

Bronchogenic Carcinoma in Young Patients

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ABSTRACT

Carcinoma of the lung is relatively uncommon in younger patients. A series of 27 young patients with lung cancer, ages 12 to 39 years, were reviewed between 1960 and 1982. This report confirms the findings of a higher proportion of women among younger patients with lung cancer as well as a higher incidence of adenocarcinoma. Twenty-three of 27 (85.2%) were in Stage III and Stage IV at the time of diagnosis or operation. Twelve patients underwent thoracotomy but only 6 patients (50%) were cured. It was concluded that the prognosis for young patients with this disease is significantly worse than that for lung cancer patients in general.

INTRODUCTION

Cancer of the lung increases in the elderly over 70 years of age and many reports were published dealing with this problem. Young people under 40 years of age are also affected with this disease, but there have been a relatively few reports. The rates of resectability and prognosis after operation of younger patients with lung cancer remains varied from one report to another.

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In this study, we report the age distribution, sex difference, symptoms, histology, treatment and prognosis of the patients below the age of 40 years with primary lung cancer.

MATERIALS AND METHODS

The cases were obtained by a survey of the clinical records of the First Department of Surgery and Second Department of Internal Medicine at the Nagasaki University Hospital for the period of 1960 to 1982. Patients with mucoepidermoid tumor, carcinoid tumors, pulmonary metastases from other organs and individuals without accurate follow-up were excluded. Twenty-seven cases below 40 years of age with bronchogenic carcinoma were found during the stated period. The diagnosis of lung cancer were made by the histologic examination of surgically resected specimen in 12, biopsy of metastatic cervical lymph nodes in 6, transbronchial tumor biopsy in 4, cytologic examination of pleural effusion in 3 and percutaneous needle biopsy in 2. Autopsy materials were also used. The tumors were classified on the basis of WHO classification. Hospital charts were reviewed to obtain the following informations; age at diagnosis, sex, duration of symptoms, date of diagnosis, treatment, date of death, smoking history and familial cancer history.

RESULTS

1) Age and sex (Table 1)

In our series, the youngest patient was 12 years old and the oldest was 39 at the time of diagnosis. The median age was 34 years. There were only 2 patients below the age of 30, 14 patients between the ages of 30 and 34, and 11 between 35 and 39 years old. There were 13 men (48.1%) and 14 women (51.9%); the ratio of men and women was 1 : 1.1.

Table 1 Age and Sex Distribution of Patients

Age	Male	Female	Total	Percent
-19 years	1		1	3.7
20-29 years		1	1	3.7
30-34 years	6	8	14	51.9
35-39 years	6	5	11	40.7
Total	13	14	27	100.0

2) Smoking history and Occupational history

Eleven patients (36.7%) had a history of smoking, while 16 did not smoke. Smokers were all men and they smoked cigarettes. Only 5 of 11 smokers smoked 20 or more cigarettes a day. The cell types of lung cancer in the eleven patients who smoked were one squamous cell carcinoma, seven adenocarcinoma and three small cell carcinoma. Occupational history was available for all patients. Most of the patients had non-industrial jobs and were teachers, housewives, sales people, office workers or farmers.

3) Symptoms (Table 2)

Cough and sputum were the commonest symptoms observed in 12 patients (44.4%), chest pain, cervical lymphadenopathy and fever were followed. Seven patients (25.9%) were totally asymptomatic. A pulmonary lesion was found on a routine chest roentgenogram in these patients. Of the surgically treated patients, 6 (50%) were asymptomatic.

The diagnosis made at first examination were lung cancer or cancer suspected in only 8 patients (29.6%). The other common diagnoses were pneumonia, pulmonary tuberculosis, mediastinal tumor or pleuritis. The duration of symptoms ranged from one month to 41 months. The duration between the onset of symptoms and visiting the physician was 1.1 month (mean), while the interval from the hospital visit to diagnosis of lung cancer was 4.1 months. There were no difference in the duration of onset of symptoms and diagnosis between operated patients and non-operated group.

4) Diagnosis

Seven of 27 patients (25.9%) were diagnosed by the tissue biopsy with bronchofiberscopy and five were by brushing cytology or percutaneous needle aspiration biopsy.

Table 2 Symptoms at time of diagnosis

Symptom	operated patients	non-operated patients	total
cough/sputum	4	8	12
chest pain	2	7	9
cervical lymphadenopathy	2	4	6
fever	2	3	5
bloody sputum		2	2
weight loss		2	2
fatigue	1	1	2
dyspnea	1	1	2
visual disturbance		1	1
asymptomatic	6	1	7

sy. Eight patients were diagnosed of lung cancer with the excisional biopsy of swelling supraclavicular lymph nodes which were metastases. Three patients had the diagnosis of lung cancer with cytology of the pleural effusion. Exploratory thoracotomy revealed lung cancer in two. Sputum cytology was checked in 27 patients, but all were negative for lung cancer.

5) Stage at diagnosis (Table 3)

The clinical stage at diagnosis due to TNM staging was stage I in 4 patients, stage III in 13 and stage IV in 10. Eighty-five per cent were advanced cases.

6) Pathology (Table 4)

Sufficient materials for tumor classification were available in 24 cases. In the remaining 3 patients, materials had been obtained by bronchial brushing cytology or needle aspiration biopsy of the pleural effusion.

The distribution by tumor type was as follows: adenocarcinoma in 14 patients (51.9

Table 3 Stage at time of diagnosis

Stage	operated patients	non-operated patients	total
I	4		4
II			
III	6 (68%)	7 (100%)	13
IV	2	8	10
Total	12	15	27

Table 4 Distribution of cell types

Cell type	Male	Female	Total	Percent
Adenocarcinoma	8(3)	6(3)	14	51.9
Squamous cell carcinoma	1(1)	4(4)	5	18.5
Large cell carcinoma		4(1)	4	14.8
Small cell carcinoma	4		4	14.8
Total	13	14	27	100.0

(): No. of operated patients

%), squamous cell carcinoma in 5 (18.5%), large cell carcinoma in 4 (14.8%) and small cell carcinoma in 4 (14.8%). The 5 patients with squamous carcinoma were performed thoracotomy and the tumors were resected in all cases, but the cases with adenocarcinoma were operated in only 6 (42.9%).

The squamous cell carcinoma was found in 4 female patients and only one male patient.

7) Treatment

Twelve patients (44.4%) underwent thoracotomy. Ten of these had resections, 6 (50.0%) of which were considered curative or relatively curative. The operative procedures performed in 10 patients were lobectomy in 7, bilobectomy in one, and pneumonectomy in 2 (Table 5).

Non-operative treatment was used in 15 young patients. All had T_3N_2 lesions or M_1 lesions. External radiation therapy was undertaken in two patients, chemotherapy in 7 and combined radiation and chemotherapy in 5.

Table 5 Operative procedures in surgical patients

operative procedure	curative	noncurative	Total
Lobectomy	5	2	7
Bilobectomy	1		1
Pneumonectomy		2	2
Thoracotomy only		2	2
Total	6	6	12

8) Survival (Table 6)

There were no operative deaths within 30 days after operation in the thoracotomized patients. Five year survival after pulmonary resection in patients under 40 years of age was 20%, and 7 of 10 patients, who were performed lung resection, died within one year after surgery. The patients who were evaluated as Stage III preoperatively have developed liver or brain metastasis early after operation. Only two patients survived more than five years.

Survival of the patients with non-operative therapy or exploratory thoracotomy was poor. One third or fourth died within 3 months after beginning of therapy. Thirteen of 15 patients died within one year with related diseases.

The median survival time of the patients with non-operated therapy was 8.3 months.

There was no statistically significant difference in survival rate between male and female patients.

Table 6 Survival in young patients with lung cancer

Survival	operative patients	non-operative patients	Total
-3 months	4	5	9
-6 months	3	3	6
-1 year	2	6	8
-2 years	1	1	2
-5 years	0	0	0
5 years-	2*		2
Total	12	15	27

* alive and well, 6 years and 10 years respectively

DISCUSSION

The definition of young patients with bronchogenic carcinoma has not been concluded concerning their ages. However, in previous reports,^{4)~8)} the patients below 40 years were regarded suitable for young patients because of rarity and biological behavior. The ratio of young patients with lung cancer below the age of 40 years distributed from 2.0 to 7.5 per cent.^{4),7),9)} In all of the reports, there were more women in the younger group than in the general population of patients with lung cancer. The ratio of men to women in these series varies from 2.6 : 1 to 1.5 : 1.⁴⁾⁵⁾⁶⁾ Our findings showed that the female patients exceeded to the male patients and the ratio was 1 : 1.1.

In the review from U.S.A and England,⁵⁾⁹⁾ smoking is one of the important factor involved in the production of lung cancer in the younger patients. However, our data as well as other Japanese reports⁷⁾⁸⁾ suggested that smoking is not related to production of lung cancer because of a low incidence of smoking history and epidermoid carconoma.

Regardless of age, lung cancer is still discovered as a symptomatic disease. The ratio of the younger patients with the respiratory symptoms we from 73%⁸⁾ to 98%.⁹⁾ The dominant presenting symptoms were cough, sputum, fever, chest pain, and cervical lymphadenopathy in our series. NOMI⁸⁾ repoted that the symptoms related to distant organ metastasis in 27% of the younger patients.

There are some interesting findings regarding the cell type of lung cancer in younger patients. A common finding has been the low incidence of squamous cell carcinoma and the relatively high occurence of anaplastic carcinoma or adenocarcinoma. Our results show

a lower incidence of squamous cell carcinoma (18.5%) and a higher incidence of adenocarcinoma (51.9%) and undifferentiated carcinoma (29.6%) than found in older patients. Sputum cytology was not a reliable technique of diagnosis in our study. ANDERSON¹⁰ reported only 2 of 14 patients were suggestive of cancer and NOMI *et al.* showed positive cytology in only 9 patients of 51. This means that more aggressive attitude such as bronchoscopic biopsy or brushing are recommended and the suspicion of lung cancer is also important to examine the young patients with respiratory symptoms and abnormal shadows in the chest X-Ray.

The prognosis of the younger patients with bronchogenic carcinoma was generally poor because of advanced diseases. ANDERSON and co-workers reported only one 5-year survivor in 21 patients. NEUMAN and associates¹¹ reported no 5-year survivors among their young patients who had resections. KENNEDY⁶ reported that only 2 in 34 patients survived 5 years. HOOD and associates¹² had no 5-year survivors and only 2 patients were alive after 3 and 4 years respectively. The few exceptions to these poor results are the report of KWONG and SLEDE,¹³ who had 5-year survival rate of 11.4% (5/44), and the results of KYRIAKAS and WEBBER⁹ with a 5-year survival rate of 18.8% (6/32). In our series, one of 10 patients (20%) who had resection survived more than 5 years. One of them had mediastinal node involvement (Stage III).

In the literature, the resectability rate of lung cancer in the younger patients are from 15.4% to 61.8%.⁶⁾⁽¹⁰⁾⁽¹¹⁾⁽¹²⁾⁽¹³⁾⁽¹⁴⁾ Our results are 37.0% of resectability rate (10/27).

In conclusion, we found that differences exist in the sex, cell types, and survival. Our results indicates that early diagnosis is very important in the treatment of the young patients with bronchogenic carcinoma.

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