Hepatocellular Carcinoma with Invasion into the Right Atrium: A Case Report

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Hepatocellular carcinoma (HCC) has a great tendency toward venous invasion; however, metastatic HCC invasion into the right atrial cavity was rarely reported. We herein report a rare case of right atrial invasion from hepatocellular carcinoma in a 50-year-old man with history of alcoholic liver cirrhosis, and later diagnosed as hepatocellular carcinoma. Because of the patient did not wish any invasive therapy, he received compassionate thalidomide therapy only. Two weeks later, he died of circulatory collapse. Cardiac involvement of HCC should be considered when a patient with a history of chronic hepatic disease presents with unexplained cardiac symptoms or refractive leg edema. Keeping a low threshold for cardiac image surveillance is suggested.

Key words: hepatocellular carcinoma, metastasis, heart

Introduction

Hepatocellular carcinoma (HCC) has a tendency to spread into the venous system, but intracavitary cardiac extension or metastasis of hepatocellular carcinoma is an uncommon form of cardiac malignancy[(1-4)]. HCC patients with cardiac involvement is rare and usually associated with extremely poor outcome[(5,6)]. These patients often exhibits symptoms of heart failure owing to flow obstruction or thromboembolism upon diagnosis[(6)].

Case Report

A 50-year-old gentleman presented to the emergency department with jaundice, bilateral lower leg edema, and exertional dyspnea of one week’s duration. He had a history of alcoholic liver cirrhosis but denied any known cardiac or pulmonary disease. His blood pressure was 110/70 mmHg, heart rate 100 beats/ minute, body temperature 37℃. Although pulse oximetry showed 96% oxygen saturation on room air, supplemental oxygen at 4 L/min via nasal cannula was given. On physical examination, the patient had acute ill looking, dyspnea, icterus sclerae and a distended abdomen with engorged superficial veins was noted. A gallop rhythm and grade III/VI holosystolic murmur were detected on auscultation. Significant biochemistry results were as follows: aspartate aminotransferase (AST) 109 IU/L, alanine transaminase (ALT) 152 IU/L, and total bilirubin 3.5 mg/dL. Coagulation profile was within normal limit. A 12-lead electrocardiogram and cardiac...
troponin I test were normal. Chest radiography showed a right side pleural effusion. He was treated with 100% oxygen, and intravenous administration of 20 mg furosemide. Bedside sonography revealed suspected multiple hepatic tumor, inferior vena cava (IVC) thrombus, and right atrial mass lesion. Urgent chest computed tomography (CT) demonstrated a mass lesion occupying the whole right atrium (Fig. 1a) with an infiltrative hypodense lesion in the superior part of both lobes of the liver (Fig. 1b). Abdominal CT disclosed an infiltrative hypodense lesion in the superior part of both lobes of the liver (Fig. 1b) with adjacent inferior vena cava (IVC) obstruction by tumor thrombus. He had a high serum level of alpha-fetoprotein 15300 ng/mL (normal reference upper limit 10 ng/mL), suggesting the diagnosis of hepatocellular carcinoma (HCC) with IVC extension to the right atrium (RA). Due to the patient did not wish any invasive treatment, he received compassionate thalidomide therapy only. Two weeks later, he died of circulatory collapse.

Discussion

HCC has a great tendency toward venous invasion; however, extension of metastatic HCC into the RA was rarely reported\(^1\)\(^-\)\(^4\). The most common mechanism of intracardiac involvement from HCC involves direct invasion of the tumor via the inferior vena cava into the right atrium, and possible extension to the patent foramen ovale and the left atrium\(^7\). Autopsy studies suggested the incidence of HCC with cardiac involvement may be underestimated. The prevalence of RA involvement in HCC patients was reported to be 2.4\%-6.3\%\(^6\)\(^,\)\(^8\)\(^-\)\(^10\). A screening examination using trans-esophageal echocardiography in HCC patients even showed the prevalence of subclinical cardiac metastasis in HCC patients may be as high as 11\%\(^11\). The symptoms with cardiac involvement in patients with HCC may be insignificant. Lower leg edema resistant to diuretics therapy is the most commonly reported symptoms, and about 22\% patients was even asymptomatic before diagnosis\(^1\)\(^-\)\(^4\). Many patients were diagnosed incidentally during surveillance abdominal image with chest extension. Besides, RA involvement may be first manifestation of HCC. In one review, 96 of the 128 reported cases of HCC with RA involvement did not disclose a history of preexisting HCC\(^4\). Therefore, clinicians should not exclude the possibility of this diagnosis in patients without compatible HCC history. In recent study, the most common symptoms of cardiac metastasis included asymptomatic in 19 cases (39.5\%),

Fig. 1 Chest and abdominal computed tomography reveals a mass lesion occupying the whole right atrium (fig 1a. arrow) with an infiltrative hypodense lesion in the superior part of both lobes of the liver (fig 1a & b. arrow heads) with adjacent inferior vena cava obstruction by tumor thrombus (fig 1b. arrow)
bilateral lower leg edema in 18 cases (37.5%) and exertional dyspnea in 15 cases (31.3%)\(^{(12)}\).

The median and mean survival times from the time of diagnosis of cardiac metastasis were 102 days and 161 days, respectively\(^{(12)}\). Recent reports, however, suggest aggressive treatment may be of significant benefit in prolonging survival. One case report showed simultaneous resections of a main tumor and RA metastasis resulted resulting in survival for more than two years\(^{(13)}\). Besides, the once contraindicated transcatheter arterial chemoembolization (TACE) therapy in patients with HCC and venous system invasion has recently been challenged. Cher et al. demonstrated in their series of 26 patients with HCC and IVC invasion that TACE resulted in a 53.8% response rate and a median 13.5 months survival among the responders\(^{(14)}\). Notably, 5 patients with right atrium involvement in their series all responds to TACE therapy, of which three showed complete response (60%) and one even had a survival of more than 6 years\(^{(14)}\). Surgical interventions as well as nonsurgical approaches, such as transcatheter arterial chemoembolization and radiotherapy, have been used in the treatment of patients with symptomatic IVC/RA tumor thrombi. However, such therapeutic modalities are usually not feasible when a patient shows poor general performance, the presence of metastatic disease, and underlying hepatic dysfunction\(^{(5)}\). HCC patients with cardiac metastases were in the advanced stages. These patients had limited survival from the diagnosis of cardiac metastases\(^{(5,12)}\). The most common cause of death was related to HCC per se or the underlying liver disease. Only a few patients expired because of cardiac metastases\(^{(12)}\). In one study, Lin et al. described a prospective study or more data may be necessary to confirm the long-term mortality\(^{(15)}\).

In conclusion, this case alerts the emergency physicians that HCC with cardiac metastasis should be considered in patients with a history of chronic hepatic disease present with unexplained cardiac symptoms such as exertional dyspnea, orthopnea, and bilateral lower leg edema. Keeping a low threshold for cardiac image surveillance is suggested. Once the diagnosis established, early consultation of surgeon or intervention radiologist is justified for further evaluation and management.

References


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肝細胞癌併右心房轉移：病例報告

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肝細胞癌(肝癌)有一個很大的傾向的是靜脈侵犯，轉移性肝癌侵犯到右心房是很少的個案。我們報告一位50歲男性病患酒精性肝硬化病史，後來診斷為肝細胞癌。肝癌細胞經由靜脈侵犯到右心房。由於病人不希望任何侵入性治療，患者只接受thalidomide治療。兩個星期後，他死於循環系統衰竭。

關鍵詞：肝癌，轉移，心臟