

# Pulmonary candidiasis presenting as tumor-like shadow

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## ABSTRACT

Lung fungal infections are rare and carry a high risk of death in critically ill patients. Further investigations including radiological imaging are needed for differential diagnosis. In this article, we present a patient with a tumor-like shadow on chest X-ray and a mildly necrotic soft tissue mass of 4 cm in the first computed tomography (CT) examination of the thorax, who was therefore pre-diagnosed with lung cancer. Due to the poor general condition of the patient, his family did not accept further examinations for cancer. Approximately 40 days later, the patient was taken to the intensive care unit with the complaint of respiratory distress. The bronchial sample was negative for malignant cells and *Candida tropicalis* was detected in cultures. The size of the mass decreased in CT controls after treatment with antifungal agents. We thought that the image on CT was due to *Candida tropicalis* infection and regressed with antifungal treatment. In conclusion, we can conclude that pulmonary candidiasis may present with atypical radiological findings. Fungal infections should be kept in mind in the differential diagnosis of lung cancer in cases with confusing mass-like images.

**Keywords:** Infection, candidiasis, diagnosis, pulmonary

## INTRODUCTION

*Candida* types are among the opportunist fungi types, are the members of the normal flora, may be in the oral cavity and even in the respiratory tract, are among the most frequently observed fungi that are infection factors. They may lead to superficial infections or to invasive infections that threaten life.<sup>1</sup> Although the fungi infections, which may be clinically or radiologically confused with pulmonary cancer, are generally observed with *Aspergillus* fungi, it is also possible that -although rare- they are observed with candida-type fungi as well.<sup>2</sup> Our purpose in this paper is to present a case that was radiologically pre-diagnosed firstly as lung cancer however, later with the follow-ups, was diagnosed with pulmonary candidiasis.

## CASE

The 76-year-old male patient applied to a medical center with the complaints of exhaustion for 6 months, cough, phlegm, general status disorder. The computerized thorax tomography (CTT) was received due to the detected bulk in the front-back lung graphics (Figure 1). After the CTT, the patient was pre-diagnosed with lung cancer since the general status of the patient was poor, the family of the patient did not accept further

examinations and tests. After about 40 days, the patient applied to a medical center with complaints of abdominal swelling, inability of defecate for a week, and respiratory problems. He was intubated in the medical center, and later was accepted in our intensive care unit for treatment and follow-up. In the history of the patient it was observed that he had Parkinson's disease for 15 years, atherosclerotic heart disease for 12 years, and 60 packages/year of cigarette smoking. It was determined in the physical examination that the patient was unconscious, the abdomen was in distension status, and the skin was dry and pale. Bilateral common rales were detected in the lungs. The general status was as follows; TA: 61/21 mmHg, pulse 128 pulse/min, Glasgow Coma Scale (GKS): 3, Acute Physiology and Chronic Health Evaluation II (APACHE II) score: 38. The medication was started with dopamine 5-20 mcg/kg/min, noradrenalin 0.1-1 mcg/kg/min infusion. In the laboratory examinations, the hemoglobin value was detected as 9 mg/dl, the number of thrombocytes was detected as 215 x 10<sup>3</sup>/ul, and the number of leukocyte was detected as 18.9 x 10<sup>3</sup>/uL, the urea was 184 mg/dl, serum creatinine 2.74 mg/dl, the erythrocyte sedimentation rate 77 mm/h, CRP 17.4 mg/L, procalsitonine 0.5 ng/ml, anti HIV negative. There were hematuria, leukocyturia, hipoproteinemia (6 g/dl), hipoalbuminemia (2.5 g/dl). The

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central venous pressure was 5 mm Hg. The 0.9% NaCl and 5% dextrose were given to the patient for hydration. After the hydration, the creatinine values became normal. The patient's hemodynamic values returned to the normal range and inotropic support was discontinued. In the CTT which was performed in the other medical center it was stated that "there were fusiform atelectasis in the size of 8 x 3.5 cm in the bulk inferior with the light necrotic soft tissue vision in 4 cm diameter with slight spicule contour in which ground glass densities were observed in the right-side pulmonary middle lobule and in the para-cardiac area" (Figure 2). In the CTT which was performed after the patient was accepted in our ICU, it was detected that the bulk had recessed to 24 x 20 mm, and showed cavitation.



Figure 1. Lung roentgenogram taken before admission to the intensive care unit



Figure 2. Thoracic CT image taken before admission to the intensive care unit

Fiberoptic bronchoscopy (FOB) was applied to the patient and the right side system subsegments were openly observed; and it was observed that the mucosa was natural. No findings were detected in favor of malignity.

On the 10<sup>th</sup> day of his hospitalization, a CTT was taken to check his situation and it was observed that the bulk was recessed to 16 x 17 mm. Upon the observation that the patient was not cachectic, and that the bulk had recessed in the pulmonary

graphics and tomography, we were doubtful about the previous lung CA diagnosis. No acid-resistant basil (ARB) was detected in the tracheal aspiration samples which were sent three times. *Candida Tropicalis* reproduced in the blood culture, urine, tracheal aspirate and rectal swab culture, and the patient was given Caspofungin Acetate (Cancidas) on the 1<sup>st</sup> day with 1 x 70 mg dosage, and then with 1 x 50 mg dosage. It was observed in the CTT taken on the 24<sup>th</sup> day of his hospitalization that the cavity recessed to 14 x 15 mm; and on the 46<sup>th</sup> day it recessed to 8 x 10 mm. It was considered that the medical picture appeared due to candida tropicalis infection, and the recession occurred with the antifungal treatment (Figure 3, Figure 4).



Figure 3. Chest roentgenogram of the patient after treatment

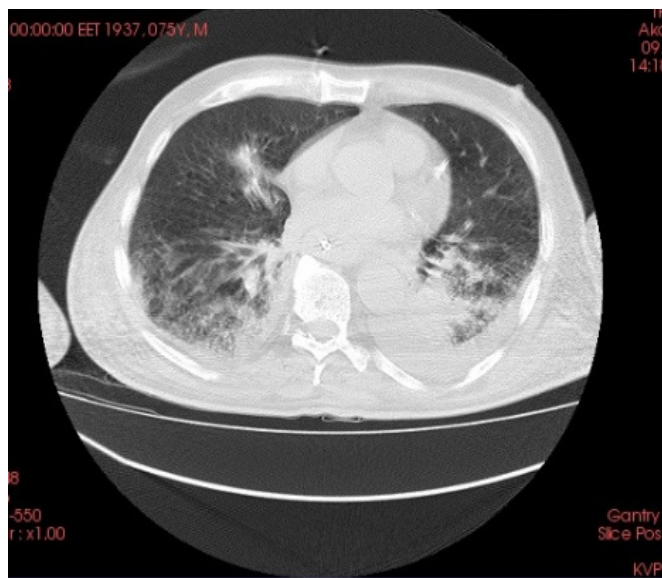


Figure 4. Thoracic CT image of the patient after treatment

In the follow-up of the patient it was observed that he had (a) fever; and in the blood and tracheal aspiration cultures, it was observed that there were only *Coly-Mycin®*-sensitive *baumanii* reproductions. However, the patient who had been receiving 3x150 mg *Coly-Mycin®* and sulbactam (and sulbactam) 2x1 (B-Laktam®) had acute kidney failure after 5 days. The highest value of the creatinine was 2.72 mg/dl (0.84-1.25 mg/dl) urea reached

150 mg/dl; but then the antibiotic dosage was adjusted according to the renal clearance and the kidney functions became normal. In the later blood and tracheal aspirate cultures it was observed that the *Acinetobacter baumannii* (*A. baumannii*) reproduction continued. According to the antibiogram results, the antibiotherapy was regulated again. In the following days, the general status of the patient was disrupted and hypothermia, hypotension and oliguria developed. Dopamine noradrenaline infusion was started. The patient was diagnosed with sepsis and septic shock due to *A. baumannii*. The patient whose cardiac and renal functions were disrupted progressively then had pancytopenia, lactic acidosis, and peripheral circulation disorder. The patient did not respond to intensive support treatment and antibiotherapy, and went exitus due to multiple organ failure.

## DISCUSSION

*Candida* infections are the factors that are isolated with 4<sup>th</sup> frequency from ICU patients.<sup>3</sup> The most frequent one among these is the *Candida albicans* (*C. albicans*) in the first row, and on the 2<sup>nd</sup> row, there is the *Candida tropicalis* (*C. tropicalis*). The gastrointestinal system is the most important way for the candidiasis to enter the body. It causes infection in the central nervous system, hepatosplenic candidiasis, abdominal and renal abscess, endocarditis, peritonitis and pneumonia.<sup>4</sup>

Together with hematologic malignancy, organ transplantation, multiple antibiotics use, burns, steroid treatment, long-term urethral catheter use, intravenous drug addiction and similar risk factors, the *Candida* reproduction in more than one body parts is accepted as being meaningful.<sup>1,3</sup> In our case, the patient had *C. tropicalis* reproduction in the blood culture, urine, rectal and tracheal aspirate samples when he arrived at the ICU. Our patient did not have any diseases or characteristics like diabetes mellitus, AIDS, malignancy, or chronic alcoholism that might cause immunosuppression. However, his being at a further age with the Parkinson's disease, and being bedridden were accepted as risk factors.

Focal/multifocal consolidation or diffuse infiltration may be observed in the radiological findings of the pulmonary candidiasis, but cavitation, adenopathy, bulk-like opacity or millier pattern are not expected.<sup>5,6</sup> Cavitation or bulk-like vision is observed frequently in aspergillosis among fungal infections. Cases with *Candida* and *Pneumococcus* together with a bulk-like vision and with necrotic fungus ball formation are reported in the literature, but no cases with a bulk vision together with isolated candidiasis are reported.<sup>7</sup>

Cavity formation is rarely observed in candidiasis. Five different cases were reported in the literature. Two of these cases who were between the ages of 33 and 62 had diabetes mellitus, two of them had immune deficiency due to malignancy, and one patient did not have any pathologies that would cause immune disorder.<sup>8-12</sup>

Our patient did not have any pathology that would suppress the immune system, which was reported by the other medical center he applied to before he came to us; and due to his being at a further age, lung cancer was considered the most probability, and we also considered that his pulmonary infections were ignored.

## CONCLUSION

We may face pulmonary candidiasis with atypical radiological findings. Although rare, it forms the vision of a bulk and may be confused with lung cancer. By keeping this in mind, proper methods must be employed for discriminative diagnosis.

## ETHICAL DECLARATIONS

**Informed Consent:** All patients signed the free and informed consent form.

**Referee Evaluation Process:** Externally peer-reviewed.

**Conflict of Interest Statement:** The authors have no conflicts of interest to declare.

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**Author Contributions:** All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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