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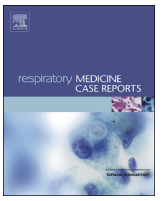

Case Report

Lung adenocarcinoma presenting as acute hypoxemic respiratory failure

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ABSTRACT

Lung adenocarcinoma usually presents with cough, hemoptysis, and weight loss with radiologic findings of suspicious nodules and masses. It rarely mimics other diseases such as pneumonia. We here present a case of a female patient who presented with acute hypoxemic respiratory failure and radiologic findings of multi-lobar consolidation and was found to have lung adenocarcinoma.

1. Introduction

Lung adenocarcinoma is the most frequent histological type of lung cancer. It usually presents with cough, hemoptysis and weight loss with radiologic findings of suspicious nodules and masses [1]. It rarely presents as bilateral consolidations mimicking other diseases of the lung such as pneumonia. We here present a case of a female patient who presented with acute hypoxemic respiratory failure and radiologic findings of multi-lobar consolidation and was found to have lung adenocarcinoma.

2. Case presentation

An 80-year-old female, who is previously healthy, presents to the hospital for a productive cough and dyspnea of 1.5 months duration. She denies any fever or chills, rhinorrhea, night sweats, gastrointestinal or urinary symptoms. However, she complains of weight loss of 4 kg in the past month with a decreased appetite. The patient is a never-smoker. She has no chronic lung diseases, no pets at home. She had travelled to Dubai two months ago and she usually travels to the United States every year.

The patient was seen two weeks before at an outpatient clinic and was diagnosed with bilateral pneumonia. She was prescribed a 10-day course of levofloxacin which she took but did not improve: her cough persisted, and she was still dyspneic.

On presentation, she had no fever, her blood pressure was normal, her heart rate was 102 beats per minute and her saturation was 85 % on room air.

On the physical exam, she was conscious and cooperative, there was bilateral air entry with diffuse ronchi. Her abdomen was soft and non-tender and there was no edema of the lower limbs. No lymphadenopathies could be palpated.

Her labs showed a mild leukocytosis (13,000/μL) and a C-recative protein (CRP) of 3 mg/dL. An auto-immune panel for connective tissue diseases was negative.

Her chest x-ray (CXR) is presented in (Fig. 1) and cuts of her computed tomography (CT) of the chest are shown in (Fig. 2).

A bronchoalveolar lavage was performed, it showed a white blood cell count of 627/μL with 70 % of neutrophils. The periodic acid-Schiff coloration was negative. And the cultures grew *Candida albicans*.

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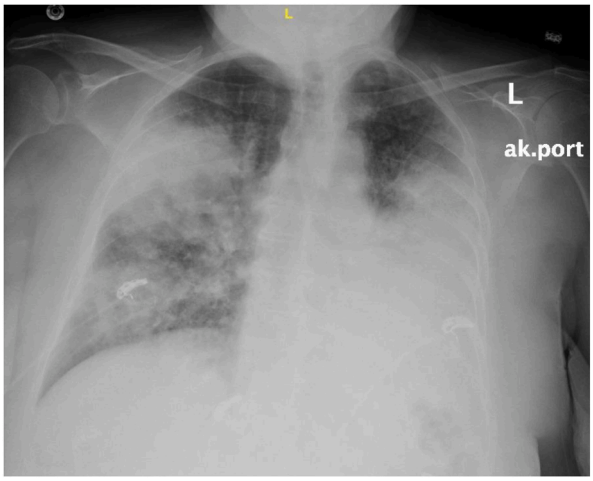

Fig. 1. CXR of the patient on admission showing bilateral lung opacities.

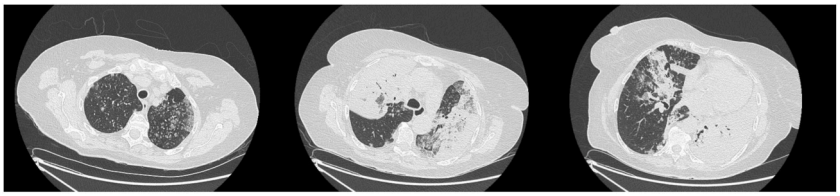

Fig. 2. CT of the chest of the patient on admission showing the upper (left), middle (middle) and lower (right) lung zones. It shows diffuse infiltrates with areas of consolidation.

The patient was started empirically on meropenem and methylprednisolone 40mg/day. Her cough and respiratory symptoms improved, and she was discharged home, 19 days later, with a provisional diagnosis of organizing pneumonia to complete a course of glucocorticoids.

Twenty days later, the patient presented back to the hospital with increasing dyspnea and cough.

She was in hypoxemic respiratory failure and required oxygen supplementation via a high-flow nasal canula. Her CXR and CT of the chest are presented in (Fig. 3) and (Fig. 4).

A surgical lung biopsy was performed via video-assisted thoracoscopic surgery with the use of conscious sedation with epidural anesthesia. It revealed a moderately differentiated adenocarcinoma with mucinous features. The tumor cells expressed CK7, CD20

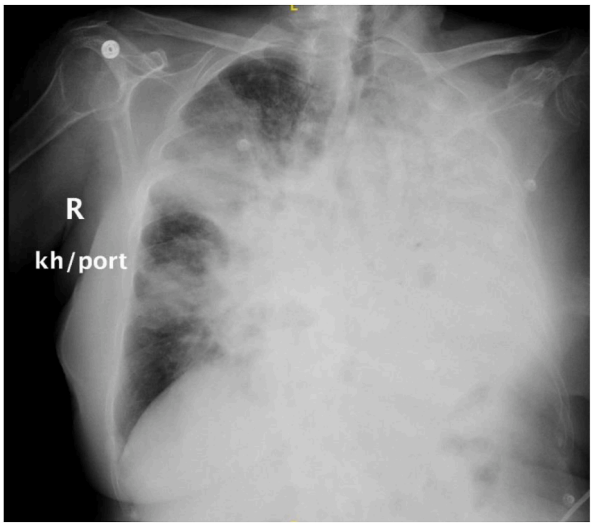

Fig. 3. CXR on the second admission showing an opacified left lung and diffuse opacities in the right lung.

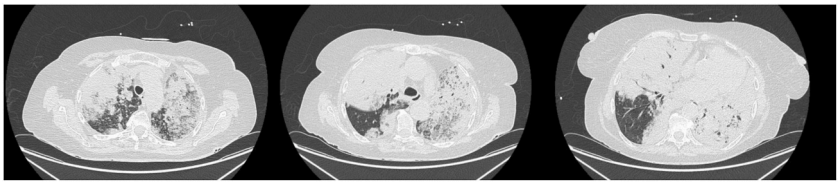

Fig. 4. CT of the chest on the second admission showing the upper (left), middle (middle) and lower (right) lung zones. The infiltrates have increased, mainly in the right upper and lower lobes.

and CDX2 while they stained negative for TTF1 and PAX8. The differential diagnosis included a metastatic adenocarcinoma of gastrointestinal origin and a primary pulmonary mucinous adenocarcinoma.

The patient did not recover from her respiratory failure. Given her old age and her cancer, a shared decision was made with her and her family not to intubate her. She passed away.

3. Discussion

Lung adenocarcinoma is the most frequent histological type of lung cancer [2]. It usually presents as a peripheral mass on CXR, and less frequently, as a central mass [3]. Detterbeck et al. defined pneumonia-type lung adenocarcinoma (P-ADC) as "adenocarcinoma presenting with pneumonia-like areas of infiltrates or consolidations involving a region of the lung" [4]. It can appear in a variety of forms on CT, including nonobstructive focal or widespread pulmonary consolidations [5]. Some reported that an uneven air bronchogram and a bulging fissure can support the diagnosis of P-ADC [6]. P-ADC manifests as diffuse non-obstructive solid infiltration of the lungs, with the lack of a mass lesion. This frequently leads to a misdiagnosis since it is easily confused with viral, bacterial or inflammatory lung disorders. Radiological findings include bilateral multiple lobe distribution, interlobular fissure bulging, hypodense sign, air space, CT angiography sign, concomitant nodules, pleural effusion, lymphadenopathy, abnormal air bronchograms and ground glass opacities [7]. Bronchioalveolar carcinoma was the term used to describe malignancies having a bronchioalveolar growth pattern including a lepidic growth. Lepidic growth implies an expansion without alveolar destruction [8]. However, the updated categorization separates lung adenocarcinomas into three types: adenocarcinoma in situ, minimally invasive adenocarcinoma, and invasive adenocarcinoma, discarding the idea of bronchoalveolar carcinoma. The lepidic growth pattern is now recognized as part of invasive adenocarcinoma [9]. The cases documented in the literature exhibit a wide variety of clinical manifestations ranging from dyspnea, cough, and fever to abrupt respiratory failure that required intubation. In this work, we describe the case of a patient who arrived with shortness of breath and a productive cough, as well as diffuse infiltrates on CXR. The presentation mimicked bilateral pneumonia but was not responding to antimicrobial therapy, and with partial response to steroids. The response to steroids was short-lived and eventually the patient developed an acute hypoxemic respiratory failure and death. To our knowledge, there are very few reported cases presenting as acute hypoxemic respiratory failure [10]. Furthermore, our patient was a never-smoker, and this added to the difficulty in making the diagnosis. In conclusion, it is critical for clinicians to keep this type of lung cancer in the differential diagnosis, particularly in patients with clinical and radiological signs suggestive of pneumonia that is resistant to standard therapy.

CRediT authorship contribution statement

Michel Tawk: Writing – original draft, Investigation. **Salim Salloum:** Writing – original draft, Validation. **Clara Chamoun:** Writing – review & editing, Supervision.

Declaration of competing interest

The authors have no conflict of interest to declare.

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