



Original research

Quality of life in cancer survivors 5 years or more after total gastrectomy: A case-control study

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ARTICLE INFO

Article history:

Received 10 May 2014

Received in revised form

12 May 2014

Accepted 20 May 2014

Available online 24 May 2014

Keywords:

Gastrectomy

Long-term care

Quality of life

Stomach neoplasms

ABSTRACT

Introduction: This study investigated how total gastrectomy (TG), along with memories of cancer, affect the subjective wellness of survivors long after surgery. Rational approaches for effectively improving the quality of life (QoL) of these survivors were suggested.

Methods: Between 2008 and 2013, QoL data of gastric cancer patients who underwent a curative TG, were obtained at 5-year postoperative follow-up visits (5-year survivors) and at visits beyond 5 years (long-term survivors). The control groups for these survivor groups were constructed from volunteers who visited our health-examination center for annual medical checkups. The Korean versions of the European Organization for Research and Treatment (EORTC) Quality of Life Questionnaire Core 30 (QLQ-C30) and the gastric cancer specific module, the EORTC QLQ-STO22, were used to assess QoL.

Results: Five-year survivors showed worse QoL compared to the control group in role functioning, social functioning, nausea/vomiting, appetite loss, financial difficulties, reflux, eating restrictions, taste, and body image, and better QoL in the emotional and cognitive functioning scales. In long-term survivors, deterioration in QoL were still apparent in financial difficulties, reflux, and eating restrictions, while QoL differences in the remaining scales had diminished.

Discussion: Surviving 5 years after TG does not result in living in a carefree state in terms of QoL. After 5 postoperative years, survivors still need extended care for deteriorated QoL indicators due to symptomatic, behavioral, and financial consequences of surgery.

Conclusion: While relevant clinical and institutional approaches are required for corresponding declines in QoL, such efforts must extend beyond 5 postoperative years.

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1. Introduction

The ultimate goal of the quality of life (QoL) assessment of cancer patients is to restore them to a healthy period as quickly as possible. In general, efforts for QoL improvement are well justified provided they do not have ill effects on the survival of cancer patients. In patients with gastric cancer in the upper part of the stomach, total gastrectomy (TG) is considered the best surgical choice. [1,2] Although there have been some attempts to preserve a food reservoir by a proximal gastrectomy [3–6] or by a TG followed by jejunal pouch reconstruction [7–9], these procedures have never gained much popularity. However, undergoing a TG for gastric cancer at the upper part of the stomach is well justified due to its curativeness and survival rates. Nonetheless, an inevitable consequence is a deterioration in QoL from a restricted food

reservoir. Moreover, having the stomach completely removed by TG results in not only problems related to a restricted food reservoir, but also problems related to vitamin B12 deficiency, which necessitates supplementation for life [10,11].

In general, the 5-year postoperative point is often regarded as a turning point in the fight against cancer even though being cancer-free after surviving 5 postoperative years represents a somewhat misleading interpretation of 5-year survival. Because a TG involves the total loss of a gastric food reservoir and a need for lifetime vitamin B12 supplementation, the functional and physiological changes from a TG last beyond 5 years of survival after surgery. Yet, regarding QoL, one may objectively be unwell and, at the same time, subjectively be well, and vice versa [12].

Several studies report QoL in patients shortly after TG in which QoL has declined [13]. Other studies report QoL after accumulation of data for significantly longer periods [14,15]. Nonetheless, QoL of those shortly after TG has been included in their analyses, and QoL deteriorations of those after TG have been reported. There has been

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an attempt to reveal long-term QoL after TG using generic QoL measures, including the Short-Form 36 and the 15D instrument [16]. Those after TG performed almost as well as the healthy control groups, except for sleeping, bladder/bowel functions, and diarrhea. However, the consequent strategies for its effective management have not been discussed in depth. While few attempts have been made to assess QoL in patients after TG using various QoL measures [17], cancer-specific QoL measures, such as the Functional Assessment of Cancer-General (FACT-G), and the European Organization for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire Core 30 (QLQ-C30), have been developed [18,19]. We used the EORTC QLQ-C30 and its gastric cancer specific module, the EORTC QLQ-STO22, to assess the QoL of long-term survivors after TG.

This study aimed to investigate how TG, along with memories of cancer, affects the subjective wellness of survivors long after surgery, and suggests rational approaches to improve the QoL in survivors after TG. We discuss the subjective wellness of survivors after TG by assessing the QoL of those who have survived 5 years and beyond after TG and by making comparisons with estimations of QoL from healthy volunteers.

2. Methods

2.1. Study participants and design

This study was approved by our institutional review board. QoL data on gastric cancer patients who underwent a curative total gastrectomy were obtained during their fifth annual follow-up visit after surgery between 2008 and 2013. Patients aged 45–70 years were included. QoL data of 155 patients were available. The exclusion criteria were as follows: (1) past history of gastric surgery, (2) combined resection or other additive procedures, and (3) comorbidities that could influence QoL. Seven patients who underwent TG for remnant gastric cancer after distal subtotal gastrectomy were excluded. A patient who underwent a combined resection (distal pancreatectomy) was also excluded. Four patients were excluded due to other malignancies (1), or cerebrovascular (1), neurologic (1), or pulmonary (1) conditions. Of 155 patients, 143 patients were included and categorized as 5-year survivors.

During the same period, the QoL data of long-term survivors (beyond 5 years) after TG were collected on their visits for regular follow-ups or vitamin B12 supplementations. Patients between the ages of 45 and 70 years were included and QoL data from 44 individuals were available. Identical exclusion criteria were applied and 5 patients were excluded due to remnant gastric cancer (3), combined resection (1), and jejunal interposition (1). Of these 44 patients, 39 were included and categorized as long-term survivors.

The control groups for the 5-year survivors and the long-term survivors were constructed from volunteers who visited our health-examination center for annual medical checkups. QoL data were obtained upon their initial visit. Those with extensive medical histories or abnormal test results that necessitated medical attention were excluded. QoL data from 80 age- and gender-adjusted healthy volunteers were used to estimate healthy QoL indicators of 143 5-year survivors. Those from 39 age- and gender-adjusted healthy volunteers were used to estimate healthy QoL indicators of 39 long-term survivors.

2.2. QoL assessments

The EORTC has developed a set of QoL measures for cancer patients in the form of a multi-dimensional and self-administrated questionnaire. It has been designed to be applicable across a

range of cultural settings, and translated versions into different languages are available. The validated Korean version of the EORTC QLQ-C30 and its gastric cancer specific module, the EORTC QLQ-STO22, were used to assess QoL [20]. The EORTC QLQ-C30 is composed of a global health status/QoL scale, five functional scales, and nine symptom scales/items. The EORTC QLQ-STO22 comprises nine symptom scales/items. QoL is represented by a score ranging from 0 to 100 for each scale. Detailed structures and interpretational guidelines of each tool are provided in Table 1.

2.3. Statistical analysis

The QoL outcomes of 5-year survivors and long-term survivors were compared to corresponding estimated healthy QoL scores. The QoL of 5-year survivors and that of long-term survivors were compared as well.

The demographic values were compared using a Student's *t*-test and a chi-square test. A Student's *t*-test was used to make QoL comparisons between groups. A *p*-value of less than 0.05 was considered statistically significant. All statistical analyses were conducted using the Statistical Package for Social Science version 20.0 (IBM Corporation, Armonk, NY, USA).

3. Results

3.1. Characteristics of study participants

The 5-year survivor group was comprised of 105 men and 38 women with a mean age of 59.6 ± 6.8 years (Table 2). The corresponding healthy control group was comprised of 57 men and 23 women with a mean age of 59.7 ± 6.6 years. There were no statistically significant differences of gender and age between them ($p = 0.727$, $p = 0.888$).

Table 1
Scales of EORTC QLQ-C30 and EORTC QLQ-STO22.

EORTC QLQ-C30
Global health status/QoL scale ^a
Functional scales ^a
Physical functioning
Role functioning
Emotional functioning
Cognitive functioning
Social functioning
Symptom scales/items ^b
Fatigue
Nausea and vomiting
Pain
Dyspnea
Insomnia
Appetite loss
Constipation
Diarrhea
Financial difficulties
EORTC QLQ-STO22 ^b
Dysphagia
Pain
Reflux
Eating restrictions
Anxiety
Dry mouth
Taste
Body image
Hair loss

QoL, quality of life; EORTC QLQ, European Organization for Research and Treatment of Cancer Quality of Life Questionnaire.

^a A higher score represents a better QoL.

^b A higher score represents a worse QoL.

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