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Laparotomy with a curative intent in patients with suspected locally recurrent gastric cancer

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ABSTRACT

Aims and background. Most recurrent gastric tumors are unsuitable for further resection or palliative surgery. The aim of the present study was to evaluate the role of re-resection in patients with local-regional recurrences of gastric cancer.

Methods and study design. Between 1998 and 2007, 26 patients underwent laparotomy for local-regional gastric cancer recurrence. Length of time to recurrence, recurrence patterns, operative procedures, morbidity, mortality and survival after re-resection were evaluated.

Results. Re-resection was possible in 13 patients (50%). Among patients with resectable tumors, survival times were markedly longer, with 2 patients reaching 60 months of survival and 2 other patients reaching 48 and 28 months, respectively. Among patients with early recurrence, peritoneal carcinomatosis was more common. After re-resection, morbidity and mortality were seen, each in one patient.

Conclusions. Most of the re-resected recurrences were intraluminal. In patients with early recurrences of gastric cancer, peritoneal carcinomatosis was encountered most frequently. Re-resection was beneficial and long-term survival was achieved after re-resection.

Introduction

Most patients with gastric cancer are diagnosed at stages 3 and 4 in Western countries, and 80% of them eventually develop a recurrence[1]. For patients with local-regional recurrences or distant metastases, the prognosis is poor. The most frequent sites of recurrence are the peritoneal surfaces[1], and recurrences are often found in various forms or at more than one site simultaneously[2]. In patients in whom preoperative evaluations show no widespread peritoneal dissemination or distant metastases, recurrences can still be found intraoperatively to be unresectable. In the literature, not much information is available regarding surgical treatment and outcomes of patients with local-regional recurrence of gastric cancer.

The aim of the present study was to investigate the role of laparotomy with a curative intent in patients with suspected locally recurrent gastric cancer.

Patients and methods

Between 1998 and 2007, 26 patients underwent laparotomy with a curative intent for local-regional gastric cancer recurrence. Within this period, 1114 patients underwent laparotomy for gastric carcinoma in our center. Patient data were recorded prospectively with the use of specially designed forms. The patients' initial operations were performed either in our center or in other centers, for histologically confirmed adenocarcinoma in all cases. Patients were not included in the study if they had pre-

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operatively recognized distant metastases or unresectable tumors, or if they had undergone operations for purposes other than resection, such as for ileus or hemorrhage. Recurrences were detected with one or more of the following: abdominal ultrasonography, endoscopy, computerized tomography, positron emission tomography and surgery. Local-regional recurrence was defined as extraluminal or intraluminal. Recurrences detected within 24 months were regarded as early and those detected after 24 months as late recurrences. Length of time to recurrence, recurrence patterns, operative procedures, morbidity, mortality and survival after secondary operations were evaluated.

The patients in the series, due to their being candidates for surgical treatment of their recurrent disease, underwent surgery as soon as possible without any preoperative chemotherapy. After surgery, all patients were directed to the medical oncology clinic to be evaluated for chemotherapy and/or radiotherapy. The need for chemo-radiotherapy and the treatment protocols to be used were determined by medical oncologists.

Statistical analysis

Data were analyzed with SPSS 11.5 statistical software (SPSS, Inc., Chicago, ILL, USA). Continuous variables were expressed as mean ± standard deviation, and quantitative data were presented as numbers of patients and in terms of percentage. Categorical data were analyzed via Fisher's Exact test. Odds ratio and 95% confidence interval were calculated for determining the effect of relapse time on resectability and the presence of peritoneal carcinomatosis, respectively. Survival was calculated via the Kaplan-Meier method. *P* less than 0.05 was considered to be statistically significant.

Table 1 - Initial operations of the patients

Operation	Number
Subtotal gastrectomy	11
Subtotal gastrectomy + segmentary ileum resection	1
Subtotal gastrectomy + D2 lymph node dissection	5
Total gastrectomy	7
Total gastrectomy + D2 lymph node dissection	1
Total gastrectomy + splenectomy + distal pancreatectomy + D3 lymph node dissection	1
Total	26

Table 2 - Resections for 13 patients

Operation	Number
Total gastrectomy + splenectomy*	4
Total gastrectomy	1
Total gastrectomy + splenectomy + distal pancreatectomy + partial diaphragm resection	1
Near total gastrectomy + splenectomy + distal pancreatectomy + transverse colon resection (R2 resection)	1
Total gastrectomy + partial colon resection	1
Total gastrectomy + partial small bowel + colon resection	1
Resection of EJ** anastomosis and re-EJ	1
Resection of EJ anastomosis and re-EJ + partial colon	1
Partial resection of the Roux loop + partial colon	1
Splenectomy + partial small bowel resection	1
Total	13

*One patient in this group underwent a tertiary operation for anastomotic recurrence 20 months after the secondary operation, and resection of esophagojejunostomy anastomosis and re-esophagojejunostomy were performed.
**Esophagojejunostomy.

Results

Twenty-six patients underwent laparotomy with a curative intent for local-regional recurrence of gastric cancer. Sixteen patients were male and 10 were female, and the overall mean age was 58.64 ±12.1 years. The median interval between primary and secondary operations was 24 months (range, 5-120). There were 16 early and 10 late recurrences. The primary operations of the patients are summarized in Table 1.

Among the 26 patients, 17 had intraluminal and 9 had extraluminal recurrences. Re-resections were performed in 13 patients (50%). The re-resections are described in Table 2. Of the intraluminal recurrences, 15 were anastomotic. Of the other 2 intraluminal recurrences, 1 was an esophageal polypoid lesion and the other was located in the afferent loop. Of these 17 patients, re-resection was carried out in 10 (58.8%): 8 patients underwent total gastrectomy; 1 underwent palliative near total gastrectomy with splenectomy, distal pancreatectomy, and transverse colon resection (R2 resection); and 1 patient underwent resection of an esophagojejunostomy anastomosis segment and re-esophagojejunostomy. Additional organ resection was performed with total gastrectomy when necessary. In one of these patients, a third operation was needed for anastomotic recurrence 20 months after the second operation and involved resection of an esophagojejunostomy anastomosis and re-esophagojejunostomy. The patient survived for 60 months from the second operation and was then lost to follow-up.

Of the 9 extraluminal recurrences, 3 (33.3%) were resected. The first patient underwent partial jejunum resection and splenectomy; the second patient underwent resection of an esophagojejunostomy anastomosis and re-esophagojejunostomy, and the third patient underwent partial resection of the Roux loop.

Resection could not be carried out in 13 patients. Of these patients, 9 had peritoneal carcinomatosis and 4 had locally extended unresectable tumor lesions. The nonresective operations performed for these patients are listed in Table 3.

Table 3 - Nonresective operations

Operation	Number
Exploratory laparotomy	6
By-pass procedure	3
Feeding jejunostomy	2
Re-gastroenterostomy	1
Partial small bowel resection	1
Total	13

The median interval between primary and secondary operations (length of time to recurrence) for patients with resectable tumors was 24 months (range, 13-108), and for patients with unresectable tumors the corresponding time was 20 months (range, 5-120). The difference was not statistically significant. For the 10 patients with peritoneal carcinomatosis, the median length of time to recurrence was 15 months (range, 5-26), and for the 16 patients without peritoneal carcinomatosis, the corresponding time was 26 months (range, 12-120). This difference was statistically significant (P <0.05).

Postoperative morbidity was seen in 3 patients. One patient who underwent total gastrectomy and splenectomy experienced ileus, which required prolonged medical therapy. The patient was discharged 23 days after the operation. Another patient experienced ileus after a bypass procedure (ileocolostomy) and was discharged after 26 days of medical therapy. The third patient experienced transient vomiting after exploratory laparotomy and was discharged on the 5th postoperative day.

Mortality occurred in 1 patient, after total gastrectomy, splenectomy, distal pancreatectomy and partial diaphragm resection. The patient's general condition did not improve after the operation, and she died following cardiac arrest on the 9th postoperative day.

Among patients with unresectable tumors, the longest survival time was 4 months. However, unexpectedly good long-term survival times were observed among the patients with resectable disease. In the latter group, 2 patients reached 60 months of survival. Of these patients, one died in the 60th month, and the other was lost to follow-up. Another patient in the resectable group had a survival time of 48 months and was then lost to follow-up, and a fourth patient survived for 28 months. One patient with resectable disease died 3 months after the second operation from cerebral emboli. In the resectable group, a total of 6 patients survived for more than 1 year. In this group, there are 3 other patients who are still alive but whose follow-up times are shorter than 1 year. Survival curves for the patients are shown in Figure 1.

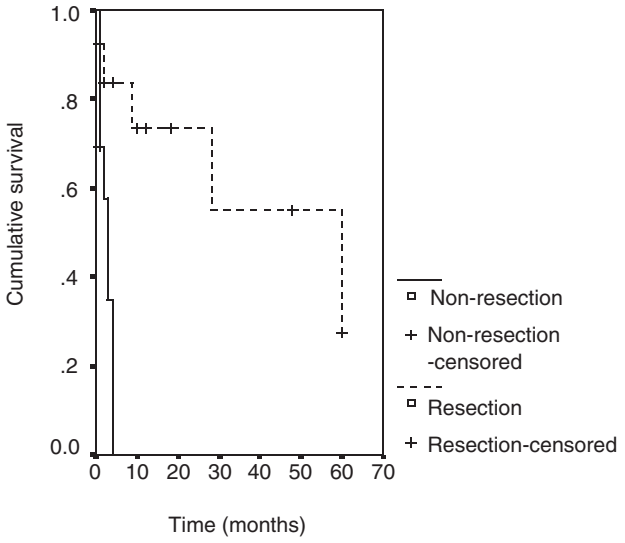

Figure 1 - Survival curves of the patients with resectable and unresectable tumors. There was a significant survival difference between the two groups (P <0.05).

Discussion

Among patients with gastric adenocarcinoma, tumors recur in more than half, even after potentially curative operations[3]. The most common sites of recurrence are the peritoneum and liver[3]. Most of the recurrent tumors are unsuitable for further resection or palliative surgery. Therefore, reoperation for cure has not been extensively studied. Yoo *et al.*[2] reported that of 508 patients with recurrent gastric carcinoma, only 19 (3.7%) were appropriate for reoperation for cure. In that study, the most common recurrence pattern was recurrence in the anastomosis and stump, and next in frequency was recurrence in the lymph nodes, mostly the mesenteric or paraaortic nodes. Local-regional recurrence was the least common among the recurrence patterns[2].

Local-regional recurrence can be seen as local lymph node metastasis, extraluminal recurrence, recurrence within the gastric remnant, or anastomotic recurrence following total gastrectomy[3]. Lehnert *et al.*[3] suggested that re-resection with a curative intent is possible for local-regional recurrence when a partial gastrectomy has been previously performed, and that resection of extraluminal local recurrence is rarely possible. In our study, most intraluminal recurrences were encountered in the anastomosis after subtotal gastrectomy, and a higher proportion of these patients were appropriate for re-resection. However, we also performed resection of the esophagojejunostomy segment for recurrences after total gastrectomy.

In our study, intraluminal recurrences were more frequently resectable than were extraluminal recurrences. Theoretically, intraluminal recurrences can be recog-

nized endoscopically at earlier stages, and potentially curative operations may be carried out. However, patients with recurrence in general often present with advanced disease.

Postoperative morbidity and mortality after re-resection were observed in one patient each in our study. This is less than in the study by Shchepotin *et al.*[4], who reported a 15% operative mortality rate in a similar group of patients. Morbidity and mortality after re-resection for recurrent gastric cancer have not been sufficiently described in the literature, but given the poor general prognosis of patients in this condition, we consider re-resection to be worthwhile when possible.

Survival after re-resection for local-regional recurrence of gastric cancer has not been extensively investigated. According to Lehnert *et al.*[3], survival after re-resection can hardly be expected to exceed 1 year. However, longer survival times have been reported for patients who underwent dissection for recurrence in the para-aortic lymph nodes[5,6]. In addition, Takeyoshi *et al.*[7] reported that 2 of 5 patients who underwent resection for recurrent gastric cancer survived for more than 3 years. Of our patients who underwent re-resection, 3 survived for 4 years or more. Of the 2 patients who died within the first few months of re-resection, one had undergone an R2 resection and the other died from cerebral emboli. The other deaths occurred at 9, 28 and 60 months after re-resection, and the remaining patients are continuing in follow-up. Our results suggest that re-resection for local-regional recurrence may be beneficial in terms of long-term survival.

In summary, the present study included only patients with local-regional recurrence of gastric cancer who were operated on with a curative intent, and most of the re-resected recurrences were intraluminal. Early recurrences were more frequently accompanied by peritoneal carcinomatosis. Unexpectedly long survival times were seen in some of our patients, which suggests that re-resection should be attempted whenever possible. It should be kept in mind that surgery is the only proven effective treatment modality for gastric cancer.

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