Isolated Right Ventricular Intracavitary Metastasis of Hepatocellular Carcinoma in a 74-year-old Woman

Chung-Ben Kan[1]*, Rei-Yeuh Chang[2], Cheng-Kang Chen[2]

[1]Division of Cardiovascular Surgery, Department of Surgery and [2]Division of Cardiovascular Medicine, Department of Internal Medicine, Chia-Yi Christian Hospital, Chia-Yi, Taiwan, R.O.C.

A 74-year-old woman with a history of chronic hepatitis C and transcatheter arterial chemoembolization for an unresectable hepatocellular carcinoma (HCC) 2 years previously presented with progressive exertional dyspnea of 1 month's duration. Two-dimensional echocardiography revealed a huge right ventricular mass with right atrial and right ventricular outflow tract extension. Palliative resection of the tumor and adjunctive chemotherapy was performed. However, the right ventricular mass recurred 1 month later and the patient died 4 months after the operation. To our knowledge, this is the oldest patient reported with isolated right ventricular intracavitary metastasis of HCC, and this report reemphasizes the lower surgical indication in patients with metastatic cardiac tumors. [*J Chin Med Assoc* 2008;71(6):318–320]

Key Words: cardiac metastasis, hepatocellular carcinoma, right ventricle

Introduction

The incidence of metastatic hepatocellular carcinoma (HCC) to the right heart cavity, with cephalad extension via the inferior vena cava, was reported to be less than 6% in an autopsy series.[1] Moreover, reports of isolated intracavitary metastatic HCC of the right ventricle without right atrium and inferior vena cava involvement are very rare.[2,3] To our knowledge, there are only 7 cases that have been reported, and our patient is the oldest (Table 1).[1,2,4–8]

Case Report

A 74-year-old woman with chronic hepatitis C and left lobe HCC had received 4 sessions of transcatheter arterial chemoembolization for her unresectable tumor 2 years before this admission.[9] She had suffered from progressive exertional dyspnea in the past 1 month, with frequent episodes of near syncope and epigastric fullness. Physical examination revealed mild respiratory distress, with 25 breaths/min, and a grade 3/6 systolic murmur was audible over the left lower sternal border. A 12-lead

Table 1. Summary of all reported cases in the English literature

Case	Reference	Age (yr)	Sex	AFP (ng/dL)	Operation	Chemotherapy	Recurrence (mo)	Survival (mo)
1	Steffens et al[6]	60	M	–	+	–	–	–
2	Lei et al[1]	54	M	–	+	–	–	7
3	Kotani et al[5]	67	F	–	–	TCCE	–	–
4	Longo et al[7]	43	M	–	–	–	–	1
5	Lin et al[8]	45	M	–	+	+	–	3
6	Chieng et al[2]	65	F	5.12	+	–	2	3
7	Liu et al[4]	45	F	544.18	+	+	–	4
8	Current case	74	F	–	+	+	1	4

AFP = alpha-fetoprotein; TCCE = transcoronary chemoembolization.

*Correspondence to: Dr Chung-Ben Kan, Division of Cardiovascular Surgery, Department of Surgery, Chia-Yi Christian Hospital, 539, Jung-Shiau Road, Chia-Yi 600, Taiwan, R.O.C.
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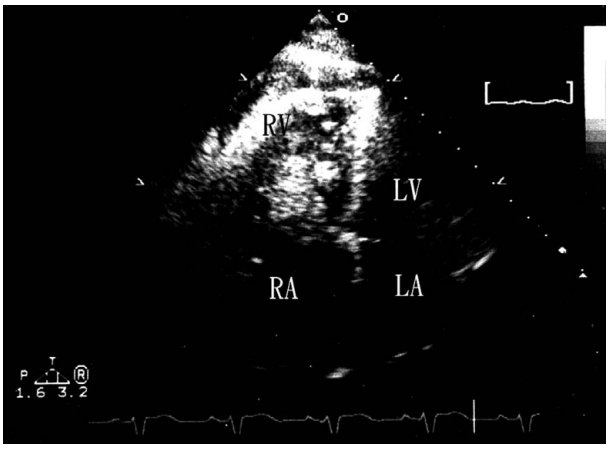

Figure 1. Apical 4-chamber view shows a huge tumor mass occupying the right ventricle (RV), with right atrial (RA) and right ventricular outflow tract extension. LV = left ventricle; LA = left atrium.

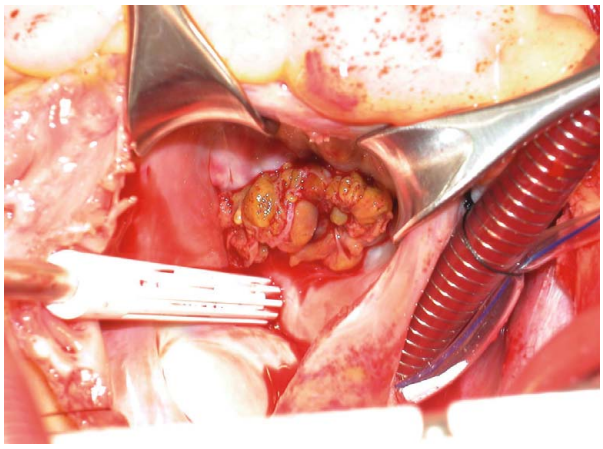

Figure 3. Huge tumor mass protruding into the right atrium through the tricuspid valve is demonstrated via right atriotomy.

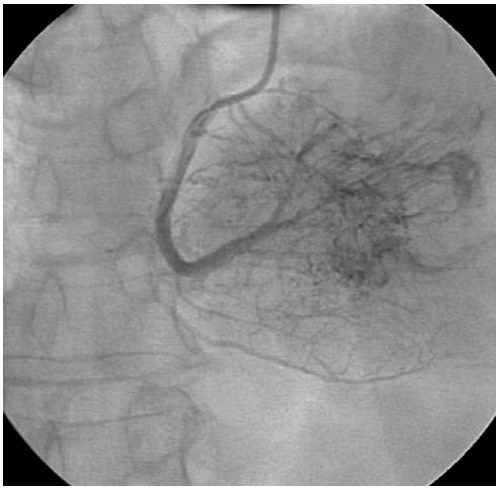

Figure 2. Right coronary angiography shows a hypervascular tumor stain.

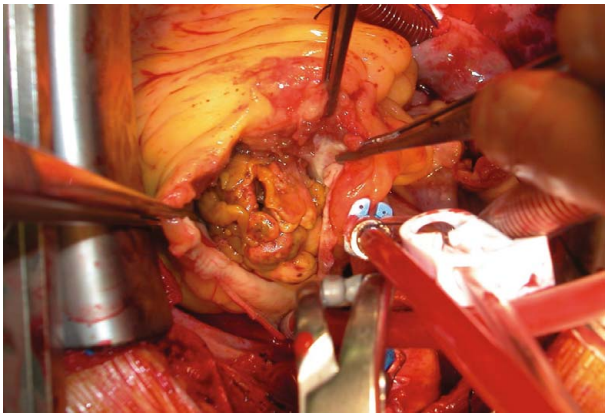

Figure 4. Huge tumor mass demonstrated via right ventriculotomy.

electrocardiography showed normal sinus rhythm with incomplete right bundle branch block, T-wave inversion in leads III and V1 through V3. Chest roentgenography showed a clear lung field with mild cardiomegaly. Two-dimensional transthoracic echocardiography revealed a huge tumor occupying the right ventricular free wall with right atrial and right ventricular outflow tract extension (Figure 1). Cardiac catheterization revealed a tumor stain over the right ventricular free wall with feeding arteries originating from the right coronary artery (Figure 2).

Palliative resection of the tumor was performed under moderate hypothermic cardioplegic cardiac arrest via right atriotomy and ventriculotomy. During the operation, a huge yellowish tumor with extensive involvement of the right ventricular free wall with right atrial and outflow tract extension was observed (Figures 3 and 4). The pulmonary and tricuspid valves were found to be intact. The tumor masses were then debulked as much as possible. The pathologic report was metastatic hepatocellular carcinoma.

The patient recovered uneventfully. She then received adjuvant chemotherapy with thalidomide. Unfortunately, she became symptomatic again, and recurrence of the right ventricular mass was confirmed by 2-dimensional echocardiography 1 month later. She finally died of her disease 4 months after the operation.

Discussion

Metastatic tumors to the heart and pericardium are more common than primary neoplasms, with reported rates of 1.5–21%.[10] Metastatic cardiac tumors may result from contiguous extension, lymphatic spread, or hematogenous spread. This disease tends to involve the myocardium rather than the valves or endocardium.[11] Metastatic cardiac tumors are frequently bronchogenic carcinomas, breast carcinomas, lymphomas, leukemias,

carcinoid tumors, thymic carcinomas, melanomas, renal cell carcinomas, and various sarcomas. Of patients with HCC, 5–10% will have cardiac metastasis.[10]

Before the era of echocardiography, only sporadic case reports of right heart tumor were diagnosed by angiography and received surgical excision. Echocardiography is the mainstay of diagnosis nowadays. Other modalities, including computed tomography and magnetic resonance imaging, can help in delineating the exact location and extent of extracardiac extension and to demonstrate the effects of the lesion on surrounding structures.[2] Cardiac catheterization can provide further details on intracardiac extension of the tumor and its feeding arteries, and is a useful tool in predicting perioperative risks.[2]

There is still no consensus on the treatment of cardiac metastasis of malignant neoplasms at the present time. The prognosis is poor, and the operative mortality rate in these patients is high because of the obscure cardiac symptoms. Dyspnea on exertion, heart murmurs and syncope are the most common symptoms.[3] Without treatment, survival is limited to days or months from the time of diagnosis. Surgical excision remains an effective palliative treatment for these desperate patients. Successful excision of metastatic HCC in the right heart cavity with prolongation of life for 1–15 months has been reported sporadically.[2] Otherwise, transcoronary chemoembolization has also been reported to be a valuable palliative treatment.[5]

In conclusion, the strategy for treating the patient with isolated intracavitary cardiac metastasis of HCC should be individualized with a multidisciplinary approach, including surgery, radiotherapy, chemotherapy, and possible transcoronary embolization to control both the primary and metastatic lesions. However, despite treatment, metastatic cardiac tumors often present close to the time of death, and rarely is treatment indicated.

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