

Bullous emphysema following prolonged mechanical ventilation for covid-19 ARDS: A mistaken case of suspected pneumothorax

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Case Report

A 58 year old male with no significant past medical history presented to the Emergency Department with 10 days of a non-productive cough, body aches, and intermittent temperature elevations to a maximum of 101.4F (38.5°C). He reported escalating shortness of breath over the past 3 days. He was unvaccinated for influenza or COVID-19. He was found to be persistently hypoxic with oxygen saturations in the low 80th percentile on room air. His chest Xray was notable for bibasilar interstitial infiltrates typical of COVID-19 (Figure 1). His COVID test returned positive. He was admitted to the Hospital for continued monitoring and pulmonary cares. Following admission, the patient's pulmonary status rapidly declined requiring intubation and mechanical ventilation. He endured a prolonged ICU course and ultimately received a tracheostomy and percutaneous gastrostomy tube. He was unable to be weaned from the ventilator and was ultimately deemed stable for transfer to a Long Term Care Facility (LTCF). On hospital day # 77, the patient was discharged to the noted LTCF for continued ventilatory support and skilled nursing cares.

Upon intake to his destination facility, he was quickly returned to the originating hospital's Emergency Department following the interpretation of a chest X-ray concerning for pneumothorax (Figure 2). At time of his return to the Emergency Department, his vital signs were stable and oxygen saturations 100% on full ventilatory support.

While the patient's chest X-ray was concerning for pneumothorax, his vital signs were stable and there was no vital sign or physiologic evidence of tension pathology. A non contrast CT imaging study was obtained for further investigation.

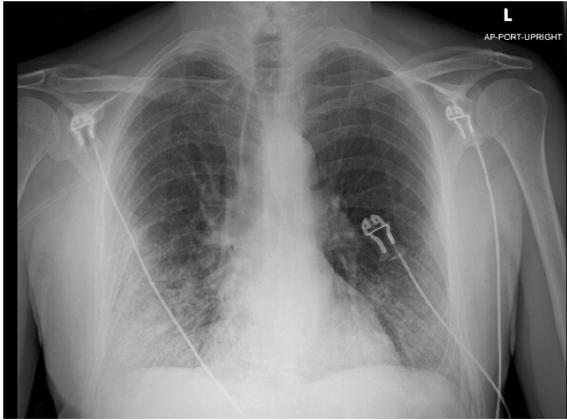


Figure 1: An AP Portable, Upright Chest X-ray Notable for Bibasilar Interstitial Infiltrates Consistent with COVID-19 Pneumonia.

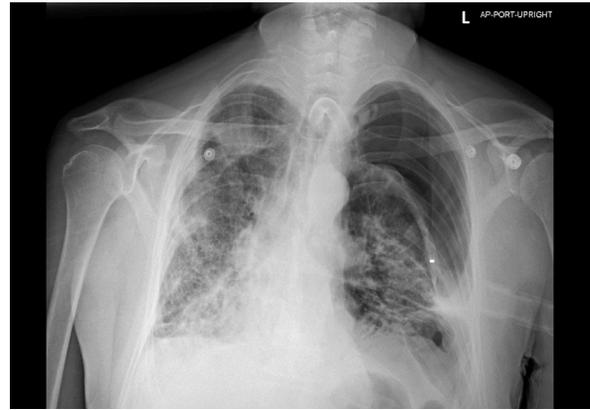


Figure 2: An AP Portable, Upright Chest X-ray Demonstrating Chronic Bibasilar Interstitial Infiltrates with a Concerning Left Upper Lobe Lucency Concerning for Pneumothorax



Figure 3: Non-Contrast, Axial CT Imaging notable for Diffuse Chronic Pulmonary Infiltrates and bronchiectasis, a Moderate Sized Right Pleural Effusion, and Left Upper Lobe Pulmonary Septations Consistent with Bullous Emphysematous Change. No Pneumothorax was identified.

Non-Contrast Chest CT results excluded an acute pneumothorax; acute intervention was not indicated.

Multiple left upper lobe pulmonary septations were noted to be consistent with bullous emphysema. Diffuse chronic appearing infiltrates were suggestive of a prior significant lung infection with resulting bronchiectasis. The patient's vital signs and ventilator settings remained stable. He was discharged back to his long term care facility in stable condition.

Discussion

Chronic lung injury is becoming an increasingly observed complication of the COVID 19 infection. Bullous emphysema, which has long been relegated to only a handful of etiologies to include prolonged to-

bacco use and alpha-1 antitrypsin disease, is now being observed in a subset of COVID 19 patients as early as 14 days from the onset of infection. The pathophysiology of bullous emphysema begins with chronic inflammation of distal airways and ends with widespread alveolar breakdown and subsequent airspace enlargement. While the evolution of bullous emphysema will take years with traditional etiologies, the disease process appears to be greatly accelerated in a sub-set of patients with active COVID 19 infection. While the pathophysiology of bullous emphysematous change is understood in terms of traditional etiologies, the reasons for this accelerated course in COVID 19 patients remains somewhat unclear. Knowledge and understanding of bullous emphysema caused by COVID 19 will likely continue to evolve as the disease remains prevalent throughout the world.

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Manuscript Information: Received: March 04, 2022; Accepted: April 01, 2022; Published: April 15, 2022

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Citation: Henry k, Hernandez B, Elsenheimer M. Bullous emphysema following prolonged mechanical ventilation for covid-19 ARDS: A mistaken case of suspected pneumothorax. Open J Clin Med Case Rep. 2022; 1846.

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