Acute pulmonary embolism as the first manifestation of hepatocellular carcinoma

Abstract

We report a case of a 56-year-old man admitted to the Emergency Department of a Hospital in Sao Paulo with dyspnea, hypoxemia and pleural effusion due to pulmonary embolism as the first presenting sign of hepatocellular carcinoma. CT angiography of the chest confirmed bilateral pulmonary embolism with tumor thrombus invasion of the inferior vena cava and right atrium. The patient was not aware of previous chronic liver disease. Anticoagulant therapy with low-molecular weight heparin was administered. Due to a high risk of complications in a cardiovascular surgery intervention, the medical team decided to start palliative treatment for the HCC with sorafenib. Patient was discharged after 5 days of anticoagulation without any respiratory complaint, using enoxaparin (1mg/kg, q12h). Patient was readmitted to hospital 6 months after the diagnosis of HCC with acute upper gastrointestinal hemorrhage and died due to its complications. Liver cancer is the sixth most prevalent cancer, and patients with cirrhosis are at highest risk for developing hepatocellular carcinoma. Thus, these patients should be screened with abdominal ultrasound every 6 months, aiming a diagnosis in early stages. A therapeutic option for a thrombus that invades inferior vena cava and the right atrium is surgery, but most patients would not tolerate such procedure due to advanced hepatic dysfunction. In a palliative scenario, sorafenib is a first line treatment option.

Keywords: hepatocellular carcinoma, pulmonary embolism, vena cavae, heart atria, case report

Introduction

Liver cancer is the fifth most prevalent cancer worldwide and it is the second most frequent cause of cancer-related death. In 11 countries, it was the most diagnosed type of cancer for men in 2015. Hepatocellular carcinoma (HCC) accounts for most liver cancer deaths and treating properly hepatitis B and C would lead to a reduction in mortality, as these are the leading causes of chronic liver disease. HCC is characterized by a large heterogeneous distribution, and patients with chronic liver disease and cirrhosis are at highest risk of developing this malignancy. As the main risk factor for HCC is cirrhosis, patients with this disease should be screened with abdominal ultrasound every 6 months, aiming a diagnosis in early stages, when the tumor is most likely to be curable by resection, ablation or even liver transplantation.

Staging the tumor and defining the best therapeutic is based on Barcelona Clinic Liver Cancer (BCLC) staging classification, which takes into consideration patient’s performance status (PS), tumor volume, number of lesions, vascular invasion, extrhepatic spread and the degree of hepatic dysfunction. Advanced stage (or stage C) is characterized by the presence of portal invasion, extrhepatic spread, PS 1-2 and Child-Pugh A-B. Sorafenib is a first line of treatment in a palliative scenario.

A tumor thrombus formation in either portal or hepatic vein is a marker of an advanced stage. Pulmonary thromboembolism (PE) as the first manifestation of HCC is rare, although vascular invasion is not. HCC is often diagnosed in advanced stages of the disease, when it is possible to detect vascular invasion and metastasis. When a thrombus invades inferior vena cava (IVC) and the right atrium (RA), it can lead to cardiac failure or pulmonary embolization. Thus, these patients usually have low life expectancy, with a high degree of pulmonary, cardiac and hepatic involvement, which, untimely, limit surgery.

We report a case of a cirrhotic patient with HCC with tumor thrombi invasion of the IVC and RA, and bilateral PE.

Case report

A 56-year-old man was admitted to the Emergency Department of a public Hospital in Sao Paulo in September 2016 for acute dyspnea and pleuritic chest pain over the previous 6 days. He referred occasional intake of alcohol in the weekends and he smoked for over 20 years, but had stopped 5 years ago. He denied promiscuous sex activity or drug abuse and had no knowledge of pre-existing liver disease.

At admission to hospital in September 2016, physical examination revealed a respiratory rate of 20 breaths/min, a heart rate of 105 beats/min, hypoxemia (SpO2 88%), sparse telangiectasias on the chest and mild ascites with no abdominal pain associated. Initial laboratory tests worth mentioning are displayed in Table 1. The chest radiograph and a 12-lead ECG were normal.

A CT angiography of the chest was performed, and a bilateral PE was found (Figure 1A). Anticoagulant therapy with low-molecular weight heparin was administered (1 mg/kg, q12h). The CT angiography also revealed a liver mass and a CT of the abdomen was performed.

The CT revealed parenchymal heterogeneity of the liver, suggesting cirrhosis, and a sizeable lesion (11.5 x 9.7 cm) in the right lobe (Figure 1B). The lesion showed typical HCC image pattern, with arterial phase enhancement and a venous/delayed phase washout.

Abbreviations:
HCC, hepatocellular carcinoma; BCLC, Barcelona clinic liver cancer; PE, pulmonary thromboembolism; IVC, inferior vena cava; RA, right atrium; IAMSPE, Sao Paulo state public server hospital; CT, computed tomography; PS, performance status

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A hyperattenuating material in the portal vein (PV) lumen was also found, with no enhancement after contrast injection, inferring thrombotic/tumoral process; and a hyperattenuation in the IVC was also described (Figure 1C&D). Transthoracic echocardiogram confirmed tumoral invasion of the vena cava and right atrium.

Table 1 Blood chemistry values worthy of note

<table>
<thead>
<tr>
<th>Test</th>
<th>Values</th>
<th>Normal Range</th>
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</thead>
<tbody>
<tr>
<td>AST</td>
<td>98 U/L</td>
<td>8-48 U/L</td>
</tr>
<tr>
<td>ALT</td>
<td>45 U/L</td>
<td>7.5-55 U/L</td>
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<tr>
<td>Amylase</td>
<td>411 U/L</td>
<td>20-1401 U/L</td>
</tr>
<tr>
<td>Total bilirubin</td>
<td>2.16 mg/dL</td>
<td>0.2-1.2 mg/dL</td>
</tr>
<tr>
<td>Direct bilirubin</td>
<td>0.9 mg/dL</td>
<td>0.1-0.4 mg/dL</td>
</tr>
<tr>
<td>Creatinine</td>
<td>0.8 mg/dL</td>
<td>0.84-1.21 mg/dL</td>
</tr>
<tr>
<td>LDH</td>
<td>277 U/L</td>
<td>105-333 U/L</td>
</tr>
<tr>
<td>Alkaline phosphatase</td>
<td>416 U/L</td>
<td>44-147 U/L</td>
</tr>
<tr>
<td>Gamma glutamyl transferase</td>
<td>396 U/L</td>
<td>9-48 U/L</td>
</tr>
<tr>
<td>Potassium</td>
<td>4.4 mEq/L</td>
<td>3.5-5.0 mEq/L</td>
</tr>
<tr>
<td>Sodium</td>
<td>135 mEq/L</td>
<td>135-145 mEq/L</td>
</tr>
<tr>
<td>Hs-CRP</td>
<td>20.14 mg/L</td>
<td>&lt; 3 mg/L</td>
</tr>
<tr>
<td>Urea</td>
<td>30 mg/dL</td>
<td>20-40 mg/dL</td>
</tr>
<tr>
<td>Hb</td>
<td>13 g/dL</td>
<td>13.5-17.5 g/dL</td>
</tr>
<tr>
<td>Ht</td>
<td>40.3%</td>
<td>42-54%</td>
</tr>
<tr>
<td>WBC</td>
<td>12,800</td>
<td>4,000-11,000 cells/cubic millimeter of blood</td>
</tr>
<tr>
<td>Platelets</td>
<td>192,000</td>
<td>150,000-400,000 platelets/mcL</td>
</tr>
</tbody>
</table>

Figure 1 CT scanning. (A) Chest enhanced CT showing PE (arrow). (B) Enhanced CT of the abdominal region showing a large low-density lesion, sized 11.5x9.7 cm, in the right lobe (arrow). (C) Enhanced CT of the abdominal region showing tumour thrombus invasion of the IVC and RA (arrow). (D) Coronal reconstruction showing tumour thrombus invasion of the IVC and RA (arrow).
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Our patient had decompensated cirrhosis (CHILD B), tumor vascular invasion with PE as its complication, not being eligible for a major surgery with cardiopulmonary bypass, to our conclusion. An MWA might have been a good treatment option in this scenario, but we did not have a medical team with this expertise at the time.

Currently, in cases of advanced HCC, the recommended antiangiogenic substance is sorafenib, which reduces tumor cell proliferation and angiogenesis and it increases apoptosis by targeting tyrosine kinase receptors. The patient received sorafenib for 6 months, with no record of limiting side effects, and died from a complication expected in cirrhotic patients.

In cirrhotic patients, the prevalence of HCC is high, and it is mandatory to screen these patients every 6 months with an abdominal ultrasound. Once the tumor is metastatic, the only treatment available is systemic chemotherapy, and nowadays there are two options available as first line treatments: sorafenib and lenvatinib. All cirrhotic patients with the diagnosis of PE should have a thorough image investigation of the abdomen performed to rule out HCC.

Acknowledgments

None.

Conflicts of interest

We have no conflicts of interest.

References


