

Our Results of the Surgical Treatment of the Lung Cancer in the Elderly Patients

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Abstract

Background: In this study, our aim was to evaluate the mortality and morbidity rates of elderly patients with non-small cell lung cancer who were treated surgically. **Methods:** Thirty patients older than 70 years had been surgically treated for nonsmall cell lung cancer in our clinic, between 1990-2000. All patients were reviewed retrospectively according to age, sex, coexisting diseases, smoking, spirometry, histology, postoperative staging, mortality and morbidity. 5-year survival rates were determined by using Kaplan-Meier method. All patients were male and smokers except one. Fifteen of them (50%) had coexisting diseases. FEV₁ values of the six (20%) patients were 80%, 20 (66.6%) were between 60-80% and four patients were lower than 60% preoperative expected values. These four cases underwent operation after treadmill test, Ventilation/Perfusion scanning. **Results:** There were nine postoperative complications and six of them were classified as serious. We had no postoperative mortality. Overall 5-year survival rate was 20%. **Conclusion:** In case of a proper patient selection, precise preoperative staging, possible smallest surgical intervention and intense postoperative care can help us to decrease mortality and morbidity rates. Under these circumstances, advanced age (age>70 years) cannot be accepted as an absolute contraindication for surgery.

Keywords: Lung cancer, elderly patients, surgery

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INTRODUCTION

Although there have been great advances in radiotherapy and chemotherapy, long term survival rates can only be managed with the help of surgical treatment in lung cancer patients (1). Average age for the diagnosis is about 60 years and mortality rates are increasing with the age. Although postsurgical mortality and morbidity rates, for lung cancer, are 4-6% and 20-40% respectively, for the patients with restricted cardiopulmonary reserve and advanced age, these parameters are increasing as high as 9-15% and 30-50% (2). Higher rates of mortality and morbidity are because of the cardiac problems, respiratory complications and pulmonary thromboembolism. The survival rates of the surgically treated patients are far better than nonoperated and radiotherapy-chemotherapy applied group. This implies

the significance of the surgical approach in elderly patients (3). Type of the resection is also an important factor affecting mortality and morbidity in elderly patients along with the other systemic disorders. In our study mortality, morbidity and 5-year survival rates of the surgically treated NSCLC patients were analyzed.

MATERIALS AND METHODS

Surgically operated all elderly patients for NSCLC in our clinic, between 1990-2000, were analysed retrospectively. Preoperative history, physical examination, routine laboratory tests, spirometry, electrocardiography, chest x-ray, thorax computerized tomography (CT) and abdominal ultrasonography (USG) were evaluated. Bone scan and cranial CT added in case of the indications were fulfilled. FEV₁ values of the six (20%) patients were 80%, 20 (66.6%) were between 60-80% and four patients were lower than 60% preoperative expected values. These four cases underwent operation after treadmill test and ventilation&perfusion scanning. In case of the postoperative predictive FEV₁ value was up to the 800 mL, surgical procedure was done. If there was no desaturation in treadmill test and vital signs returned normal value in 15th minute post exercise period, the patients were operated. Lobectomy was preferred for these patients. Especially, the patients who had cardiac disease, were evaluated for cardiac capacity, and lesser resection than pneumonectomy was preferred.

All patients were reviewed retrospectively according to the age, gender, comorbidity, smoking, spirometry, histology, postoperative staging, mortality and morbidity (in the first 30 days postoperatively or during the stay in the ward). Preoperatively, the patients who had radiologically and histologically N2 disease, were excluded in this study. Neither chemotherapy nor radiotherapy was carried out postoperatively in our study group. 5 years survival rates were determined by using Kaplan Meier method.

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Table 1. Coexisting diseases with lung cancer.

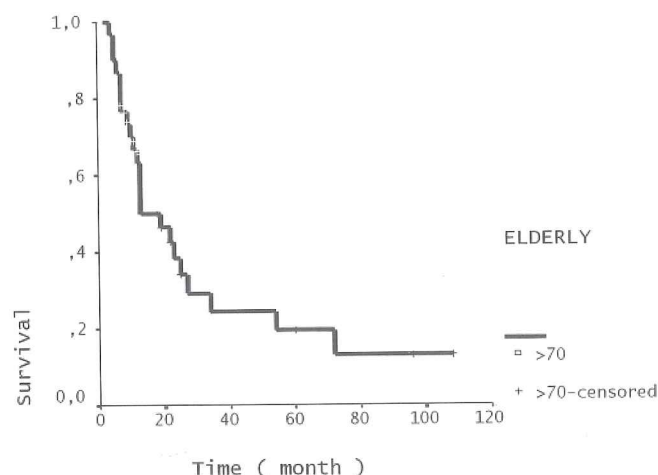
Diseases	Number of patients	Percentage
Peptic ulcer	6	20
Hypertension	4	13,3
Diabetes mellitus	3	10
Ischemic heart disease	2	6,6
Chronic renal failure	1	3,3
COPD	1	3,3
Surgically treated urinary bladder tumor	1	3,3
Surgically treated nephrolithiasis+ urolithiasis	1	3,3

RESULTS

All patients (n=30) were male aging between 70-80 (average 72.2 ± 2.53 years of age). All patients were smoker except one patient and 15 of the patients (50%) had additional diseases (Table-1).

FEV₁ values of the six (20%) patients were 80%, twenty patients (66.6%) were between 60-80% and four patients were lower than the 60% of the preoperative predicted FEV₁ values. Four patients underwent operation after exercise testing and ventilation scanning. Localization of the tumors were as follows: 14 (46.6%) on the right lung and 16 (53.4%) on the left lung. Eighteen (60%) lobectomies, two (6.6%) bilobectomies, six (20%) pneumonectomies, one (10%) segmentectomy and three (10%) exploratrix thoracotomies were performed (Table-2).

Systematic mediastinal lymph node sampling performed in all patients. Most of the patients were diagnosed as stage IB (18 patients, 60%) according to postoperative histologic findings. Distribution of the cases with respect to stages was shown in table-3.

**Figure 1.** Survival rate of the elderly**Table 2.** Types of operations performed

Types of operations	Number of patients	Percentage
Pneumonectomy	6	20
Bilobectomy	2	6,6
Lobectomy	18	60
Segmentectomy	1	3,3
Exploratrix thoracotomy	3	10

Five patients with stage IIIB and IV evaluated as stage I or II preoperatively. All these patients were explored and resection was performed in two. Two patients who were resected didn't receive adjuvant therapy, because of insufficient condition. One patient with mediastinal invasion, one patient with multiple pleural metastases and one patient intolerant for the single lung ventilation, because of insufficient pulmonary capacity for the complete resection, were accepted unresectable. Those were not included in survival analysis.

Histopathologic diagnosis were as follows: 21 (70%) squamous cell carcinoma, 5 (16.6%) large cell carcinoma and 4 (13%) adenocarcinoma.

There were 9 (30%) patients emerged with postoperative complications. Six (20%) of the complications could be classified as serious and three (10%) of them mild. Table-4 shows the postoperative complications.

In two cases, who developed atelectasis in the postoperative second and third days, one of them needed bronchoscopic aspiration and the other patient was cured with the help of the tracheal aspiration and chest physiotherapy. Two of the patients who underwent pneumonectomy, developed bronchopleural fistula (33%). Endoscopic fibrin glue application and tube thoracostomy drainage, because of the postpneumonectomy empyema, were the preferred procedures. There was no linear correlation between comorbid disease and complications.

No postoperative mortality was encountered in our series. Overall five year survival rate was 20% (n=27). Eighteen patients of the total of 27 patients, who were resected, were ascertained as stage IB (T2N0). Five year survival rate in this stage was found to be 28%. The following figure shows the survival rate of the elderly (figure 1).

DISCUSSION

Old age is usually defined as a poor prognostic factor in patients, who have resectable tumors, because of the high mortality and morbidity rates (4). Better prognosis in younger patients can be explained by means of intense chemotherapy regimen and absence of the coexisting medical diseases. Although many authors advocate that

Table 3. Classification of the patients according to the stages

Postoperative stage	Number of patients	Percentage
Stage IA	1	3,3
Stage IB	18	60
Stage IIA	1	3,3
Stage IIB	5	16,6
Stage IIIA	-	-
Stage IIIB	3	10
Stage IV	2	6,6

the operative mortality can not be related with the age (5), Harvey et al. (6) did not find significant mortality rates until the age of 80. On the other hand, the mortality rates of the patients older than 80 years of age can easily reach as high as 17.6% in their series, which were surgically treated, consisting of 370 NSCLC cases. Mortality rates with respect to the ages are as follows: 1.4% under 70 years, 1.6% between 70 and 79 years and 17.6% over 79 years. Postoperative (first 30 days) lung cancer mortality rate was stated as 2% for the patients between 70-79 years, by the Japanese Thoracic Surgery Society for a series of 7099 patients. As we have no mortality in the postoperative period and the low rates in the literature can be a result of current modern anesthetic procedures, surgical equipment and the conditions of ICU's that can easily yield to low rates in the elderly patients.

The postoperative complication rate is 30% in our study group. Rates in the literature is somewhere between 30-50% (3,7). Serious complications and high mortality after bilobectomy and pneumonectomies could usually be related the advanced stage disease (8). When we compared the postoperative complications in pneumonectomy and the limited resection groups in elderly patients, the rates are 78.5% and 58% respectively. Pulmonary complications are 40.4% in pneumonectomy group and 33.3% in the limited resection group (9). In our study, the postoperative complications and mortality carries high risk for the elderly patients who underwent pneumonectomy.

Postoperative epidural analgesia, non-sedative analgesics, minithoracotomy, pulse oximeters and the development of the similar new techniques increased the reliability and resection margins of the elderly patients who had limited spirometric values. None of the pulmonary function tests could precisely predict the postoperative mortality and morbidity related with the respiratory failure before the surgical procedure. From the report of Certfolio et al. we could understand that the FEV₁ values lower than 43% of the predicted postoperative value and the patients requiring supplemental oxygen at home have an increased risk of

Table 4. Postoperative complications

Complications	Number of patients	Percentage
Wound infection	3	10
Atelectasis	2	6,6
Bronchopleural fistula	2	6,6
Postpneumonectomy empyema	1	3,3
Prolonged air leak	1	3,3
Respiratory failure	1	3,3

developing postoperative mortality and morbidity in their study group consisting 85 patients although they did not exactly propose a criteria (10). Certfolio also said that elderly patients had double risk for developing major morbidity after resection if they underwent neoadjuvant therapy (11). Ishida et al. emphasized the relation of postoperative mortality and morbidity with smoking and preoperative limited spirometric values in a series of 185 cases older than 70 years (12). In our research group we had four patients of whom postoperative predicted FEV₁ values were lower than 60%. These patients were evaluated by means of exercise testing and ventilation-perfusion scanning, consequently no complications were noted. Thomas et al. also informed that if the preoperative spirometric values were lower than the operability criteria, further investigations including quantitative ventilation-perfusion scanning and treadmill test should be performed in order to have predicted postoperative spirometric values (13).

For a series of 500 patients (male preponderance) over 70 years of age, having squamous cell carcinoma, the overall survival rate was informed 33.7% (14). In our study the majority of the patients were male and 70% of the cases were squamous cell carcinoma. In another study, 5-year survival rate was established as 27% and for the patients who underwent pneumonectomy the rate decreased to 13%, on the contrary segmental resection increased to 42% (15). Mizushima et al. reported the 5-year survival rate for the elderly patients 11.5% but the patients lower than 70 years 5-year survival rate was found 30.5% (16). In a study of which the age related survival rates were investigated the results are as follows: 21.5% under the age of 45, 12.6% between 65-74 years and 8.5% older 75 years of age (17). Harvey et al. reported overall 5-year survival rate was 42% but in case of stage I patients the rate was 65%. Riquet et al. stated that 5-year survival rates were 16% and 30.1% respectively (18).

The wide range of the 5-year survival rates in elderly patients (8-48%) can be attributed to heterogeneous features of the study groups. The 5-year survival rate of our group was 20%, consistent with the literature. Survival

rates for the early stage lung cancer for the elderly patients could be between 30-65%. Eighteen patients in our study group were diagnosed as T2N0 who had a 5-year survival rate as 28%. When we add the T1N0 group to T2N0 the resultant 5-year survival rates can even be higher which is also quite consistent with literature.

Coexisting medical diseases, more aggressive biologic behavior of the lung cancer and partial failure of the immune system can be the explanation for the low survival rates in the elderly (19). In our study; 50% of the patients had coexisting diseases in the preoperative period. Preoperative diagnosis and treatment of the coexisting diseases, control of the infections, pulmonary rehabilitation and the proper staging of the cancer preoperatively in the elderly should be the mainstay for the procedure (20).

Consequently, control or the elimination of the coexisting diseases accompanying lung cancer in the elderly, pulmonary rehabilitation before and after the operation and the possible smallest resection could decrease the mortality and morbidity rates. Advanced age cannot be a contraindication for the surgery alone but more precise and proper patient selection, staging and postoperative care can help us in order to have more acceptable postoperative mortality and morbidity rates.

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