Case 11456

Haemoperitoneum due to ruptured hepatocellular carcinoma
Published on 19.12.2013

DOI: 10.1594/EURORAD/CASE.11456
ISSN: 1563-4086
Section: Abdominal imaging
Area of Interest: Abdomen
Procedure: Diagnostic procedure
Procedure: Embolisation
Imaging Technique: Image manipulation / Reconstruction
Imaging Technique: CT
Imaging Technique: Catheter arteriography
Special Focus: Neoplasia Haemorrhage Case Type: Clinical Cases
Authors: Tovar Marta, Bares Ignacio, Olalla JR, Ocete A
Patient: 64 years, male

Clinical History:

A 64-year-old man with a history of hepatitis B virus-related cirrhosis was referred to our Emergency Department due to vasovagal syncope, hypotension (BP: 107/57) and intense right flank pain for 24 hours. Laboratory examination showed Hb: 12g/dl (Normal range: 13-17) and acute renal failure (Cr: 2.1 mg/dl).

Imaging Findings:

Ultrasound and multiphase MSCT study of the abdomen showed moderate and hyperdense ascites with a sentinel clot in the left anterior perihepatic space without active bleeding. The liver had morphological changes of chronic liver disease. A 5 cm in size, subcapsular and heterogeneous solid mass between segments II-III was identified. MSCT displayed a hypervascular dynamic behaviour in the arterial and portal phase, a mosaic pattern and a contrast wash-out at the equilibrium phase, in which a peripheral capsule was suspected.

The radiological diagnosis was haemoperitoneum due to spontaneous rupture of hepatocellular carcinoma. Therefore, transarterial catheter embolization with microspheres was performed.

Discussion:

Background

Hepatocellular carcinoma (HCC) is the most frequent malignant liver neoplasia. Spontaneous rupture of HCC is a rare and potentially fatal complication with a reported incidence of 3 to 15%, especially in cirrhotic patients with associated coagulopathy. The rupture may be intratumoural or into the peritoneal cavity. The smaller anatomical extent of the left hepatic lobe favours an exophytical growth pattern and subsequent rupture in HCC [1, 2, 3].

The mechanism of rupture of HCC is poorly understood. It is believed that subcapsular tumours may destroy the liver capsule by high intramural pressure or direct invasion [1, 3]. Other authors consider the injury of a feeding tumoural artery under high intraabdominal pressure secondary to ascites as the cause of rupture. Another hypothesis is a laceration in the surface of the tumour by minimal trauma [3]. Venous congestion (secondary to vascular invasion), intratumoural necrosis and the presence of coagulopathy, may lead to intratumour haemorrhage. [4, 5]

Clinical perspective

Patients may experience an acute abdominal pain, abdominal distension, hypotension, and a sudden decrease in
haematocrit and haemoglobin. [1]

Imaging perspective

MSCT is the first-line modality of choice. The appropriate CT protocol for this entity is 4-phase dynamic study (precontrast, arterial, portal and equilibrium phase). The role of CT in HCC work-up is the detection, characterization, staging of the tumour and assessment of complications. Helpful findings on CT for the diagnosis of spontaneous rupture of HCC are: peripheral location and protrusion of the tumour, discontinuity of the hepatic surface, active extravasation of iv contrast, haemoperitoneum, subcapsular haematoma and the presence of a sentinel clot. [3, 4, 5]

Outcome

The spontaneous rupture of HCC requires prompt resection or transarterial catheter embolization, so early diagnosis is essential. The success rate for haemostasis after transarterial catheter embolization ranges from 53 to 100% and mortality ranges from 0 to 36.4%, which is lower than that of emergency surgery. [1, 3]

Knowledge of complications of hepatocellular carcinoma and its CT findings are important for the radiologist as it is an entity that may require prompt treatment.

**Differential Diagnosis List:** Spontaneous rupture of hepatocellular carcinoma., Rupture of hypervascular liver metastases, Rupture of hepatic adenoma

**Final Diagnosis:** Spontaneous rupture of hepatocellular carcinoma.

**References:**


Peter Tw Kim, MD; Jenny C Su, MD; Andrzej K Buczkowski, MD, MSc; David F Schaeffer, MD, PhD; Stephen W Chung, MD, PhD, FRCSC; Charles H Scudamore, MSc, FRCS (Edin); Stephen GF Ho, MD, FRCPC (2006) Computed Tomography and Angiographic Interventional Features of Ruptured Hepatocellular Carcinoma: Pictorial Essay. Canadian Association of Radiologists Journal 57,3 (PMID: 16881473)
Description: Unenhanced MSCT of the upper abdomen. There are ascites (ROI 2) and a haemoperitoneum with a sentinel clot (ROI 1) surrounding a solid mass at the left hepatic lobe. Origin: Department of Radiology, Morales Meseguer Hospital, Murcia, Spain.
**Description:** Hypervascular enhancement with a large feeding artery. **Origin:** Department of Radiology, Morales Meseguer Hospital, Murcia, Spain.
Figure 3

Description: Left hepatic mass with a mosaic pattern. Origin: Department of Radiology, Morales Meseguer Hospital, Murcia, Spain.
**Figure 4**

*Description:* Central wash-out and peripheral capsule

*Origin:* Department of Radiology, Morales Meseguer Hospital, Murcia, Spain.
Description: The Volume Rendering reconstruction displays the hypervascular hepatic mass and its large feeding artery. Origin: The Volume Rendering reconstruction displays the hypervascular hepatic mass and its large feeding artery.
Figure 6

Description: Images of transarterial catheter embolization with microspheres pre-treatment. Origin: A. Ocete, Department of cardiovascular interventional Radiology, Virgen de la Arrixaca Hospital, Murcia, Spain
Description: Images of transarterial catheter embolization with microspheres post-treatment, showing the complete occlusion of the feeding vessels. Origin: A. Ocete, Department of cardiovascular interventional Radiology, Virgen de la Arrixaca Hospital, Murcia, Spain