Case Reports

Right Ventricular Bronchogenic Cyst

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We report an exceedingly rare case of primary bronchogenic cyst in the outflow tract of the right ventricle in a 48-year-old woman. In our review of the world literature, we found only 1 other report of an intracardiac bronchogenic cyst. Our patient's only symptom was mild dyspnea not associated with physical exertion, and the cyst was resected successfully. We report clinical aspects of the case, diagnostic methods, surgical management, and histopathologic findings. ***(Tex Heart Inst J 2003;30:71-3)***

The resection of a cardiac tumor was first performed in 1951, when Maurer[1] successfully removed an epicardial lipoma. In 1954, extracorporeal circulation enabled Crafoord[2] to excise successfully a left atrial myxoma.

Primary cardiac neoplasms are 100 to 1,000 times less prevalent than are secondary neoplasms of the heart.[3,4] Autopsy findings have shown that their prevalence in the general population ranges from 0.0017% to 0.28%.[5]

About 75% of primary cardiac neoplasms are benign.[5] Of these benign tumors, about 50% are myxomas. In children, rhabdomyomas are the most common.[4,6,7] Most malignant tumors are sarcomas, but lymphomas, thymomas, and plasmacytomas have also been reported.

Bronchogenic cysts have benign characteristics and comprise 1.3% of all primary tumors of the heart and pericardium.[8] In our review of the world literature, we found only 1 case of an intracardiac bronchogenic cyst, which occurred in the left atrium of a 43-year-old woman and involved the entire atrial septum.[8]

Case Report

In October 1996, a previously healthy 48-year-old woman was seen in our hospital. She complained of dyspnea not related to physical exertion. She reported no history of family cardiopathy, hypertension, smoking, alcoholism, or hormonal disorders.

At physical examination, her vital signs were blood pressure, 120/80 mmHg; heart rate, 72 beats/min; and axillary temperature, 36.5 °C. Pulmonary auscultatory findings consisted of bilateral vesicular breath sounds without rales. Cardiac auscultatory findings included a regular rhythm, S_1 and S_2 audible, and a low-frequency, harsh systolic ejection murmur, most intense in the 4th left intercostal space and radiating to the 2nd left intercostal space, without thrills. She presented no jugular distention, adenopathy, hepatomegaly, ascites, or edema in the lower limbs. The rest of the physical examination was normal.

An electrocardiogram revealed sinus rhythm and right bundle branch block. The chest radiograph was normal.

Transthoracic echocardiography revealed a cyst with well-defined margins, which caused a 4.2-cm reduction in the right ventricular (RV) cavity and subtotal obstruction of the RV outflow tract. The RV cavity was enlarged, but the size of the other cardiac cavities was normal. The valves were morphologically and functionally normal. The pericardium exhibited normal, free movement of its layers.

Magnetic resonance imaging showed a cystic mass (Fig. 1) invading the myocardium of the anterior wall of the right ventricular outflow tract. This mass measured 3.3 × 4.2 cm in diameter, and obstructed the RV outflow tract almost completely.

Right ventriculography revealed a spherical mass in the outflow tract, which produced a systolic gradient of 46 mmHg. Coronary angiography findings were normal.

Key words: *Bronchogenic cyst/surgery; case report; female; heart neoplasms/diagnosis; heart neoplasms/primary; heart ventricle*

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Referred to surgery with a diagnosis of RV cystic tumor, the patient underwent median sternotomy, pericardiotomy, cannulation of the ascending aorta and of the superior and inferior venae cavae, extracorporeal circulation at a flow rate of 4 L/min, infusion of a hypothermic crystalloid cardioplegic solution, and hypothermia at 30 °C.

The protrusion caused by the tumor in the RV outflow tract was seen. We performed a right ventriculotomy, exposed the cystic mass (Fig. 2), and resected it completely. We patched the endocardium with a small piece of preserved bovine pericardium. The aortic clamping time was 25 minutes, and cardiopulmonary bypass time was 42 minutes. The surgery was successful. The patient had an uneventful postoperative recovery and was completely asymptomatic at her discharge on the 7th postoperative day. Histologic examination revealed that the mass was a bronchogenic cyst (Figs. 3 and 4).

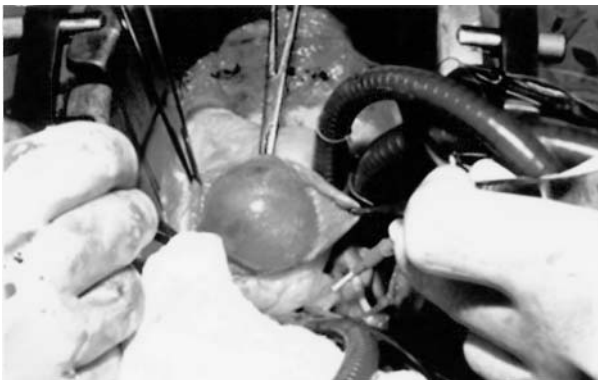
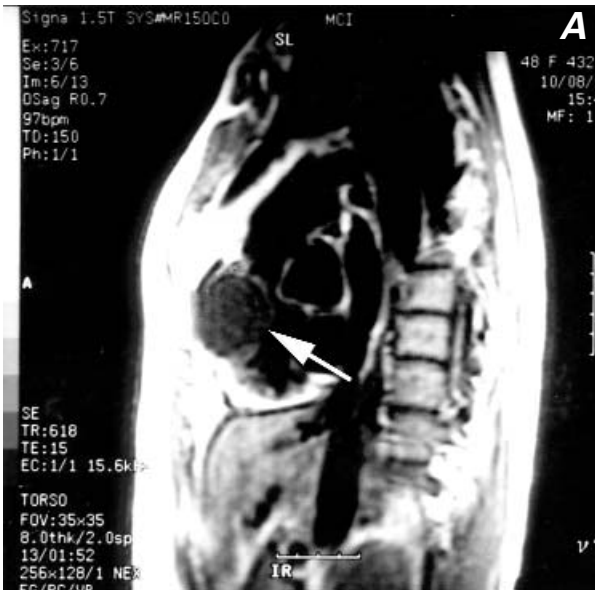


Fig. 2 *Operative exposure of the cystic mass.*



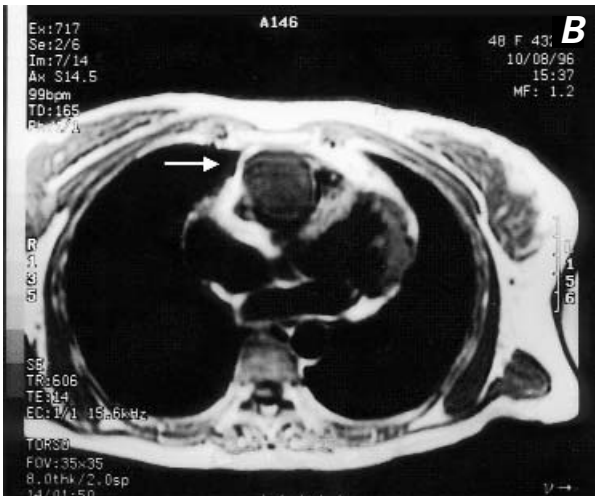


Fig. 1 ***A****) Sagittal magnetic resonance image shows a high-intensity lesion (arrow) causing obstruction of the right ventricular outflow tract.* ***B****) Axial magnetic resonance image shows high-intensity lesion (arrow) invading the myocardium of the anterior wall of the right ventricular outflow tract.*

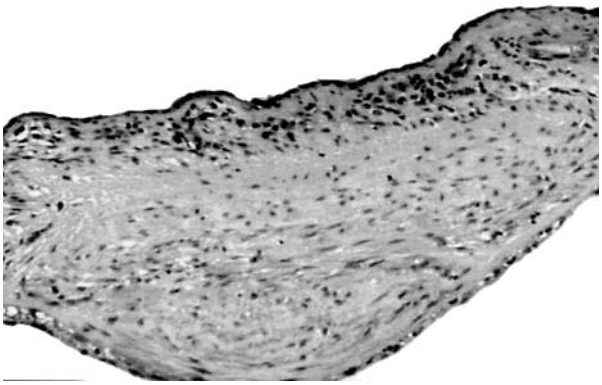


Fig. 3 *Photomicrograph of the cystic wall, low magnification (H&E, orig. ×200).*

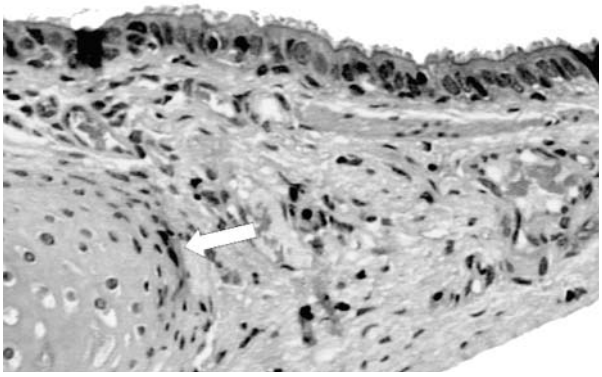


Fig. 4 *Cystic wall, high magnification (H&E, orig. ×400). Photomicrograph shows respiratory epithelium and intramural cartilage, indicated by the arrow.*

Discussion

Bronchogenic cysts of the heart are exceedingly rare tumors; in our review of the world literature, we found only 1 other report of a case. They are benign congenital malformations that arise from an abnormality of the primitive foregut. They may occur in any part of the lung, but are uncommon in the mediastinum.[9,10]

Clinical manifestations of cardiac tumors are variable and often reflect the chamber of origin, rather than the specific tumor type.[11,12]

Cardiac tumors can cause dyspnea by obstructing the cardiac chambers, compressing the heart, and embolizing systemically. This last manifestation can result in the initial presentation—with the central nervous system as the most common site.[12-15] Moreover, cardiac tumors are a possibility in the differential diagnosis of valve diseases, congestive heart failure, conduction abnormalities, abnormal heart murmurs, ventricular and supraventricular arrhythmias, syncope, congestive heart failure, severe cyanosis, and pulmonary embolism.[16,17]

Our patient's tumor originated in the anterior wall of the RV, next to the outflow tract, and partially obstructed the blood flow, which explained her symptoms.

The initial investigation of patients with suspected cardiac tumors should include chest radiography and transthoracic 2-dimensional echocardiography. The echocardiography can provide accurate determination of tumor size, location, point of attachment, mobility, and hemodynamic relevance. Magnetic resonance imaging (MRI) provides a noninvasive method of obtaining 3-dimensional images of masses involving the cardiac chambers and pericardium. Indeed, MRI has become an established method in the diagnosis of a mass and in preparing for surgical intervention, for it can show not only location and movement, but spacial relationships. An MR image can distinguish between solid and fluid lesions and can determine tissue characteristics.[18]

Two-dimensional echocardiography is also highly sensitive and noninvasive, and has the advantage, over MRI, of lower cost. It can be recommended as an optimal alternative for postoperative follow-up.[12,13]

Surgery for benign cardiac tumors can be performed safely with the use of modern techniques for myocardial protection, extracorporeal circulation, and hypothermic circulatory arrest. High rates of healing and low morbidity and mortality rates can be obtained.[6] The prognosis is associated with the resectability of the tumor but is usually good even when resection is incomplete.[19]

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