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Quality of life in the elderly after major lung resection for lung cancer

Michele Salati*, Alessandro Brunelli, Francesco Xiumè, Majed Refai, Armando Sabbatini

Umberto I Regional Hospital, Ancona, Italy

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Abstract

The objective of this study was to assess the residual quality of life (QoL) in elderly patients submitted to major lung resection for lung cancer. From July 2004 through August 2007 a total of 218 patients, 85 of whom were elderly (70 years), had complete preoperative and postoperative (3 months) quality of life measures assessed by the Short Form 36v2 health survey. QoL scales were compared between elderly and younger patients. Furthermore, limited to the elderly group, we compared the preoperative with the postoperative SF36v2 measures and the physical component summary (PCS) and mental component summary (MCS) scores between high-risk patients and low-risk counterparts. The postoperative SF36 PCS (50.3 vs. 50, P = 0.7) and MCS (50.6 vs. 49, P = 0.2) and all SF36 domains did not differ between elderly and younger patients. Within the elderly, the QoL returns to the preoperative values three months after the operation. Moreover, we did not find any significant differences between elderly higher-risk patients and their lower-risk counterparts postoperatively. The information that residual QoL in elderly patients will be similar to the one experienced by younger and fitter individuals may help them in their decision to proceed with surgery.

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1. Introduction

Thoracic surgeons are faced with an increasingly elderly population with potentially resectable lung cancer. Recent studies have shown that surgery in these group of patients has acceptable morbidity and mortality rates and achieves in selected patients similar long-term survival compared to younger patients [1, 2]. Particularly when dealing with subjects with an increased incidence of underlying comorbidities, early outcomes and survival may not be the most appropriate endpoints to consider. The patients’ perspective may differ from the surgeons’ one and the possibility to resume an acceptable daily lifestyle is an important factor that may critically influence the decision to be submitted to lung resection [3].

Until now few studies have focused on patients’ reported outcomes such as quality of life (QoL) [4] and this still limits the capability of the surgeons to exhaustively counsel the patients about their perioperative risk and residual function. In our specialty there is growing interest in this endpoint to be used as an adjunct to more traditional outcomes [5] and some authors have proposed its use for future quality of care monitoring initiatives [6].

Based on these premises, we designed this study to verify whether the residual quality of life of elderly patients after major lung resection for lung cancer differed from the one observed in younger patients, in order to provide additional information that could help to clarify the role of surgery in this high-risk group of patients.

2. Materials and methods

2.1. Patients

From July 2004 through August 2007, 279 patients were consecutively submitted to major lung resection (246 lobectomies and 33 pneumonectomies) for NSCLC in our Unit and were prospectively enrolled in this study. The study was approved by the local Institutional Review Board of the hospital, and all patients gave their informed consent to participate in the study.

Postoperative early mortality rate was 2.1% (6 cases). Of the 273 patients surviving the operation, a total of 218 patients had complete cardiopulmonary (FEV1, DLCO, stair climbing test) and QoL assessment preoperatively and at three months postoperatively (202 lobectomies, 16 pneumonectomies). Fifty-five patients (20%) dropped out for several reasons (lung cancer recurrence, current chemotherapy, refusal).

2.2. Operative and perioperative management

All the patients were operated on by the same staff of qualified thoracic surgeons and managed in a dedicated thoracic ward. During the period of the study a standard-
ized postoperative management was applied to all patients in agreement with institutional protocols either for uneventful or complicated postoperative courses.

Criteria for inoperability were a predicted postoperative 
FEV1 (ppoFEV1) and a predicted postoperative DLCO (ppoDLCO) <30% of the predicted normal values associated with an insufficient exercise tolerance (height at stair-climbing test <12 m and V02 peak <10 ml/kg/min) [7]. As a rule, lung resections were performed through a muscle-sparing lateral thoracotomy. Postoperative management included chest physiotherapy, early mobilization, antibiotic and antithrombotic prophylaxis, and thoracotomy chest pain control by continuous intravenous infusion of ketorolac and tramadol to keep the visual analogue scale score below 3 or 4 in the first 72 h (on a scale from 0 to 10, assessed twice daily).

No formal preadmission or post-discharge physiotherapy or psychological supportive programs were administered.

2.3. Follow-up and quality of life measures

QoL was measured in all patients before and three months after the operation by administration of the Short Form-36 Health Survey [8], version 2 (SF36v2), which is a generic QoL instrument that, through a 36-item short form survey, assesses eight health concepts (physical functioning, role limitation caused by physical problems, bodily pain, general health perception, vitality, social functioning, role limitation caused by emotional problems, mental health). Scores standardized to norms and weighted averages are used to create summary physical component summary (PCS) and mental component summary (MCS) scores on a standard scale (Table 1) [8]. In the SF36v2, all health dimension scores are standardized to norms by employing a linear transformation of data originally scored on a 0–100 scale. Norm-based scores have a mean of 50 and a standard deviation of 10 in the general 1998 US population. As a consequence, for all health dimensions and component scales any score <50 falls below the general population mean and each point represents 1/10th of a standard deviation. This allows to directly compare measures among different populations.

2.4. Analysis

This is an observational analysis performed on a prospectively compiled electronic database. Informed consent was obtained from all patients to use their data for clinical research. The database was approved by the local institutional review board.

In addition to preoperative and postoperative (three months after operation) quality of life measures (SF-36v2), the following variables were used for comparing elderly (older than 70 years of age, 85 patients, mean age: 75 years) and younger patients (133 patients, mean age: 59.4 years): preoperative haemoglobin concentration, smoking history (pack-years), forced expiratory volume in one second (FEV1) in percent of predicted; carbon monoxide lung diffusion capacity in percent of predicted (DLCO); performance at preoperative stair climbing test (m), COPD index (calculated by adding the percent preoperative forced expiratory volume in one second to the preoperative ratio of forced expiratory volume in one second to forced vital capacity, both values taken in decimal form), nutritional status (albumin level; body mass index [BMI]), Eastern Cooperative Oncology Group (ECOG) performance status scale [9], and ASA (American Society of Anesthesiologists) score, history of coronary artery disease (CAD), and neo-adjuvant therapy.

The Shapiro–Wilk normality test was used to assess distribution of numeric variables. Continuous variables were compared by means of the unpaired Student’s t-test or Mann–Whitney test (non-normal distribution). Categoric variables were compared by the χ2-test or the Fisher’s exact test as appropriate.

No matching procedure was used to match the two populations, as the primary objective was not to assess the influence of a factor/treatment on two comparable populations but rather to verify the influence of the same intervention (major lung resection) on two different groups of patients.

Furthermore, limited to elderly patients, we compared the preoperative with the postoperative SF36v2 measures. Finally, postoperative SF36v2 physical and mental component summary scores measured in selected groups of high-risk elderly patients (DLCO<70%, ppoFEV1, or ppoDLCO<40%, moderate to severe COPD (GOLD criteria), history of coronary artery disease and pneumonectomy) were compared to the ones found in their low-risk counterparts.

All the statistical tests were two-tailed, with a significance level of P=0.05, and were performed on the statistical software Stata 8.2 (Stata Corp, College Station, Texas).

3. Results

Table 2 summarizes the results of the comparison of preoperative characteristics between young and elderly patients.

The two groups were comparable in terms of spirometric variables, smoking history, incidence of cardiac co-morbidity and neo-adjuvant chemotherapy, haemoglobin levels, nutritional status and type of operation. The elderly had a worse exercise performance at stair climbing test (P<0.0001), higher ASA (P<0.0001) and ECOG (P<0.0001) scores.

Fig. 1 shows the results of the comparison between the two groups in relation to subjective preoperative status as
pointed out by the 10 different domains of the SF-36 v2. The elderly group had significant lower PCS ($P = 0.03$) and PF ($P = 0.009$) but higher MCS ($P = 0.08$) and MH ($P = 0.02$).

Fig. 2 shows that all SF-36 v2 measures of elderly patients are not different from those of younger ones at three months after the operation.

Fig. 3 depicts the quality of life scores before and after the operation in elderly patients. No differences were found in any of the eight domains nor in the composite scores.

Table 3 summarizes the results of the comparison of PCS and MCS between elderly patients deemed at higher risk and lower risk counterparts three months after the operation. We were not able to detect any significant differences.

4. Discussion

Patients’ perception of perioperative risk may differ from ours as surgeons. While we put great emphasis on early and late objective outcomes such as operative morbidity and mortality and long-term survival, and weigh the success of our operation based on these factors [10], a patients main fear is not to be able to return to an acceptable standard of quality of life [3]. When counselling patients about their perioperative risk, we should be ready to provide reliable information on their residual psychological and physical function. This is even more important in elderly patients and in those with a limited cardiorespiratory reserve in whom the balance between oncological radicality and the prospect of a poor residual quality of life may ethically influence the decision to proceed to surgery.

Nevertheless, few studies have tried to address the issue of patients’ reported outcomes, such as the perception of mental and physical status before and after the operation [11–13].

The present study adds to a previous publication that analysed the evolution of quality of life before and at several times after operation [14], focusing now on elderly patients only.

With the purpose of having a valuable and comparable tool to measure the subjective health status of the patients, we adopted the SF-36 v2 questionnaire [8]. This is a generic type of health measure that, using a norm-based scoring system, allows to compare not only the test results
of a group in analysis to the general population mean, but also the scores of different groups of patients.

In spite of the fact that the elderly had higher preoperative values of ASA and ECOG scores and poorer results at the exercise test, reflected by a poorer subjective perception of their physical status (lower PCS and PF), they scored higher values of MCS and MH, compared to younger patients.

It appears that although the elderly are conscious of their poorer physical conditions, they are also more prepared to be sick and to face the challenge of cancer and a cancer operation.

Despite these preoperative differences, all the postoperative SF-36v2 domains were not different between elderly and younger patients, and the composite physical and mental scores were in line with the general population means.

Moreover, the QoL of the elderly patients returns to the preoperative values three months after the operation.

With the purpose to provide any additional information to be used during counselling, we then assessed the residual quality of life in elderly patients at high risk for surgery (DLCO < 70, moderate to severe COPD, ppoFEV1 < 40% and/or ppoDLCO < 40%, coronary artery disease, pneumonectomy). We found that the residual QoL of these high-risk patients was not different from the one of healthier subjects. These results seem to be in contrast to previous published studies, which report that the presence of comorbidity is adversely related to the patients’ health status perception [15].

This study has potential limitations. The first limitation is one common to most of the follow-up analyses and concerns the dropped-out patients. As these patients could have been those in the worst functional status, their inclusion in the analysis could have, perhaps, changed the results, and that should be taken into account when interpreting the results.

Second, some studies have shown that quality of life continues to improve up to six months to one year after the operation. We limited our follow-up to three months in order to minimize the drop-out rate and prevent a 'cream-skimming' effect.

Finally, quality of life measures reflect the patients’ perspective and may be affected by several external factors with an emotional impact such as the radicality of the procedure, the degree of satisfaction of received care, and the social support at home, among others. Further analyses are needed to investigate the influence of these factors on the postoperative residual QoL.

The present study provides information on health status and residual QoL to help elderly patients with lung cancer in their difficult decision to proceed to surgery. We found that they experience a level of postoperative individual physical, emotional and social well-being comparable to the mean of a general population.

Obviously further studies are needed to confirm these results in a larger population and to identify strong predictors of residual QoL that may further assist us in counselling our patients and in planning perioperative physical and psychological supportive programs to improve their health perception.

References
