sık rastlanan akciğer patolojileridir. İyi huylu olmalarına rağmen, nadiren malign değişim gösterebilirler ya da primer akciğer kanserine eşlik edebilirler. Otuz sekiz yaşında kadın hasta kronik öksürük ve solunum sıkıntısı nedeniyle başvurdu. Bilgisayarlı tomografide sol akciğer alt lobda 3x2 cm ölçülerinde, sol ana bronşu çevreleyen kitlesel lezyon görüldü. Torakotomi sırasında kitleden yapılan frozen section sonucunun malign bildirilmesi üzerine sol alt lobektomi yapıldı. Histopatolojik incelemede hamartom ve skuamöz hücreli karsinom *in situ* saptandı. Hasta bir yıllık takipte semptomsuzdu.

Anahtar sözcükler: Karsinom, skuamöz hücreli; hamartom/cerrahi; akciğer neoplazileri/cerrahi.

Pulmonary hamartoma is the most common benign neoplasm in the lung, and accounts for 7-14% of all solitary lung nodules.[1] The majority of hamartomas are parenchymal and often located in the periphery of the lung. These tumors grow slowly. They tend to be asymptomatic and are usually found incidentally on chest radiographic examination.[2]

CASE REPORT

A 38-year-old woman was admitted with complaints of chronic cough and shortness of breath. She had a history of chronic bronchial asthma for which she received treatment for more than four years. On physical examination, there was only a widespread inspiratory rhonchus in the lungs. Laboratory data were within the normal limits. A chest roentgenogram demonstrated a nodular density in the lower lobe of the left lung. A computed tomography scan of the thorax showed a 3x2-cm mass surrounding the left main bronchus concentrically in the paramediastinal site of the lower lobe of the left lung (Fig. 1). The patient underwent bronchoscopy under local anesthesia, which demonstrated narrowing of the superior segment of the lower lobe like a fissure by a mass effect. Bronchoalveolar lavage cytology and mucosal biopsy were found benign, and transbronchial fine needle aspiration biopsy showed cells with benign characteristics. Under general anesthesia, the patient was placed in the left thoracotomy position on the operating table. After left posterolateral thoracotomy, a hard, and immobile mass, 4x3x2 cm in size, was palpated in the left lower lobe, surrounding the bronchus completely. A biopsy was taken from the mass for frozen section analysis. Histopathological findings were consistent with malignity, so a left lower lobectomy and mediastinal lymph node dissection were performed. Following hemorrhage control, two drains were placed in the left hemithorax. The layers were covered appropriately. Intraoperative bleeding was minimal. Operative time was 90 minutes. There was no complication in the postoperative period. The patient was discharged on the eighth day of the operation. Histopathological examination showed squamous cell carcinoma in situ in the layer epithelium

Received: June 22, 2006 *Accepted*: August 17, 2006

Correspondence: Dr. Sami Karapolat. Dokuz Eylül Üniversitesi Tıp Fakültesi, Göğüs Cerrahisi Anabilim Dalı, 35340 İnciraltı, İzmir.
Tel: 0232 - 426 69 89 e-mail: samikarapolat@yahoo.com

of bronchial structures accompanied by a hamartoma (Fig. 2a). The patient was asymptomatic during a year's follow-up.

DISCUSSION

Hamartoma is defined as an abnormal mixture of tissue elements, or an abnormal proportion of a single element, normally present in an organ. Pulmonary hamartoma is the most frequent benign neoplasm of the lung, occurring in the parenchyma or sometimes within the bronchi.[3] It consists of an admixture of cartilage, loose collective tissue, fat, bone, epithelial clefts, and gland like epithelial aggregates. Depending upon the predominant component, hamartomas can be divided into various subtypes: chondromatous, leiomyomatous, lymphangiomyomatous, adenofibromatous, and fibroleiomyomatous. Chondromatous hamartomas are the most common subtype. Hamartoma is also referred to as fibrolipochondroma.

For hamartomas, the age of presentation is 50 to 60 years, with a male/female ratio of 3-5/1. In our case, the patient was a 38-year-old female. The size of hamartomas may range from 1 cm to larger than 10 cm, but they are usually smaller than 4 cm.

Intraparenchymal hamartomas are usually asymptomatic. However, they may cause complaints like chest pain, dyspnea, cough, and hemoptysis. When the tumor becomes large enough, it may obstruct a bronchus causing atelectasis and recurrent or persistent pulmonary infection. It may sometimes be mistaken for chronic obstructive pulmonary disease, pneumonia, and tuberculosis. Our patient had complaints of cough and dyspnea for more than four years and received medication with a diagnosis of chronic bronchial asthma.

Diagnostic imaging methods include chest roentgenogram, computed tomography, magnetic resonance imaging, and bronchoscopy. In general, hamartomas are discovered incidentally on routine chest roentgenograms as an asymptomatic coin lesion. On chest roentgenograms, intraparenchymal hamartoma appears as a sharply outlined, round or oval mass, with lobulation, calcification, peripheral location, and a size smaller than 3 cm. Computed tomography helps make a differential diagnosis. The major radiographic difficulty with pulmonary hamartomas is to distinguish them from inflammatory and metastatic lesions. Hamartomas must be differentiated from small primary bronchogenic carcinoma and solitary pulmonary nodules. Specific popcorn-type calcification is almost pathognomonic for pulmonary hamartoma. In our patient, computed tomography of the thorax showed a 3x2-cm mass surrounding the left main bronchus concentrically at the paramediastinal site of the lower lobe of the left lung. The mass, descending aorta, and left inferior pulmonary vein were separated by fat plans, suggesting that the mass was not attached to the major vessels. With these computed tomography findings, the initial diagnosis of the mass included pri-

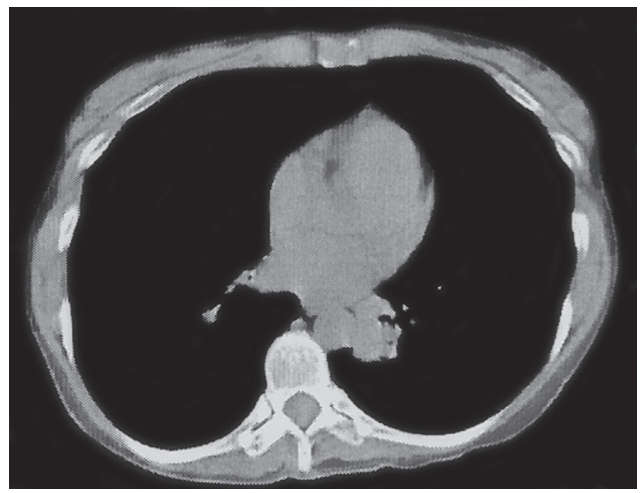

Fig. 1. Computed tomography of the thorax showing a mass in the lower lobe of the left lung.

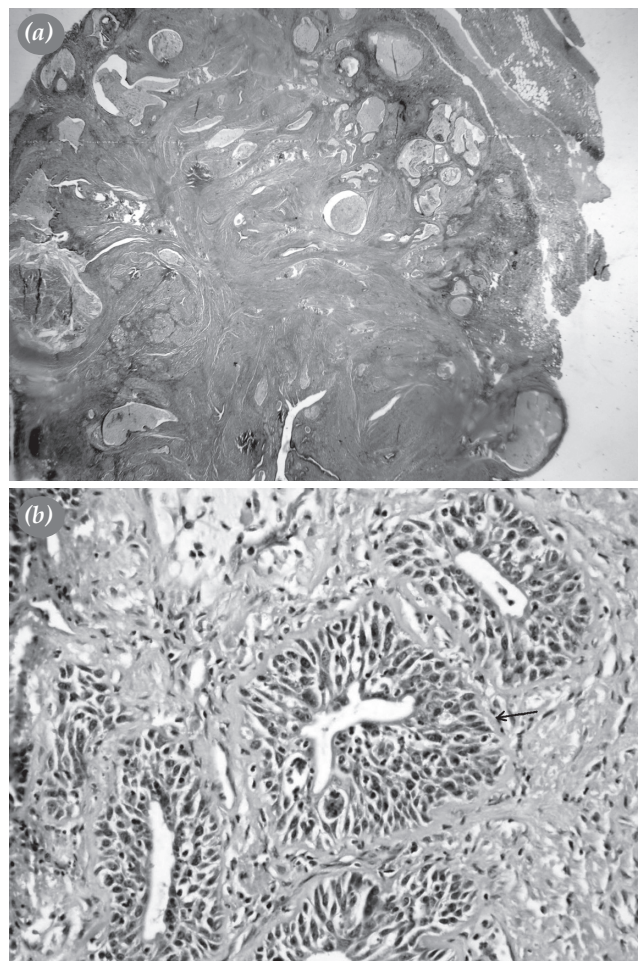

Fig. 2. (a) Hamartoma and in situ squamous cell cancer (H-E x 2). **(b)** Severe atypical squamous metaplasia and squamous cell carcinoma in situ areas in the bronchial epithelium (arrow) (H-E x 100).

mary lung cancers, bronchial carcinoid tumors, vascular tumors, or benign neoplasms of the lung.

Parenchymal hamartomas are not visible on bronchoscopy. However, indirect tumor findings can be visualized by bronchoscopy. In our patient, computed tomography, bronchoscopy, and transbronchial fine-needle aspiration biopsy were performed preoperatively. Yet, the precise diagnosis was made after histopathological examination.

Surgical treatment is the gold standard in intraparenchymal hamartomas including enucleation, lobectomy or sleeve resection, wedge resection, segmentectomy, and pneumonectomy. Endobronchial hamartomas can be removed successfully through bronchoscopy.[4]

We could easily reach the mass through a left posterolateral thoracotomy in our patient. The mass was firm, fixed, and immobile. Upon detection of malignancy in frozen section analysis, left lower lobectomy and mediastinal lymph node dissection were performed.

Although hamartomas are benign tumors, they may rarely assume malignant characteristics and may be invasive to surrounding tissues.[5] Besides, some other lung pathologies may rarely accompany pulmonary hamartomas such as bronchiectasis, primary lung cancer, tuberculosis, and metastatic tumors of the lung. It has been recommended that patients with hamartoma should be thoroughly evaluated and closely followed-up with respect to the risk for associated synchronous malignancies.[6,7]

In addition to hamartomatous lesions in the fibromuscular stroma, squamous cell carcinoma in situ was determined in the epithelial layer of the bronchial structures. The tumor was composed of cartilage, fibromyxoid stroma, and adipose tissue with incorporated bronchiolar epithelium. Areas of severe atypical squamous metaplasia and squamous cell carcinoma in situ were seen in the bronchial epithelium which was surrounded by the basal membrane (Fig. 2b). Hemorrhage and atelectasis sites were noted in the lung parenchyma around the lesion. No pathology apart from intensive anthracosis was observed in lymph node specimens. Based on these findings, the stage of the tumor was rated as $T_{is}N_0M_0$.

Tojo et al.[8] reviewed some 50 reports of lung cancer accompanying chondromatous hamartoma and summarized some common features as follows: men past middle age, adenocarcinoma, and lung cancer and chondromatous hamartoma present in the same lobe. In our case, the tumor accompanying hamartoma was squamous cell cancer and it was in situ stage.

In conclusion, hamartomas can be seen together with lung malignancies. However, the question whether the accompanying malignancy is a coincidental occurrence or is associated with malignant growth in the existing hamartoma layer remains uncertain. It should be kept in mind that hamartomas greater than 4-5 cm, firm, and fixed on manual examination during operation should raise suspicion for malignancy. In such cases, perioperative histopathological examination is required to determine the existence of malignancy and the extent of surgical procedure.

REFERENCES

1. Kim GY, Han J, Kim DH, Kim J, Lee KS. Giant cystic chondroid hamartoma. J Korean Med Sci 2005;20:509-11.
2. Sharkey RA, Mulloy EM, O'Neill S. Endobronchial hamartoma presenting as massive haemoptysis. Eur Respir J 1996; 9:2179-80.
3. Kurkcuoglu IC, Demircan S, Kurul IC, Demirag F. Endobronchial lipomatous hamartoma. Asian Cardiovasc Thorac Ann 2005;13:372-3.
4. Sahin AA, Aydiner A, Kalyoncu F, Tokgozoglu L, Baris YI. Endobronchial hamartoma removed by rigid bronchoscope. Eur Respir J 1989;2:479-80.
5. Poulsen JT, Jacobsen M, Francis D. Probable malignant transformation of a pulmonary hamartoma. Thorax 1979;34:557-8.
6. Ribet M, Jaillard-Thery S, Nuttens MC. Pulmonary hamartoma and malignancy. J Thorac Cardiovasc Surg 1994;107:611-4.
7. Higashita R, Ichikawa S, Ban T, Suda Y, Hayashi K, Takeuchi Y. Coexistence of lung cancer and hamartoma. Jpn J Thorac Cardiovasc Surg 2001;49:258-60.
8. Tojo Y, Bandoh S, Fujita J, Ishii T, Ueda Y, Okamoto T, et al. A case of synchronous primary lung cancer with hamartoma. Nihon Kokyuki Gakkai Zasshi 2003;41:474-9. [Abstract]