Surgery of gastric cancer in patients over 80 years old

Tadahiro Uemura, Himeji St. Mary’s Hospital
Jun Otani, Himeji St. Mary’s Hospital
Seiji Kawasaki, Okayama University
Hiroshi Kawai, Himeji St. Mary’s Hospital
Masando Suga, Himeji St. Mary’s Hospital
Shuichiro Maruyama, Himeji St. Mary’s Hospital
Masakazu Murakami, Himeji St. Mary’s Hospital
Shinpachi Morisue, Himeji St. Mary’s Hospital
Ken Yoshizane, Himeji St. Mary’s Hospital
Yoshiro Morokoshi, Himeji St. Mary’s Hospital
Masahiko Yamamoto, Himeji St. Mary’s Hospital
Mitsuhiro Soda, Himeji St. Mary’s Hospital
Surgery of gastric cancer in patients over 80 years old*

Tadahiro Uemura, Jun Otani, Seiji Kawasaki, Hiroshi Kawai, Masando Suga, Shuichiro Maruyama, Masakazu Murakami, Shinpachi Morisue, Ken Yoshizane, Yoshiro Morokoshi, Masahiko Yamamoto, and Mitsuhiro Soda

Abstract

A retrospective study on postoperative complications and factors affecting prognosis was performed on elderly patients with gastric cancer. We studied the correlation of age, pathological depth, preoperative laboratory data, physical status, duration of surgery, volume of blood loss, blood transfusion, curability, and extent of lymph node dissection to postoperative complications and prognosis in 47 patients with gastric cancer over 80 years old. Preoperative function of lung and liver frequently showed abnormal data. Postoperative complications were noted in 47% of patients, especially in the pulmonary system, liver and heart. Curability and extent of lymph node dissection were the significant factor affecting survival. Some mortalities caused by initial malignancy were recognized in the conservative lymph node dissection in the stage I. The incidence of postoperative complications was not significantly different according to extent of lymph node dissection. Blood transfusion was the only significant factor for the incidence of postoperative complication. The most frequent cause of death was the initial malignancy. We recommend that a low grade lymph node dissection should not be readily chosen for elderly patients in early cases.

KEYWORDS: gastric cancer, elderly patients, postoperative complications, preoperative evaluation, blood transfusion

*PMID: 9227796 [PubMed - indexed for MEDLINE]
Copyright (C) OKAYAMA UNIVERSITY MEDICAL SCHOOL
Surgery of Gastric Cancer in Patients Over 80 Years Old

Tadahiro UEMURA*, Jun OTANI, Seiji KAWASAKI†, Hiroshi KAWAI, Masando SUGA, Shuichiro MARUYAMA, Masakazu MURAKAMI, Shinpachi MORISUE, Ken YOSHIZANE, Yoshiro MOROKOSHI, Masahiko YAMAMOTO and Mitsuhiro SODA

Department of Surgery, Himeji St. Mary’s Hospital, Himeji City, Hyogo 670 and ‡Second Department of Surgery, Okayama University Medical School, Okayama 700, Japan

A retrospective study on postoperative complications and factors affecting prognosis was performed on elderly patients with gastric cancer. We studied the correlation of age, pathological depth, preoperative laboratory data, physical status, duration of surgery, volume of blood loss, blood transfusion, curability, and extent of lymph node dissection to postoperative complications and prognosis in 47 patients with gastric cancer over 80 years old. Preoperative function of lung and liver frequently showed abnormal data. Postoperative complications were noted in 47% of patients, especially in the pulmonary system, liver and heart. Curability and extent of lymph node dissection were the significant factor affecting survival. Some mortalities caused by initial malignancy were recognized in the conservative lymph node dissection in the stage I. The incidence of postoperative complications was not significantly different according to extent of lymph node dissection. Blood transfusion was the only significant factor for the incidence of postoperative complication. The most frequent cause of death was the initial malignancy. We recommend that a low grade lymph node dissection should not be readily chosen for elderly patients in early cases.

Key words: gastric cancer, elderly patients, postoperative complications, preoperative evaluation, blood transfusion

Increasingly sophisticated surgical procedures and preoperative support techniques have already permitted the extension of surgical indications to older patients (1). Furthermore, remarkable progress has been made in anesthesia, postoperative management and nutritional management. Surgery has been performed safely on elderly patients. However, various complications frequently occur in elderly patients and sometimes become more severe in comparison to those in other patients. Therefore, we retrospectively studied postoperative complications and factors affecting prognosis in elderly patients with gastric cancer.

Subjects and Methods

Patients. From January 1983 to December 1994, we performed surgery on 47 gastric cancer patients over 80 years old. The control group consists of 997 gastric cancer patients under 70 years old during the same period.

The correlation of age, pathological depth, preoperative laboratory data, physical status, duration of surgery, volume of blood loss, preoperative anemia, blood transfusion, curability and D-number to postoperative complications and prognosis were studied. Curability and D-number refer to the general rules for gastric cancer study of the Japanese Research Society for Gastric Cancer (the 12th edition) (2).

Curability shows the absence or presence of residual tumor after surgery.

Curability A: no residual tumor
Curability B: other than curability A and C
Curability C: macroscopic residual tumor
D-number shows the extent of lymph node dissection.
D0: no lymph node dissection or insufficient dissection of perigastric lymph node

*To whom correspondence should be addressed.
Present address: Second Department of Surgery, Okayama University Medical School, Okayama 700, Japan.
Table 1  Physical status classification of the American Society of Anesthesiologists

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Healthy patient</td>
</tr>
<tr>
<td>II</td>
<td>Mild systemic disease—no functional limitation</td>
</tr>
<tr>
<td>III</td>
<td>Severe systemic disease—definite functional limitation</td>
</tr>
<tr>
<td>IV</td>
<td>Severe systemic disease that is a constant threat to life</td>
</tr>
</tbody>
</table>

Table 2  Criteria of preoperative organic disorder

<table>
<thead>
<tr>
<th>Laboratory data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung</td>
</tr>
<tr>
<td>Heart</td>
</tr>
<tr>
<td>Liver</td>
</tr>
<tr>
<td>Kidney</td>
</tr>
<tr>
<td>Nutrition</td>
</tr>
<tr>
<td>Blood pressure</td>
</tr>
<tr>
<td>Blood sugar</td>
</tr>
</tbody>
</table>

The abnormal data of each item was scored as one point, and those points were added for each patient.

D1: lymph node dissection of perigastric lymph node
D2: lymph node dissection of perigastric lymph node and lymph nodes along the left gastric, common hepatic, celiac and right gastric or splenic arteries.

Each patient was classified preoperatively according to the physical status classification of the American Society of Anesthesiologists (ASA) (3) (Table 1).

The following criteria regarding preoperative organ disorder were arbitrarily established (Table 2). Abnormal data for each item was treated as one point, and all points for each patient were added together.

Cumulative survival curves were calculated using the Kaplan-Meier method. Statistical analysis was performed with the generalized-Wilcoxon test and the $\chi^2$ test. A value of $P < 0.05$ was considered significant.

Results

There were 31 men (66 %) and 16 women (34 %). These patients were classified into two groups by pathological depth of cancer invasion. One group consisted of invasion which was limited to muscularis propria while the other included invasion over muscularis propria. The group over 80 years old included more progressive cases with such features as pathological depth, peritoneal dissemination, liver metastasis and lymph node metastasis than the group under 70 years of age (Fig. 1).

Therefore, curability C cases in patients over 80 year old were more frequent than those among patients under 70 years of age ($P = 0.04$) (Fig. 1).

Under 70 years old (n=997)  Over 80 years old (n=47)

- Gender distribution
  - Female
  - Male
  - 33% 67% 34% 66%
  - 38% 62% 53% 47%

- Pathological depth
  - P(+)
  - 12% 88% 22% 78%
  - 53% 47%

- Peritoneal dissemination
  - P(+)
  - 6% 94% 13% 87%
  - 39%

- Liver metastasis
  - P(+)
  - 6% 94% 13% 87%
  - 39%

- Lymph node metastasis
  - N(+)
  - 45% 55% 55% 55%
  - 20%
  - 20%

Cur C
- Cur A and B
- 20% 80% 47% 53%

Fig. 1  Comparison of patients over 80 years old with those under 70 years old. Curabilities A~C (Cur A~C) are described in Materials and Methods.
Pulmonary function and liver function frequently showed abnormal data in preoperative examinations (Fig. 2).

Postoperative complications were noted in 47% of patients. Many kinds of complications were recognized, especially in the pulmonary system, liver and heart. Mental disorder was noted in 12.8% (Fig. 3).

Curability and D-number were the significant factors affecting survival (Fig. 4). D2 surgery also showed a comparatively good survival rate in the stage I cases, in which D2 surgery can yield curability A. Preoperative physical status judged by ASA classification did not affect the survival rate and the incidence of postoperative complications. Blood transfusion was the only significant factor for the incidence of postoperative complication (Fig. 5).

The most frequent cause of death was the initial malignancy (Fig. 6). Hospital mortality was seen in 6 cases. Hospital mortality in this paper means refer to mortality before the first discharge after surgery. Three cases of hospital mortality were surgical death and the other three cases were caused by the initial malignancy. All the cases of surgical death and hospital mortality were ASA III.
Fig. 4  Overall survival rates and incidence of postoperative complications in regard to eight factors.
(a) American Society of Anesthesiologists (ASA) classification. ASA II (n = 31), 5 year survival rate 45.4% (---); ASA III (n = 16), 5 year survival rate 50.9% (-----). (b) The total score regarding organic disorder. Score ≤ 2 (n = 13), 5 year survival rate 61.5% (-----); Score ≥ 3 (n = 8), 5 year survival rate 37.5% (-----). (c) Amount of bleeding. Slight bleeding (n = 24), 5 year survival rate 46.0% (-----); Severe bleeding (n = 23), 5 year survival rate 49.5% (-----). (d) Blood transfusion. With blood transfusion (n = 19), 5 year survival rate 43.2% (-----); Without blood transfusion (n = 28), 5 year survival rate 49.9% (-----). (e) Postoperative complication. With complication (n = 22), 5 year survival rate 53.8% (-----); Without complication (n = 25), 5 year survival rate 39.6% (-----). (f) Curability. Curability A (n = 14), 5 year survival rate 100% (-----); Curability B (n = 11), 5 year survival rate 54.4% (-----); Curability C (n = 22), 5 year survival rate 0% (-----). (g) D-number. D2 (n = 10), 5 year survival rate 87.5% (-----); D1 (n = 10), 5 year survival rate 55.6% (-----); D0 (n = 28), 5 year survival rate 24.5% (-----). (h) D-number in stage I case. D2 (n = 6), 5 year survival rate 100% (-----); D1 (n = 8), 5 year survival rate 71.4% (-----); D0 (n = 12), 5 year survival rate 70.7% (-----).
Fig. 5  Incidence of complications in 47 patients over 80 years old.
(a) ASA classification;  (b) score;  (c) the amount of bleeding;  (d) blood transfusion;  (e) curability;  (f) preoperative anemia;  (g) D-number.
ASA: See legend to Fig. 4.

Fig. 6  Twenty-six dead cases in 47 patients over 80 years old. (a) Causes of death (26 cases); (b) Details of initial malignancy (19 cases)
Discussion

In this study, more progressive cases were recognized among the elderly patients. This suggests that early detection and early treatment are especially important in elderly patients.

D2 surgery significantly influences survival despite the lack of significance in the background of ASA classification (Fig. 4g). This is probably because D2 surgery was performed in more early cases. Moreover, the 5 year survival rate after D2 surgery was 100% in stage 1 cases, in which D2 surgery is able to yield curability A (Fig. 4h). In these cases, D0 and D1 surgery yield four and three cases of death, respectively. Four dead cases in D0 surgery consisted of two initial malignancies (one liver metastasis and one peritoneal dissemination), one senility and one surgical death. Three mortalities in D1 surgery consisted of two initial malignancies (one liver metastasis and one lymph node metastasis) and one senility. Initial malignancy was often missed in these D0 and D1 mortality cases, and this suggests that lymph node dissection should be done more accurately in these early cases, Nishimura et al. also reported that increased curability in D2 surgery facilitated a better survival rate (4). In other words, simple gastrectomy without lymph node dissection should not be chosen even in elderly patients in early cases. But in the other progressive stages, the extent of lymph node dissection showed no significant differences.

Some believe that conservative lymph node dissection is advantageous for elderly patients (5). But in our study, the incidence of postoperative complications was not significantly different according to the extent of lymph node dissection. More extensive lymph node dissection and increased curability tended to yield a better survival rate, though there was no significant difference in the survival rate between D1 and D0 dissection. Studies of risk factors using many parameters have been performed to examine the correlation between preoperative evaluation and postoperative complications and prognosis (6, 7). Scores of preoperative abnormal data did not clearly relate to the frequency of postoperative complications and survival rates. Survival rates were also not statistically related to the ASA classification of octogenarians in our study. But all the cases of surgical death and hospital mortality were ASAIII. On the other hand, Hosking et al. reported that short-term morbidity and both short- and long-term mortality were closely associated with the ASA classification of patients 90 years of age and over (8). Though there is a difference between octogenarians and patients over 90 years old, it seems that the indications for surgery should be chosen carefully in patients with severe grades of ASA classification.

In preoperative examinations, the highest incidence of abnormal data was noted in the lung (70.0%), followed by the liver (52.2%) and nutritional status (39.1%). The incidence of postoperative complication was 47.7% and pulmonary complications were predominant. Pulmonary complications in elderly patients are often frequent and severe (9). As counter measures, various measures have been taken and we have also suggested stopping smoking and respiratory training (10). Furthermore, for patients with especially poor respiratory function, we operate under epidural anesthesia without tracheal intubation. Using this method, it is thought that pulmonary complication during and after surgery can be lessened because tracheal secretions are lessened.

Many complications were recognized, particularly in the pulmonary system, liver and heart. These organs also showed many abnormal data in preoperative examinations. It is suggested that abnormal data in preoperative examination are associated with postoperative complications to some extent. Postoperative mental disorder (delirium) was also frequent in our study. Delirium is a characteristic feature of elderly patients and almost always occurs in the intensive care unit. Thus, it seems that elderly patients should be returned to general wards as early as possible.

The cause of death was mainly the initial malignancy and other causes were minimal. Therefore, we recommend that a low grade D-number should not be readily chosen for elderly patients. However, D3 or D4 surgery have not been performed to elderly patients at our institution. In the future, it will be necessary to show how D3 or D4 surgery affects postoperative complications and prognosis in elderly patients.

Blood transfusion was a significant factor only in the incidence of postoperative complications. It seems to be important to suppress intraoperative bleeding and avoid blood transfusion, though the amount of bleeding and preoperative anemia were not significant factors. Homologous transfusion was performed in this series. It has been reported that transfusion of homologous blood weakens the tumor immunity of the host (11, 12). Recently, autologous transfusions have been often used for major gastroenterological surgery at our institution. Autologous
transfusion has several merits, such as post-transfusional hepatitis and graft versus host disease. It seems that autologous transfusion ought to be used for elderly patients in whom severe bleeding is expected.

References


Received July 1, 1996; accepted February 4, 1997.