



Case Report

SPONTANEOUS PNEUMOTHORAX AS A POST COVID-19 COMPLICATION

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ABSTRACT

Background. Conditions that appear four weeks after infection with SARS-CoV-2 are accepted as “post COVID”. Spontaneous pneumothorax (SP) is one of these late COVID consequences. Our aim is to present a series of cases with this post COVID complication.

Case series. We present four patients with post COVID expression of spontaneous pneumothorax. These patients were non-smokers; never ventilated and had no underlying pre-existing lung diseases and they were treated and recovered from COVID-19 pneumonia in an outpatient setting. Tube thoracostomy, under video-assisted control in three of the patients, was performed as a management of pneumothorax.

Conclusion. With these case series, we highlight SP as an expression of long-term COVID-19 morbidity. The effectiveness of thoracoscopy in the diagnosis and management of such type of secondary late COVID-19 spontaneous pneumothorax was demonstrated.

Key words: spontaneous pneumothorax, post COVID-19, tube thoracostomy, thoracoscopy

INTRODUCTION

Spontaneous pneumothorax (SP) is a well-known complication of COVID-19 pneumonia, presenting in no more than 1 % of cases (1, 2). Conditions that appear four weeks after infection with SARS-CoV-2 are accepted as “post-COVID” (3). A wide range of terms is used to note these conditions (such as post-acute COVID, late COVID consequence, chronic COVID, and long COVID). To our knowledge, there are only several case reports of SP as a post-COVID consequence (4). One of these reports, named “Delayed recurrent spontaneous pneumothorax in a patient recovering from COVID-19 pneumonia” appeared in September 2020 (5). There are no published case series on SP as a late COVID-19 presentation. In our thoracic surgery practice, we have experienced four patients with SP as a late COVID condition. Our aim is to present this series of cases.

CASE SERIES

The case series includes patients who were non-

smokers, never ventilated, and had no underlying pre-existing lung diseases. They were treated and recovered from COVID-19 pneumonia in an outpatient setting. The patients' complaints, before their admission to our thoracic surgery department were: acute onset of mild to moderate chest pain, dry cough, and shortness of breath. Conventional chest X-Ray (CXR), performed in outpatient clinics, established the SP as a post-COVID entity. At the time of the patients' hospitalizations, nasopharyngeal swabs were taken. All patients' displayed negative PCR results.

Case # 1 was a 79-year-old woman with left-sided total SP established 35 days post COVID-19 infection (**Figure 1**). Tube thoracostomy was performed and CXRs were repeated on the 2nd, 5th, and 9th day of hospitalisation, revealing a re-inflated lung. The woman was discharged on the 10th day.

Case # 2 was a 45-year-old man with SP 31 days post COVID-19 infection. Left-sided tension pneumothorax with a contralateral shifting of the mediastinum was determined (**Figure 2**). Repeated CXRs after tube thoracostomy revealed re-expansion of the lung and he was discharged on the 9th day. On the

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21st day of the patient's discharge, he developed a dry cough and mild dyspnea. A control CXR and examination were performed in an outpatient setting, and a partial recurrent left-sided SP was determined. The patient was re-admitted and scheduled for a thoracoscopy. A

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thin layer of fibrin covered the lung surface and pleural adhesions were revealed (**Figure 3**). Pleural debridement was performed and full inflation of the lung was determined at the end of the procedure. The man was discharged after 11 days with lung re-expansion.

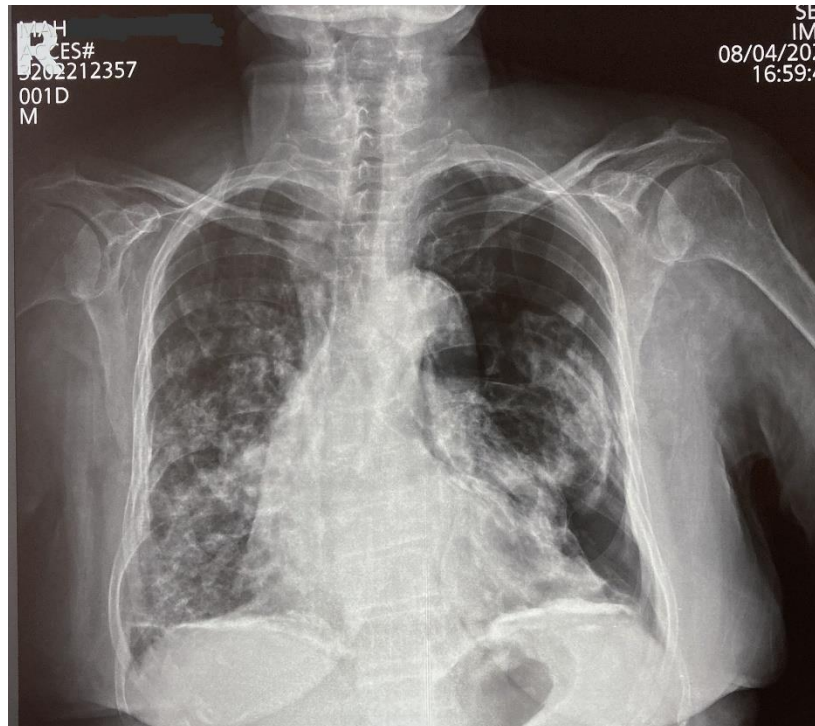


Figure 1. Chest radiograph – presentation of the left-sided total pneumothorax (case # 1).

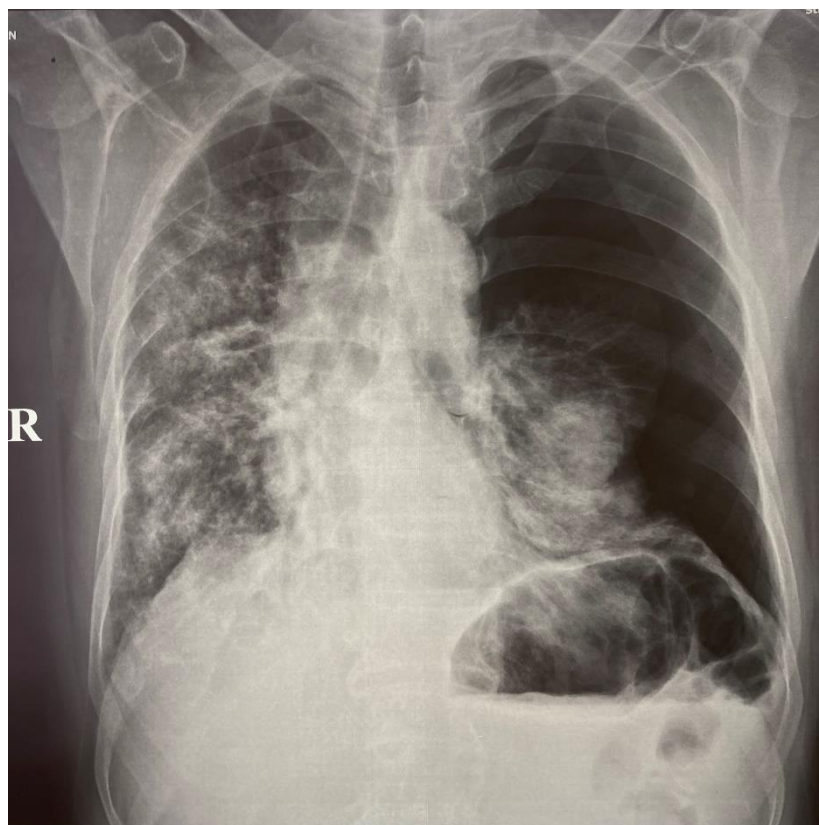


Figure 2. Chest radiograph showing total pneumothorax on the left side (case # 2).

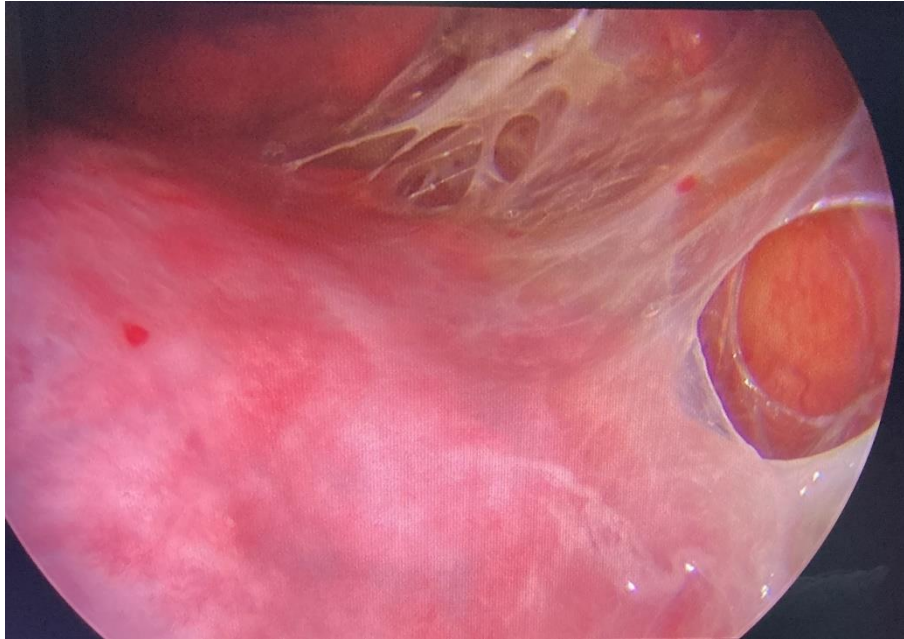


Figure 3. Thoracoscopic finding (case #2): fibrin deposition on the lung surface and pleural adhesions.

Right-sided SP was expressed on the 35th day post COVID-19 infection for case # 3 (30-year-old man) and respectively on the 34th day for case # 4 (63-year-old woman). Due to a persistent air leak after chest drain insertion and no full expansion of the lung as documented by chest CT, both patients were scheduled for thoracoscopy – on the 5th day of tube thoracostomy for the man and respectively on the 6th day for the woman. The thoracoscopic

finding was identical for both patients: multiple round red spots (**petechiae**) on the lung surface (**Figure 4**). Full expansion of the lung under positive pressure ventilation was determined in both patients. At the end of thoracoscopy, iod-povidone was placed in the pleural cavity and a chest drain was inserted. After thoracoscopy, repeated CXRs revealed keeping of lung expansion. The man was discharged on the 9th and the woman on the 10th day.



Figure 4. Thoracoscopic finding (case #3): multiple round red spots (petechiae) on the lung surface.

A control chest CT was performed for all four patients on the day of their dehospitalization. In

addition to the lung expansion, areas of lung consolidation with small nodular and linear opacities were shown with no bullas (**Figure 5**).



Figure 5. Chest computed tomography (case #4): full re-expansion of the lungs with areas of lung consolidation.

DISCUSSION

These cases present SP in patients with organizing post COVID-19 pneumonia. From this point of view, this is a secondary type of SP. But imaging and thoracoscopic diagnosis did not reveal any gross pathological changes of the lung that would clearly explain this type of SP. These cases suggest that SP results from a progression of viral induced lung parenchymal alterations in the late COVID period. Petechial spots on the lung surface, determined in two of the presenting cases, are considered an expression of vascular inflammatory processes with focal endotheliitis in late COVID-19. The capillary and alveolar damage is accepted to be responsible for the frailty of the lung parenchyma with increased alveolar epithelial permeability. The result of these parenchymal alterations is air leakage through the surface of the post COVID lung; this is considered to be responsible for SP.

This case series highlights SP resulting from increased alveolar permeability, as an expression of long-term COVID-19 morbidity. The effectiveness of thoracoscopy in the diagnosis and management (by debridement and chemically induced pleurodesis) of patients with such types of secondary late COVID-19 spontaneous pneumothorax was demonstrated.

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