



A CASE REPORT: ACUTE EXACERBATION OF BRONCHIAL ASTHMA COMPLICATED BY PNEUMOMEDIASTINUM

Pulmonary Medicine

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ABSTRACT

Pneumomediastinum is presence of air or other gas in the mediastinum. Also known as mediastinal emphysema, is one of several forms of aberrant extra-alveolar air [1]. Obstructive lung diseases, especially acute asthma, is a well described predisposing factor leading to pneumomediastinum [2].

A 22-year male, known case of bronchial asthma presented with productive cough and cold since 2 days, breathlessness and wheezing since 1 day, Chest pain and pain in neck since 2 hours. Physical examination revealed bilateral ronchi and subcutaneous emphysema of neck and right upper chest. CT thorax showed Pneumomediastinum and subcutaneous emphysema.

Patient was treated with high flow oxygen via NRBM mask and bronchodilators. Successive CT thorax showed resolution of Pneumomediastinum and subcutaneous emphysema and no evidence of oesophageal rupture. Patient was discharged after 7 days

KEYWORDS

Bronchial Asthma, Pneumomediastinum, Pneumothorax, Surgical Emphysema

INTRODUCTION

Pneumomediastinum consists of air or other gas in the mediastinum. Also known as mediastinal emphysema, it is one of several forms of aberrant extra-alveolar air that include subcutaneous emphysema, pulmonary interstitial emphysema, pneumopericardium, pneumoperitoneum, pneumoretro-peritoneum, pneumocephalus, and pneumorachis (air in the spinal canal). The pathophysiology of pneumomediastinum depends on the clinical circumstances in which it is encountered [1].

Pneumomediastinum most commonly results from alveolar rupture but can also result from air escaping from the upper respiratory tract, intrathoracic airways, or gastrointestinal tract. Gas can be generated by certain infections, and outside air can reach the mediastinum after trauma or surgery [2].

The potential sources of pneumomediastinum include Lung parenchyma- disruption of alveoli (penetrating trauma, surgery, transbronchial biopsy, needle aspiration), "Spontaneous" alveolar rupture (between alveolus and adjacent bronchovascular bundle). Upper airways- head and neck infections, fracture of facial bones, dental procedures. Other sources- Blunt and penetrating trauma to chest and neck, iatrogenic (bronchoscopic procedures, mediastinoscopy, tracheostomy, needle aspiration, chest tubes), bacterial mediastinitis [3].

Obstructive lung diseases, especially acute asthma, are a well described predisposing factor leading to pneumomediastinum. On rare occasions, pneumomediastinum during asthma exacerbations can lead to life-threatening respiratory and hemodynamic compromise. Although chest radiographs are not routinely obtained during attacks of asthma, pneumomediastinum was noted in 5.4% of 479 radiographs of children admitted with asthma attacks [2]. Other predisposing factors include intrinsic airway and parenchymal disorders, altered breathing patterns, barotrauma (mechanical ventilation).

CASE STUDY

A 21-year male, known case of bronchial asthma, presented to emergency with productive cough and cold since 2 days, breathlessness and wheezing since 1 day, chest pain and pain in neck since 2 hours.

Physical examination findings were- PR-120/min, BP-140/100 mmHg, RR-24/min, SPO2-96% on room air, Bilateral air entry equal and bilateral diffuse ronchi heard on auscultation. And subcutaneous

emphysema was present in right side of neck extending to right infraclavicular area. CT thorax showed Pneumomediastinum and subcutaneous emphysema.

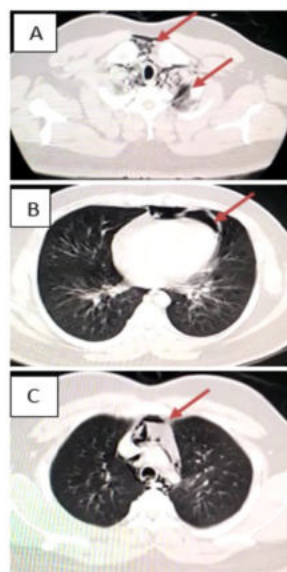


Fig.1 (A-C)., CT thorax images taken during admission Showing.

- A. Subcutaneous emphysema of chest wall and neck (arrows)
- B. Pneumomediastinum in retrosternal area (arrow)
- C. Pneumomediastinum (arrow)

Patient was treated conservatively with high flow oxygen via NRBM mask, bronchodilators and antibiotics. Successive CT thorax done on Day 3 of admission and before discharge, showed resolution of Pneumomediastinum and subcutaneous emphysema.

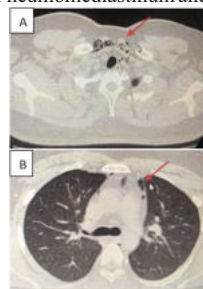


Fig.2(A & B)., Images of CT thorax done 3 days after admission).

- A. Resolving subcutaneous emphysema of Chest (arrow)
- B. Resolving para-cardiac pneumomediastinum (arrow)

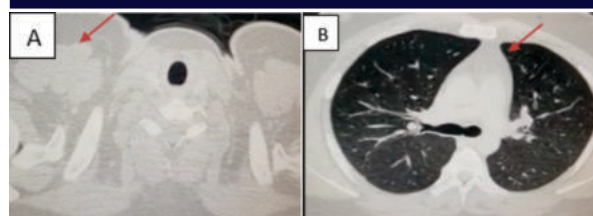


Fig.3 (A & B), Images of CT thorax done before discharge.

- A. Resolved subcutaneous emphysema of Chest (arrow)
- B. Resolved para-cardiac pneumomediastinum (arrow)

Patient was managed conservatively and discharged after 7 days.

CONCLUSIONS

Pneumomediastinum is a rare complication of acute exacerbation of bronchial asthma. Patients with acute exacerbation should be looked for signs and symptoms suggestive of pneumomediastinum and subcutaneous emphysema like chest pain, neck pain and swelling of chest and neck.

Treatment of predisposing or precipitating factors of spontaneous pneumomediastinum is usually followed by gradual resolution of the aberrant air. Supplemental oxygen may hasten reabsorption, but specific therapy for pneumomediastinum is rarely needed. Most cases resolve with conservative management alone [4,5]. In rare instances pneumomediastinum can produce life-threatening cardiovascular collapse. In these instances, small infraclavicular venting incisions seem to be the most prudent initial approach. In case of barotrauma, delivered tidal volumes should be reduced if possible. Positive end-expiratory pressure should be reduced or discontinued. Occult positive end-expiratory pressure, or "auto-PEEP," can augment air leakage and, if present, should be reduced. Bronchospasm and other potentially reversible contributors to air trapping during mechanical ventilation should be treated. Cough suppression should be considered. Tracheobronchial disruption causing extra-alveolar air requires prompt diagnosis and surgical repair [6].

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