Penetrating Gastric Ulcer Presenting as a Subcapsular Liver Abscess: a case report

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CASE REPORT

A 37-year-old male was admitted to our hospital with complaints of tarry stool passage and persistent high fever for more than one week. He denied drug history of aspirin or other NSAID medications. He regularly visited the outpatient departments of other hospitals for a neuropsychological disorder. There was no history of other systemic diseases.

Physical examination revealed a febrile patient with mild tenderness at the epigastric region. Initial laboratory data showed leukocytosis (white blood cell count: 33700/mm³; normal value: 4000–10000/mm³), anemia (hemoglobin: 8.3 g/dL; normal value: 14–17 g/dL) and normal liver function test. The stool routine showed positive for occult blood. Plain abdominal film revealed abnormal air collection in the epigastric region (Fig. 1a). Abdominal computed tomography (CT) scan revealed a 15 cm × 11 cm well-demarcated cystic lesion in the subcapsular region of lateral segment of liver with air-fluid level (Fig. 1b, 1c). Under the impression of subcapsular liver abscess, percutaneous drainage was arranged on the same day. Before this procedure, presence of a fistulous tract between the abscess cavity and gastrointestinal tract was suspected, thus an upper gastrointestinal study was conducted after oral water-soluble contrast medium. However, no definite communication between the abscess cavity and gastrointestinal tract was noted. After drainage of the subcapsular liver abscess with a pigtail catheter was achieved, turbid whitish pus with foul odor was obtained.

During admission, the abscess cavity was continuously inflated with air and we changed drainage tubes of different sizes (Fig. 2a). Water-soluble contrast medium was infused into the abscess cavity for demonstration of possible fistulous tract. However, the follow-up CT scan did not reveal any fistulous tract connecting to the gastrointestinal tract (Fig. 2b). Panendoscopy was suggested, but the patient refused. The pus culture revealed mixed flora, including Enterococcus faecalis, Candida glabrata and Escherichia Coli.
Surgical procedure was performed 2 weeks after admission. Initially, laparoscopic method was attempted for draining the subcapsular hepatic abscess, but food debris was noted inside the abscess cavity. Therefore, laparotomy was performed. During operation, a giant gastric ulcer in the distal

Figure 1. a. Abnormal air collection in the epigastric region (arrow). b. c. A well-demarcated cystic lesion, 15 cm × 11 cm in size, in the left lobe of the liver with an air-fluid level (arrow). Subcapsular liver abscess was impressed.

Figure 2. a. Continuous inflation of the abscess cavity with air after changing different drainage tubes several times (arrow). b. A water-soluble contrast medium was infused into the abscess cavity (arrow), but no contrast was noted in the gastrointestinal tract. c. d. A giant gastric ulcer (approximately 3.5 cm × 1.5 cm in size) in the distal antrum was adhered to the left aspect of the round ligament and left lateral segment of the liver (arrow in c). After lysis of adhesions, the perforated gastric ulcer was noted (arrow in d).
antrum was identified, about 3.5 cm × 1.5 cm in size, with adhesion to the left aspect of round ligament and lateral segment of liver by a fistulous tract, which was about 1 cm in diameter, and communicated with the abscess cavity (Fig. 2c, 2d). Gastrorrhaphy with omental patch and tube jejunostomy were applied. The patient was discharged from our hospital three months after admission.

**DISCUSSION**

Perforation occurs in 5%-10% of patients with peptic ulcer disease, and 60% of gastric ulcer perforations occur along the lesser curvature. Abdominal radiograph examination revealed extraluminal air in 75% of patients with acute gastric ulcer perforation. Moreover, 5%-10% of peptic ulcer perforations at the stomach and duodenum occur posteriorly, and these may cause pancreatitis or lesser sac abscess.

Unusual presentations of penetrating gastric ulcer include pneumopericardium, subcutaneous emphysema, splenic abscess, tension pneumothorax, gastropleural fistula, gastrobronchial fistula, gas emphysema, splenic abscess, tension pneumothorax, gastropleural fistula, gastrobronchial fistula, and penetration into the heart and liver [1-7].

Hepatic-related complications of a perforated gastric ulcer, such as liver abscess, upper gastrointestinal hemorrhage, subcapsular liver abscess, or even liver rupture, are uncommon. Usually, such condition is diagnosed during surgery or at autopsy [8-10]. Kayacetin et al. reported one patient and reviewed thirteen other patients with gastric ulcer penetrating into the liver with gastrointestinal bleeding. The diagnosis was established in all the cases by the presence of liver tissue in the histologic examination of endoscopic biopsies. The average age of these patients was 64.6 ± 15.8 years. Males were predominant (78.6%). The locations of the ulcers were the lesser curvature of the stomach (42.9%), anterior (21.4%) and posterior (7.1%) walls of the antrum, and anterior (14.3%) and posterior (14.3%) walls of the duodenal bulbs [8].

Tsokos et al. reported a rare case of non-traumatic liver rupture due to a necrotizing perihepatic abscess caused by a perforated gastric ulcer. Gastric acid from a perforated gastric ulcer can lead to liver rupture via digestion of Glisson’s capsule, resulting in intrahepatic hemorrhage and increased intrahepatic pressure with subsequent liver rupture [9].

Cases of liver abscess and subcapsular liver abscess due to perforated gastric ulcer are uncommon. We have come across only a few reports.

Three cases of perforated gastric ulcer with liver abscess occurred in the left lobe of liver. This is because anatomically, the pylorus adjoins the left lobe of the liver. Venkatesh et al. reported a similar case of subcapsular liver abscess of the left lobe of liver due to a penetrating gastric ulcer at the antrum. This case revealed extravasated contrast medium into the abscess cavity, but was misinterpreted as an opacified bowel loop on CT images. They assumed that the magnetic resonance imaging not only revealed the subcapsular location of the abscess, but also showed the ulcer crater and the site of communication between the ulcer crater and liver [10].

Gastric perforation caused by foreign bodies may also lead to the formation of liver abscess. In such conditions, although the underlying causes for the formation of liver abscess differ from that of liver abscess caused by perforated gastric ulcer, they revealed similar results. Chintamani et al. reported many types of foreign bodies such as needles, chicken bones, fish bones, and toothpicks that may perforate the gastric wall and cause abscess formation in the liver. Of the 13 cases, 11 had liver abscess in the left lobe of liver (84.6%). The penetration sites are located in the stomach (61.5%), duodenum (23.1%), and others (15.4%) [11].

Upper gastrointestinal studies are seldom helpful in diagnosing ulcer penetration. Haubrich reported that 27 of 47 patients with surgically proven ulcer penetration (57%) did not show suggestive findings on upper gastrointestinal series [12].

In our case, despite the large diameter (approximately 1 cm) of the fistulous tract, the communication between the gastrointestinal tract and abscess cavity could not be identified by imaging study preoperatively. First, inflammation may cause edematous changes in the soft tissue around the fistulous tract. Second, during imaging studies the lack of communication between the gastrointestinal tract and abscess cavity may be due to the difference in pressure between the abscess cavity and gastrointestinal tract. Before inserting the drainage tube, the pressure of the abscess cavity was greater than that of the gastrointestinal tract, which prevented the contrast medium from leaking into the abscess cavity via the fistulous tract. After placing the drainage tube, the abscess cavity was decompressed. When we infused water-soluble contrast medium into the abscess cavity, the pressure of the abscess cavity was lower than that of the gastrointestinal tract, therefore the contrast medium did not leak into the gastrointestinal tract via the fistulous tract.
However, a persistent inflation of the abscess cavity was noted even after replacing the drainage tube of large caliber. This may be an indirect sign that suggested the communication between the abscess cavity and gastrointestinal tract.

Subcapsular liver abscess due to perforated gastric ulcer is uncommon. As the case we report here, the possibility of fistulous tract formation between the gastrointestinal tract and abscess cavity should be considered if follow-up images show persistent inflation of the abscess cavity.

REFERENCES

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胃幽門部潰瘍穿孔以包膜下肝膿瘍來表現：病例報告

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胃幽門部潰瘍有許多表現。大部分的病例表現是：腸道外的游離空氣、胰臟炎或是腹膜腔
小囊膿瘍。其它不常見的包括：心包膜腔積氣、皮下氣腫、脾臟膿瘍、張力性氣胸、胃肋膜腔
瘻管、胃支氣管瘻管、胃胰臟瘻管、胃腸道間瘻管以及造成心臟或主動脈穿孔。我們報告一位
37 歲男性，因為胃幽門部潰瘍穿孔而造成肝臟左葉的包膜下膿瘍。