Spontaneous hemoperitoneum due to ectopic variceal bleeding in cirrhosis

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Section: Abdominal imaging
Area of Interest: Abdomen Portal system / Hepatic veins
Imaging Technique: CT
Imaging Technique: CT-Angiography
Special Focus: Haemorrhage Case Type: Clinical Cases
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Patient: 49 years, male

Clinical History:

Hypovolemic shock with increasing abdominal distension in a middle-aged male alcohol addict. Abnormal laboratory tests including Hb 9.6 g/dl, Hct 29.4%, 41.000/mm² platelets; doubled prothrombin (PT) and partial thromboplastin (APTT) times; raised fibrinogen, plasma D-Dimer (>10.000), serum CPK, LDH and lipase.

Imaging Findings:

After resuscitation and blood transfusion support, emergency MDCT was requested. Unenhanced CT acquisition disclosed diffuse high-density (mean attenuation values 48-52 HU) peritoneal fluid consistent with massive haemoperitoneum causing abdominal distention; in the pelvis an even more hyperdense (60-63 HU) effusion was detectable. Jet-like contrast extravasation consistent with active bleeding was recognisable in the distal mesentery. Additional CT findings included markedly hypoattenuating hepatomegaly consistent with steatotic liver disease without appreciable focal lesions; spleen within normal limits; patent portal venous system; flattened inferior vena cava due to hypovolemia. Emergency laparotomic surgery was performed: opening the peritoneum, abundant bloody peritoneal effusion (5 litres) was confirmed and evacuated. According to the CT findings, a ruptured mesenteric vein was identified as the source of bleeding, clamped and successfully ligated. Surgical exploration revealed hardened, micronodular-appearing hepatomegaly and diffuse portosystemic collaterals. Despite prompt diagnosis and surgical treatment, the patient survived only 12 hours after presentation.

Discussion:

Although uncommon, non-traumatic abdominal haemorrhage represents a dramatic emergency diagnosis that is almost invariably investigated with CT thanks to its high sensitivity for the detection of even small blood effusions in the peritoneal cavity. The key finding indicating haemoperitoneum is represented by the presence of hyperattenuating peritoneal fluid: unclotted extravascular blood usually ranges from 30 HU to 45 HU on unenhanced CT images because of its high protein content, but measured attenuation values vary according to the patient’s serum haematocrit and may be significantly reduced in anaemic conditions [1, 2]. The “sentinel clot” sign, represented by a relatively higher attenuation (usually measuring 50-70 HU) hematic
component, corresponds to clotted blood forming closest to the bleeding source and helps in the localisation of the primary site of haemorrhage [1, 2].
Extravasation of intravenously injected contrast medium, observed during CT angiography as serpiginous or amorphous density with similar attenuation to that of the nearby enhanced vessels, is consistent with active bleeding and indicates critical need for emergency embolisation or surgery [1, 2].
Causes of haemoperitoneum include gynaecologic conditions (ectopic pregnancy, corpus luteum cyst, HELLP syndrome), haemorrhagic pancreatitis, splenic rupture during infections or haematologic malignancies, liver or kidney ruptured tumours, bleeding aortic or splanchnic aneurysms [1, 2].
Portal hypertension, usually caused by chronic liver disease, is complicated by the development of portosystemic shunts in well-defined anatomic sites such as the gastroesophageal, haemorrhoidal and umbilical veins with possible alimentary tract bleeding [3].
Spontaneous haemoperitoneum due to intra-abdominal rupture of ectopic varices is a very rare, life-threatening occurrence in cirrhotic patients, and represents a very challenging diagnosis in the emergency setting. According to a 2009 review, less than 50 cases have been reported. Ectopic varices causing haemoperitoneum were localised in the gastroplenic ligament, the omentum or in the mesentery.
The usual presentation includes abdominal pain and distention with hypotension and haemorrhagic shock. Surgical variceal ligation is the only effective treatment, prognosis is usually severe with a global mortality rate of 65-75%, depending upon the patients’ functional liver reserve, early diagnosis and successful operative bleeding control [3-7].
The key differential diagnosis of bloody ascites and haemodynamic compromise in cirrhosis is from rupture of large, peripheral hepatocellular carcinoma (HCC) [3, 4, 8]. As in the reported case, ectopic variceal bleeding should be surgically treated without delay; conversely, CT identification of bleeding HCC represents an indication for emergency arteriography and embolisation [3, 9].
**Differential Diagnosis List:** Spontaneous haemoperitoneum due to ectopic variceal bleeding in cirrhosis, Ruptured hepatocellular carcinoma, Ruptured hepatic adenoma, Bleeding aortic aneurysm, Bleeding splanchnic aneurysm, Spleen rupture

**Final Diagnosis:** Spontaneous haemoperitoneum due to ectopic variceal bleeding in cirrhosis

**References:**
Description: Axial (a-c, top to bottom) and coronal-reformatted (d) images show massive hyperattenuating (48-52 HU) peritoneal fluid consistent with haemoperitoneum; markedly hypoattenuating hepatomegaly consistent with steatotic liver disease. Origin:
Description: Axial (a-c, top to bottom) and coronal-reformatted (d) images show massive hyperattenuating (48-52 HU) peritoneal fluid consistent with haemoperitoneum; markedly hypoattenuating hepatomegaly consistent with steatotic liver disease. Origin:
Figure 2

Description: Axial images in the pelvis (a,b) show abundant mixed-density peritoneal effusion with even more hyperdense (60-63 HU) dependent component consistent with clotted blood (sentinel clot sign). Origin:
**Figure 3**

*Description:* Axial (a-d) and coronal-reformatted (e) images show patent portal olive, flattened inferior cava with central venous line, contrast extravasation in the distal mesentery consistent with active bleeding. **Origin:**
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