



Gastric Cancer in Patients Above 70 Years of Age

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Clinical records of 406 patients over 70 years of age with gastric cancer operated on during the past 22 years were analyzed. These cases amounted to 11.8% of the 3,425 patients with gastric cancer treated surgically at our hospitals during the same period.

The primary tumor was confined to the upper one-third portion of the stomach in 15.8% of the cases, which was significantly higher than that usually reported. Macroscopic staging of the lesion revealed that more than two-thirds of the patients were suffering from highly advanced disease. The size of the tumor was larger than 50 mm in diameter in 50.8% of the cases. The tumor was predominantly of Borrmann II and III types. Early gastric cancer was observed in only 14.8% of the cases, which was approximately one-half of the usual rate. However, histological study revealed well-differentiated adenocarcinoma in two-thirds of the lesions, a remarkable characteristic of gastric cancer in the elderly.

Resection was possible in 70.9%, and curative resection was performed in 46.8%. The over-all hospital mortality rate was 16.5%. The prognosis of curative resection cases yielded a 5-year survival rate of 51.5% and 10-year survival rate of 25.5%. These results would justify the practice of early diagnosis and aggressive surgery in every acceptable risk patient, if no contraindication exists.

In recent years, with marked prolongation of the average span of life, gastric cancer in the elderly patient has been increasing significantly. In order that the modality of optimal treatment be established in these patients, special characteristics, if any, of gastric cancer in the elderly should be clarified in comparison to gastric cancer in general.

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Thus, this study was undertaken to analyze over the last 22 years our hospital records of patients over 70 years of age who developed gastric cancer.

Methods and Materials

Of 3,425 patients with gastric cancer who underwent laparotomy at the Third Department of Surgery, University of Tokyo and Tohma Hospital in Kumagaya for a 22-year period ending December, 1980, there were 406 patients (11.8%) who were over 70 years of age. The oldest patient was a 91-year-old woman.

The criteria used to determine the indication for operation and the extent of surgical dissection of the lesions including regional lymph nodes were essentially the same for both clinics. Pathological specimens were thoroughly re-examined by one of the authors (Oohara). All data were described and analyzed in accordance with The Japanese General Rules of the Gastric Cancer Study in Surgery [1]. A portion of the Rules is described below.

Macroscopic Stage

Macroscopic stage of gastric cancer is defined by a combination of 4 factors based on gross findings as shown in Table 1, namely, P-factor (peritoneal metastasis), H-factor (hepatic metastasis), N-factor (lymph node metastasis), and S-factor (serosal invasion).

The P-factor category is defined as P₀: no disseminating metastases; P₁: disseminating metastases to the adjacent peritoneum above the transverse colon; P₂: a few to several scattered metastases to the distant peritoneum; and P₃: numerous metastases to the distant peritoneum. The H-factor category is

Table 1. Macroscopic stage of gastric cancer based on the General Rules for the Gastric Cancer Study in Surgery [1].

Stage	Peritoneal metastasis	Liver metastasis	Lymph node metastasis	Degree of serosal invasion
I	P ₀	H ₀	N ₀	S ₀
II	P ₀	H ₀	N ₁ N ₂	S ₁
III	P ₀	H ₀	N ₃	S ₂
IV	More than P ₁	More than H ₁	N ₄	S ₃

defined as H₀: no liver metastasis; H₁: metastasis limited to one of the lobes; H₂: a few scattered metastases to both lobes; and H₃: numerous scattered metastases to both lobes.

The regional lymph nodes of the stomach are designated and classified into groups 1, 2, 3, and 4 in accordance with the location of primary cancer. Then the N-factor category is defined as N₀: no suspected lymph node metastasis; N₁: metastases to lymph nodes of group 1; N₂: metastases to lymph nodes of group 2; N₃: metastases to lymph nodes located beyond group 3.

The S-factor category is defined as S₀: no serosal invasion; S₁: suspected serosal invasion; S₂: definite serosal invasion; and S₃: invasion to contiguous structures.

Radicality of Gastric Resection Procedure

The following 4 types of resection are differentiated: R₀: gastric resection including incomplete removal of group 1 lymph nodes; R₁: gastric resection including complete removal of group 1 lymph nodes only; R₂: gastric resection including complete removal of lymph nodes from groups 1 and 2; and R₃: gastric resection including complete removal of lymph nodes from groups 1, 2, and 3.

Based on histological findings, a curative resection fulfills the following conditions: no metastasis to the liver or peritoneum, no cancer infiltration to the cut margins of the stomach, serosal invasion of S₂ or less degree, and the number of microscopic lymph node metastases smaller than or equal to the R number. The resection procedure not applicable to definition of curative resection is called a noncurative resection.

Results

There were 294 men and 112 women, with a male:female ratio of 2.63.

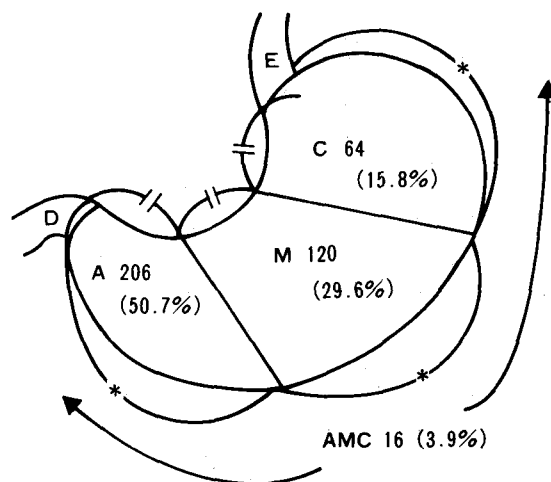


Fig. 1. Location of gastric cancers.

Location of the lesion was classified into A, M, and C, in which A denoted a lesion confined to the lower one-third portion of the stomach, M to the middle one-third portion, and C to the upper one-third portion. There were 206 cases (50.7%) classified as A, 120 cases (29.6%) as M, 64 cases (15.8%) as C, and 16 cases (3.9%) as AMC, in which cancer had extended to all regions of A, M, and C (Fig. 1).

Seventy-nine cases (19.5%) were classified as stage I, 46 cases (11.3%) as stage II, 104 cases (25.6%) as stage III, and 177 cases (43.6%) as stage IV. Since stage III and stage IV are usually considered as highly advanced stages, the result indicates that more than two-thirds of the patients were suffering from highly advanced disease.

A curative resection of gastric cancer was performed in 190 patients (46.8%). As far as radicality of the procedure was concerned, 43 operations were classified as R₁, 144 operations as R₂, and 3 operations as R₃. A noncurative resection was carried out in 98 patients (24.1%). When curative and noncurative resections were combined, there was a total of 288 resectable cases, with a resection rate of 70.9%. Of these, 56 patients with proximal cancers underwent a total gastrectomy. The procedure of proximal gastrectomy was not performed in our series. The operative procedures in 118 patients with non-resectable lesions were as follows: a gastrointestinal anastomosis in 66 patients and a simple laparotomy with or without enterostomy in 52 patients.

The size of the resectable lesions is depicted in Table 2. Although 7 (2.4%) of 288 resectable cases demonstrated small gastric carcinomas less than 10 mm in diameter of major axis, very large gastric cancers of more than 50 mm in diameter were noted in 167 cases (58.0%).

Early gastric cancer, defined as cancerous inva-

Table 2. Size of the lesion in 288 patients with resectable lesions.

Diameter of major axis (mm)	No. of patients	Percent
0-5	2	0.7
6-10	5	1.7
11-20	14	4.9
21-30	17	5.9
31-40	36	12.5
41-50	47	16.3
51-100	129	44.8
101-	38	13.2
Total	288	

Table 3. Macroscopic classification in 228 patients with resectable gastric cancer in an advanced stage.

Classification	No. of patients	Percent
Early cancer-like advanced cancer	18	
Elevated lesion	1	5.6
Flat lesion	0	0
Depressed lesion	17	94.4
Advanced cancer	210	
Borrmann I	11	5.2
Borrmann II	97	46.2
Borrmann III	76	36.2
Borrmann IV	17	8.1
Unclassified	9	4.3

sion not beyond the submucosal layer, was observed in 60 (20.8%) of 288 resectable cases. Figure 2 shows macroscopic classification of these cases. There were 25 cases of elevated lesions and 35 cases of depressed lesions.

Macroscopic classification in 18 cases of early cancer-like advanced cancer of the stomach is listed in Table 3. All but one case were classified as depressed lesions.

Advanced gastric cancer of Borrmann's type was detected in 210 cases (72.9%). Compared to gastric cancer in general, Borrmann II and III types were seen more frequently, Borrmann I less frequently, and Borrmann IV much less frequently—only 17 cases (8.1%) of Borrmann IV type were recorded among these elderly patients (Table 3).

As shown in Table 4, so-called differentiated adenocarcinoma (intestinal type, Laurén [2]) such as papillary adenocarcinoma, tubular adenocarcinoma, and mucinous adenocarcinoma was seen in 197 (68.4%) of 288 resectable cases, while so-called undifferentiated adenocarcinoma (diffuse type, Laurén) such as poorly differentiated adenocarcinoma and signet ring cell carcinoma was detected in 91 cases (31.6%).

	NO. of patients	Percent
Elevated lesion (I, IIa)	25	41.7
Flat lesion (IIb)	0	0
Depressed lesion (including IIc or III)	35	58.3

Fig. 2. Macroscopic classification of the resectable early gastric cancer.**Table 4.** Histological classification of the cases of resectable gastric cancer.

Histological classification	No. of lesions	Laurén's classification
Papillary adenocarcinoma	82	"Intestinal type" 197 (68.4%)
Well-differentiated tubular adenocarcinoma	32	
Moderately differentiated tubular adenocarcinoma	76	
Mucinous adenocarcinoma	7	
Poorly differentiated adenocarcinoma	71	"Diffuse type" 91 (31.6%)
Signet ring cell carcinoma	20	
Total	288	

The deepest layer of cancerous invasion in the stomach wall was determined microscopically and analyzed as listed in Table 5. Again, 116 (40.3%) of the 288 lesions proved to be an advanced gastric cancer having already invaded the serosal layer.

In the 288 specimens of gastric cancer resected, regional lymph node involvement was negative in 131 specimens (45.5%) and positive in 157 specimens (54.4%).

Of the 406 cases of gastric cancer in elderly patients, follow-up studies were possible in 372 cases (91.6%). Death within the hospitalization occurred in 67 cases with a hospital mortality rate of 16.5%. The prognosis of curative resection cases yielded a 3-year survival rate of 56.8%, a 5-year survival rate of 51.5%, and a 10-year survival rate of 25.5%. The prognosis of all operative cases revealed a 3-year survival rate of 27.7%, a 5-year survival rate of 22.7%, and a 10-year survival rate of 9.8%. In the proximal cancers, the 5-year survival rate of curative total gastrectomy was 47.1% (8/17).

These data compare acceptably with the survival rates of corresponding cases of gastric cancer in general [3] (Fig. 3).

In 119 patients with an advanced distal gastric cancer, palliative resection of the lesions was performed in 53 patients, and the results were com-

Table 5. Depth of cancerous invasion in cases of resectable gastric cancer.

Deepest layer of cancerous invasion	No. of lesions	Percent
Mucosa	27	9.3
Submucosa	33	11.5
Proper muscle	30	10.4
Subserosa	82	28.5
Serosa	116	40.3
Total	288	

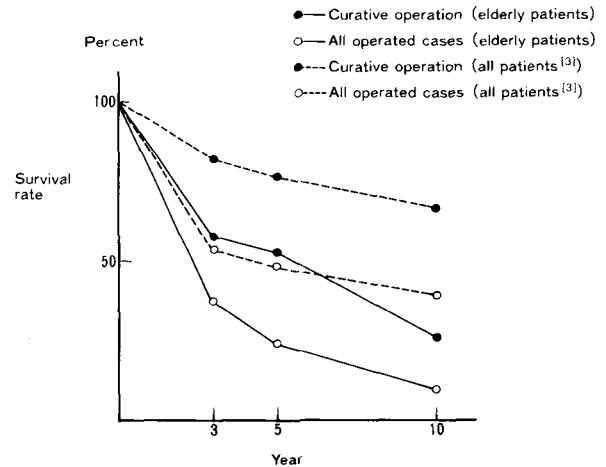
pared with that of gastroenterostomy in 66 patients. Hospital morbidity and mortality rates were lower in the former: 7 patients (13.2%) died in the palliative resection group and 12 (18.2%) in the gastroenterostomy group. On the other hand, mean survival time was longer in the palliative resection group: 14.4 months (the longest survival was 132 months) versus 6.1 months (the longest survival was 30 months) in the gastroenterostomy group.

Discussion

Numerous reports [4-12] have been concerned with special characteristics of gastric cancer in elderly patients, but unanimous conclusions have not yet been reached. Based on our present study performed in a large number of elderly patients with gastric cancer, the following features are noteworthy.

First, a higher than usual incidence of cancer in the proximal portion of the stomach was evident. Of the 406 patients operated on, primary cancer 64 (15.8%), was located in the upper one-third portion of the stomach which was significantly higher than the rate of 12.3% reported by the nationwide registration of gastric cancer for the entire generation [11]. As reported previously, this tendency was more pronounced in patients older than 80 years [13]. Recently, attention has been focused on intestinal metaplasia of the gastric mucosa as a precancerous lesion [14-16]. Since intestinal metaplasia in the upper part of gastric mucosa becomes more evident with increasing age, the higher incidence of cancerous change might be related to this metaplastic change.

As far as the operative treatment is concerned, cancer located in the proximal portion of the stomach is more difficult to deal with than those located distally. The procedure of proximal gastrectomy instead of total gastrectomy is carried out by some surgeons in selected cases. However, we have not performed this procedure in the present series, since postoperative reflux gastritis was frequent

**Fig. 3.** Survival rate of elderly patients compared to that of all patients.

and dissection of the parapyloric lymph nodes tended to be incomplete. In addition, our results of total gastrectomy were satisfactory enough to continue this therapy as a procedure of choice.

The second distinct feature of gastric cancer in the elderly patient was a high incidence of advanced lesions showing larger size and deeper invasion irrespective of a relatively modest malignancy histologically. Actually, early cancer was observed in only 14.8% of our total operative cases, approximately one-half of the expected value of 30% at our institutions. Histological study revealed a well-differentiated adenocarcinoma in two-thirds of the entire lesions. This tendency has been mentioned also in the American literature [7].

For a variety of physico-psychological as well as socioeconomic reasons, early diagnosis of malignant disease is delayed in the elderly patients. This may be because the elderly do not seek medical attention, because the history taken is confusing, and because the patient makes so many complaints that significant ones are not appreciated. Effort should be continued to solve these problems and to treat the patients earlier and aggressively. The results of the present series reveal rather encouraging survival results with acceptable operative mortality and morbidity rates even in advanced cases.

Résumé

Les dossiers cliniques de 406 cas de cancer gastrique opérés au cours des 22 dernières années chez des malades âgés de plus de 70 ans ont été étudiés. Ces cas représentent 11,8% des 3 425 cancers gastriques qui ont été opérés dans les formations hospitalières des auteurs au cours de la même période.

La tumor se localizó en el nivel del tercio superior del estómago en 15,8% de los casos, este porcentaje siendo superior al habitual.

El estudio macroscópico de la tumor mostró que dos tercios de los enfermos presentaban lesiones muy importantes. El diámetro de la tumor excedía 50 mm en 50,8% de los casos y correspondía al tipo II y al tipo III de la clasificación de Borrmann. El cáncer temprano no fue observado en 14,8% de los casos solamente, esto responde aproximadamente a la mitad del porcentaje habitual. El estudio histológico, por su parte, mostró que en los dos tercios de los casos el adenocarcinoma era de tipo indiferenciado, hecho característico del cáncer del sujeto mayor.

La resección fue posible en 70,9% de los casos y una exéresis con fines curativos fue realizada en 46,8% de los casos. La mortalidad postoperatoria fue de 16,5 por ciento. La exéresis con fines curativos se resolvió con un porcentaje de supervivencia a 5 años de 51,5% y un porcentaje de supervivencia a 10 años de 25,5%.

Estos resultados apoyan a favor de un diagnóstico temprano del cáncer y de una actitud terapéutica emprendedora que implica practicar una laparotomía sistemática en la ausencia de contra-indicación de orden general desde que el cáncer del estómago es diagnosticado.

Al curso de las últimas años la frecuencia del cáncer gástrico ha aumentado paralelamente a la duración de la vida. Es necesario desde ahora definir los caracteres específicos que son susceptibles de permitir el diagnóstico temprano del cáncer gástrico del sujeto mayor.

Resumen

Se analizaron las historias clínicas de 406 casos de cáncer gástrico en enfermos mayores de 70 años operados en el curso de los últimos 22 años. Tales casos representaron el 11,8% del total de 3 425 de cáncer gástrico sometidos a cirugía en nuestros hospitales durante el mismo periodo.

El tumor primario apareció confinado al tercio superior del estómago en 15,8% de los casos, lo cual es significativamente mayor de lo que se informa usualmente.

La clasificación macroscópica del estado de la lesión reveló que más de dos tercios de los enfermos padecían de enfermedad neoplásica extremadamente avanzada. El tamaño de la lesión fue de un diámetro mayor de 50 mm, en el 50,8% de los casos, y el tumor demostró ser predominantemente de los tipos Borrmann II y III. Cáncer gástrico temprano se observó sólo en el 14,8% del total de casos, lo cual representa aproximadamente la mitad de la tasa ordinaria. Sin embargo, el estudio histoló-

gico reveló un carcinoma bien diferenciado hasta en dos tercios de la totalidad de las lesiones, una característica verdaderamente notable del cáncer gástrico en el anciano.

La resección fue posible en el 70,9% y la resección curativa en el 46,8% de los casos. La tasa global de mortalidad hospitalaria fue de 16,5%. En cuanto a pronóstico, la tasa de supervivencia a cinco años para las resecciones curativas fue de 51,5% y la tasa de supervivencia a 10 años fue de 25,5%.

Los anteriores resultados justifican la práctica de un diagnóstico precoz y de conducta agresiva para lograr la operación exploratoria en todo paciente de riesgo aceptable cuando no existan contraindicaciones absolutas.

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Invited Commentary

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This article reminds me of that famous quip about the differences between rich people and us ordinary mortals. "They have more money". And, to be sure, "patients above 70 years of age" are older! Beyond that, the authors had to stretch their data to the limit to find features of gastric cancer in the elderly that are worth discussing. Their resectability rates and operative results, while good, do not differ materially from those one has come to expect from other Japanese studies of gastric cancer. And, whereas I would agree with the authors that, whenever possible, a palliative resection provides a better quality of survival than a gastroenterostomy, I disagree with the data that they provide to support this view: a lower mortality and morbidity after resection than after gastroenterostomy in patients with far-advanced cancer. This fallacy is so time-worn that to enlarge upon it seems almost trite. The authors must realize that this kind of comparison requires random allocation of treatment. In their cases, those individuals whose lesions were anatomically so advanced that a palliative resection was technically impossible underwent gastroenterostomy. Naturally they fared less well! One finds the same problem throughout the article. We are told, for instance, that the hospital mortality rate for this group of 406 elderly patients was 16.5%. So what? In an article whose *raison d'être* purports to

be an analysis of the special features of gastric cancer in the elderly, the authors should have provided us with the comparable figure for a younger group of patients from their population of 3,425 patients with gastric cancer operated during the same period.

Few would disagree with the authors' view that proximal lesions are more difficult to treat than tumors located in the distal reaches of the stomach. One heartily agrees with their policy of not performing a proximal gastrectomy. Perhaps their reasons should be stated more forcefully: inadequate node dissection and almost universal, and sometimes very severe, reflux esophagitis result from removal of the proximal half of the stomach and anastomosis of the esophagus to the antrum.

The authors have concluded that the elderly have a disproportionately higher incidence of proximal lesions. They base this on a comparison of their incidence of 15.8% with a rate of 12.3% provided by their national registry. Once again, their argument would be better served by a comparison with data within their own patient population.

I must confess to becoming slightly irritated (but only for a moment) upon reading their statement, "Recently attention has been focused to (sic) intestinal metaplasia of the gastric mucosa as a precancerous lesion" with attribution to the recent Japanese literature. I remember vividly having my attention focused on this matter by the writings of Arthur Purdy Stout and, alas, this was *not* recently. Perhaps their omission, no doubt unintentional, is excusable in an article touching on the ravages of time. "Tempus edax rerum"!