1. Introduction

Hepatocellular carcinoma with cardiac involvement is rare, and thus, its prognosis remains unclear because of its rarity. A 48-year-old male hepatocellular carcinoma patient presented with right atrial involvement through the inferior vena cava and a left atrial mass, which nearly occluded the mitral valve, and extended from a pulmonary metastasis. Emergent surgery was performed due to sudden severe respiratory failure despite profound liver cirrhosis and a left atrial mass, which nearly occluded the mitral valve, and extended from a pulmonary metastasis. Emergent surgery was performed due to sudden severe respiratory failure despite profound liver cirrhosis. Nevertheless, the patients postoperative course was uneventful, and over six months of follow-up, he has shown no remarkable symptoms and has maintained a tolerable liver function.

2. Case

A 48-year-old man, with a history of hepatocellular carcinoma and liver cirrhosis of Child–Pugh class B presented at our emergency department with sudden dyspnea. He had undergone 11 transarterial embolizations against hepatocellular carcinoma over the previous three years after diagnosis. A physical examination revealed a grade IV–VI diastolic murmur, and massive bilateral pleural effusion was evident on plain film. The transthoracic echocardiographic finding was of a huge echogenic mass in the left atrium, which almost obliterated the mitral valve orifice. His chest computed tomographic findings were of a lobulated heterogeneously enhancing mass in the left lower lobe close to the left inferior pulmonary vein, a tumor thrombus in the inferior vena cava and right atrium of diameter exceeding 6 cm, bilateral pleural effusion, and a left atrial mass of diameter >4.5 cm (Fig. 1). The patient underwent emergent surgery due to severe progressive dyspnea refractory to medical management, which included diuretics and oxygen therapy.

After uneventful anesthetic induction, standard median sternotomy was performed. Routine antibiotics of cefazolin 2.0 g was administered preoperatively. The femoral vein was used for venous drainage below the diaphragm because the inferior vena cava was totally obstructed by the tumor thrombus. This thrombus from the inferior vena cava was palpated in the right atrium, and was found to have infiltrated the atrial wall and the vena cava. Left atriotomy just above the right upper pulmonary vein was used as a septal approach, rather than right atriotomy. The tumor was found to have totally obliterated the mitral valve orifice and to have originated from left pulmonary veins (Fig. 2). The tumor was removed from the left pulmonary vein using the technique used for pulmonary endarterectomy.

Despite aggressive tumor removal, mitral valve leaflets and the subvalvular apparatus were normal. Histologically, the tumor was identified as hepatocellular carcinoma. The procedure was completed promptly because he had moderate hepatic failure. Weaning from cardiopulmonary bypass was uneventful with tolerable postoperative bleeding. During first 6 h after surgery, two units of packed red blood cells, five units of fresh frozen plasmas and eight units of platelet concentrates were transfused. Postopera-
of tumor extension into the inferior vena cava was found to range from 0.7 to 22% and metastases to the heart from hepatocellular carcinoma was found in 7 (2%) of 325 autopsies [2–4]. However, left atrial metastasis is extremely rare, and a literature search revealed only one previous case report on the surgical excision of a left atrial mass [5]. The most common mechanism of intracardiac involvement from hepatocellular carcinoma involves direct extension of the tumor via the inferior vena cava into the right atrium, and possible extension to the patent foramen ovale and the left atrium. It is also possible that left atrial metastasis could occur by hematogenous spread from hepatocellular carcinoma in the lung within the lumen of pulmonary veins into the left atrium.

Advanced hepatocellular carcinoma has a dismal prognosis with a median survival of four to seven months. In hepatocellular carcinoma patients with cardiac involvement, the risk for cardiopulmonary collapse is higher, and heart failure or sudden deaths are cited as causes of death in 25%. However, the aggressive treatment of hepatocellular carcinoma with cardiac involvement can prolong survival as compared with palliative care [6]. We believe that mass excision reduces the risk of heart failure and cardiac cirrhosis due to severe mitral stenosis. We suggest that surgery should be performed when a ventricular inflow or outflow obstruction is present, despite the risk of recurrence.

Fig. 1. Left atrial mass protruding into the left ventricular cavity causing dynamic obstruction of mitral inlet.

Fig. 2. Left atrial mass originated from left pulmonary veins: an intraoperative finding.

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Clinical results have been reported infrequently for open-heart surgery in patients with liver cirrhosis, and according to these reports, patients with Child–Pugh class B or C have a high-mortality rate. For example, Klemperer et al. reported that patients with Child–Pugh class A cirrhosis had an overall mortality rate of 0% and that patients with Child–Pugh class B cirrhosis had an overall mortality rate of 80% [7]. This higher mortality was attributed to gastrointestinal bleeding and an increased susceptibility to infections, the latter of which is probably related to a poor nutritional state and a high rate of chest re-exploration. Hayashida et al. found that 33% of Child–Pugh class B cirrhosis patients experienced a postoperative infection and that 17% patients had a bleeding complication [8]. We performed emergent open-heart surgery despite a Child–Pugh class B cirrhotic status, because of acute pulmonary edema refractory to medical treatment. Fortunately, in our case no postoperative infection or bleeding occurred, the only notable complication was prolonged pleural effusion. The liver function improved to a Child–Pugh class A during follow-up. Here, we report a rare case of hepatocellular carcinoma with pulmonary metastasis extended to the left atrium causing left ventricular inflow obstruction. We conclude that an aggressive approach in this type of case might help the patient in terms of prolonged survival and improved quality of life.

3. Comment

This is the first reported case of the successful surgical excision, despite the presence of liver cirrhosis, of a metastatic left atrial tumor associated with advanced, ongoing hepatocellular carcinoma with extension to the inferior vena cava and right atrium.

Metastatic hepatocellular carcinoma with involvement of the heart is rare. In an antemortem series, the prevalence of tumor extension into the inferior vena cava was found to range from 0.7 to 22% and metastases to the heart from hepatocellular carcinoma was found in 7 (2%) of 325 autopsies [2–4]. However, left atrial metastasis is extremely rare, and a literature search revealed only one previous case report on the surgical excision of a left atrial mass [5]. The most common mechanism of intracardiac involvement from hepatocellular carcinoma involves direct extension of the tumor via the inferior vena cava into the right atrium, and possible extension to the patent foramen ovale and the left atrium. It is also possible that left atrial metastasis could occur by hematogenous spread from hepatocellular carcinoma in the lung within the lumen of pulmonary veins into the left atrium.

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References


