

CASE REPORT

PNEUMOMEDIASTINUM IN A SPUTUM POSITIVE TUBERCULOSIS

PATIENT:

THE CONTINUOUS DIAPHRAGM SIGN.

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ABSTRACT:

Although subcutaneous and mediastinal emphysema are fairly common in traumatic injury of the chest, yet their presence complicating active pulmonary tuberculosis is rarely reported. We report a case of 14 year old girl with active pulmonary tuberculosis admitted in Ward of Murshid Hospital, who developed subcutaneous emphysema and pneumo-mediastinum after admission. This case actually outlines the mechanism of development of subcutaneous emphysema and pneumomediastinum. The rarity with which the complication is encountered in clinical practice has prompted us to report the case.

Key Words: Pneumomediastinum; Mediastinal emphysema.

INTRODUCTION:

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 14 years old sputum positive tubercular girl who presented with pneumomediastinum and was diagnosed on chest X-ray¹. Pneumomediastinum occurs after alveolar rupture as gas travels along the bronchovascular interstitial sheaths into the mediastinum². Non-traumatic causes include invasive procedures and mechanical ventilation, airway obstruction, barotrauma, and pulmonary or pericardial infections, and it has also been described after dental extractions³. There are many causes of pneumomediastinum and several radiographic signs: pneumopericardium, continuous diaphragm sign², 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 sign⁴. 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.

CASE REPORT:

14 year old girl came to emergency of Murshid Hospital with complaints:

Fever 100-101 °F and Productive cough with yellow sputum for 3 days and Shortness of breath, Hemoptysis (fresh blood), Neck and Upper Chest Pain for 1 day.

For last 3 days she had fever which was low grade without rigors /chills with evening rise , and subside at night with sweats or by taking 2 tablets of antipyretics, and not associated with vomiting or body aches. She had mild cough with white to yellow sputum for last two months. Sputum did not foul smell, nor mixed with blood.

A day before presenting to the hospital, she had mild hemoptysis, initially with small pieces of blood with sputum, 3 episodes in last 24 hours. On the day of admission she had frank hemoptysis about 100ml (quarter cup) of fresh blood, she also had neck and upper chest pain with mild short of breathlessness (Chest tightness).

There was no significant illnesses in past.

Socio-economically stable with satisfactory nutritional status. Living with 4 brothers, 3 sisters and parents, in a west open house with 6 well ventilated rooms, and good sun light. Her mother had pulmonary TB 10 yrs ago and one sister also had Pulmonary Tb about 6 years ago.

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On general physical examination: Pulse 100/min regular, 99°F, B.P. 140/70 mmHg, respiratory rate 22/min, weight 42 Kg, Anaemia was present. There was no clubbing, jaundice or lymph nodes.

Systemic review shows loss of supra clavicular fossa and suprasternal notch. Subcutaneous crepitations over front of chest and lower part of neck. Normal percussion note all over chest except cardiac dullness impaired. Hamman's sign was negative. Coarse crackles bilaterally upper front chest. Bilateral fine polyphonic wheezes all over chest.

Rest of systems exam were normal including C.V.S.

Biochemical and haematological examinations were normal except mild anaemia (Hb 9.6 gm/dl) and raised

ESR 70mm ICT TB Negative, Mountox test (10 TU) Induration. 1.0 mm at 72 hrs Negative and Sputum for AFB +1 x 2 Smears.

Her CXR on admission shows small air in subcutaneous tissues in neck and anterior chest wall Fig I.

Admitted in vitally stable condition but after 1 ½ hour she complaints of choking sensation and become tachypnoec with palpitation and shifted to ICU heart rate 140/min regular, respiratory rate 40/min, Afebrile, oxygen saturation 90% with 10L/min Oxygen.

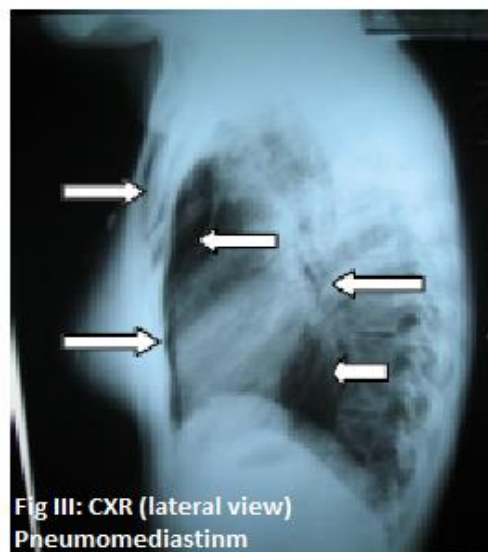
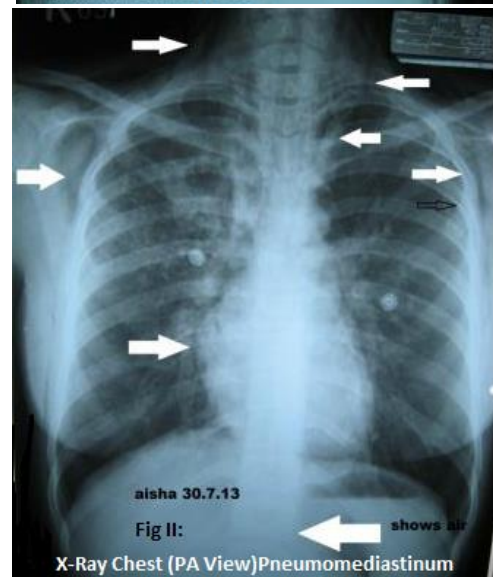
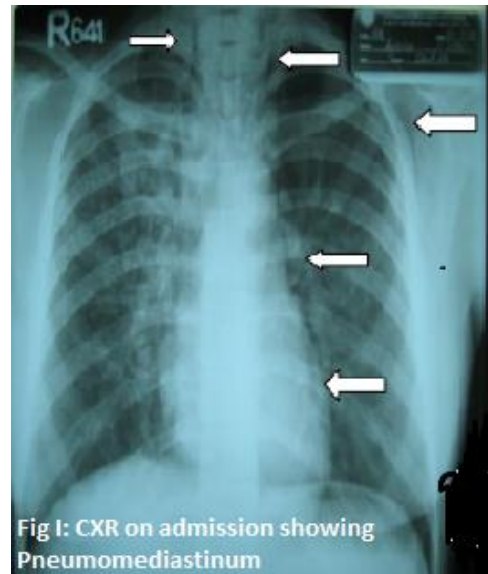
Chest examination shows increased wheezes bilaterally and increased coarse crepitations over front of chest bilaterally. (Fig II and III)

Supportive treatment with Oxygen and Nebulization

along with Category I TB drugs (3 tabs 4FDCs having Rifampicin 150 mg, Isoniazid 75mg, Ethambutol 275mg, and Pyrazinamide 400mg) according to weight and NTP guidelines started under DOTS program. Foot end of bed was raised and milking of subcutaneous air towards chest was done and repeated thrice every 2 hourly.

She responded well to treatment, Chest X-Ray was repeated after 48 hours. Fig IV shows decrease subcutaneous air & no air around Heart and she was discharged after 72 hrs on oral medicine with follow-up after 7 days.

She came for follow-ups after 10 days; her CXR PA View shows complete resolution of subcutaneous air



and pneumomediastinum, and a small cavity in right upper zone Fig V.

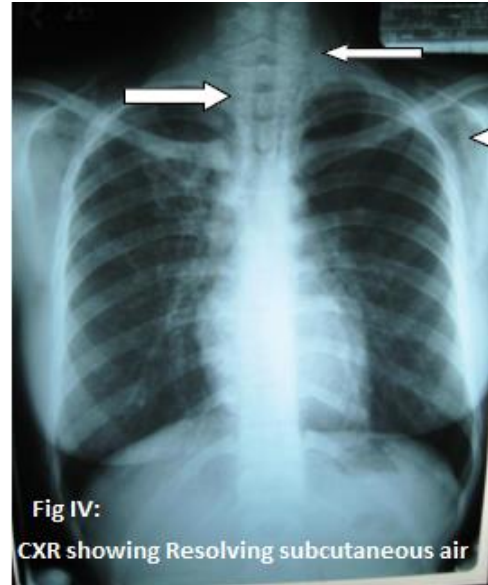
At 2 months follow-up she was put on continuation phase Cat I (Rifampicin 150mg, and Isoniazide 75 mg) according to weight 3 tablets. Fig VI is showing her sputum Culture and Sensitivity report shows SENSITIVE to all 1st line anti Tb drugs.

Discussion:

The occurrence of subcutaneous emphysema and pneumomediastinum complicating active pulmonary tuberculosis is triggered off usually by coughing which results in a sudden rise of intra-alveolar pressure, with concomitant airway narrowing¹. This leads to alveolar rupture causing air to pass into the interstitial tissues of the lung and into the vascular adventitia of the hilum. From there, it moves into the mediastinum along the continuous pathway that extends into the mediastinum. Once in the mediastinum, air can track along the fascial planes of the great vessels into the neck and anterior chest wall, producing subcutaneous emphysema Fig VII. The air, thereafter, has access to the subcutaneous tissues and can travel elsewhere in the body. If the air in the mediastinum can rupture through the mediastinal pleura into the pleural space, pneumomediastinum and pneumothorax may be associated⁵. If there is no pneumothorax, no treatment is necessary, Spontaneous pneumomediastinum usually resolves in a few days without complications. Other than spontaneous pneumomediastinum like rupture in esophagus (usually from vomiting), Major bronchus tear (trauma) both need prompt diagnosis & surgical intervention.

Narang et al^{6,7} described 5 cases of pneumothorax and pneumomediastinum out of which in one case only there was subcutaneous emphysema and pneumomediastinum without pneumothorax. In a review of world literature, Perkin et al⁸ reported only 15 cases of mediastinal emphysema without pneumothorax complicating acute miliary tuberculosis. In India, bilateral recurrent pneumothorax⁹ and interstitial as well as mediastinal emphysema¹⁰ have been reported following miliary tuberculosis.

There are various signs on X-Ray. Mediastinal gas outlining the superior surface of the diaphragm and separating it from the heart (continuous diaphragm sign). In infants, an upwards and outwards deviation of thymic



lobes (spinnaker sign). Gas outlining the lateral margin of the descending aorta and extending laterally between the parietal pleura and the medial left hemi diaphragm (V sign of Naclerio). Gas surrounding the mediastinal (extra pericardial) portion of the right pulmonary artery (ring around the artery sign).

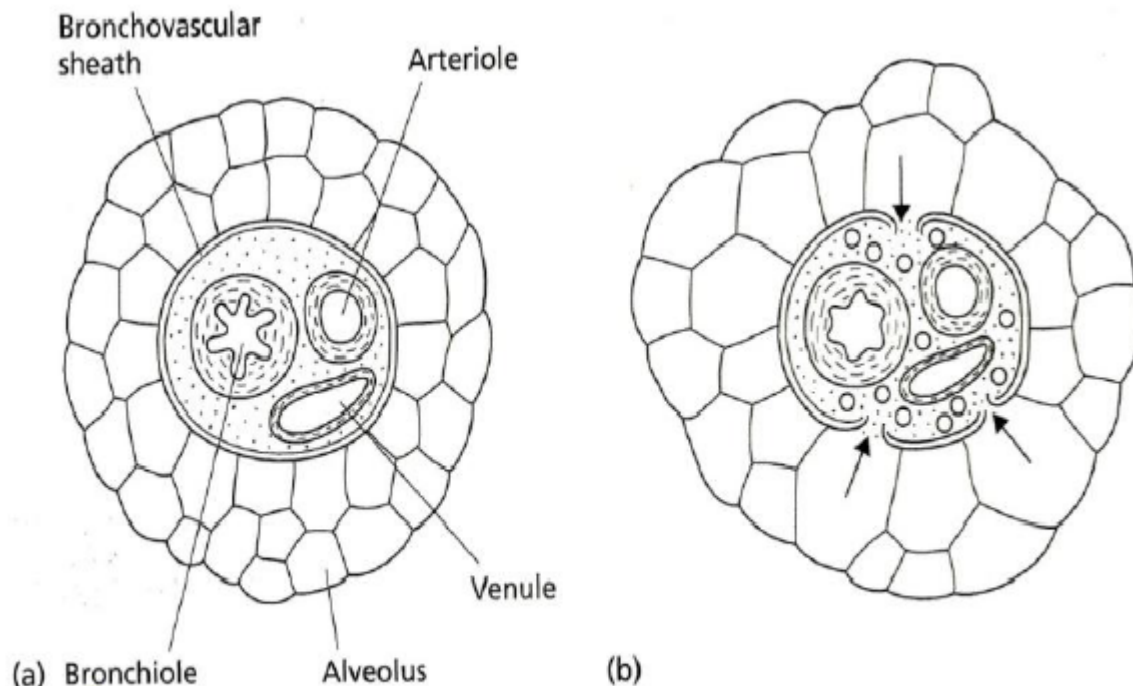


Fig VI: Barotrauma resulting in Pneumomediastinum (a) Normal situation (b) Distended gas containing Spaces with air tracking from ruptured alveoli into the connective tissue plan of bronchovascular bundle.

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