Case Report

Surgical Resection of Cardiac Papillary Fibroelastoma in the Left Ventricular Outflow Tract

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An 81-year-old man was referred to our hospital on May 29, 2006, for a left ventricular tumor that a cardiologist had evaluated by echocardiography. The patient underwent surgical resection of a left ventricular tumor including the stalk through the aortic annulus on June 6. The aortic cross-clamp time, cardiopulmonary time, and operation time were 27 minutes, 48 minutes, and 2 hours 40 minutes, respectively. The specimen was examined pathologically and found to be a cardiac papillary fibroelastoma (CPF), 20 × 15 mm in size. He was discharged home 10 days after the surgery without significant adverse events. There are approximately 6 case reports on CPF in the left ventricular cavity published in Japan. Our surgical experience was reported, and a clinical feature of papillary fibroelastoma on the prior clinical data was reviewed retrospectively. (Ann Thorac Cardiovasc Surg 2008; 14: 393–395)

Key words: cardiac papillary fibroelastoma, cardiac tumor, left ventricular outflow tract

Introduction

Cardiac papillary fibroelastoma (CPF) is a rare benign cardiac tumor. This tumor constitutes about 10% of all primary cardiac tumors most commonly involving heart valves, and it may cause thromboembolism.[1)] Because echocardiography has become increasingly available, these tumors have been identified more often over recent years. Although clinical features about CPF have not been well known, surgical resection is generally advisable when it is detected by any examination including echocardiography. A clinical feature of CPF is a relatively small-sized (10 to 20 mm) round shape with mobility and the potential to grow on any endocardium. Several patients with CPF have a past history of thromboembolic events including cerebral infarction, transient ischemic attack, blindness, or myocardial infarction.

Case

An 81-year-old man was admitted to our hospital for surgical resection of a left ventricular tumor that a cardiologist had identified by echocardiography. The patient's chief complaints were general fatigue and dyspnea on effort. He denied neurological symptoms and was in normal activity. With the exception of mild hypertension, his physical examination was normal.

Transthoracic echocardiography detected a small (20 × 15 mm) mass in the left ventricular outflow tract (LVOT) that was round shaped and floating with a stalk (Fig. 1). The patient had normal left ventricular function and mild mitral insufficiency resulting from degeneration without relation to the tumor. There were no feeding arteries from coronary arteries with coronary angiography. Surgical resection of the cardiac tumor was performed on June 6 under cardiac arrest using a cardiopulmonary support. The ascending aorta was opened transversely, and inspection of the LVOT was performed through the aortic annulus. The tumor was

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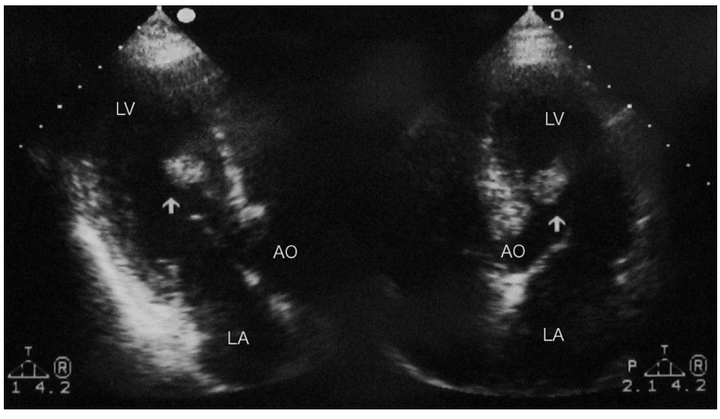

Fig. 1. Transthoracic echocardiography indicated a small (20 × 15 mm) mass in the left ventricular outflow tract; it was round and floating with a stalk (white arrows).
LV, left ventricle; AO, aorta; LA, left atrium.

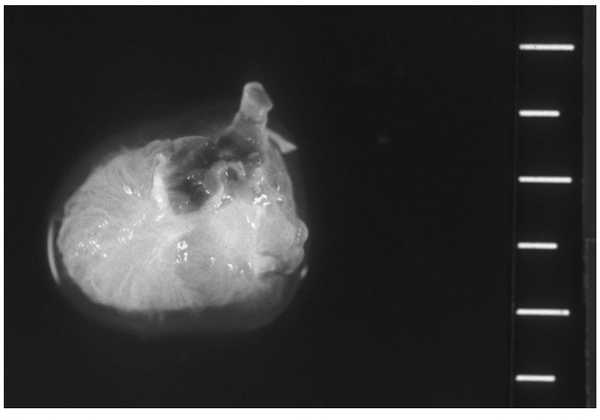

Fig. 2. The gross appearance of the tumor was round and without thrombus on the surface.
It was like a sea anemone and fragile.

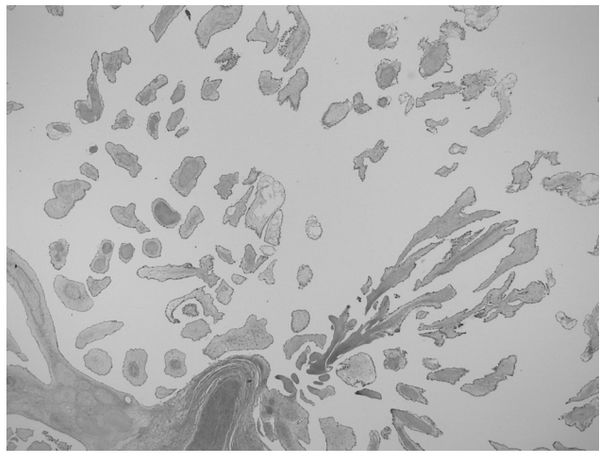

Fig. 3. Histopathological examination with Hematoxylin-Eosin stain showed the presence of specific fronds, superficial endothelial layer surrounding the tumor, and an intermediate edematous layer that was compatible with cardiac papillary fibroelastoma.

detected easily with mild retraction of the LVOT. This tumor had arisen from intraventricular septal endocardium and was excised with a stalk (Fig. 2). Its gross appearance was a round shape, 20 mm in size, without thrombus on the surface. The tumor was like a sea anemone, and it was fragile. The aortic cross-clamp time, cardiopulmonary time, and operation time were 27 minutes, 48 minutes, and 2 hours 40 minutes, respectively. Histopathological examination confirmed a diagnosis of papillary fibroelastoma by showing the presence of specific fronds, a superficial endothelial layer surrounding the tumor, and an intermediate edematous layer (Fig. 3). He recovered gradually without adverse events and was discharged home 10 days after surgical resection.

Discussion

CPF is a rare benign tumor accounting for about 10% of all primary cardiac tumors (three-fourths benign and a fourth malignant).[1] Although CPFs potentially arise from any endocardium, they most often arise from the valvular endocardium, especially the aortic valve or mitral valve.[2,3] Some patients need valvular reconstruction or replacement on the extent of CPF invading the valve or annulus. Case reports of surgically treated CPF have been increasing over recent years because of the availability of noninvasive cardiac echo examinations. However, there are only 6 case reports of surgical resection of CPF in the left ventricle (LV), the first one

published in Japan in 1989.[4–9] A large series of CPFs reported only 9% to 18% of the prevalence of their originating from LV in all CPFs.[3,10]

Surgical resection in our case was not difficult because the CPF was close to the aortic annulus in the LVOT. Some cases needed use of the technique of endoscopic resection[11] to avoid some risk to the left ventriculotomy. This maneuver is suitable for small-sized cardiac tumors, such as CPF in LV. CPF is fragile and easily broken with forceps. Care should be taken during operation to avoid embolization.

The operative indication of CPF is generally accepted whenever the tumor is detected, especially in the left side of the heart, because of the potential of life-threatening thromboembolism. According to the CPF in the right side of the heart, some cases were reported to have pulmonary embolism of the CPF.[12] The indication of operation of a right-side CPF should be considered on the basis of the patient's medical condition. Asymptomatic patients without mobile CPF should be closely followed up with echocardiography until symptoms develop or tumors have mobility.[3]

Ngaage et al.[10] reported the surgical outcomes of CPF of 88 patients at a single-center experience. The primary indication for surgery was a detection of intracardiac tumor in 53% of patients, and 47% of patients were incidental findings of other cardiac diseases. The most common clinical symptom was neurological (53%) with cerebral embolism (38%), retinal embolism (9%), and transient ischemic attack (6%). According to the location of CPF, the cardiac valve was the most common tumor site (77%), and the left ventricular chamber was only 18% of 88 surgically treated patients. Surgical mortality was 2%, and no recurrence was detected at the 3-year follow-up in this series.

Conclusion

Surgical treatment of CPF in the LVOT was reported. A few case reports on the surgical resection of CPF in LV have been published in Japan. Our surgical experience was reported with retrospective review of a CPF clinical feature on prior clinical data.

References

1. Kouchoukos NT, Blackstone EH, Doty DB, Hanley FL, Karp RB. Cardiac tumor. In: Kirklin JW, Barratt-Boyes BG eds. Cardiac Surgery. 3rd edn. Philadelphia: Churchill Livingstone, 2003; pp 1679–95.
2. Grinda JM, Couetil JP, Chauvaud S, D'Attellis N, Berrebi A, et al. Cardiac valve papillary fibroelastoma: surgical excision for revealed or potential embolization. *J Thorac Cardiovasc Surg* 1999; **117**: 106–10.
3. Gowda RM, Khan IA, Nair CK, Mehta NJ, Vasavada BC, et al. Cardiac papillary fibroelastoma: a comprehensive analysis of 725 cases. *Am Heart* J 2003; **146**: 404–10.
4. Shigenobu M, Kurosumi K, Imai S, Takata K, Senoo Y, et al. Cardiac papillary Fibroelastoma no geka chiryou keikenn. *Geka* 1989; **51**: 315–7. (in Jpse.)
5. Uchida S, Obayashi N, Yamanari H, Matsubara K, Saito D, et al. Papillary fibroelastoma in the left ventricular outflow tract. *Heart Vessels* 1992; **7**: 164–7.
6. Kawada M, Oda K, Hirose K, Fukutomi T, Yamashiro T, et al. A case report of surgical treatment for left ventricular papillary fibroelastoma. *Nippon Kyobu Geka Gakkai Zasshi* 1996; **44**: 1159–62.
7. Matsumura Y, Sasaki T, Hashimoto K, Hachiya T, Onoguchi K, et al. Left ventricular papillary fibroelastoma associated with chief complaints of palpitation, general fatigue, and feverish. *Kyobu Geka* 2003; **56**: 793–6.
8. Sato Y, Yokoyama H, Satokawa H, Takase S, Maruyama Y. A report of a surgical case of papillary fibroelastoma in the left ventricular outflow tract. *Ann Thorac Cardiovasc Surg* 2003; **9**: 270–3.
9. Tanaka H, Narisawa T, Mori T, Masuda Y, Kishi D. Double primary left ventricular and aortic valve papillary fibroelastoma. *Circ J* 2004; **68**: 504–6.
10. Ngaage DL, Mullany CJ, Daly RC, Dearani JA, Edwards WD, et al. Surgical treatment of cardiac papillary fibroelastoma: a single center experience with eighty-eight patients. *Ann Thorac Surg* 2005; **80**: 1712–8.
11. Misumi T, Kudo M, Koizumi K, Yamazaki M, Nakagawa M, et al. Intraoperative endoscopic resection of left ventricular tumors. *Surg Today* 2005; **35**: 1092–4.
12. Kimura T, Yoshimatsu T. A case of papillary fibroelastoma of the right atrium with pulmonary embolism. *Jpn J Cardiovasc Surg* 2006; **35**: 340–2.