

A Lung Abscess on CT Scan: Think of Lung Cancer

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Abstract Background: Lung cancer can be present with lung abscess in up to a third of lung abscess cases. However, lung cancer is often overlooked as an underlying condition while making a diagnosis of lung abscess. Case report: The authors present a case of a 69-year-old male that experienced a syncopal episode, accompanied by productive cough and shortness of breath. Lung abscess was diagnosed, and the patient was placed on antibiotics with no improvement in the cough after a week. Additional tests were performed, and latent squamous cell carcinoma was discovered. Conclusion: Since lung cancer can masquerade as lung abscess, physicians should have a high suspicion for lung cancer whenever there is a radiographic diagnosis of lung abscess, especially in patients with risk factors for lung cancer.

Keywords: lung abscess, lung cancer, case report

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1. Introduction

Lung abscess can occur with lung cancer and present difficulties in diagnosis. The underlying lung cancer can be overlooked, and patient placed on long treatment with antibiotics with valuable time lost in making a diagnosis of a malignant cancer. [1,2] Physicians should have a high suspicion for lung cancer whenever there is a radiographic diagnosis of lung abscess especially in patients with risk factors for lung cancer. We present a case of lung cancer that was initially diagnosed as a case of lung abscess and treated with antibiotics without clinical improvement.

2. Case Presentation

69-year-old male with diabetes type 2 and hypertension was brought in by ambulance after a syncopal episode. Patient reports feeling dizzy and fell at home while walking during his coughing spells. Patient reports productive cough with white sputum that has been ongoing for the past year with associated shortness of breath.

In the emergency room, blood pressure was 117/72mmHg, heart rate 99, respiratory rate 20, and temperature 98.8F. Physical examination revealed a patient that was alert and oriented with no other remarkable findings apart from bilateral crackles on lung examination. Hemoglobin was 12.1g/dl, white blood cell count was 13,100/ml, and platelets 256,000/ml. Urinalysis, hepatic and renal parameters and arterial blood gas were normal. Chest x-ray showed lung fibrosis but could not

rule out lung infiltration. Patient was admitted for syncope and pneumonia and started on intravenous antibiotics.

Chest computed tomography (CT) angiogram (Figure 1 and Figure 2) on day 1 of admission showed lung fibrosis and enlarged mediastinal and hilar lymph nodes and 7 cm in diameter low density mass containing multiple small air pockets, with need to rule out left lower lobe lung abscess. On day 2 of admission, interventional radiologist had a successful CT-guided aspiration of the left lobe lung abscess and 10 mL of purulent aspirate was sent for laboratory analysis. Patient was continued on antibiotics by the infectious disease team for possible lung abscess without relief of his cough.

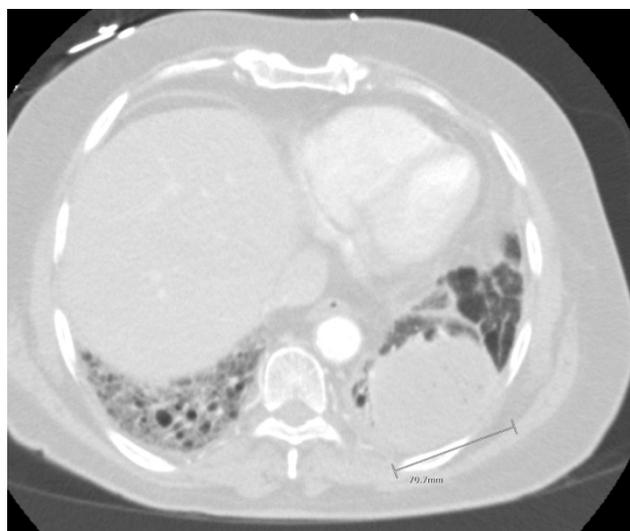


Figure 1. CT chest showing lung mass with air pockets (axial plane)



Figure 2. CT chest showing lung mass with air pockets (Coronal plane)

Bronchoscopy showed a left lower lobe that was quite inflamed, friable and edematous but no evidence of endobronchial growth. Gram stain, fungal and lower respiratory cultures were negative. Tests for legionella, mycoplasma pneumonia, acid fast bacilli, Bordetella pertussis, respiratory syncytial virus and influenza were all negative. Cytology of the bronchial washings showed atypical cells present suspicious for squamous cell carcinoma. Cytology of CT guided lung aspiration showed necrotic keratinized squamous epithelial cells favoring squamous cell carcinoma. MRI brain, and CT abdomen and pelvis did not show any metastasis. Patient was discharged to follow up with the oncologist with a PET scan as outpatient.

3. Discussion

3.1. Epidemiology of Lung Abscess/Neoplastic Lung Abscess

Patients presenting with lung abscess have associated lung cancer in 7 to 36% of cases depending on patients' age and prior exposure to lung cancer risk factors. [1,2] Men account for 60% of all lung cancer cases, and smoking is the predominant risk factor associated with lung cancer, accounting for an estimated 80-90% of all cases of lung cancer. The risk of lung cancer increases as the number of cigarettes and duration of smoking increases. [3] There are four major histologic subtypes of lung cancer including squamous cell carcinoma, adenocarcinoma, small-cell carcinoma, and large-cell carcinoma with the commonest being adenocarcinoma (30.7% of cases) and squamous cell carcinoma (30% of cases). [3]

3.2. Pathology/Pathogenesis of Neoplastic Lung Abscess

Local conditions, host resistance and infecting agents all play a role in the formation of lung abscesses. Development of lung abscess is predisposed by common risk factors such as: aspiration from the nasopharynx, mouth or stomach, a prior pneumonia, a history of alcohol abuse, bronchiectasis, immunosuppression or a (malignant)

endobronchial obstruction. [1] Poor dental hygiene has also been linked to lung abscesses due to the presence of specific bacteria, microbiomes or flora in the oral cavity. [4,7] Since lung cancer can masquerade as lung abscess, repetitive cytology, or additional analysis of pleural fluid may be necessary in lung abscess with initial negative cytology results when malignancy is suspected. [6]

3.3. Clinical Features of Lung Abscess/Neoplastic Lung Abscess

Symptoms of lung abscess include cough, purulent sputum, chest pain, fever, dyspnea, hemoptysis, anorexia/malaise, hoarseness, dysphagia, bone pain, clubbing, supraclavicular nodes, pleural effusion, hepatomegaly, as well as neurological manifestations like headaches, syncope, or seizures. [1,3] Often with cases of malignancies, vascular involvement, bronchial obstructions, and suppurative obstructive pneumonia are also present. [1]

In cases of squamous cell carcinoma, lung abscesses typically appear with cavitation, but not always with the presence of a mass lesion. Attention should be paid to air fluid levels as well as irregularities within the wall of the cavity with varied thickness, as both may suggest a malignant tumor. [6]

3.4. Diagnosis and Treatment

CT of the chest, bronchoscopy and cytological analysis of the abscess fluid are often helpful to diagnose underlying lung cancer. [1] The diagnostic accuracy of a chest X-ray is low. An irregular internal wall is found more frequently in malignant cavitary nodules than in benign ones when analyzing a CT. [1] Fine needle aspiration with cytological analysis may yield a faster diagnosis of an underlying malignancy. [2]

Definitive diagnosis of lung cancer and lung cancer type can only be made by pathology using a cytologic or surgical biopsy specimen. Cytologic specimens can be obtained through sputum, bronchoscopy or transthoracic fine needle aspiration biopsy while histologic biopsy specimens can be obtained from endobronchial, transbronchial, transthoracic, or open biopsy procedures. [3]

CT scan, positron emission tomography (PET), radionuclide bone scan, and histological evaluation of mediastinal lymph nodes are helpful in staging the cancer and checking for metastasis prior to treatment. Treatment options include surgery (lobectomy, bilobectomy, or a pneumonectomy), chemotherapy, radiotherapy or palliative therapy depending on stage of disease and presence of significant comorbid illness. [3]

In summary, it is difficult to distinguish benign symptomatic lung abscesses from malignant ones due to similar clinical features, symptoms, and underlying pathology. Physicians should have a high suspicion for lung cancer whenever there is a radiographic diagnosis of lung abscess especially in patients with risk factors for lung cancer. Proper diagnostics are necessary so as not to delay an underlying diagnosis of lung cancer, thus maximizing the outcome of the diagnosis. Since lung cancer can masquerade as lung abscess, repetitive cytology, or additional analysis of pleural fluid may be

necessary in lung abscess with initial negative cytology results when malignancy is suspected. [6]

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