

Rupture of liver abscess following hepatogastric fistula caused by perforation of remnant gastric carcinoma: a case report

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Abstract. – OBJECTIVE: We report the case of a 73-year-old man, with a history of proximal subtotal gastrectomy, who suffered acute abdominal symptoms and signs. Laparotomy showed rupture of liver abscess and hepatogastric fistula formation caused by perforation of remnant stomach.

CASE REPORT: Residual stomach resection, incision and drainage of liver abscess were performed, and the patient was smoothly discharged from hospital nineteen days after the emergency operation.

RESULTS: The final pathology confirmed the remnant gastric adenocarcinoma. This case is so far the first reported liver abscess caused by perforation of residual stomach malignant tumor.

CONCLUSIONS: Liver abscess and hepatogastric fistula are rare. This is the first report on a remnant gastric adenocarcinoma (RGC) invading the adjacent liver, with ruptured liver abscess resulting from gastric perforation. We speculated that there were inevitable factors for this case. Direct invasion to the liver capsule of gastric carcinoma was the bridging basic of the formation of a hepatogastric fistula. Pyloric obstruction caused by gastric carcinoma was the driver of liver abscess rupture since the increased proximal gastrointestinal pressure led to the inner pressure of liver abscess rising through the conduction of hepatogastric fistula. The recommended treatment protocol for this clinical entity comprises removal of the primary lesions and drainage of the liver abscess. This successful case provided us with a great deal of clinical information and treatment experience.

Key Words:

Remnant gastric carcinoma, Hepatogastric fistula, Liver abscess.

Introduction

Liver abscess secondary to hepatogastric fistula is a rare complication. Hepatogastric fistula is usually caused by foreign body extending from

the stomach into the liver¹, or by direct invasion to gastrointestinal tracts by hepatocellular carcinoma (HCC)^{2,3}. In this report, we described an uncommon case of a liver abscess after hepatogastric fistula formation through the reverse process of direct metastasis and perforation of remnant gastric adenocarcinoma (RGC) to the liver.

Case Report

a 73-year-old native male was admitted with complaints about initially right upper quadrant pain spreading to the whole abdomen, fever and abdominal distension. The patient had an operation on his proximal subtotal gastrectomy due to cardia ulcer bleeding eleven years ago (details were not provided). On physical examination, he was conscious, but malnourished with body mass index (BMI) of 19.0. He suffered from moderate anemia, febrile (axillary temperature=100.4°F), with a blood pressure of 129/81 mmHg, a pulse rate of 86/min, and a respiratory rate of 19/min. Acute diffuse peritonitis (abdominal tenderness, rebound tenderness and muscular guarding) was palpable and bowel sounds were absent. Laboratory investigations revealed that hemoglobin was 8.2 g/dl; hematocrit 30.40%; red blood cell count 3.98×10^6 per μl ; white blood cell count 2890/ μl (with 74.7% neutrophils and 13.5% lymphocytes); platelet count 265000/ μl ; prothrombin time (PT) 15.6s; activated partial thromboplastin time (APTT) 44.7 s; thrombin time (TT) 17.2 s; plasma fibrinogen (FIB) 0.365 g/dL; d-dimer level 0.984 mg/dl; international normalized ratio (INR) 1.29; blood urea nitrogen (BUN) 14.48 mg/dl; creatinine (Cr) 1.22 mg/dl; Na^+ 139.3 mEq/L; K^+ 3.76 mEq/L; and Cl^- 91.5 mEq/L. Results from blood gasses measurement showed that the patient was in respiratory alkalosis with a blood pH of 7.54 and partial carbon dioxide pressure (PaCO_2) of 29 mmHg. The initial im-

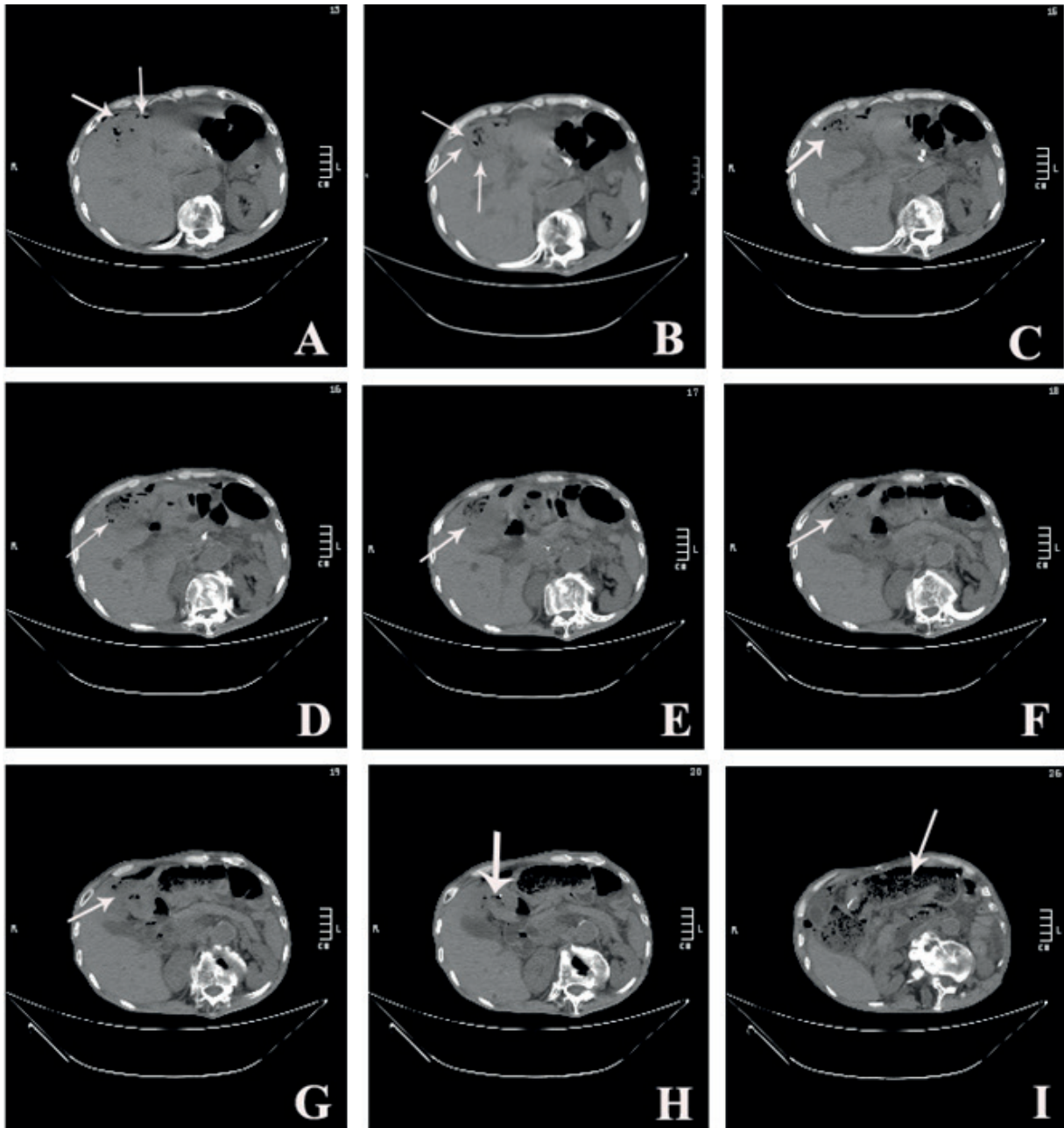


Figure 1. Preoperative imaging studies with abdominal computed tomography (CT) scan. *A*, Subdiaphragmatic free air (*white arrows*); *B-G*, Successive slice images showing the liver cystic mass (*white arrows*); *H*, Hepatogastric fistula formation (*white arrow*); *I*, Distension of interposed jejunum (*white arrow*).

pression by an abdominal computed tomography (CT) scan showed subdiaphragmatic free air in suggestive of upper digestive tract perforation, pleural fluid on the left side and multiple liver cysts (Figures 1A to 1G). Acute diffuse peritonitis and subdiaphragmatic free air revealed operation indication. When the patient was taken to the operating room using laparotomy, we found 800 ml of turbid purulent liquid in peritoneal and pelvic

cavity we also found big amounts of pus masses on the surface of peritoneum and intestine. We observed the rupture of the liver's left inner lobe (segment IV) on the diaphragmatic surface with necrotic tissues and pus overflow, and double "S" precolonic anastomoses with jejunal interposition between remnant stomach and esophagus after proximal subtotal gastrectomy (Figure 2A). Further examination of liver parenchyma through the

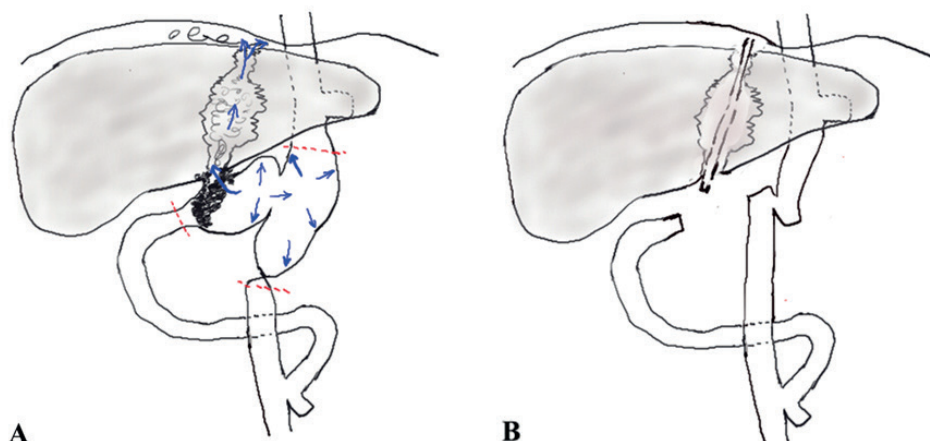


Figure 2. Schematic plot of laparotomy findings, resection range and alimentary tract reconstruction. **A**, Positive findings at exploratory laparotomy including pyloric obstruction with the distension of remnant gastric cavity and interposed jejunum (blue arrows), rupture of the left lateral lobe of the liver on diaphragmatic surface, and the irregular liver abscess with hepatogastric fistula formation between visceral surface of the left inner lobe of the liver (segment IV) and lesser curvature of remnant stomach; red dotted lines are indicating the resection range while the original operation was double “S” precolonic anastomoses with jejunal interposition between remnant stomach and esophagus after proximal subtotal gastrectomy. **B**, The final reconstruction of digestive tract similar to Roux-en-Y anastomosis after total gastrectomy, and a drainage tube placed from the rupture site on diaphragmatic surface to hepatogastric fistula site on visceral surface passing through the liver abscess cavity.

rupture site using forefinger showed an irregular liver abscess with a size of 5.0 cm×5.0 cm×4.0 cm. We observed hepatogastric fistula formation (diameter=1.0 cm) between the visceral surface of the left inner lobe of the liver (segment IV) and lesser curvature of the remnant stomach (Figure 2A), in concurrence with the preoperative CT scan (Figure 1H). Moreover, we found gastric wall thickening complicated by pyloric obstruction, resulting in the distension of remnant gastric cavity and interposed jejunum (Figure 2A), which can account for the expansion of intestine in Figure 1I. Residual stomach resection as well as partially interposed jejunum, and Braun’s anastomosis (side-to-side jejunojejunostomy) were performed. The final digestive tract reconstruction was similar to that after the total gastrectomy with Roux-en-Y anastomosis (Figure 2B). When dealing with rupture of liver abscess, we drained the abscess cavity, removed necrosis tissues, and flushed with hydrogen peroxide, and physiological saline in turn. Subsequently, a drainage tube was placed from the rupture site on the diaphragmatic surface to hepatogastric fistula site on visceral surface passing through the abscess cavity of the liver. The postoperative supportive care included the application of antibiotics, hepatic protectant and total parenteral nutrition. A nasogastric tube was removed and the patient was allowed to eat in day 7 post-operation. CT scan

results revealed that there was a basic obliteration of the abscess cavity (Figure 3A) and there was no pus and bile leakage. The drainage of the abscess through the catheter gradually ceased by pulling the tube outward 1 cm per day. Then, the drainage tube was completely removed on day 11 post-operation. One week later, CT scan revealed that the liver abscess was absorbed (Figure 3B). The patient was discharged on day 19 post operation. The postoperative pathology results revealed remnant gastric adenocarcinoma (Figure 4) with the differentiation grades of II and III, gastric wall perforation, infiltrated serosa, violation of vascular, nerve and adjacent intestine, and positive six lymph node metastases. At three months follow-up, the patient was doing well without any discomfort.

Discussion

Liver abscess and hepatogastric fistula are rare⁴. The reported causes of gastric perforation are diverse, and include mostly foreign body ingestion (such as fish bones⁵, toothpicks⁶, shells⁷, needles⁸, and chicken bones⁹), and penetrating gastric ulcer^{10,11}. To our knowledge, this is the first report on a remnant gastric adenocarcinoma (RGC) invading the adjacent liver, with ruptured liver abscess resulting from gastric perforation.

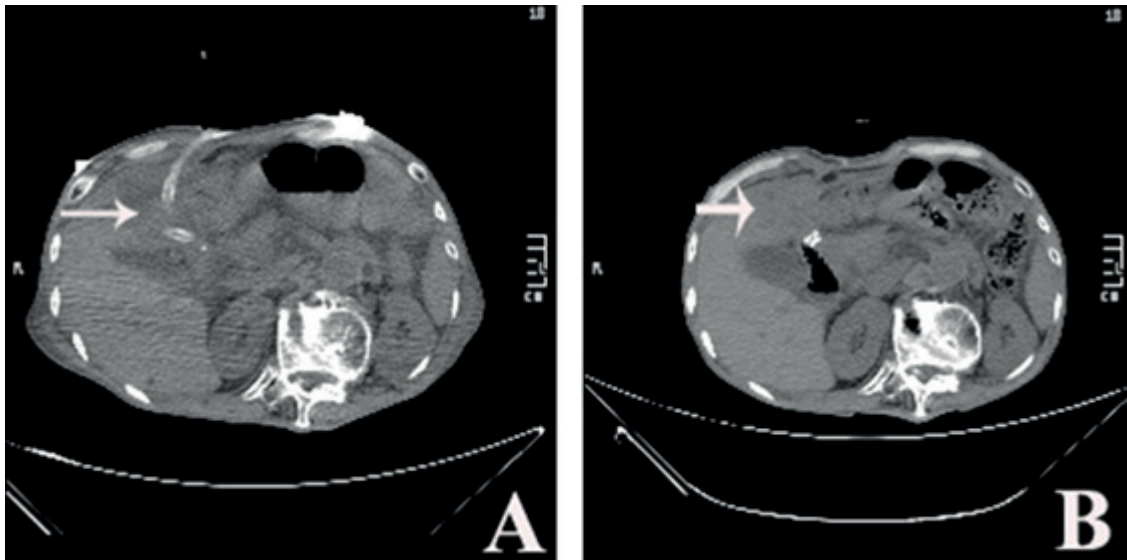


Figure 3. Postoperative imaging studies with abdominal CT scan. A, 7th day; B, 18th day. The site of liver abscess was outlined by white arrows.

The signs and symptoms of hepatic abscess resulting from gastric perforation are often subtle and non-specific. The most common symptoms are abdominal pain and fever, followed by vomiting and nausea. In most cases, the initial diagnosis is made by CT. CT is the main diagnostic tool, due to its high resolution and accuracy in the identification of etiologies, complication of the gastric penetration and trace free pneumoperitoneum. It is also noteworthy to rule out amebic liver abscess¹² and hepatic carcinoma in any patient as they may all cause hepatogastric fistula^{2,3}. We speculated that there were inevitable factors for this case (as shown schematically in Figure 5). Direct invasion to the liver capsule of gastric carcinoma was the bridging basis of the formation of a hepatogastric fistula, which avoided the gastric perforation into the abdominal cavity. Pyloric obstruction caused by gastric carcinoma was the driver of liver abscess rupture since the increased proximal gastrointestinal pressure led to

the inner pressure of liver abscess rising through the conduction of hepatogastric fistula (Figure 1I and Figure 2A). However, any diagnosis obtained solely via laparotomy should be considered with caution.

The recommended treatment protocol for this clinical entity comprises removal of the primary lesions and drainage of the liver abscess¹³. In our case, surgery was complex and difficult since the patient has been under the operation of double “S” precolonic anastomoses with jejunal interposition between remnant stomach and esophagus after proximal subtotal gastrectomy. In the case of severe infection, removal of the primary lesion and guaranteeing anastomotic blood supply are important. In our case, these were achieved and completed by our highly experienced surgeons. The reasonable liver abscess treatment was also crucial and although there was no established treatment protocol for this rare disease, we showed that adequate abscess drainage via laparotomy

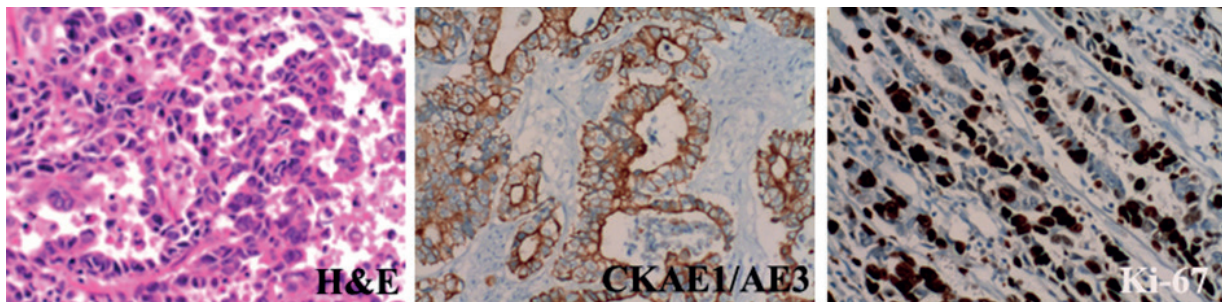


Figure 4. Postoperative pathology revealed remnant gastric adenocarcinoma (H&E, 200X; CKAE1/AE3, 200X; Ki-67, 200X).

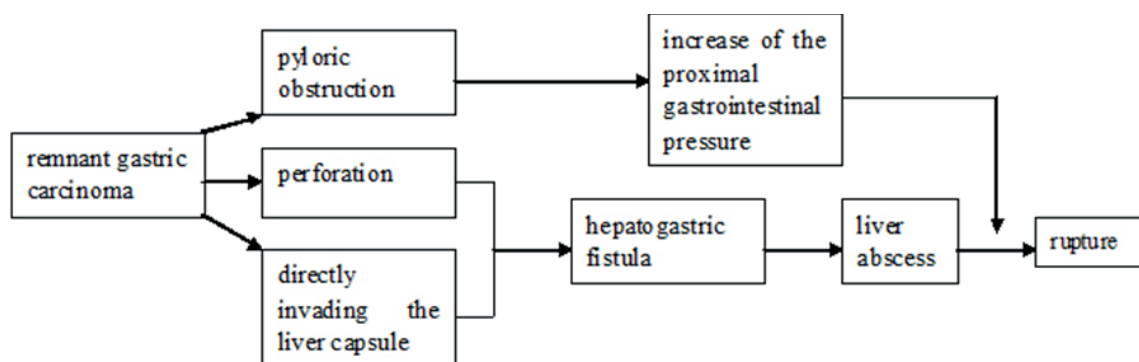


Figure 5. Inference graph in terms of the formation of hepatogastric fistula and the rupture of the liver abscess.

might shorten the length of hospital stay. The method we used, in this case, was superior to the ultrasound or CT-guided percutaneous catheter drainage methods. On the other hand, the choice of conservative treatment with antibiotics may be a therapeutic option for patients with liver abscesses without evidence of rupture into the peritoneal cavity or with serious surgery taboo.

Conclusions

We reported an unusual case of hepatic abscess rupture caused by perforation of remnant gastric carcinoma with the formation of a hepatogastric fistula. The early diagnosis may be made easily by CT scan combined with abdominal signs and symptoms. Timely surgical intervention and appropriate treatment were of great importance. This successful case provided us with a great deal of clinical information and treatment experience. However, long-term efficacy for patients in advanced stages of remnant gastric adenocarcinoma needs further investigation.

Conflicts of interest

The authors declare no conflicts of interest.

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