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CASE REPORT / *OLGU SUNUMU*

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Spontaneous Hemopneumothorax During the Course of COVID-19 Pneumonia

COVID-19 Pnömonisinde Görülen Spontan Hemopneumotoraks

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ABSTRACT COVID-19 pneumonia can be very complicated, particularly if the patient is unresponsive to treatment. In addition to clinical and laboratory examinations, radiological examination can facilitate the early diagnosis and treatment of aggravating problems during follow-up. Here we present the case of a patient with COVID-19 pneumonia who experienced a serious complication of hemopneumothorax. Hemopneumothorax is rapidly diagnosed and treated with close monitoring in the case of COVID-19 pneumonia. Patients who have COVID-19 pneumonia and are unresponsive to treatment should be closely followed-up for complications.
Keywords: COVID-19 pneumonia, coronavirus, hemothorax

ÖZ Koronavirüs hastalığı-2019 (COVID-19) pnömonisi özellikle tedaviye yanıt vermeyen durumlarda daha karmaşık olabilir. Buna ilaveten klinik ve laboratuvar incelemeleri, radyolojik değerlendirme izlem sırasında ortaya çıkabilecek problemlere erken tanı koymayı kolaylaştırır. Biz bu olgu sunumunda COVID-19 pnömonili hastada ciddi bir komplikasyon olan hemopnömotoraks olgusunu değerlendirdik. COVID-19 pnömonili hastanın yakın takibi ile hemopnömotoraksa hızlıca tanı konulup, tedavi edildi. Özellikle tedaviye dirençli COVID-19 pnömonili hastalar, komplikasyonlar açısından yakın takibe alınmalıdır.
Anahtar Kelimeler: COVID-19 pnömoni, koronavirüs, hemotoraks

Introduction

A group of consecutive patients who has Coronavirus disease-2019 (COVID-19) Severe Acute Respiratory Syndrome-Coronavirus-2 (SARS-CoV-2) detected in Wuhan, China and the disease spread to other countries and called pandemic (1). In March 2020, the disease has been detected in Turkey. Turkey Ministry of Health has issued a guideline for diagnosis and treatment of COVID-19, and the guideline has

been continuously updated. In COVID-19 patients, radiology together with clinical and reverse transcription-polymerase chain reaction (RT-PCR) findings enables early diagnosis and treatment (2,3).

Fever and cough in addition to other non-specific symptoms, including dyspnea, headache, muscle soreness and fatigue are the most common clinical symptoms (4). In suspected of COVID-19 infection, thoracic radiological evaluation is often crucial to diagnosis (5). Chest radiograph shows low-density pneumonia foci (viral pneumonia), which mostly involve bilateral mid-lower zones in this disease. However, chest X-ray sensitivity is low (30-60%) (6), and normal chest radiography does not exclude pneumonia (3). Computed tomography (CT) findings have proven to be diagnostic in most of the cases with an initial false-negative RT-PCR screening test (7,8).

Beside initial diagnosis of COVID-19, it is essential to repeat the radiological evaluations if necessary for detecting adverse events. Adverse events should be kept in mind during treatment of COVID-19 pneumonia to manage them effectively. Here we presented a case of COVID-19 pneumonia complicated by hemopneumothorax. We suspected hemopneumothorax by clinical assessment and confirmed using the radiological examination. The patient was managed successfully and discharged.

Case Report

Fifty-nine years old male admitted to the emergency department with complaints of cough. His general condition was good at admission. He was ex-smoker and had no chronic disease. Laboratory findings showed a mild increase in liver functions, C-reactive protein, ferritin, D-dimer, procalcitonin, troponin. These values were considering COVID-19. Thorax CT revealed widespread bilateral ground-glass opacities, predominantly in lower lobes, coherent with COVID-19 pneumonia. With these findings, the patient was diagnosed as COVID-19 pneumonia and hospitalized to the ward. According to Ministry of Health COVID-19 guideline, hydroxychloroquine, azithromycin and low-molecular-weight heparin (LMWH) and nasal oxygen therapy were started. COVID-19 was verified by PCR. Five days later, favipiravir was added to the treatment as the patient's clinical findings worsened. Since he got worse on the twelfth day, tocilizumab was given. On the twentieth day of medical therapy, hemoptysis started. At that time, the SpO_2 was 88% while the patient was receiving 4 L/min O_2 with a nasal mask. Thorax CT scan revealed bilateral cystic changes and hydropneumothorax. The patient underwent tube thoracostomy from the right hemithorax, and 600 cc blood was evacuated. Haemoglobin level reduced to 8.0 g/dL from 15.4 g/dL, and blood replacement was done. On the twenty ninth day, the operation was performed. Lower lobe segmentectomy + partial pleurectomy was done under right lateral thoracotomy, and 1200 cc hematoma was

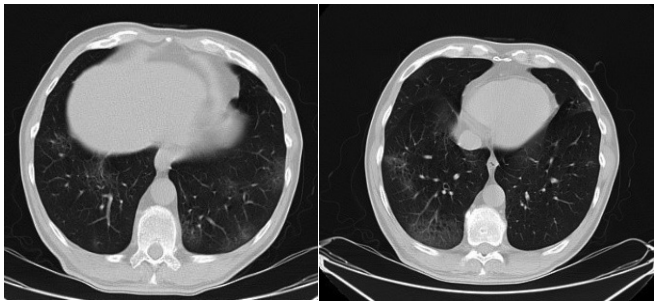

Figure 1a-1b. At diagnosis, computed tomography scans show bilateral peripheral ground-glass opacities in the lower lobes (arrows)

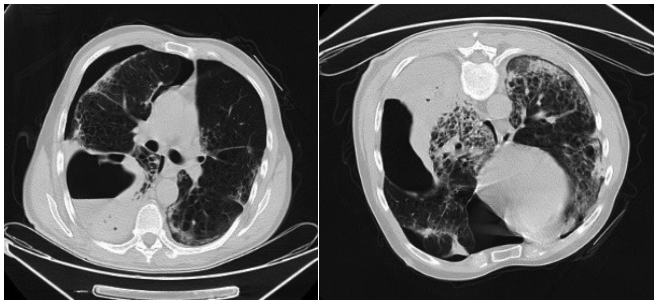

Figure 2a-2b. On day 20th, computed tomography scans show bilateral consolidation, honeycomb, and right hydropneumothorax

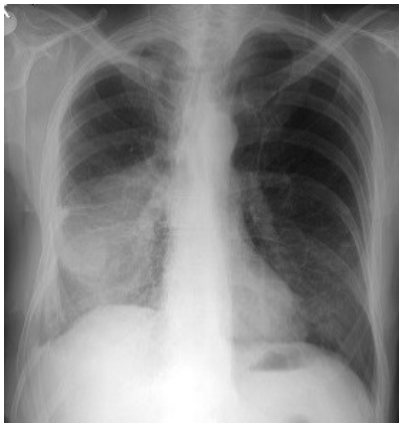

Figure 3. Chest X-ray after discharged

aspirated. Emphysematous lung parenchyma, including bulla, was seen in the right upper lobe. Also, damaged lung parenchyma, including cystic changes, intraparenchymal haemorrhage were reported by pathologist in the lower lobe and lateral basal segments. After clinical observation in the intensive care unit for nine days, the patient was transferred to the thorax surgery ward; after a week, the patient was discharged by taking the thorax tube off.

Discussion

We presented a case of COVID-19 pneumonia complicated with hemopneumothorax during therapy in the hospital. The patient underwent surgery to take control of the bleeding, and extensive cystic changes and damaged lung were seen throughout the right lung. He was managed successfully and discharged after twenty-nine days.

The clinical and radiological findings of COVID-19 have been fairly well documented in a short time. The most common complaints of COVID-19 were fever, fatigue, dry cough, anorexia, myalgia, dyspnea and sputum (9,10). Although it is not common, hemoptysis might be a possible clinical presentation of COVID-19 (10,11). In the study from China, hemoptysis was reported in two of 41 COVID-19 patients (1.43%) (9). Hemoptysis may develop due to parenchymal damage in progressive disease. Chest CT is an essential diagnostic tool for suspected COVID-19 patients because it is easy to use, and it has got high sensitivity. It also helps in early diagnosis of complications during follow-up. The most common CT finding in COVID-19 pneumonia is ground-glass opacities in the subpleural regions of the lower lobes (11). These findings are mainly seen in the early stages of COVID-19 pneumonia and may be attributed to alveolar swelling, exudation in the alveolar space, and alveolar septal inflammation caused by coronavirus (12). Cyst and pneumothorax are uncommon at diagnosis. Cystic parenchymal changes and pneumothorax often develop during the disease due to non-invasive or invasive mechanical ventilation. Both infection and mechanical ventilation can cause parenchymal damage (13,14). Pneumothorax, mediastinal emphysema and hemothorax are well-known complications of mechanical ventilation in Acute Respiratory Distress syndrome (ARDS) (15). However, hemopneumothorax developed in our patient without mechanical ventilation support.

COVID-19 may predispose patients to thrombotic disease, both in the venous and arterial circulations, due to excessive inflammation, platelet activation, endothelial dysfunction, and stasis (16).The lungs affected by COVID-19 also showed distinctive vascular features, consisting of severe endothelial injury associated with the presence of the intracellular virus and disrupted cell membranes. Histologic analysis of pulmonary vessels in patients with COVID-19 showed widespread thrombosis with microangiopathy (17). Most autopsy reports describe hyaline membrane changes and microvessel thrombosis suggestive of early ARDS in patients with COVID-19 (12). Therefore, LMWH should be used for COVID-19 patients.

Our patient worsened over time despite medical therapy and hemopneumothorax developed while under nasal oxygen therapy. Diffuse lung damage was reported in the pathology report. Therefore, we think that parenchymal injury facilitated the development of hemopneumothorax. Severe cough and LMWH treatment in COVID-19 pneumonia may play a role as contributors for hemopneumothorax in the damaged lung.

Hemopneumothorax as an undesirable event should be kept in mind, especially in patients with COVID-19 pneumonia who do not respond to treatment.

Ethics

Informed Consent: Written informed consent was obtained from patient who participated in this case.

Peer-review: Externally peer reviewed.

Authorship Contributions

Concept: A.V., B.A., Design: Z.Ç., D.G.M., Data Collection or Processing: A.V., B.A., Analysis or Interpretation: Z.Ç., D.G.M., Writing: A.V., B.A., Critical Review: Ü.A.T., D.G.M., Other: A.V., Z.Ç., D.G.M.

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