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Hepatocellular carcinoma with tumoral extension to the inferior vena cava and right atrium

Keywords: Hepatocellular carcinoma. Chronic liver disease. Intracavitary mass. Tumoral extension. Intracardiac extension. Contrast enhanced abdominal tomography. Right-sided heart failure.

Dear Editor,

We present the case of an 81-year-old male, diagnosed with Child-Pugh B chronic liver disease, who arrived at the Emergency Department with a one-week history of anorexia, generalized weakness and hypoactivity. He reported dyspnea and atypical precordial pain. An electrocardiogram revealed a third-degree atrioventricular block, requiring temporary pacemaker placement. Portable cardiac ultrasound detected an intracavitary mass in the right atrium. Initial laboratory tests showed hemoglobin (Hb) 7.81 g/dl, mean corpuscular volume (MCV) 89 fl, mean corpuscular hemoglobin concentration (MCHC) 30.6 g/dl, creatinine (Cr) 1.9 mg/dl, blood urea nitrogen (BUN) 28 mg/dl, alkaline phosphatase (ALP) 397 IU/l, and lactate dehydrogenase (LDH) 202 IU/l. The remaining tests showed no significant alterations.

A triphasic abdominal computed tomography (CT) scan revealed a solid lesion in hepatic segments VII and VIII, with arterial phase enhancement and late-phase washout. The lesion had lobulated, poorly defined borders, measuring 9.3 x 8.3 cm, suggestive of a neoplastic process with extension into the right suprahepatic vein, inferior vena cava and right atrium (Fig. 1). Consultation with the Oncology Service was requested for an assessment of outpatient treatment options.

Discussion

Hepatocellular carcinoma (HCC) is a major contributor to global cancer-related mortality. It is primarily associated with cirrhosis due to viral hepatitis or alcohol abuse (80-90 % of cases) (1). HCC has a notable inclination for vascular invasion. While extension to the portal system is common, invasion of the inferior vena cava (IVC) and right atrium (RA) without portal system involvement is rare (2). This infiltration can occur either as an isolated metastasis or by direct extension of the tumor with associated thrombus due an appropriate environment for the accelerated growth of tumor cells (3).

Intracardiac involvement in HCC leads to a range of cardiopulmonary and vascular complications, including heart failure, tricuspid stenosis or insufficiency, sudden cardiac death, and pulmonary embolism. Symptoms commonly resemble those of portal hypertension or right-sided heart failure (4). Similar to the article by Xiaokun Li (5), our patient exhibited involvement of the IVC and RA, emphasizing the vascular invasion predilection of hepatocellular carcinoma. However, two different etiologies were observed: a thrombotic etiology in the former article and tumoral extension in our case. This underscores the significance of tomographic findings when exploring etiology, such as contrast enhancement.

For HCC cases with extension to IVC and RA, the average survival ranges from one to four months, regardless of treatment. Potential benefits may be observed with radiation, trans arterial chemoembolization, or systemic chemotherapy using sorafenib (1). Palliative cardiac surgery becomes an option in cases of cardiac obstruction or when there is a high risk of sudden death (5).

Conflict of interest: the authors declare no conflict of interest.

Artificial intelligence: the authors declare that they did not use artificial intelligence (AI) or any AI-assisted technologies in the elaboration of the article.



Fig. 1. Contrast enhancement is observed in the arterial phase in the inferior vena cava and right atrium, similar to hepatocellular carcinoma, indicating tumoral extension, with washout in the venous phase.

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