Spontaneous Pneumothorax Developing in the Late Period in Association with COVID-19 Infection: A Case Report

COVID-19 Enfeksiyonuna Bağlı Geç Dönemde Gelişen Spontan Pnömotoraks; Vaka Sunumu

Serenay Kandur Tunc, Mucahit Senturk, Ilker Gunduz, Erkan Duman, Asim Kalkan

INTRODUCTION
The COVID-19 infection that emerged in the city of Wuhan in the Chinese province of Hubei in late 2019 has attracted worldwide attention due to the respiratory failure it causes (1). The essential feature of this infection is that it causes pneumonia. The formation of exudate with high protein density in the alveoli, infiltration of pneumocytes by multinuclear giant cells despite a high inflammatory response, and development of edema are events involved in the pathogenesis of COVID-19 pneumonia. Fibrosis subsequently develops secondary to this inflammatory response. Lung elasticity decreases in association with this process (2). Positive-pressure ventilation of these lungs exhibiting decreasing elasticity increases the risk of pneumothorax. Although COVID-19 infection appears with several radiological findings, spontaneous pneumothorax is one rarely seen complication of this infection. This case report discusses a case of spontaneous pneumothorax developing after approximately 20 days in association with the progression of COVID-19 pneumonia. Informed consent was obtained from the patient before the article.

CASE
A 27-year-old man initially presented to our emergency department with weakness and fever persisting for three days. He had no history of chronic disease, and was a non-smoker. The patient had no personal or family history of pneumothorax. No cough or respiratory distress was present at this presentation on 27.03.2020, and physical examination was normal. No pathology was detected at thoracic computed tomography (CT), and the viral nucleic acid real-time reverse transcriptase-polymerase chain reaction (RT-PCR) test performed for COVID-19 was negative. Since kidney and liver functions and electrolytes were normal at routine biochemistry tests, the patient was discharged and instructed to re-present if new symptoms occurred. The patient re-presented on 04.04. 2020, when fever and shortness of breath were present. Minimal bilateral basal crepitant rales were present at physical examination. No pathology was detected at thoracic computed tomography (CT), and the viral nucleic acid real-time reverse transcriptase-polymerase chain reaction (RT-PCR) test performed for COVID-19 was negative. Since kidney and liver functions and electrolytes were normal at routine biochemistry tests, the patient was discharged and instructed to re-present if new symptoms occurred.

A repeat RT-PCR test resulted positive. Blood test values were leukocytes 5.4 x10^3/μL (normal 3.8-10x10^3/μL), neutrophils 3.3x10^3/μL (normal 1.56-6.13x10^3/μL), lymphocytes 0.78 x10^3/μL (normal 1.18-3.74x10^3),
platelet 300 x10^3 /µL (normal 150-400x10^3), and high sensitive C reactive protein 82 mg/L (N:0-3 mg/L). No pathological finding was present at blood gas analysis. Blood pH, and partial oxygen and partial carbon dioxide pressures were normal. The patient’s general condition was good. Due to his high socio-cultural level and the fact he was capable of self-isolating at home, he was treated on an outpatient basis. Treatment included hydroxychloroquine, azithromycin, and paracetamol. The patient’s contact details were noted, and he was discharged, with advice to return to the emergency department if shortness of breath occurred.

The patient re-presented with sudden onset shortness of breath and severe chest pain on 15.04.2020. He had no history of exposure to trauma capable of causing pneumothorax. No findings of paraseptal emphysema, cavitary lesion, or cystic bronchiectasis were also present at the previous thoracic CT examination. His body temperature was normal, but saturation was 88%. Arterial blood pressure was 100/70-mmHg and heart rate was 110/min. Auscultation at physical examination revealed decreased respiratory sounds on the left side, and crepitant rales in all zones on the right (Figure 2).

No pathology was present at other system examinations. Left-sided pneumothorax was detected at thoracic CT. Closed underwater drainage was applied, and the patient was transferred to the chest diseases hospital.

**DISCUSSION**

There may be several predisposing causes of spontaneous pneumothorax. Thin men, smokers, and individuals with chronic cough or chronic obstructive pulmonary disease have a greater disposition to pneumothorax development. Spontaneous pneumothorax essentially involves air leakage into the pleural space in association with development of alveolar rupture. Our patient had no underlying chronic disease or history of smoking for the development of spontaneous pneumothorax. One study involving tomographic findings of COVID-19 infection reported a 1% development rate for pneumothorax. In that study, Chen et al. attributed the development of pneumothorax to positive-pressure mechanical ventilation (3). Spontaneous pneumothorax development has been very rarely reported in COVID-19 infection (4-6). These cases have generally involved patients receiving positive-pressure respiratory support after intubation. The cause of the pneumothorax developed in the
Conflict of Interest: Authors declare no conflict of interest.

REFERENCES