

Clinicopathologic Characteristics and Surgical Outcome of Gastric Cancer in Patients Younger than 36 Years of Age

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OBJECTIVE This study was designed to determine the clinicopathologic features of young patients who underwent gastrectomy for gastric cancer and to improve the clinical management of this disease.

METHODS From 1981 to 2000, among 1,830 gastric cancer patients were admitted in our hospital for surgical treatment, 66 of them were < 36 years of age. The clinicopathologic data of these young patients were collected and reviewed.

RESULTS The male : female ratio was 1.2 : 1. Most tumors were located in the lower third of the stomach (63.1%). The overall 5-year survival rate of 66 cases was 28.7%. The 5-year survival rates in the patients with early stages and with advanced stages of gastric carcinoma were 77.8% (7/9) and 21.1% (12/57), respectively. Unfavorable prognostic factors associated with poor 5-year survival included the degree of the invasion in the gastric wall ($P < 0.05$), and curability of resection (non-curative vs. curative; $P < 0.05$).

CONCLUSION Gastric cancer in young adults tends to be more advanced presentation when diagnosed. However, young patients with early gastric cancer can tolerate radical treatments well. It is important to promptly make a precise diagnosis for gastric carcinoma in young patients and to treat it in early stage.

KEY WORDS: gastric carcinoma, clinicopathologic characteristics, young patients prognosis.

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Introduction

Gastric cancer (GC), one of the most common malignant diseases, is the second leading cause of cancer-related death both in China and rest of the world (700,000 deaths annually)^[1,2]. Gastric carcinoma is usually found in aged population at a mean age of approximately 50–60 years old^[3–6]. The incidence of GC in subjects at 40 years of age or younger is very low and ranges between 2%–15%^[7–9]. It is assumed that carcinoma in young patients develops aggressively and with a poor prognosis. Thus, in our study we retrospectively analyzed the clinicopathologic characteristics for young patients with gastric cancer.

Patients and Methods

Patients

From 1981 to 2000, 1,830 patients with gastric carcinoma underwent surgery in the Department of Oncology, the First Affiliated Hospital

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of China Medical University, Shenyang. Of these, 66 (3.61%) were young patients (defined as younger than 36 years of age). The clinicopathologic features of these young patients were retrospectively reviewed.

Statistical analysis

All data were analyzed using SPSS16.0 statistical software. The survival rate of the patient was calculated using the Kaplan-Meier method, and the relative parameters of prognostic factors were investigated using the Cox proportional hazards model. The Chi-squared test was used to evaluate the statistical significance of differences and P value < 0.05 was considered statistically significant.

Results

Of 1830 patients, 66 (3.61%) were classified as young patients with the age of < 36 years and among them, 36 were male and 30 were female. The ratio of male and female was 1.2:1. The age of the patients at initial diagnosis ranged from 21–35 years, with a mean age of 31.4 years.

The clinicopathologic features of the patients are summarized in Table 1. Among the 66 cases, there were 2 patients whose tumor was located mainly in the upper third of the stomach, 7 located in the middle third, 41 located in the lower third, and 16 located almost throughout the entire stomach. The tumor size ranged from 2 cm–15 cm (mean, 6.6 cm).

Univariate analysis showed that depth of invasion, tumor site, tumor size, distant metastasis and curative resection were the significant prognostic factors for young patients with gastric carcinoma.

The analysis using Cox proportional regression hazard model revealed that the invasive depth of tumor and curative resection were the factors which affected prognosis (Table 2).

The overall 5-year survival rate of the 66 cases was 28.7% (19/66). Nine cases with early stages of gastric carcinoma had much better prognosis ($P < 0.001$) than the others with advanced gastric carcinoma. The 5-year survival rate of the patients with early stages of gastric carcinoma was 77.8% (7/9) and that of the advanced gastric carcinoma patients was 21.1% (12/57) (Fig. 1). Survival curves showed the relationship between the survival time and the type of resection for the patients. The survival rate of the patients receiving the curative resection was significantly higher than that of those receiving non-curative resection (Fig. 2).

There were no significant differences between the 5-year survival rate and the gender, or between the 5-year survival rate and the lymph node metastasis. The 5-year survival rate of the male patients was 33.3% (12/36) and that of the female was 23.3% (7/30). For the patients with lymph node metastasis, the 5-year survival

rate was 23.5% (8/34). In the patients without lymph node metastases, the 5-year survival rate was 34.4% (11/32).

Table 1. Clinicopathologic findings and survival rate of the gastric carcinoma in study patients.

	No. of patients	5-year survival (%)	P
Sex			0.279
Male	36	12 (66.7)	
Female	30	7 (23.3)	
Location			0.008
U	41	17 (41.5)	
M	7	2 (28.6)	
L	2	0	
W	16	0	
Tumor size (cm)			0.008
≤ 5	34	15 (44.1)	
> 5	32	4 (12.5)	
T stage			0.001
T1	9	7 (77.8)	
T2-4	57	12 (21.1)	
Curative resection			0.000
Yes	40	19 (47.5)	
No	26	0	
Distant metastasis			0.000
Yes	21	1 (4.8)	
No	45	18 (40.8)	
Lymph node metastasis			0.297
Yes	32	11 (34.4)	
No	34	8 (23.5)	

Table 2. Multivariable analysis for overall survival after resection.

Variable	SE	χ^2	P
Depth of invasion	0.384	17.805	0.000
Curative resection	1.026	4.641	0.031

Discussion

Although declining trends of morbidity and mortality of gastric cancer have been reported, it is still one of the most common malignancies of the gastrointestinal tract and the leading cause of cancer death in the world^[10–12]. Most patients with gastric cancer are diagnosed at between the age of 50 and 70 years, and 2%–15% of the cases are found in subjects at 40 years old or younger^[5,13–15]. In our study, the young patients less than 36 years old only accounted for 3.61% (66/1830) of all patients with gastric cancer treated in the Department of Oncology, the First Affiliated Hospital of China Medical University.

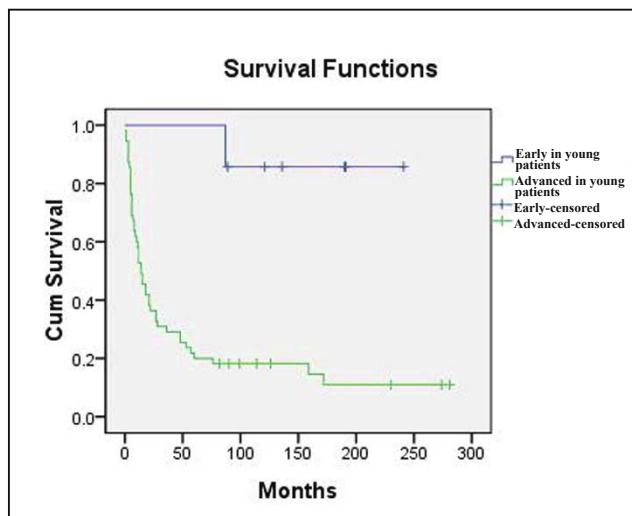


Fig.1. Cumulative survival rates in early and advanced gastric carcinoma patients.

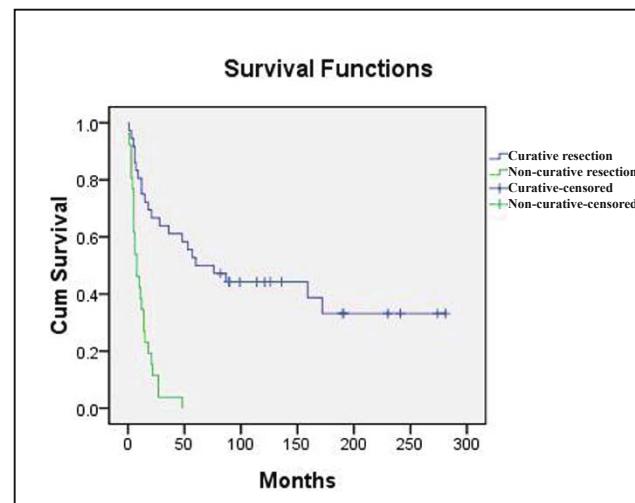


Fig.2. Survival curves of the patients who underwent resection. The survival rate for young patients those with curative resection were significantly better than for those with non-curative resection.

The sex distribution of young patients with gastric cancer is controversial. In most series, the number of the female is either similar or higher than the male, and the ratio of the male and the female ranges from 1.6 to 0.64^[5,16–19]. Other investigators have noted an equal frequency of both males and females in young patients or a male predominance^[20]. Mori et al.^[21] investigated 23 patients with early stages of gastric carcinoma and reported female predominance (the male: female ratio was 1:2.8). Umeyama et al.^[22], investigated that in patients younger than 30 years of age, females predominated (male: female ratio, 0.85/1; $n = 513$), but in patients older than 30, this ratio became reversed (male: female ratio, 1.45/1; $n = 579$), which more closely approximates the situation seen in elderly patients (male : female ratio, 2/1). In our study, the ratio between the male and the female was 1.2 : 1. The reasons for the difference in gender ratios in gastric cancer are currently unknown.

A higher proportion of tumors in the upper third of the stomach in young patients has also been postulated by some authors^[5,16,23]. However, in contrast to these reports, we found a difference in the distribution of GC in the young patients and mostly in cases with tumors located in the low third of the stomach (41/66, 62.1%). Wang et al.^[3] and Choi et al.^[4] reported the same tendency.

Concerning depth of tumor, it has been reported that the deep invasion of tumor happened in a high proportion of young patients with advanced cancer. However, 13.6% of our young patients had early stage of cancer. The prognosis of young patients with gastric carcinoma has shown considerable variation, although it is generally poorer than or similar to that of older patients^[4–6]. Some authors have found that young patients have a worse prognosis mainly due to the different features of

gastric cancers in younger and older patients and a frequent delay in diagnosis^[5,6,24].

It is known that younger patients show a tendency to have a larger proportion of diffuse and undifferentiated tumors and the *linitis plastica* appears more frequently in the young patients than in older patients^[24–26]. Other studies have suggested that the delay in the diagnosis is a negative prognostic factor in young patients and that they also have more aggressive disease^[26,27]. Lai et al.^[28], also showed that the survival of patients younger than 35 years, despite the more aggressive features of the tumor depended on the stage of the disease, not on the age of the patients.

However, among young patients with early stages of carcinoma, high 5-year survival rate (7/9, 77.8%) was recognized in the study. Mori et al.^[21] reported that the 5-year survival rate of 23 patients with early gastric carcinoma was 100%. Among the young patients with advanced carcinoma, a poorer 5-year survival rate (12/57, 21.1%) was seen in this study. Choi et al.^[4] reported that the 5-year overall survival rate of young patients with advanced gastric carcinoma younger than 35 was 51.9%. These findings suggest that young patients with early gastric cancer can tolerate radical treatments well. Prompt and accurate diagnosis of gastric cancer in young patients and starting treatment in the early stage are thus crucial. However, early diagnoses in young patients can be difficult. Doctors should pay more attention to young patients with upper gastrointestinal symptoms, and endoscopic examinations should be recommended in those cases with a high clinical suspicion of GC. The young population should be educated on the signs and symptoms indicative of the presence of GC. The rate of early diagnosis might be increased in young patients if these recommendations are followed.

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