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Surgical excision of a giant cardiac fibroma in an asymptomatic child

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ABSTRACT

Cardiac fibroma is a rare primary tumor of the heart. Patients can be asymptomatic or present with palpitations, cardiac murmur, syncope, arrhythmias, symptoms of congestive heart failure, or sudden death. We report a case of successful surgical excision of a giant cardiac fibroma in an asymptomatic child.

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Keywords: Cardiac fibroma, surgery, cardiopulmonary bypass

Introduction

Cardiac fibromas are rare benign tumors predominantly seen in the pediatric population [1]. Cardiac fibromas are connective tissue tumors derived from fibroblasts, encapsulated and extend into the surrounding myocardium. These patients may be asymptomatic for a long period of time and present with a large intramural mass [2], or present with congestive heart failure, sudden death, or arrhythmias. Although management of asymptomatic patients with cardiac fibromas is controversial, surgical resection is recommended in symptomatic cases [1].
In this paper, we present a successful resection of a large primary cardiac fibroma in an asymptomatic child.

Case Presentation

A 21-month-old male, who had been followed with cardiac mass, was referred to our clinic. A 15×23 mm cardiac tumor was identified with echocardiography when he was 2-month old with no symptom. He was followed-up with echocardiographic examination. The tumor showed rapid growth at the age of 1 year and 9 months. The two-dimensional transthoracic echocardiography revealed a hyperechoic mass with maximal size of 25×45 mm in the apical part of the left ventricle. Magnetic resonance imaging showed a solitary, well-defined intramural mass measuring 35×60 mm in the same location. Magnetic resonance imaging findings were characteristic, with homogeneous signal

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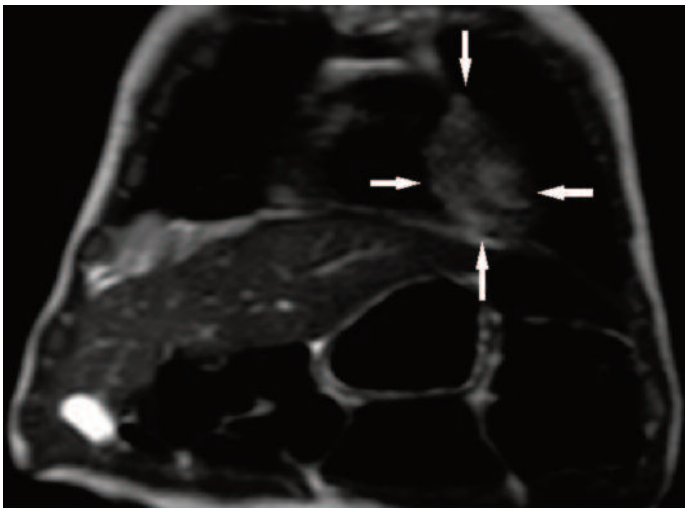

Figure 1. Magnetic resonance imaging in coronal view showing a mass in the apical area.

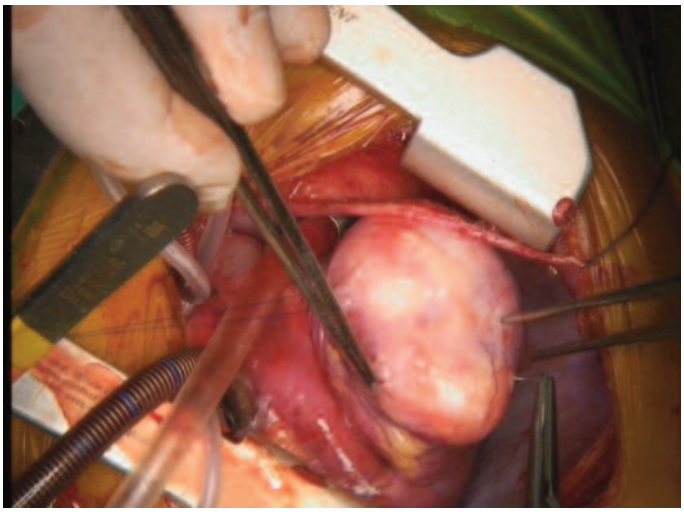

Figure 2. Intraoperative view. The gray-white tumor located in the apex.

isointense to myocardium on T1-weighted and hypointense signal on T2-weighted images (Figure 1). The patient was entirely asymptomatic at the time of these examinations. Elective surgery was recommended due to the risk of ventricular arrhythmias and of sudden cardiac death [1].

The chest was opened using a median sternotomy. Total cardiopulmonary bypass was established with aorto-bicaval cannulation and a cross-clamp was applied. Antegrade cardioplegia was used in an intermittent fashion. Macroscopically, a firm white mass was situated in the apical part of the left ventricle (Figure 2). A layer of thin myocardium was stretched over the mass. Through a limited apical ventriculotomy incision, the mass was resected en bloc by sharp dissection (Figure 3). The mass had 4.5×3×2 cm dimensions (Figure 4). Reconstruction of the left ventricular wall was performed using a Teflon felt in a fashion similar to a Dor procedure (Figure 5). At the end of the surgery, the wound surface was coated with Tisseal (Baxter). The patient was easily weaned from cardiopulmonary bypass with minimal inotropic support. The aortic cross-clamp time was 30 minutes, and the total cardiopulmonary bypass time was 53 minutes. Protamine was administered, and hemostasis was secured. The sternum was closed in the routine manner.

The postoperative course was uneventful and the patient had regular sinus rhythm. Transthoracic echocardiography showed good ventricular function. The patient was discharged from the hospital on the 6th postoperative day. Pathologic studies revealed intracardiac fibroma. At the 7-month follow-up, he was asymptomatic with no evidence of recurrence and good left ventricular function on echocardiography.

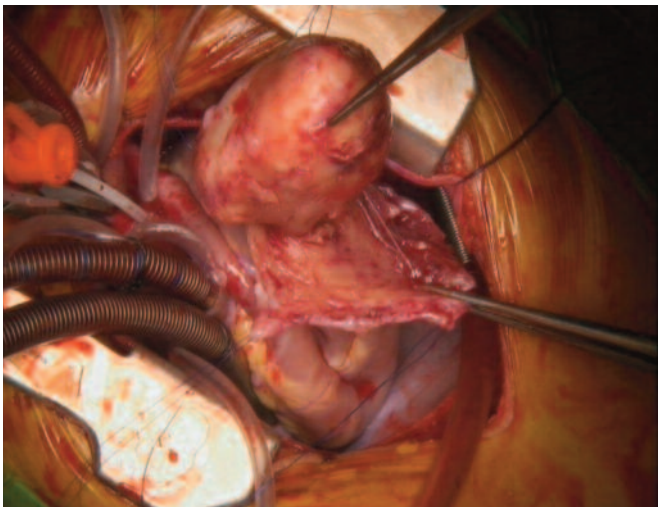

Figure 3. The solid tumor was excised by sharp dissection.

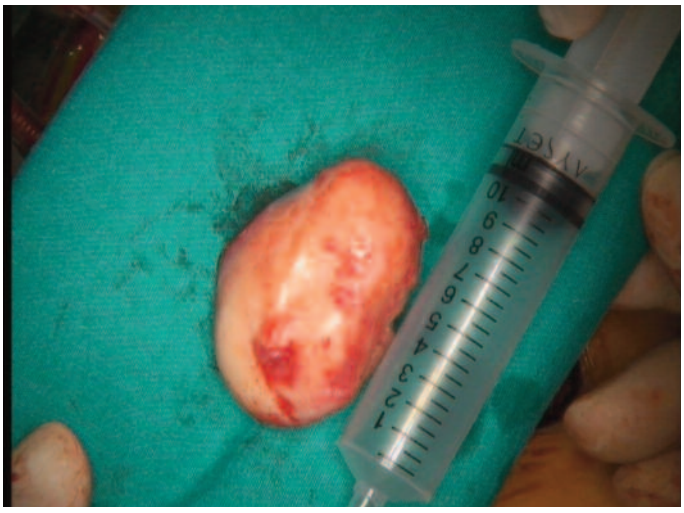

Figure 4. The huge mass after excision.

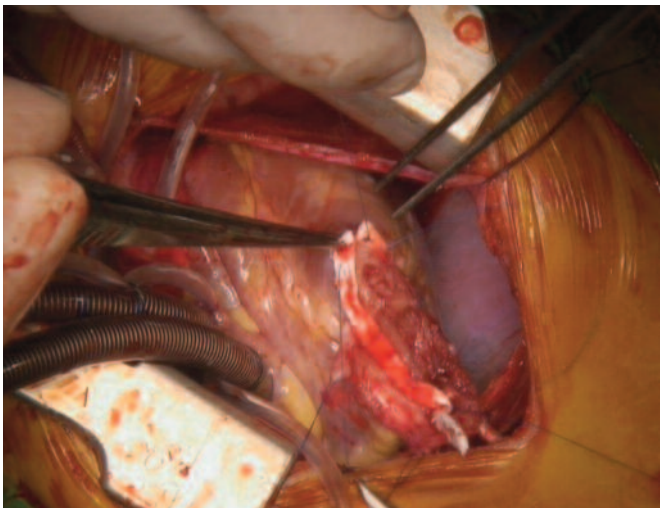

Figure 5. Left ventricle apex reconstructed using teflon felt

Discussion

Primary cardiac tumors are very rare [3] and cardiac fibromas are the third most common type of primary cardiac tumors in children, after rhabdomyomas and teratomas [4]. Fibroma accounts for 12-16% of primary cardiac tumors in children [5]. Fibromas are derived from fibroblastic structures and may invade the ventricular muscle or may extend into the ventricular conduction system, resulting in congestive heart failure or ventricular arrhythmias [4]. While patients with fibroma may manifest arrhythmias or heart failure, cyanosis, syncope, chest pain, or even sudden cardiac death, as many as one-third of them are asymptomatic [1].

Surgical resection is recommended in symptomatic patients. However, management of asymptomatic patients with cardiac fibromas is controversial. Numerous authors advocate for surgical resection due to concerns regarding sudden death associated with arrhythmias and operation is favored in patients with enlarging tumors to prevent progressive cardiac deformity and valvular dysfunction [6]. In our case, we closely followed the tumor's development and surgery was indicated because tumor had the tendency to grow fast.

Imaging techniques are very sensitive in making the diagnosis of cardiac fibromas. Echocardiography is the mainstay of non-invasive diagnostic tool that depicts tumour size, location, surrounding structures and any functional impairment [5]. Diagnostic imaging may include computed tomography or magnetic resonance imaging scanning to confirm the diagnosis and it provides sectional views of cardiac and mediastinal structures from various angles, defines the extent of tumor involvement.

Conclusion

In conclusion, cardiac fibromas are very rare. Though, one-third of them are asymptomatic, elective surgical removal should be considered before the appearance of symptoms as they have the tendency to grow and spontaneous regression rarely occurs. Surgical resection can be performed safely with good long-term prognosis.

Informed consent

Written informed consent was obtained from the patient's family for the publication of this case report.

Conflict of interest

The authors declared that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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