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(CASE REPORT)

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Fatal alliance: Aspergillosis and bronchial Adenocarcinoma: A case report

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Abstract

Pathological coexistence in pulmonary diseases poses significant diagnostic and therapeutic challenges, especially when fungal infections overlap with malignant neoplasms. Aspergilloma, an opportunistic infection caused by *Aspergillus* spp., typically develops in pre-existing pulmonary cavities, while bronchial adenocarcinoma represents one of the most aggressive forms of lung cancer. The coexistence of these two conditions is rare but can greatly complicate clinical management and diagnosis. Here, we present a unique case of aspergilloma associated with advanced bronchial adenocarcinoma in a patient with superior vena cava syndrome (SVCS) and a history of chronic smoking.

Keywords: Aspergilloma; Intracavitary; Superior Vena Cava Syndrome; Bronchial neoplasia

1. Introduction

Pulmonary aspergillosis, particularly in the form of aspergilloma, is a well-recognized complication in patients with pre-existing lung conditions such as tuberculosis, chronic obstructive pulmonary disease, or lung cancer. The association between pulmonary neoplasia and fungal infections, especially aspergillosis, has been increasingly acknowledged, as cancer patients often exhibit compromised immune systems due to the malignancy itself or its treatment [1]. While the occurrence of aspergillomas in patients with cavitating lung tumors, such as adenocarcinoma., is rare, it remains a critical diagnostic challenge due to the overlap of symptoms and radiographic features [2].

In this report, we describe a patient with a adenocarcinoma. of the right lung who presented with an aspergilloma in the cavitary lesion, emphasizing the need for awareness of this association. This case highlights the potential for pulmonary neoplasia to predispose to fungal colonization or infection, thus complicating the clinical picture and potentially impacting the management and prognosis of affected patients. The interest of our presentation lies in raising the possibility that pulmonary neoplasia may frequently be associated with pulmonary aspergillosis, which could influence treatment decisions and outcomes [3].

2. Case presentation

A 56-year-old male , a chronic smoker with a 40 pack-year history, **presented** with a two-year history of chronic bronchitis and dyspnea. He has no history of tuberculosis and works as a laborer. His mother passed away from bronchopulmonary cancer. One year ago, his dyspnea worsened from stage II to stage III on the Sadoul scale, accompanied by a cough with expectoration sometimes streaked with blood. Two months ago, he developed right-sided chest pain, facial swelling, dizziness, and dysphonia, in the context of apyrexia and general weakness, including weight loss and anorexia.

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On examination, the patient was alert (Glasgow Coma Scale 15/15) with a performance status of 2. Vital signs were stable. Physical examination revealed signs of superior vena cava syndrome, including supraclavicular fullness and collateral circulation. Respiratory examination showed discreet wheezing on the right. There were also firm, non-tender, mobile axillary lymph nodes.

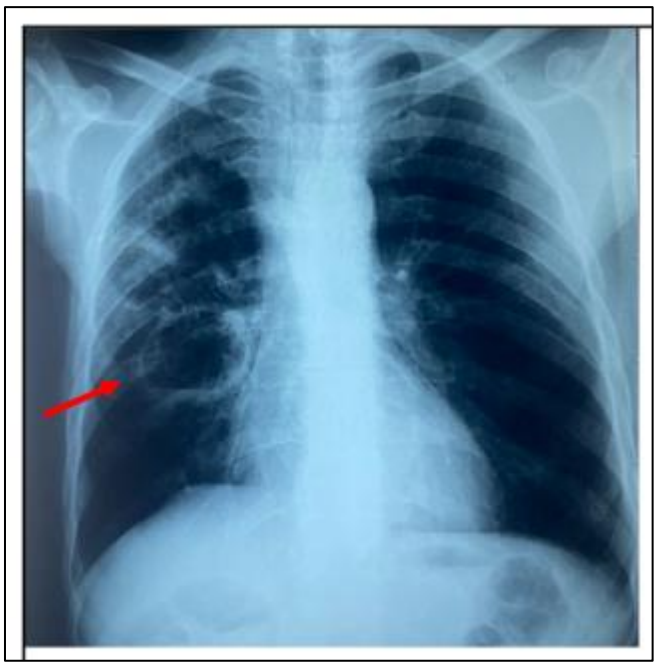

Figure 1 Posteroanterior chest radiograph demonstrating a cavitary lesion

A round opacity with a central hyperclarity surrounded by a thick wall in the right middle lobe, consistent with a cavitary lesion. Dense nodular opacities in the right upper lobe.

A cervicothoracic CT scan showed a right hilar lobar tumor with vascular invasion, secondary pulmonary nodules, and mediastinal-hilar lymphadenopathy. There is extensive thrombosis of the superior vena cava (SVC) extending to the innominate vein and left internal jugular vein. (Figure: 2)

Flexible bronchoscopy performed in the right bronchi a second-degree inflammatory with thickened spurs and reduced orifice size. No buds or granulomas, with a "truffle" appearance at the Nelsonian site. The bronchial biopsy revealed a poorly differentiated and infiltrative adenocarcinoma. (Figure :3)

Aspergillus serology: Positive galactomannan antigen. Sputum Mycobacterium tuberculosis (TB) test: Negative. The biopsy of the axillary lymph nodes revealed metastatic lymphadenopathy from a pulmonary adenocarcinoma. Based on the clinical, radiological, endoscopic findings, as well as microscopic and immunohistochemical data, a diagnosis of aspergilloma associated with bronchial adenocarcinoma was established.

The patient was started on voriconazole at a dose of 400 mg per day prior to initiating any anticancer therapy. In addition, he received therapeutic-dose anticoagulation, methylprednisolone at 120 mg, and continuation of his baseline treatment for COPD. Three weeks later, despite these interventions, the clinical course was marked by the onset of respiratory distress, leading to the patient's death.

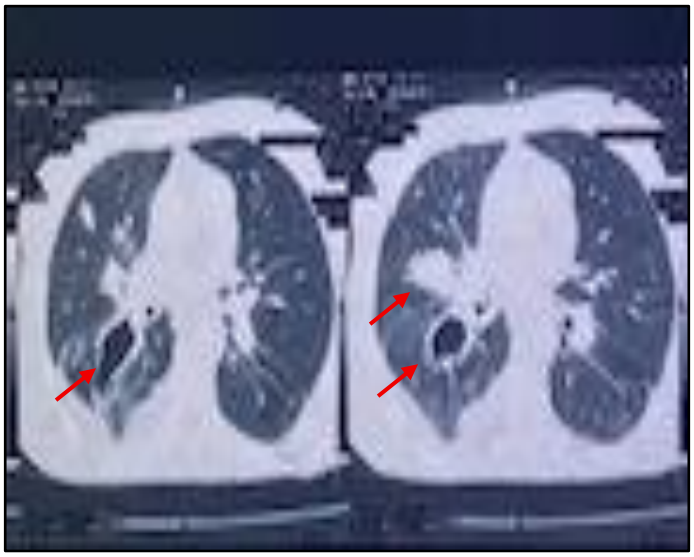

Figure 2 The chest CT scan reveals a right Fowler's cavity with a thickened wall, along with a right hilar ganglionic tumor process

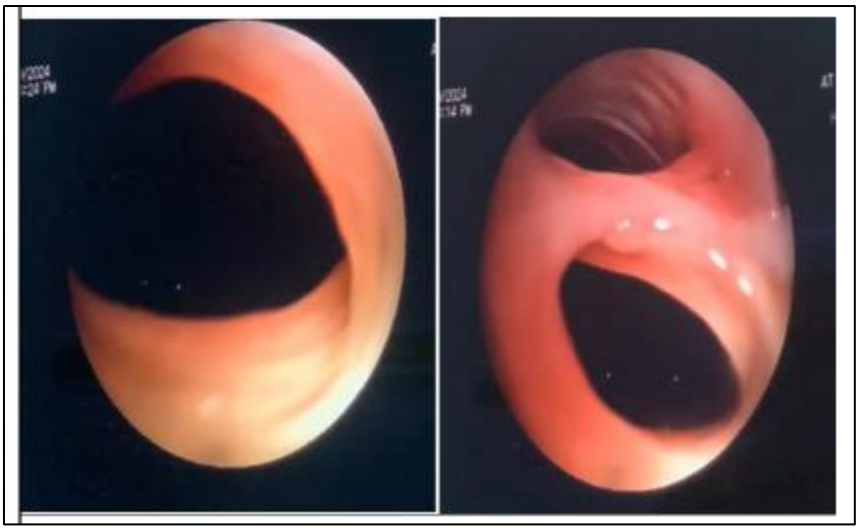

Figure 3 Bronchial endoscopy showing a blackish formation at the entrance of the left mainstem bronchus the imaging revealed a characteristic truffle-like appearance suggestive of aspergilloma

3. Discussion

Pulmonary aspergillosis is an important opportunistic infection, particularly in patients with chronic lung disease or malignancy. Aspergillus fumigatus, the most common causative agent, can form aspergillomas within lung cavities, which may be exacerbated in patients with pulmonary malignancies. This patient's cavitary lesion and positive Aspergillus galactomannan antigen test strongly suggest an aspergilloma formation within a cavitating tumor, which is frequently observed in patients with lung cancer [4]. Aspergillus infections in cancer patients are often diagnosed by serological testing, cultures, and imaging, though a positive galactomannan antigen test should be interpreted with caution, as it can also be detected in non-invasive forms of the disease[5].

SVCS is a common complication of advanced lung cancer, especially non-small cell lung cancer (NSCLC), which often involves the right lung due to the proximity of large mediastinal structures. The obstruction of the superior vena cava leads to the characteristic clinical features of facial and upper extremity swelling, distended neck veins, and respiratory distress [6]. In this patient, the right hilar tumor with vascular involvement led to the development of SVCS. Studies

have shown that SVCS occurs in approximately 3-10% of all lung cancer patients and is more common in those with right-sided tumors [7]. The early diagnosis and management of SVCS are essential in improving the patient's quality of life and addressing life-threatening complications.

Lung cancer commonly metastasizes to regional lymph nodes and distant sites, including the axillary lymph nodes. In this case, the biopsy of axillary lymph nodes revealed metastatic poorly differentiated carcinoma, confirming the advanced stage of the disease. Lymph node metastasis is associated with poor prognosis, especially when distant nodes like axillary or supraclavicular are involved. This underscores the aggressive nature of the tumor and the importance of early detection and management of metastasis [8]. Lymph node involvement in lung cancer is a key prognostic factor that influences treatment decisions and overall survival.

This case describes a 56-year-old male chronic smoker with progressive dyspnea, blood-tinged expectoration, and symptoms suggestive of superior vena cava syndrome (SVCS). The combination of radiological findings, metastatic axillary lymphadenopathy, positive Aspergillus galactomannan antigen, and endoscopic examination findings led to the diagnosis of a right hilar tumor with vascular invasion, pulmonary aspergillosis, and advanced malignancy. This case highlights the need to consider secondary infections in patients with pulmonary neoplasms and the diagnostic challenges that arise in such cases

The management of this patient requires addressing both the underlying lung malignancy and the Aspergillus infection. The treatment of SVCS usually involves chemotherapy or radiation therapy, particularly for small-cell lung cancer (SCLC) and non-small-cell lung cancer (NSCLC). Systemic chemotherapy, often in combination with radiation or immunotherapy, is the standard treatment for advanced lung cancer with SVCS [9]. The use of antifungal therapy, such as voriconazole or liposomal amphotericin B, is necessary to treat Aspergillus infection, especially in immunocompromised patients [10]. Given the advanced stage of disease and the presence of multiple complications, including metastasis and Aspergillus infection, the prognosis for this patient is poor, and palliative care may be required for symptom management.

4. Conclusion

The interplay between a cavitating lung tumor and the development of pulmonary aspergillosis emphasizes the importance of a thorough diagnostic approach, combining clinical, radiological, and microbiological evaluations. Early identification of these complications can improve patient outcomes by enabling timely intervention. Furthermore, this case highlights the critical role of interdisciplinary care, involving oncologists, pulmonologists, and infectious disease specialists, in optimizing management strategies and palliative care for patients with advanced lung cancer and its complications.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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