Case report

Surgical treatment of a cavernous hemangioma of the left atrial roof

Y. Matsumotoa,*, G. Watanabe b, M. Endoa, H. Sasaki a

a Department of Cardiovascular Surgery, National Kanazawa Hospital, 1-1 Ishibiki, Kanazawa, 920-8650, Japan
b Department of Surgery, Kanazawa University School of Medicine, 13-1 Takaramachi, Kanazawa, 920-8641, Japan

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Abstract

A hemangioma that occurs as a primary tumor of the heart is extremely rare. The authors experienced a cavernous hemangioma located in the epicardium of the left atrial roof in a patient who had paroxysmal atrial fibrillation. Resection of the tumor and cryo-coagulation yielded a satisfactory clinical course. No recurrence of the tumor is noted at the time of 5 years after operation.

Keywords: Cardiac tumor; Cardiac cavernous hemangioma; Cryo-coagulation

1. Introduction

Hemangiomas consist of closely packed capillary structures or widely dilated vascular channels lined by flattened endothelial cells and with focal connective tissue in the walls and localized frequently in the liver, skin and subcutaneous tissues [1]. Although any organ can be involved, it is extremely rare to occur as a primary tumor of the heart. Presented here is a primary cavernous hemangioma in the epicardium of the left atrial roof. Resection and cryo-coagulation yielded satisfactory results.

2. Case report

The patient, a 41-year-old woman, noticed shortness of breath with palpitations on exertion, and consulted a cardiologist of our hospital. Since the ECG revealed paroxysmal atrial fibrillation and echocardiography performed at the same time suggested a cardiac tumor, the patient was hospitalized. The clinical history of the patient was non-contributory. At the time of admission, blood pressure was 118/76 mmHg and pulse 68/min and irregular. No apparent abnormality was found in X-ray films of the chest. Thoracic computed tomography (CT) disclosed a tumorous lesion, 6 × 4 cm, of relatively low intensity and with somewhat heterogenous content, in the intrapericardial region surrounded by the right and left atria and the aorta. The right atrium and the superior vena cava were compressed by the tumor. The boundary of the tumor was partially unclear. Thoracic magnetic resonance imaging (MRI) indicated a lesion similar to that revealed in CT. The lesion had moderate signals with internal high signals in T1-enhanced images (Fig. 1). Images in cardiac catheterization showed that the right atrium was compressed considerably by the tumor. Coronary imaging demonstrated feeding blood vessels extending from the right coronary artery and circumflex artery toward the tumor, which was depicted by the characteristic 'tumor blush'. Surgery was performed via a median sternotomy. After the pericardium was incised and opened, the tumor, which was 7 × 5 × 3 cm, elastic, soft and reddish brown, was found to cover the left atrial roof and surround the aorta. The tumor compressed the superior vena cava, right atrium and right ventricle. While cardiopulmonary bypass was instituted between the ascending aorta and both venae cavae, dissection of the tumor was performed in the direction from right ventricle to right atrium. The right coronary artery could be detached without injury. Finally, the tumor, as well as a portion of the left atrial wall at the site of primary lesion, were resected while cardioplegic arrest was obtained. Taking into consideration the possibility that the tumor infiltrated into surrounding tissues, N2O cryo-coagulation (−60°C × 90 s) was performed around the resection site. The left atriotomy was sutured directly. Macroscopically, the tumor was capsulated and the content comprised a uniformly spongy structure that was filled with blood. In histopathological examination, the tumor was determined to be a cavernous hemangioma, the inside of which had a layer of endothelial cells, and venous hyper-
plasia with various degrees of dilatation that were anastomosed to each other and connected irregularly (Fig. 2). There was no malignant finding. Postoperative clinical course was satisfactory and paroxysmal atrial fibrillation disappeared. The tumor has not recurred at the time of this writing, 5 years after operation.

3. Comment

Primary tumors of the heart or pericardium have been found in 0.0017–0.28% of autopsy cases. In a breakdown of 533 primary tumors of the heart and pericardium analyzed at the Armed Forces Institute of Pathology, very few cases involved hemangioma (2.8%), in contrast to the more frequently observed myxoma or lipoma, when 319 benign tumors were considered [2]. There is modest female predominance and hemangiomas are present in every age groups, from 7 months to 80 years of age. The histopathological feature of hemangioma is closely packed capillary structures or widely dilated vascular channels lined by flattened endothelial cells and with focal connective tissue in the walls. While the tumor can localized in any portion of the heart and pericardium, growth in the myocardium or into cardiac cavity is more common than arising from the left atrial epicardium, as in the present case [3,4]. Although transesophageal echography, CT, MRI and cardiac catheterization were employed for preoperative diagnosis, it was difficult to determine the nature of the lesion qualitatively. Signal characteristics in MRI and the heterogenous tumor blush in angiography suggested other possibilities. Definitive diagnosis was made based on postoperative pathological findings. The symptoms of hemangioma depend upon its site and size, and some cases are asymptomatic. In most cases, prognosis is reportedly satisfactory following simple resection, if multiple lesions do not recur [4]. Spontaneous tumor resolution during a 2-year follow-up also has been reported [5]. However, since this tumor may cause sudden death [6], surgical treatment seems to be indicated in cases with clinical symptoms. In the present case, transient atrial fibrillation was induced by compression load on both atria. The clinical findings suggested that overall hemodynamics would be adversely affected without treatment and the
tumor might have been malignant. Consequently, surgery was performed without delay and resulted in a satisfactory outcome. In the tumor resection, cryo-coagulation was performed as a supplemental therapy. Cryo-coagulation is applied in treatment of various benign or malignant neoplasms. The optimal temperature of cell death is reported to be $-50^\circ C$ [7]. Cryo-coagulation has the advantage that structure and configuration are maintained. It is highly possible that hemodynamic disturbance occurs, if the size of resection is enlarged in tumor resection. In order for the radical cure to be compatible with maintaining cardiac function, we plan to minimize the size of resection and add cryo-coagulation of the surrounding tissues.

References


