

Case Report: Lung Cancer in A Very Young Male

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Abstract

Lung cancer is rare disease in patients under 20 years of age. It typically occurs in older patients with a History of tobacco use. This case concerns a 17-year-old man with history of tobacco one pack/day since 8 years old. He complained of several months of cough and hemoptysis which developed recently. He was treated for pneumonia after a chest radiograph which showed a rounded, multi lobular opacity of the left lower lung. CT scan imaging subsequently revealed mass at the peripheral part of the left lower lobe, adjacent to the chest wall. No mediastinal lymphadenopathy in CT scanning. Transthoracic needle aspiration guided by CT scan was performed, the cytology report revealed adeno carcinoma.

Keywords: Lung Cancer; Non-Small-Cell Lung Cancer; Young Age

Introduction

Lung cancer is the leading cause of death for men and women in the United States, surpassing deaths from breast, prostate, and colon cancer [1]. The age-adjusted incidence for 2006 reveals that lung cancer is the number one cause of death for men over the age of 40 and for women over the age of 60 [1]. Increasing age and tobacco use constitute the strongest risk factors for lung cancer. Young patients less than 20 years of age without a history of tobacco use, environmental exposures, or genetic predisposition are only rarely diagnosed with lung cancer even those with history of tobacco use itself.

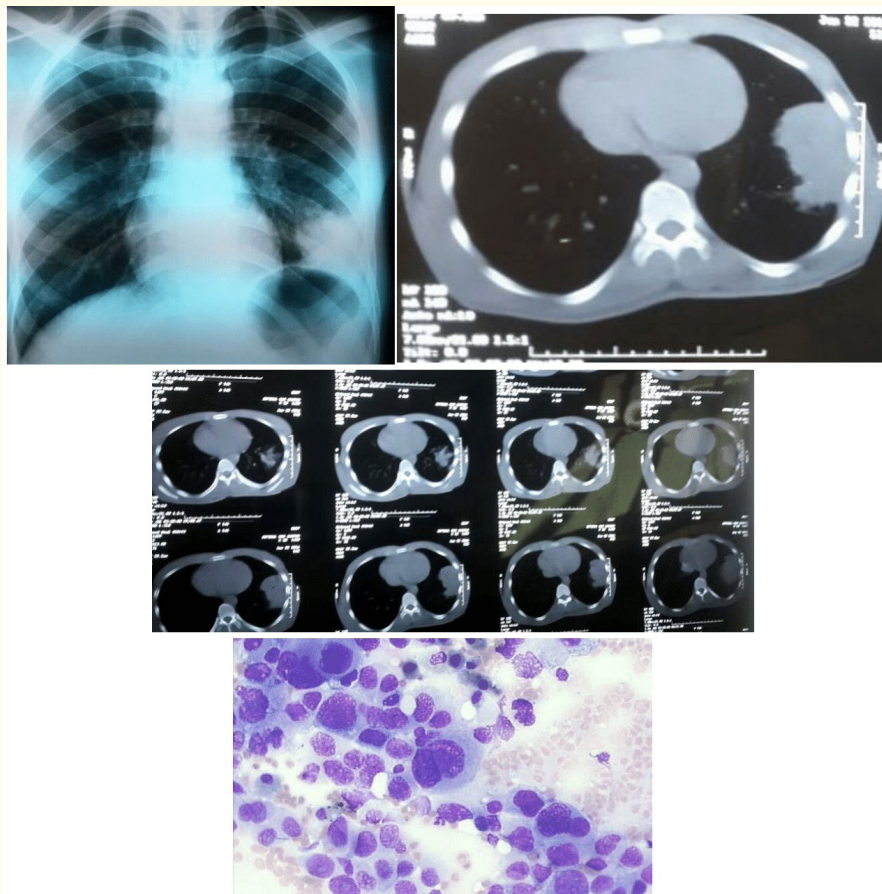
Case Report

A 17-year-old man presented himself to Hospital National Guido Valadares, Dili, Timor Leste, with a several-months history of cough and hemoptysis (blood streak) and weight loss. He had no shortness of breath, chest pain, headache, nausea or vomiting. He had a history of tobacco use (one pack a day since he was 10 years old). No history of Tb contact or any infectious disease. None of his family has history of malignancy, on physical examination, he appears with a moderately good general condition, less nourished, without dyspnea, cyanosis, lately he developed mild fever. There is no enlargement of neck or supraclavicular lymph nodes. The chest are clear, the heart is not enlarged, the heart sounds are normal. There is no abnormality of abdomen or extremities.

A posterior anterior chest radiograph revealed a multi lobular opacity at the left lower lobe lung. Adjacent to the chest wall. The hilus is not enlarged, the left diaphragm is elevated. The rest of the lung fields are clear. CT scan imaging of the thorax revealed a 5 x 4 x 3 cm mass in the periphery of the left lower lobe, adjacent to the chest wall, with spiculae. There is no destruction of the costae and no mediastinal lymphadenopathy or pulmonary metastasis is seen. Laboratory investigation shows no abnormality, there is no sign of acute or chronic

infection, infectious serology's were negative. Transthoracic needle aspiration guided by CT scan was performed, the cytology report revealed adeno carcinoma. The EGFR mutation test is not yet performed.

The patient was diagnosed as primary adenocarcinoma of the left lung, T3N0M0 (stage 3A). He was urgently referred to the thoracic surgeon for lower lobectomy.



Rare case of lung cancer in a male, 17 years old with persistent cough and a long history of tobacco use. Postero anterior chest radiograph revealed a multi lobular opacity at the left lower lobe lung, adjacent to the chest wall. The hilus is not enlarged, the left diaphragm is elevated. The rest of the lung fields are clear (top right). CT scan imaging of the thorax revealed a 5 x 4 x 3 cm mass in the periphery of the left lower lobe, adjacent to the chest wall, with spiculae (top right). There is no destruction of the costae and no mediastinal lymphadenopathy or pulmonary metastasis is seen (bottom left). Cytological specimen from Trans thoracic needle aspiration contains malignant cells of adenocarcinoma (bottom right).

Discussion

Lung cancer is the leading cause of cancer-related death worldwide, with NSCLC accounting for 85% of all lung cancers [2]. Lung adenocarcinoma has the highest incidence among lung cancer patients, with a sex-specific incidence of about 30% in men and 37% in

women in the United States [3]. The strongest risk factors for lung cancer are tobacco use and age, although small-cell lung cancer and squamous cell lung cancer have a stronger association with tobacco use than does lung adenocarcinoma [3].

In patients under 20 years of age, NSCLC is exceedingly rare, having an incidence rate for 2002 - 2006 of 0.3 per 100,000 [4]. In Asian countries like Thailand and Indonesia, lung cancers are rare among patients under the age of 40 [5]. Data from Dharmais Cancer Hospital and Persahabatan Hospital in Jakarta shows only 5.9 - 15 patients are under 40 years old. In India, 40% of patients are under 50 years of age and only 11% are less than 40 years of age [6].

The most common type's cancers in this group of patients are pleural pulmonary blastoma, germ-cell tumors (terato carcinoma), carcinoid, and metastatic cancer from a non-lung primary, namely mediastinal tumors [7]. In reference to NSCLC occurring in young people, a higher incidence of adenocarcinoma is seen in female patients, and most cases show no history of tobacco use [8].

The patient we are reporting is very young male (17 years old) with 8 years history of cigarette smoking, since he was only an 9 years old child. It is our opinion that genetic factors may have a greater role in the development of cancer in this patient population, beside tobacco use since very young age. The reason for this is the fact that the size of the tumor in the chest x-ray film and CT is more than 7 cm, which may have taken several years to reach such a big size. Genetic factors are known to play a role in the development of lung adenocarcinoma, and familial genetic clustering of lung cancer has been found. Common gene mutations in KRAS, EGFR, and TP53 have been associated with a higher risk for the development of lung adenocarcinoma. We do not know the EGFR or KRAS status for this patient's tumor, since these tests are not yet performed in our hospital.

The location of the tumor in this patient is peripheral, so it is not very difficult for us to perform biopsy using fine needle aspiration from the chest wall. It may have been very difficult to show the tumor using bronchoscopy. Since clinically there is no sign of metastasis of brain, bones and other organs, we diagnose the patient as adenocarcinoma of the left lung, stage 2B (T3N0M0) and suggest him to undergo surgery.

Survival in this group of patients remains highly variable. Mizushima, *et al.* found no difference in survival between lung adenocarcinoma patients less than and more than 30 years of age [8]. Similarly, a retrospective study of patients younger than 50 years of age compared with those older than 50 found no difference in survival or in time to disease progression [9]. In contrast, two other studies found a worse prognosis for young patients with lung adenocarcinoma than for their older counterparts [10].

Because of the death of cases, data evaluating the effectiveness of treatment for lung cancer in patients under 20 years of age are limited. Combined modalities of chemo radiation and surgical resection have been tried and compared. Bourke, *et al.* [13] studied lung cancer in patients less than 45 years of age, comparing them with patients more than 45 years of age at three different geographic sites [11]. In that study, lung cancer staging was demonstrated to be the factor most determinant for survival in patients less than 45 years of age [11,12].

Conclusions

This is the first report of a lung cancer case in a very young patient from Timor Leste. Adenocarcinoma under the age of 20 years are rare. Additional malignancies to be considered for thoracic masses in this age group include germ cell tumours (teratocarcinoma), lymphoma, carcinoid, and metastases from a non-lung primary cancer. The prognosis of metastatic NSCLC including adeno carcinoma in young patients remains poor.

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