Acute shortness of breath due to reoccurrence of an intrapericardial bronchogenic cyst

Damian Gimpel1,2, Joseph Conway1, Felicity Meikle1, Zaw Lin1, David John McCormack1,2 & Adam El-Gamel1,2,3

1Waikato Cardiothoracic Unit, Waikato Hospital, Hamilton, New Zealand.
2Faculty of Medical and Health Sciences, University of Auckland, Auckland, New Zealand.
3University of Waikato Medical Research Centre, University of Waikato, Hamilton, New Zealand.

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Correspondence
Damian Gimpel, Waikato Cardiothoracic Unit, Level 2 Wairoa Building, Pembroke Street, Hamilton West, Hamilton 3204, New Zealand. E-mail: gimpeldamian@gmail.com

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Abstract
A 71-year-old woman presented with dysphagia and acute shortness of breath. Surgical history included a prior thoracotomy overseas for a bronchogenic mesothelial cyst 19 years before. Computed tomography demonstrated a mass within the posterior mediastinum measuring 69 × 70 × 74 mm. A median sternotomy was performed, and after removal of the cyst, repair of the left atrium and pulmonary vessels was undertaken due to the invading nature of the cyst. Intrapericardial bronchogenic cysts are a rare form of congenital cysts arising from the primitive foregut. The cardiac primordia are in close proximity to the foregut and primitive tracheobronchial tree, and thus, abnormal budding of the tracheobronchial tree can arise in a myocardial location. Irrespective of the method of approach in redo surgery, complete resection must be performed in order to minimize the chance of recurrence, relieve symptoms, eliminate risk of infection, and prevent malignant degeneration.

Introduction
We present our unit’s case of an unusual diagnosis of causation of dysphagia and acute shortness of breath with successful surgical resolution.

Case Report
A 71-year-old woman presented to a peripheral hospital with a six-week history of dysphagia and acute onset shortness of breath. A clinical diagnosis of aspiration pneumonia was made based on clinical imaging and pathology results. Chest x-ray did not demonstrate any mediastinal shadow consistent with a bronchogenic cyst. The patient was commenced on intravenous antibiotic therapy. The patient was also in fast atrial fibrillation, and a nasojejunal tube was inserted for feeding under direct vision on gastroscopy. During gastroscopy, compression of the middle third of the oesophagus was evident.

Her surgical history included a prior thoracotomy for a bronchogenic mesothelial cyst 19 years prior to the current admission. This previous operation was performed at an overseas institution. Previous medical history included a transient ischaemic attack in 2017 with no residual deficit, type II diabetes mellitus with diet control, and osteoarthritis. She was otherwise an ex-smoker and independent in all activities of daily living.

Computed tomography imaging at the time of referral to the specialist cardiothoracic surgical centre demonstrated a large, thin-walled hypoattenuating mass within the posterior mediastinum splaying the carina, measuring 69 × 70 × 74 mm. It was also displacing the adjacent mediastinal structures. At this time, antibiotics had already been utilized to treat the aspiration pneumonia (Video S1, Supporting Information). There was a small number of peripheral surgical clips reflecting previous resection procedures. There was no associated lymphadenopathy. A barium swallow test was performed to confirm no anatomical communication between the oesophagus and the cystic mass.

Due to the residual adhesions from the previous thoracotomy and size and anatomical complexity of the...
bronchial cyst, it was determined that endovascular drainage was not suitable, and thus, the patient underwent a medium sternotomy for bronchial cyst resection. A thoracotomy was not performed as this was a redo procedure, and the inherent scar tissue with a cyst in close proximity to the heart and great vessels deemed a median sternotomy to be the safer approach. An intraoperative echocardiogram did not present any other identifiable cause for atrial fibrillation. Cardiopulmonary bypass was on standby if decompression of the heart and great vessels was required. Both pleura were divided, with dense adhesions found on the right. The mass was unable to be palpated behind the right ventricle or through the pleura. With manipulation of the heart, the subcarinal region was explored safely. The mass was located behind the right atrium and was intrapericardial (Fig. 1). An extensive resection was performed as the mass was densely adhered to the left atrium, oesophagus, trachea, and pulmonary vessels (Fig. 2). The cyst originated from the pericardium with invasion of surrounding structures and no attachment to the bronchus. Due to the nature of the friable tissue, the bronchogenic cyst ruptured during the resection. Repair of the left atrium and pulmonary vessels was required. No cardiopulmonary bypass was required. A pericardial drain was left in situ, positioned into the post-resection space. This was gradually removed postoperatively to drain fluid that collected in the remaining space. The patient was in sinus rhythm at the time of discharge from the cardiothoracic specialist service.

**Discussion**

Intrapericardial bronchogenic cysts are a rare form of congenital cystic lesions in the mediastinum arising from the primitive foregut [1]. It is hypothesized that, at 21 days after fertilization, the cardiac primordia are in close proximity to the foregut and or primitive tracheobronchial tree, and thus, at this time, abnormal budding of the tracheobronchial tree can arise in a myocardial location [2].

The clinical symptoms of the patient will often be a direct result of the size of the cyst and the local invasion and or compression [3]. In this particular case, the external compression of the oesophagus by the intrapericardial bronchogenic cyst is considered to be the precipitating cause of the aspiration pneumonia. Furthermore, the atrial fibrillation is
hypothesized to be due to the compression of the left atrium. The acute shortness of breath was due to aspiration pneumonia as a direct result of oesophageal compression.

Although uncommon, bronchogenic cysts can reoccur after initial resection. Redo mediastinal surgery requires careful consideration and planning. Methods of redo thoracotomy and video-assisted thorascopic surgery have been described for the resection of recurrent bronchogenic cysts [4]. Irrespective of the method of approach, the mainstay of therapy must be complete resection in order to minimize the chance of recurrence and relieve symptoms, eliminating risk of infection and malignant degeneration [5]. This case report highlights the complexity associated with acute shortness of breath and the potential wide-ranging list of diagnoses.

Disclosure Statement

Appropriate written informed consent was obtained for publication of this case report and accompanying images.

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Supporting information

Additional Supporting Information may be found in the online version of this article at the publisher’s web-site: http://onlinelibrary.wiley.com/doi//suppinfo.

Video S1. Computed tomography coronal slices of bronchogenic cyst with nasogastric tube in situ due to dysphagia.