



Special article

Gastric cancer treated in 1991 in Japan: data analysis of nationwide registry

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Abstract

The Japanese Gastric Cancer Association Registration Committee reported the treatment results and causes of death of patients with primary gastric cancer treated in 1991 at the leading hospitals in Japan. Data of 8851 patients with primary gastric cancer were collected from 113 hospitals, and data of 7935 patients with gastric resection were finally analyzed. The lost-to-follow-up rate was 6.9%; the direct death rate was 1.0%. The cumulative 5-year survival rate (5YSR) of all the patients was 68.2%; 89.9% for Stage I, 69.1% for Stage II, 43.5% for Stage III, and 9.9% for Stage IV. Characteristic findings of the analyzed data were (1) high proportion of early-stage cancer, (2) high resection rate, (3) low mortality rate, (4) low incidence of upper-third cancer, (5) poor treatment results in cases with scirrhous cancer, infiltrating growth, and marked lymphatic or venous invasion, and (6) predominance of systematic (D2) and extended lymphadenectomies possibly resulting in reducing local recurrence and improving survivals.

Key words Gastric cancer · Nationwide registry · Japan · Treatment results

Introduction

In 1963, a nationwide registry of gastric cancer patients was launched by the Japanese Research Society for Gastric Cancer. The society was reorganized into the Japanese Gastric Cancer Association (JGCA) in 1997, but the data collection has been continued by the new association. Requirements to participate in the activity were strict: leading national or regional hospitals having full-time specialists of diagnosis, surgery, and pathology, and 90% and more follow-up rate. In the period 1963–1990, data were collected and analyzed. The re-

sults were published in the annual and special reports; total 54 volumes [1].

The registry system was changed from paper form to a personal computer data-collection system in 1991. The first data including cumulative 5-year survivals were collected in 1998. Data of 8851 patients were registered from 113 hospitals, and 543 were excluded because of the final diagnosis as a recurrence in the gastric remnants, histological diagnosis of gastric sarcoma, or lack of essential data. Data of 8308 patients with primary gastric carcinoma were finally analyzed in this report. The JGCA Registration Committee intends to wake known the 1991 treatment results at the leading hospitals in Japan.

Member hospitals

Data of gastric cancer patients were collected from the following 113 surgical departments (in alphabetical order).

Aichi Cancer Center, Aichi Prefectural Hosp, Akita Univ Dept 2, Cancer Institute, Center for Adult Diseases Osaka, Chiba Cancer Center, Chiba Univ Dept 2, Defense Med Coll Dept 1, Dokkyo Med Coll Dept 2, Fujita Health Univ Hosp 2, Fujita Health Univ Funabiki-Dept, Fujita Health Univ Miura-Dept, Fukui Med Coll Dept 1, Fukui Red Cross Hosp, Fukui Saiseikai Hosp, Fukuoka City Hosp, Fukuoka Univ Chikushi Hosp, Fukushima Med Coll Dept 1, Gifu Univ Dept 2, Gunma Univ Dept 2, Hamamatsu Univ Dept 2, Himeji Chuo Hosp, Hirosaki Univ Dept 1, Hiroshima City Hosp, Hiroshima Univ Dept 2, Hyogo Cancer Center, Ishikawa Chuo Hosp, Iwate Fukuoka Hosp, Iwate Med Coll Dept 1, International Med Center Tokyo, Kagawa Med Coll Dept 1, Kagoshima Nanpu Hosp, Kagoshima Univ Dept 1, Kanagawa Cancer Center, Kansai Med Coll Dept 2, Karasawa Hosp, Kawasaki Ida Hosp, Keio Univ Dept of Surg, Kinki Chuo Hosp, Kinki Univ Dept 1, Kita-kyushu Med Center, Kitasato Univ East Hosp, Kobe Univ Dept 1, Kumamoto Univ Dept 2, Kurume Univ Dept of

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Received: February 3, 2005 / Accepted: February 14, 2006

Surg, Kyoto Prefectural Univ Dept 1, Kyoto Prefectural Univ Dept 2, Kyoto Univ Dept 1, Kyushu Med Center, Kyushu Univ Dept 2, Matsushita Memorial Hosp, Matsuyama Red-Cross Hosp, Mitoyo General Hosp, Nagasaki Univ Dept 1, Nagasaki Univ Dept 2, Nagoya City Univ Dept 1, Nagoya Univ Dept 2, National Cancer Center, National Chiba Hosp, National Oita Hosp, National Osaka Hosp, National Tokyo Med Center, Nihon Kokan Hosp, Nihon Univ Dept 1, Nihon Univ Dept 3, Niigata Cancer Center, Niigata Univ Dept 1, Nippon Med School Dept 1, Ohmiya Med Center, Oita Med Coll Dept 1, Okayama Saiseikai Hosp, Okayama Univ Dept 1, Okayama Univ Dept 2, Osaka City Univ Dept 1, Osaka City Univ Dept 2, Osaka Med Coll Dept of Surg, Osaka Post Hosp, Osaka Univ Dept 2, Saitama Chuo Hosp, Saitama Med Coll Dept 1, Santoyo Sogo Hosp, Sapporo Keiyu Hosp, Sapporo Kosei Hosp, Shiga Med Coll Dept 1, Shikoku Cancer Center, Shinshu Univ Dept 1, Shinshu Univ Dept 2, St. Mary Med Coll Dept 1, St. Mary Med Coll Yokohama Hosp, Teikyo Univ Dept 1, Teikyo Univ Dept 2, Teikyo Univ Mizonokuchi Hosp, Tochigi Cancer Center, Tohoku Rosai Hosp, Tohoku Univ Dept 1, Tokushima Univ Dept 1, Tokyo Jikei Med Coll Dept 2, Tokyo Jikei Med Coll Aoto Hosp, Tokyo Metropolitan Komagome Hosp, Tokyo Med Coll Dept 3, Tokyo Med Dent Univ Dept 1, Tokyo Univ Med Institute, Tokyo Women's Med Coll Dept 2, Tokyo Women's Med Coll 2-Hosp, Tokyo Women's Med Coll GI Center, Toranomon Hosp, Tottori Univ Dept 1, Toyama Med Pharm Univ Dept 2, Tsuyama Chuo Hosp, Wakayama Med Coll Dept 2, Yamagata Chuo Hosp, Yamagata Kahoku Hosp, Yamanashi Univ Dept 1.

Materials and methods

In 1989, the registration committee of the Japanese Research Society for Gastric Cancer started to design and organize a personal computer registration system for patients with gastric cancer. The committee had to produce four programs for different computer operation systems: MS-DOS Basic, FileMaker Pro for Windows, FileMaker Pro for Macintosh, and a special database system sold in the Japanese market. Each member hospital selected an appropriate program for its computer. In 1991, the new nationwide registry was started. Definition and documentation were based on the Japanese Classification of Gastric Carcinoma, 11th edition [2]. The data list is shown in Table 1. Data of patients treated in 1991 were collected in 1998–1999 because 5-year follow-up data and the causes of death were requested to be reported. Names of patients and other personal data were removed from the data for privacy protection. The 3.5" floppy disks containing the data were mailed to the data center located in the National Cancer Center Hospital, Tokyo.

Eventually, data from 8851 patients were collected from 113 hospitals. Of these, 305 patients were excluded because of the final diagnosis as a recurrence in the gastric remnants, or histological diagnosis of other

malignant tumors such as malignant lymphoma or leiomyosarcoma. Data of 238 patients were also excluded because of lack of essential data. Data from the remaining 8308 patients with primary gastric carcinoma underwent the final statistical analysis. The cumulative 5-year survival rate (5YSR) was calculated for various subsets of patients. Any types of death observed during 5 post-operative years, including direct death, or death due to other cancer or other diseases, were reflected in the survival analysis. Causes of death were also reported.

In this report, the data were translated into the 2nd English edition of the Japanese Classification of Gastric Carcinoma [3], published in 1998, to facilitate international understanding. Although the UICC TNM Classification, 4th edition [4], published in 1987, was designed using the same principle as the Japanese classification,

Table 1. Collected data

Patient factors	32 stage (UICC TNM)
1 year of treatment	33 reconstruction
2 registration no.	
3 sex	Histopathological findings
4 date of birth	34 histological findings
5 category of diseases	35 cancer-stroma reaction
6 co-existing diseases	36 infiltration pattern (INF)
7 double (secondary) cancers	37 lymphatic invasion (ly)
8 symptoms	38 venous invasion (v)
9 preop. complications	39 macroscopic type
	40 depth of invasion (pT)
Clinical findings	41 lymph node metastasis (pN)
10 location	
11 macroscopic type	Final findings
12 depth of invasion (cT)	42 macroscopic type
	43 depth of invasion (T)
Surgical findings	44 lymph node metastasis (N)
13 date of surgery	45 hepatic metastasis (H)
14 macroscopic type	46 peritoneal metastasis (P)
15 location	47 distant metastasis (M)
16 depth of invasion (sT)	48 maximal diameter
17 organs of T4	49 proxim. resection margin (PM)
18 lymph node metastasis (sN)	50 distal resection margin (DM)
19 peritoneal metastasis (sP)	51 curative potential of resection
20 liver metastasis (sH)	52 stage (Japanese)
21 distant metastasis (sM)	53 stage (UICC TNM)
22 stage (Japanese)	Adjuvant treatments
23 stage (UICC TNM)	54 preop. chemotherapy
	55 intraop. chemotherapy
Surgical treatment	56 postop. chemotherapy
24 approach	57 preop. treatments
25 resection method	58 intraop. treatments
26 proximal margin (sPM)	59 postop. treatments
27 distal margin (sDM)	
28 lymph node dissection (D)	Treatment results
29 combined resection	60 postop. complications
30 curability	61 cause of death, or alive
31 stage (Japanese)	62 last confirmed date alive

the latter was more detailed in several categories. The Japanese T-category and staging system were compatible with the TNM classification. Peritoneal metastasis and liver metastasis were separately recorded in the Japanese classification as P- and H-categories, but they could easily be translated into the M-category in the TNM classification. The N-category was the most problematic for translation because the Japanese was based on the anatomical lymphatic streams and extension of node metastasis in association with location of the primary tumor, while the N category in the TNM classification was 4th edition also adopted the anatomical extension of node metastasis but not strictly based on lymph node (LN) stations as defined by the Japanese classification. Survival data stratified by TNM stage in this report should therefore be considered as preliminary.

The following data by important categories were shown on each table: total number of patients, direct death within 30 postoperative days, lost to follow-up, cumulative survival rates by year, 5% standard difference of 5YSR, number of alive patients at 5th postoperative year, causes of death such as local recurrence including lymph node metastasis, peritoneal recurrence, liver recurrence, distant metastasis excluding peritoneal and liver recurrence, recurrence of unknown site, other cancer, other disease, cause of death unknown. Cumulative survival curves of essential categories are also shown in Figs. 1–9. Definitions used in the Japanese Classification of Gastric Carcinoma, 11th edition, are briefly explained in the footnotes with reference to the 2nd English edition.

Results

Of the 8308 patients, 7935 underwent gastric resection, and the resection rate was 95.5%. Eighty-seven patients died within 30 days of surgery, and the direct death rate was 1.0% (87/8308). The number of patients who were lost to follow-up was 571, and the percentage was 6.9% (Table 2).

For patients treated by gastric resection, the most frequent cause of death was peritoneal recurrence ($n = 737$) followed by other diseases ($n = 390$), local recurrence including node metastasis ($n = 318$), liver metastasis ($n = 318$), recurrence of unknown site ($n = 266$), distant metastasis other than the peritoneum and liver ($n = 108$), and secondary cancer ($n = 104$), while the cause of death was unknown in 131 patients (Table 2).

A high incidence of early-stage cancer is the major characteristic of this series, and the proportion of pT1 was 48.8% (3871/7935). The 5YSR of this population was 90.4% (Table 13). It was noteworthy that their primary cause of death was not cancer recurrence ($n =$

84) but other diseases ($n = 161$). A large proportion of patients (58.1%) had a stage-I disease by the Japanese classification, with the 5YSR of 89.9%. Stage IV was found among 15.1% of the series, with a poor 5YSR of 9.0% (Table 38).

The proportion of upper-third cancer was 20.8% (1652/7935), and its 5YSR was relatively low at 57.1%. The 5YSR of patients with esophageal invasion was even lower, at 33.4% (Table 7).

As for the histopathological type, poorly differentiated carcinoma (5YSR was 59.0% for solid type and 55.5% for nonsolid type) and mucinous carcinoma (5YSR: 49.7%) showed poorer prognosis (Table 20). Also carcinoma with scirrhous type stroma (5YSR: 47.2%), strong infiltrating growth or INF γ , (5YSR: 47.5%), marked lymphatic invasion or ly3, (5YSR: 24.7%), and severe venous invasion or v3, (5YSR: 23.5%) were other histopathological signs of poor prognosis (Tables 21–25).

D2 lymph node dissection was most commonly performed ($n = 5366$, 67.6%) and its 5YSR was 73.9%. Almost 10% of the series (783/7935) were treated by more extended node dissection, dissecting lymph nodes along the hepatoduodenal ligament (D3) and para-aortic region (D4). 5YSR of this subset was 51.2% and was poorer than that of D2. The result most likely reflects the generally advanced stage of the patients (Table 34). For pT2 cancer, 5YSR was higher among patients receiving systematic LN dissection (D2–D4) (68.4%) than in those with limited dissection (D0 or D1) (40.6%) (Tables 14, 15). Likewise, patients treated with systematic lymphadenectomy had higher 5YSR than those treated with limited dissection for pT3 cancer (39.0% versus 8.0%) (Tables 14, 15). Similarly in patients with pN1 metastasis, D2–D4 dissection showed better survival (5YSR: 62.3%) to D0 or D1 (5YSR: 33.1%) (Tables 27, 28).

The proportion of patients treated by combined resection of neighboring organs was 30.2% (2394/7935), and the 5YSR was 49.3% (Table 35). The proportion of total gastrectomy was 30.7% (2439/7935), and its 5YSR was 49.2% (Table 32).

The curative potential of resection was an important prognostic factor. The number of patients with a high probability of cure (curability A) was 4959 (proportion: 62.5%), and its 5YSR was 88.5%. On the other hand, patients with definite residual tumor (curability C) was 1235 (proportion: 15.6%), and its 5YSR was 6.5% (Table 37).

Discussion

The data presented in this report were collected from 113 leading hospitals in Japan. The number of new pa-

tients with gastric cancer in 1991 was estimated to be approximately 100000; thus the patients registered in this study ($n = 8308$) correspond to 8.3% of the total new patients. However, the data may not be suitable to use for epidemiological studies because they represent gastric cancer diagnosed and treated at specialized centers.

The findings were recorded based on the 11th edition of the Japanese Classification of Gastric Carcinoma (published in 1985). For international understanding, the registration committee tried to translate the data for the 2nd English edition of the Japanese classification (1998) and the 4th edition of the UICC TNM classification (1987). All data except the N-category were completely translatable. However, several considerations were necessary in translating the N-category. For example, regional LN stations, classified into four compartments (N1–N4) in the 11th Japanese edition, were reclassified into three compartments (N1–N3) in the 2nd English edition. Consequently, metastases to the para-aortic nodes, classified as N4 in the 11th Japanese edition, are now included in N3 in the 2nd English edition. In this article, patients with N3 and N4 status according to the Japanese classification 11th edition and those treated by D3 or D4 dissection were analyzed together, and these groups were designated as N3 + N4 and D3 + D4.

The predominance of early-stage cancer with excellent survival, relative rarity of proximal cancer, and a high percentage of patients undergoing D2 and extended D3 + D4 dissection are among some features of this population that may seem strikingly different from the situation in the West. From the viewpoint of morbidity associated with surgery, it is important to note that combined resection of the pancreas was no longer a commonly performed procedure, 9.1% (726/7935). Locoregional recurrence was not a common pattern of disease failure in this population, and this may reflect the effect of D2 dissection in terms of local control. However, differences in survival between the D2–D4 group and the limited surgery (D0, D1) group for pT2, pT3, and pN1 cancers may need some explanation. Death due to other diseases was observed in 10% (25/239) of patients with pT2 cancer treated by limited surgery as compared with 4.3% (74/1714) in those treated with D2–D4 lymphadenectomy, and there is a possibility that limited lymphadenectomy had been selected for patients with co-morbidity who were destined to have a poor outcome. Peritoneal recurrence was observed among 37.7% (119/316) of pT3 cancer treated with limited surgery versus 22.6% (288/1274) treated with D2–D4. There is a possibility that limited surgery might be selected for patients who had concomitant peritoneal seeding and nevertheless underwent gastrectomy. To clarify the survival benefit of systematic LN dissection

(D2–D4), we are now planning a multivariate analysis using the series.

Acknowledgments The Japanese Gastric Cancer Association Registration Committee appreciates very much the great effort of member hospitals in collecting accurate and detailed data for this project. We also wish to thank Dr. Peter Gunven, Karolinska University Hospital, Sweden, for his valuable assistance.

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Table 2. Primary cancer and resected cases

categories	total number	direct death	lost f.u.	1yr (%)	2yr (%)	3yr (%)	4yr (%)	5yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
Primary cancer	8308	87	571	83.9	75.4	70.8	68.0	66.0	1.1	5019	336	876	315	126	316	109	415	138
Unresected cases	7935	81	548	86.4	78.0	73.2	70.4	68.2	1.1	4966	318	737	286	108	266	104	390	131
Resected cases	240	6	12	16.0	4.5	3.5	2.4	2.4	2.2	4	16	114	17	13	37	2	13	6
Other surgeries	133	0	11	56.8	48.6	45.3	43.6	42.7	8.8	49	2	25	12	5	13	3	12	1

Abbreviations for tables

lost f.u. lost to follow-up
ysr (%) year of cumulative survival rate
5% s.d. 5% standard difference of 5yr
local rec. local recurrence including lymph node metastasis
peritoneal peritoneal recurrence
liver rec. liver recurrence
distant meta. distant metastasis excluding peritoneal and liver recurrence
R recurrence of unknown site
unknown cause of death unknown

Abbreviations for figures

dd patients by direct death
lof lost to follow-up

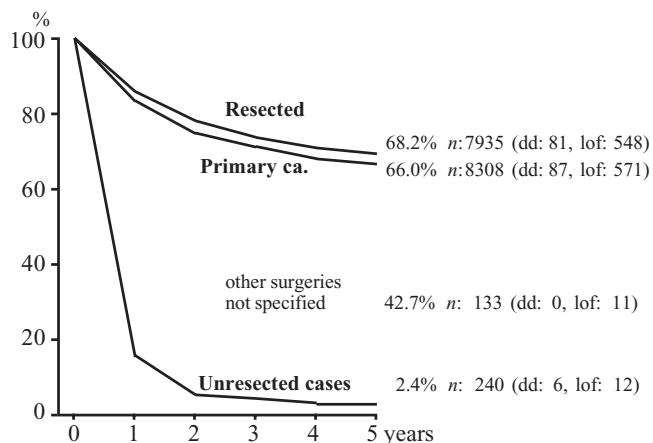


Fig. 1. Primary cancer and resected cases

Table 3. Sex (resected cases)

categories	total number	direct death	lost f.u.	1yr (%)	2yr (%)	3yr (%)	4yr (%)	5yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
Male	5493	70	394	85.6	77.1	72.1	69.4	67.2	1.3	3368	227	465	223	76	187	87	295	101
Female	2441	11	154	88.2	79.9	75.5	72.6	70.6	1.9	1597	91	272	63	32	79	17	95	30
Not specified	1	0	0	100.0	100.0	100.0	100.0	100.0	0.0	1	0	0	0	0	0	0	0	0

Table 4. Age (resected cases)

categories	total number	direct death	lost f.u.	1yr (%)	2yr (%)	3yr (%)	4yr (%)	5yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
-39	302	0	23	87.5	79.2	76.7	74.6	72.4	5.3	199	6	53	2	4	11	0	2	2
40-59	2805	14	182	89.9	83.6	79.9	77.4	76.1	1.6	1976	113	240	83	42	57	16	60	22
60-79	4276	61	292	84.6	75.3	70.2	67.1	64.8	1.5	2537	170	404	179	55	157	78	258	85
80-	344	6	32	74.5	60.3	49.3	45.1	39.7	5.5	119	23	31	15	6	24	8	63	17
Not specified	207	0	19	93.0	82.2	76.4	75.9	72.1	6.5	134	6	9	7	1	17	2	7	5

Table 5. Age in males (resected cases)

categories	total number	direct death	lost f.u.	1yr (%)	2yr (%)	3yr (%)	4yr (%)	5yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
-39	150	0	14	87.8	81.5	78.7	76.5	75.0	7.2	100	3	19	1	3	8	0	0	2
40-59	1964	11	138	90.1	84.0	80.1	77.7	76.4	2.0	1381	84	143	67	28	37	13	47	15
60-79	3006	53	206	83.1	73.4	68.2	65.3	62.7	1.8	1721	118	278	140	40	115	69	201	65
80-	224	6	22	73.3	60.7	49.3	44.7	40.0	6.9	77	16	18	9	4	15	3	40	14
Not specified	148	0	14	90.9	79.3	71.8	71.1	66.6	8.1	88	6	7	6	1	12	2	7	5

Table 6. Age in females (resected cases)

categories	total number	direct death	lost f.u.	1 yr (%)	2 yr (%)	3 yr (%)	4 yr (%)	5 yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
-39	152	0	9	87.3	76.9	74.8	72.7	69.8	7.6	99	3	34	1	1	3	0	2	0
40-59	841	3	44	89.4	82.6	79.6	76.8	75.3	3.0	595	29	97	16	14	20	3	13	7
60-79	1270	8	86	88.2	80.0	74.8	71.6	69.8	2.6	816	52	126	39	15	42	9	57	20
80-	120	0	10	76.7	59.5	49.4	45.7	39.1	9.3	42	7	13	6	2	9	5	23	3
Not specified	58	0	5	98.2	89.1	87.3	87.3	85.4	9.5	45	0	2	1	0	5	0	0	0

Table 7. Tumor location (resected cases)

categories	total number	direct death	lost f.u.	1 yr (%)	2 yr (%)	3 yr (%)	4 yr (%)	5 yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
Upper third	1643	29	124	81.2	68.1	62.4	59.5	56.9	2.5	845	90	212	69	35	80	18	112	29
Middle third	3244	28	193	88.1	82.2	78.4	76.2	74.4	1.6	2246	83	273	81	41	90	34	132	43
Lower third	3047	24	231	87.3	78.6	73.2	69.8	67.6	1.7	1874	145	252	136	32	96	52	146	59
Esophageal invasion	313	5	21	68.1	45.5	37.5	33.9	32.8	5.5	91	27	57	19	18	36	0	31	8
Not specified	1	0	0	100.0	100.0	100.0	100.0	100.0	0.0	1	0	0	0	0	0	0	0	0

Table 8. Tumor location, circumference (resected cases)

categories	total number	direct death	lost f.u.	1 yr (%)	2 yr (%)	3 yr (%)	4 yr (%)	5 yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
Lesser curvature	3141	36	224	88.9	81.6	77.0	74.2	71.6	1.6	2063	112	204	103	42	98	44	163	52
Greater curvature	1606	14	104	90.8	84.6	80.2	78.1	76.1	2.2	1132	41	102	48	17	35	20	74	19
Anterior wall	1259	7	76	91.8	85.6	81.2	78.6	76.8	2.4	901	29	64	46	12	27	22	57	18
Posterior wall	1000	7	78	89.0	81.2	77.8	75.1	73.7	2.9	670	21	75	38	10	29	12	40	20
Circumferential	927	17	66	60.0	39.2	30.9	26.7	24.4	2.9	198	115	292	51	27	77	6	56	22
Not specified	2	0	0	100.0	100.0	100.0	100.0	100.0	0.0	2	0	0	0	0	0	0	0	0

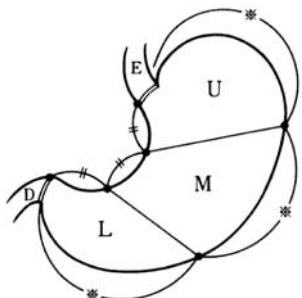
Table 9. Peritoneal metastasis (resected cases)

categories	total number	direct death	lost f.u.	1 yr (%)	2 yr (%)	3 yr (%)	4 yr (%)	5 yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
P0 not metastatic	7404	70	497	89.7	82.0	77.4	74.6	72.3	1.1	4938	297	441	258	94	214	104	366	125
P1 metastatic	529	11	50	39.2	18.2	10.6	8.1	7.1	2.5	27	21	296	28	14	52	0	24	6
Not specified	2	0	1	100.0	100.0	100.0	100.0	100.0	0.0	1	0	0	0	0	0	0	0	0

Footnote for **Table 7:** Tumor location

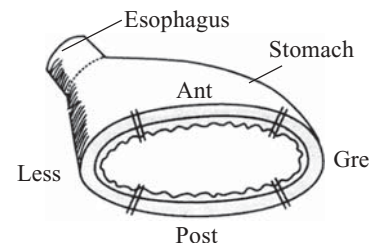
The stomach is anatomically divided into three portions. If more than one portion is involved, all involved portions should be described in order of degree of involvement. Namely, the first letter indicates the portion in which the bulk of the tumor is situated, and the portion is used for categorization in Table 7.

U: Upper third
M: Middle third
L: Lower third
E: Esophagus
D: Duodenum

Footnote for **Table 8:** Tumor location, circumference

The cross-sectional circumference of the stomach is divided into four equal parts as shown in the figure below. Circumferential involvement is recorded as Circ.

Less: Lesser curvature
Gre: Greater curvature
Ant: Anterior wall
Post: Posterior wall
Circ: Circumferential

Footnote for **Tables 9-11:** Distant metastasis

Distant metastasis is separately documented by peritoneal metastasis (P0 or P1), liver metastasis (H0 or H1), and other distant metastases (M0 or M1).

Table 14. pT classification by D0 or D1 dissection (resected cases)

categories	total number	direct death	lost f.u.	1 yr (%)	2 yr (%)	3 yr (%)	4 yr (%)	5 yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
pT1	1019	7	61	95.4	93.1	90.1	88.4	86.5	2.2	825	6	4	3	2	3	30	63	15
pT2	239	3	26	70.3	54.7	47.6	44.1	40.6	6.7	81	23	28	25	2	13	3	25	10
pT3	316	9	33	40.8	20.2	11.8	9.3	8.0	3.4	18	28	119	46	10	24	4	21	4
pT4	210	4	19	31.5	13.6	8.9	7.0	7.0	3.9	11	33	77	19	4	26	1	13	3
Not specified	1	0	0	100.0	100.0	100.0	100.0	100.0	0.0	1	0	0	0	0	0	0	0	0

Table 15. pT classification by D2, D3, or D4 dissection (resected cases)

categories	total number	direct death	lost f.u.	1 yr (%)	2 yr (%)	3 yr (%)	4 yr (%)	5 yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
pT1	2852	8	175	97.8	96.2	94.4	93.3	91.8	1.0	2453	17	14	17	7	11	31	98	21
pT2	1714	24	118	90.7	81.3	74.7	71.3	68.4	2.3	1079	65	116	81	32	56	22	74	47
pT3	1274	20	96	77.0	57.8	48.7	42.3	39.0	2.8	439	119	288	71	41	89	13	72	26
pT4	309	6	19	59.4	36.6	28.8	24.4	21.5	4.9	59	27	91	24	10	44	0	24	5
Not specified	0	0	0	—	—	—	—	—	—	0	0	0	0	0	0	0	0	0

Table 16. pT classification by curability-A resection (resected cases)

categories	total number	direct death	lost f.u.	1 yr (%)	2 yr (%)	3 yr (%)	4 yr (%)	5 yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
pT1	3665	13	220	97.6	96.0	94.1	92.8	91.4	0.9	3140	13	11	11	4	11	57	151	34
pT2	1294	10	85	95.6	90.1	85.9	82.9	80.3	2.3	965	19	40	31	11	22	18	58	35
Not specified	0	0	0	—	—	—	—	—	—	0	0	0	0	0	0	0	0	0

Table 17. pT classification by curability-B resection (resected cases)

categories	total number	direct death	lost f.u.	1 yr (%)	2 yr (%)	3 yr (%)	4 yr (%)	5 yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
pT1	175	1	14	93.6	90.1	85.9	84.6	80.9	6.1	129	3	4	5	3	3	4	7	2
pT2	417	8	39	86.7	70.6	57.7	53.1	50.1	5.1	185	32	45	27	14	23	4	27	13
pT3	984	15	80	85.4	69.1	60.2	52.7	48.9	3.3	428	77	173	29	29	61	14	55	23
pT4	163	3	13	74.4	55.5	48.0	42.5	37.6	7.9	54	11	30	9	5	17	0	18	3
Not specified	0	0	0	—	—	—	—	—	—	0	0	0	0	0	0	0	0	0

Footnote for **Tables 14, 15, 27, 28, 34:** Extent of LN dissection

Letter D indicates extent of lymph node (LN) dissection. Japanese N-classification (refer to footnote on page 59) and D-classification have an anatomical base, and are completely different from the present TNM N-Classification, 5th edition. For a detailed explanation, refer to Japanese Classification of Gastric Carcinoma, 2nd English edition.

D0: No or incomplete dissection of the N1 nodes
 D1: Dissection of all the N1 nodes
 D2: Dissection of all the N1 and N2 nodes
 D3: Dissection of all the N1, N2, and N3 nodes

Dissection of para-aortic LNs was classified as “D4” in the 12th edition. These procedures are now included in D3. D3 and D4 were called as “extended LN dissection” and D2–D4 were called as “systematic LN dissection.”

Footnote for **Tables 16–18:** Curative potential of resection

The curative potential of gastric resection is evaluated on the following basis:

Resection A: No residual disease, with high probability of cure (see below)
 Resection B: No residual disease, but not fulfilling criteria for Resection A
 Resection C: Definite residual disease

Resection A implies resection satisfying all of the following conditions: T1 or T2; N0 treated by D1, or more extended dissection or N1 treated by D2, or more extended dissection; M0, P0, H0, CY0 and proximal and distal margins >10mm.

Resection A + B corresponds to R0 in the UICC-TNM classification and Resection C corresponds to R 1+ R2.

Table 18. pT classification by curability-C resection (resected cases)

categories	total number	direct death	lost f.u.	1yr (%)	2yr (%)	3yr (%)	4yr (%)	5yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	un-known
pT1	31	1	2	66.7	52.6	38.6	35.1	31.6	17.3	9	7	3	4	2	0	0	3	0
pT2	242	9	20	51.0	24.3	14.8	10.3	5.0	3.1	10	37	59	48	9	24	3	14	9
pT3	606	14	49	44.6	19.6	10.3	7.9	6.3	2.2	29	70	234	88	22	52	3	38	7
pT4	356	7	25	36.1	14.3	8.1	5.8	5.5	2.6	16	49	138	34	9	53	1	19	5
Not specified	0	0	0	—	—	—	—	—	—	0	0	0	0	0	0	0	0	0

Table 19. Macroscopic type (resected cases)

categories	total number	direct death	lost f.u.	1yr (%)	2yr (%)	3yr (%)	4yr (%)	5yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	un-known
Type 0 (early cancer)	4055	18	255	97.1	95.1	93.0	91.6	90.0	1.0	3410	25	28	23	13	17	62	165	39
Type 1	208	4	14	81.9	71.3	64.7	60.6	56.4	7.0	107	11	15	17	2	8	8	13	9
Type 2	1004	16	71	81.2	66.9	59.7	55.1	52.5	3.2	479	62	84	110	20	55	16	68	23
Type 3	1752	25	148	73.8	58.1	49.7	45.9	42.8	2.5	658	138	336	12	53	130	15	98	39
Type 4	556	14	39	56.0	32.7	24.0	18.7	16.2	3.3	78	62	240	13	16	51	2	31	10
Type 5 (unclassified)	359	4	21	89.5	81.2	75.9	71.1	69.6	5.0	233	20	34	11	4	5	1	15	11
Not specified	1	0	0	100.0	100.0	100.0	100.0	100.0	0.0	1	0	0	0	0	0	0	0	0





Table 20. Histological type (resected cases)

categories	total number	direct death	lost f.u.	1yr (%)	2yr (%)	3yr (%)	4yr (%)	5yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	un-known
Papillary ca.	453	6	23	85.0	72.0	66.9	65.0	63.4	4.6	269	17	25	43	5	21	10	28	6
Well differentiated	1941	12	141	93.4	88.6	85.6	83.4	81.1	1.8	1448	40	53	45	7	28	39	105	23
Mod. differentiated	1889	21	127	87.3	78.7	72.8	69.7	67.8	2.2	1176	66	111	106	30	65	29	119	39
Poorly ca. solid	1297	15	70	80.1	69.9	65.1	61.7	59.0	2.8	713	91	172	59	28	45	10	61	33
Poorly, non-solid	1297	19	107	80.0	67.7	61.1	57.9	55.5	2.9	645	57	276	19	26	74	9	50	15
Signet ring ca.	825	4	59	91.1	87.2	84.3	82.5	81.2	2.8	616	23	64	3	8	13	5	20	10
Mucinous ca.	192	3	20	77.3	64.2	56.2	51.5	49.7	7.5	82	21	31	6	3	17	1	4	4
Other types	41	1	1	72.8	60.3	52.7	47.7	42.7	15.6	17	3	5	5	1	3	1	3	1

Table 21. Lauren’s histological type (resected cases)

categories	total number	direct death	lost f.u.	1yr (%)	2yr (%)	3yr (%)	4yr (%)	5yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	un-known
Intestinal type	4283	39	291	89.8	82.4	78.0	75.4	73.3	1.4	2893	123	189	194	42	114	78	252	68
Diffuse type	3611	41	256	82.4	72.8	67.6	64.6	62.4	1.7	2056	192	543	87	65	149	25	135	62
Other type	40	1	1	72.2	59.3	51.5	46.4	41.2	15.8	16	3	5	5	1	3	1	3	1
Not specified	1	0	0	100.0	100.0	100.0	100.0	100.0	0.0	1	0	0	0	0	0	0	0	0

Footnote for **Table 19:** Macroscopic type

Macroscopic type	Type 0	early (T1) cancer
	Type 1	
	Type 2	
	Type 3	
	Type 4	

Footnote for **Table 20:** Histological type

The histological classification should be based on the predominant pattern of the tumor. Following are the classifications of common histological types of gastric carcinoma.

- Papillary adenocarcinoma
- Tubular adenocarcinoma
- Poorly differentiated adenocarcinoma
- Signet-ring cell carcinoma
- Mucinous adenocarcinoma
- Well-differentiated type
- Moderately differentiated type
- Solid type
- Non-solid type

Table 22. Cancer–stroma relationship (resected cases)

categories	total number	direct death	lost f.u.	1 yr (%)	2 yr (%)	3 yr (%)	4 yr (%)	5 yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
Medullary	1115	5	84	89.5	81.4	78.1	75.3	72.4	2.8	738	31	56	56	13	48	19	46	19
Intermediate	1594	17	139	85.3	76.3	71.1	68.3	65.7	2.4	935	73	119	82	24	71	22	88	24
Scirrhou	891	11	87	76.9	62.2	54.3	50.5	47.2	3.5	362	40	242	23	20	63	3	31	9
Not specified	4335	48	238	87.9	80.9	76.5	73.8	72.2	1.4	2931	174	320	125	51	84	60	225	79

Table 23. Infiltration pattern (INF) (resected cases)

categories	total number	direct death	lost f.u.	1 yr (%)	2 yr (%)	3 yr (%)	4 yr (%)	5 yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
INF α	1678	10	102	94.6	90.9	88.5	86.6	84.6	1.8	1327	19	33	35	10	17	28	78	19
INF β	2873	31	189	86.8	78.1	73.0	70.3	68.3	1.8	1805	126	177	169	40	94	47	143	52
INF γ	1983	30	161	75.5	61.5	54.4	50.4	47.5	2.3	836	143	450	57	46	131	5	92	32
Not specified	1401	10	96	90.9	84.9	81.1	78.7	77.2	2.3	998	30	77	25	12	24	24	77	28

Table 24. Lymphatic invasion (ly) (resected cases)

categories	total number	direct death	lost f.u.	1 yr (%)	2 yr (%)	3 yr (%)	4 yr (%)	5 yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
ly 0	3511	18	215	96.6	94.1	91.8	90.3	88.7	1.1	2915	18	72	18	10	23	48	129	45
ly 1	1669	15	122	88.9	81.0	75.1	71.6	69.3	2.3	1057	53	141	59	21	39	27	106	29
ly 2	1400	20	114	77.8	61.4	53.8	49.7	46.5	2.8	576	105	244	110	35	77	18	77	24
ly 3	1070	25	82	59.6	40.0	32.0	27.5	24.7	2.8	230	131	263	95	41	114	5	59	25
Not specified	285	3	15	86.8	79.2	74.8	72.2	70.3	5.5	188	11	17	4	1	13	6	19	8

Table 25. Venous invasion (v) (resected cases)

categories	total number	direct death	lost f.u.	1 yr (%)	2 yr (%)	3 yr (%)	4 yr (%)	5 yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	unknown
v 0	5210	36	342	93.0	88.0	84.3	82.1	80.1	1.1	3872	105	291	67	49	83	76	218	71
v 1	1440	18	120	78.2	63.6	55.9	51.6	49.2	2.7	626	111	221	83	35	82	17	92	35
v 2	663	11	45	65.3	48.5	41.7	37.2	34.5	3.8	204	70	120	84	15	54	4	42	14
v 3	302	12	23	58.0	35.0	28.4	25.0	23.5	5.1	60	21	79	48	8	33	1	14	3
Not specified	320	4	18	85.4	78.3	73.7	71.4	68.4	5.3	204	11	26	4	1	14	6	24	8

Footnote for **Tables 22, 23:**

Cancer–stroma relationship

Medullary type: Stroma is scanty
 Scirrhou type: Stroma is abundant
 Intermediate type: Quantity of stroma is intermediate

Pattern of tumor infiltration into the surrounding tissue

INF α : The tumor shows expanding growth and a distinct border with the surrounding tissue
 INF β : This category is between INF α and INF γ
 INF γ : The tumor shows infiltrating growth and an indistinct border with the surrounding tissue

Footnote for **Tables 24, 25:**

Lymphatic invasion

ly 0: No lymphatic invasion
 ly 1: Minimal lymphatic invasion
 ly 2: Moderate lymphatic invasion
 ly 3: Marked lymphatic invasion

Venous invasion

v 0: No venous invasion
 v 1: Minimal venous invasion
 v 2: Moderate venous invasion
 v 3: Severe venous invasion

Table 26. Lymph node metastasis (pN) (resected cases)

categories	total number	direct death	lost f.u.	1yr (%)	2ysr (%)	3ysr (%)	4ysr (%)	5ysr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	un-known
pN0	4700	23	292	96.5	93.9	91.6	89.8	87.9	1.0	3860	30	85	29	10	37	64	209	61
pN1	1399	20	114	84.7	72.3	64.2	60.2	57.7	2.7	725	57	173	97	29	58	23	70	33
pN2	1145	18	93	70.3	51.7	41.8	36.2	32.6	2.9	324	105	279	93	38	86	15	72	22
pN3	333	12	20	53.1	27.3	16.8	12.8	11.4	3.6	34	39	103	37	18	43	1	18	8
pN4	356	8	28	41.0	15.5	9.9	8.9	7.8	3.1	22	87	97	30	13	42	1	21	7
Not specified	2	0	1	100.0	100.0	100.0	100.0	100.0	0.0	1	0	0	0	0	0	0	0	0
<i>pN3 + pN4</i>	<i>689</i>	<i>20</i>	<i>48</i>	<i>46.9</i>	<i>21.3</i>	<i>13.3</i>	<i>10.8</i>	<i>9.6</i>	<i>2.4</i>	<i>56</i>	<i>126</i>	<i>200</i>	<i>67</i>	<i>31</i>	<i>85</i>	<i>2</i>	<i>39</i>	<i>15</i>

Table 27. Lymph node metastasis (pN) by D0 or D1 dissection (resected cases)

categories	total number	direct death	lost f.u.	1yr (%)	2ysr (%)	3ysr (%)	4ysr (%)	5ysr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	un-known
pN0	1108	8	74	94.7	91.4	87.9	85.8	83.7	2.3	860	9	17	10	3	5	27	76	19
pN1	228	4	24	57.0	42.9	35.7	34.7	33.1	6.6	63	14	57	25	3	12	6	15	5
pN2	187	6	19	34.3	18.9	10.3	6.6	4.0	3.4	5	17	73	23	6	14	4	17	3
pN3	105	3	7	36.9	10.9	6.5	3.3	3.3	3.7	3	13	36	14	4	18	0	6	1
pN4	156	2	15	34.4	10.0	5.2	4.2	4.2	3.6	4	37	45	21	2	17	1	8	4
Not specified	1	0	0	100.0	100.0	100.0	100.0	100.0	0.0	1	0	0	0	0	0	0	0	0
<i>pN3 + pN4</i>	<i>261</i>	<i>5</i>	<i>22</i>	<i>35.5</i>	<i>10.3</i>	<i>5.7</i>	<i>3.7</i>	<i>3.7</i>	<i>2.6</i>	<i>7</i>	<i>50</i>	<i>81</i>	<i>35</i>	<i>6</i>	<i>35</i>	<i>1</i>	<i>14</i>	<i>5</i>

Table 28. Lymph node metastasis (pN) by D2, D3, or D4 dissection (resected cases)

categories	total number	direct death	lost f.u.	1yr (%)	2ysr (%)	3ysr (%)	4ysr (%)	5ysr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	un-known
pN0	3592	15	218	97.0	94.6	92.8	91.0	89.2	1.1	3000	21	68	19	7	32	37	133	42
pN1	1171	16	90	89.9	77.8	69.5	65.0	62.3	2.9	662	43	116	72	26	46	17	55	28
pN2	958	12	74	77.2	57.9	47.6	41.6	37.7	3.2	319	88	206	70	32	72	11	55	19
pN3	228	9	13	60.4	34.6	21.3	17.0	15.1	4.9	31	26	67	23	14	25	1	12	7
pN4	200	6	13	46.0	19.6	13.4	12.3	10.5	4.6	18	50	52	9	11	25	0	13	3
Not specified	0	0	0	—	—	—	—	—	—	0	0	0	0	0	0	0	0	0
<i>pN3 + pN4</i>	<i>428</i>	<i>15</i>	<i>26</i>	<i>53.7</i>	<i>27.6</i>	<i>17.6</i>	<i>14.8</i>	<i>12.9</i>	<i>3.4</i>	<i>49</i>	<i>76</i>	<i>119</i>	<i>32</i>	<i>25</i>	<i>50</i>	<i>1</i>	<i>25</i>	<i>10</i>

Footnote for **Tables 26–31:** Regional LN stations and N classification by tumor location

The regional LNs are classified into four compartments depending upon the location of the primary tumor. The extent of LN metastasis (N) is classified into the 5 categories (N0–N4) in the 11th Japanese edition. Metastasis to para-aortic LNs were included in N3 in the 2nd English edition.

- N0: No evidence of LN metastasis
- N1: Metastasis to N1 nodes, but not to N2, N3, or N4
- N2: Metastasis to N2 nodes, but not to N3 or N4
- N3: Metastasis to N3 nodes, but not to N4
- N4: Metastasis to N4 nodes

LN station	Location	LMU	MUL	MLU	UML	L	LM	M	ML	UM	No. 7	No. 8a	No. 8p	No. 9	No. 10	No. 11	No. 12	No. 13	No. 14v	No. 14a	No. 15	No. 16	
		MU	LM	MU	UM	2	2	2	2	2													2
No. 1	rt paracardial	1				2		1		1													
No. 2	lt paracardial		1			3		2		1													
No. 3	lesser curvature		1	1		1		1		1													
No. 4s	lt gastroepiploic		1			1		1		1													
No. 4d	rt gastroepiploic		1			1		1		2													
No. 5	suprapyloric		1			1		1		2													
No. 6	infrapyloric		1			1		1		2													

From the 11th Japanese edition. The 2nd English edition differs in several points.



Table 33. Resection margins (resected cases)

categories	total number	direct death	lost f.u.	1yr (%)	2yr (%)	3yr (%)	4yr (%)	5yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	un-known
Negative margins	7566	72	514	88.5	80.4	75.8	73.0	70.8	1.1	4930	270	600	257	96	235	104	361	127
Positive margins	258	8	22	38.0	19.2	10.1	7.1	5.1	3.0	10	41	102	23	9	23	0	17	3
Not specified	111	1	12	54.1	44.2	34.7	31.5	30.4	9.2	26	7	35	6	3	8	0	12	1

Table 34. Lymph node dissection (D) (resected cases)

categories	total number	direct death	lost f.u.	1yr (%)	2yr (%)	3yr (%)	4yr (%)	5yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	un-known
D0	267	3	20	38.3	23.3	18.9	16.6	15.7	4.7	34	25	97	28	6	25	2	24	3
D1	1518	20	119	81.7	74.2	69.7	67.7	65.8	2.5	902	65	131	65	12	41	36	98	29
D2	5366	42	357	90.8	83.4	79.0	76.2	73.9	1.2	3664	156	393	153	68	158	61	230	84
D3	668	11	43	82.0	67.7	59.4	55.1	52.8	4.0	323	58	96	33	20	35	5	30	14
D4	115	5	8	79.8	58.2	47.9	45.0	42.0	9.5	43	14	20	7	2	7	0	8	1
Not specified	1	0	1	100.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0
D3 + D4	783	16	51	81.7	66.3	57.7	53.6	51.2	3.7	366	72	116	40	22	42	5	38	15

Table 35. Combined resection of neighboring organs (resected cases)

categories	total number	direct death	lost f.u.	1yr (%)	2yr (%)	3yr (%)	4yr (%)	5yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	un-known
No comb. resection	5530	33	373	90.8	84.8	80.7	78.3	76.3	1.2	3899	172	318	161	53	147	60	241	73
Comb. resection	2394	48	175	76.2	62.0	55.7	52.0	49.3	2.1	1061	146	419	122	55	119	44	147	58
Not specified	11	0	0	81.8	72.7	63.6	63.6	54.5	30.0	6	0	0	3	0	0	0	2	0

Table 36. Resected organs, combined (resected cases)

categories	total number	direct death	lost f.u.	1yr (%)	2yr (%)	3yr (%)	4yr (%)	5yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	un-known
Spleen	1515	34	111	75.3	58.9	52.6	48.4	46.0	2.6	622	102	295	71	40	94	16	90	40
Pancreas	726	18	49	72.6	53.4	46.9	42.1	39.0	3.7	253	55	158	39	25	62	6	41	20
Colon	171	5	12	59.2	43.3	34.4	31.1	27.1	7.1	41	8	59	10	4	13	3	15	1
Adrenal gland	76	1	3	81.6	72.3	62.9	57.5	50.4	11.6	36	5	16	4	2	3	1	3	2
Liver	101	3	9	60.0	47.8	44.4	41.0	33.0	9.8	29	8	13	19	1	8	2	6	3
Gall bladder	730	9	58	79.5	69.4	63.8	60.9	58.3	3.8	383	43	105	41	5	13	16	40	17
Diaphragm	27	1	1	70.4	44.4	33.3	21.6	17.3	15.0	4	2	5	3	2	6	0	2	1

Table 37. Curative potential of resection (resected cases)

categories	total number	direct death	lost f.u.	1yr (%)	2yr (%)	3yr (%)	4yr (%)	5yr (%)	5% s.d.	alive	local rec.	peri-toneal	liver rec.	distant meta.	R	other cancer	other disease	un-known
Resection A	4959	23	305	97.1	94.4	92.0	90.2	88.5	0.9	4105	32	51	42	15	33	75	209	69
Resection B	1739	27	146	85.5	70.3	61.1	55.1	51.4	2.5	796	123	252	70	51	104	22	107	41
Resection C	1235	31	96	44.0	19.9	11.3	8.5	6.5	1.5	64	163	434	174	42	129	7	74	21
Not specified	2	0	1	100.0	100.0	100.0	100.0	100.0	0.0	1	0	0	0	0	0	0	0	0
Resection A + B	6698	50	451	94.1	88.3	84.1	81.3	79.0	1.0	4901	155	303	112	66	137	97	316	110

Footnote for **Table 33:** Resection margins

Negative resection margins means no cancer involvement of either proximal or distal margins. Positive resection margin means cancer involvement of the proximal or distal resection margin or both.

Footnote for **Tables 35, 36:** Combined resection of neighboring organs

The organs are the spleen, liver, pancreas, transverse colon, transverse mesocolon, gallbladder, adrenal gland, ovary, etc. Resection of the greater or lesser omentum, the anterior sheet of the transverse mesocolon, the abdominal esophagus and the first portion of the duodenum are not included in this category.

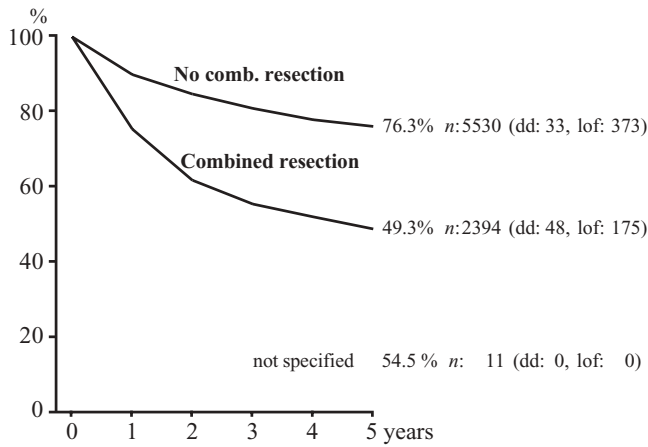


Fig. 6. Combined resection of neighboring organs

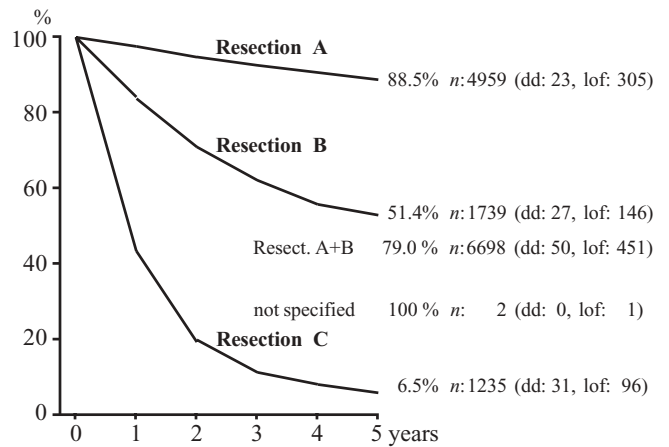


Fig. 7. Curative potential of resection

Table 38. Japanese stage (resected cases)

categories	total number	direct death	lost f.u.	1 yr (%)	2 yr (%)	3 yr (%)	4 yr (%)	5 yr (%)	5% s.d.	local alive	peri- toneal rec.	liver rec.	distant meta.	other R	other cancer	other disease	un- known	
Stage I	4614	21	282	97.1	95.2	93.0	91.5	89.9	0.9	3884	22	36	24	8	22	68	192	55
Stage II	834	10	61	93.9	84.1	77.9	73.5	69.1	3.3	528	26	48	28	15	26	13	54	25
Stage III	1285	23	120	81.5	63.1	51.7	45.0	41.5	2.9	463	120	231	58	48	95	20	76	31
Stage IV	1200	27	84	44.4	20.8	13.2	10.5	9.0	1.8	90	150	422	176	37	123	3	68	20
Not specified	2	0	1	100.0	100.0	100.0	100.0	100.0	0.0	1	0	0	0	0	0	0	0	0

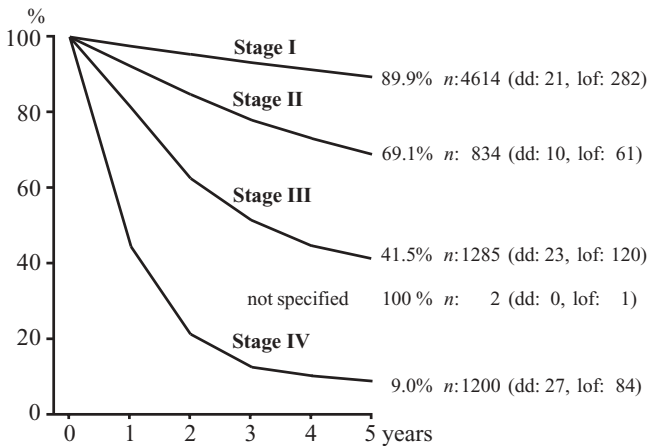


Fig. 8. Japanese stage

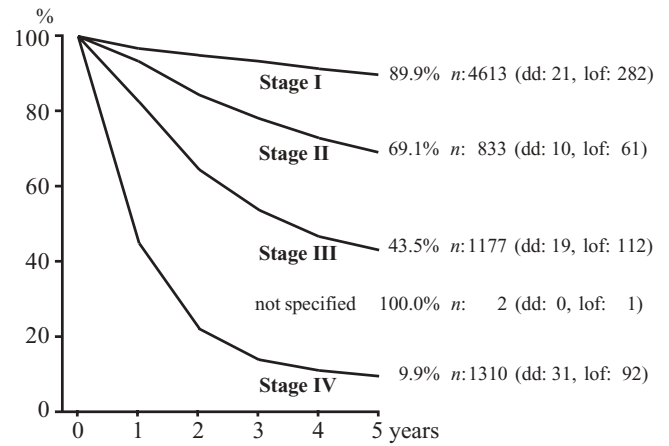


Fig. 9. UICC TNM stage, 5th ed.

Footnote for Tables 38–41:
Japanese staging in the 12th Japanese edition [5]

Japanese staging, 11th ed., was not correlated with survivals. To remove the contradiction, Japanese staging, 12th ed., was published in 1993, and it was principally the same as UICC-TNM staging, 5th ed. For the continuity of statistics, this analysis used the Japanese staging, 12th ed. As the staging was evaluated by a combination of T, N, and M, it was possible to recalculate the Japanese staging, 12th ed., from the collected data (see table at right). The UICC-TNM staging, 5th ed., could also be recalculated.

	N0	N1	N2	N3	P0, H1, <N2	N3/N4
T1	IA	IB	II	IIIA	IVA	
T2	IB	II	IIIA	IIIB		
T3	II	IIIA	IIIB	IVA		
T4	IIIA	IIIB			+P1 or H1 or M1 IVB	
P1, H0, <T3	IVA					
T4						

