

An unusual presentation and way to diagnose hepatocellular carcinoma

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ABSTRACT

A 67-year-old man with a history of chronic obstructive pulmonary disease (COPD) was admitted with acute progression of dyspnoea, productive cough, fever, elevated central venous pressure, oedema and liver enzyme abnormalities. Pneumonia with secondary right-sided congestive heart failure was considered. Additional abdominal ultrasound examination confirmed by a CT scan showed a mass in the inferior vena cava (VCI) extending into the right atrium. The central liver location and impaired haemostasis rendered liver biopsy impossible. An alternative approach was discussed and guided by two-dimensional transoesophageal electrocardiography accessing the right internal jugular vein, biopsies were taken from the atrial mass with histology suggesting the presence of a hepatocellular carcinoma as the cause of acute dyspnoea.

BRIEF REPORT

A 67-year-old male originating from Turkey was admitted to our hospital because of progressive dyspnoea and productive cough, associated with flu-like symptoms during the previous two weeks. The day before admission, his dyspnoea acutely worsened and he developed left-sided tightness of the chest. He smoked 50 cigarettes a day and was a heavy drinker up until six years ago. His medical history revealed a deep vein thrombosis of the leg five years before admission, hypertension and COPD. He was not taking any medication. On physical examination he was moderately ill, with a body temperature of 39°C, blood pressure 195/105 mmHg, a regular pulse rate at 110 beats/min and a respiration rate of 28/min. His central venous pressure was elevated.

Rales were heard over the right lung with left basal pleural rubbing. Heart sounds were normal. Beside palmer erythema and slight ankle oedema no further abnormalities were found; there was no hepatosplenomegaly or ascites.

Laboratory analysis (normal values in brackets) revealed a haematocrit of 0.44 l/l, white blood cell count $12.0 \times 10^9/l$ with 77% neutrophils and platelets $98 \times 10^9/l$, C-reactive protein 172 mg/l (<5), total bilirubin 28 $\mu\text{mol/l}$ (<10 $\mu\text{mol/l}$) conjugated 13 $\mu\text{mol/l}$ (<5 $\mu\text{mol/l}$), alkaline phosphatase 205 U/l (<110 U/l), lactate dehydrogenase 438 U/l (<275 U/l), alanine aminotransferase 39 U/l (<25 U/l), aspartate aminotransferase 69 U/l (<30 U/l), γ -glutamyltranspeptidase 475 U/l (<38 U/l) and albumin 35 g/l (35-55 g/l). Electrolytes and kidney function were normal. Arterial blood gas analysis revealed pH 7.45, pCO_2 30 mmHg, pO_2 63 mmHg, HCO_3^- 20.1 mmol/l and O_2 saturation 93.5%. ECG showed sinus tachycardia, and a Q wave in leads II and aVF, while the chest X-ray revealed basal crowding, possibly early infiltrates.

The working diagnosis was an early pneumonia with right-sided congestive heart failure in a patient with prior COPD. Initially, he was treated with antibiotics and diuretics with good clinical response. Because of the liver enzyme abnormalities and his past alcohol abuse, abdominal ultrasound examination was performed and unexpectedly revealed a mass in the VCI extending into the right atrium. A ventilation-perfusion scan showed complete absence of perfusion of the left lung circulation.

To identify the origin and nature of the obstructive mass a triphasic helical computer tomography was performed, showing a large irregularly enhancing area in the right

liver lobe continuously extending into the VCI and into the right atrium (figure 1). Thrombi were demonstrated both in the VCI proximal to the obstructing mass and in the left pulmonary artery. No other intra-abdominal abnormalities were found.

Additional laboratory investigations showed a moderately elevated α -fetoprotein at 54 IU/l (<30 U/l). Partial thromboplastin time and activated thromboplastin time were both prolonged, 17 sec (<13 sec) and 46 sec (<39 sec) respectively. Antithrombin III was 43% (>75%). Anti-HBs and anti-HBc were positive, HB-s antigen and hepatitis C antibodies both negative.

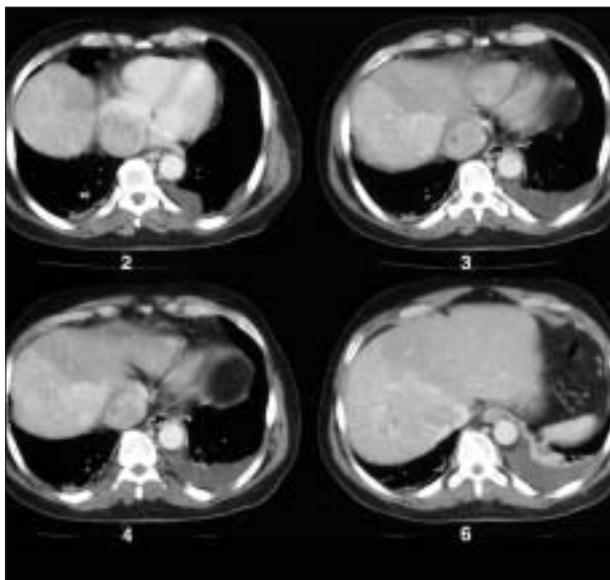


Figure 1

CT scan of the heart and liver

Contrast-enhanced helical CT of the chest and upper abdomen showing abnormal contrast enhancement of the right liver lobe (all slides). In continuity with this irregularly enhancing liver area, a mass is extending via the inferior vena cava (slides 4 and 6) into the right cardiac atrium (slides 2 and 3). Additionally, there is a left-sided pleural effusion.

The radiological findings suggested the presence of either a liver process with secondary thrombosis or a primary intracardial process with secondary flow obstruction leading to impaired flow and thrombosis in the VCI. Because of the central location of the liver mass and impaired haemostasis, percutaneous liver biopsy was not possible. Alternative routes to obtain material for histology were discussed. Reaching the atrial mass via the right internal jugular vein seemed a logical approach. The right internal jugular vein was accessed by two-dimensional transoesophageal electrocardiography and guided biopsies were taken from the atrial mass.

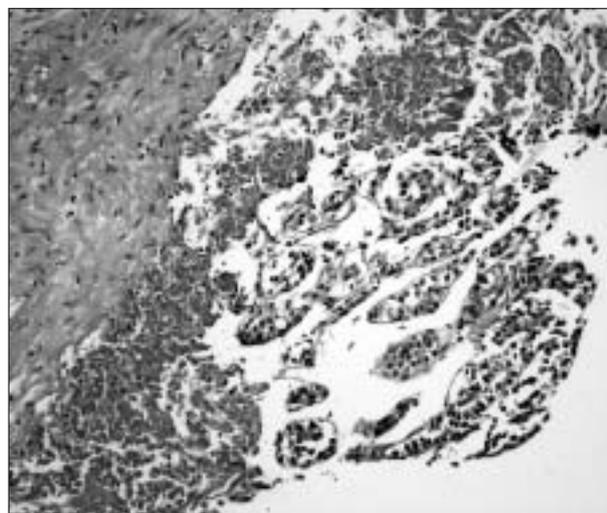


Figure 2

Histology biopsy of intracardial mass in right atrium Haemotoxylin-eosin staining of the biopsy taken from the atrial mass showing partly necrotic endomyocardial tissue with infiltration of a large cell carcinoma.

Histology showed a large cell malignancy with a hepatoid pattern partly infiltrating myocardial tissue (figure 2). Differential diagnostic possibilities were a large cell carcinoma and epitheloid angiosarcoma. There was focal positivity for periodic acid-Schiff (PAS) while PAS-diestase staining was negative. Immune histochemistry was consistent with a carcinoma. Endothelial markers (CD 31, CD 39 and factor VIII) were negative, while the keratin marker (CAM 5.2) was positive. There was focal positivity for α -fetoprotein. The diagnosis of a hepatocellular carcinoma (HCC) was suggested by these findings.

In this patient with a history of alcohol abuse and past hepatitis B infection, the results confirmed the presence of an HCC continuously growing into the VCI and the right atrium, causing venous thrombosis and tumour embolism in the left pulmonary artery.

Due to the lack of curative options, the patient was treated with anticoagulants and diuretics and was discharged from hospital. After three months, the patient died of massive ascites and hepatic coma. Autopsy was not permitted.

DISCUSSION

Dyspnoea has a broad differential diagnosis and can be caused by pulmonary, cardiac, anatomic, or metabolic abnormalities. Here, we have presented a rare and unexpected cause of dyspnoea, due to embolism originating from an HCC extending into the VCI and right cardiac atrium. The patient had a history of COPD and heavy smoking.

Initial clinical and laboratory findings indicated an infectious pulmonary origin of the dyspnoea with right-sided congestive heart failure and secondary liver congestion. Additional analyses revealed massive pulmonary embolism caused by an HCC growing into the right cardiac atrium as a rare cause of dyspnoea. Anamnestically, this had occurred the day before admission. The histological diagnosis was eventually established using an alternative approach: an intracardial biopsy of the tumour could be taken by accessing the right internal jugular vein guided by two-dimensional transoesophageal echocardiography. To our knowledge, extension of HCC into the heart has only been reported once before as radiological image.¹

Secondary cardiac metastasis and thrombosis due to local compression of the VCI by tumour growth was seen in several malignancies such as renal cell carcinoma.² A cardiac tumour was less likely because malignant cardiac tumours are rare. Cardiac tumours can be primary and secondary.³ Three different types have been described: mesotheliomas, angiosarcomas and rhabdomyosarcomas. Angiosarcomas are composed of malignant cells from vascular channels and usually arise in the right heart, particularly the right atrium. These may be associated with right heart obstruction and thrombosis. Mesotheliomas and rhabdomyosarcomas rarely involve the cardiac cavities. Other more common cardiac tumours such as myxoma can be seen in the right atrium (15%), but are generally seen in the left atrium (75%). The presence of these tumours may also lead to thrombosis or embolism.

Regarding this patient, the diagnosis of HCC was primarily suspected because of the absence of other intra-abdominal abnormalities, although the α -fetoprotein was only moderately elevated. Evaluating underlying risk factors,⁴ we had circumstantial evidence of alcoholic liver cirrhosis and a history of hepatitis B infection in a patient originating from Turkey. However, HB-s antigen carriership and hepatitis C could both be excluded. In this patient, an unusual method was used to obtain material for histology indicating that common sense combined with insight into the possibilities of available techniques can provide alternative diagnostic approaches.

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