A rare case of emphysematous hepatitis with spontaneous pneumoperitoneum

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Section: Abdominal imaging
Area of Interest: Abdomen
Procedure: Diagnostic procedure
Technique: CT
Technique: Ultrasound
Special Focus: Infection Case Type: Clinical Cases
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Patient: 78 years, female

Clinical History:

A 78-year-old female patient without relevant past medical history presented with symptoms of upper right quadrant pain, nausea and fever. During admission she was conscious and the physical exam revealed jaundice and fever (39.5°C). Laboratory assays showed metabolic acidosis, leukocytosis and elevated C-reactive protein. Enterococcus faecium was grown on haemoculture.

Imaging Findings:

A Computed Tomography (CT) of the abdomen was performed before and after the intravenous administration of iodinated nonionic contrast agent, and showed an area of mottled gas opacity replacing the parenchyma of the segments II and III of the liver with no focal air or fluid collections. Between the left border of the left hepatic lobe and the small gastric curvature there was pneumoperitoneum that communicated with the intrahepatic gas. The adjacent hepatic parenchyma was normal and there was no evidence of pneumobilia or portal venous gas. The hepatic artery and portal veins were patent. There was also a small quantity of intraperitoneal fluid. Abdominal ultrasound showed extensive dirty echogenic shadowing in the left hepatic lobe compatible with intrahepatic gas.

A diagnosis of emphysematous hepatitis with spontaneous rupture to the peritoneum was made based on the CT findings.

The patient was successfully treated with a left hepatic lobectomy and aggressive antibiotic therapy.

Discussion:

Intra-abdominal emphysematous infections can be commonly found in many organs including the urinary tract, gallbladder, stomach and pancreas. However, emphysematous hepatitis is a very rare condition [1]. It is a life threatening infection that requires a rapid diagnosis and an aggressive and prompt medical and/or surgical management [1, 2, 3].

This condition can have an insidious initial clinical manifestation and progresses rapidly in absence of therapeutic intervention [2, 3, 4].

Parenchymal hepatic emphysema can more frequently occur in pyogenic liver abscesses or after invasive procedures (eg. transarterial embolisation, radiofrequency ablation, and percutaneous ethanol injection in hepatocellular carcinoma) [2, 3]. There are also reports of hepatic gas gangrene in the clinical setting of hepatic
trauma or liver transplantation, which requires compromise of both the hepatic arterial and portal venous supplies [5]. Emphysematous infections have more preponderance in diabetic patients [3]. Emphysematous hepatitis occurs with replacement of the liver parenchyma with gas, without abscess formation or presence of fluid collections [2, 3, 4]. CT is the first-line imaging modality for the diagnosis and evaluation of abdominal emphysematous infections because of its sensitivity and specificity in detecting gas bubbles [1]. The imaging features are similar to other abdominal emphysematous infections, with parenchymal destruction and replacement with mottled or streaky gas [3]. Ultrasound is also very sensitive in the detection of hepatic gas. It can be seen as areas of dirty echogenic shadowing in the liver parenchyma [2, 3, 4].

The prognosis for emphysematous hepatitis is very poor and successful treatment requires aggressive and prompt medical and/or surgical management [1, 2, 3, 4]. The fatality of emphysematous hepatitis warrants awareness of this entity amongst radiologists and clinicians alike for early diagnosis and aggressive management.

**Differential Diagnosis List:** Emphysematous hepatitis with spontaneous pneumoperitoneum, Hepatic abscess, Hepatic infarction (gas gangrene)

**Final Diagnosis:** Emphysematous hepatitis with spontaneous pneumoperitoneum

**References:**


**Figure 1**

**a**

Description: CT axial image depicting an area of mottled gas opacity replacing the parenchyma of left hepatic lobe (circle). Between the left border of the liver and the stomach there was a small pneumoperitoneum (arrow). Origin: Hospital de Santa Maria

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**b**

Description: CT axial image depicting an area of mottled gas opacity replacing the parenchyma of left hepatic lobe (circle). Between the left border of the liver and the stomach there was a small pneumoperitoneum (arrow). Origin: Hospital de Santa Maria

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**c**

Description: CT axial image depicting the communication (blue lines) between the intrahepatic gas (circle) and the pneumoperitoneum (arrow). Origin: Hospital de Santa Maria
Description: CT axial image depicting patent hepatic arteries. Origin: Hospital de Santa Maria
Description: CT axial image depicting patent portal veins. Origin: Hospital de Santa Maria
Description: CT coronal reconstruction image depicting an area of mottled gas opacity replacing the parenchyma of left hepatic lobe (circle). Origin: Hospital de Santa Maria
Description: CT coronal reconstruction image depicting an area of mottled gas opacity replacing the parenchyma of left hepatic lobe (circle). Origin: Hospital de Santa Maria
Description: CT coronal reconstruction image depicting a small pneumoperitoneum between the left border of the left hepatic lobe and the small gastric curvature (arrow). Origin: Hospital de Santa Maria
Description: CT coronal reconstruction image depicting a small pneumoperitoneum between the left border of the left hepatic lobe and the small gastric curvature (arrow). Origin: Hospital de Santa Maria
Description: CT sagittal reconstruction image showing an area of mottled gas opacity replacing the parenchyma of left hepatic lobe (circle). Pneumoperitoneum between the left border of the liver and the stomach is also seen (arrow). Origin: Hospital de Santa Maria
Description: CT sagittal reconstruction image showing an area of mottled gas opacity replacing the parenchyma of left hepatic lobe (circle). Pneumoperitoneum between the left border of the liver and the stomach is also seen (arrow). Origin: Hospital de Santa Maria
Description: CT sagittal reconstruction image showing an area of mottled gas opacity replacing the parenchyma of left hepatic lobe (circle). Pneumoperitoneum between the left border of the liver and the stomach is also seen (arrow). Origin: Hospital de Santa Maria
Description: CT scout view of the abdomen (antero-posterior projection) depicting an ill defined rounded area of hipodensity (circle) consistent with the CT findings of intrahepatic gas. Origin: Hospital de Santa María
Description: Ultrasound transverse view of the left hepatic lobe showing extensive dirty echogenic shadowing in the left hepatic lobe compatible with intrahepatic gas (circle). Origin: Hospital de Santa Maria
Figure 7

Description: CT axial image after left hepatectomy. Origin: Hospital de Santa Maria