

might be more challenging. Recent clinical evidence, however, has suggested that recreation of a double coronary artery system by means of reimplantation might allow for normalization of coronary flow reserve³ and for greater protection against secondary coronary/bypass graft changes because of age and atherosclerosis.² On the basis of these considerations, repair by means of coronary button reimplantation was performed in our patient. Because of the unusual combination of ARCAPA and ACCAPA, translocation of the coronary button proved complex, requiring extensive skeletonization of the proximal RCA and CxA combined with the trapdoor technique, as derived by experience with the arterial switch operation. Evidence of normalization of treadmill test results 3 months after repair confirms that reimplantation should always be attempted, even in adults with isolated ARCAPA or ACCAPA.

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Bronchogenic cyst: Unexpected finding in a large aneurysm of the *pars membranacea septi*

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Intracardiac bronchogenic cysts are rare, with only 5 cases reported to date: 2 in the atrial septum,^{1,2} 1 in the left atrium,³ and 2 in the right ventricle.^{4,5} They are identified by asymptomatic occasional findings or nonspecific symptoms, mostly in the second to fourth decades.³

Bronchogenic cysts are believed to represent a localized portion of the tracheobronchial tree that separates from the normal airways during the branching process and does not undergo further development. They develop between the 26th and the 40th day of intrauterine life, during the most active period of airway development.³ The timing of the abnormal budding may determine the location: earlier in the mediastinum and later within lung tissue, which are the 2 most common locations.³ Intracardiac location can be explained with a more precocious abnormal bud-

ding, approximately 21 days after fertilization, when the cardiac primordium tube is near the foregut or primitive tracheobronchial tree.²

Other noncardiac, atypical locations are cutaneous, retroperitoneal, cervical, intradiaphragmatic, intrapericardial, intraspinal, and intrapleural.²

We report a case of a bronchogenic cyst located in the wall of a large aneurysm of the *pars membranacea septi* triggering premature ventricular complex (PVC) and sinus tachycardia.

Clinical Summary

A 5-year-old girl was referred to us for the occasional finding of PVC first recorded in 2001 in the third month of life, and confirmed in further controls. Two years later, a Holter monitoring documented sinus tachycardia with several PVCs. An echocardiographic study indicated a possible aneurysm of the left Valsalva sinus. The left atrium and ventricle were moderately enlarged. In 2004, a further echocardiogram described the lesion as a "subaortic aneurysm of the left ventricle."

On November 2005 the girl presented with normal cardiac tones and apparently free pauses; the chest roentgenogram showed a slightly enlarged cardiac shadow. The electrocardiogram confirmed sinus rhythm with respiratory arrhythmia and several PVCs. Transthoracic echocardiography documented an "aneurysm of the *pars membranacea septi*" with internal diameter of 2 cm (Figure 1, A). Tricuspid, mitral, aortic, and pulmonary valves showed normal function. The need for an angiographic scan was discussed, but it was decided that echocardiography was sufficient for surgery. Indication for surgical excision was based on the potential link between the aneurysm and the PVC, and on the potential risk of emboliza-

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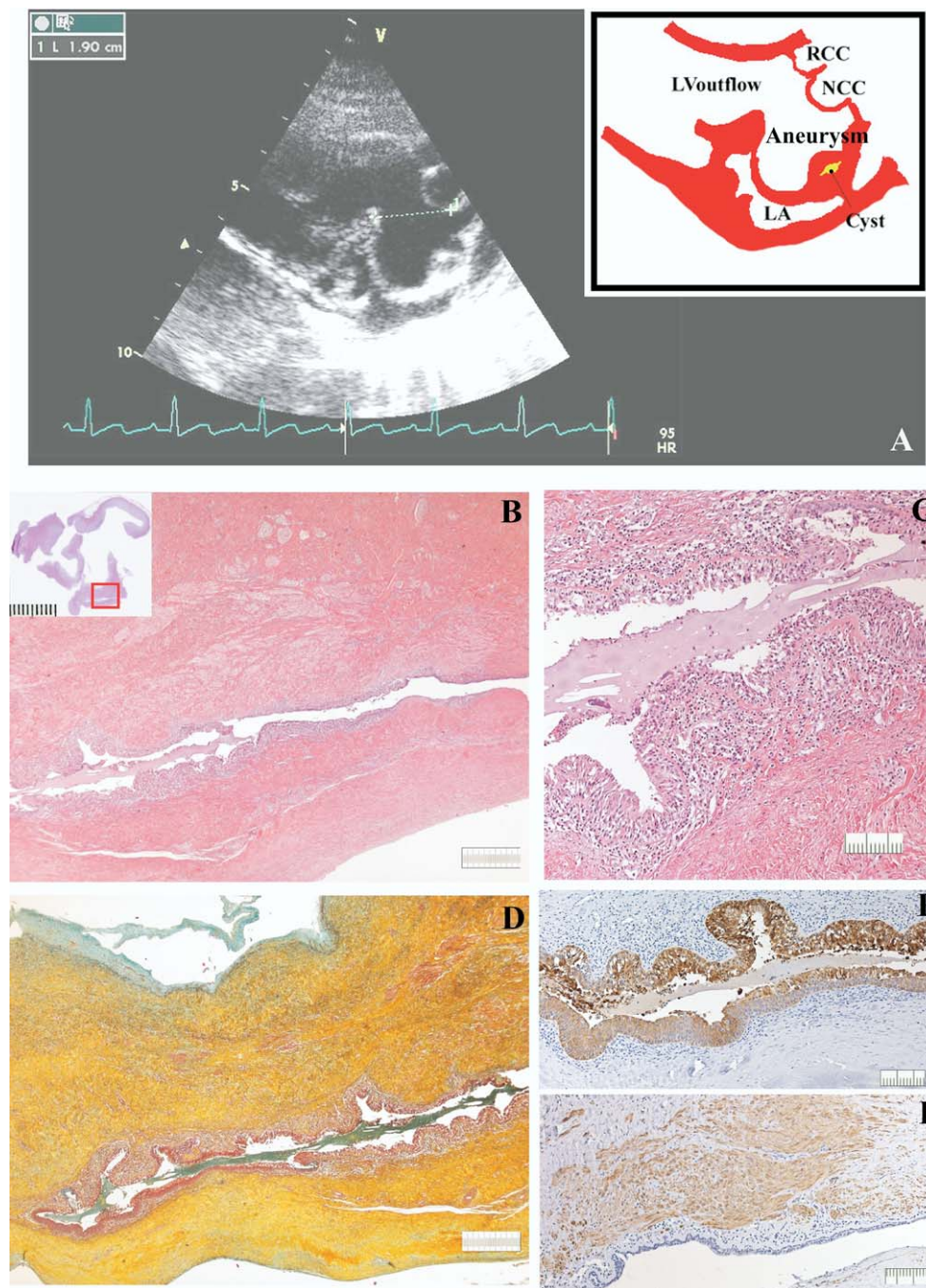


Figure 1. A, Echocardiographic imaging of the aneurysm and cyst; although visible at the echocardiography, the cyst was a non-expected finding at the pathologic study. Inset: aneurysm and cyst (yellow) profiles. B-F, The histopathologic study showed a bronchogenic cyst lined by epithelial cells. The wall of the cyst was composed of irregular groups of smooth muscle cells (B); inset: aneurysm walls with the cyst squared in red. C, The lining was composed of epithelial respiratory type cells, with foci of squamous metaplasia. D, Movat pentachrome stain of (B). Immunohistochemical stains, with anti-cytokeratin 7 antibodies (E) and anti-smooth muscle actin antibodies (F) staining the epithelium and smooth muscle cells, respectively. *Bars:* 520 μ m (B, D); square = 1 cm (B); 135 μ m (C, E, F). *RCC*, Right common carotid; *NCC*, noncoronary cusp; *LA*, left atrium.

tion. The girl underwent successful surgery and is doing well 1 year after the resection. Sinus tachycardia and PVC were no longer recorded after surgery, suggesting a cause and effect relationship between the aneurysm and the arrhythmias.

The pathologic study showed a mucus-filled bronchogenic cyst of approximately 1 cm in its greatest diameter. The cyst was located within the wall of the aneurysm. The cyst lining was in part ciliated, columnar of respiratory type, and in part polyptychial cubical, with interposed mucous cells and foci of squamous metaplasia with mild lymphocyte infiltrates. Irregular bundles of smooth muscle cells were present in the thickness of the cyst wall (Figure 1, B, F).

Discussion

The bronchogenic cyst was a non-expected finding at the pathologic study of the removed aneurysm that constituted the major lesion. This case documents the possible presence of a bronchogenic cyst within the wall of an aneurysm of the *pars membranacea septi*.

Prior reported cases are different from the present one because the bronchogenic cysts were large enough to be detected as cysts at the echocardiography or computed tomography scan study.¹⁻⁵ In our patient the lesion diagnosed with echocardiography was the aneurysm. A small cystic space was suspected (Figure 1, A) but

did not influence the echocardiography diagnosis and the surgical decision.

A bronchogenic cyst is a benign lesion. Surgical treatment is controversial,² especially in patients without clinical symptoms. However, the benign nature of the cyst is unknown before pathologic examination. Moreover, the cyst may progressively enlarge¹ because of mucus accumulation and inflammation of the wall. Analogously to other cardiac masses, it may trigger complications such as arrhythmias, conduction disturbances, obstruction of blood flow, or embolization.²⁻⁴

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Coronary artery bypass grafting and biventricular pacing efficacy: Do past trials dictate a change in future practice?

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Biventricular pacing, or chronic resynchronization therapy (CRT), has been increasingly used in management of patients with class III to IV heart failure who have evidence of interventricular conduction delay. Despite the widespread use of this therapy, the endocardial procedure required for left ventricular (LV) lead placement can be labor

intensive and fails in approximately 10% of patients.^{1,2} In fact, the LV lead placement in the Multicenter InSync Randomized Clinical Evaluation (MIRACLE) trial was associated with the highest rate of complication.¹ Large number of patients undergoing cardiac surgery have some degree of systolic dysfunction in conjunction with interventricular conduction delay. Prophylactic epicardial LV lead placement in this setting may be beneficial and can be performed with ease. In the absence of any trials showing the beneficial effects of prophylactic LV lead placement during cardiac surgery, we sought to perform a subgroup analysis of the Multicenter InSync Implantable Cardioverter-Defibrillator (ICD) Randomized Clinical Evaluation (MIRACLE-ICD) trial to determine whether the beneficial effects of biventricular pacing continue to be evident in patients who had previously undergone coronary artery bypass grafting (CABG).

Methods

A review of the raw data from the MIRACLE-ICD trial was performed to determine the response to CRT of patients with coronary artery disease who received biventricular therapy long

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Medtronic is the sponsor of the MIRACLE trial, which provided the data for this study. R.D. reports consulting and lecture fees from Medtronic. T.M. and K.H. report that they are employees of Medtronic and hold stock options in the company.

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