

# Occult Pneumothorax in a Mechanically Ventilated Covid-19 Patient: A Clinical Challenge

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Mechanical ventilation may lead to several complications including pneumothorax [1]. Sometimes there is a delay in the diagnosis of pneumothorax as patients often have other unstable conditions such as septic shock, neurological crisis, trauma, renal or liver failure, and related disorders. Furthermore, often these patients are laying in bed, with sedation and sometimes require paralysis proving a timely diagnosis challenging. A daily chest X-ray in mechanically ventilated patients often helps to confirm any change in lung parenchyma and review central venous lines, chest tubes, and/or endotracheal tube. Due to supine position and lack of breath-holding during a portable chest X-ray, the presence of free air in the pleural cavity can be missed as air moves anterior to the abnormal lung parenchyma and no clear demarcation of the pneumothorax may be seen [2]. The utility of a non-contrast CT scan of the chest and bedside chest ultrasound can help with diagnosis in this situation. Bedside ultrasound is the standard of care and looks for a lung point sign, absence of lung sliding at the level of pneumothorax, and absence of seashore sign [3]. A 22-year-old male patient was admitted to the intensive care unit (ICU) due to acute respiratory failure associated with COVID-19 infection. On admission to the ICU, a chest X-ray was performed showing bilateral cotton-wool infiltrates characteristic of infection by SARS-CoV2 virus (Fig 1a). The patient was managed with mechanical lung ventilation including prone positioning. Due to continued mechanical ventilation needs (Fig 1b), a tracheostomy was performed on day 14. Chest X-ray did not show any pneumothorax but a chest CT scan was performed due to persistent hypoxemia after the tracheostomy, which showed hidden pneumothorax (Fig 1c). The management was conservative and free air gradually resolved. Occult pneumothorax is a circumstance where the presence of pneumothorax cannot be observed on conventional chest X-rays and is evident only on non-contrast chest CT or chest

ultrasound [4, 5]. SARS-CoV2 induced ARDS have a high incidence of pneumothorax [6] and requires close monitoring. A bedside ultrasound to look for signs of pneumothorax in high-risk patients may be used to diagnose early and promptly intervene to stabilize a patient.

## DECLARATION OF PATIENT CONSENT

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Figure 1:** Admission chest X-ray (a), a follow-up chest X-ray after intubation (b), and CT scan chest (c) showing anterior pneumothorax not seen on the plan portable chest X-ray.

