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An Uncommon Contributor of Multifactorial Shock

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Abstract:

Shock is a life-threatening condition of circulatory failure that most commonly presents with hypotension. "Undifferentiated shock" refers to the situation where the shock is recognized, but the cause is unclear. Patients often have more than one form of shock (multifactorial shock). We describe a patient with the acute coronary syndrome who presented with heart failure-like symptoms caused by a large infected hepatic cyst obstruction of the right atrial and ventricular inflow tract.

Case Report:

A 63-year-old male presented to our emergency department with complaints of breathlessness, chest pain, and worsening right hypochondrial pain. He had intermittent right upper quadrant pain for about one year but reported a recent, progressive worsening of pain and discomfort over the past few weeks. He also complained of fever. He denied nausea or vomiting. He had a history of poorly controlled diabetes mellitus. Physical examination revealed an afebrile male with a blood pressure of 70/40 mmHg and a heart rate of 114 beats per minute. There was no jaundice, jugular venous distention, or pedal edema. Cardiac examination revealed sinus tachycardia with normal heart sounds and no murmurs. ECG showed evidence of recently evolved anterior wall myocardial infarction. The abdominal examination revealed tenderness in the right upper quadrant with an enlarged smooth liver. The rest of the examination was unremarkable.

Investigation:

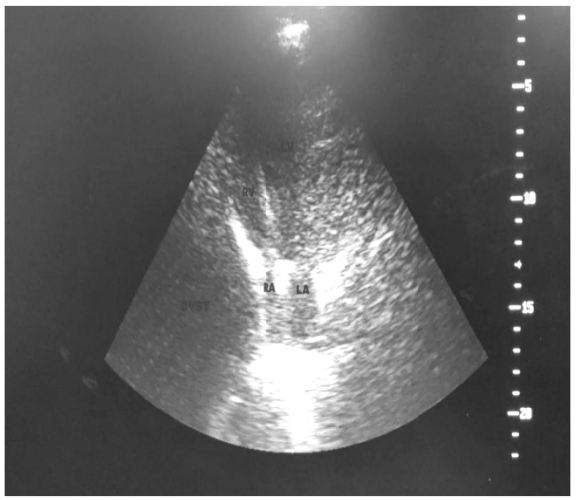
Laboratory workup showed elevated total counts (19,300 cells/cu.mm) with neutrophil predominance (96%). Liver function tests revealed normal serum transaminases, bilirubin, and albumin concentrations. Renal parameters showed serially rising serum creatinine suggestive of acute kidney injury (serum creatinine increased from 1.6 to 2.7). Antibodies against hepatitis C virus, Hepatitis B surface antigen, the antibody against human immunodeficiency virus type 1 and 2 were all negative. Serum CRP was elevated to 23mg/L(day 1) with serially rising levels (CRP 29 mg/L on day 3). Serum lactate was 4.2 mmol/L. CEA level was 1.2 ng/mL, and CA 19-9 was 2.6 U/mL.

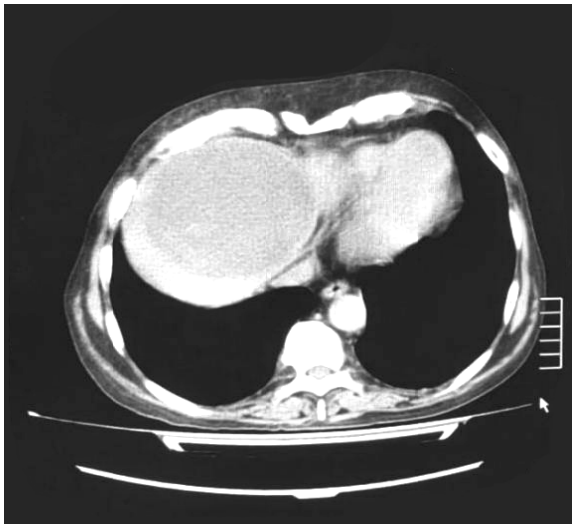
Chest x-ray: An elevated right hemidiaphragm is noted.

USG abdomen: well-defined irregular thick-walled lesion of size 12 × 11.5 cm with internal debris is noted in 6, 7, and 8th segments of the liver. Both kidneys are normal in size with increased cortical echoes.

CT Abdomen: A computed tomography of the abdomen showed a large single non-enhancing thick-walled liver cyst measuring 14 x 12 x 11.5 cm located in the right lobe.

Blood serology: Echinococcus antibody was negative





Echocardiogram: Regional wall motion abnormality was noted in the anterior, anteroseptal, and basal region with an ejection fraction of 20%. Mild MR was present. A large echo lucent mass from the liver was seen compressing the right atrium and right ventricular inflow tract.

Ultrasound-guided percutaneousaspiration of the cyst was done, a milky yellow fluid was obtained, and a sample was sent for cytology, gram stain, and culture. No bacteria were detected in gram staining of fluid obtained from the cyst. The staining showed debris from the neutrophils and the monocytes. No organism was cultured from the fluid of the cyst.

As the initial part of the management, the patient was treated with Inj. Heparin, dual anti-platelets, and ionotropes. Antibiotic Piperazillin – tazobactam was then added. A therapeutic percutaneous aspiration of the liver cyst was attempted, but the patient didn't show clinical or laboratory improvement to the treatment.

Discussion:

Ventricular failure after acute myocardial infarction remains the most frequent cause of cardiogenic shock, accounting for more than 80% of Cases. Cardiogenic shock is the leading cause of death in patients with acute MI, with hospital mortality rates approaching 50 percent[1]. The associated decrease in coronary perfusion pressure can lead to a vicious cycle of ischemia, further myocardial dysfunction, and a downward spiral with progressive end-organ hypoperfusion and ultimately death[2]. In some patients, post-MI shock is accompanied by relative vasodilation rather than vasoconstriction. The most likely explanation for vasodilation in the setting of cardiogenic shock is the presence of a systemic inflammatory state similar to that seen with sepsis [3, 4]. In the SHOCK trial, 54 of the 302 patients (18 percent) had a fever and/or leukocytosis.[4]

Simple cysts of the liver are cystic formations containing clear fluid that does not communicate with the intrahepatic biliary tree. The prevalence of hepatic cysts ranges from 2-3 % in older studies[5] to as high as 18% in more recent studies[6]. The vast difference in this prevalence is probably due to diagnostic radiology sophistication and increasingly frequent imaging use. The majority of these simple hepatic cysts are asymptomatic and usually found incidentally on imaging. However, larger cysts may produce more symptoms such as abdominal pain, distension, fullness, early satiety, nausea, or vomiting. The most common complications reported with hepatic cysts are rupture,[7] infections,[8] obstructive jaundice, bleeding into the cyst, portal vein occlusion with splenic varices[5], and inferior vena cava thrombosis.[9] Infection in a hepatic cyst is a clinical diagnosis that depends on the signs and symptoms suggestive of infection, and its

confirmation remains difficult despite recent advances in imaging technologies [10,11].

Our patient presented with heart failure-like symptoms secondary to a large infected hepatic cyst compressing the right side of the heart. A cardiac complication of hepatic cyst comes under obstructive shock. The etiology of shock in our patient can also be attributed to acute myocardial infarction (cardiogenic shock) and infected hepatic cyst (septic shock). Thus we presented a patient with the multifactorial shock of which obstructive shock due to a large hepatic cyst is a rare cause of shock. The cardiac complication of hepatic cyst should be considered differentially in all patients with cardiovascular signs and symptoms due to the close anatomic proximity of the liver to the heart and major vessels.

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