Original Article

Clinical observation of radical total gastrectomy without postoperative gastrointestinal decompression in elderly patients with gastric cancer

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A B S T R A C T

Purpose: To investigate the safety and feasibility of radical total gastrectomy without postoperative gastrointestinal decompression in elderly patients with gastric cancer. Methods: Elderly patients (65–80 years of age) hospitalized with gastric cancer from May 2009 to August 2012 were selected to receive radical total gastrectomy with (controls, n = 39) or without (n = 37) postoperative gastrointestinal decompression. Postoperative recovery conditions and associated complications were observed and compared. Results: In the group without decompression, the first passage of flatus post-operation was significantly earlier, and scores of nausea, pharyngitis, insomnia, and postoperative ambulation limitation were significantly reduced compared to controls (all \( p < 0.01 \)). However, there were no differences in the degree of abdominal distension, time to first anal defecation, or incidence of postoperative complications between the groups. Conclusion: Gastrointestinal decompression is not necessary after total gastrectomy in elderly gastric cancer patients, and may improve patient comfort and recovery.

1. Introduction

Gastric cancer (GC) is the fourth most common type of cancer and the second most frequent cause of cancer mortality, and thus remains an important public health problem [1,2]. Moreover, the incidence of GC increases with age, thus placing elderly patients at an increased risk [1,3,4]. Treatment of GC is limited because of its genetic complexity and heterogeneity [2], though total gastrectomy is the primary surgical therapy.

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Advanced surgical techniques and supportive measures allow for reasonable safety with minimal disabling side effects from this procedure [5–7]. However, elderly patients have an increased risk for morbidity and mortality after surgery [8,9], and thus greater attention should be paid to treatment for this group of patients.

Gastrointestinal (GI) decompression is a routine treatment following GI surgeries, such as gastroenterostomy, enterostomy, and cecostomy [10]. GI decompression provides for drainage of air and gastric contents from the stomach and intestines, thus reducing nausea, vomiting, pulmonary complications, and the risk of anastomotic leakage and surgical wound complications, thereby accelerating the recovery of GI function [11]. However, increasing evidence indicates that postoperative GI decompression is unnecessary [12,13], and potentially deleterious [14,15]. Some studies report that the incidence of immediate postoperative complications (infection and dehiscence of the wound or anastomotic leakage) is not affected by performing GI decompression [16,17], whereas others show bowel movements return earlier with a lower incidence of pulmonary complications in patients for whom the procedure is not performed [18–21]. Furthermore, GI tube placement is contraindicated for cases with uncorrectable coagulopathy, hemodynamic instability, respiratory compromise, and certain anatomic alterations [22]. Therefore, the aim of the present study was to evaluate the need for GI decompression after total gastrectomy in elderly GC patients, and the impact the procedure has on postoperative recovery and complications.

2. Methods

2.1. Patients

Seventy-six elderly patients met the criteria with GC that were scheduled to undergo radical total gastrectomy in our department between May 2009 and August 2012 were recruited for this study. Patients were randomly assigned to receive (control group; n = 39) or go without (experimental group; n = 37) postoperative GI decompression. All the patients were fully informed about the objectives and methods of this study and provided informed consent. The study was approved by the ethical committee of the First Affiliated Hospital of Anhui Medical University.

2.1.1. Inclusion criteria

For inclusion in the study, patients were required to be: i) 65–80 years of age; ii) diagnosed with GC by gastroscopy and pathological examination; and iii) without metastasis.

2.1.2. Exclusion criteria

Patients were excluded if they: i) received radiotherapy or chemotherapy simultaneously; ii) had a medical history of laryngitis, chronic bronchitis, or emphysema; and iii) had comorbid diseases, such as diabetes and chronic liver disease.

2.2. Procedures

Disposable nasojejunal tubes for postoperative nasogastric enteral nutrition (Nutricia Pharmaceutical co., LTD, Wuxi, China) were inserted in all patients the morning of the surgery, and patients in the control group also received a disposable gastric tube (Rongye Technology Ltd., Yangzhou, China). Postoperative GI decompression in control patients was performed by connecting the gastric tube to a vacuum aspiration disk (Rongye Technology Ltd., Yangzhou, China) until first flatus after the operation. Nasojejunal tubes were vacuum sealed when nasogastric enteral nutrition was not being provided. All other interventions such as oral-care and health education conducted for both groups were the same.

2.3. Observed parameters

Postoperative recovery conditions that were observed and compared between the two groups included recovery of bowel function (abdominal distension and the times of the first flatus and anal defecation), and patient complaints of nausea, pharyngitis, sleep disruption, and ambulation limitation [scored as 0 (no symptom), 1 (slight), 2 (medium), and 3 (serious)]. In addition, the incidence of postoperative complications, including anastomotic leakage and pulmonary infection, was observed throughout the hospitalization period.

2.4. Statistical analysis

All statistical analyses were performed using SPSS (version 12.0.1; SPSS Inc., Chicago, IL, USA). Differences between control and experiment groups were tested by Student’s t, Mann-whitney U, or χ² tests; abdominal distension was compared using a repeated measure analysis of variance. Data are presented as mean ± standard error mean, with p < 0.05 considered as statistically significant.

3. Results

3.1. Recovery of bowel function

Baseline patient and cancer characteristics did not differ between control and experimental groups (Table 1). Although abdominal distension changed significantly during the postoperative hospital stay (time effect: F = 153.50; p < 0.01), it was not affected by GI decompression (group effect: F = 1.81; p = 0.18), but there was a significant interaction between days and group (intercept effect: F = 23666.14; p < 0.01) (Fig. 1).

The time of the first flatus after the operation was earlier in experimental patients than that in the control group (p < 0.01) (Fig. 2). However, there was no difference between the groups regarding the time of first defecation.

3.2. Postoperative somatic complaints

Patients who did not receive GI decompression reported significantly lower scores for postoperative nausea, pharyngitis, disrupted sleep, and ambulation limitation (p < 0.01) (Fig. 3).

3.3. Postoperative complications

Anastomotic leakage only occurred in one patient in the control group, and was not different from the experimental
The incidence of postoperative pulmonary infection also did not differ between the experiment and control groups (1/37 vs. 2/39; Z = 0.54; p = 0.59).

### Table 1 – Baseline patient characteristics.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Experimental group</th>
<th>Control group</th>
<th>p value</th>
</tr>
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<tr>
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<td>24</td>
</tr>
<tr>
<td></td>
<td>Female</td>
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<td>15</td>
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<tr>
<td>Age (yr)</td>
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<td>69.74 ± 3.98</td>
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<tr>
<td>Weight (kg)</td>
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<td>63.83 ± 1.26</td>
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<tr>
<td></td>
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<td>21</td>
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<tr>
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<td>&gt;9</td>
<td>13</td>
<td>9</td>
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<tr>
<td><em>Helicobacter pylori</em> infection</td>
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</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td>Poorly differentiated</td>
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<td>25</td>
</tr>
<tr>
<td></td>
<td>Well differentiated</td>
<td>16</td>
<td>12</td>
</tr>
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</table>

Data are expressed as n unless otherwise indicated.

group (Z = 0.97; p = 0.33). The incidence of postoperative pulmonary infection also did not differ between the experiment and control groups (1/37 vs. 2/39; Z = 0.54; p = 0.59).

### 4. Discussion

#### 4.1. Elimination of GI decompression does not postpone the recovery of GI function

GI dysfunction is a common symptom in patients receiving total gastrectomy, resulting from anesthetization, operation-induced nerve injury, slowed peristalsis or neuroparalysis, and infection [23]. Abdominal distension, an indicator of GI dysfunction, was approximately 2 cm greater after total gastrectomy in patients from both groups in the present study. However, this parameter was not altered by GI decompression, which suggests that the postoperative procedure does not promote the recovery of GI function.

![Fig. 1 – Abdominal distension. The data are presented as mean ± standard error mean. Results of repeat-measure ANOVA showed the time effect, but not group effect, on the abdominal distension with the interactive effect between time and group.](image1)

![Fig. 2 – Recovery of bowel function. Time of the first flatus and defecation after radical gastrectomy with (control) and without (experimental) gastrointestinal decompression. Data are presented as mean ± standard error mean; *p < 0.01 vs. controls.](image2)

![Fig. 3 – Postoperative somatic complaints. Postoperative complaints scored by patients following radical gastrectomy with (control) and without (experimental) gastrointestinal decompression. Data are presented as mean ± standard error; *p < 0.01 vs. controls.](image3)
Our results show that GI decompression after gastrectomy delays the passage of flatus and ambulation, consistent with previous results [13,24]. These findings suggest that the absence of gastric tubes may increase the flexibility and convenience for ambulation, which could in turn accelerate the recovery of peristalsis [21], though the time to first defecation and convenience for ambulation, which could in turn accelerate the recovery of peristalsis [21], though the time to first defecation was not impacted. Furthermore, patients receiving GI decompression reported more severe postoperative nausea, pharyngitis, and sleep disturbance, indicating that the direct oppression and stimulation from the tube contributes to the discomfort [25].

4.2. Elimination of GI decompression does not increase postoperative complications

GI decompression after gastrectomy is performed to prevent from anastomotic leakage [11], which is associated with increased mortality and morbidity and prolonged hospital stay, and may also influence the local recurrence of carcinoma [26]. However, the outflow of the GI decompression is relatively low [13], and thus not sufficient to reduce the anastomotic pressure from digestive juices. In fact, previous studies report no difference in the incidence of anastomotic leakage with and without GI decompression [23,25]. Only one patient in our study exhibited anastomotic leakage, which suggests that GI decompression after gastrectomy is not crucial to protect patients against anastomotic leakage.

Similarly, only a few cases of pulmonary infection occurred in our study, one patient with and two without GI decompression. The low incidence is in contrast to previous reports showing that gastric intubation after abdominal operations increases the incidence of postoperative respiratory infection [23,27]. This discrepancy may be due to the limited number of patients included in our study.

4.3. Study limitations

There are several limitations of this study that should be noted. First, only a relatively small number of cases was included. In order to more accurately identify significant differences in rates of anastomotic leakage, which range from 1% to 6% [13,19], several hundred patients would be required. This would require a much longer study period, or the inclusion of more than one surgical department. Furthermore, the ratio of males to females in this study (1:0.64) is lower than that reported in other studies [4], likely a result of the limited number of patients. Second, this study was focused on effects of GI decompression in elderly patients; thus, selection and confounding biases in our study were inevitable. Further studies, such as multi-centre randomized controlled clinical trials with large samples, are needed to confirm our results and to generalize the findings to patients of all age groups.

4.4. Conclusion

The results of the present study demonstrate that GI decompression is not necessary after total gastrectomy, and can improve the quality of life of elderly GC patients. Specifically, elimination of the postoperative procedure did not impede recovery of GI function nor increase the risk of postoperative complications. Thus, it is safe and feasible for elderly GC patients to receive total gastrectomy without prophylactic postoperative GI decompression.

Acknowledgments

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Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.ijnss.2015.01.007.

References


