

### INTRODUCTION

Rupture of Hepatocellular Carcinoma (HCC) with intraperitoneal hemorrhage is a life-threatening condition. The incidence of ruptured HCC has reduced in the recent past, owing to the early diagnosis, but this condition still remains a significant health problem. In patients diagnosed with HCC, rupture occurs in 3-15% with high in-hospital mortality rate of 25-75%. In most cases, spontaneous rupture of HCC occurs abruptly and these patients usually present to the emergency department with abdominal pain and/or hypotension. It is often difficult to stratify these patients based on clinical manifestations and biochemical data. In patients without a previous history of liver cirrhosis or HCC, diagnosing a ruptured tumor may be challenging, because of the missing patient history and the rarity of the disease.

### CASE DESCRIPTION

A 61-year-old man without a prior history of liver disease presented with sudden onset generalised abdominal pain and distension. He was hemodynamically unstable, with hypotensive episodes.

Initial vital signs showed blood pressure of 98/46 mmHg, pulse rate of 98 beats/min, respiratory rate of 20 breaths/min, and oxygen saturation of 98% on room air. Physical examination showed conjunctival pallor and significant generalised tender and guarding of the abdomen, bowel sounds were heard, normal heart sounds with no murmurs or added sounds, and normal breath sounds. Initial lab results showed a white blood cell count of 15.47k/ $\mu$ L, hemoglobin of 11.1 g/dL, hematocrit of 31.9%, platelets of 346k/ $\mu$ L, creatinine of 137 mg/dL, aspartate aminotransferase of 44IU/L, alanine aminotransferase of 35 IU/L, alkaline phosphatase of 106, total bilirubin of 19, albumin of 27 g/L.

Bedside abdominal ultrasound revealed massive free fluid in the peritoneal cavity and multiple homogenous echogenicity masses in the liver.



Fig 1a USG image of right hypochondriac area showing liver mass and free fluid



Fig 1b USG image of left hypochondriac area showing free fluid



Fig 1c USG image of suprapubic area showing free fluid and sediments

FF= free fluid, RHC = Right hypochondriac, LHC = Left hypochondriac, SPBC = Suprapubic

With the presence of liver lesions and presence of free fluid in the peritoneal cavity on ultrasound, patient was initially treated as acute liver failure complicated with spontaneous bacterial peritonitis with the assumption of the free fluid to be ascites and patient was planned for admission to ward with the intent of supportive treatment with intravenous antibiotics.

However, in the span of 3 hours, patient complained of worsening abdominal pain, a repeated full blood count showed hemoglobin level decreased from 11.1 g/dl to 9.3 g/dl which raised suspicions for ascites. A diagnosis of acute abdomen was revised, which corresponds to the sudden onset abdominal pain with evidence of haemorrhage. A more assertive approach was initiated with involvement of interdisciplinary teams.

A computed tomography (CT) of the abdomen was then performed and it showed ruptured tumor with breached Glisson capsule and bleeding into the peritoneal space.



Fig.2 Computed tomography of the abdomen. The axial plane showed multiple hepatic tumor (arrows) with perihepatic fluid. Interdisciplinary discussion arrived at a decision for trans-arterial embolization for hemostasis. Post procedure, hemostasis achieved, successful embolization.

### DISCUSSION

We present a challenging patient who presented with acute abdomen without a prior history of liver disease and was diagnosed with ruptured HCC. For the diagnosis of a ruptured HCC, an adequate workup is often missing in the emergency room.

The diagnosis can be confirmed by the presence of hemoperitoneum on abdominal paracentesis. Non-invasive diagnostic imaging tools include abdominal ultrasonography may demonstrate a hepatic tumor and ascites, the rupture site appears as a hyperechoic area around the tumor. CT is valuable as standard examination in showing the tumor with a high attenuation closed to it, which represents acute blood clotting, and also defines the hypervascularization of tumors, the anatomy of hepatic arteries, the periportal lymph nodes, and the patency of the portal vein. Conventional angiography may reveal extravasations of contrast from the tumor. The positive rate of correct diagnosis was 86% with paracentesis, 66% by ultrasonography, 100% by CT, and 20% by angiography<sup>3</sup>. However, in this case, the diagnostic dilemma was abdominal ultrasound has misled free fluid in abdominal cavity to be ascites, and misdiagnosed patient to have spontaneous bacterial peritonitis and delayed treatment which could bring forth a fatal outcome.

Vigilance should be maintained when encountering free fluid in the abdomen, initiatives to look for the appearance of mixed echogenicity and sediment on ultrasonography in the peritoneal cavity ( Fig 1c ) should be present, as it denotes haemorrhage and it differs from the homogenous clear fluid in typical ascites.

### CONCLUSION

Challenges in arriving to diagnosis of ruptured HCC is real as absence of previous history and rarity of the presentation. Role of imaging modalities like sonography and CT must be incorporated along with careful clinical history and examination to ensure accurate diagnosis, Dismissing important clinical history may delay treatment and yield fatal outcomes.

As demonstrated in this case, sudden distension of abdomen within hours and hypovolemic shock relate that this patient is having active bleed, as opposed to ascites which develops over more extended period of time. Along with confirmatory ultrasonography and CT, a sensible and accurate diagnosis could be achieved and consequently provide optimal care and treatment.

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### DECLARATION OF CONFLICTS

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article

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