

# Quality of Life After Esophagectomy for Cancer

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**Purpose/Objectives:** To examine symptoms and quality of life (QOL) of esophagectomy patients after curative surgery.

**Design:** Longitudinal, descriptive pilot study.

**Setting:** Comprehensive cancer center in the northeastern United States.

**Sample:** 23 patients were surveyed: 20 men and 3 women. The mean age was 62.3 years.

**Methods:** The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-C30 (version 2.0) and the esophageal-specific module were used. Data collection included three or four time points: before neoadjuvant treatment (if administered), before surgery, and three and six months after surgery.

**Main Research Variables:** The effects on symptoms and QOL of curative esophagectomy performed by a thoracic surgical oncologist.

**Findings:** Global QOL declined slightly over time; this change was not statistically significant. A significant inverse relationship was found between symptom intensity and global QOL. The intensity of hoarseness, reflux, and diarrhea increased significantly pre- to postsurgery. The average symptom intensity for the esophageal-specific subset of 24 symptoms increased significantly over time; the greatest intensity was found before surgery.

**Conclusions:** Over the six-month observation period, the study found little average change in global QOL or functional status. However, symptoms increased significantly during this time period. Increased symptoms were associated with decreased QOL.

**Implications for Nursing:** Symptom management should focus on symptoms that interfere with patients' QOL. Further research should target the evaluation of specific interventions for symptoms.

## Key Points . . .

- ▶ Nurses play an important role in early detection of and intervention for symptoms in patients who have undergone esophagectomy.
- ▶ Reduction in symptom intensity can improve quality of life.
- ▶ Preoperative patient education should include a brief review of possible postoperative symptoms to encourage early reporting and optimal management of symptoms.

presentation and surgical preference, is available to those with potentially resectable disease. Despite improved rates of morbidity and mortality associated with curative surgical resection, some patients reportedly have experienced symptoms because of surgery (McLarty et al., 1997). The intensity and frequency of reported symptoms could have a negative impact on quality of life (QOL) (Ellis, Huberman, & Busse, 1995). This study examined one institution's experience with symptoms after curative esophagectomy procedures and documented the impact of these symptoms on QOL to identify nursing management needs.

## Conceptual Framework

QOL refers to the characteristics and limitations that determine an individual's ability to function and derive satisfaction in doing so. Several dimensions define QOL, including physical, psychological, and social well-being (Ferrell & Dow, 1997). Symptoms are central to health-related QOL in that they affect all dimensions of well-being (Cella, 1994; van Knippenberg & de Haes, 1988). For example, individuals

Carcinoma of the esophagus is responsible for an estimated 13,100 new diagnoses and 12,600 deaths a year (American Cancer Society, 2002). Two-year survival for the disease is less than 20% (Wilke, Siewert, Fink, & Stahl, 1994). For individuals undergoing surgery, the five-year survival rate is 10%–36% (Blazeby, Williams, Brookes, Alderson, & Farndon, 1995; Sagar, Gauperaa, Sue-Ling, McMahon, & Johnston, 1994). Curative esophagectomy, using several different classic but aggressive surgical approaches based on tumor

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Digital Object Identifier: 10.1188/02.ONF.1127-1131

with no symptoms or minor, transient symptoms are likely to see little change in their physical well-being, mental attitudes, or role fulfillment. However, individuals with chronic or intense symptoms are likely to have impairment in all aspects of QOL. This article examines the type and intensity of symptoms experienced after esophagectomy and the relationship of these symptoms to other dimensions of QOL.

## Literature Review

Nursing research focusing on QOL and esophageal cancer is limited. Long-term, patient-reported symptoms after esophagectomy include early satiety, dysphagia, diarrhea, vomiting, and postprandial sweating (Collard, Otte, Reynaert, & Kestens, 1992). Baba et al. (1997) surveyed 44 patients who survived 10 years postesophagectomy. Reported symptoms included difficulty swallowing, weight loss, reflux, and heartburn. The study demonstrated that, for a small number of patients who survived 10 years postesophagectomy, a variety of symptoms persisted.

Baba et al. (1998) examined QOL in 116 postesophagectomy patients whose surgery included cervical node dissection. Questionnaires were administered every other year, four times in six years. The researchers found that QOL was worse for patients who had a cervical node dissection. The patients experienced decreased performance status as well as difficulty talking or hoarseness related to vocal cord paralysis. This contrasted a study conducted in Japan in which QOL improved after cervical node dissection (Fujita et al., 1995). Baba et al. (1998) recommended early treatment for vocal cord paralysis before discharge from the hospital to improve outcomes and, therefore, QOL.

Van Knippenberg et al. (1992) used the Rotterdam Symptom Checklist to gauge patients' assessments of their QOL. Researchers queried 132 patients before esophagectomy and again 3–4 months after surgery. Questions included those regarding food intake and difficulty eating. Eighty-three patients completed the survey; 33% had fewer swallowing problems postoperatively. However, patients also reported increased physical symptoms after surgery, including loss of appetite, fatigue, sore muscles, shortness of breath, increased sputum production, and diarrhea. Despite the increase in symptoms, patients' QOL ratings improved postoperatively. The investigators suggested that patients were willing to endure increased symptoms for an improved prognosis.

Zieren, Jacobi, Zieren, and Muller (1996) assessed QOL in 119 patients with esophageal cancer 12 months after surgery using the European Organization for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire (QLQ) and the Spitzer Index, which categorizes QOL into activity, daily living, health, support, and outlook. In the study, QOL was assessed by patients and a psychologist; patients answered the EORTC questionnaire, and the psychologist completed the Spitzer Index after interviewing the patients. Patient results indicated that QOL was impaired after esophageal resection because of physical limitations. Patients' and the psychologist's ratings of QOL were correlated, but the psychologist scored QOL higher. The researchers concluded that patients were the most accurate and valid appraisers of their QOL. QOL immediately after surgery was poorer because of physical symptoms but returned to a presurgical baseline over time unless patients experienced disease recurrence, anastomotic stricture, or long-term swallowing and digestive problems.

Blazeby et al. (1995) used the EORTC QLQ-Core 30 (C30) to survey 59 patients with esophageal cancer. Thirty-three of the patients underwent esophagectomy, and 26 received supportive care. Patients who underwent esophagectomy noted better physical, emotional, cognitive, and global health scores than patients who received supportive treatment. More recently, Blazeby, Brookes, and Alderson (2001) investigated whether changes in QOL before and during treatment for esophageal cancer were prognostic. Eighty-nine patients completed the EORTC QLQ-C30 and the dysphagia scale of EORTC's esophageal-specific module before treatment and at regular intervals. Physical function at baseline was associated significantly with survival ( $p = 0.002$ ). Emotional function six months after treatment was related significantly to longer survival ( $p < 0.0001$ ).

Finally, McLarty et al. (1997) studied 107 patients 5–23 years postesophagectomy (median time since esophagectomy was 10.2 years) to analyze their QOL. The patients underwent a variety of different types of esophagectomy, including the Ivor Lewis, transhiatal, extended, and thoracoabdominal esophagectomy procedures. Using the Medical Outcomes Study 36-Item Short Form Health Survey to assess QOL, the investigators found that patients who survived five years or more were troubled by gastrointestinal symptoms such as reflux, dumping, and dysphagia. However, they rated their overall QOL highly. The investigators concluded that the patients might have rated their QOL higher despite increased symptoms because they were pleased to be alive and free of cancer. The researchers recommended that a QOL instrument specific to esophageal cancer be developed.

These studies demonstrated that esophagectomy reduces the incidence of some symptoms but increases the intensity of others. Some researchers have found that the net effect on QOL was negligible: QOL neither improved nor declined after surgery. In a few studies, QOL improved despite the presence of multiple symptoms after surgery. The results of one study supported a relationship between patient-rated QOL scores and survival. The findings indicate that further research is needed to examine the relationship between symptoms and QOL after esophagectomy.

## Methods

This longitudinal, descriptive pilot study examined symptoms after curative esophagectomy and their impact on QOL. All patients with esophageal cancer that was potentially surgically resectable were invited to participate. An evaluation, including computerized tomography scans of chest and abdomen and a bone scan, had to be negative for metastatic disease prior to a clinical determination of resectability and study participation. Patients going directly to esophagectomy, as well as those receiving neoadjuvant chemoradiation before surgery, were included. The study received institutional review board approval and written informed consent. Participants received questionnaires at three or four different time points, depending on whether they received neoadjuvant chemoradiation. The first time point established a baseline prior to neoadjuvant chemoradiation if it was administered; the second provided a baseline two weeks before esophagectomy; the third was three months after surgery, a typical recovery milestone after surgery; and the fourth was six months postsurgery. The four time points were established to track changes in QOL from baseline (i.e., prior to treatment) through the milestones of the treatment experience and recovery.

## Instruments

The **EORTC QLQ** is an integrated measure of QOL in patients with cancer participating in international clinical trials. The core questionnaire, the QLQ-C30, is the result of collaborative research. It has been used widely in cancer clinical trials because it is cancer specific, multidimensional, brief, and easy to complete; has been field-tested in a cross-cultural study of patients with lung cancer; and has established reliability and validity (Aaronson et al., 1993). The current tool is composed of five functional scales, three symptom scales, a global health status and QOL scale, and six single items. All of the scales and single-item measures are scored from 0–100. A high score represents a higher response level; therefore, a high score for a functional scale represents a high or healthy level of functioning and a high score for global health status and QOL represents a high QOL, but a high score for a symptom scale represents a high level of symptomatology or problems. The functional scale is subdivided into physical, role, emotional, cognitive, and social subscales. The global health status and QOL scale is determined by two questions regarding a respondent's sense of overall health and QOL over the past week. The symptom scale contains questions regarding general symptoms, including fatigue, nausea, vomiting, pain, dyspnea, insomnia, appetite loss, constipation, and diarrhea. The esophageal-specific module contains 24 questions assessing symptoms related to esophageal cancer, including dysphagia, eating, gastrointestinal symptoms, pain, and emotional problems (Blazeby et al., 1996). The investigators obtained written permission to use these tools and added 10 questions related to gastrointestinal symptoms. The total time required to complete all questions was about 15 minutes.

## Results

### Demographic and Clinical Characteristics

Over 18 months, 25 patients with potentially surgically resectable esophageal carcinoma were asked to participate in the study. Two declined because of a language barrier or disinterest; 23 enrolled, 20 men and 3 women. The mean age was 62.3 years (see Table 1). Of the 23 participants, four were found to have metastatic disease before or at the time of surgery, so they were dropped from the study. Of the 19 patients who underwent esophagectomy, 13 (68%) were alive and without evidence of disease six months after surgery. One additional patient died five months after surgery because of streptococcal pneumonia without evidence of disease recurrence.

Five patients underwent a three-hole or synchronous combined abdominoracocervical esophagectomy. Twelve underwent the Ivor Lewis esophagectomy. One underwent a variation of esophagectomy called a transhiatal, and another had a transabdominal esophagectomy. The same thoracic surgical oncologist performed all but one patient's surgery. Prevalent comorbidities included smoking history ( $n = 16$ ) and hypertension ( $n = 7$ ).

Clinically, the sample of patients lost an average of 35 pounds from surgery, with a range of 10–58 pounds. Two patients were fed through a jejunostomy feeding tube preoperatively. Another patient used the tube for supplemental feedings for six months after surgery. Six of 19 patients had to undergo upper endoscopy with dilation after surgery for anastomotic narrowing. The mean number of dilations was 1.2 times, with a range of 1–4 dilations.

**Table 1. Demographic and Clinical Characteristics**

Characteristic	n
<b>Gender</b>	
Male	20
Female	3
<b>Neoadjuvant treatment</b>	
No	7
Yes	16
<b>Surgery</b>	
No	4
Yes	19
<b>Procedure (n = 19)</b>	
Three-hole	5
Ivor Lewis	12
Transhiatal	1
Transabdominal	1
<b>Disease-free survival (n = 18)</b>	
No	5
Yes	13
<b>Age (years)</b>	
$\bar{X} = 62.3$	–
$SD = 8.35$	–
Range = 46–81	–

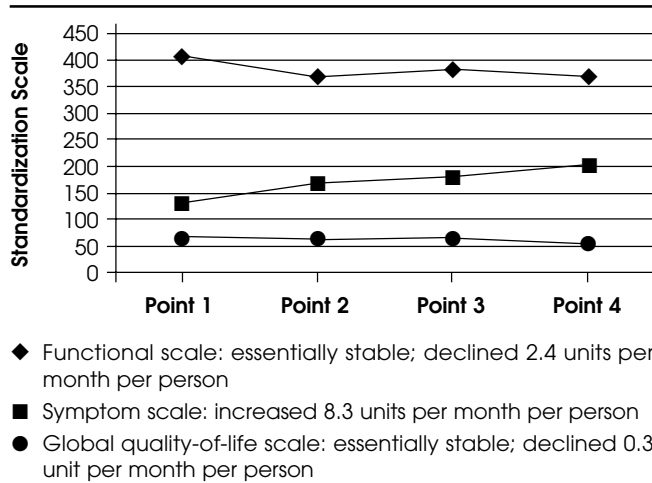
N = 23

### Survey Responses

In the overall functional scale of the QLQ-C30, the researchers found a slight, statistically nonsignificant average decline of 2.4 units per month per person (see Figure 1). The general symptom scale showed a significant increase ( $p = 0.039$ ) of 8.3 units per month per person from baseline to six months postsurgery. Global QOL demonstrated an average 0.3 unit decline per month per person, which was stable over time and not significant. The researchers examined the relationship between global QOL and weight loss from baseline to six months postsurgery. A trend was noted, albeit statistically insignificant, that as weight loss increased, global QOL declined. A significant ( $p = 0.004$ ) inverse relationship was found between symptom intensity and global QOL; as symptom intensity increased, QOL declined (see Figure 2). Fifty percent of the variance in QOL was explained by symptom intensity.

Statistical analysis for each esophageal-specific symptom over time spanned by each pair of time points was assessed using the Wilcoxon matched pairs signed rank test. Because the goals of this study were descriptive in nature, no formal statistical correction for multiple hypothesis tests was implemented and the change in each symptom was evaluated at the 5% level. Symptom variation over time was evaluated using the Pearson product-moment correlation coefficient.

Patients reported that three months after esophagectomy, hoarseness had increased significantly ( $p = 0.015$ ); however, it could not be related to type of esophagectomy procedure performed. Patients reported a significant ( $p = 0.05$ ) increase in the intensity of acid reflux. Reflux also could not be related to type of esophagectomy performed. Eight of 14 patients who reported chest pain before treatment had improved at six months. Six of 14 patients with stomach pain reported worsening by six months. The triad of postprandial



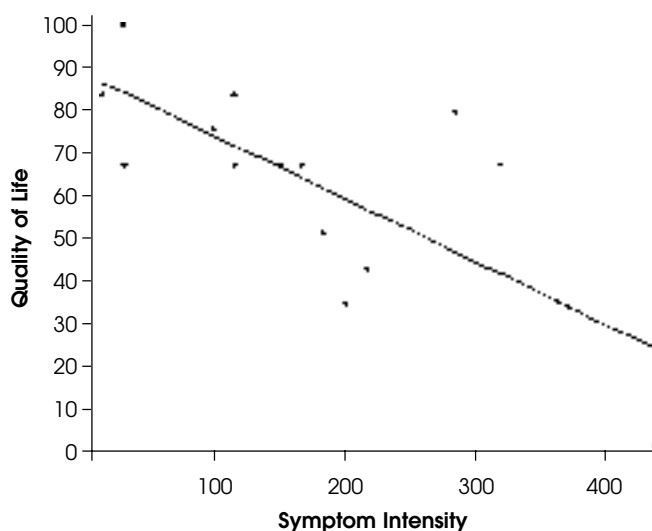
**Figure 1. Variation of Response Over Time**

diarrhea, dizziness, and diaphoresis (i.e., “dumping syndrome”) can occur after esophagectomy as a result of the rapid transit of food from the smaller remnant gastric pouch into the small intestine. A statistically significant ( $p = 0.006$ ) increase was found in the intensity of diarrhea. No significant changes occurred in postprandial diaphoresis or dizziness. The complete triad of dumping syndrome was not present in this sample.

The esophageal-specific subset of 24 symptoms was selected for further analysis. For each patient at each time point, the arithmetic average of intensities recorded for the 24 symptoms was computed. The score represents the average symptom intensity observed at each time point available for that patient. A significant overall tendency existed for an increase in average symptom intensity over time ( $p = 0.019$ ) that was not linear.

## Discussion and Conclusion

This pilot study supported previous findings related to post-esophagectomy symptoms, including weight loss, diarrhea, and acid reflux (Baba et al., 1997; McLarty et al., 1997). The



**Figure 2. Symptom Intensity Effects on Quality of Life**

sample also reported an increase in hoarseness, but, as in a previous study (Fujita et al., 1995), it could not be attributed to cervical node dissection or use of the abdominoracocervical approach. The etiology of hoarseness in this sample remains unknown. This study supported the conclusion that overall QOL is stable over time after curative esophagectomy and suggested that a better prognosis correlates with a willingness to tolerate increased symptoms (van Knippenberg et al., 1992; Zeiren et al., 1996).

This exploratory research indicated that symptom intensity increased after curative esophagectomy and that overall symptom intensity played a pivotal role in determining global QOL. The latter finding was consistent with the proposition of the QOL model that symptom intensity affects QOL (Cella, 1994). The findings suggested that patients’ QOL can be improved after curative esophagectomy if healthcare professionals target the management and reduction of symptoms.

This study was limited by its small sample size. Some findings were not significant, possibly because of insufficient power to detect associations. In addition, subgroup analyses could not be attempted because of low numbers. This research should be replicated with a larger sample to confirm the findings. In addition, a symptom management intervention could be tested to evaluate the hypothesis that reduction of symptoms improves overall QOL.

## Clinical Implications

This study provides valuable information about symptoms that interfere with patients’ QOL after esophagectomy. Presurgery patient education should include a brief review of possible postoperative symptoms and treatments. If patients have heard about the possibility of a symptom, they likely will report it more readily, thereby enacting earlier intervention. Preparing patients for the possibility of postoperative endoscopy with dilation for anastomotic stricture may help to minimize fear of recurrence. In many cases, dysphagia is the initial symptom of esophageal cancer. Patients need continued support and reassurance that experiencing some symptoms for many months after surgery is normal but that the goal is reduction of their intensity.

In a busy follow-up clinic after esophagectomy, nurses must prioritize problems and deal first with those of greatest concern. Based on this study, patient symptoms require nursing attention to reduce overall symptom load and improve QOL. Nutritional support may be needed to reduce symptoms, thereby maintaining or improving QOL. Patients need to learn about optimizing caloric intake and about treatments for diarrhea prevention. Specific reinforcement regarding smaller, frequent meals and avoidance of significant liquid ingestion while eating solids may reduce symptoms such as early satiety, nausea, and stomach pain. Reflux must be prevented and managed by optimizing hydrogen blockers, using proton pump inhibitors, not eating within a couple hours of bedtime, and elevating the head of the bed. Nursing assessment and intervention are key to symptom management and optimizing QOL.

*Special thanks to Pat Salthouse, RN, for helping with data collection, Andrew Balshem, BA, for data analysis, and Jeanne Held-Warmkessel, MSN, RN, APRN, BC, AOCN®, for a thoughtful review.*

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