

Adenocarcinoma of the lung with concurrent *Mycobacterium avium* complex infection

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ABSTRACT

Nontuberculous mycobacterial infection, particularly *Mycobacterium avium* complex (MAC), which is also known as Lady Windermere syndrome usually presents with chronic cough, typically seen in elderly caucasian women who chronically suppress the normal cough reflex. Computerized tomography of the chest in patients with MAC infection can present as a tree in bud nodules, pulmonary nodules, cavity, or consolidation. However, other coexisting diseases such as lung cancer should be kept in mind while investigating these radiographic changes in patients with suspected MAC infection, more so if they have underlying risk factors for malignancy. We present a patient with suspected MAC infection who had co-existing lung adenocarcinoma.

KEY WORDS: Adenocarcinoma, cavitory lung disease, lung cancer, *Mycobacterium avium intracellulare* infection

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INTRODUCTION

Adenocarcinoma of the lung usually presents on computed tomography (CT) of the chest as solid nodules, although part-solid or ground-glass nodules are also often seen. In the case of cavitory lesions on CT in combination with nodular opacities, the diagnosis of *Mycobacterium avium* complex (MAC) infection is more readily considered. Herein is a case in which lung adenocarcinoma with concurrent MAC infection presented on CT with multifocal cavitory lesions.

CASE REPORT

A 60-year-old Caucasian female with a history of former tobacco use (30 pack-years) presented with chronic cough productive of white sputum for 4 months as well as dyspnea on exertion. She was diagnosed on two

separate occasions with pneumonia 13 and 3 months prior to presentation. Evaluation of her cough included chest CT, which revealed dense consolidation with air bronchograms and widespread interstitial infiltration with ground-glass opacities highlighting numerous cysts in the right upper lobe [Figure 1]; a 6-cm cavitory lesion in the superior segment of the right lower lobe [Figure 2]; and bilateral nodularity with both ground-glass and cavitory components in a centrilobular, nonhematogenous distribution in the central lung zone regions [Figure 3].

The clinical presentation and the radiologic findings were initially concerning for MAC infection. Bronchoscopy with bronchoalveolar lavage (BAL) and transbronchial lung cryobiopsy (TBLC) was performed in the right upper lobe to confirm the diagnosis. Cytology from BAL revealed malignant glandular cells consistent with adenocarcinoma,

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Figure 1: Axial view of a computerized tomography scan of the chest. Bilateral pulmonary nodules, cysts, and cavitary lesion seen

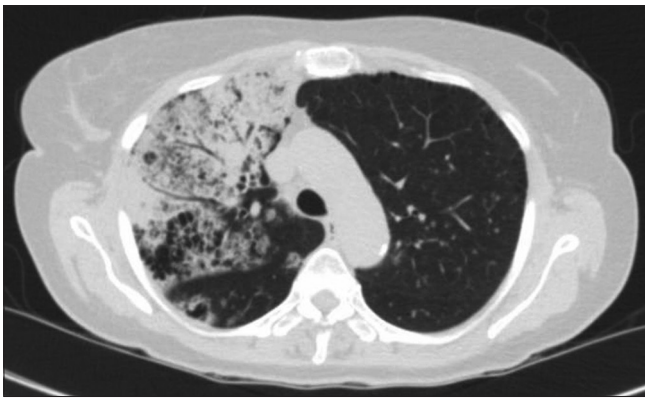


Figure 2: Axial view of computerized tomography scan of the chest. A right upper lobe consolidation with air bronchogram noted

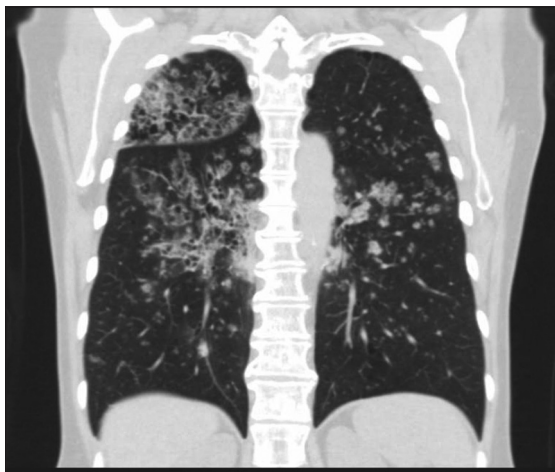


Figure 3: Coronal view of computerized tomography scan of the chest. Bilateral nodularity with both ground-glass and cystic components is noted

and surgical pathology revealed moderately differentiated, nonmucinous neoplastic epithelium with papillary architecture. Sputum smear initially revealed no acid-fast bacilli, but 3 weeks later, cultures grew *M. avium-intracellulare*. Few weeks later, the patient underwent

video-assisted thoracoscopic biopsy of the left lung which confirmed multifocal adenocarcinoma and MAC infection.

DISCUSSION

While MAC is a nearly ubiquitous organism and exposure is extremely common in the general population, the development of disease predominantly occurs in patients with underlying lung disease or immunosuppression that permits opportunistic growth.^[1] However, MAC may rarely cause clinical lung disease in otherwise healthy populations, most commonly in middle-aged and elderly women.^[2] The patient described in this case lacked an established underlying lung disease or immunosuppression, placing her within the second population. As the clinical suspicion for MAC was high, confirmatory testing was pursued. Typically, the diagnosis is performed with bronchial lavage and imaging. In this case, a TBLC was also performed as there was some concern for underlying coexisting malignancy.

As expected following TBLC, pathologic evaluation and culture initially did not show acid-fast bacilli, although MAC did grow on culture after 3 weeks. During this 3-week interval, the cytology and surgical pathology findings of nonmucinous neoplastic epithelium provided a reasonable context of underlying lung malignancy. A diagnosis of lepidic predominant nonmucinous adenocarcinoma with coexisting MAC, while rare, explains this patient's presentation and radiographic findings.

Lepidic predominant nonmucinous adenocarcinoma on CT typically shows partly solid lesions but may have nonsolid or cystic components.^[3] Based on a 2015 interdisciplinary and international classification on lung adenocarcinoma recommendation, lepidic predominant adenocarcinoma in tumors >3.0 cm in size is favored over mucinous invasive adenocarcinoma if the tumor invades lymphatics, blood vessels, or pleura; or features tumor necrosis in addition to the lepidic growth as a predominant component.^[4] Lepidic predominant nonmucinous adenocarcinoma commonly presents in female patients with a history of smoking and may also feature ground-glass attenuation on radiography.^[4] This patient had CT findings of widespread interstitial infiltration with ground-glass opacities with numerous cysts in the right upper lobe, as well as a 6-cm cavitary lesion in the superior segment of the right lower lobe. In the central lung zones on CT, this patient demonstrated bilateral nodularity with ground-glass and cavitary components in a centrilobular, nonhematogenous distribution. These findings are consistent with MAC, but also with lung malignancy by these guidelines.

This case presents a unique situation in which the initial clinical and radiographic imaging was most consistent with MAC, and an underlying condition remained suspicious. The coexistence of MAC and lung cancer, while rare, is

not an unheard of phenomenon and should be considered on the differential.^[5] Cavitory lung lesions, such as in this case, may indicate infectious pathologies including fungal, tuberculous, and nontuberculous mycobacterium or malignant pathologies. Clinical suspicion should be maintained for underlying predisposing factors in the diagnosis of MAC. In addition, one should retain a suspicion of MAC when radiographic findings are suggestive of MAC, while initial confirmatory studies are suggestive of malignancy. A diagnosis of either condition alone could have explained the patient's presentation, resulting in a prematurely terminated diagnostic investigation, and inadequate therapeutic response. Had evaluation of this patient relied primarily on a suspected diagnosis of isolated MAC, the additional diagnosis of lepidic predominant nonmucinous adenocarcinoma may have gone unfound. Physicians should remain suspicious for coexisting MAC and lung cancer when radiographic imaging is consistent with either diagnosis until further confirmatory testing can be performed.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and

other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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