

Long-Term Lung Cancer Survivors Have Permanently Decreased Quality of Life After Surgery

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Abstract

This study assessed the very long-term health-related quality of life (HRQoL) among operated non–small-cell lung cancer patients. We compared the data of 230 patients to that of the general population. The patients scored lower on total HRQoL and especially on the dimensions mobility and breathing. HRQoL should also be considered because of longer life expectancy of operated lung cancer patients.

Background: Retrospective evaluation of the long-term health-related quality of life (HRQoL) among survivors after non–small-cell lung cancer (NSCLC) surgery. **Patients and Methods:** A total of 586 patients underwent surgery for NSCLC in Helsinki University Central Hospital between January 2000 and June 2009. Two validated quality-of-life questionnaires, the 15D and the EORTC QLQ-C30 with its lung cancer–specific module, QLQ-LC13, were sent to the 276 patients alive in June 2011. Response rate was 83.3%. Results of the 15D were compared with those of an age- and gender-standardized general population. **Results:** Median follow-up was 5 years. Compared with a general population, our patients had a significantly lower 15D total score, representing their total HRQoL and scores for dimensions of mobility, breathing, usual activities, depression, distress, and vitality. The patients, however, scored significantly higher on vision, hearing, and mental function. **Conclusions:** NSCLC survivors may suffer postoperatively from permanently reduced long-term HRQoL compared to an age- and gender-matched general population. This is essential patient information as more patients are surviving longer.

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Introduction

Lung cancer, the second most common malignancy among men and fourth among women in Finland when determined by incidence, is Finland's leading cause of cancer-related deaths among men and second among women.¹ Surgical resection is the main treatment modality for early-stage non–small-cell lung cancer (NSCLC) with permanent cure as the primary objective. Its prognosis and 5-year survival rates of 8% among men and 13% among women are grim,¹ so more attention has recently been paid to patients' postoperative health-related quality of life

(HRQoL) as an indicator of treatment outcome. As an aid to increasing the patients' disease-free survival, sustaining HRQoL has become a crucial secondary objective. Patients may value their HRQoL as highly as they do the increase of their remaining years,² making better patient information concerning risks for postoperative HRQoL deterioration vital.³ Many studies evaluate the effect of surgical resection on HRQoL in various patient groups during recent decades, using generic and disease-specific questionnaires.⁴⁻¹⁰ Most have focused on short-term effects of curative surgery on HRQoL, but studies focusing also on long-term effects are increasing.⁵ During studies' follow-up, postoperative short-term reductions in HRQoL may reach preoperative levels within 3 to 9 months.^{6,11,12} Long-term reductions may last for up to 2 years.^{4,5,13-15}

Many studies have observed a statistically significant relationship between preoperative HRQoL and postoperative patient survival,^{16,17} with some even indicating that the power of preoperative HRQoL as a predictor of postoperative survival is even greater than that of patient age or extent of disease.^{8,18}

To gain a better understanding of long-term HRQoL among postoperative lung cancer patients, we investigated the long-term

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HRQoL of such patients from our hospital, utilizing the 15D, a generic quality-of-life instrument proven valid in evaluation of HRQoL, and the disease-specific European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC-QLQ) C30, together with the lung cancer-specific module LC-13, to assess HRQoL among these patients.

Patients and Methods

Patients

Between January 2000 and June 2009, a total of 586 patients were operated on for NSCLC in the Division of General Thoracic and Esophageal Surgery of Helsinki University Central Hospital. Seventy-nine had video-assisted thoracic surgery, and 507 had muscle-sparing anterolateral thoracotomy. Survival was verified in June 2011 through the Finnish population register. Two HRQoL questionnaires, 15D and EORTC QLQ-C30 + LC13, were sent to those patients still alive, to be completed and returned by mail. If no reply came within the month, questionnaires went out again to those who did not respond. If no reply came within 2 months, the patient was contacted by phone and asked to answer the questionnaire, either by mail or phone.

Quality-of-Life Instruments

The HRQoL was measured with the 15D¹⁹ and the EORTC QLQ-C30 + LC13²⁰ questionnaires.

The 15D is a standardized self-administered generic HRQoL instrument containing 15 dimensions with 5 levels each: moving, seeing, hearing, breathing, sleeping, eating, speech, excretion, usual activities, mental function, discomfort and symptoms, depression, distress, vitality, and sexual activity. The single index score (15D score) representing the overall HRQoL on a 0 to 1 scale (1 = full health, 0 = dead) and dimension level values reflecting the goodness of the levels relative to no problems on the dimension (= 1) and to being dead (= 0) are calculated from a health state-descriptive system by a set of population-based preference or utility weights. A change of 0.02 to 0.03 in the 15D score is considered clinically important.¹⁹

The 15D data for our general population came from the National Health 2000 Health Examination Surveys representing the Finnish population aged 30 and over.²¹ For this analysis, 4191 individuals were matched. This sample was weighted to reflect patients' age and gender distribution.

The EORTC QLQ-C30 + LC13 is a standardized, self-administered disease-specific HRQoL instrument designed for use in estimation of the HRQoL in oncologic patients. It contains the core questionnaire C30 and the supplementary module LC13 designed specifically for use with lung cancer patients. The C30 is composed of 9 multi-item scales including 5 functional scales, 3 symptom scales, a global quality-of-life scale, and 6 single-item symptom measures. The LC13 contains 1 multi-item and 9 single-item symptom scales assessing both the symptoms of the cancer and the adverse effects of the treatments. All the items are scored on a scale of 0 to 100, with a high score on a functional or the global quality-of-life scale representing a high level of functioning or quality of life and a high score on a symptom scale representing a high level of symptoms.

Statistical Analysis

Results are presented as mean \pm standard deviation (SD) or as percentages. Comparisons of results between continuous variables were analyzed with the independent samples *t* test, and between categorical variables with chi-square statistics. Linear association between variables was measured with the Pearson correlation coefficient. All tests for significance were 2-sided, with *P* < .05 considered statistically significant. Data analyses were performed by SPSS 18.0.0.²²

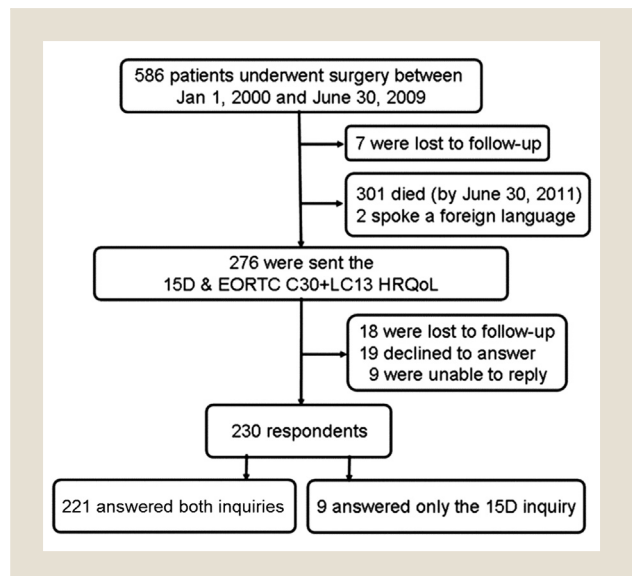
The ethics committee of Helsinki University Central Hospital approved this protocol.

Study Population

Of the 586 surgical patients, 301 (51.4%) died during follow-up. Seven patients were lost to follow-up with data unavailable for analysis. Data from 2 patients were excluded even without questionnaires, as they spoke neither Finnish or Swedish, the languages of this study. Altogether, the data of 579 patients were included. Questionnaires went to 276 patients, and 230 (83%) answered. Of these, 9 declined to answer the EORTC C30 and LC13 questionnaires (Figure 1). Mean and median follow-up times of the patient group were, respectively, 5.37 \pm 2.45 and 4.85 years (range 2.01-11.13 years). Table 1 shows patient preoperative characteristics, with data on the clinical stage of 2 patients missing because each was diagnosed with 2 simultaneous primary tumors with different histology in their contralateral lungs. Only *P* values with statistical significance or nearly statistically significant are provided. Table 2 lists the postoperative results.

Video-assisted thoracic surgical lobectomy and anatomical segmentectomy began in our unit in 2006. The complication was considered major if potentially life-threatening or requiring reoperation. Postoperative complications among those who did and did not respond to the questionnaires are presented in Table 3.

Figure 1 Flow Chart of Patients and Questionnaire Respondents



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