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Cardiac metastasis of hepatocellular carcinoma in a young non-cirrhotic patient, to the left ventricle

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ABSTRACT

Hepatocellular carcinoma (HCC) is the most common primary tumor of the liver.[1,2] The most common extrahepatic metastatic sites are lung, abdominal lymph nodes and bone, while its cardiac metastasis is rare.[2,3] Metastasis of HCC into the cardiac cavity is mostly caused by direct tumor invasion of vena cava inferior with continuous extension into the right cardiac cavity.[4,5] Right heart metastasis without invasion of inferior vena cava, which may be caused by hematogenous spread of cancer cells, is rarely reported.[6,7] This paper announces an unusual case of isolated involvement of left ventricle (LV) together with myocardial invasion of HCC. Our patient is known to be the first case with isolated HCC metastasis to the left ventricle. Strikingly, the patient was young and non-cirrhotic with negative serum HBsAg, and anti-HCV results.

Key words. Hepatocellular carcinoma. Metastasis. Left ventricle metastasis. Cardiac tumors.

CASE REPORT

A 24-year-old male patient had only prominent hepatomegaly on his physical examination. Hepatitis B surface antigen (HBsAg), hepatitis C and D virus antibodies (anti-HCV, anti-HDV) were all negative. Abdominal ultrasound and computerized tomography (CT) revealed a solid, heterogeneous, irregular mass with dimensions of 6 x 6 x 4 cm in the right lobe of the liver. Needle biopsy from the liver mass received a histopathological diagnosis of HCC on the basis of a non-cirrhotic liver and the radiologic and laboratory findings also did not reveal any finding of cirrhosis. Histologically, tumor cells which had large, pleomorphic nuclei with distinct nucleoli and coarsely granular cytoplasm, were grown in cords with more than three cell thickness, diffusely forming a trabecular pattern. The stroma showed a sinusoid like pattern. There was no prominent intratumoral fibrosis between the malignanat hepatocyte nests. A staging CT scan of the thorax showed several micrometastases to the left lung. Subsequently a left partial hepatectomy was performed. One year later, the patient presented with exertional dyspnea, hoarseness, palpitation and peripheral subcutaneous edema. The thorax CT revealed findings consistent with brochiolar pneumonia and showed a mass in the wall of the left cardiac ventricle (Figure 1) with a dia-

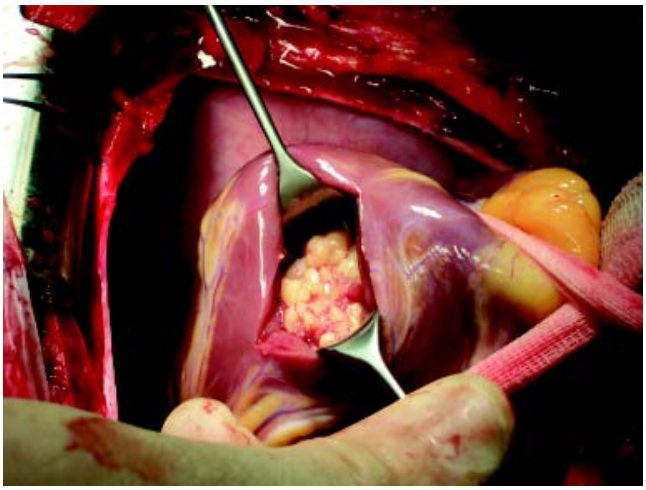

Figure 1. *Intraoperative view of cardiac mass.*

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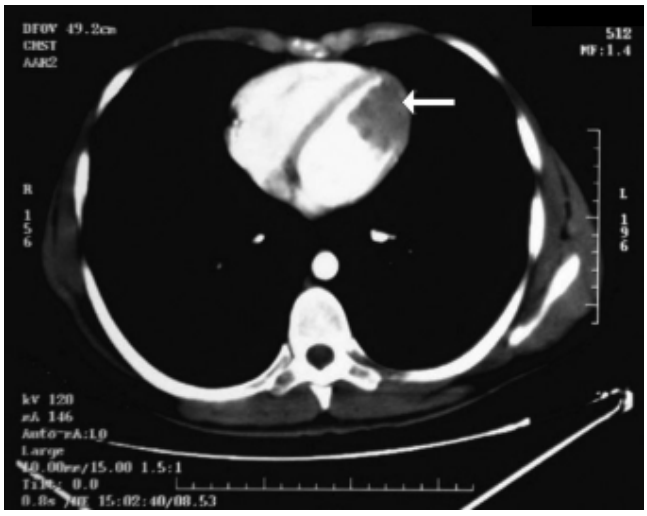

Figure 2. *Computerized tomography image of cardiac mass (arrow).*

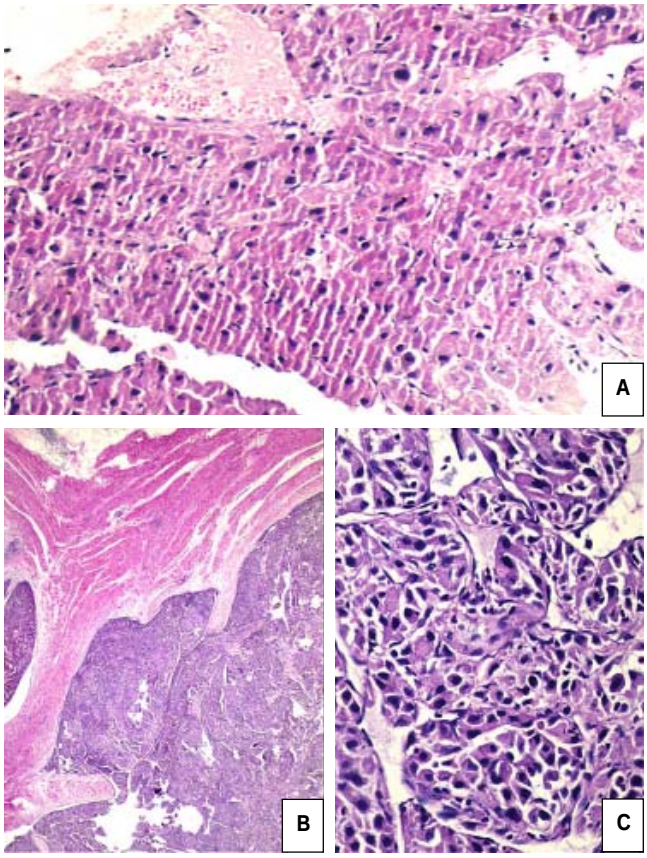

Figure 3. *Hepatocellular carcinoma.* ***A.*** *Liver needle biopsy.* ***B-C.*** *Metastatic tumor in the left ventricle. Tumor cells are large, polygonal shaped with a deeply eosinophilic and coarsely granular cytoplasm and have distinct nucleoli (A-HE x 200; B-HE x 50; C-HE x 200).*

meter of 4 cm. Echocardiography also confirmed the cardiac mass. Other cardiac structures were

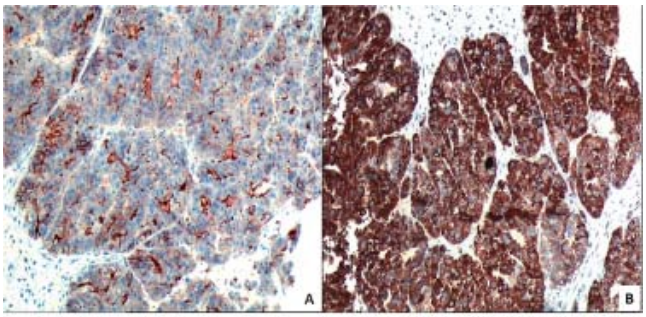

Figure 4. *Immunohistochemically policlonalcarcinoembrionicantigene (**A** x 200) and Hepatocyte Specific Antigen positivity (**B** x 200) in tumoral infiltration.*

normal with CT and echocardiography. A palliative resection of the tumor mass was performed surgically (Figure 2). Histologic features of tumor infiltrating the deep myocardial muscle fibers were similar with the HCC diagnosed in the liver biopsy (Figure 3). Immunohistochemically the tumor cells showed positive reaction for Hepatocyte Specific Antigen, polyclonal carcinoembryonic antigen (p-CEA) (Figure 4) and thyroid transcription factor-1 (TTF-1) antibodies. These findings supported the diagnosis of left ventricular metastasis of hepatocellular carcinoma. In routine controls of the patient multiple bone and brain metastasis were detected and 6 months later the cause of his death was multiple organ failure.

DISCUSSION

Hepatocellular carcinoma is the most common primary hepatic malignancy[3] and the incidence rates of HCC is increasing, with a shift towards younger age group.[8] Fibrolamellar variant of HCC usually arises in non-cirrhotic livers of adolescents or young adults.[9] Initially, under the light of radiologic and clinical informations, the liver tumor was suspected to be the fibrolamellar variant of HCC or hepatoblastoma as the patient was very young and non-cirrhotic. However, the tumor cells were forming cords with different thickness revealing a trabecular pattern. Histologically there was no intratumoral fibrosis between malignant hepatocyte nests which is the key diagnostic feature of fibrolamellar variant of HCC. Tumor areas did not contain epithelial/mesenchymal/embrional areas or other features of hepatoblastoma.

Worldwide, the majority of patients with HCC have underlying cirrhosis, and it is uncommon to diagnose HCC in a patient without cirrhosis, still it seems almost impossible if the patient is in the third

decade.[10] In contrast to the cirrhotic patients, HCC is symptomatic in the non-cirrhotic ones.[11] Sezaki, *et al.* claimed that HCC developing non-cirrhotic patients are mostly young adults.[12] It also seems challenging for our patient to be both non-cirrhotic with negative laboratory results for both HBV and HCV infections and also being at a young age at the time of initial diagnosis.

Intracavitary cardiac extension or metastasis is an unusual form of HCC metastasis.[4,13] Such metastases, however, usually invade the heart through the vascular system or by infiltrating from neighboring organs.[6] The incidence of metastatic HCC to the right heart cavity with extension via vena cava inferior was reported to be < 6% in an autopsy series.[14] Moreover, reports of isolated intracavitary metastasis of HCC to the right ventricle without involvement of right atrium and/or vena cava inferior are very rare.[7] Left cardiac intracavitary metastasis of HCC seems to be extremely rare, as there is still no case reported in the literature. In the presented case, lung metastasis of HCC can be accepted as the origin of metastatic intracavitary left ventricle tumor. It can be presumed that, the tumor cells spread from the tumor located in the lung via the pulmonary veins directly into the left atrium and then to the left ventricle. Another way of left ventricular metastasis can be asymptomatic patent foramen ovale. However, with echocardiography and CT, there was no detected patent foramen ovale or another cardiac defect in our patient.

This report introduces an unusual case of myocardial invasion and isolated involvement of the left cardiac ventricle by HCC. To our knowledge our patient seems to be the first reported case with HCC metastasis to left ventricle in the literature. More interestingly, this patient is HBsAg, anti-HCV, anti-HDV negative, and he is the youngest patient in the literature with a non-cirrhotic liver at the time of initial diagnosis of HCC.

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