[SpringerLink] DOI 10.1007/s11805-007-0089-5

Rational Operation for Primary Gastric Carcinoma with Liver Metastasis

Caigang Liu
Ping Lu
Jinsong Gu
Junqing Chen

Department of Oncology, The First Affiliated Hospital of China Medical University, Shenyang 110001, China.

Correspondence to: Ping Lu
e-mail:luping2999@yahoo. com.cn

Foundation item: This work was supported by National Natural Science Foundation (No.30471678)

Received January 26, 2007; accepted February 10, 2007.

OBJECTIVE To investigate the prognosis of advanced gastric carcinoma patients with liver metastasis, and provide a foundation for rational operations.
METHODS The operations and prognosis of 102 primary gastric carcinoma patients with liver metastasis were studied retrospectively.
RESULTS In gastric carcinoma patients with H1 metastasis who underwent a resection operation, the 6-month, 1- and 2-year post-operative survival rates were 61%, 42% and 7%. There was a statistically significant difference in survival between resected and non–resected patients (P=0.000) In gastric carcinoma cases with H2 metastasis, resection operations resulted in 54%,16% and 8% respective survival rates, with no significant difference compared to patients not receiving a resection (P=0.132). Gastric carcinoma patients with H3 metastasis who received a resection operation showed 25%, 13% and 0% respective survivals with no significantly better prognosis compared to the non–resected cases (P=0.135). There was no statistically significant difference in survival between the cases with or without peritoneal metastasis (P=0.152).
CONCLUSION A resection operation provides a better prognosis for gastric carcinoma patients with H1 metastasis independent of peritoneal metastasis, but resection has no benefit for gastric carcinoma cases with H2 or H3 metastasis. Peritoneal metastases are not the significant influencing factor for the prognosis of gastric cancer with liver metastasis.

KEYWORDS: stomach neoplasms, liver metastasis, prognosis.

Many gastric carcinoma cases are advanced when diagnosed, and some are accompanied with liver, peritoneal, distant lymph node and other organ metastases. The surgical therapy for advanced gastric carcinoma, especially for the cases with liver metastasis, is still disputed. This study analyzed the effect of an operation on the prognosis in order to provide a foundation for a rational operation for Stage IV gastric carcinoma with liver metastasis.

MATERIALS AND METHODS

Patient information

A total of 102 primary gastric carcinomas with liver metastasis were selected, who were treated in the Onco-Surgery Department of the First Affiliated Hospital of China Medical University from 1993 to 2004. There were 89 male and 13 female patients, with an average age of 55 years (30-75 years).
Of the total cases, 85 were followed-up (83.3%). Among them, 39 cases were with H1 metastasis, 22 cases were with H2 and 24 cas-

es were with H3. Of the 39 H1 cases, 6 cases (15.4%) received P1, 2 cases (5.1%) received P2 and none received P3. Among the 22 H2 cases, 4 cases (18.2%) received P1, 1 case (4.6%) received P2, and 3 cases (13.6%) received P3. Among the 24 cases with H3, 2 cases (8.3%) received P1, 4 cases (16.7%) received P2, and 8 cases (33.3%) received P3.

Surgical treatment

In all the 102 cases, 63 underwent a resection operation (extensive or palliative resection), and 39 cases did not receive a resection operation (by-pass procedure or exploratory laparotomy). Among the 63 cases mentioned above, 15 cases were treated with an extensive resection (≥D2 lymphadenectomy or with other organ combined excision), and 48 cases were treated with a palliative resection. Of the 39 cases without a resection operation, 25 cases received a by-pass procedure, and 14 cases only underwent an exploratory laparotomy.

The operations of the followed-uped cases were as follows. In 39 cases with H1, 28 cases received a resection operation (12 cases with an extensive resection, 16 cases with a palliative resection). For all the 11 H1 cases without a resection operation, 6 cases underwent a by-pass procedure, and 5 cases received an exploratory laparotomy.

In the 22 cases with H2 metastasis, 17 cases received a resection operation (1 case with an extensive resection, and 16 cases with a palliative resection). The other 5 cases were not resected (4 cases with a by-pass procedure, 1 case with an exploratory laparotomy).

In the 24 cases with H3 metastasis, 11 cases received a palliative resection, and 13 underwent no resection (8 cases with a bypass procedure, and 5 cases with an exploratory laparotomy).

Reference standard

Liver metastasis referred to the Japanese classification for gastric carcinoma [1]. H1 is identified when metastases are located in one liver lobe, metastases founded in two liver lobes are H2, and H3 indicates diffuse liver metastasis.

Statistical treatment

All the data were analyzed with SPSS 13.0 statistical software. Group comparisons were analyzed with the $\chi 2$ test. The Kaplan-Meier and Log rank tests were adopted for the analysis of survival-rate comparisons.

RESULTS

Relationship between liver and peritoneal metastasis

Of the 102 cases, 34 cases (33.3%) were associated with peritoneal metastasis. Peritoneal metastases were found in 12 cases (21.4%) of the 56 H1 cases, 8 cases (36.4%) of the 22 H2 cases, and 14 cases (58.3%) of the 24 H3 cases. The occurrence of peritoneal metastasis was significantly different among the H1, H2 and H3 cases (P=0.005)，(Table 1).

Table 1. Relationship between liver metastasis and peritoneal metastasis.

	n	P total（%）	P1（%）	P2（%）	P3（%）
H1	56	12(21.4)	7（12.5）	3（5.4）	2（3.6）
H2	22	8(36.4)	4（18.2）	1（4.6）	3（13.6）
H3	24	14(58.3)	2（8.3）	4（16.7）	8（33.3）
		P=0.005	*P*=0.604	*P*=0.183	*P*=0.001

Complications and operative mortality

In the 63 cases who underwent resection operations, 5 (7.9%) developed complications, and 3 cases (4.8%) died under operation. In the 39 cases receiving no resections, 1 case (2.6%) developed complications, and 3 patients (7.7%) expired during the surgical procedure. No statistically significant difference was found associated with the complications or operative mortality between resected or non-resected cases (P=0.265, P=0.543).

Patient prognosis

In cases with H1, the post-operative median survival time following resection operations was 11 months, and the 6-month, 1- and 2-year survival rates were 61%, 42% and 7% respectively. The median survival time for non-resected cases was 6 months, and the 6-month, 1- and 2-year survival rates were 24%, 0% and 0% respectively. A statistically significant difference was found in survival between resected and non-resected patients (P=0.000), (Fig. 1).

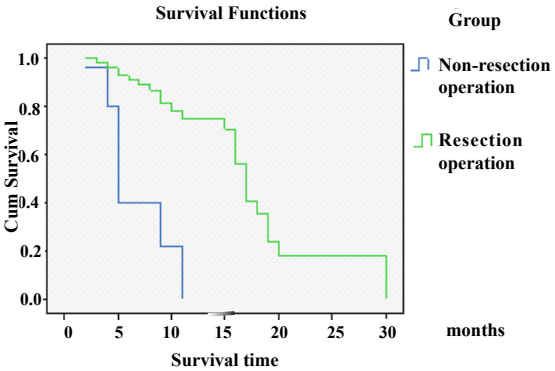

Fig.1. Kaplan-Meier survival curve for cases with H1 metastasis.

In cases with H2 metastasis, the post-operative me-

dian survival time for resected cases was 6 months, and the 6-month, 1- and 2-year survival rates were 54%, 16% and 8% respectively. The post-operative median survival time for non-resected patients was 5 months, and the 6-month, 1- and 2-year survival rates were 13%, 0% and 0% respectively. No statistically significant difference was found in survival between cases receiving a resection or non-resection operation (P=0.132), (Fig. 2).

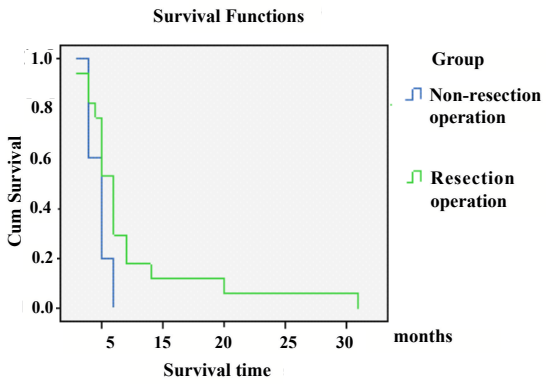

Fig.2. Kaplan-Meier survival curve for cases with H2 metastasis.

In cases with H3, the post-operative median survival time for resected cases was 4 months, and the 6-month, 1- and 2-year survival rates were 25%, 13% and 0% respectively. The post-operative median survive time for non-resected patients was 4 months, and the 6-month, 1- and 2-year survival rates were 5%, 0% and 0% respectively. No statistically significant difference was found in survival between resected and non-resected cases (P=0.135), (Fig.3).

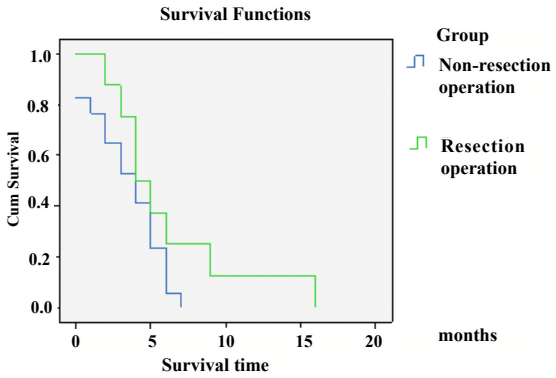

Fig.3. Kaplan-Meier survival curve for cases with H3 metastasis.

Prognosis of cases with peritoneal metastasis

For the cases without peritoneal metastasis, the 6-month, 1- and 2-year post-operative survival rates were 57%, 32% and 4%. For cases with peritoneal metastasis, they were 28%, 17% and 3%. There was no statistically significant difference in survival between the cases with or without peritoneal metastasis (P=0.152), (Fig. 4).

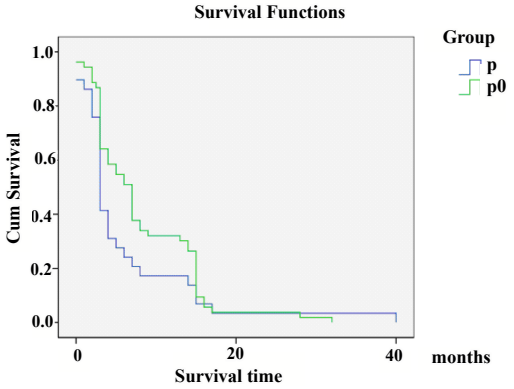

Fig.4. Kaplan-Meier survival curve for cases with or without peritoneal metastasis.

DISCUSSION

At present, most gastric carcinoma patients are in an advanced condition when diagnosed. Stage IV gastric carcinoma accounts for 20%, and liver metastasis are found in 6-11% of the patients [2]. The prognosis of these cases with liver metastasis is poor, and the surgical therapies are still disputed. Advanced gastric carcinoma with liver metastasis is usually accompanied with pyloric obstruction, cancer focus perforation, hemorrhage, hydroperitoneum, peritoneal metastasis etc, so most are not curable. In the past, passive treatments were employed, but now, many cancer surgeons recommend active treatments[3~6].

In our study, the H1 patients who underwent a resection operation had a post-operative median survival time of 11 months, with a statistically significant difference in survival compared to cases without a resection operation. Kwok et al. [7] reported that the post-operative median survival time of cases treated with a palliative resection for gastric carcinoma with H1 or H2 was 7.8 and 4.3 months. Palliative resections improved the prognosis of gastric carcinoma cases, but failed to improve the prognosis for patients with H2 metastasis. Kanda et al. [8] analyzed 79 cases of gastric carcinoma with liver metastasis. For a simple lobe or a scattering on two liver lobes, the prognosis of cases with a liver resection was better than without. Palliative resections can significantly improve prognoses. The Japanese gastric carcinoma therapy guide-lines [9] advocate the following: Extensive resections can be conducted for cases with H1

metastasis on the basis of radical therapy after systematic evaluation. Palliative resections can delay the occurrence of hemorrhage, obstruction, stenosis and pain caused by the tumor. In our gastric cancer patients with liver metastasis, peritoneal metastasis was not a significant influencing factor. However, with or without peritoneal metastasis, we should perform a resection operation for H1 gastric carcinoma cases. A resection operation can relieve the tumor load and decrease complications, as well as create a chance for other therapies. For gastric carcinoma with H2 or H3 metastasis, survival was not significantly different with or without a resection, so this operation may not be beneficial for the patients. In our study, no significant differences were found in complications or operative mortality with or without a resection operation.

Sasaki et al. [4] reported that for gastric carcinoma patients with H3 metastasis, operation does not improve the prognosis. For Stage IV gastric carcinoma with liver metastasis, especially for H3 cases, we should conduct an auxiliary examination before operation, to avoid as far as possible an unnecessary exploratory laparotomy. Palpation of the tumor repeatedly in an exploratory laparotomy can destroy the tumor immunological barrier, and is not beneficial for prognosis.

At present, active treatments are advocated for advanced gastric carcinoma cases with liver metastasis. For cases with H1 metastasis, resection operations can relieve the tumor load and decrease complications. For the cases which are unoperable, other treatments should be performed and terminal care is helpful. However, unnecessary exploratory laparotomies should be avoided[10~14].

We have studied the prognosis of gastric carcinoma with liver metastasis and have proposed specific surgical therapies. For patients with advanced gastric carcinoma and liver metastasis. The results of this study may provide a foundation for surgical treatments.

REFERENCES

1 Japanese Research Society for Gastric Cancer. The general rules for gastric cancer studies in surgery and pathology. 12th ed. Tokyo. 1993:64-67.
2 Zhang MS, Mao WZ, Chen JQ. Early diagnosis and predict of liver metastasisof gastric cancer. Chin J Curr Adv Gen Surg. 2004; 7:327-329.
3 Noda K, Umekita N, Shiba Y, et al. Indication and meaning of liver resection formetastatic liver tumors from gastric cancer. Gan To Kagaku Ryoho. 2005; 32:1688-1690.
4 Sasaki H, Ninomiva M, Yano S, et al. Evaluation of multimodlity therapy for synchronous liver metastases of gastric cancer. Gan To Kagaku Ryoho. 2004; 31:1924-1926.
5 Roh HR, Suh KS, Lee HJ, et al. Outcome of liver resection for metastatic gastic cancer. Am Surg. 2005; 71:95-99.
6 Hirai I, Kimura W, Fuse A, et al. Surgical management for metastatic liver tumors. Hepatogastroenterology. 2006; 53:757-763.
7 Kwok CM, Wu CW, Lo SS, et al. Survival of gastric cancer with concomitant liver metastases. Hepatogastroenterology. 2004; 51:1527-1530.
8 Kanda T, Muneoka K, Ikeda Y, et al. Indication of liver resection for metatatic liver tumors from gastric cancer. Gan To Kagaku Ryoho. 2004; 31:1891-1893.
9 Sasaki T. In regard to gastric cancer treatment guideline--a revised edition. Gan To Kagaku Ryoho. 2004; 31:1947-1951.
10 Nunobe S, Sano T, Shimada K, et al. Surgery including liver resection for metastatic gastrointestinal stromal tumors or gastrointestinal leiomyosarcomas. Jap J Clin Oncol. 2005; 35:338-341.
11 Nashimoto A, Tsuchiya Y, Sasaki J, et al. Evaluation of liver arterial infusion chemotherapy using reservoir for liver metastases from gastric cancer. Gan To Kagaku Ryoho. 1998; 25:1402-1405.
12 Kunieda K, Saji S, Sugiyama Y, et al. Evaluation of treatment for synchronous liver metastases from gastric cancer with special reference to long-time survivors. Surg Today. 2002; 32:587-593.
13 Mizutani S, Oyama T, Hatanaka N, et al. Unresectable gastric cancer with multiple liver metastases effectively treated with combined paclitaxel and doxifluridine chemotherapy. Int J Clin Oncol. 2006; 11:471-474.
14 Yilmaz U, Oztop I, Alacacioglu A, et al. Irinotecan combined with infusional 5-fluorouracil and high-dose leucovorin for the treatment of advanced gastric carcinoma as first-line chemotherapy. Chemotherapy. 2006; 52:264-270.