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Drainage of a Subphrenic Abscess Followed by Two-Stage Gastrectomy and Adjuvant Hyperthermic Intraperitoneal Chemotherapy (HIPEC) for Perforated Gastric Carcinoma: A Case Report

Authors' Contribution:

Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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Patient: Male, 65
Final Diagnosis: Gastric carcinoma
Symptoms: Abdominal and/or epigastric pain
Medication: —
Clinical Procedure: —
Specialty: Surgery

Objective: Unusual clinical course

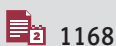
Background: Perforated gastric cancer accounts for less than 1% of patients who present with an acute abdomen and for up to 16% of all gastric perforations. A two-stage laparoscopic procedure may be the therapeutic strategy of choice in selected patients, and adjuvant hyperthermic intraperitoneal chemotherapy (HIPEC) can reduce the incidence of peritoneal recurrence. A rare case of subphrenic abscess and gastric perforation due to carcinoma of the gastric fundus, followed by two-stage gastrectomy and adjuvant HIPEC is presented.

Case Report: A 65-year old man presented with a left subphrenic abscess secondary to perforated gastric carcinoma. Laparoscopic drainage of the abscess was performed. Ten days later, following recovery from sepsis, the patient underwent total laparoscopic gastrectomy, and adjuvant HIPEC followed by a Roux-en-Y esophagojejunostomy. Histopathology showed an intestinal-type gastric adenocarcinoma. The tumor was staged as pT4aN0. The post-operative course was uneventful except for transient atrial fibrillation. The patient was discharged home on postoperative day 11. Systemic adjuvant chemotherapy was begun one month later. At six-month follow-up, the patient had no discomfort on eating or any other symptoms.

Conclusions: In this case, a two-stage laparoscopic treatment for perforated gastric carcinoma combined with adjuvant HIPEC was feasible and safe and may be considered at the time of laparoscopic gastrectomy in selected patients with perforated gastric carcinoma.

MeSH Keywords: Antineoplastic Agents • Gastrectomy • Laparoscopy • Stomach Neoplasms

Full-text PDF: <https://www.amjcaserep.com/abstract/index/idArt/910823>



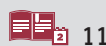
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Background

Gastric perforation is a rare condition which is associated with less than 1% of cases of primary gastric carcinoma and up to 16% of all causes of gastric perforation [1]. The preoperative diagnosis of gastric malignancy is rare [2], and a two-stage surgical operation has been recommended to control peritonitis following perforation and to achieve complete resection of the tumor [3].

Gastric perforation associated with gastric carcinoma may cause dissemination of cancer cells in the peritoneal cavity, leading to peritoneal carcinomatosis. Adjuvant hyperthermic intraoperative chemotherapy (HIPEC) has been shown to reduce the risk of developing peritoneal carcinomatosis from gastric cancer [4].

We report the case of a patient with perforated carcinoma of the gastric fundus treated by emergency laparoscopy with drainage of subphrenic and perisplenic abscesses, and subsequent laparoscopic total gastrectomy with adjuvant HIPEC and Roux-en-Y esophagojejunostomy.

Case Report

A 65-year-old Caucasian man was admitted to the emergency department with persistent dyspnea, fever, and mild abdominal pain in the left upper quadrant. He had a body mass index (BMI) of 28.1 kg/m² and a past medical history of type 2 diabetes mellitus and mild hypertension. Before admission to hospital, he had been treated with levofloxacin and ceftriaxone during the previous week for suspected left basal pneumonia.

On physical examination, there was slight tenderness of the upper left quadrant without peritoneal signs.

His body temperature was 38°C, blood pressure was 120/60 mmHg, pulse rate was 95 beats/min, and oxygen saturation was 95% on room air.

On hospital admission, blood gas analysis showed acute respiratory alkalosis and increased serum lactate (3.90 mmol/L). Laboratory findings also included hemoglobin (Hb) 6.7 g/dL (normal range, 14.0–18.0 g/dL); white blood cell (WBC) count 45.01×10³/uL (normal range, 4.00–11.00×10³/uL), consisting of 97.2% neutrophils (normal range, 55.0–70.0%). C-reactive protein (CRP) was 34.1 mg/dL (normal, <0.5 mg/dL). Chest X-ray showed left basal atelectasis and pleural effusion. A computed tomography (CT) scan of the chest and abdomen showed the presence of a left subdiaphragmatic and perisplenic abscess with air-fluid levels and multiple enlarged celiac and splenic lymph nodes (Figure 1A). About 900 mL of cloudy fluid was drained from the left pleural cavity. An upper gastrointestinal endoscopy showed a large and deep ulcerative lesion of the gastric fundus with no active bleeding (Figure 1B). During endoscopy, multiple gastric biopsies were taken.

Emergency laparoscopy was performed, with drainage of the abscesses. Samples of peritoneal fluid were taken for bacterial culture and for cytology. Peritoneal cytology showed the presence of carcinoma cells. Histopathology of the endoscopic biopsies confirmed the diagnosis of intestinal-type gastric adenocarcinoma, of moderate grade (G2).

Ten days later, following resolution of sepsis (Figure 2), the patient underwent a laparoscopic total gastrectomy. The surgical

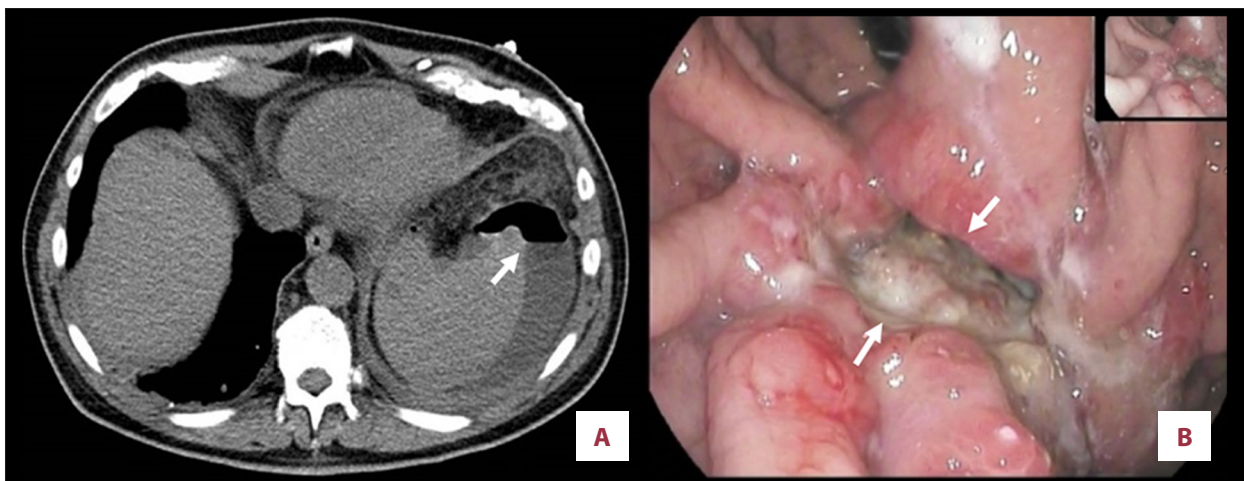


Figure 1. Computed tomography (CT) imaging of the chest and upper abdomen and endoscopy of the gastric fundus. (A) Computed tomography (CT) scan of the chest and upper abdomen shows a left subdiaphragmatic and perisplenic abscess with an air-fluid level (arrow). Multiple enlarged celiac and splenic lymph nodes are present. (B) Upper endoscopy shows a large ulcerative lesion of the gastric fundus (arrows).



Figure 2. A postoperative computed tomography (CT) scan of the chest and upper abdomen. The postoperative computed tomography (CT) scan of the upper abdomen shows resolution of the abscess (arrow).

gastrectomy specimen was retrieved through a 5 cm mini-laparotomy protected by an Alexis® device. Based on the findings of a locally advanced gastric tumor of the upper-third of the gastric fundus, with positive peritoneal cytology, hyperthermic intraperitoneal chemotherapy (HIPEC) was administered as an adjuvant therapy. Fifteen minutes before starting the HIPEC treatment, the patient received 20 mg/m² of folinic acid and 400 mg/m² of fluorouracil (5FU) intravenously, as induction chemotherapy. The Combat PRS™ peritoneum recirculation system (Galma Biotech, Madrid, Spain) was used, which allowed HIPEC to be undertaken with a closed abdomen technique and CO₂ recirculation, maintaining a constant temperature of 42°C [5]. The laparoscopic port sites were used to accommodate the inflow and outflow catheters. The solution used for intraperitoneal chemotherapy was a combination of oxaliplatin 250 mg/m² and a 2 L/m² solution of 5% glucose, and perfusion lasted for 60 minutes. At the end of the HIPEC treatment, a Roux-en-Y esophagojejunostomy was performed using the OrVil™ circular stapler, introduced through the mini-laparotomy.

The patient's postoperative course was uneventful, except for an episode of atrial fibrillation, which was successfully treated with amiodarone. The patient had a postoperative serum creatinine and glomerular filtration rate (GFR) that remained within normal limits. The diagnosis of intestinal type gastric adenocarcinoma (Grade 2) was confirmed on the surgical specimen (Figure 3) and the surgical resection margins were negative. The tumor was staged as pT4a–N0 following histological examination of 48 retrieved lymph nodes. Oral nutrition commenced on postoperative day 5, after a CT scan, performed with oral water-soluble contrast, confirmed regular esophagojejunal transit and the absence of leaks.

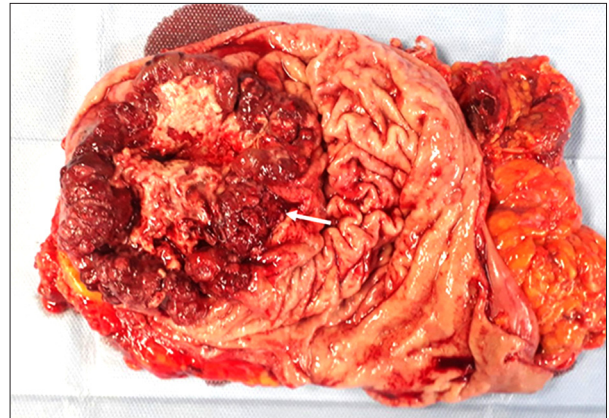


Figure 3. The macroscopic appearance of the gastrectomy surgical resection specimen. The postoperative gastrectomy specimen shows a large ulcerated tumor of the gastric fundus (arrow).

The patient was discharged home on postoperative day 11. Systemic adjuvant chemotherapy with capecitabine and oxaliplatin was initiated one month later. At six-month postoperative follow-up, the patient had no discomfort on eating and had no other symptoms.

Discussion

To our knowledge, this is the first report of a perforated gastric carcinoma treated by a sequential two-stage laparoscopic approach and adjuvant hyperthermic intraperitoneal chemotherapy (HIPEC). The high mortality rate associated with one-stage surgical procedures and the fear that peritoneal dissemination of viable neoplastic cells may adversely affect long-term prognosis has profoundly influenced the approach to the management of patients with perforated carcinoma in the past.

In a retrospective review of ten patients with perforated gastric carcinoma, a preoperative diagnosis of gastric cancer was made in three individuals and the overall mortality rate following simple closure or gastrectomy was 40% [1]. A systematic literature review showed that the mortality rates for one-stage gastrectomy ranged from between 0–50% [6]. Because one-stage emergency gastrectomy is associated with high mortality rates, a two-stage approach, including the control of peritonitis and subsequent curative or excisional gastrectomy, was initially proposed by Lehnert et al. in 2002 [7]. In 2014, a 78.4% rate of curative R0 resection, with 1.9% patient mortality, was reported in a series of 54 Japanese patients, in which five patients underwent laparoscopic omental patch repair at initial surgery [3].

In the patient described in this report, the initial laparoscopy allowed effective drainage of the subphrenic abscess, which

reduced the development of postoperative adhesions, and facilitated the subsequent laparoscopic gastrectomy. A previously published report did not find significant differences in the pattern and the rate of recurrence of perforated versus non-perforated gastric cancer [8]. However, the patient in this report had positive cytology at initial laparoscopy in the absence of overt macroscopic peritoneal malignancy or metastatic disease.

The importance of staging laparoscopy and positive peritoneal cytology in patients with locally advanced gastric cancer has been recently reviewed, and the role of immediate gastrectomy has been questioned, at least in the non-emergency setting [9]. We decided to offer to our patient the chance of a radical gastrectomy with adjuvant HIPEC in an attempt to reduce the risk of recurrence of peritoneal cancer [4,10]. In our experience with adjuvant HIPEC, the closed abdomen technique using the CO₂ recirculation system results in safe and effective

treatment because of the constant temperature and the homogeneous distribution of the chemotherapy perfusate [5,11].

Conclusions

Hyperthermic intraperitoneal chemotherapy (HIPEC) may be a safe and useful adjunctive treatment to a two-stage surgical approach in selected patients with perforated gastric carcinoma. However, prospective clinical studies are still required to provide evidence that this management approach can reduce the recurrence rate in cases of perforated gastric carcinoma.

Conflict of interest

None.

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