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Case Report:

Pneumothorax and Pneumomediastinum in a Sputum Positive Tuberculosis Patient: The Continuous Diaphragm Sign

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Abstract: Secondary pneumothorax is a very common medical emergency. At times it is associated with pneumomediastinum, which could be fatal at times if not identified. We present a case of a 11 years old sputum positive child who presented with both these conditions and was diagnosed on chest x ray.

Key Words: Pneumothorax; Pneumomediastinum; Continuous diaphragm sign.

Introduction:

Pneumothorax is commonly seen condition in emergency setting. They are divided into primary and secondary pneumothorax depending on whether underlying lung disease is present or not. Pneumomediastinum can be associated with pneumothorax but usually it is seen in patients of trauma or in patients with iatrogenic injury. We report a case of a 11 years old sputum positive tubercular child who presented with both these conditions and was diagnosed on chest X-ray.

Case Report:

A 11 years old male with history of weight loss for 4 months and cough with fever for four days was brought to emergency department with complaints of shortness of breath. Fever was documented, around 99 to 100 F. Cough was productive, whitish in colour and was not associated with any blood. Child had history of weight loss which was undocumented. Four days prior to admission he started complaining of shortness of breath which was sudden in onset not associated with chest pain. This shortness of breath was progressive. On examination patient was in distress with a respiratory rate of 24/min, with a blood pressure of 100/70 mmHg and a pulse rate of 100/min. General physical examination revealed mild pallor and axillary lymph nodes which were insignificant and there was no evidence of subcutaneous emphysema. Rest of the general physical examination was normal. In respiratory examination, trachea was in the midline there were decreased chest movements in the left infra-axillary and infrascapular region. On percussion there was hyper-resonant note in the left infrascapular and left infra-axillary region. On auscultation, breath sounds were decreased in the left infrascapular and left infra-axillary region. Cardiovascular examination was normal.

Bio chemical and haematological investigations were within normal limits except for mild anaemia and and an ESR of 45 mm. Chest radiography (Fig 1) revealed evidence of left sided pneumothorax (star) with right side mediastinal shift. Patches of consolidation were evident in bilateral lung fields. There was evidence of visualisation of thin lucency of gas seen between the heart and diaphragm making the diaphragm visible where it is normally obscured by the heart suggestive of continuous diaphragm sign (thin black arrows). The observation of continuous diaphragm sign in this patient helped in diagnosing the associated pneumomediastinum.

Sputum for AFB was sent in the view of patients clinical profile which was 3 + AFB positive. Patient was managed with chest tube insertion on left side and was put on CAT 1 antitubercular regimen according to his weight. Patient was given supportive care and was observed, his pneumomediastinum and pneumothorax disappeared and lungs expanded well. His chest tube was removed on the 5Thday of admission and patient was discharged on ATT.

Discussion:

Pneumothorax is defined as the presence of air in the pleural space. Pneumothorax is classified as spontaneous (not caused by trauma or any obvious precipitating factor), traumatic, or iatrogenic. Primary spontaneous pneumothorax occurs in persons without clinically apparent lung disease; secondary spontaneous pneumothorax is a complication of preexisting lung disease. Iatrogenic pneumothorax results from a complication of a diagnostic or therapeutic intervention. Traumatic pneumothorax is caused by penetrating or blunt trauma to the chest, with air entering the pleural space directly through the chest wall; visceral pleural penetration; or alveolar rupture due to sudden compression of the chest.[1]

In contrast to the benign clinical course of a primary spontaneous pneumothorax, secondary spontaneous pneumothorax is a potentially life-threatening event, because patients with this condition have associated lung disease and limited cardiopulmonary reserve. There are numerous causes of secondary pneumothorax, important ones are diseases of airway, infectious disease of lung, connective tissue disorders, cancer etc.[1]

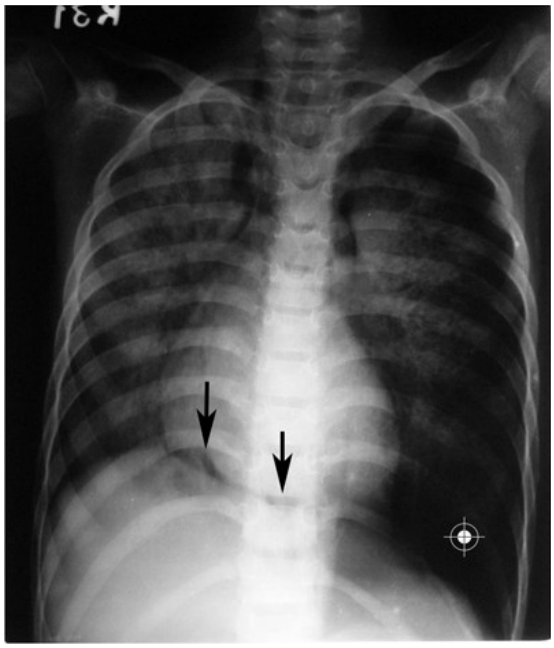

Fig 1: Chest x ray PA view showing left sided pneumothorax (star) with continuous diaphragm sign (thin black arrows) suggestive of pneumomediastinum

Pneumomediastinum occurs after alveolar rupture as gas travels along the bronchovascular interstitial sheaths into the mediastinum.[2] Nontraumatic causes include invasive procedures and mechanical ventilation, airway obstruction, barotrauma, and pulmonary or pericardial infections, and it has also been described after dental extractions.[3] There are many causes of pneumomediastinum and several radiographic signs: pneumopericardium, continuous diaphragm sign, continuous left hemidiaphragm sign, Naclerio's V sign, V sign at confluence of brachiocephalic veins, ring-around-the-artery sign, thymic spinnaker-sail sign, and extrapleural air sign.[4] Identifying these signs are important because this condition presents with subtle signs and can be life threatening in few cases. The identifications of these signs on x ray can avoid the use of costly investigations like CT chest in our resource scarce country.

Management of pneumothorax is with chest tube insertion and usually pneumomediastinum is observed and managed conservatively. The issue of prophylactic antibiotic coverage in pneumomediastinum is contradictory. All patients in one study received at least one dose of a third-generation cephalosporin. That seemed reasonable, particularly in highly suspicious cases and until any additional workup is completed. Although recent reports from smaller series advocate immediate admission or expedite diagnostic approach, it was found that pneumomediastinum does not usually require aggressive intervention or hospitalization. Taking into consideration the benign nature of this entity, only cases, where the diagnosis is in question, the underlying disease needs specific treatment or the possibility of an organ perforation cannot be ruled out, should be considered for further diagnostic workup and admission.[5] As seen in our patient, pneumomediastinum usually improves with conservative management.

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