Case Report

Adenocarcinoma of the Lung with Unusual Widespread Contralateral Lung Metastases in a Young Nonsmoker

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Abstract

Lung cancer is a fairly common malignancy, after breast cancer in women and prostate cancer in males. Most cases of cancer of the lung occur in older patients with a history of tobacco use or other risk factor(s). It rarely occurs in patients under 25 years of age. Female patients with family history appear to develop lung cancer at an earlier age. In patients with extensive disease, intrathoracic metastases often spread to the mediastinum, ipsilateral pleura, body thoracic skeletal, and the ipsilateral lung. However, contralateral lungs metastasis is a very rare finding. This case report involved a 23-year-old male, nonsmoker that presented adenocarcinoma of the lung with an unusual widespread contralateral metastasis.

Keywords: Adenocarcinoma, lung metastasis, nonsmoker

Introduction

Adenocarcinoma of the lung, a fairly common form of nonsmall cell lung cancer constitutes between 25% and 30% of all lung cancers.[1] Active cigarette smoking remains the single most significant risk factor, other established risk factors include; passive cigarette smoking, chronic pulmonary scar, and heavy occupational exposure to dust containing radioactive materials, chromates, asbestos, tar, and nickel.[1,2] Cyto-histopathological test(s) is the mainstay of establishing the diagnosis. Imaging tests are valuable in initial evaluation, determining the stage, and monitoring of the disease. The lesion could be seen on the chest radiograph, but has a limited value in staging of tumor. Detailed assessment could be achieved by computerized tomography (CT) scans, magnetic resonant imaging (MRI), positron emission tomography (PET), and PET-CT.[3] Adenocarcinoma of the lung has a varied presentation. The shape could be a small oval or sphere often located peripherally located, either as smooth single or more nodular tumor. Rarely, it may be centrally located or speculated or marginated. In advanced cases, often the foci for metastases include; bones, adrenals, brain, and kidney.[2,3] Intrathoracic metastatic lesion is often associated with extensive adenocarcinoma. The spread of the metastatic lesion commonly involves the mediastinum, ipsilateral pleura, body thoracic skeletal, and the ipsilateral lung.[3,4] However, contralateral lungs metastasis are very rare finding.[2-4] This case report involved a 23-year-old male, nonsmoker that presented adenocarcinoma of the lung with an unusual widespread contralateral metastasis.

Case Report

The case involved a 23-year-old male student who presented with 3 months history of chronic cough productive of whitish sputum with occasional hemoptysis and progressive weight loss. It was not associated with fever or night sweat, and there was a history of contact with an adult with chronic cough. No history of cigarette smoking and history exposure to any industrial waste. On examination, he was chronically ill-looking and wasted, dyspnoeic with respiratory rate of 20 cycles/min. Other finding on both physical and systemic examination was normal.

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His chest radiograph at presentation [Figure 1], showed two huge well circumferences right upper and middle lobe masses with obliteration of adjacent mediastinal margin. The right pleural effusion was also noted. The left lung and the thoracic cage were normal. Mycobacterial smears and cultures of obtained sputum were negative. The histologic examination of pleural biopsy specimen revealed lung adenocarcinoma. Skeletal survey and abdominal ultrasound did not reveal any other site of metastasis. He was staged as T4N0M0 and commence on chemotherapy. However, one month after the initial presentation, the patient developed progressive shortness of breath, with deterioration of the clinical symptoms. Repeat chest radiograph [Figure 2] and high-resolution CT scan of the chest [Figure 3] reveals complete right opaque hemithorax suggestive of massive effusion and multiple widespread masses of varying shape and sizes in the contralateral lung. The patient was diagnosed as having stage IVa lung cancer (T4N1M1). The patient was being evaluated for possible cytotoxic chemotherapy. However, the patient clinical condition rapidly deteriorated, and died of respiratory failure.

Discussion

Adenocarcinoma of the lung, a form of nonsmall cell lung cancer. It could present as either papillary, acinar, bronchioloalveolar, or solid form. Established risk factors include; chronic active and passive cigarette smoking, chronic pulmonary scar, and heavy exposure industrial carcinogens such as asbestoses, arsenic, and nickel.[3,4] However, adenocarcinoma is the most common lung cancer among the nonsmoker and young which is in agreement with the above case.[1,3,5]

Conventional methods of evaluation for adenocarcinoma involve assaying biochemical markers such as alkaline phosphatase assessment of liver function tests. Others include skeletal survey using bone scintigraphy and imaging of the body with, plain radiographs, CT scan, MRI, and PET.[3,4] In the index patient, the tumor staging and metastasis search are limited to a chest CT, abdominal ultrasound scan, and skeletal survey due to the absence of extrathoracic symptoms and signs.[3]

Adenocarcinoma of the lung typically presents as a small smoothly outlined solitary or multiple peripheral lesion. In rare cases, it may be centrally located and/or with speculation. Calcification is seldom seen on plain chest radiographs; however, lesion appearing in the form of amorphous or eccentric calcification has been reported in about 6% of cases on CT scan. Other intrathoracic findings include; hilar and mediastinal lymphadenopathy.[2-4] Our patient initially presented with two centrally located masses and pleural effusion. Later develops widespread masses in the contralateral lung which is quite unusual.[5]

Tumor resection is the treatment of choice for adenocarcinoma of the lung, therefore accurate staging is essential for the determination of surgical candidates.[2-4] The universally accepted method of staging is the (TNM); it involves the assessment of the primary tumor (T), involvement of regional lymph node (N), and metastasis (N). CT scan is valuable in determining the T-staging, it can assess the extent including looking for satellite nodes as was done in this patient. The PET-CT is the best investigation for determining the stage of the disease based on the N and M staging system.[3-5]

T1 includes smaller tumors (<3 cm), surrounded by lung parenchyma. T2 include tumors >3 cm with involvement of either limited obstructive pneumopathy, atelectasis, or visceral pleura. It also includes tumor involving the main bronchus >2 cm from the carina. T3 includes; tumor with entire lung obstructive pneumonitis or atelectasis or tumor in the main bronchus <2 cm from Carina without involving it or tumor deposit seen on pericardium, diaphragm, chest wall, or mediastinal pleura.

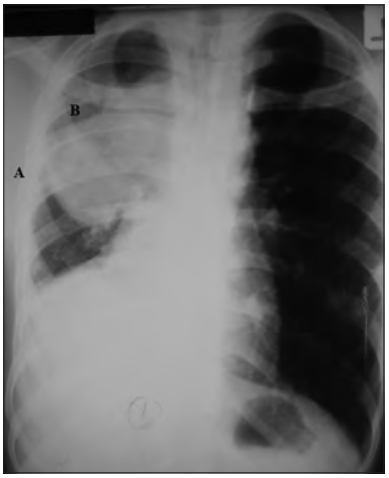

Figure 1: Chest radiograph of the patient at presentation showing 2 huge well circumferences masses (A and B) in the right upper and middle lobe with obliteration of adjacent mediastinal margin. Right pleural effusion is also noted

Figure 2: Repeat chest radiograph (a month after) showing right opaque hemi-thorax with spare apex suggestive of massive effusion and multiple widespread opacities of varying shape and sizes in the contralateral lung suggestive of metastases

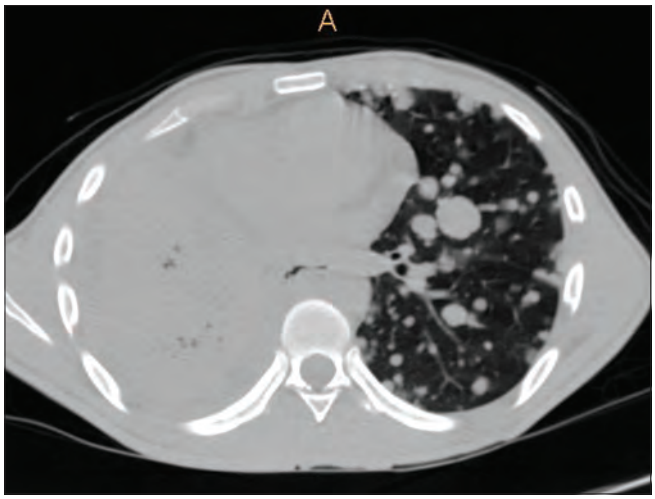

Figure 3: High resolution computerized tomography scan of the chest showing massive right pleural effusion and multiple widespread hyperdense masses of varying shape and sizes in the contralateral lung suggestive of metastases

T4 stage includes; involvement of vital organs such as the heart or large blood vessels, esophagus, trachea) or vertebral body or malignant pericardial or pleural effusion (supported by cytology) or metastatic tumor lesion originating from the same lung (supported by biopsy result).[4,6,7] Our patient had histologic evidence of adenocarcinoma [Figure 4] and cytologic evidence of malignant effusion which is in keeping with stage T4 tumor.

N2 disease connotes ipsilateral tumor lesion in the lymph node located either the hilum or peribronchial structure. Conversely, N3 represents metastatic node involvement in mediastinum, scalene, or supraclavicular region.[3-6] In M staging; M0 indicates no lesion, M1a represents separate tumor nodule (s) in the opposite lung lobe; tumor with malignant pleural (or pericardial) effusion or pleural invasion, and M (1b) indicates distal spread of the lesion.[3,6,7] our patient was stage T4N0M0 initially but later progress to T4N0M1a, both indicate very advance conditions.

The risk of distant spread of adenocarcinoma increases with advance in the stage of the disease. In the index patient, the only site of distal seeds is contralateral lung, which is not among the documented common sites.[4,7] In the early stage (T1 or 2, N0) lung cancer, occult metastatic foci is rare often seen in <1%, and therefore evaluation for the distant spread in these patients is not routinely indicated.[3,6] The index case presented in stage is T4 due to malignant effusion. However, the initial metastasis search was negative by chest radiograph, skeletal survey, and abdominal ultrasound

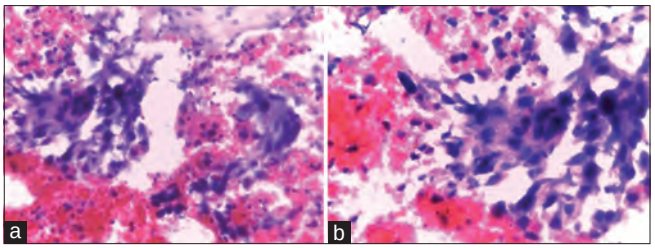

Figure 4: Photomicrographs: (a)-trucut lung tissue displaying malignant epithelial neoplasm disposed in nests with attempt at acini formation, consistent with adenocarcinoma, hematoxylin and eosin stains, ×100. (b)-High magnification hematoxylin and eosin stains, ×200

scan.[3.5] Distant tumor deposits are consistent with stage IV lung cancer. Surgery is not the treatment of choice for cases in the advance state; however, and resection of the isolated lesion has been shown to improve survival. TNM stage IV is considered non a resectable tumor, hence the treatment option is palliation.[3,7]

Conclusion

We report a 23-year-old male nonsmoker, who presented with advanced carcinoma of the lung with unusual widespread contralateral lung metastases and malignant pleural effusion. Intrathoracic metastases to contagious organs are very common in patients with advance disease but contralateral lung seeding is uncommon.

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Conflicts of interest

There are no conflicts of interest.

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