

Spontaneous Closure of Bronchopleural Fistula Following Anti-tuberculous Treatment

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Abstract This case report highlights a 55 year old gentleman of Malay descent who presented to the hospital with chronic cough, dyspnoea and night sweats. He is a chronic smoker and works in a rubber plantation. On examination, he was tachypnoeic and tachycardia, febrile and in type 1 respiratory failure. Physical examination was consistent with a right sided spontaneous pneumothorax which was confirmed on a chest radiograph. The chest radiograph also showed evidence of active tuberculosis involving the right upper and middle lobes. His sputum samples smear and culture revealed Mycobacterium tuberculosis complex. He was immediately placed on an intercostal drain with air leak persisting after two weeks. A high resolution CT scan of the thorax showed a bronchopleural fistula measuring 7 mm in diameter in the anterior segment of the right lower lobe. With careful management of the chest drain and early administration of antituberculous chemotherapy, the air leak ceased and the repeated CT scan of the thorax showed obliteration of the fistula. He continued to improve and currently on the 5th month of treatment. Conclusion: An underlying tuberculosis infection resulting in a bronchopleural fistula should not be missed in a patient from a tuberculous endemic area. Effective careful management of the chest drain and early administration of antituberculous treatment are vital to facilitate the healing of a bronchopleural fistula.

Keywords: tuberculosis, bronchopleural fistula, chest drain, pneumothorax

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1. Introduction

Bronchopleural fistula is defined as an abnormal communication between the pleura and bronchial tree. It is a major cause of morbidity and mortality in the developing world. The most common cause is post-operative complication of pulmonary resection with a reported incidence from 1.5% to 28% after pulmonary resection [1]. The other contributing factors are tuberculosis, spontaneous persistent pneumothorax, a complication of radiotherapy for lung carcinoma and necrotizing pneumonia. In the developing world which is endemic for tuberculosis, resolution of bronchopleural fistula depends on quick diagnosis and early treatment of underlying tuberculosis and careful management of intercostal drainage.

2. Case Presentation

A 55 year old gentleman of Malay descent presented with unproductive cough and dyspnoea for a month. He complained of loss of weight, anorexia and daily nocturnal diaphoresis. He had no recent travel or sick contact. He had no past medical illness. He was a chronic smoker and a teetotaler. He denied any high risk behaviours. He works as a rubber tapper.

On examination, he was alert with a respiratory rate of 24 breaths per minute. He was tachycardic at 102 beats per minute with pyrexia of 38°C. His other vital signs were stable. His respiratory examination revealed reduced chest wall expansion, hyperresonance on percussion and reduced breath sounds on the right side of the lung. His trachea was central. Other examination systems were unremarkable.

An urgent chest radiograph showed a large right lung pneumothorax with multiple cavitations and consolidations over the upper and middle lobes of the right lung. The arterial blood gas revealed Type 1 Respiratory failure. The blood and sputum parameters are shown in Table 1.

Table 1. Blood and sputum parameters

Variables (unit)	Value (normal range)
Haemoglobin (g/dL)	13.5 (12-16)
Total White Cell Count (per mm ³)	10600 (4000-12000)
Platelet (per mm ³)	375000 (150000-400000)
Urea (mmol/L)	7.8 (2.6-8.0)
Sodium (mmol/L)	139 (136-145)
Creatinine (umol/L)	78 (40-80)
Aspartate Aminotransferase	26 (0-45)
Alanine Aminotransferase	23 (0-41)
Anti-HIV 1,2	Not reactive
HepBsAg	Not reactive
Anti HepC	Not reactive
Sputum for Acid Fast Bacilli	3+
Sputum for Mycobacterium Tuberculosis culture and sensitivity	Typical Mycobacterium Tuberculosis Complex sensitive to first line treatment



Figure 1. The High Resolution CT scan of the thorax shows a bronchopleural fistula-horizontal tubular tract measuring 7 mm in calibre filled with air fluid level in the anterior segment of the right lower lobe. Extensive tree in bud changes with surrounding interlobular septal thickening seen

He was started on first line antituberculous treatment which consisted of oral isoniazid, rifampicin, ethambutol and pyrazinamide. An intercostal drain was inserted immediately. Air leak continuously persisted after two weeks posing a diagnostic dilemma. A High Resolution CT scan of the thorax (Figure 1) showed a bronchopleural fistula tract. A cardiothoracic opinion was sought and as the patient had shown significant improvement with medical treatment, intervention was not considered.

With completion of intensive phase of antituberculous treatment for two months, and a repeat of high resolution CT scan of the thorax showed obliteration of the bronchopleural fistula. Careful management of intercostal drain and subsequent removal done after 6 weeks. He continued to improve with no recurrence of symptoms. He completed six months of anti-tuberculous treatment. He is well.

3. Discussion

Bronchopleural fistula can be diagnosed non invasively using a computed tomography scan. In computed tomography, apart from demonstration of a pneumothorax, pneumomediastinum and underlying lung pathology, the demonstration of actual fistulous communication may be possible [2]. Alternatively, fiberoptic bronchoscopy can be used to confirm and locate the site of the bronchopleural fistula. If the bronchopleural fistula is not clearly seen via bronchoscopy, selective bronchography can be used to locate the site of the fistula. Instillation of methylene blue into segmental bronchi with its subsequent appearance in the chest drainage can confirm and localise a bronchopleural fistula [3].

Once the diagnosis is made, effort should be undertaken to control the underlying active disease. Medical management include dependent drainage, reduction of the pleural space, antituberculous chemotherapy or antibiotics and adequate oxygenation. Intercostal drainage of bronchopleural fistula allows pleural space decompression which aids in lung re-expansion and minimizes airflow through the fistula which helps in fistula healing. After one to three weeks,

surgical intervention may be attempted in suitable cases. Surgical closure of the fistula is attempted by either an anterior, transpericardial approach thoracotomy with muscle flap to fill the pleural space, or muscle flap coverage of the fistula with a limited thoracoplasty to obliterate the pleural space [4]. Alternatively, if a patient's general condition is poor and the bronchopleural fistula tract is less than 5mm in diameter, bronchoscopic treatment may be employed. Use of bronchial blockade, intrabronchial valves, endobronchial placement of vascular embolisation coils, endovascular metallic ring-shaped coil in combination with a sealant are among the bronchoscopic procedures utilized [5].

4. Conclusion

An underlying tuberculosis infection causing a bronchopleural fistula should not be missed in a patient residing in a tuberculous endemic area. Effective careful management of chest drain and early administration of antituberculous chemotherapy are vital to facilitate the healing of a bronchopleural fistula.

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None.

Statement on Competing Interests

None.

List of Abbreviations

None.

Consent from Patient for Publication

Consent obtained.

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