Case report - Congenital

Remarkable giant right atrial diverticulum in asymptomatic patient

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Abstract

We describe the case of a 31-year-old man who had a giant right atrial diverticulum. Although he was asymptomatic, preoperative echocardiography and three-dimensional computed tomography scan found a large mass on the right atrium. He was diagnosed with a right atrial diverticulum and underwent surgical resection of the diverticulum because of the risk of thromboembolism, arrhythmia and rupture of the diverticulum. Intra-operative finding was compatible with the feature of a diverticulum which includes thin wall and large space inside the diverticulum. Postoperative pathological examination showed a thin diverticulum wall consisting of only fibrous tissue and intima without muscular tissue. We concluded that a large diverticulum should be treated surgically because of the critical complications.

Keywords: Congenital heart disease; Right atrial aneurysm; Right atrial diverticulum; Right atrium

1. Introduction

Diverticulum of the right atrium is a rare congenital heart anomaly. Its etiology and treatment have not been clearly defined and surgical intervention for this anomaly is controversial. Since there have been reports of fatal complications of this anomaly, correct diagnosis and appropriate treatment have to be done. We performed surgical resection of a giant right diverticulum and report the case of this anomaly.

2. Case report

An asymptomatic 31-year-old man presented with cardiomegaly on chest X-ray during routine yearly health examinations every year but cardiomegaly on chest X-ray had not been progressive and then he was placed under observation. He took careful examination for cardiomegaly when he was 30 years old. Echocardiography showed a giant diverticulum (60 mm × 68 mm in diameter) of the right atrium, and three-dimensional computed tomography scan showed a large diverticulum too (Fig. 1a). He did not feel palpitation in his daily life and his electrocardiogram showed normal sinus rhythm. Surgical treatment was recommended because of the risk of thromboembolism, arrhythmia, rupture of the diverticulum and his intention to undergo surgical treatment. Resection of the diverticulum was performed under cardiopulmonary bypass because resection under cardiopulmonary bypass was thought to be a safe strategy as comparing with resection without cardiopulmonary bypass. At the operation, the gross findings were remarkable. The diverticulum measured 20 cm in length and 16 cm in width (Fig. 1b) and had a very thin wall that looked like just the external layer. Although the diverticulum covered the entire anterior side of the right atrium free wall, it was not compressing the heart. The diverticulum was thought to have a high risk of rupture and thromboembolism because of its thin wall and the large space that it occupied. After induction of cardiac arrest, the diverticulum was incised and inside the diverticulum communication between the right atrium and the diverticulum was found on the area of the right atrium free wall measuring 60 × 50 mm, where there were two openings to the right atrium which measured 25 and 10 mm in length, 20 and 10 mm in width, respectively (Fig. 1c). These openings were closed by continuous suture and the wall of the diverticulum was then removed. Weaning from cardiopulmonary bypass was smooth, and his postoperative course was uneventful. On postoperative day 11, he was discharged from our hospital. He did not have any kind of arrhythmia after the resection of the diverticulum. Pathological findings of the specimen after the operation showed a thin diverticulum wall consisting of only fibrous tissue and intima without muscular tissue (Fig. 2).

3. Discussion

Diverticulum is a very rare congenital anomaly of the right atrium [1, 2]. The etiology of diverticulum is not yet clearly understood. Although there is a single report of a familial occurrence [3], suggesting a genetic predisposition, this finding has not been confirmed. In histological examination, the diverticulum enters from the right atrium but does not involve all layers of the atrial wall. Atrial diver-
Fig. 1. (a) Three-dimensional computed tomography scan found a large mass on the anterior side of the right atrium. Ao, aorta; RV, right ventricle. (b) Operative findings showed a large diverticulum and thin wall of it. Ao, aorta; RV, right ventricle. (c) Surgical view after decompression of diverticulum. There were two openings to one of which a sucker was inserted. There was communication between the right atrium and diverticulum. RA, right atrium.

Fig. 2. Examination showed the wall of diverticulum which was including only intima and fibrous layer without muscular layer. (Hematoxylin and eosin stain.)

ticulum and enlarged right atrium, remain asymptomatic until late in life [7]. In these patients, diverticulum may be found accidentally as cardiomegaly on chest X-ray [8]. For asymptomatic patients, the optimal therapeutic approach is still controversial. Binder et al. concluded in their review that surgical intervention should be performed only for patients with symptomatic right ventricular compression, while asymptomatic patients should be treated conservatively [1]. But rupture of the diverticulum, sudden thrombus formation and paroxysmal arrhythmia are life threatening. A review of reported cases of single right atrial diverticulum indicated 6% incidence of sudden cardiac death [1]. Thus, we recommend that a large diverticulum should be resected to prevent sudden death, even if a patient is asymptomatic although the size of the diverticulum which needs surgical treatment is not clearly indicated. Bailey was the first to excise a diverticulum of the right atrium in 1953 without cardiopulmonary bypass [9].

In our case, a giant diverticulum was found by accident since the patient was asymptomatic. The diverticulum was resected because of the critical risk of thromboembolism, arrhythmia and rupture of the diverticulum under cardiopulmonary bypass. Although in some reports resection of diverticulum without cardiopulmonary bypass was reported, in our case it was impossible to resect the diverticulum without cardiopulmonary bypass because the diverticulum was too large to clamp partially and the diverticulum should be resected under cardiopulmonary bypass when the risk of the diverticulum rupture during the operation was considered. Based on our experience, we concluded that a large diverticulum should be treated surgically because of risk of fatal complications in the safe strategy.

References


