



Case Report

Mucoid impaction mimicking multiple metastatic lung cancer

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ABSTRACT

The most common etiology of multiple pulmonary nodules is metastatic lung cancer. Although benign etiologies have been reported, mucoid impaction less commonly presents as multiple pulmonary nodules. Herein, we report the case of an 81-year-old demented man who presented with multiple pulmonary nodules due to mucoid impaction. Chest radiographs revealed rapid resolution after tracheostomy and adequate mucus clearance. We suggest that mucoid impaction may present as multiple pulmonary nodules mimicking multiple metastatic lung cancer.

KEYWORDS: *Metastatic lung cancer, Mucoid impaction, Pulmonary nodules*

INTRODUCTION

Mucoid impaction is commonly seen in patients with underlying lung disease, especially asthma, chronic bronchitis, and allergic bronchopulmonary aspergillosis [1,2]. It is defined as mucus collection in the segmental or subsegmental bronchus that is distinguishable from true tumors by documenting their disappearance after having the patient cough [1,3]. Diagnosis is often difficult because radiographic abnormalities vary [1]. Mucus is commonly retained in the large airway and less in the small airway or acini [3]. Furthermore, mucoid impaction rarely shows multiple pulmonary nodules. Here, we present the case of an old demented man with multifocal mucoid impaction mimicking metastatic lung cancer that was completely resolved after tracheostomy with aggressive sputum clearance.

CASE REPORT

An 81-year-old man who had started suffering from dementia after a stroke 3 years prior was being fed through a nasogastric tube long-term and experiencing intermittent shortness of breath. He had been admitted and treated for aspiration pneumonia over the course of 11 episodes within 3 years.

On this visit, his shortness of breath had persisted for 3 days. On admission, he was found to have severe dyspnea and a violent cough with mucoid sputum. The patient had no apparent fever or leukocytosis. His vital signs were as follows:

heart rate – 112 beats/min, respiratory rate – 32 breaths/min, and blood pressure – 128 / 68 mmHg. A physical examination revealed bilateral coarse crackles without wheezing. We also observed hypersecreted saliva and nasal discharge that caused the patient to frequently choke. His sputum culture was negative for bacteria, tuberculosis, and fungus. A chest radiograph (CXR) revealed bilateral lower lung infiltration [Figure 1a]. Amoxicillin with clavulanic acid was administered at 1200 mg every 8 h. One week later, the CXR revealed left lower lung consolidation and bilateral multiple pulmonary nodules [Figure 1b]. A chest computed tomography (CT) scan revealed that the nodule reflected water attenuation with a density of –15.28 Hounsfield units without enhancement after contrast administration [Figure 2a]. The nodules were located in both central and distal airways and even within the acini of an axial image [Figure 2b] and a coronal reconstructive image [Figure 2c]. Metastatic lung cancer could not be ruled out, and thus, a chest CT-guided biopsy was performed. The histopathological findings revealed interstitial fibrosis and mild chronic inflammation with a few multinuclear giant cells and suppurative exudate mixed with necrotic debris, suggesting aspiration foreign body granulomas complicated with an

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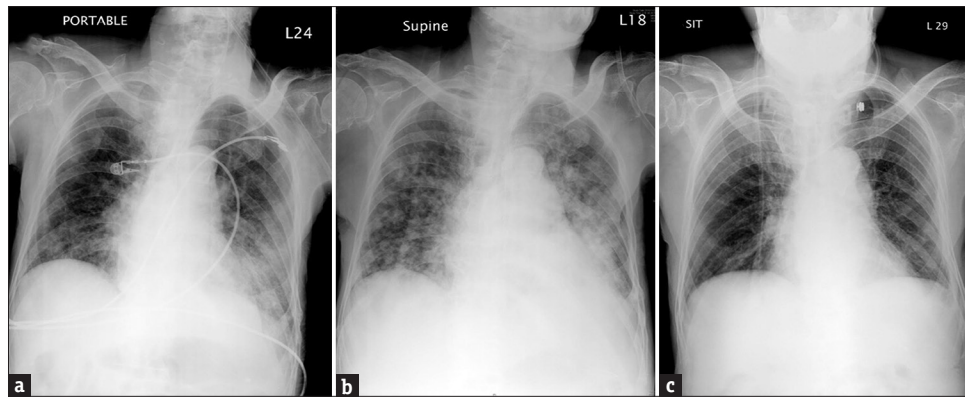


Figure 1: Series of chest radiographs of the patient. The chest radiograph revealed bilateral lower lung infiltration, especially the left lower lobe (a). One week later, the chest radiograph revealed left lower lung consolidation and bilateral multiple pulmonary nodules (b). After tracheostomy with intensive airway clearance, the chest radiograph revealed nearly total obliteration of the nodules and lung consolidation (c)

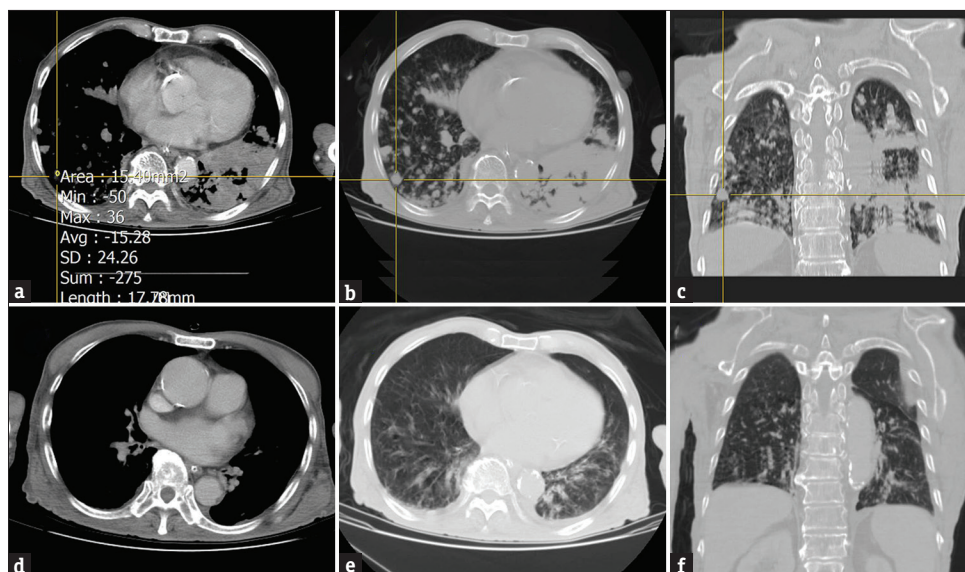


Figure 2: Chest computed tomography before and 3 months after tracheostomy. A chest computed tomography revealed left lower lung consolidation and numerous round nodules in the central and distal airways and even in the acini, especially at the dependent part (a-c). The nodule reflected a water attenuation with a density of -15.28 Hounsfield units and no definite enhancement after contrast administration (a). After tracheostomy for 3 months, all the lesions resolved completely with some peripheral airway bronchiectatic changes (d-f)

infection [Figure 3]. In addition, we performed a periodic acid–Schiff stain, a Gomori’s methenamine silver nitrate stain, and an acid-fast stain, which were all negative. There was no evidence of malignancy. Therefore, to treat the mucoid impaction, a tracheostomy was performed with intensive sputum clearance. Three months later, the CXR [Figure 1c] and chest CT [Figures 2d-f] showed nearly total obliteration of the nodules and lung consolidation and some residual peripheral bronchiectasis. The patient recovered well except for frequent constipation with paralytic ileus requiring future admission. Unfortunately, 2 years later, the patient expired due to severe colon volvulus that resulted in septic shock.

DISCUSSION

Mucoid impaction typically occurs in patients with underlying lung disease and excessive mucus problems [1,2]. Although our patient had no underlying lung disease, he was demented with an impaired swallowing function that produced

excessive nasal discharge and saliva which frequently aspirated into the lower airway. The symptoms of mucoid impaction vary greatly between patients, from asymptomatic to obstructive pneumonia, consolidation, and abscess [4]. About 62% of patients with mucoid impaction have a productive cough and 36.5% have a fever, but only 21.1% experience dyspnea [4]. However, our patient mainly presented with dyspnea and no fever, presumably due to old age and the comorbidities associated with being immunocompromised.

Mucoid impaction mainly affects the large airways and induced indicative radiographic findings such as atelectasis or lobular, ovoid, round, or branching opacity (finger-in-glove sign) [3,5]. Mucus impaction in distal airways or acini is less common [3]. In fact, CXRs of distal airways or acini might be normal or only show branching or tree-in-bud opacities [3]. In the present case, mucus was also retained in distal airways and acini, but presented as multiple pulmonary nodules, making it impossible to rule out metastatic lung cancer. Mucoid

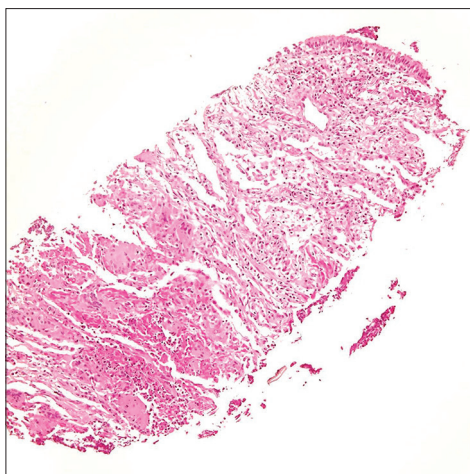


Figure 3: Histopathological findings of the left lower lung. The histopathological results revealed interstitial fibrosis and mild chronic inflammation with a few multinuclear giant cells and suppurative exudate mixed with necrotic debris, suggesting aspiration foreign body granulomas complicated with infection (H and E, $\times 100$)

impactions are mostly found in the upper lungs and rarely located at multiple sites [4]. Interestingly, our patient's mucus was retained in multiple sites of the lungs, which might be due to the fact that he had been bedridden for a long period of time. Although mucoid impaction unrelated to malignancy is less common, it is still important to differentiate it from metastatic lung malignancy if the CXR or CT shows multiple discrete round pulmonary nodules [3]. In this situation, surgical intervention is often suggested but poses high risk, particularly in elderly patients. Therefore, we suggest a CT-guided biopsy from the consolidated left lower lung to minimize the risk of pneumothorax and bleeding.

Medical treatment with adequate sputum clearance is efficient for mucoid impaction [1,4]. After the mucus is cleared, residual bronchiectasis may be observed mainly in the central bronchus if there was significant bronchial wall damage [1,4]. In our patient, after the mucus was cleared, we did not find overt central bronchiectasis but only some bronchiectatic change in distal airways. Importantly, he recovered quite well after the tracheostomy. This suggests that with the creation of an artificial airway early on and intensive sputum clearance, surgical intervention can be avoided in patients with mucoid impaction.

Even though the rapid onset and presence of multiple lung nodules suggested its benign nature, we still had to rule out lung metastasis before tracheostomy. The histopathological

findings helped to rule out malignancy and supported the diagnosis of foreign body reaction coming from mucoid aspiration and impaction. The clinically dramatic improvement of the CXRs after tracheostomy with intensive sputum clearance also supported this diagnosis.

CONCLUSION

Mucoid impaction may present as multiple pulmonary nodules mimicking metastatic lung cancer. When patients have medical conditions of aspiration and present with an abrupt presence of multiple pulmonary nodules in CXRs, mucoid impaction should be considered.

Ethical approval and declaration of patient consent

This report was approved by the Institutional Review Board of Taipei Tzu Chi Hospital (IRB No. 00-IRB-002-CR). Informed consent was obtained from the patient's daughter. The patient's daughter gave the written informed consent for publication of his personal or clinical details along with any identifying images and understood that this patient's name and initial 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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