A hemorrhagic hepatic cyst presenting with clinical signs and symptoms of right-sided heart failure: A case report

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Abstract

A 96-year-old Afro-Caribbean woman was referred with a two-week history of exertional dyspnea, reduced exercise tolerance and bilateral leg swelling. She had been started on warfarin for atrial fibrillation a month prior to presentation. The previous year she had undergone an abdominal ultrasound to investigate right upper quadrant abdominal pain and hepatomegaly. This had revealed multiple simple liver cysts but she had been asymptomatic since. She now had clinical signs of right-sided heart failure. Echocardiography showed normal cardiac anatomy and function but there was extrinsic compression of the right atrium. Computerised tomography and ultrasound revealed a large hemorrhagic cyst in the right lobe of the liver, despite a sub-therapeutic INR. The patient was managed conservatively with diuretics and by stopping warfarin. Her symptoms improved and she lost 10kg in weight. She was managed throughout as an outpatient without the need for hospital admission.

Keywords: right-sided heart failure; cysts; warfarin; hemorrhage; ambulatory care

1. Introduction

This is the unique case of an elderly patient who presented with clinical signs and symptoms of right-sided heart failure secondary to a hemorrhagic hepatic cyst. Compression of the right atrium by hepatic cysts has only rarely been reported in the literature and, to our knowledge, hemorrhage into a cyst following the initiation of anticoagulation as the precipitating event has not previously been described.1–4

2. Case report

An independently living 96-year-old Afro-Caribbean woman was referred to our Acute Medical Clinic (AMC) by her General Practitioner with a two-week history of exertional dyspnea, reduced exercise tolerance and bilateral leg swelling. She had not had any chest discomfort or palpitations and was not experiencing orthopnea or paroxysmal nocturnal dyspnea.

In the past she had been diagnosed with hypertension and a month previously had been started on warfarin for stroke prevention by the cardiology team after being diagnosed with chronic atrial fibrillation (AF). The previous year she had been investigated with an abdominal ultrasound scan (USS) for right upper quadrant pain and hepatomegaly. This had shown multiple simple cysts largest measuring up to 10 × 11cm. No intervention was required and the patient was managed conservatively and remained asymptomatic.

Her medications were lisinopril 2.5mg daily, nifidipine (sustained-released) 30mg daily, bendroflumethiazide 2.5mg daily and warfarin.

At presentation, she looked well. Her weight was 61.3kg. She was clinically in AF at a rate of 100bpm with a blood pressure of 125/67mmHg. Her jugular venous pressure was raised at 8cm and her apex beat was displaced laterally to the anterior axillary line. Heart sounds were dual with a soft systolic...
murmur. She had a respiratory rate of 16 breaths per minute and oxygen saturations were 97% on room air. Her chest was dull to percussion at the right base where there was decreased air entry, but the rest of the lung fields had vesicular breath sounds throughout. The abdomen was soft and non-tender, with a palpable liver edge 15cm below the right costal margin. No other masses were present and a rectal examination was unremarkable. She had significant pitting edema in both legs extending to her abdomen. Breast examination was entirely normal and no lymphadenopathy could be detected.

The patient's clinical signs and symptoms at the time of presentation, together with her history of hypertension and AF, were suggestive of heart failure. However, the age of the patient and the presence of the hepatomegaly were concerning for underlying malignancy, possibly in association with pulmonary embolism given that she had presented with predominantly right-sided heart failure.

Blood tests revealed a microcytosis with hemoglobin of 13.6g/dL (normal range 12.0-16.0), Ferritin was 86ug/L (normal range 10–120), serum iron 6 μmol/L (normal range 14–30), transferrin 3.44g/L (normal range 2.0–3.3), total iron binding capacity 86μmol/L (normal range 50–85) and iron saturation 7% (normal range 15–85). The international normalized ratio (INR) was 1.9. Her liver function tests were normal except for a mildly elevated gamma-glutamyltransferase of 79U/L (normal range 0–38) and an albumin of 33g/L (normal range 35–50). Brain natriuretic peptide (BNP) was slightly elevated at 414ng/L (normal range 20–350).

A chest radiograph showed an elevated right hemidiaphragm. An abdominal USS revealed a very large and irregular heterogenous mass in the right upper quadrant and concern about malignancy was raised (Fig. 1). There was also a small amount of ascites. Further investigation included a Doppler scan of the leg veins that did not show any evidence for deep vein thrombosis. A computed tomography scan (CT) confirmed a 17 × 12 × 20cm low density (10-20 HU) septated lesion in the right lobe of the liver (Fig. 2). The lesion had higher attenuation than the multiple well-defined cysts within both liver lobes. The changes were representative of a hemorrhagic cyst. On the transthoracic echocardiography, there was an extra-cardiac mass that was compressing the right atrium, presumed to represent the hepatic cyst seen on CT (Fig. 3). The inferior vena cava could not be visualised but the right ventricle appeared normal in size and function.

Her management involved a multidisciplinary approach. Discussions with a consultant hepatologist, cardiologist and radiologist were held on how best to manage her. Aspiration of the cyst under imaging guidance was considered but, given both her advancing age and her wishes, a conservative approach was employed. Her warfarin was stopped and she was diuresed for symptomatic relief of her leg and abdominal edema. All of the above took place in an ambulatory care setting. She attended on daily basis for the first three days for the administration of intravenous furosemide 40mg. She was then switched to oral therapy (80mg daily) and reviewed on a weekly basis. On each occasion, she was weighed and her renal function and serum electrolytes were monitored.

The patient continued to attend the AMC so that her diuretic therapy could be monitored, and she attended 12 times in total. A month after her initial presentation, she had lost 10kg in weight (weight 51kg) and was feeling much better with increased exercise tolerance. Her diuretic therapy was then stopped. Repeat ultrasounds were performed one month and 10 months later that showed stable appearances of the haemorrhagic cyst.

3. Discussion

Although there are some case reports of large hepatic cysts presenting with right-sided heart failure secondary to

![Fig. 1. Contrast USS showed a heterogeneous cystic lesion incorporating the majority of the right lobe of liver. Within this there were echogenic septations, some of which were free floating in keeping with haematoma. There was no evidence of vascular enhancement following the administration of contrast.](image)
compression of the right atrium, this is the first case to our knowledge where a previously asymptomatic cyst has caused this phenomenon due to hemorrhage induced by anticoagulation for stroke prevention in a patient with AF. In this case, significant symptomatic and clinical improvement was achieved with conservative management, and others have also used this approach. The alternative strategy would have been to relieve the pressure on the right atrium by draining the cyst, as has been described elsewhere. The patient improved with diuresis as would be expected in cardiac failure of any etiology. The hemorrhagic cyst remained stable on imaging and we believe that it may have become more organized so that the pressure it exerted on the right atrium was reduced. We do not have any post-treatment cardiac imaging but this is supported by the patient's symptomatic improvement that was sustained 10 months after the cessation of furosemide. The initial echocardiogram showed an estimated left ventricular ejection fraction of 69% with no regional wall motion abnormalities and normal valves. These findings, together with a BNP of 414ng/L, did not support cardiac failure of an alternative etiology.

The case serves as a reminder that anticoagulants are high-risk medication and can cause spontaneous bleeds even when in therapeutic range, especially in elderly population. The case also demonstrates the safe and efficient management of an elderly patient in an ambulatory care setting. An inpatient stay was avoided by the readily available access to investigations and senior medical review that an acute medical clinic can provide.

References