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CASE REPORT

A Tenacious Trio of Retropharyngeal Emphysema, Pneumomediastinum and Subcutaneous Emphysema Secondary to Pulmonary Tuberculosis: A Case Report

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ABSTRACT

Retropharyngeal emphysema (RPE) is the presence of air in the retropharyngeal area. It may occur due to various etiologies or sometimes spontaneously due to an underlying lung pathology. This report describes a case of a 26-year-old gentleman with pulmonary tuberculosis on treatment who presented with acute breathlessness and dysphagia. His neck and chest radiograph showed retropharyngeal emphysema with pneumomediastinum and subcutaneous emphysema. This was further confirmed by a CT neck and thorax. The patient was managed conservatively with analgesia, antibiotics, IV corticosteroids and oxygen supplementation. Repeat chest radiograph after 17 days showed resolution of retropharyngeal emphysema. Clinicians should have a high index of suspicion for RPE in patients who present with unexplained acute breathlessness and dysphagia of a diseased lung.

INTRODUCTION

Retropharyngeal emphysema has classically been reported as a complication of pneumothorax (Suda et al., 2020), asthma exacerbation (Farouji et al., 2023), trauma to orofacial structures (AlEnazi et al., 2022), central venous catheters (Licina, 2019) or may occur spontaneously (Long, 2021). The trio of retropharyngeal emphysema, subcutaneous emphysema, and pneumomediastinum has

only been described once in literature as a complication of asthma (Khan et al., 2020). To our knowledge, this is the first report of this rare trio in a patient with smear positive pulmonary tuberculosis (TB).

CASE REPORT

A 26-year-old man with recently diagnosed smear positive pulmonary TB, presented to the emergency department with sudden onset breathlessness associated with dysphagia. He denied any stridor, chest pain, post-prandial regurgitation or recent trauma. He was compliant to his anti-tuberculosis medications which had been commenced two weeks prior. Vital signs revealed hypotension with a blood pressure of 92/60 mmHg, pulse rate of 100/min and oxygen saturation of 93% on room air. Physical examination revealed palpable crepitations extending from bilateral surfaces of the neck to the supraclavicular regions bilaterally. The trachea was centrally located, while lung examination was remarkable for coarse crepitations in the right upper lobe. There was no facial puffiness.

Chest radiograph showed subcutaneous emphysema with pneumomediastinum and diffuse patchy consolidations predominantly in bilateral upper lobes (Figure 1A). There was no evidence of pneumothorax. Patient was initially on 8L/40% venturi mask which was weaned to 3L nasal prong. Upper airway endoscopy by the otolaryngology team was unremarkable. Subsequently, lateral neck radiograph demonstrated a column of hypodensity anterior to the vertebral column, suggesting retropharyngeal emphysema (Figure 1B).

Computed tomography (CT) of the neck and

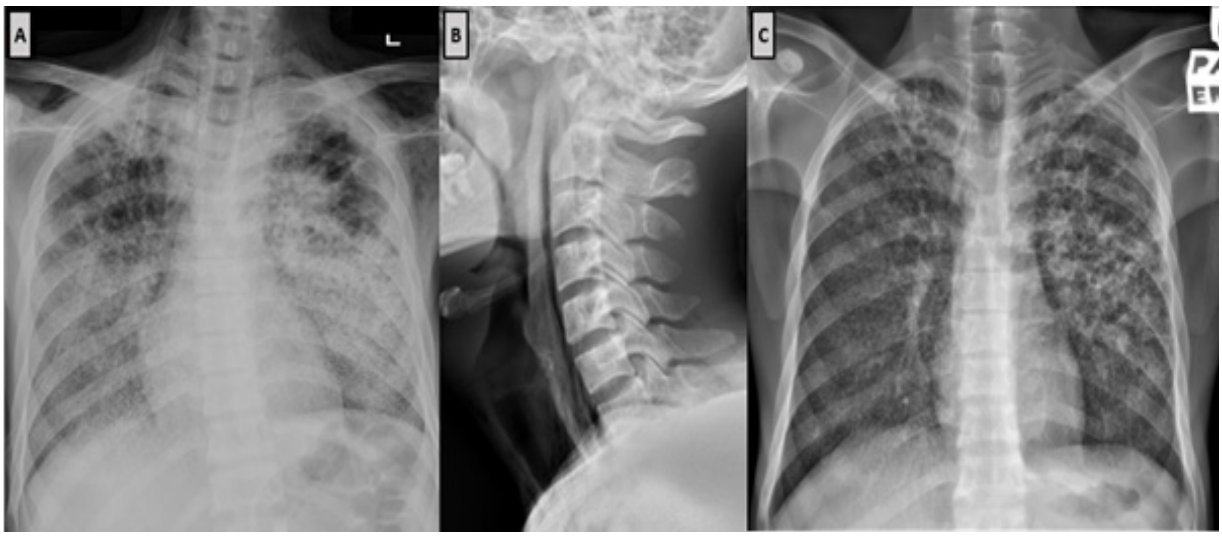

Figure 1: Anteroposterior chest radiograph on admission demonstrated consolidative and diffuse reticulonodular changes over bilateral middle to lower zones, with presence of linear lucency at the superior mediastinum extending to the mediastinal borders which is in keeping with pneumomediastinum. Subcutaneous emphysema can be elicited at the supraclavicular and upper chest region (A). Lateral cervical radiograph shows air at the retropharyngeal space extending to the skull base in keeping with retropharyngeal emphysema. There is also presence of prevertebral soft tissue swelling (B). Day 17 anteroposterior chest radiograph shows resolution of subcutaneous emphysema as well bilateral middle to lower zone consolidation and pneumomediastinum (C).

thorax showed retropharyngeal emphysema with extensive subcutaneous emphysema involving the neck spaces, left anterior chest, bilateral axilla and bilateral posterior chest; with extensive pneumomediastinum and pneumopericardium. There was no demonstrable tracheal wall, oesophageal wall, alveolar-pleural, or bronchial-pleural defects (Figure 2). He was referred to the Respiratory team, and a decision was made for conservative management as patient did not exhibit signs and symptoms of mediastinitis or worsening airway obstruction. On day four of admission, his subcutaneous emphysema reduced and dysphagia resolved with no intervention and he was able to be weaned off oxygen supplementation. His anti-tuberculous medications were continued. Repeat neck and chest radiograph on day 18, showed complete resolution (Figure 1C).

DISCUSSION

TActive pulmonary tuberculosis (TB) may be complicated by secondary pneumothorax with pneumomediastinum leading to subcutaneous emphysema (Vats et al., 2007), respiratory failure (Pratap et al., 2022), and even venous thromboembolism (Kumarihamy et al., 2015). In the absence of pneumothorax on chest radiograph, symptoms like acute dyspnoea and pleuritic chest pain warrant further urgent investigation.

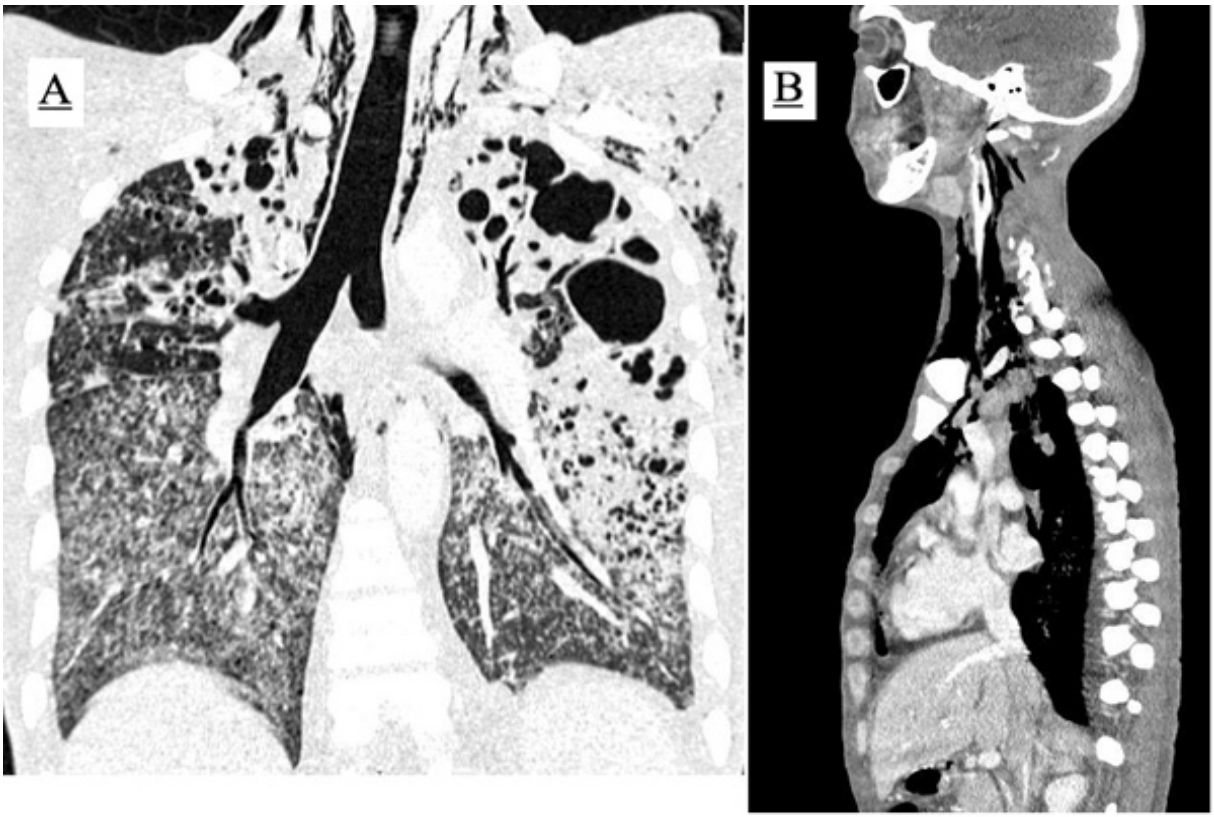

Figure 2: Coronal CT neck and thorax (multiplanar reformation) demonstrates pneumomediastinum with concurrent subcutaneous emphysema. Also seen are cicatrization collapsed with diffuse bronchiectatic changes and surrounding consolidation, predominantly at the bilateral upper lobes. Diffusedly scattered centrilobular nodules with tree-in-bud patterns in both lung fields (A). Saggital CT neck and thorax shows retropharyngeal emphysema and pneumomediastinum (B).

Spontaneous pneumomediastinum (SPM) is an uncommon entity describes as free air or gas present within the mediastinum that has occurred with no obvious cause. It has been associated with many conditions like bronchial asthma (Newcomb & Clarke, 2005), strenuous exercise (Partridge et al., 1997) and even

activities linked with the Valsalva manoeuvre (Panacek et al., 1992). Some mechanisms that could lead to SPM are: 1) rupture of alveoli; 2) bridge of mucosal or cutaneous barrier at the level of tracheobronchial tree or the oesophagus leading to gas/air leak into the mediastinum; 3) gas produced by organisms in the mediastinum (Murayama & Gibo, 2014).

According to Farouji et al. (2023), retropharyngeal emphysema (RPE) is a known complication of pneumomediastinum, along with subcutaneous emphysema. As described by Elnazi et al. (2022) and Long (2021), RPE is a condition that occurs when air is trapped in the retropharyngeal space and is postulated to be a sequela of abruptly increased intra-alveolar pressure leading to ruptured alveoli, thus allowing extraluminal gas to enter the retropharyngeal, space along the fascial planes.

The management of RPE is predominantly conservative unless the circulation or airway is compromised due to upper airway obstruction. In this situation an urgent tracheostomy is indicated or in more serious cases, a cardiothoracic consult is warranted (Suda et al., 2020). Otherwise, as described in several case reports such as Suda et al. (2020), Farouji et al. (2023), Elnazi et al. (2022) and Khan et al. (2020), conservative management involves supplemental oxygen, with some centres practicing administration of systemic corticosteroids. We opted for a conservative approach in our patient as there were no signs of respiratory distress. The absence of pneumothorax precluded the need for a chest drain. He was treated with supplemental oxygen, intravenous hydrocortisone 100mg thrice daily and intravenous amoxicillin clavulanic acid 1200 mg thrice daily for 2 weeks.

Literature has shown that dysphagia, more often than not, points towards oesophageal involvement or gastrointestinal tuberculosis (Paudel et al., 2021), (Rana et al., 2013). However, the acuteness of the presentation is a tell-tale sign that something more sinister and life threatening should be sought after. From this case it is evident that an acute history of sudden breathlessness coupled with dysphagia should raise a suspicion of RPE or subcutaneous emphysema (SE).

Subcutaneous emphysema is often observed in association with spontaneous pneumomediastinum, and both entities have been uncommonly reported in pulmonary tuberculosis (Saxena et al., 2013), (Phadte et al., 2018). In the absence of obvious traumatic causes, CT thorax is required to exclude concurrent spontaneous pneumomediastinum and the presence of caverno-pleuro-subcutaneous fistula; the latter was absent in our patient.

While non-traumatic subcutaneous emphysema is usually self-limiting due to reabsorption of air into capillaries by diffusion (Ahmed & Awouda, 2010), prompt intervention is required in non-resolving cases, to prevent hypoxia, cardiac tamponade and sudden death. The mainstay of treatment involves treating the underlying lung pathology. Additional high flow oxygen helps to correct hypoxia and denitrification of the blood which hastens reabsorption of subcutaneous air (Dixit & George, 2012). Other more invasive management methods include bilateral infraclavicular incisions down to the pectoralis fascia or placement of fenestrated catheters has been described in Saxena et al. (2013) and negative pressure wound therapy (Janssen et al., 2022).

CONCLUSION

In conclusion, a high index of clinical suspicion for TB must be kept in mind in patients from TB prevalent areas, presenting with dyspnoea and cough especially as it can be complicated with potential air leaks such as spontaneous secondary pneumothorax, subcutaneous

emphysema or pneumomediastinum. In cases of confirmed pulmonary TB presenting with sudden dyspnoea, the aforementioned potential air leaks must also be excluded. As displayed in this particular case, conservative management, when administered emergently can be effective in resolving air leaks at the same time avoiding unnecessary complications that may be posed with surgical intervention.

CONFLICT INTEREST

The authors do not have any conflict of interest.

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