



Pulmonary Tuberculosis Presenting as Surgical Emphysema without Pneumothorax and/or Pneumomediastinum

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Abstract

Surgical emphysema as a presenting manifestation of pulmonary tuberculosis in the absence of pneumothorax and/or pneumomediastinum is not yet known. We report one such case in which surgical emphysema was probably the result of rupture of a pulmonary cavity into subcutaneous tissue resulting from caverno-pleuro-cutaneous fistula.

Key words

Surgical emphysema, caverno-pleuro-cutaneous fistula

Introduction

Patient of pulmonary tuberculosis may present in various ways, the usual presenting features are cough with expectoration, fever, generalised weakness, chest pain, dyspnoea etc. Surgical emphysema in a case of pulmonary tuberculosis may be present because of associated secondary spontaneous pneumothorax or may be iatrogenic following chest tube insertion for pleural pathology. Surgical emphysema in a case of pulmonary tuberculosis in the absence of these conditions is not yet known. We report one such case of pulmonary tuberculosis that presented with surgical emphysema.

Case Report

A 40 year old female was admitted to casualty department because of sudden onset of swelling all over the body for 3 days. She had history of acute sharp chest pain in right mammary region after which she noticed slight swelling in right mid chest, which gradually increased and spread all over body (Fig. 1). She also became dyspnoeic after the episode.

On examination there was generalised swelling over face, chest, back, abdomen, arm and on legs. On palpation

crepitus was felt all over the affected area. On auscultation surgical crepts were heard. There was no evidence of mediastinal crunch. Chest radiograph showed surgical emphysema along with bilateral upper zone heterogeneous soft exudative shadows with a cavity in right middle zone (Fig. 2). There was no evidence of pneumothorax or mediastinal emphysema on chest radiograph. Because of respiratory distress patient was put on high flow O₂ through a facemask along with manual reduction of surgical emphysema with under water seal. It was reduced successfully but only to reappear over next few hours. Repeated manual reduction of surgical emphysema was performed and O₂ inhalation with other supportive treatment was continued. She was investigated in the mean time. Her sputum for AFB was 3+. Other investigations like liver function test, renal function test, complete blood counts, USG abdominal and pelvis was normal. After 20 days of above treatment along with anti-tuberculosis treatment, the surgical emphysema gradually reduced (Fig. 3) and patient was sent to home on category I treatment under RNTCP.

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Fig. 1. Photograph of the patient showing generalised swelling over face, neck & chest wall because of surgical emphysema.



Fig. 2. Chest radiograph of the same patient showing surgical emphysema in soft tissue along with cavities in right upper & mid zone with scattered pulmonary infiltrates. There is no evidence of mediastinal emphysema and/or pneumomediastinum.



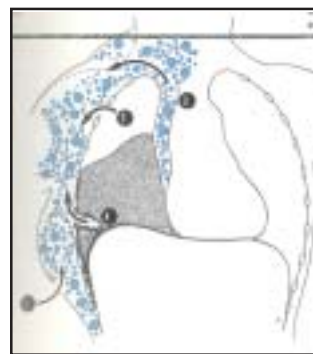
Fig. 3. Post treatment photograph of the same patient with complete regression of surgical emphysema.

Discussion

Subcutaneous or surgical emphysema is the presence of air in subcutaneous tissue. Various causes for surgical emphysema are :

- (i) Chest trauma (Road traffic accident, penetrating wound chest, oesophageal and tracheo bronchial rupture) (1)
- (ii) Iatrogenic following chest intubation for pneumothorax management.
- (iii) Spontaneous rupture of sub pulmonary blebs, which leads to pneumothorax which is followed by surgical emphysema or pneumomediastinum which may occur following pneumothorax when air leaks into mediastinum and spread to subcutaneous tissue of the neck and face which may spread to involve chest wall & beyond giving appearance of Michelin Man (2).
- (iv) Pleural tear (pulmonary laceration in obliterated pleural cavity) (3)
- (v) Infection of gastrointestinal tract caused by gas forming bacilli like Clostridium wellchi.

The mechanism of subcutaneous emphysema is similar to that of closed pneumothorax. When the pleura are torn, air infiltrates the web of the thoracic wall and diaphragm, spreads through the truncal muscles and reaches the subcutaneous tissue. Since the body's subcutaneous tissue is undivided, air from the chest can spread upward to the neck and face and/ or downward to the abdominal wall. Air accumulates in areas where subcutaneous tissue is most relaxed. The result is that patient becomes bloated – the eyelid, neck, chest wall & scrotum are inflated.



Origin of air in slight and massive subcutaneous emphysema.
 (Adopted from Besson A., Saegesser F.: In colour Atlas of chest trauma).
 1.From outside (wound, surgical incision).
 2.(Tension) pneumothorax (pulmonary laceration by fractured ribs).
 3.Mediastinal emphysema, even if slight.
 4.Pleural tear (pulmonary laceration in obliterated pleural cavity).
 The causes of slight and massive subcutaneous emphysema are the same.
 The origin of subcutaneous emphysema must always be elucidated.



In the present case there was no evidence of pneumothorax and/or pneumomediastinum, which could have led to surgical emphysema. The most probable explanation for this comes from the history as explained by patient that she complained of pain in right chest followed by swelling of that site. The swelling gradually increased both above & down ward to involve anterior chest wall, face & gradually whole of body. In the present case, cavity which is seen radiologically might have ruptured & there became a caverno-pleuro-cutaneous fistula (4,5). Persistent leak of air from bronchus through this cavity led to development of surgical emphysema and repeated manual reduction of surgical emphysema failed. Over the time with anti tubercular therapy the fistula gradually healed and there was no leak from the bronchus into subcutaneous plane and ultimately the air

already present in subcutaneous plane was replaced by supplemental O₂ therapy and the O₂ was absorbed into subcutaneous tissue.

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