CASE REPORT

- 黃×錦 51y/o, female
- C/C: progressive abdominal pain for 3 days
- PI:

  This patient is a HBV carrier w/o regular follow up.

  Started with chest pain 3 days ago, and then became diffuse severe abdominal pain with abdominal distension.
CASE REPORT

• Personal History:
  shrimp allergy
• Past history:
  (1) Medical: Mitral valve prolapse with medical control
  (2) Surgery: varicose vein (both legs, 1999)
CASE REPORT

• PE:
  (1) General condition: weakness(+)
  (2) Eye: icteric(+) conjunctiva pale(+)
  (3) Chest: chest pain(+)
  (4) Abdomen:
    distension(+), hypoactive(+)
    diffuse tenderness(+)
    diffuse rebound pain(+)
    muscle guarding(+)


CASE REPORT

- Lab data (95/06/20)
  WBC 18970/uL ↑ ↑
  RBC 3.70 x10^6/uL ↓ Hb 7.2 g/dL ↓ ↓
  HCT 23.8% ↓
  MCV 64.3 fL ↓
  MCH [26-34 pg] 19.5 pg ↓
  MCHC [33-37 g/dL] 30.3 g/dL ↓
  RDW [11.5-14.5 %] 19.5% ↑
CASE REPORT

NEUT [40-74 %] 81.8% ↑↑  LYM [19-48 %] 9.9% ↓
PT [10.7-13.0 sec.] 14.70 sec ↑
aPTT [20-36 sec] 44.40sec ↑
BUN (blood) [7-18 mg/dl]  20 ↑
Creatinine(blood)[0.5-1.3 mg/dl]  1.4 ↑
GOT [0-40 IU/L]  72 ↑
GPT [0-40 IU/L]  72 ↑
CRP  33.20mg/dl ↑↑
Bilirubin D [0.0-0.4 mg/dl ]  1.3 ↑
Bilirubin T  [0.2-1.2 mg/dl ]  2.0 ↑
Mild left pleural effusion (blunting)
Mild left and right fluid collection (pleural effusion)
ill-defined margin, iso- to mild hypodense circular mass
lateral of Lt lobe liver(Seg II/III): irregular margin and ill-defined circular mass with heterogeneous hypodense enhancement
Image(CT/contrast+)
Minimal fluid collection
remarkable localized fluid collection at cul-de-sac
Image-Differential Diagnosis

**Focal decreased-attenuation masses in liver**

- **Cyst** (non-parasitic, echinococcal cyst, polycystic disease)
- **Abscess** (pyogenic abscess, amebic abscess, fungal abscess)
- **Neoplasm** (cavernous hemangioma, adenoma, FNH, HCC, metastasis)
- **Trauma** (subcapsule hematoma, intrahepatic hematoma)
Image-Differential Diagnosis

- **Hyperenhancing focal liver lesions**

  cavernous hemangioma, adenoma, FNH, HCC, hypervascular metastasis (uncommon)
Differential Diagnosis

**Focal decreased-attenuation + hypoenhanced lesions**

*Cyst* (non-parasitic, echinococcal cyst, polycystic disease)

*Abscess* (pyogenic/amebic abscess, fungal abscess)

*Neoplasm* (metastasis)

*Trauma* (subcapsule hematoma, intrahepatic hematoma)
Differential Diagnosis

(1) non-parasitic cyst

- **Image finding:** sharply delineated round or oval, near water attenuation (-10~+10HU) lesion with a very thin wall, no internal septation, no contrast enhancement.
Differential Diagnosis

1) non-parasitic cyst

Anechoic lesion with through transmission, no septation
Image-Differential Diagnosis
(2) echinococcal cyst

- **Image finding**: sharply delineated round or near water attenuation lesion with a thin wall. May appear multilocular with internal septations representing the walls of daughter cysts. No contrast enhancement.
**Image-Differential Diagnosis**

(3) pyogenic/amebic abscess

**Image finding:**

1. **Without contrast**: Sharply defined area hypodense to normal liver (0-45HU) attenuation usually **greater than that of a benign cyst** but **lower than that of a solid neoplasm**.

   **Cluster sign**: Cluster of small abscesses coalescence into a single, large abscess cavity

2. **With contrast**: No enhancement, but a **rim of tissue around the cavity** may become denser than normal liver. (ring enhancement)

3. Demonstration of **gas in a low density hepatic mass** is highly suggestive of an abscess
A thick-walled cavity with low attenuation center is located in the right lobe of the liver.

contrast-enhanced periphery CT scan cannot differentiate amebic liver abscess from pyogenic liver abscess.
Image-Differential Diagnosis
(4) metastasis

*Image finding:*
- Single or *multiple (more common)* low density (or isodensity) masses.
  - hyperdense: due to diffuse calcification, recent hemorrhage, fatty infiltration of surround hepatic tissue
  - (a) Hypovascular lesion (more common)
    - low attenuation with peripheral rim enhancement
  - (b) Hypervascular lesion
    - hyperdense in late arterial phase/ may have internal necrosis w/o uniform hyperdense
(a) Hypovascular: metastasis from Lung, GI, pancreatic, most breast, lymphoma
(b) Hypervascular lesion: metastasis from RCC, thyroid carcinoma, melanoma, sarcoma

- Shaggy and irregular wall
- Calcification deposits (GI metastasis)
Multiple hypodense lesions.
multiple metastasis from the large bowel.

Precontrast: calcification in metastatic lesion

Differential Diagnosis
(4) metastasis
Differential Diagnosis (5) intrahepatic hematoma

- **Image finding:**
- Fresh haematoma: High attenuation during the first few days
- Diminish gradually over several weeks to become low-density lesions
- Chronic hematoma:
  1. hypoattenuating on the precontrast scan.
  2. display rim enhancement following intravenous contrast medium administration.
Differential Diagnosis
(5) intrahepatic hematoma

a. Acute phase: contrast (-) 
a round area (arrow) of slightly increased attenuation lateral to the liver hilus.
b. Acute phase: contrast (+) 
The same area (arrow) is nonenhancing and appears clearly hypoattenuating relative to the liver parenchyma

Subcapsular hepatic hematoma
Impression:

- r/o pyogenic /amebic abscess
- r/o intrahepatic hematoma
Rupture of the capsule
On cut section, there is an demarcated, tan-gray, soft and necrotic mass, measuring 6.2 x 4.8 x 5.4 cm in size.
Pathology

(1) picture of liver abscess containing necrotic liver tissue and numerous neutrophils accompanied by lymphocytes and eosinophils
(2) Clumps of bacilli surrounded by neutrophils are found.

Diagnosis: liver abscess
Discussion

• 1. How to distinguish amebic from pyogenic liver abscess
• 2. HCC rupture? Hemorrhagic adenoma?
Discussion

• *distinguishing* amebic from pyogenic liver abscess *should not depend* on image or clinical criteria

• Amebic serology (Amebic immunofluorescent antibody test) has a sensitivity of about 95% and is highly specific for *E. histolytica* infection

• In areas of low endemicity, suspected amebic liver abscess should be aspirated to exclude pyogenic liver abscess
**Discussion**

<table>
<thead>
<tr>
<th></th>
<th>Pyogenic</th>
<th>Amebic</th>
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</thead>
<tbody>
<tr>
<td><strong>Number</strong></td>
<td>Single or multiple</td>
<td>Solitary abscess right lobe</td>
</tr>
<tr>
<td><strong>Pathogens</strong></td>
<td>Polymicrobial, Enterobacteriaceae enterococci</td>
<td><em>Entamoeba histolytica</em></td>
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<tr>
<td><strong>Patients</strong></td>
<td>Elderly, 50-60y/o, underlying gastrointestinal or biliary tract disease</td>
<td>30–40y/o, Much more common in males than females</td>
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<tr>
<td><strong>Diagnosis</strong></td>
<td>US or CT ± aspiration</td>
<td>US or CT and serology</td>
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<tr>
<td><strong>Presentation</strong></td>
<td>Subacute</td>
<td>Acute</td>
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</table>
Discussion

less likely: hemorrhagic adenoma (fig: layering hematocrit effect from rupture of a large adenoma. low-density areas of necrosis within the hemorrhagic mass as well as a faint pseudocapsule)
Liver abscess

Epidermiology:
The 3 major forms of liver abscess
(1) Pyogenic abscess, which is most often polymicrobial (80%, USA)
(2) Amebic abscess due to *Entamoeba histolytica* (10%)
(3) Fungal abscess, most often due to *Candida* species (less than 10%)
Liver abscess

**Etiology** of 1086 cases of liver abscess

- Biliary tract: 60%
- Portal venous/systemic: 23%
- Cryptogenic
- Hematogeneous/seeding
- Direct extension
- Traumatic
- Others
Liver abscess

Mortality/Morbidity

With timely administration of antibiotics and drainage procedures, mortality currently occurs in 5-30% of cases. The most common causes of death include sepsis, multiorgan failure, and hepatic failure.
Liver abscess

History:
The most frequent symptoms of hepatic abscess:

– Fever (either continuous or spiking)
– Chills
– Right upper quadrant pain
– Anorexia
– Malaise
Liver abscess

PE:

- most commonly seen include fever and tender hepatomegaly (palpable mass need not be present)
- Mild epigastric tenderness → suggestive of left lobe involvement
- pleural or hepatic friction rub may present
- Jaundice may be present in as many as 25% of cases and usually is associated with biliary tract disease or the presence of multiple abscesses.
Liver abscess- Lab data

- CBC with differential
  - Anemia of chronic disease
  - Neutrophilic leukocytosis
- Liver function studies
  - Hypoalbuminemia and elevation of alkaline phosphatase (most common abnormalities)
  - Elevations of transaminase and bilirubin levels (variable)
- Blood cultures are positive in 50% of cases
- Culture of abscess – establish microbiologic diagnosis
- Enzyme immunoassay should be performed to detect *E histolytica*
Liver abscess

Imaging Studies:

(1) Chest x-ray:

Findings: **lower lobe atelectasis**, atelectasis, **hemidiaphragm elevation**, and **pleural effusion** are present in approximately 50% of cases (diagnostic clues).
Liver abscess

(2) Ultrasound (sensitivity 80-90%)
(a) Hypoechoic or hyperechoic with irregularly shaped borders
(b) wall: irregular hypoechoic /mild echogenic abscess:
   *pyogenic*—anechoic (50%) hyperechoic (25%)
   hypoechoic (25%)
   *Amebic*—hypoechoic with fine internal echos (50%)
Chronic stage: well-defined cavity with various degrees of internal echogenicity and a well-defined thickened irregular wall
Liver abscess

Sagittal scan showing a round abscess (A) with irregular margins and abundant internal echoes.
Liver abscess **Ultrasound (D/D)**

- **necrotic hepatic** neoplasm which simulate an abscess include sonolucency, and an irregular, echo-poor wall; multiple lesions or different echo patterns favor a malignant process.

- **hematoma** may also have an irregular wall and internal echoes; linear internal septa and a change in the ultrasonic appearance with time.

- **cysts** are highly sonolucent; their margins are regular, smooth, thin, bright, and echogenic.
Liver abscess

(3) CT scan (sensitivity 95-100%)

- **Without contrast**: Sharply defined area hypodense to normal liver (0-45HU) attenuation usually greater than that of a benign cyst but lower than that of a solid neoplasm. 
  
  **cluster sign**: cluster of small abscesses coalescence into a single, large abscess cavity

- **With contrast**: no enhancement, but a rim of tissue around the cavity may become denser than normal liver (ring enhancement)

- Gas can be seen in as many as 20% of lesions (esp. Klebsiella)
Liver abscess

(4) MRI

Low signal intensity on T1-weighted images and high signal intensity on T2-weighted scans

"Double target sign" on T2WI = hyperintense center (fluid) + hypointense sharply marginated inner ring (abscess wall) + hyperintense poorly marginated ring (perilesional edema) rim enhancement (86%)

With contrast: low signal intensity on T1-weighted images with capsule enhancement
Liver abscess

(5) Nuclear medicine findings

- Ga-67 scan: pyogenic and amebic—cold center and hot rim
- In-111 tagged WBC (highly specific for pyogenic)

Pyogenic: hot (due to WBC accumulation)
Amebic: cold center + hot rim
Liver abscess - Treatment

- Treatment
  
  **Pyogenic:** IV antibiotics ± drainage
  
  **Amebic:** Metronidazole (Aspiration only if the diagnosis remains uncertain. reddish-brown pasty aspirate ("anchovy paste" or "chocolate sauce") is typical)

- Indications for surgical drainage include:
  - a risk of peritoneal leakage of necrotic fluid after aspiration; and
  - rupture of a liver abscess
Liver abscess - Prognosis

Prognosis

- If untreated, the prognosis is uniformly fatal
- Amebic: poor prognosis is associated with ascites or coma, patient over 50 years, severe jaundice, signs of peritonitis
- Pyogenic: usually treated 4- to 6-week total course