



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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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.

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References

1. Japanese Research Society for Gastric Cancer and Japanese Gastric Cancer Association. Statistical report of nationwide registry of gastric carcinoma, No. 1–54 (in Japanese). Tokyo: National Cancer Center; 1972–2001.
2. Japanese Research Society for Gastric Cancer. General rules for gastric cancer study. 11th ed (in Japanese). Tokyo: Kanehara; 1985.
3. Japanese Gastric Cancer Association, Japanese classification of gastric carcinoma. 2nd English ed. *Gastric Cancer* 1998;1:10–24.
4. International Union Against Cancer. TNM classification of malignant tumours. 4th ed. Hermanek P, Sobin LH, editors. Berlin, Heidelberg, New York, London, Paris, Tokyo: Springer; 1987.
5. Japanese Gastric Cancer Association, Japanese classification of gastric carcinoma. 12th ed (in Japanese). Tokyo: Kanehara; 1993.

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

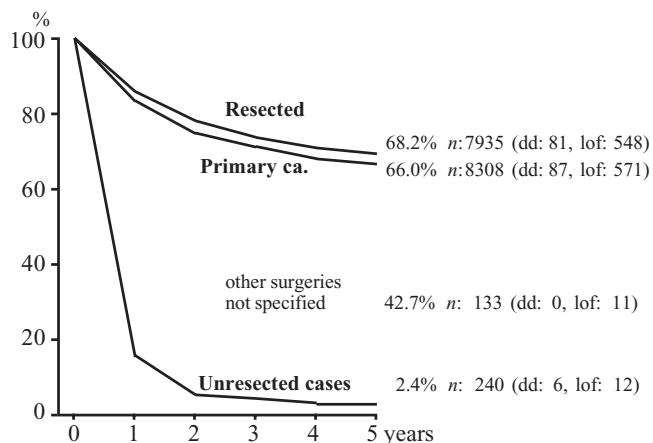


Fig. 1. Primary cancer and resected cases

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 |

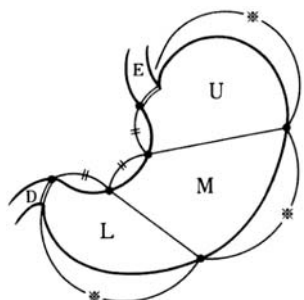
Table 9. Peritoneal metastasis (resected cases)

| 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.

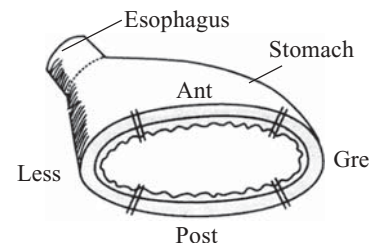
U: Upper third
M: Middle third
L: Lower third
E: Esophagus
D: Duodenum



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 |
|------------|-------------------|-----|-----|-----|-----|---|----|---|----|----|
| | | LMU | MUL | MLU | UML | L | LM | M | ML | UM |
| No. 1 | rt paracardial | 1 | 2 | 1 | 1 | | | | | |
| No. 2 | lt paracardial | 1 | 3 | 2 | 1 | | | | | |
| No. 3 | lesser curvature | 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 | | | | | |
| No. 7 | rt paracardial | 2 | 2 | 2 | 2 | | | | | |
| No. 8a | lt paracardial | 2 | 2 | 2 | 2 | | | | | |
| No. 8p | lesser curvature | 3 | 3 | 3 | 3 | | | | | |
| No. 9 | lt gastroepiploic | 2 | 2 | 2 | 2 | | | | | |
| No. 10 | rt gastroepiploic | 2 | 3 | 2 | 2 | | | | | |
| No. 11 | suprapyloric | 2 | 3 | 2 | 2 | | | | | |
| No. 12 | infrapyloric | 3 | 3 | 3 | 3 | | | | | |
| No. 13 | retropancreatic | 3 | 3 | 3 | 3 | | | | | |
| No. 14v | sup mesenteric v. | 3 | 3 | 3 | 3 | | | | | |
| No. 14a | sup mesenteric a. | 4 | 4 | 4 | 4 | | | | | |
| No. 15 | middle colic | 4 | 4 | 4 | 4 | | | | | |
| No. 16 | para-aortic | 4 | 4 | 4 | 4 | | | | | |

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 |
| Diaphragma | 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.

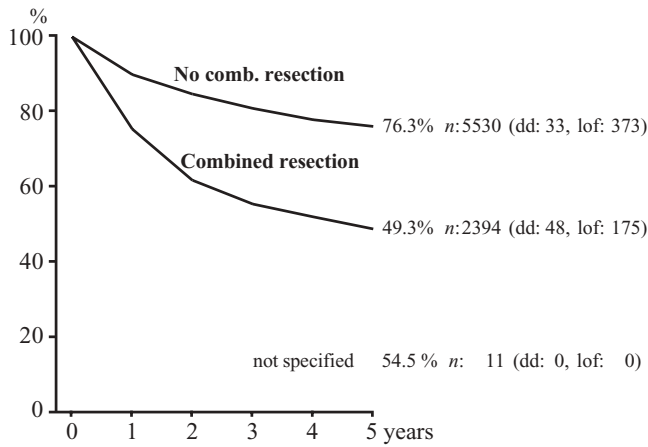


Fig. 6. Combined resection of neighboring organs

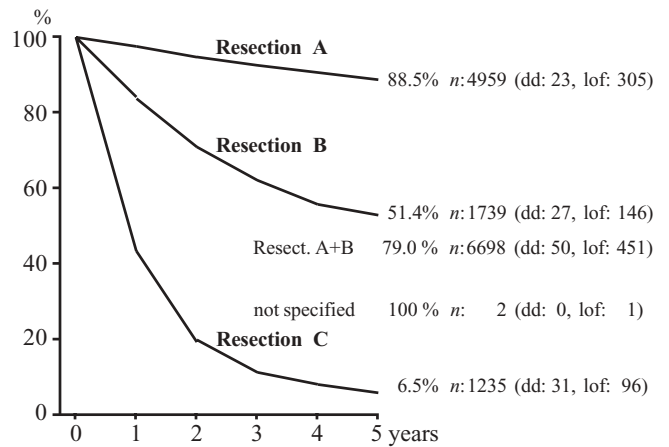


Fig. 7. Curative potential of resection

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 |

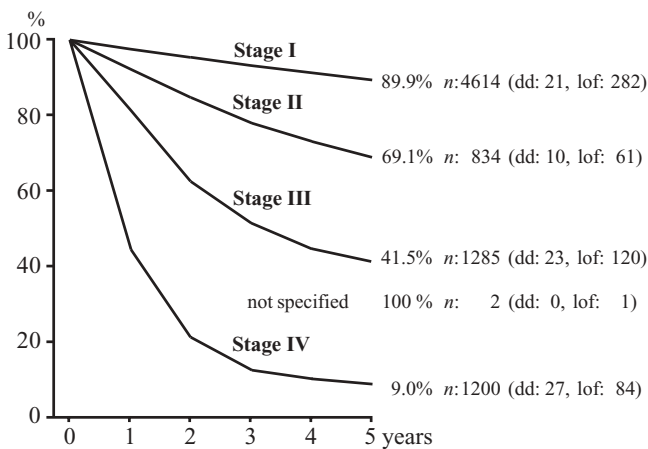


Fig. 8. Japanese stage

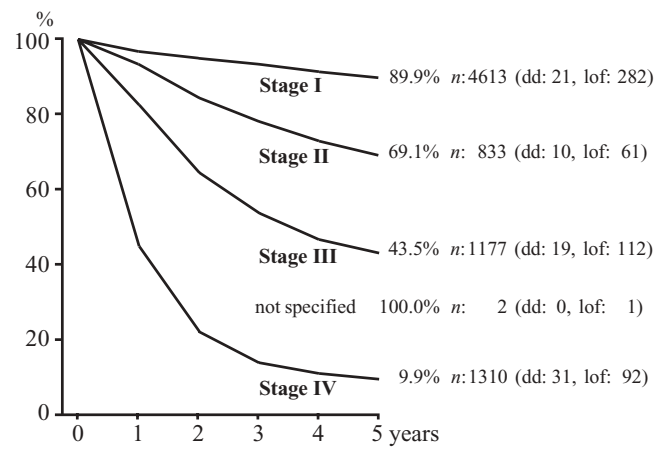


Fig. 9. UICC TNM stage, 5th ed.

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 | | | | | | |

