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Case Report

Surgery Section

Secondary Spontaneous Pneumothorax (SSP) with Bronchopleural Fistula in A Patient with COPD

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ABSTRACT

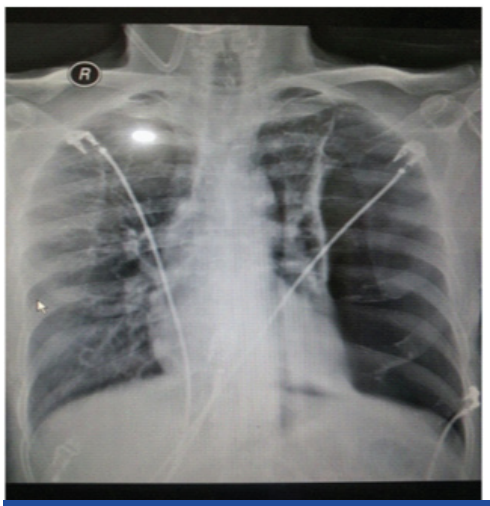
The aim of this article is to report a case of secondary spontaneous pneumothorax (SSP) with bronchopleural fistula in a patient with chronic obstructive pulmonary disease (COPD). SSP is a common life threatening complication in a patient with COPD and usually creates confusion in the mind of the treating physician during an episode of acute exacerbation of COPD. A 52-year-old male presented with a three day history of dry cough and breathing difficulty. He had a history of COPD. A large pneumothorax on the left side was confirmed after chest X-ray. Tube thoracostomy was performed which showed a persistent air-leak suggesting a bronchopleural fistula. The patient was treated conservatively with patience and the leak sealed spontaneously. The patient recovered uneventfully. This case emphasizes that SSP should be considered in the differential diagnosis of patients having a history of long-term COPD who are in a relatively stable condition with non- critical respiratory distress and the importance of conducting a chest X-ray along with repeated clinical examination in a patient of COPD who does not improve with adequate therapy.

Keywords: Chest X-ray, Emphysema, Thoracostomy

CASE REPORT

A 52-year-old male visited the emergency of the hospital with complaints of cough and breathing difficulty of three days duration. His breathing difficulty was progressive in nature and did not get relieved with his usual medicines- short and long acting beta-agonist inhalers. The cough was dry and irritable. There was not a history of chest pain or trauma. He had a history of COPD.

He was conscious, with vital signs of arterial blood pressure 120/70 mmHg, the heart rate 90/min, respiratory rate 24/min and an oxygen saturation of 92% at room air. There were decreased respiratory sounds in all zones on the left lung auscultation, and presence of ronchi at the right mid and lower zones. Other systemic examination was normal. Keeping in mind the clinical signs and symptoms of cardiopulmonary and COPD exacerbation causes, his electrocardiogram, chest X-ray, complete blood count, and other routine tests were performed. Despite adequate nebulisations with short and long acting beta agonists and intravenous steroids his dyspnoea did not settle down. He remained haemodynamically stable throughout. Chest X-ray showed appearance of a large pneumothorax [Table/Fig-1] on the left side. As he was stable, it was planned to do a CT- chest to rule out a large bulla (appearing as pneumothorax). An urgent CT chest was done which confirmed left pneumothorax with the underlying collapse of the left lung with mild left hydrothorax and severe emphysematous changes seen in the right lung [Table/Fig-2]. A tube thoracostomy was performed, and within a few minutes after, patient's complaints declined significantly and the post procedure chest X-ray showed complete lung expansion [Table/Fig-3]. The patient developed no complications during or after the process, but showed the persistent air leak, suggestive of a broncho pleural fistula. It was decided to be patient and wait for the air leak to settle down by itself. The patient was discharged home after seven days with his thoracostomy tube drain in situ, as he was stable without any respiratory complaints. He was followed up as an outpatient. After three days of discharge and it was noticed, that his air leak has got sealed spontaneously and the chest X-ray showed complete regression of pneumothorax. Therefore, the thoracostomy tube drain was clamped and a chest X-ray done 24 h post-clamping of the tube did not show any signs of pneumothorax and the tube was removed. With no additional lung pathology except for findings of chronic pulmonary disease, the patient was discharged and was advised to come for periodical follow-up as outpatient.



[Table/Fig-1]: Chest X-ray with a left-sided pneumothorax **[Table/Fig-2]:** CT scan of the chest showing left pneumothorax with underlying lung collapse
[Table/Fig-3]: Chest X-ray with a left-sided pneumothorax with intercostal drain tube in situ

DISCUSSION

Acute COPD exacerbations are treated easily in an outpatient setting most of the times, but in some cases, complications such as SSP can be the presenting feature. A pneumothorax is defined as an accumulation of air in the pleural cavity, that is, between the lung and the chest wall, which results in collapse of the lung on the affected side. Spontaneous pneumothorax (SP) is a cardiopulmonary emergency occurring in the absence of iatrogenic or traumatic causes [1,2].

SSP is characterized by [3]:

- Association with underlying lung disease – e.g. COPD, pulmonary fibrosis.
- Usually occurs in elderly patients in the age group of 60 y and above.
- It requires urgent management, which is also potentially more difficult as the pulmonary reserves are limited due to the underlying lung disease.
- The most common pathology is the rupture of an apical sub pleural bleb or bulla.

The authors describe a case of the SSP who presented to them as an acute exacerbation of COPD, and thus remind the physicians of this possibility in a case who does not improve with adequate therapy and also the importance of clinical re-examination and chest X-ray.

The most common cause of SSP is COPD accounting for 50% to 70% of the cases and rupture of apical bulla/bleb being the most common cause [3,4]. It is one of the common causes of mortality and morbidity in these patients with the risk of recurrence in the patients treated conservatively of up to 30% [5].

COPD has been visually classified into two types on the basis of CT scan of chest as: emphysema dominant and non-emphysema dominant [6], the former being typically associated with the SSP due to rupture of bulla.

Patients with acute exacerbation of COPD present with respiratory distress with reduced air entry on auscultation of the chest. It may either be due to hyperinflation of the chest or a probable pneumothorax. Asymmetrical or focal finding on chest auscultation is usually suggestive of a pneumothorax. The standard investigation of choice to detect a pneumothorax is a chest X-ray [2,3].

Patients presenting or diagnosed having SSP should be admitted to the hospital and those patients having pneumothorax of less than 15% of the hemi thorax and no respiratory distress, should be observed. To accelerate the rate by which the pleural air gets absorbed supplemental oxygen is administered. Simple aspiration is more likely to succeed in patients with primary spontaneous pneumothorax, rather than with SSP. It is recommended that all patients with SSP be treated with tube thoracostomy [7,8], most of the times.

Persistent or prolonged air leak is defined as continued air leak at two days after the chest tube insertion and usually requires intervention to seal the leak in cases of SSP (in most cases primary spontaneous pneumothorax the leak heals itself) [9]. Interventions such pleurodesis with talc or autologous blood or surgery or video assisted thoracoscopy may be required to seal the air leak, though it is recommended to wait for 14 days before any intervention.

CONCLUSION

To conclude, we emphasize that the SSP should be considered in the differential diagnosis of patients having a history of long-term COPD who are in a relatively stable condition with non- critical respiratory distress. We also highlight the importance of conducting a chest X-ray along with repeated clinical examination in a patient of COPD who does not improve with adequate therapy.

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