

Large Bronchial Cyst Causing Compression of the Left Atrium

Tohru Mawatari, MD,¹ Toshiro Itoh, MD,¹ Yoshikazu Hachiro, MD,¹
Hideyuki Harada, MD,¹ Takeshi Kobayashi, MD,¹ Tatsuya Saitoh, MD,¹
Hisayoshi Ohsawa, MD,² Atsushi Watanabe, MD,² and Tomio Abe, MD²

We describe here a case with a large bronchogenic cyst treated by surgical resection, who presented with evidence of left atrial overload on electrocardiogram (ECG). The 50-year-old male patient presented with the chief complaint of heaviness in the chest on exertion. An ECG revealed evidence of left atrial overload, and echocardiography and imaging revealed a mass having a maximum diameter of 9 cm on the cranial aspect of the left atrium, caudal to the tracheal bifurcation. The patient was treated by surgical resection of the cystic mass via right anterolateral thoracotomy. His postoperative course was satisfactory and the patient was relieved of his main symptom. (Ann Thorac Cardiovasc Surg 2003; 9: 261–3)

Key words: large bronchial cyst, left atrial overload

Introduction

Bronchial cyst is a frequently encountered mediastinal tumor, and most cases are either asymptomatic or present with respiratory system-related symptoms. In this case, the main symptom was a sensation of heaviness in the chest on exertion, and electrocardiogram (ECG) revealed findings suggestive of left atrial overload. Such a case of bronchogenic cyst presenting with these symptoms and ECG findings is rare, therefore, we report this case with a large bronchial cyst.

Case Report

A 50-year-old man visited our hospital with a chief complaint of heaviness in the chest on exertion. The projection of the right cardiac border was more prominent than normal, and the left second arch of the cardiac shadow was prominent on the chest roentgenogram. On ECG, the *From ¹Department of Thoracic Surgery, Kushiro Prefectural Hospital, Kushiro, and ²Department of Thoracic and Cardiovascular Surgery, Sapporo Medical University School of Medicine, Sapporo, Japan*

Received March 5, 2003; accepted for publication March 19, 2003. Address reprint requests to Tohru Mawatari, MD: Department of Thoracic and Cardiovascular Surgery, Sapporo Medical University School of Medicine, South 1 West 16, Chuo-ku, Sapporo 060-8556, Japan.

P wave was noted to be biphasic and the Morris index of this wave in lead V₁ was calculated to be -0.09 (Fig. 1a), suggestive of left atrial overload. Echocardiographic examination revealed a mass located on the cranial aspect of the left atrium, dorsal to the ascending aorta, and compressing the left atrium. There were no other cardiac or valvular abnormalities. Preoperative transesophageal echocardiography (Fig. 2) and chest computed tomography (CT) (Fig. 3) revealed a large mass with a maximum diameter of 9 cm located on the cranial aspect of the left atrium, dorsal to the ascending aorta. Coronary angiography did not reveal any significant abnormalities. Based on these findings, we diagnosed the lesion as a cystic mass located in the middle mediastinum causing a sensation of heaviness in the chest, and considered the patient to be a candidate for surgery. The operation was conducted via a right anterolateral thoracotomy in the left lateral position. In the process of abruption between the mass and the surrounding tissues, the pericardium was accidentally opened. The mass was found to be so tightly adherent to the left atrium that even with the best effort by observation through the pericardial cavity, complete separation proved impossible. We therefore abandoned complete resection immediately, and after confirming that the mass was indeed a cyst by aspiration of yellow-white viscous fluid from it, it was resected as broadly as possible. The residual cyst wall was finally ablated by electrocautery.

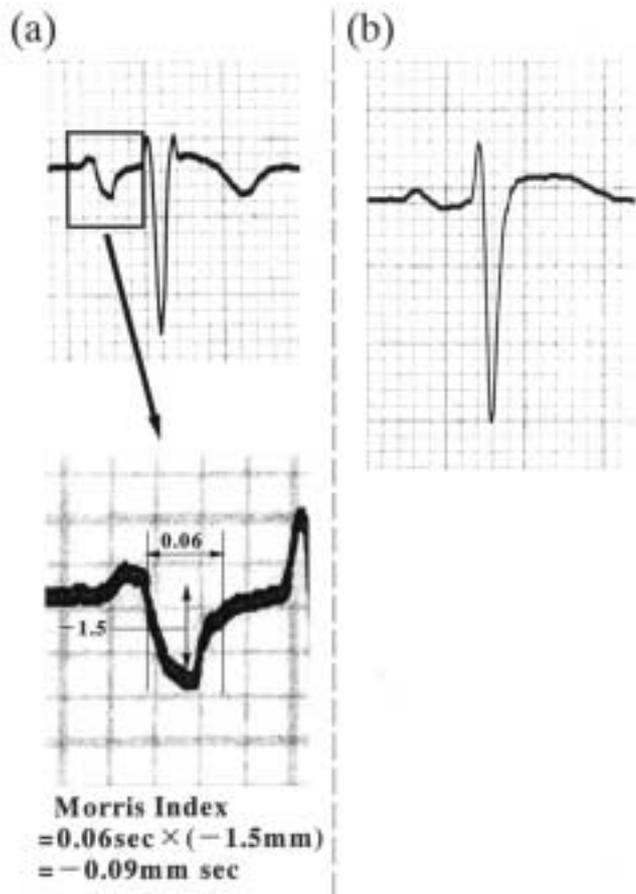


Fig. 1. Preoperative (a) and postoperative (b) ECG (lead V₁). a: The P wave is biphasic and the Morris index is -0.09 , suggestive of left atrial overload. b: The P wave is no longer biphasic, suggesting disappearance of the left atrial overload.

The postoperative course was satisfactory. As histopathological examination of the resected cyst confirmed that it was lined by ciliated columnar epithelium, it was diagnosed as a bronchial cyst. Postoperative ECG showed that the P wave in lead V₁ was no longer biphasic (Fig. 1b), and postoperative echocardiography and chest CT revealed that left atrial compression was no longer present. The patient became asymptomatic after the operation. Currently, two years after surgery, the patient remains well under regular follow-up in our outpatient department. There has been no recurrence of the cyst to date.

Discussion

The most common causes of left atrial overload observed on ECG are cardiac diseases such as mitral valvular disease, atrial fibrillation, and left ventricular hypertrophy. The biphasic nature of the P wave in these conditions is

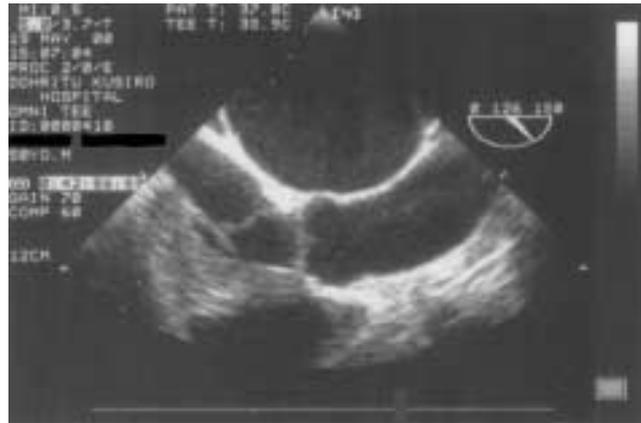


Fig. 2. Preoperative transesophageal echocardiography showing a giant cystic mass with homogeneous contents on the dorsal aspect of the ascending aorta.



Fig. 3. Preoperative chest contrast-enhanced CT. A non-enhancing mass having a maximum diameter of 9 cm is seen on the cranial aspect of the left atrium, dorsal to the ascending aorta.

considered to be attributable to left atrial hypertrophy associated with the left atrial overload. Morris introduced the concept of the “Morris index”: the product of the width and dimension of the negative component of the biphasic P wave in V₁. He considered left atrial overload to be present if the index was less than -0.04 , and that the index was useful for diagnosis of valvular heart disease.¹⁾ In the present case, the Morris index was -0.09 , and thus strongly suggestive of left atrial overload. Since no valvular abnormalities were noted on echocardiography and

the patient had no arrhythmias or history of hypertension, the left atrial overload was thought to be due to compression of the left atrium by the bronchogenic cyst.

Bronchogenic cysts account for 10-15% of all primary mediastinal masses,²⁾ and can be classified as either intrapulmonary or mediastinal. Overall, 72% of bronchogenic cysts produce some symptoms,²⁾ but 90% of mediastinal-type bronchogenic cysts are reported to be asymptomatic.³⁾ Mediastinal-type bronchogenic cysts have been classified into five types: paratracheal, carinal, hilar, paraesophageal, or miscellaneous.⁴⁾ The paratracheal and carinal types may produce symptoms such as dyspnea and chest pain, due to compression of the trachea or bronchi. A giant bronchial cyst of the carinal type would be expected to produce left atrial compression due to the anatomic proximity of the left atrium, although in practice, patients with a bronchogenic cyst have rarely been reported to show symptoms related to the heart and/or signs of left atrial overload on ECG. In the present patient, the feeling of chest heaviness on exertion disappeared after surgery, suggesting that the left atrial compression had probably been caused by the giant bronchial cyst.

Because a bronchial cyst is a benign condition, there are various opinions regarding surgical treatment. Some clinicians consider that surgery should be performed as soon as such a cyst has been diagnosed, because of the possible occurrence of complications such as fistula formation, bronchial ulceration, bleeding, or infection, while others believe that conservative treatment should be considered and that a decision to conduct surgery should be delayed until the appearance of symptoms or complications.⁵⁾ Considering our experience in this case, if a carinal-type bronchial cyst becomes large, adhesion to the left atrium may occur and there may be an increased risk of bleeding and difficulty in dissecting the cyst from the left atrium during surgery. Therefore, we believe that even in cases of small bronchial cysts, in particular the carinal type, the possibility of surgical treatment should

be considered once a diagnosis has been made.

In principle, the surgical procedure of choice is complete resection, although in this case the cyst wall could not be completely separated from the left atrium. There have also been reports of drainage of the cyst contents and ablation of the cyst wall by electrocautery.⁶⁾ We think that conservative treatment should be considered when complete resection carries a high risk. Since cases of relapse and complication by carcinoma have been reported,⁷⁾ we believe that periodic follow-up is essential for cases that have been incompletely resected. The practical use of video-assisted thoracoscopic surgery (VATS) for the removal of bronchial cysts should be positively considered, particularly in cases for which partial resection and ablation are planned in advance, or when relapse occurs.

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