



Case report

Broncho pleuro subcutaneous fistula with subcutaneous emphysema: A rare presentation of pulmonary tuberculosis

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ABSTRACT

Subcutaneous tissue emphysema is observed in a several clinical settings but spontaneous subcutaneous emphysema in the absence of pneumothorax with broncho pleuro subcutaneous fistula is rare. We report a case of spontaneous subcutaneous emphysema secondary to cavitary pulmonary tuberculosis in the absence of pneumothorax.

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1. Introduction

Subcutaneous emphysema and pneumomediastinum occur frequently in critically ill patients in association with alveolar rupture, blunt or penetrating trauma, soft-tissue infections, or any condition that creates a gradient between intra-alveolar and perivascular interstitial pressures.¹ We report a case where patient presented with severe shortness of breath and subcutaneous emphysema that was secondary to direct communication of cavitary tuberculosis lesion of left upper lobe into the soft tissue of chest wall.

2. Case report

A 46-year-old male who worked in a factory presented with complaints of breathlessness, with swelling over the chest for past two days. This was sudden in onset after a bout of coughing leading to an initial swelling at the left side of the chest and then spreading to whole chest, neck, arm and face over the next few hours. There was history of low-grade fever and cough with expectoration for the past one year. There was history of antitubercular treatment 6 months back for one month which the patient had left due to financial reasons. He denied any history of trauma to chest, lifting of heavy weight, vomiting or retching. There was no history of chest pain or any hospitalization or any medical or surgical procedure in

the recent past. There was no previous history of shortness of breath. There was no history of smoking, alcoholism or any other addiction. Bowel and bladder were regular and sleep was decreased.

On examination, there was swelling over neck, chest, abdomen, scrotum and both upper limbs. Vital parameters revealed pulse rate 90/min, blood pressure 116/78 mm Hg, respiratory rate 24/min with respiratory distress. The skin over the third intercostal space on the left side showed an expansile impulse on coughing. There was no evidence of mediastinal shift or cardiac tamponade clinically, and neck veins were normal. On palpation there was no tenderness. Characteristic Rice Kris pies sensations were present over the swollen area. Crepts were heard on auscultation. Classical cavernous type of breathing was present in left infraclavicular area.

The patient was put on high flow oxygen and bronchodilators. Multiple subcutaneous incisions were given at the level of thoracic inlet. Subcutaneous emphysema initially reduced, but only to recur after several bout of coughing. Other body system examinations were unremarkable.

Investigations revealed hemoglobin 8.6 gm%; total leukocyte count 7400 cells/mm³ (polymorphs 80%, lymphocytes 20 %). Sputum smear was 2+ for acid-fast bacilli. Skiagram chest PA view disclosed extensive subcutaneous emphysema, bilateral upper zone cavity, along with emphysematous changes. There was no evidence of pneumothorax, or gas under diaphragm. Ultrasound of abdomen was reported to be normal (Fig. 1).

CECT of the chest showed subcutaneous emphysema with pneumomediastinum with multiple variable sized cavity formation in bilateral upper and right middle lobe with a rent in the lateral

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Fig. 1. X-Ray Chest (PA View) of the patient showing a large cavity on the left side with subcutaneous emphysema.

aspect of the largest cavity in left upper lobe communicating to the subcutaneous tissue resulting in a cavernous–pleuro–soft tissue fistula. The cause was attributed to the high tension inside the cavity. Manual reduction of emphysema was done by multiple subcutaneous incisions at the level of thoracic inlet. The patient was put on anti-tuberculosis drugs in combination along with broad spectrum antibiotics, bronchodilators and oxygen. Subcutaneous emphysema resolved in twenty days and the patient was discharged on the twentieth day on anti-tuberculosis drugs and supportive therapy (Fig. 2).

3. Discussion

Presence of air or any other gas in the mediastinum is called pneumomediastinum. Presence of air in the subcutaneous layer of skin is called subcutaneous emphysema. Pneumomediastinum commonly results from alveolar rupture but air escaping from the upper respiratory tract, intrathoracic airways, or gastrointestinal tract may also cause pneumomediastinum. Gas can be generated by certain infections, and trauma or surgery can result in gas reaching the mediastinum. Head and neck infection, fractures (involving facial bones), mucosal disruption (trauma, surgery, attempted endotracheal intubation), dental procedures (extractions, air-turbine drilling) may cause pneumomediastinum. Blunt or penetrating chest trauma to the intrathoracic airways, foreign body in the intrathoracic airways, procedures like bronchoscopy, bronchial

brushing, transbronchial biopsy, needle aspiration and neoplasms of the intrathoracic airways can cause pneumomediastinum. Pneumomediastinum can also be caused by direct disruption of alveoli (penetrating trauma, surgery) or spontaneous alveolar rupture (between alveolus and adjacent bronchovascular sheath). Esophageal perforation, pneumoperitoneum or pneumoretroperitoneum (gastric or intestinal perforation, diverticulitis, pneumatosis cystoides intestinalis, endoscopy, biopsy, and infection) may also give rise to pneumomediastinum. Penetrating trauma to neck or chest like surgical procedures (tracheotomy, mediastinoscopy), chest tube insertion, acute bacterial mediastinitis and head and neck infections with gas producing organisms may also cause pneumomediastinum.¹ When pressure gradient becomes sufficient to rupture alveolar walls, air may enter the pulmonary interstitium and bronchovascular sheath. This air may pass through the fascial planes which connect cervical soft tissues with the mediastinum and retroperitoneum, permitting aberrant air arising in any one of these areas to spread elsewhere.^{2–4}

Subcutaneous emphysema may be observed in association with pneumothorax or pneumomediastinum as a result of pathological changes in the respiratory tract. Spontaneous pneumomediastinum has been reported in several forms of pulmonary tuberculosis like miliary, silico tuberculosis and cavitary tuberculosis.^{5,6}

Spontaneous subcutaneous emphysema from cavernous–pleuro–subcutaneous fistula is rare.^{7,8} In our case the CT scan revealed a communication of pulmonary cavity to the subcutaneous tissue (cavernous–pleuro–soft tissue fistula). The cavity was probably under tension that allowed passage of bronchial air through a tear to create subcutaneous emphysema.

Subcutaneous emphysema may result in cosmetic deformity and can rarely be associated with airway compromise, respiratory failure and death. Treatment involves treating the underlying condition. Sometimes decompression may be done by making bilateral 3-cm infraclavicular incisions down to the pectoralis fascia.⁹ Fenestrated catheters have been used in the treatment of subcutaneous emphysema.¹⁰

Conflict of interest

The author had no conflict of interest to disclose.

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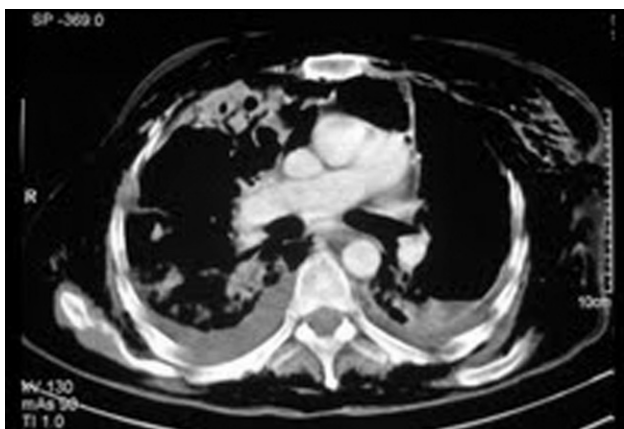


Fig. 2. CT Scan of the chest showing a cavity on the left side communicating with the soft tissues of the chest wall.