



## Case Report

# A Right Atrial Mass as Initial Presentation of a Hepatocellular Carcinoma

Valéry Legris, MD,<sup>a</sup> Mathieu Sergerie, MD,<sup>b</sup> Patrick Garceau, MD,<sup>a</sup> and  
Nicolas Thibodeau-Jarry, MD, MMSc<sup>a</sup>

<sup>a</sup>Department of Medicine, Montreal Heart Institute, Montreal, Québec, Canada

<sup>b</sup>Department of Internal Medicine, Hôpital Maisonneuve-Rosemont, Montreal, Québec, Canada

### ABSTRACT

Hepatocellular carcinoma (HCC) is recognized to have a strong tendency for vascular invasion. However, right atrial (RA) involvement is uncommon. It has been principally described as a fortuitous discovery during oncology follow-up or as an autopsy finding of patients with known HCC. We present a case of a patient whose initial HCC presentation was an RA mass found during a dyspnea investigation. Thereby, on the basis of this new finding, clinicians should consider HCC in their differential diagnosis when discovering an RA mass.

### RÉSUMÉ

Le carcinome hépatocellulaire (CHC) est fortement associé à une invasion vasculaire. Une atteinte auriculaire droite est toutefois peu fréquente. Elle a principalement été décrite comme une découverte fortuite lors d'un examen de suivi en oncologie ou à l'autopsie chez des patients qui avaient reçu un diagnostic de CHC. Nous vous présentons le cas d'un patient dont le CHC s'est présenté initialement sous forme de masse au niveau de l'oreillette droite lors d'un examen mené en raison d'une dyspnée. Compte tenu de cette observation, les cliniciens doivent envisager un diagnostic différentiel de CHC lorsqu'une masse est découverte au niveau de l'oreillette droite.

Hepatocellular carcinoma (HCC) is the most frequent hepatic neoplasia. The cardiac cavities are uncommon metastatic sites for this cancer; the right atrial (RA) is the principal location to have been described.<sup>1</sup> It was principally reported as a fortuitous discovery during oncology follow-up or as an autopsy finding of patients with known HCC.<sup>2,3</sup> We present a case of a patient where the discovery of an RA mass during a trans-thoracic echocardiogram (TTE) for evaluation of dyspnea was the first clinical element leading to an HCC diagnosis.

echocardiography a year ago, which was unremarkable. His other medical history included hypertension, dyslipidemia, diabetes mellitus, and chronic atrial fibrillation on rivaroxaban once daily.

### Case Presentation

#### Patient characteristics

A 75-year-old man presented to the emergency department with a 1-week history of class III/IV dyspnea (New York Heart Association classification system). He had undergone a stress

#### Investigations and diagnostics

The patient underwent a TTE; the presence of an RA mass was confirmed with injection of agitated saline in the subcostal view that revealed a 24 × 29 mm mass (Fig. 1). The mass was attached to the interatrial septum. The diagnosis of a myxoma or more likely a thrombus was raised given the finding of pulmonary hypertension on a TTE, suggesting a pulmonary embolism. The patient's investigation continued with a computed tomography pulmonary angiogram, which revealed a 40 × 42 mm lesion at the RA and inferior vena cava (IVC) junction (Fig. 2). The computed tomography pulmonary angiogram also demonstrated multiple segmental and sub-segmental pulmonary embolism affecting both lungs and a suspicious hepatic mass. The hypothesis of a neoplastic liver lesion with an invasion of the IVC and the RA was retained. The neoplastic process was confirmed via a positron emission tomography scan highlighting a hypermetabolic hepatic mass as well as a linear hypermetabolic uptake from the IVC extending to the RA.

The diagnosis of an HCC was made using a magnetic resonance imaging of the liver and an  $\alpha$ -fetoprotein serum assay

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**Ethics Statement:** Although no specific Institutional Review Board approbation has been sought for this case report, the research reported has adhered to the relevant ethical guidelines.

Corresponding author: Dr Nicolas Thibodeau-Jarry, Montreal Heart Institute, University of Montreal, 5000, Belanger East, Montreal, Québec H1T 1C8, Canada. Tel.: +1-514-376-3330; fax: +1-514-593-2575.

E-mail: nicolas.thibodeau-jarry@icm-mhi.org

See page 378 for disclosure information.

### Novel Teaching Points

- Clinicians should thus include HCC in their differential diagnosis when discovering an RA mass.
- RA invasion is associated with an end-stage HCC.

that was elevated to 2717.2  $\mu\text{g/L}$  (normal: 0.0-15.0  $\mu\text{g/L}$ ). The screenings for HIV and hepatitis B and C have been negative; just as CEA and CA 19-9 serum levels were normal. Because the tumour was found on a liver free of any other lesion, a hepatic biopsy was suggested in a medical multidisciplinary meeting to confirm the neoplastic etiology. However, considering the patient's thromboembolic and haemorrhagic risks, the test was declared as unnecessary.

### Management

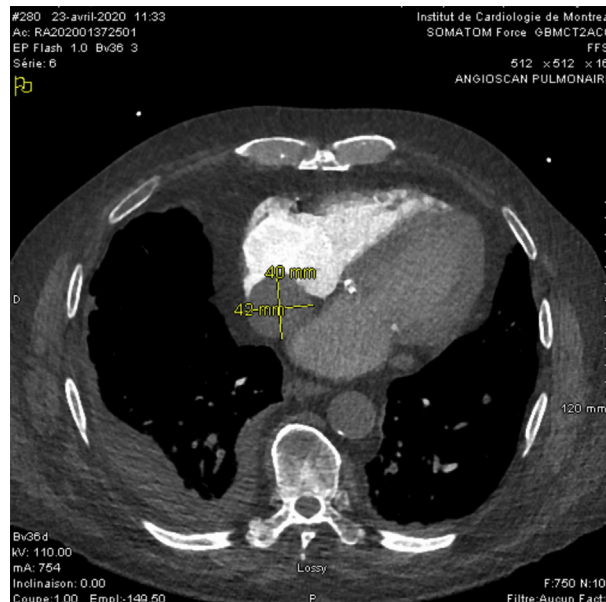
The patient has been evaluated by the radiation oncology department, and he is awaiting palliative radiotherapy treatments. In the neoplastic context, the patient's anticoagulation for his chronic atrial fibrillation as well as for his pulmonary embolism was modified to low-molecular-weight heparin.

### Discussion

The most frequent neoplastic etiology of an IVC and/or RA invasion is renal cell carcinoma. It was reported in 4%-10% of patients with renal cell carcinoma.<sup>4</sup> Other possible causes for an RA mass include myxoma, thrombus, angiosarcoma, cardiac lymphoma, melanoma, and adrenocortical cancer.<sup>5</sup>

Even if HCC is known to have a strong tendency for vascular invasion, right heart cavity involvement is uncommon, with RA as the most affected heart chamber when there is cardiac invasion.<sup>1</sup> In some autopsy series report of patients with HCC, vascular involvement of the RA was reported in 2.4%-6.3% of the cases.<sup>3</sup>

More interestingly, Kawakami et al.<sup>2</sup> and Sung et al.<sup>3</sup> described in the last few years 2 cases of intracavitary cardiac



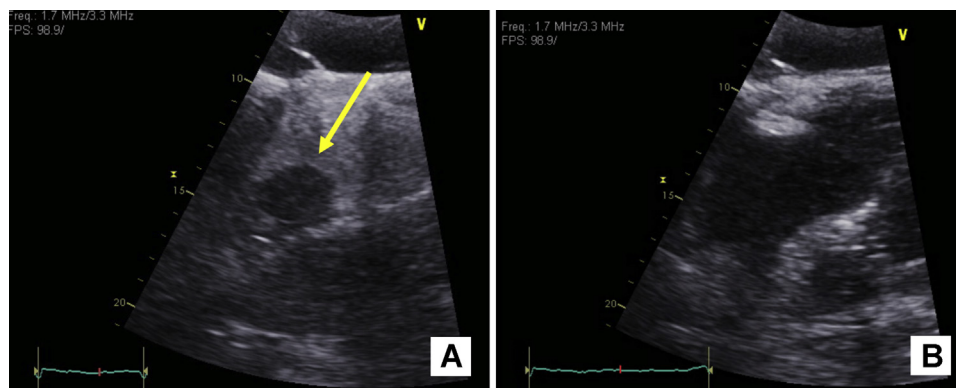
**Figure 2.** Computed tomography pulmonary angiogram; 40 × 42 mm lesion at the right atrial and inferior vena cava junction showing an important re-enhancing.

involvement in patients with known HCC. Both patients had their RA mass discovered on an oncologic surveillance computed tomography scan while asymptomatic. The 3 main presentations reported in patients with HCC and cardiac metastasis are (in order) asymptomatic, bilateral lower leg oedema, and exertional dyspnea. These nonspecific presentations may explain why cardiac metastases remains underdiagnosed antemortem. The finding of RA invasion carries a worse prognostic for patients with HCC.<sup>1</sup>

To our knowledge this is the first case report of HCC with an initial presentation as an RA mass.

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**Figure 1.** Transthoracic echocardiogram, subcostal view (A) with and (B) without injection of agitated saline; 24 × 29 mm right atrial mass attached to the interatrial septum.

**Disclosures**

The authors have no conflicts of interest to disclose.

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