

Air outside the airways: an unusual complication of asthma

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A 19-year-old male, non-smoker with asthma since 8 years presented with sudden onset dyspnea over three days along with swelling over the body beginning from chest and extending to face since one day. No history of chest pain, vomiting, weight lifting, rapid ascent or descent of altitude. His asthma was well controlled on long acting beta-2-agonists and inhaled corticosteroids.

On examination, patient was afebrile, respiratory rate — 42/min, regular pulse — 145 bpm and blood pressure — 101/68 mm Hg. His SpO₂ at room air — 78%. Blood gas analysis: pH — 7.32, pCO₂ — 55 mm Hg, pO₂ — 50 mm Hg and HCO₃ — 24.5 mmol/L. Respiratory movements were bilaterally reduced in all areas. Crepitations were present in bilateral hemithoraces. Vesicular breath sounds of reduced intensity were heard bilaterally. Patient's chest roentgenogram showed bilateral pneumothorax (2 cm on right; 1 cm on left), pneumomediastinum and subcutaneous emphysema all over the chest wall extending upto neck (Figure 1A).

Bilateral intercostal tube thoracostomy (ICT) was done through the 4th intercostal space in the midaxillary line (Figure 1B). CECT (Contrast enhanced Computed Tomography) chest was done showed no cysts, bullae or emphysema. Trachea, major bronchus and esophagus were normal (Figure 1C). On 3rd day, complete lung expansion was present with no air leak in tubes. After clamping tubes alternatively, there was no recurrence of pneumothorax. Subsequently pleurodesis with doxycycline was done and tubes were removed.

Pneumothorax can have varied presentation ranging from being asymptomatic to severe life threatening illness depending upon the aetiology and underlying cardiopulmonary reserve [1].

Primary spontaneous pneumothorax (PSP) is generally seen in tall, thin, men with no otherwise underlying pathology and the most likely cause being rupture of subpleural blebs. Secondary spontaneous pneumothorax (SSP) most commonly occurs in cases of chronic obstructive pulmonary diseases. Others being suppurative lung diseases, malignant lung diseases, interstitial lung diseases, lymphangioleiomyomatosis, histiocytosis X, infections, acute respiratory distress syndrome, catamenial pneumothorax [1].

Asthma as a cause of spontaneous pneumothorax is a very rare presentation. The various causes of pneumothorax in reported cases of asthma were subpleural blebs, intubation, central line insertion, diffuse pulmonary ossification [2–10], occupational exposure to aluminium [11] and metal use to SSP [12] and cases of Boerhaave's syndrome [13, 14].

Menga *et al.* in their series of 46 patients with pneumothorax had found alpha-1 antitrypsin (AAT) deficiency in 8 (17.3%) of them [15]. The recommendations of the Polish Respiratory Society for Standards for Diagnosis and Care of Patients with AAT Deficiency mentions one of the main indications for diagnosing alpha-1 antitrypsin deficiency as bronchial asthma [16]. Our patient's AAT levels were normal (1.72 g/L).

Immediate management in cases of bilateral pneumothoraces is bilateral chest drain insertion with subsequent intervention to prevent recurrence [17]. This can be done using VATS or open thoracotomy with bullectomy, surgical pleurectomy, pleural abrasion and talc pleurodesis. We did bilateral pleurodesis for our patient.

This case report underlines the need to evaluate cases of asthma presenting in acute exacerbation for pneumothorax and the need to evaluate the underlying cause for definitive management.

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Figure 1. **A.** CXR — Subcutaneous emphysema, Bilateral Pneumothorax and Pneumomediastinum; **B.** CXR with bilateral intercostal thoracostomy tube, with tip at the apex and resolution of bilateral pneumothorax; **C.** CECT chest diffuse subcutaneous emphysema, pneumomediastinum, B/L ICT in situ at apical regions with normal morphology, attenuation and contrast enhancement of B/L lung fields. No cyst, bull or emphysema was observed. Trachea and major bronchus were normal in position, course and calibre. Oesophagus appeared normal in calibre and outline

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