Spontaneously Ruptured Gas-Containing Pyogenic Liver Abscess: an unusual case of Pneumoperitoneum

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We report a case of pneumoperitoneum due to spontaneous rupture of a gas-containing pyogenic liver abscess. The patient suffered from fever and right upper quadrant abdominal pain for 4 days. The pain became aggravated and was accompanied by nausea and vomiting. The patient was sent to the emergency room of our hospital. The chest X-ray and KUB revealed a liver abscess that was complicated by pneumoperitoneum. The diagnosis was confirmed by CT scan. An emergency operation with abscess excision, peritoneal lavage and drainage was done and followed by administration of appropriate antibiotics. To our knowledge, pneumoperitoneum due to a ruptured liver abscess is very rare. For most of the cases reported in the literature, an accurate diagnosis could not be made by the first impression or they were misdiagnosed as hollow organ perforation. In our case, we made the diagnosis, in the emergency room, of a gas-containing pyogenic liver abscess that had ruptured and been complicated by pneumoperitoneum.

Key words: Liver, abscess; Pneumoperitoneum

In recent years, the advances of ultrasound and computed tomography have resulted in early detection of liver abscesses. However, a perforated gas-forming liver abscess complicated by pneumoperitoneum is rare. Most of the cases reported in the literature could not be diagnosed accurately and promptly before surgical intervention, or they were misdiagnosed as hollow organ perforation. Our case is a 50 years old Chinese man from the Philippines who suffered spontaneous pneumoperitoneum due to a ruptured, gas-containing liver abscess. The patient was appropriately treated by surgical excision and drainage combined with antibiotic therapy without any delay in diagnosis.

CASE REPORT

A 50 years old Chinese male who came back from the Philippines presented with fever and right upper quadrant abdominal pain for 4 days. The painful sensation was aggravated and accompanied by abdominal fullness, nausea and vomiting. He was sent to the emergency room of our hospital. He had been well before this incident and denied any systemic disease. In the emergency room, his vital signs including body temperature and respiratory rate were stable except with mild tachycardia with a heart rate of 111 per minute. The blood pressure was 143/75 mmHg. Laboratory data revealed a hemoglobin of 13.9 g/100 ml and leukocytosis with a white blood cell count of 18400/mm³. An automated chemistry analysis revealed an elevated glucose level of 365 mg/dl, BUN up to 57 mg/dl, and elevated creatinine of 2.1 mg/dl. Chest X-ray (Fig. 1) and KUB (Fig. 2) showed a suspicious gas-containing liver abscess complicated by rupture, and free air bilaterally in the subphrenic space. The diagnosis was confirmed by computed tomography (CT) (Fig. 3). An emergent exploratory laparotomy was done. Operative findings disclosed a liver abscess of 7 cm × 6 cm × 6 cm in size at hepatic segment 5 with free perforation into the peritoneal...
cavity and purulent material present in the upper abdomen. Incidental findings included chronic cholecystitis and a cholecystoduodenal fistula. Excision of the liver abscess and gall bladder and closure of the cholecystoduodenal fistula was done. JP drains were placed in the abscess cavity and Morison’s pouch. Blood culture data obtained days later showed growth of Klebsiella pneumoniae and Escherichia coli. Antibiotics administered included ceftriaxone sodium, metronidazole and gentamycin. Follow-up blood sugar confirmed the diagnosis of diabetic mellitus. The course of infection was uneven and a recurrent subphrenic abscess occurred later. The abscess was drained by insertion of a pigtail catheter under ultrasound guidance. After hospitalization for two months, the infection was controlled and the patient was discharged in a stable condition.

**DISCUSSION**

Spontaneous pneumoperitoneum is a common presentation of intra-abdominal pathology. Over 90% are a result of hollow viscous perforation [1,2]. Ruptured gas-containing liver abscess is a rare etiology. Only a few cases have been reported in the last 20 years [2,3,4,5]. Other etiologies included perforated pyometra, pneumatosis cystoides intestinalis, lung base alveolar rupture [6] and ruptured of necrotic liver metastasis [6,7].
Most of the patients with pyogenic liver abscess had underlying disease of diabetes mellitus [1,2,4,5]. High serum level of glucose and creatinine and presence of gas in the abscess are significant poor prognostic factors [5]. In most cases, bacterial cultures revealed Klebsiella pneumoniae and Escherchia coli. High blood sugar is thought to be associated with lowered host defense mechanisms and increased opportunity for bacterial infection. These anaerobic organisms generate carbon dioxide by fermentation of glucose in tissues that are under anaerobic conditions. The impairment of local perfusion may also inhibit the removal of gas from the infected tissue. These factors may play a role in gas-forming liver abscess [4,8].

In most of the cases of spontaneous rupture of gas-containing pyogenic liver abscess the physicians did not, until surgical intervention, make a proper diagnosis or made a misdiagnosis such as perforated peptic ulcer disease. In the case we report here, the correct diagnosis was made after chest X-ray, KUB and CT examination at the emergency room. The clinical hint of fever for days, pneumoperitoneum on chest X-ray, and abnormal gas shadow at right upper quadrant on KUB led to the impression of a ruptured gas-containing pyogenic liver abscess. CT confirmed the diagnosis.

In conclusion, according to the experience of the case we report here, a careful evaluation of the chest X-ray and KUB may allow the physician to make the correct diagnosis before surgery. We strongly recommend that a patient with abdominal pain and peritonitis should have both chest X-ray and KUB examination.

REFERENCES

細菌性含氣肝膿瘍破裂引起氣腹：病例報告

沈顯章1  高志賢1  廖達興1  劉錦勳1  翁惠生2  楊誠群3

敏盛綜合醫院  放射診斷科1  急診科2  外科3

氣腹是急診常見的症狀，常常是腸胃道破孔所引起。由細菌性含氣肝膿瘍破裂而引起的氣腹則甚為罕見。患者因發燒及右上腹痛並隨噁心嘔吐而到醫院急診室就診。胸部及腹部X光片所見，高度懷疑是含氣肝膿瘍破裂併發氣腹，並經腹部電腦斷層證實此診斷。外科醫師馬上安排手術把膿瘍切除，腹腔清洗及引流並注射抗生素治療。

從以前所發表的論文所知，這疾病多被延誤診斷或誤診為腸胃道破孔。本病例在第一時間就被正確診斷，並給予適當治療。

關鍵詞：肝膿瘍；氣腹