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Long-Term Survival of Resected Advanced Gastric Cancer with Hepatic and Pancreatic Invasion

Hiromitsu Domen Masanori Ohara Misa Noguchi
Yoshitsugu Nakanishi Kazuteru Komuro Nozomu Iwashiro
Masanori Ishizaka

Department of Surgery, National Hospital Organization Hakodate Hospital,
Hakodate, Japan

Key Words

Gastric cancer · Hepatic invasion · Pancreatic invasion · Surgery

Abstract

A 64-year-old man was transferred to our division with a suspicion of gastric cancer. Computed tomography showed widespread irregular thickening of the stomach walls close to the liver and pancreas. Gastrointestinal fiberoscopy showed a type 5 tumor in the upper to lower stomach, histologically diagnosed as tubular adenocarcinoma. Gastric cancer with hepatic and pancreatic invasion was diagnosed. Distant metastasis was not proven and complete resection was planned. At laparotomy, the tumor showed general expanding growth and invasion through the lateral segment of the liver and pancreas. Total gastrectomy and combined resection of the distal pancreas, spleen and left segment of the liver were performed. Hepatic and pancreatic invasion and lymph node metastasis were microscopically proven. Pancreatic fistula occurred postoperatively. On postoperative days 40, he was discharged. He received two cycles of adjuvant tegafur/gimeracil/oteracil chemotherapy. He has had no sign of recurrence for 7 years and 8 months.

Introduction

Extended surgery is necessary to perform curative resection of gastric cancer with hepatic or/and pancreatic invasion. However, the prognosis of such cases is very poor. The value of extended organ resection for advanced gastric cancer has been debated for many years. The potential advantage of extended resection for T4 gastric cancer is necessary to improve the R0 resection rate of these lesions. Arguments against this approach are based on an observed increase in the morbidity and mortality rates, with

little objective benefit in survival. The complication rates of additional organ resection with gastrectomy have consistently been reported to be higher when compared to patients undergoing gastrectomy alone. Several new perioperative adjunctive approaches (neoadjuvant and/or adjuvant) for highly advanced gastric cancer have been explored [1–4]. A randomized phase III trial of surgery plus neoadjuvant chemotherapy compared with surgery alone for type 4 and large type 3 gastric cancer by the Japan Clinical Oncology Group (JCOG 0501) is being performed. Although preoperative chemotherapy might be useful as a standard procedure for advanced gastric cancer after the completion of the trial JCOG 0501, the result is not yet available.

We herein present a long-term survival case of advanced gastric cancer with hepatic and pancreatic invasion with extended surgery performed.

Case Report

A 64-year-old man visited a local outpatient clinic complaining of appetite loss. Examination revealed severe anemia and advanced gastric cancer. Thus he was transferred to our division. Computed tomography showed widespread irregular thickening of the stomach walls. The boundary between the stomach and the lateral segment of the liver or pancreas was ambiguous, so we suspected the tumor to be invading these tissues (fig. 1). Gastrointestinal fiberoptic endoscopy showed a type 5 tumor in the upper to lower stomach showing easy bleeding (fig. 2), histologically diagnosed as tubular adenocarcinoma. Advanced gastric cancer involving the liver and pancreas was diagnosed. The serum hemoglobin level was 6.2 g/dl at first visit. It required preoperative transfusion of a total of ~1,000 ml of red cell concentrate (mannitol adenine phosphate erythrocytes). Preoperative biochemistry showed that the total bilirubin level was 0.2 mg/dl, 15-minute clearance of indocyanine green was 7.5%, carcinoembryonic antigen was 2.2 ng/ml (normal <5.0 ng/ml), gastrointestinal cancer antigen level was 1.7 U/ml (normal <37 U/ml), and alpha-fetoprotein was 3.4 ng/ml (normal <20 ng/ml). Distant metastasis was not proven.

Complete surgical resection was planned on September 2002. An upper midline incision extending from the xiphoid process to above the umbilicus was made. On entering the peritoneal cavity, a small amount of serous peritoneal fluid was found to have no malignancy after cytological examination. There was no peritoneal dissemination. Since it was difficult to identify the whole aspect of the tumor from just the abdominal upper midline incision, an additional oblique incision and left thoracotomy was carried out. A tumor involving almost all of the gastric wall from the cardia to the antrum region was seen. The tumor showed general expanding growth and invasion through the lateral segment of the liver and pancreas, however, it was considered to be resectable. At first, mobilization of the stomach with the distal pancreas and spleen from the retroperitoneum was performed. The lymph nodes around the common hepatic artery were not enlarged and soft. After the lymph nodes were dissected, the splenic artery was ligated. Lateral segmentectomy was done with Pringle's maneuver. The abdominal esophagus was dissected with merger excision of a part of the esophageal hiatus. The splenic artery and vein were ligated and cut. Pancreas diversion was made and Roux-en-Y anastomosis was performed. Three drainage tubes were inserted into the left thoracic cavity, Winslow's foramen and left subphrenic space. The abdominal wall and left thoracic cavity were closed. Total gastrectomy and combined resection of the distal pancreas, spleen and left segment of the liver was completed. Operation time was 173 min, blood loss was 750 ml.

Macroscopically, the resected tumor was a 18.5 × 14.0 cm mass, ulcerated without definite limits, infiltrating into the surrounding wall (fig. 3). Microscopically, the tumor comprised moderately differentiated tubular adenocarcinoma showing hepatic and pancreatic infiltration (fig. 4). Moderate lymphatic and venous invasion were seen. Lymph node metastasis was proved (lymph nodes along the lesser curvature 1/1, lymph nodes along the short gastric vessels 4/9, lymph nodes along the left gastric artery 1/1). There was no involvement of the proximal and distal margin. Pancreatic fistula occurred postoperatively, recovering fully with conservative management. On postoperative day 40, the patient was discharged from our hospital. He received adjuvant tegafur/gimeracil/oteracil chemotherapy which

had to be stopped for two cycles because of grade 3 skin side effect (severe rash; hand-foot skin reaction). He is in good health now without sign of recurrence 7 years and 8 months after therapy.

Discussion

The two main staging systems for gastric cancer are the TNM staging system of the International Union Against Cancer (UICC) [5] and the Japanese Classification of Gastric Carcinoma by the Japanese Gastric Cancer Association (JGCA) [6]. In Japan, the JGCA classification has been used widely for clinical practice and research. According to this classification, the present case was pathological T4 (tumor invasion of adjacent structures), N2 (metastasis to group 2 lymph nodes), M0 (no other distant metastases), stage IV. The 5-year survival rate of stage IV gastric cancer with spreading through all gastric domains after surgery is reported to be 11.0% [7]. Our present result seems to be good that the patient has been living with no recurrence for 7 years and 8 months.

In recent years, discussion about the medical treatment guideline, which shows the method that seems to be the most appropriate among the various ones, has been actively done. Gastric cancer treatment guidelines, published by the JGCA in April 2004 [7, 8], suggest that extended surgery, reduction surgery, chemotherapy or hyperthermochemotherapy may be performed in stage IV gastric cancer. Extended surgery is defined as gastrectomy more than standard surgery, including combined resection of involved organs. The principle of indication of extended surgery is tumor directly invading the surrounding organs, in which combined resection is the only treatment for cure [7, 8]. In the present case, severe anemia accompanied by tumor bleeding was preoperatively seen. An immediate treatment was necessary, so it was thought that neoadjuvant chemotherapy did not have to adjust. Total gastrectomy and combined resection of surrounding organs is considered to be the almost only treatment for completely cure.

There are various opinions on whether extended surgery of T4 gastric cancer is clinically meaningful. The most frequent invasion organs of T4 gastric cancer are the transverse colon, pancreas and liver [9]. In case surgical treatment of T4 gastric cancer is performed, the following two points should be considered: (1) postoperative complications accompanying excision of the adjacent organs and (2) whether improvement of survival rate is obtained or not. Shchepotin et al. [9] reported that the incidence of complications is 31.2% and the mortality rate resulting from complications is 13.2%. Yasuda et al. [10] reported that in T4 gastric cancer, especially tumors more than 10 cm in diameter, local complications such as ruptured suture or intraperitoneal infection increase. Martin et al. [11] reported that when the number of combined resected organs, serious complications increase significantly. Kodama et al. [12] proposed that the best indication for en bloc combined organ resection was invasion limited to only one other organ. On the other hand, Shchepotin et al. [9] reported that patients who present with T4 gastric cancer (about 20% of the patient population) will benefit from aggressive en bloc surgical resection and should not be considered unresectable. Maehara et al. [13] concluded that pancreas-invasive gastric cancer cells are likely to advance via lymphatic and vascular routes and survival time is shorter, but curative resection can improve the survival rate, and perioperative treatment should be appropriately designed.

In the present case, there seemed perioperatively to be no direct invasion of the tumor into the common hepatic artery or no massive metastasis in lymph nodes along the common hepatic artery. Appleby procedure (AP), that is celiac trunk and common hepatic artery resection without arterial reconstruction, could be avoided. AP might cause ischemia-related complications, such as hepatic or gallbladder necrosis [14]. AP should be performed as rarely as possible. Left upper abdominal evisceration (LUAE) might be chosen for the present case, that is the en bloc resection of the left side upper abdominal organs, including the whole stomach, omentum, body and tail of the pancreas, spleen, and transverse colon. However the effectiveness of LUAE is not yet established [7]. Curative resection could be successfully done without performing AP and LUAE.

There has been little evidence on significant survival benefit in the clinical trials of chemotherapy for prevention of recurrence from microresidual tumor after curative resection. At present, the single or multiple agents for postoperative adjuvant chemotherapy most frequently used are the following: 5-FU, CDDP, CPT-11 (irinotecan), docetaxel, paclitaxel, UFT (tegafur/uracil) and S-1 (tegafur/gimeracil/oteracil). In the present case, S-1 was administered, but the chemotherapy had to be given up for two cycles because of side effects. It seems that in the present case, surgery rather than chemotherapy greatly contributed to the long-term survival after resection of advanced gastric cancer.

In conclusion, although the prognosis for patients with stage IV gastric cancer involving the liver or/and pancreas remains poor, a long-term survival case among the complete resection cases occasionally exists. We performed not excessive but extended surgery of advanced gastric cancer with hepatic and pancreatic invasion, and long-term survival was achieved.

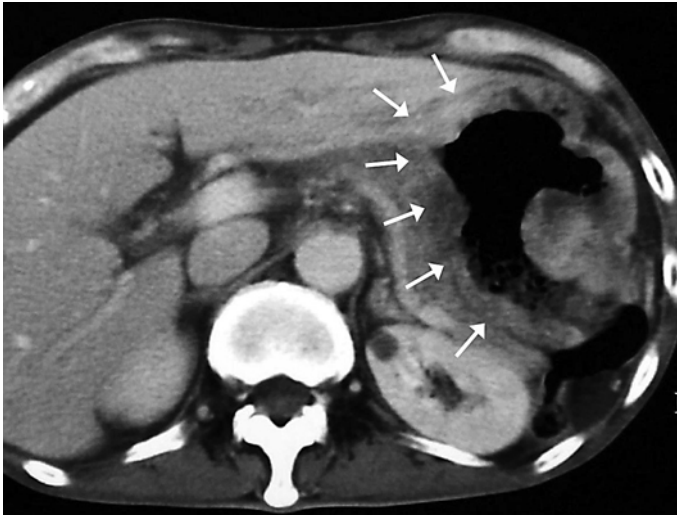


Fig. 1. Enhanced abdominal computed tomography findings. Widespread irregular thickening of the stomach walls (arrows) was observed. The boundary between the thickening wall and the liver or pancreas was ambiguous, so we suspected the tumor to be invading the left hepatic lobe and pancreas.

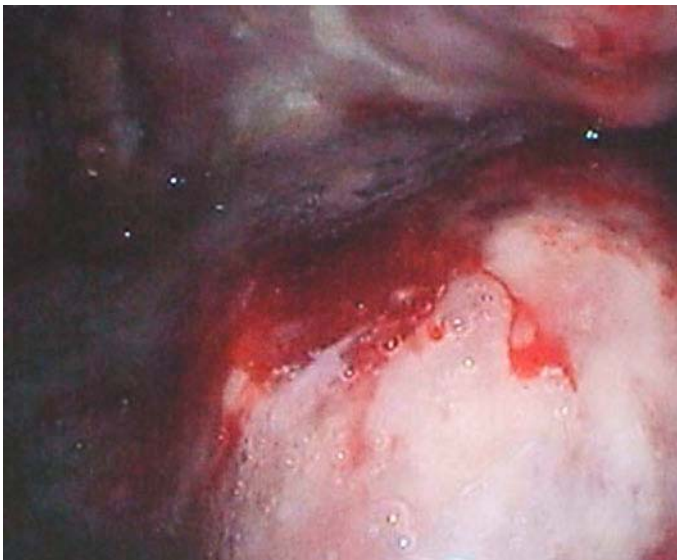


Fig. 2. Gastrointestinal fiberoptic findings. A type 5 tumor in the upper to lower stomach showing easy bleeding and white moss was observed. It was histologically diagnosed as tubular adenocarcinoma.

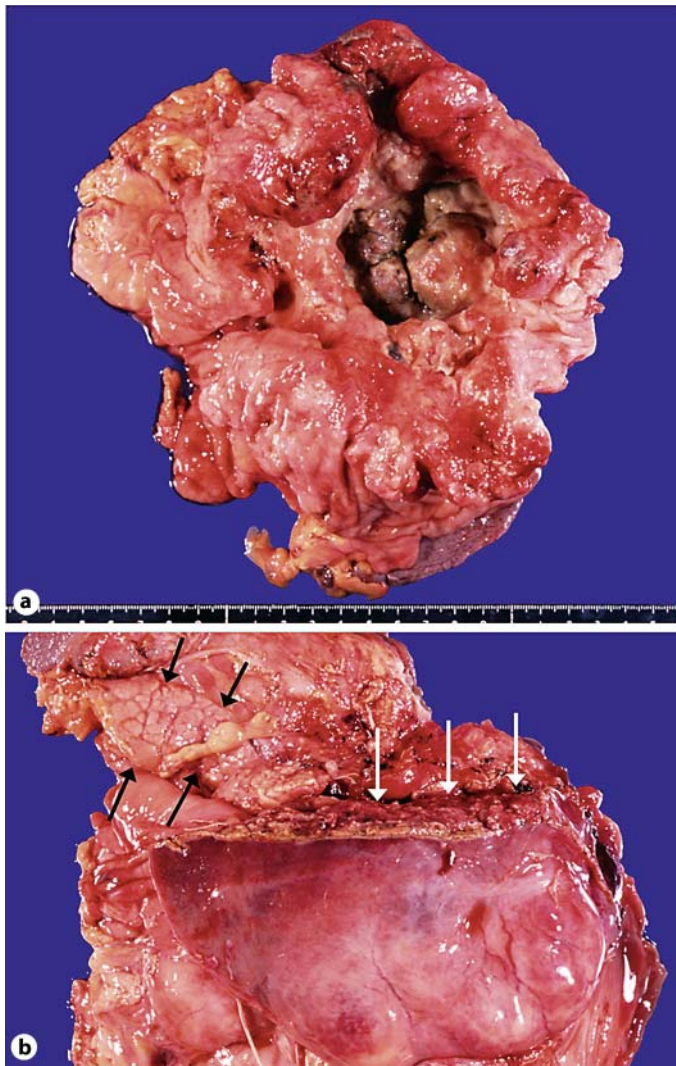


Fig. 3. Macroscopic findings. The resected tumor was a 18.5 × 14.0 cm mass, ulcerated without definite limits (a), infiltrating into the surrounding tissues (b) (white arrows: liver; black arrows: pancreas).

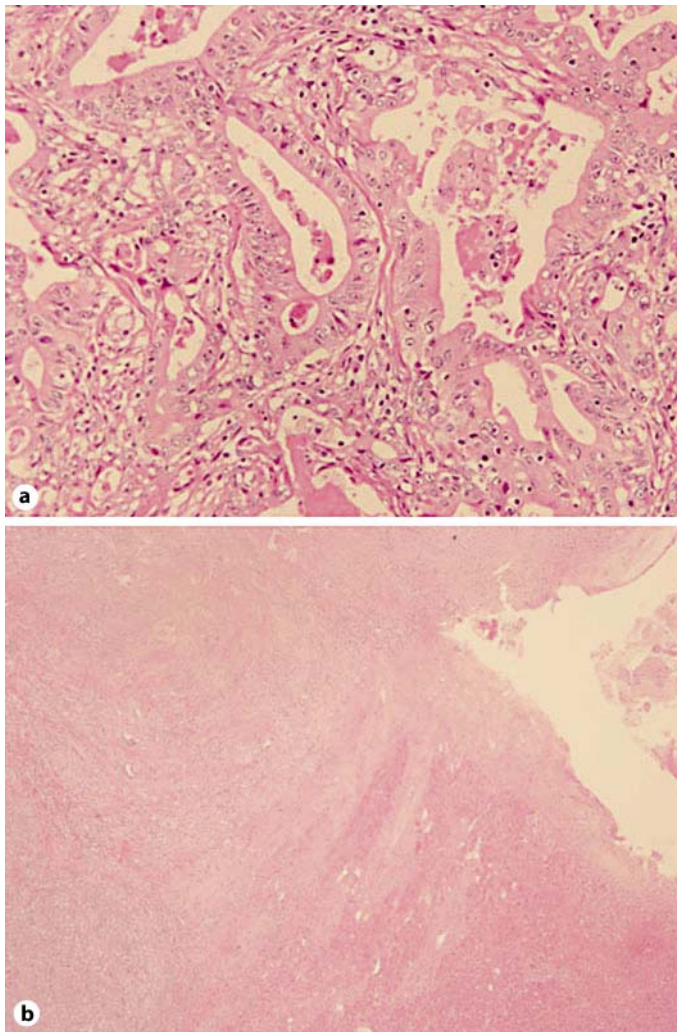


Fig. 4. Microscopic findings. The tumor comprised moderately differentiated tubular adenocarcinoma (a). The tumor cells invaded the liver tissue (b).

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