



Multiple Bilateral Parenchymal Cavitory Lung Lesions: A Case Report

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Several infections and diseases can cause lung cavitation. Pulmonary metastases are common from a variety of tumors and they can spread via blood or lymphatic system. In this report, we present a 54 year-old man with multiple bilateral parenchymal cavity lesions with a ground glass manifestation. According to immunohistochemistry (IHC) results of both cell block sample and lung biopsy specimen, pulmonary primary cancers were excluded and the diagnosis of metastatic carcinoma was established.

Keywords: Carcinoma; cavity lesions; pulmonary metastases.

1. INTRODUCTION

The drainage of necrotic material through the bronchial tree produces a pulmonary cavity. Several infections and diseases can cause lung cavitation including bacterial causes,

inflammatory disease, bronchiectasis, pulmonary embolism and metastatic cancer. The most common cancers responsible for cavitory pulmonary metastases are: bowel cancer, [1,2] kidney cancer, [2] bladder cancer, [3,4] prostate cancer, [5] stomach cancer, [2,6] breast cancer,

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[7] cancer of the head, neck and urogenital system, [8] opposite lung, cervix, esophagus, pancreas, larynx and anal canal cancers [2] and rarely others. Though, pulmonary metastases are common from a variety of tumors and can be spread via blood or lymphatic system.

Symptoms of these types of lesions may include: a persistent cough, shortness of breath, recurrent chest infections, weight loss, hemoptysis, pleural effusion. In this report, we present a patient with dyspnea and multiple bilateral parenchymal cavity lesions.

2. PRESENTATION OF CASE

The patient was a 54 year-old man from Iran, working as a shovel man, with no history of alcohol intake. He smoked for 2 years, 40 years ago and reported cessation since then. His past medical history was remarkable for hypertension, asthma and a recent cerebro-vascular accident 3 months ago. In the past two weeks, he had hemoptysis. Furthermore, he reported appetite reduction and weight loss about 6 kg, during the last 3 months. Before getting admitted to the hospital, his medications were Amlodipine, 5 mg per day and Aspirin, 80 mg per day. On presentation, the patient had tachypnea and fever and was looking ill. Examination of both breasts was normal. Hepatomegaly, splenomegaly or peripheral lymphadenopathy was not detected. The patient's vital signs were pulse 84/min, blood pressure 130/70 mmHg, temperature 38.7 centigrade degree, O₂ Saturation without oxygen 87% and respiratory rate 22 rate/min. Main laboratory findings included hemoglobin 13.1, WBC 11600, plat 187000, Cr 1.1, negative blood culture (tested 2 times to examine bacteria and fungi), normal liver function tests, normal urine analysis, negative urine culture, normal stool culture (tested 3 times), negative galactomannan, negative human immunodeficiency virus (HIV) antibody, negative beta-glucan, negative purified protein derivative (PPD) test.

Computed Tomography (CT) scan of the lungs revealed multiple bilateral cavity lesions in the lung parenchyma with a ground glass pattern (Fig. 1). Lung biopsy specimen (wedge biopsy) was prepared by the surgeon and pathologic evaluation followed, demonstrated multiple clusters of neoplastic epithelial cells with papillary appearance, anthracotic fibrotic changes and mild emphysematous pattern (Fig. 2).



Fig. 1. Lung MDCT: Multiple lung cavities and ground glass pattern

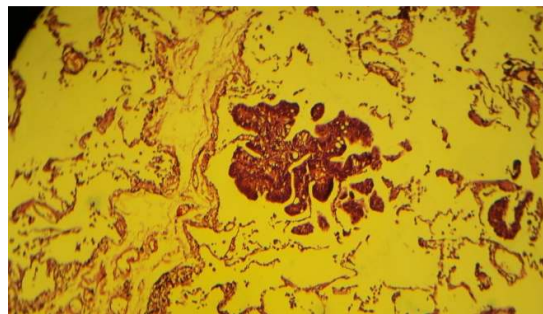


Fig. 2. Neoplastic epithelial cell mostly papillary or in small group in pattern

In the IHC performed on both cell block specimens provided from pleural effusion and lung biopsy specimen, metastatic carcinoma was reported (IHC staining was negative for thyroid transcription factor1 (TTF1), Calretinin, CK20, CD117, P63, WT1, napsin A, PSA, thyroglobulin and P40 and positive for CK7).

Additionally, serum tumor markers including carcinoembryonic antigen (CEA), cancer antigen (CA) 19-9 and CA125 were recorded with high titer. A week after hospitalization, the patient reported diplopia and blurry vision. A brain Magnetic Resonance Imaging (MRI) was then ordered, which revealed acute infarctions in right inferior parietal and left occipital lobes of the brain.

In abdominopelvic multidetector CT scan (MDCT) with intra venous (IV) and per os (PO) contrast, no tumor mass or metastases were observed. Bronchoscopy and bronchoalveolar lavage (BAL) were performed and provided specimens were sent for microbiological analysis, in which no evidence of tuberculosis (TB), pneumocystis pneumonia (PCP) or other infection was found. In sigmoidoscopy, no pathologic lesion was seen. Considering patient's

poor general condition and progressive disease; more diagnostic procedures such as colonoscopy and upper GI endoscopy were considered to be impossible.

Ten days after admission, the patient was intubated due to respiratory distress and hypoxemia. He succumbed 5 days later.

3. DISCUSSION

Occasionally, secondary lung cancers are diagnosed in the presymptomatic stage, during tests to diagnose the primary cancer. Rarely, the first symptoms can be provoked from a secondary lung cancer. A primary lung cancer can produce a cavity, but multiple cavitory lesions due to primary lung cancer are rare. However, multifocal bronchoalveolar cell carcinoma can occasionally present with multiple cavitory lesions [9]. Alternatively, any cancer can spread to the lung. Metastatic lung lesions can also cavitate, but this occurs less frequently when compared with primary lung cancers. The frequency of cavitation is 4% in metastatic tumor detected by plain radiograph [2].

Overall, cavitory lung metastasis can occur in any histological type of carcinoma. However, squamous-cell carcinoma is the most common cause of cavitation metastases, comprising 69% of these instances [10] Other malignant causes include colon carcinoma [11], ovarian cancer, [12] basal cell carcinoma [13], squamous cell carcinoma of the head and neck [14] and other less frequent cancers [15].

Given that the results of IHC, calretin and WT1 were reported negative, the diagnosis of mesothelioma was rejected. Also, TTF1 and napsin A were negative, which is against the existence of lung adenocarcinoma. P63 and P40 were negative, which excludes the existence of squamous cell carcinoma. PSA and Thyroglobulin were negative, which suggest non-existence of prostate cancer and thyroid cancer, respectively. However, co-existence of CK7 positivity with negative CK20 may be indicative of existence of pancreatic carcinoma, cholangiocarcinoma, breast carcinoma, thyroid carcinoma or other cancers.

As already mentioned, cavitory lung lesions can be caused by infections (such as bacteria and fungi), primary lung cancer or metastases. In the described case, according to the results of the laboratory tests and—the examination of BAL

specimen of the patient, Infections were excluded. Moreover, based on the IHC of biopsy specimen of the lung and cell block from the pleural fluid, primary lung cancers were also ruled out. Therefore, carcinoma pulmonary metastases could be the most probable cause of cavitory lesions in this patient.

4. CONCLUSION

The initial manifestation of a carcinoma can be lung involvement. Therefore, in cases where no obvious source of lung lesions is detected and especially when patient's history is indicative of malignancy (e.g. weight loss, loss of appetite, etc.), specific diagnostic tests should follow in order to uncover the primary source of cancer.

CONSENT

As per our hospital's standard procedure, written patient consent has been collected and preserved by the authors.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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