

# Hepatocellular Carcinoma Extending into the Inferior Vena Cava and Right Atrium

Yusaku Kajihara 

Department of Gastroenterology, Fuyoukai Murakami Hospital, Aomori, Japan

A 74-year-old Japanese woman presented to the author's department with a 1-week history of progressive leg edema and shortness of breath. She had no medical history of cardiovascular diseases. Although her vital signs were normal, electrocardiography showed ventricular bigeminy. Chest radiography showed sharp lateral costophrenic angles and a cardiothoracic ratio of 55%. Echocardiography revealed a  $48 \times 33$  mm mass in the right atrium (RA) (Figure 1). The above-mentioned clinical course and ultrasound imaging findings were interpreted as suspicious of myxoma. However, contrast-enhanced computed tomography (CT) demonstrated a huge hepatocellular carcinoma (HCC) extending through the inferior vena cava (IVC) into the right atrium (Figure 2). She desired to receive palliative care.

In 2020, HCC is the sixth most common cancer (905 677 cases, 4.7%) and ranks third as cause of death (830 180 deaths, 8.3%) worldwide.<sup>1</sup> Macrovascular invasion, such as the formation of a tumor thrombus (TT), is a common feature of HCC; most of the cases are of portal vein invasion.<sup>2</sup> In contrast, IVC invasion is

rare; the worldwide incidence of TT in the IVC and RA in cases of advanced HCC in 2010 ranged from 1.4% to 4.9%.<sup>2</sup> Since tumor extension to the heart via IVC is often diagnosed at an advanced stage and can lead to pulmonary embolism or heart failure, the prognosis is extremely poor.<sup>2</sup> The median survival for untreated patients is 2-5 months.<sup>2</sup> Treatment options include surgery, radiotherapy, trans-arterial chemoembolization, and chemotherapy.<sup>2</sup> However, the management of patients with HCC extending into the IVC and RA is extremely difficult and risky, and no optimal treatment strategies have been established.<sup>2</sup>

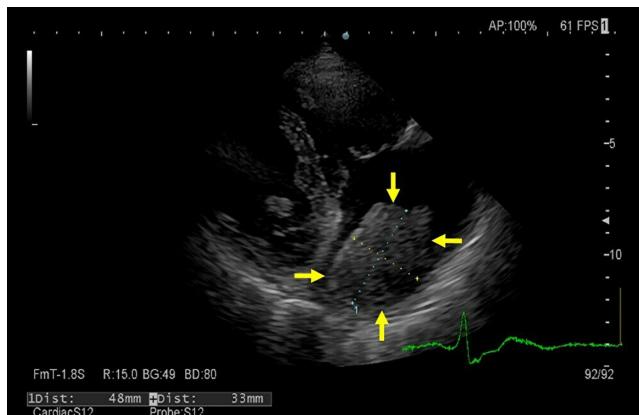


FIG. 1. Echocardiography showing a  $48 \times 33$  mm mass in the right atrium (arrows).

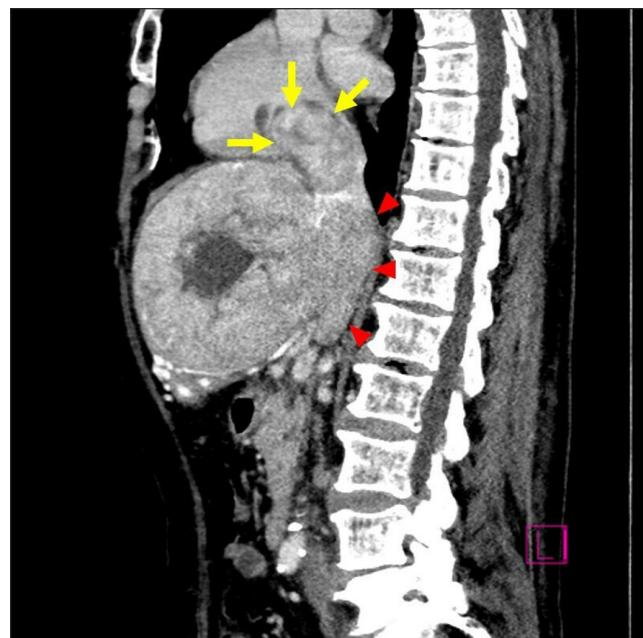


FIG. 2. Contrast-enhanced computed tomography sagittal view demonstrating a huge hepatocellular carcinoma extending through the inferior vena cava (arrowheads) into the right atrium (arrows).

Address for Correspondence: Yusaku Kajihara, Department of Gastroenterology, Fuyoukai Murakami Hospital, Aomori, Japan  
e-mail: y\_kaji2012@yahoo.co.jp

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ORCID iD of the author: Y.K. 0000-0002-3233-8829.

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In the present case, the important clinical messages are as follows:

1. HCC involving the IVC and RA is a rare but serious condition.
2. Intracardiac extension of HCC mimics right atrial myxoma.
3. Physicians should keep in mind the possibility of HCC with invasion of the IVC and RA in cases with symptoms of right heart failure.

**Ethics Committee Approval:** N/A.

**Patient Consent for Publication:** Written informed consent was obtained from the patient.

**Conflict of Interest:** The authors has no conflict of interest to declare.

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