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Case Report

Pulmonary mucinous adenocarcinoma in the presence of reactivated tuberculosis: A case report ☆,☆☆,★

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ABSTRACT

We report the case of a 55-year-old male patient with concomitant pulmonary mucinous adenocarcinoma and reactivated tuberculosis, documented with multiple MSCT (multi-slice computed tomography) changes. The patient initially presented with productive cough, sluggishness, fatigue, voice hoarseness and tuberculosis changes in MSCT. Later, he was diagnosed with pulmonary mucinous adenocarcinoma, which was confirmed by sputum cytology and transthoracic biopsy. Therefore, clinicians should always evaluate the likelihood of simultaneous lung cancer in patients whose MSCT images suggest TB alterations in the lungs, and swiftly decide on the correct treatment and management approach.

Introduction

Cancer is a global health concern, causing almost 10 million deaths per year, thus being the second leader on overall deaths worldwide, after cardiovascular diseases. Almost 20 million new cancer cases were reported only in 2020. In particular, lung carcinoma is the leading cause of cancer-related deaths, making up to 18% of all cancer deaths, thus representing a major public health concern [1,2].

Mucinous adenocarcinoma is the rarest type of lung cancer. According to a recent classification there are: in situ, minimally invasive and invasive mucinous adenocarcinomas.

Mucinous adenocarcinoma of the lung is morphologically characterized by tall columnar cells, with abundant cytoplasm that contain varying amounts of mucin. Mucus secreted by cancer cells can commonly be discharged as sputum. How-

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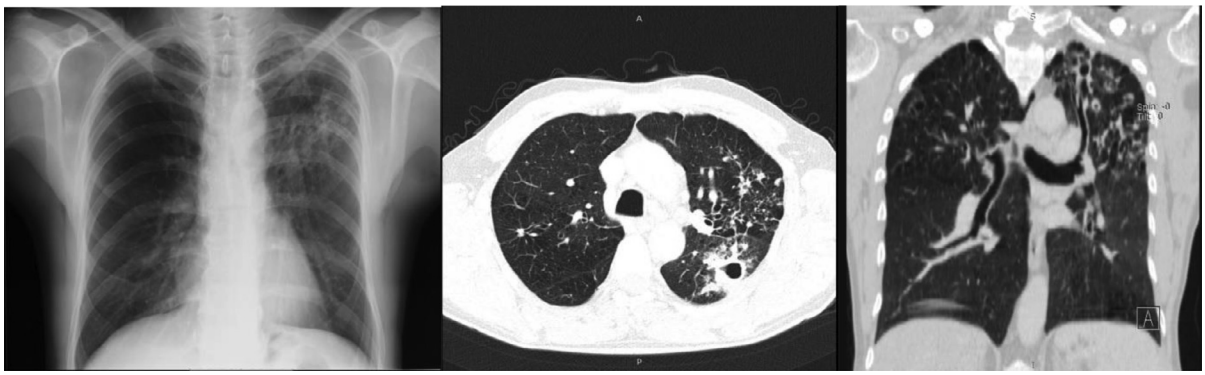

Fig. 1 – First chest radiography and MSCT conducted soon after the onset of the first symptoms

ever, if airway obstruction happens, obstructive pneumonia might occur consequently [3].

Tuberculosis, on the other hand, is still one of the most common respiratory diseases, with one-third of the human population being infected with Mycobacterium tuberculosis nowadays.

TB is the world's 12th greatest cause of death and the third biggest cause of infectious diseases mortality, despite better TB prevention, early diagnosis, and treatment, particularly in poorer countries [4-8].

Many investigations have documented the co-occurrence of tuberculosis and lung cancer in the same patient. Long-term tuberculosis (TB) causes bronchial and alveolar epithelial metaplasia, which is considered a precancerous condition affecting significant areas of the lungs. The correlation between lung tuberculosis and carcinoma has been verified by many pathologists and clinical doctors. Potentially, there are two scenarios: Cancer develops in the presence of tuberculosis due to chronic inflammation, or patients diagnosed with cancer can further develop tuberculosis due to local immunosuppression.

Patients with lung cancer are frequently misdiagnosed as having pulmonary tuberculosis, causing delays in diagnosis and improper treatment [9-14].

We hereby present a case of a patient who was treated for tuberculosis for almost 2 years, and was eventually diagnosed with pulmonary mucinous adenocarcinoma, which was confirmed by sputum cytology and transthoracic biopsy.

Case report

In 1998-99, a 55-year-old male patient, a heavy smoker, contracted tuberculosis, which was followed by a left lung pneumothorax in 2000.

Late in 2019, the patient began to have a productive cough, sluggishness, weariness, and hoarseness in his voice. He was recommended for chest radiography and MSCT because the pulmonologist feared pulmonary involvement (Fig. 1).

The MSCT revealed a 45×30mm irregular mass in the left lung, which was exacerbated after contrast application. Multiple mediastinal lymph nodes, measuring up to 24 mm in diameter, were also noticed.

Bronchoscopy and sputum cytology were also recommended for the patient.

Non-atypical plaque cells, macrophages, leukocytes, cell debris, and degraded plaque cells were found in sputum cytology, however no cancerous cells were found.

Additionally, an abdominal ultrasound was conducted, which revealed no major changes.

The patient was provided anti-tuberculosis medications and treated for 8 months, after the Xpert MTB- RIF assay G4 detected low Mycobacterium tuberculosis that was non-resistant to Rifampin.

Because the patient's voice hoarseness remained, he was referred to an ENT specialist, who diagnosed him with chronic laryngitis, left laryngeal recurrent nerve paralysis, and left vocal cord paralysis.

Despite the fact that he was being treated for tuberculosis and his blood oxygen saturation level remained at 97 percent, the patient insisted on not feeling well, so he went to a second and third pulmonologist in private clinics, where he was prescribed antibiotics like Metronidazole 400mg for 10 days, followed by Nystatin 500 000UI for another 10 days.

A year after symptoms onset, the patient was referred for a second chest radiography and MSCT, which revealed a 6mm spiculated mass in the right middle lobe and enlarged mediastinal lymph nodes up to 18 mm (Fig. 2).

Meanwhile, the patient had ten blood tests, with inflammatory values ranging from low to high, including ESR (14-95 mm/h), leukocytes (5.4-8×109/L), neutrophils (75.5%-83.3%), lymphocytes (6.2%-20%), monocytes (3%-9.5%) and CRP (4.2-31.2 mg/L).

The patient presents to the pulmonologist with shortness of breath almost a year and a half after first symptoms onset. A chest radiography and third MSCT were conducted at the pulmonologist's request, revealing left pleural effusion (Fig. 3).

Thoracentesis was immediately performed, and cytological testing of the effusion revealed unusual, polymorphic, hyperchromic cells arranged in a discohesive pattern, with anisocytosis, anisonucleosis, and dyskariosis. There were a lot of inflammatory infiltrates, resembling carcinomatosis.

Patient also showed hepatosplenomegaly, with a liver of 164mm and a spleen of 127mm on abdominal ultrasonography.

New chest radiography and the fourth chest and abdominal MSCT were conducted as the patient's clinical state worsened,

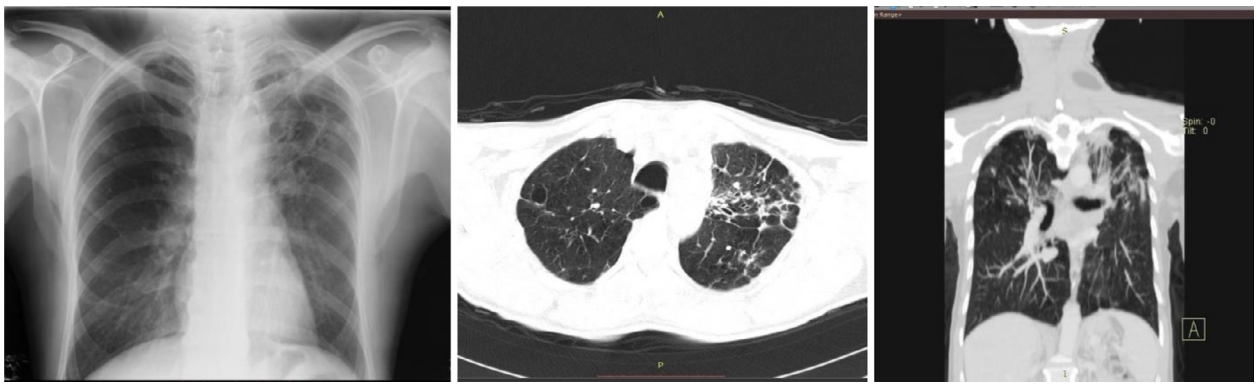

Fig. 2 – A year later, a second chest radiography and MSCT were conducted

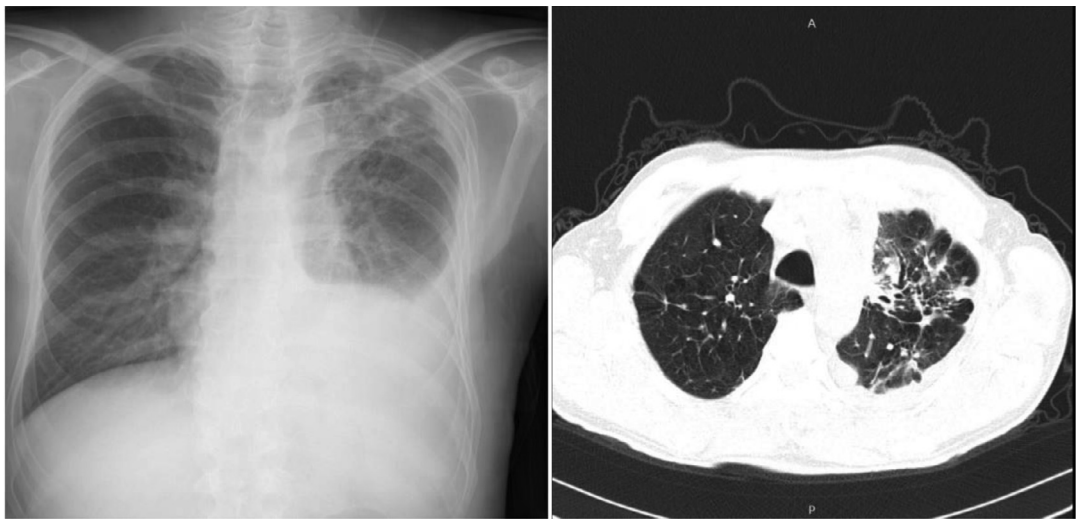

Fig. 3 – Left pleural effusion was discovered on third chest radiography and MSCT

revealing a tiny mass with spiculations on the right lung, as well as enlarged mediastinal lymph nodes up to 21 mm. The results of an abdomen CT scan, on the other hand, were normal (Fig. 4).

This time, the Xpert MTB- RIF test G4 was used, and MTB was not discovered.

Despite this, the patient was prescribed antibiotics for 3 weeks in a row, including Ciprofloxacin 500mg for ten days, Cefixime 400mg for 7 days, Moxifloxacin 400mg for 7 days, and Levofloxacin 500mg for ten days.

As a result, the patient was referred to the University Clinical Center of Kosovo for additional treatment after undergoing a fifth MSCT in a private clinic, which revealed a significant malignant left pleural effusion (Fig. 5).

Tumor markers such as CEA, CA 19-9, CA 72-4, Cyfra 21-1, and AFP were all within normal ranges, despite the patient's bad health condition.

Following that, bronchoscopy was conducted, and the lower lobe bronchus and B6 apical segment were found to be fibrotic and constricted.

The patient's saturation declined to 92 percent over time, prompting the pulmonologist to recommend a transthoracic biopsy. Histological findings suggested to pulmonary mucinous adenocarcinoma.

Finally, the patient underwent a left thoracotomy and 1300ml aspirate drainage, reconfirming the histologic diagnosis and cytological assessment of the exudate.

Thus, over the course of almost 2 years, the patient saw 5 different pulmonologists (11 visits in total), 2 ENT specialists, an internist, a cardiologist, 3 radiologists, 2 pathologists, and one chest surgeon, underwent 5 chest MSCTs, and had twenty blood tests, including 37 biochemical parameters, before being accurately diagnosed with pulmonary mucinous adenocarcinoma.

Discussion and conclusion

Clinicians frequently encounter patients with co-existing lung carcinoma and pulmonary tuberculosis, causing a delay in the diagnosis and proper treatment [15,16].

Chronic inflammation due to tuberculosis is thought to be responsible for the carcinogenesis.

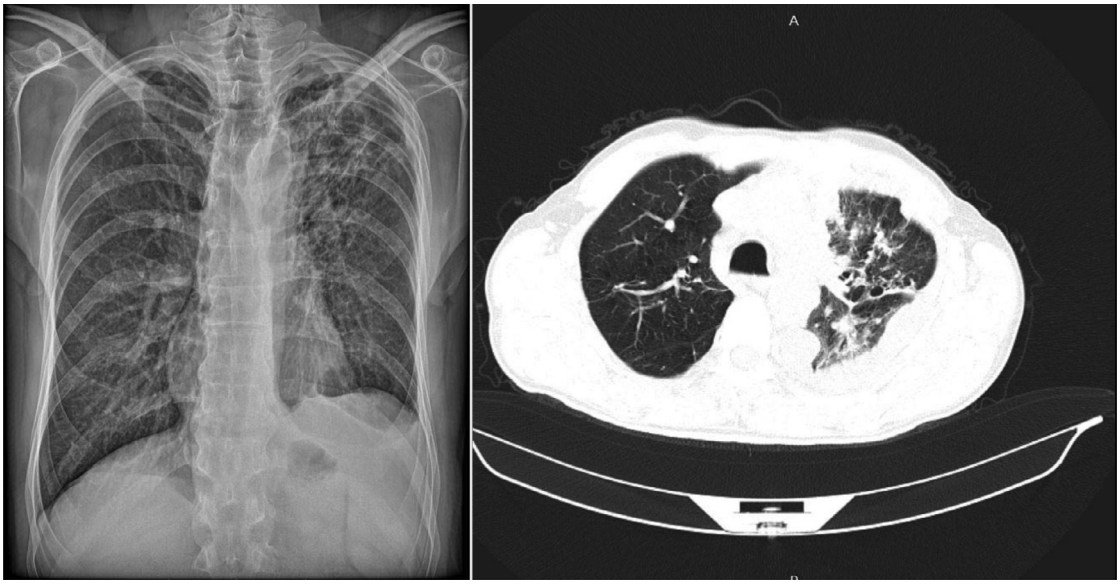

Fig. 4 – The results of the fourth chest radiography and the MSCT

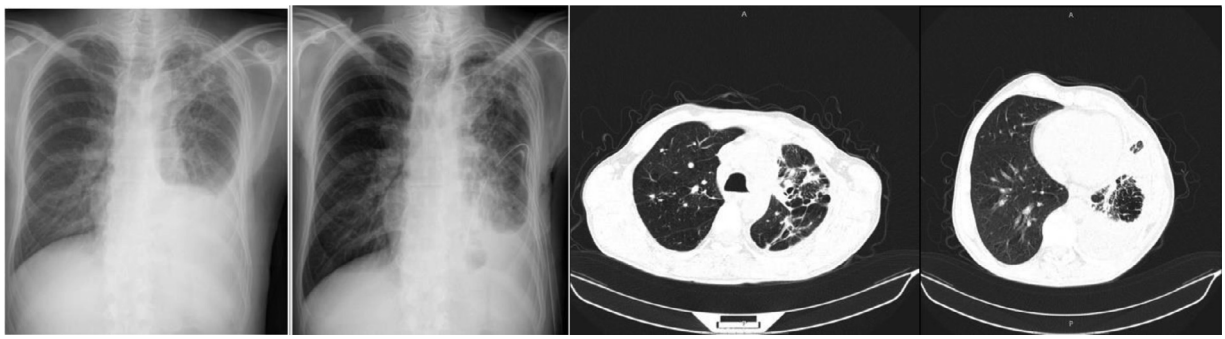

Fig. 5 – Fifth MSCT and chest radiography reveal a large malignant left pleural effusion

Patients with chronic TB lesions have a statistically significant association with lung adenocarcinoma.

Hypothesis exists that the tumor arises from a previous TB lesion called a scar cancer, or arise from sustained inflammation leading to fibrosis, scarring, host-tissue damage, causing lymph stasis thus enhancing carcinogen deposition in specific area [11,12,17,18,19].

A delayed diagnosis of lung cancer by a physician can result in therapy delays, incorrect treatments, or no treatment at all, lowering the patient's quality of life and shortening their lifetime.

The vast majority of lung tumors (more than 80%) are discovered at an advanced stage, such as stage IIIB or IV, when resection is no longer an option [20].

Patients with active tuberculosis and lung cancer have a poorer survival rate than those with lung cancer but no TB. Surgical resection combined with anti-TB therapy is a viable treatment for early-stage lung cancer; however, there are currently no clear guidelines [17,21].

In conclusion, we described a unique case of lung mucinous adenocarcinoma with TB in the same patient. Lung cancer may have developed as a result of chronic inflammatory tuberculosis modifications that led to epithelial metaplasia in the caves, calcified lymph nodes, or ancient scars in the bronchi caused by the rupture of tuberculosis-changed lymph nodes.

As a result, clinicians should always evaluate the likelihood of simultaneous lung cancer in patients whose MSCT images suggest TB alterations in the lungs, further analyze the case, and swiftly decide on the appropriate treatment and management approach.

Ethics approval

The study was conducted anonymously.

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