

PRIMARY SPONTANEOUS PARTIAL PNEUMOTHORAX IN A PATIENT WITH COVID-19 PNEUMONIA. HAVE WE UNDERESTIMATED THIS COMPLICATION? A CASE REPORT

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Abstract: Introduction and case report: We described a case of primary spontaneous partial pneumothorax in a middle-aged man with COVID-19 pneumonia who presented with fever, loss of appetite, and malaise. Laboratory results revealed higher levels of inflammatory markers, as well as sterile urine and blood cultures. On admission, a chest X-ray revealed bilateral patchy consolidations in the lung parenchyma, as well as a left-sided partial pneumothorax. Throughout his hospitalization, the patient was closely examined by a thoracic surgeon, and a chest X-ray was taken on multiple occasions. There was spontaneous resorption of air from the pleural space. **Conclusion:** Pneumothorax is a rare but serious complication of the COVID-19 infection that has recently been documented in patients with no comorbidities, requiring various types of ventilatory support. The precise mechanism of primary spontaneous pneumothorax in COVID-19 infection is unknown, but it will undoubtedly pose a challenge to future researchers.

Keywords: primary spontaneous pneumothorax, partial, COVID-19, treatment.

INTRODUCTION

The presence of air in the pleural space that is not produced by trauma or another clear triggering factor is referred to as spontaneous pneumothorax (trauma or iatrogenic during a procedure). Secondary spontaneous pneumothorax is a consequence of preexisting lung disease, whereas primary spontaneous pneumothorax (PSP) occurs without a clinically detectable lung ailment (1). According to the literature, spontaneous pneumothorax is a rare and infrequent complication of Coronavirus disease (COVID-19) pneumonia

(2). A few authors discovered that while the frequency in hospitalized patients is extremely low, about 0.3%, in those who required invasive mechanical ventilation (IMV), the incidence climbed to 12.8-23.8 %, with a mortality rate of up to 100% (3). This case presentation aims to stress this complication and explore potential risk factors associated with this phenomenon.

CASE REPORT

A 46-year-old man was admitted to the pulmonology department after complaining of a five-day fever, malaise, and loss of appetite. The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) real-time polymerase chain reaction (RT-PCR) test resulted in a positive result. On admission, he was afebrile, with a blood pressure of 130/85 mmHg and a heart rate of 120 beats per minute. In room air, the pulse oximeter saturation was 87%. He had weakened breath sounds and no cardiac murmurs on auscultation. The patient disputed having drug allergies or a chronic condition, nor was a heavy smoker. On admission, laboratory findings revealed that C reactive protein (CRP) was 71.6 mg/l, leucocytes 14.8 cells/mcl, neutrophils 92%, lymphocytes 4.5%, erythrocytes 4.5 million cells/mcl, hemoglobin 142 g/l, platelets 243 cells/mcl, ferritin 1463 ng/ml, and IL-6 was 36.3 pg/ml. The D-dimer concentration was 1630 ng/ml. The blood gas analysis was within normal limits. Blood and urine cultures were both sterile. On admission, a chest X-ray revealed bilateral patchy consolidations in the lung parenchyma, as well as a left-sided partial pneumothorax (Figure 1). He was given ceftriaxone 2g once a day, levofloxacin 400 mg once a day, dexamethasone 6mg three times a day, low molecular weight heparin

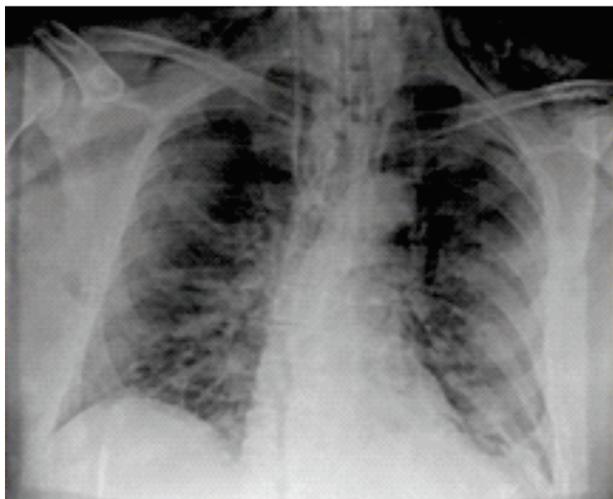


Figure 1. Chest X-ray on admission showed bilateral spotty consolidations in lung parenchyma with left-sided partial pneumothorax

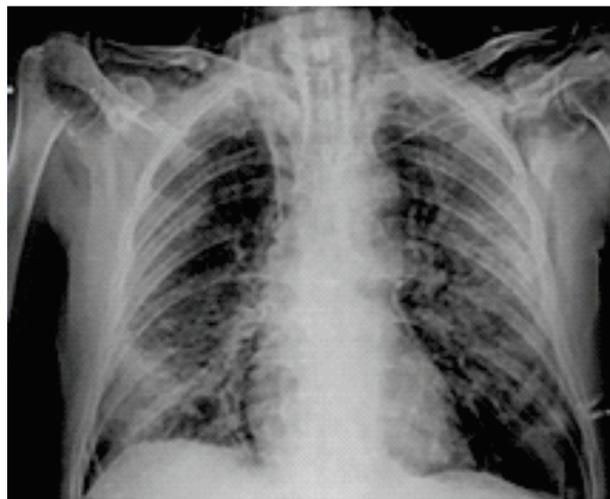


Figure 2. Control chest X-ray showed slightly regression of inflammatory changes and left-sided pneumothorax only in the apicoposterior segment

(LMWH) 80mg twice a day, vitamins C, B6, and D, pantoprazole 20 mg twice a day, and oxygen therapy at 2-4 l/min. The patient's condition was closely monitored during his hospitalization; he was examined by a thoracic surgeon who did not indicate drainage, a chest X-ray was conducted on several occasions, and there was no worsening of respiratory symptoms. Blood, gas analyses were always within normal limits. On the tenth day of hospitalization, the patient had a control chest X-ray, which revealed a slight regression of inflammatory changes and a left-sided pneumothorax only in the apicoposterior segment (Figure 2). In the weeks that followed, the patient had two chest X-rays that revealed complete removal of the pneumothorax.

DISCUSSION

PSP symptoms might be mild or non-existent. These clinical symptoms are based on the proportion and size of the pneumothorax. Patients may suffer a sudden onset of pleuritic chest pain with dyspnea and shortness of breath, and some may experience shoulder tip pain (4). PSP is frequent in young people, with men having a higher frequency than women (7.4-18 per 100.000 men and 1.2-6 per 100.000 women). Being a male, having a slim and tall stature, and smoking are all risk factors (5). Some studies observed that PSP in COVID-19 pneumonia is usually associated with hypertension (37.5%), asthma (20%), and diabetes (17.5%), none of which were present in our patient (6). In laboratory findings, higher levels of inflammatory markers, particularly IL-6, were found, which value, according to data from some researchers, matches levels seen in COVID-19 infection (7). A chest X-ray revealed bilateral pneumonia with partial pneumothorax on the left side. According to the literature, the most prevalent

chest-X-ray findings in COVID-19 are: lower lung zone involvement (50%) bilaterality (50%) consolidations (47%) peripheral infiltrates (41%), and ground-glass opacities (33%). A chest X-ray should be considered a viable imaging method for detecting COVID-19 pneumonia (8). However, a chest X-ray has been shown to have low sensitivity in detecting pneumothorax, particularly in the spine position, and computed tomography (CT) represents the "gold standard" diagnostic test for pneumothorax, but it is well limited by its high exposure to radiation, and can be unsafe to transport unstable patients (9). According to several experts, lung ultrasonography (LUS), particularly the BLUE protocol, can now cover some of the most critical disorders, including pneumothorax, with an accuracy of about 90% (10). We decided to monitor pneumothorax only through control chest X-rays due to the patient's symptomatology and overall good health. Given that he was not a smoker and had no other risk factors, we suspect that our patient developed PSP as a result of pulmonary lesions induced by COVID-19 infection.

CONCLUSION

Pneumothorax is a rare but serious complication of COVID-19 infection that has recently been documented in patients with no comorbidities and who are receiving various types of ventilatory support. The precise mechanism of PSP in COVID-19 infection is unknown, but it will undoubtedly pose a challenge to future researchers.

Abbreviations

CT — computed tomography
CRP — C reactive protein

IMV — invasive mechanical ventilation
LUS — lung ultrasound
LMWH — low molecular weight heparin
PSP — primary spontaneous pneumothorax

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Sažetak

PRIMARNI SPONTANI PARCIJALNI PNEUMOTORAKS KOD BOLESNIKA SA DIJAGNOSTIKOVANOM COVID-19 UPALOM PLUĆA. DA LI SMO POTCENILI OVU KOMPLIKACIJU? PRIKAZ SLUČAJA

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Uvod i prikaz slučaja: Opisali smo slučaj bolesnika srednjih godina sa primarnim spontanom parcijalnim pneumotoraksom kod koga je dijagnostikovana COVID-19 pneumonija sa tegobama u vidu povišene temperature, gubitka apetita i malaksalosti. U laboratorijskim rezultatima zabeležene su povišene vrednosti markera zapaljenja, urino i hemokulture su bile sterilne. Na radiografiji srca i pluća opisana je obostrana upala pluća sa konsolidacijama i levostranim parcijalnim pneumotoraksom. Tokom hospitalizacije bolesnik je pregledan od strane grudnog hirurga, ra-

diografija srca i pluća je ponovljena više puta. Na poslednjem snimku došlo je do potpune resorpcije vazduha iz pleuralnog prostora. **Zaključak:** Pneumotoraks je retka ali ozbiljna komplikacija COVID-19 infekcije koja je zabeležena kod bolesnika bez komorbiditeta i onih koji nisu zahtevali bilo koji vid ventilatorne podrške. Tačan mehanizam razvoja primarnog spontanog pneumotoraksa još uvek nije poznat, ali će nesumljivo predstavljati izazov budućim istraživačima.

Ključne reči: primarni spontani pneumotoraks, parcijalni, COVID-19, lečenje.

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