

Introduction

Bronchopleural fistula (BPF) is a connection between bronchial tree and pleural space which leads to air collection in the pleural space called pneumothorax. Common etiologies include cystic lung diseases, cavitary lung lesions, complication of cardio-thoracic surgery, recurrent pneumonia and empyema, thoracic cavity biopsies, traumatic chest tube placement, lung cancer, chronic obstructive pulmonary disease and bronchiectasis. Common risk factors include chemotherapy, radiation therapy, diabetes mellitus and smoking. Management begins with chest tube placement for pneumothorax and drainage of empyema, if present. Patients with infectious etiology are candidates for antibiotics, postural drainage and optimized nutrition while patients with postoperative fistulas are surgical repair candidates. All other patients including poor surgical candidates requires bronchoscopic modalities of repair. Here we present an interesting case of a BPF caused by lung cavitations from septic emboli.

Discussion

Chest tube suctioning can cause negative intra-thoracic pressure in the setting of BPF which can trigger the ventilator. BPF should be a differential diagnosis in patients with unexplained tachypnea despite adequate sedation and use of paralytics.

Case Presentation

Patient is a 33 year old male with history of tricuspid valve vegetation from IV drug abuse who presented with dyspnea and hypoxia. Chest imaging revealed large left sided pneumothorax along with numerous cavitary lesions from septic emboli, right sided pleural effusion and bilateral consolidation. He underwent left sided chest tube placement and remained on high flow nasal cannula. Pleural fluid and blood culture grew Methicillin resistant Staphylococcus aureus for which patient was already on vancomycin. After few days, patient went into progressive respiratory failure and intubated with worsening consistent with Acute Respiratory Distress Syndrome. He subsequently developed right sided tension pneumothorax requiring another chest tube placement. Patient was eventually placed on Veno-Venous Extracorporeal Membrane Oxygenation (ECMO) because of severe underlying lung pathologies. Patient developed recurrent bilateral pneumothoraxes during hospital stay with multiple chest tubes as a result and had persistent air leaks bilaterally. Patient was sedated and paralyzed and in spite of lung resting strategy with low tidal volume and respiratory rate set at 10 breaths/minute, patient's spontaneous respiratory rate of 30 breaths/minute on ventilator was baffling. We figured out that the trigger for his tachypnea was significant air leak from large BPF as clamping the chest tube brought the respiratory rate down to 10 breaths/minute as set. We clinically diagnosed BPF and CT chest revealed right sided BPF and a pleuro-cutaneous fistula with subcutaneous air collection. Hence pathophysiology of tachypnea was deemed from auto-triggering of the ventilator from chest tube suction in the setting of BPF. Chest tube subsequently was placed on water seal and respiratory rate stabilized. Unfortunately because of underlying infectious pathology fistula was managed conservatively. Patient was weaned off of ECMO after few weeks but succumbed to the disease process with recurrence of full blown septic shock he eventually expired.

Conclusion

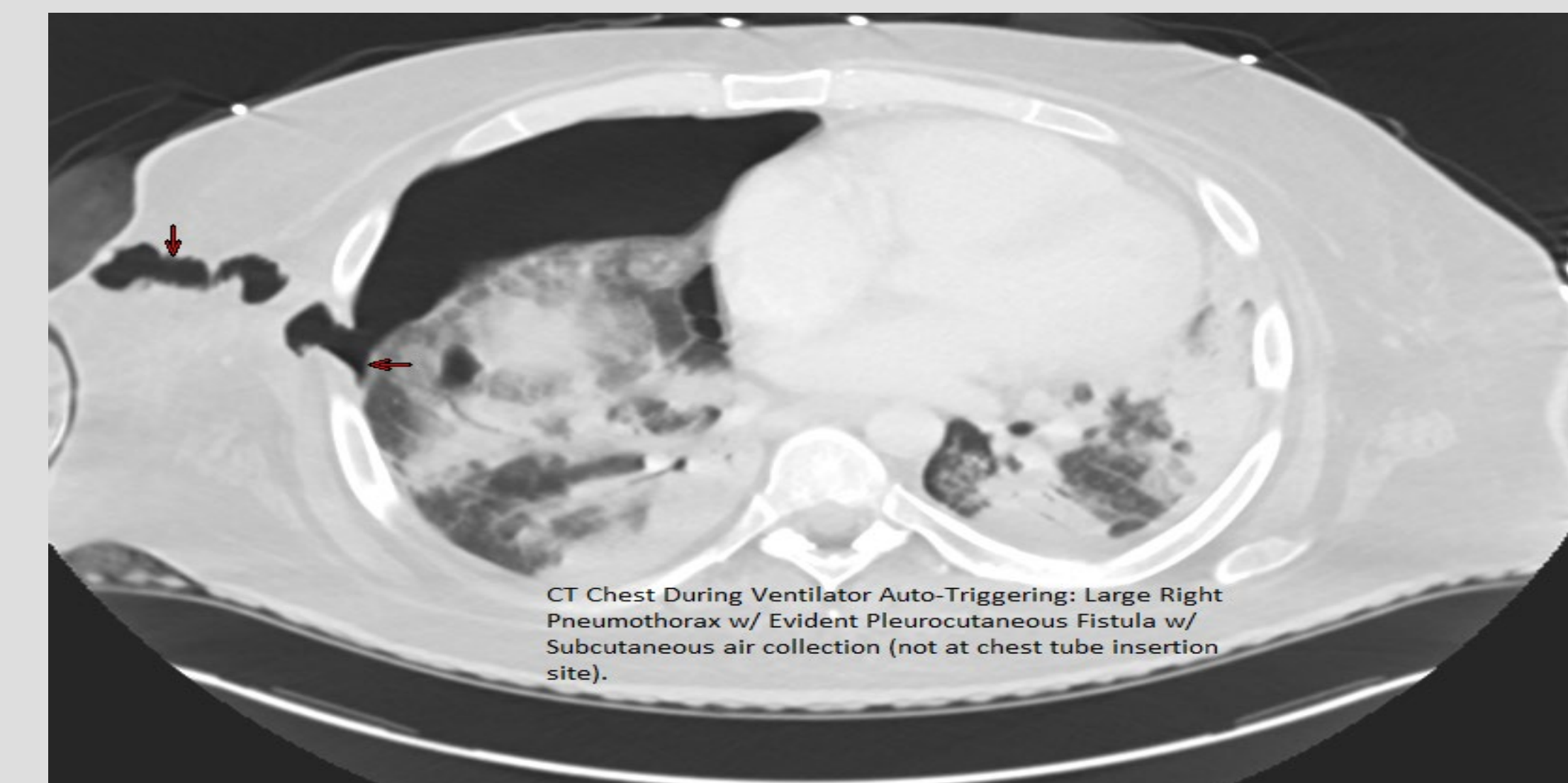
It is advisable to change ventilator or chest tube settings before going towards aggressive measures in patients with suspected BPF and tachypnea. Chest tube placed on water seal cautiously can improve the tachypnea as it did in our case

References

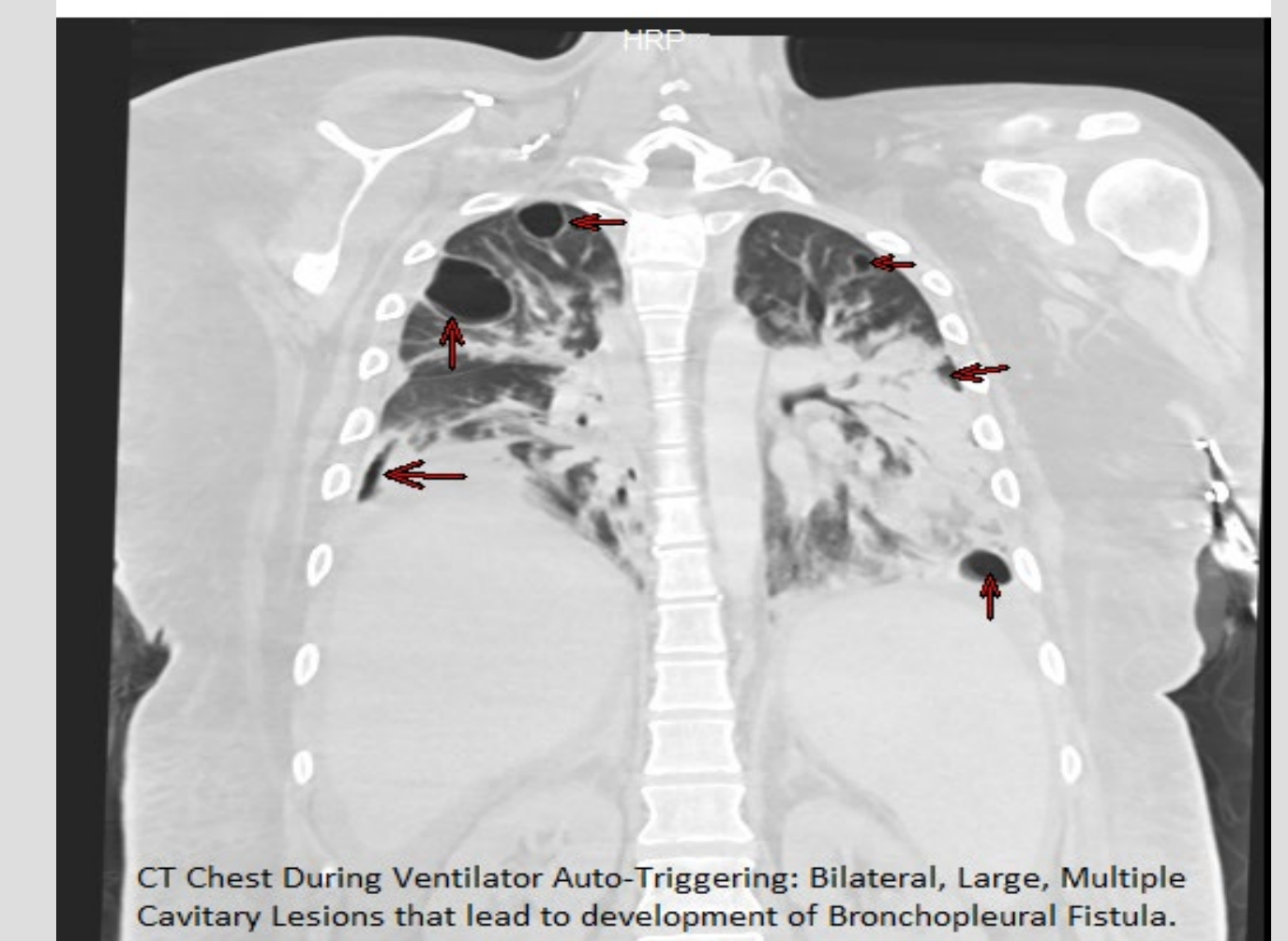
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CT Chest on Admission: Large Left Pneumothorax w/ Multiple Bilateral Cavitary Lesions.



CT Chest During Ventilator Auto-Triggering: Large Right Pneumothorax w/ Evident Pleuro-cutaneous Fistula w/ Subcutaneous air collection (not at chest tube insertion site).



CT Chest During Ventilator Auto-Triggering: Bilateral, Large, Multiple Cavitary Lesions that lead to development of Bronchopleural Fistula.