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Pneumomediastinum in Asthmatic with COVID-19 Pneumonia

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Pneumomediastinum is an uncommon condition with air present in the mediastinum outside the trachea and oesophagus. It is usually self-limiting but occasionally air leaks into the pericardial space causing pneumopericardium which may lead to a life-threatening cardiac tamponade thereby requiring pericardiocentesis.[1] It can be spontaneous in aetiology or secondary to mechanical ventilation, inflammation such as COVID-19, neoplasm or perforation of a hollow abdominal organ. The most common symptom is chest pain. The diagnosis is confirmed by imaging where air can be seen as vertical radio-translucent regions in the mediastinum and along the borders of the heart.[2] We present the case of two patients with asthma and COVID-19 pneumonia who developed pneumomediastinum.

Patient A is a 41-year-old man with a history of well controlled asthma and a Body Mass Index of 36. He was admitted with myalgia, pyrexia, worsening dyspnea and a productive cough having tested positive for SARS-CoV-2 one week prior in the community. He was hypoxic with a PaO2 of 8.5 kPa on 100% inspired oxygen and transferred to ICU where he spent ten days receiving continuous positive airway pressure (CPAP), Tocilizumab, steroids and antibiotics. He avoided intubation and mechanical ventilation. In addition to his COVID-19 pneumonia, a CXR on day 8 of his admission was suggestive of an incidental pneumomediastinum which was confirmed on CT scan of his chest. His pneumomediastinum was treated conservatively and showed subsequent improvement on further imaging with no residual pneumomediastinum evident on a CXR three weeks post initial diagnosis. He continued to improve over the coming weeks and was discharged home with portable oxygen after undergoing pulmonary rehabilitation and is being followed up in the respiratory clinic.

Patient B is a 52-year-old asthmatic man who presented with dyspnoea and central chest pain having tested positive for SARS-CoV-2 eight days prior in the community. He was treated with antibiotics, steroids, tocilizumab and required CPAP. A CXR performed on day 10 of his admission suggested a possible subtle pneumomediastinum in addition to his pneumonia. A CT chest on the same day confirmed a new moderate volume pneumomediastinum with gas locules tracking through the anterior, middle and superior mediastinum and supraclavicular soft tissues. A repeat CT 48hrs later showed interval improvement. Patient B continue to improve and is currently undergoing pulmonary rehabilitation.

The above cases highlight a rare but increasingly reported complication of COVID-19. Interestingly both patients had a history of asthma, COVID-19 pneumonia and was on CPAP. It is thought that the pathogenesis of the pneumomediastinum in the above cases is due to alveolar rupture secondary to barotrauma associated with high PEEP settings via CPAP highlighting the fact that barotrauma associated pneumomediastinum are not solely related to intubation and mechanical ventilation. Pneumomediastinum should be treated conservatively once oesophageal rupture is outruled. Patients should be monitored closely for development of pneumothorax at which point a chest drain insertion may be required.[3]

Reflecting on the above cases, we can conclude that efforts should be made to use the lowest PEEP possible to achieve adequate oxygenation in asthmatic COVID-19 pneumonia who require CPAP.

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