Intracardiac Metastatic Rhabdomyosarcoma

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A 70-year-old man who visited Samsung Medical Center reported experiencing palpitation for 2 weeks. He had undergone excision of a mass in the right buttock due to rhabdomyosarcoma 7 years prior to this visit. Transesophageal echocardiography showed a pedunculated mass in the left ventricle, which was thought to be a vegetation of infective endocarditis, metastasis of the primary tumor, or thrombus. He underwent removal of the cardiac tumor, and the pathologic report was metastatic rhabdomyosarcoma. Thus, here, we report a rare case of metastatic rhabdomyosarcoma in the left ventricle.

Key words: 1. Heart neoplasms 2. Cardiac tumor 3. Metastatic rhabdomyosarcoma

CASE REPORT

A 70-year-old male who complained of cough and palpitation persisting for 2 weeks visited Samsung Medical Center. Seven years previously, he had undergone wide excision surgery of the right buttock area for rhabdomyosarcoma (about 4 cm). Although he received adjuvant chemotherapy following the surgery, rhabdomyosarcoma recurred in the left hip 4 years later. He underwent excision surgery of the left hip mass followed by postoperative radiation therapy. He did not show any recurrence of the disease until his most recent visit.

A transesophageal echocardiogram showed an oval-shaped mass at the chorda of the anterior mitral valve (Fig. 1), which was thought to be a metastasis of rhabdomyosarcoma, vegetation, thrombus, or a primary tumor. Positron emission tomography/computed tomography (PET/CT) showed no distant metastasis of the primary rhabdomyosarcoma at the buttock. To further evaluate the tumor, coronary CT angiography and cardiac magnetic resonance imaging (MRI) were performed; the images showed a 13-mm mass attached to the basal anterolateral left ventricle (LV) wall (Fig. 2).

His vital signs were stable except for arrhythmia, and the laboratory results were within normal limits. We planned to perform a surgical resection of the cardiac mass and a maze operation for arrhythmia. The surgery progressed under general anesthesia with the patient in the supine position, and a standard median sternotomy and conventional cannulation were performed. The left atrium was incised, and a mass on the LV anterolateral wall was observed through the mitral valve (Fig. 3). The mass was completely removed along with the myocardium (Fig. 3), and a modified Cox maze III procedure was performed with cryoablation.

Upon pathological examination, the patient was diagnosed with metastatic rhabdomyosarcoma. The resection margin was
clear, and the postoperative course was uneventful. The patient was discharged 9 days after surgery with a normal sinus rhythm. Postoperative echo findings showed no residual tumor. One month after the operation, his thigh MRI showed tumor recurrence at the left thigh. He was referred to the Department of Hemato-oncology and received palliative chemo-

Fig. 1. Preoperative findings. (A) Transesophageal echocardiography (arrow, tumor). (B) Cardiac magnetic resonance imaging, sagittal view (arrow, tumor).

Fig. 2. (A, B) Preoperative computed tomography angiography findings (arrow, tumor).

Fig. 3. Intraoperative findings. (A) Left ventricle mass. (B) After tumor removal.
therapy. Three months later, a follow-up in the outpatient department revealed that his rhythm still maintained a normal sinus and was hemodynamically stable.

**DISCUSSION**

Although primary cardiac tumors are rare, with the autopsy incidence ranging from 0.001% to 0.03%, cardiac metastases are not as low as expected and range from 2.3% to 18.3%. With the exception of mesothelioma, which leads to cardiac metastasis more often in men (57.3%) than in women (30%), cardiac metastases are equally present in both sexes [1].

In our patient, the mass originated in the LV. The clinical symptoms of cardiac metastasis are variable, and these tumors often go unrecognized in vivo until after the patient’s death. In the case of secondary tumors located in the myocardium, the clinical pattern is typically proportional to the degree of myocardial infiltration or is related to the wall infiltration site. A typical presentation includes arrhythmias such as atrial flutter or fibrillation, premature beats or ventricular arrhythmia, conduction disturbances, and complete atrioventricular blocks, particularly if the conduction system has been infiltrated [2].

We first performed transesophageal echocardiography because of the atrial fibrillation presented by the patient, and this method was shown to be helpful for tumor diagnosis in our patient. Echocardiography evaluates the tumor size, shape, attachment, and mobility [3]. Chest CT and MRI with enhancement are also helpful imaging modalities to evaluate tumors because they show tumors as contrast-enhanced masses; these imaging modalities also evaluate the adjacent organs for metastasis and seeding [4].

Surgical management is generally critical for secondary cardiac tumors, as the metastases are often neither solitary nor confined to the heart. Nevertheless, resection may be considered in individual cases if no other organs are involved, and the tumor can be removed completely [5].

In our case, laboratory values measuring inflammation were within normal limits, so the possibility of infective endocarditis was low. It was not completely clear whether surgery was indicated for the metastatic cardiac tumor. However, we decided on surgical resection because the patient complained of palpitations and the PET/CT results confirmed that no other organs were involved. The operation was successful, as indicated by the clear resection margin and the absence of further symptoms. Thus, in this paper, we report a rare case of metastatic cardiac rhabdomyosarcoma.

**CONFLICT OF INTEREST**

No potential conflict of interest relevant to this article was reported.

**REFERENCES**