

Surgery for Recurrence of Lung Cancer

Hiroyoshi AYABE, Masao TOMITA and Katsunobu KAWAHARA

*First Department of Surgery, Nagasaki University School of Medicine,
Nagasaki, Japan.*

Received for publication, June 25, 1990

ABSTRACT: Fifteen patients with recurrence after surgery for lung cancer were clinically investigated in terms of the validity and the indication of reoperation.

- 1) In most of cases with reoperation for recurrence, the disease stage was stage I lung cancer at the time of the initial operation.
- 2) In five out of the eight patients who underwent node dissection, nodal involvement was positive (62.5%).
- 3) A longer survivor is predicted in patients with negative node metastasis at the initial and the second operations.
- 4) Reoperation for recurrence is required for obtaining a longer survivor, if possible.

The surgical outcome for lung cancer has been more and more improved. However, a five year survival rate is not satisfactoried with as large as 25 to 35%. It is great concern about the treatment of postoperative recurrence. Recently advances in the adjuvant therapy of chemotherapy and radiation enabled us to make the survival rate longer.

In rare cases with localized recurrence, it has become possible to perform a radical excision for recurrence. The purpose of this study is to clarify the feasibility and validity of reoperation on the basis of clinical experience with the 15 patients who underwent re-excision for recurrence.

PATIENTS

Fifteen patients who underwent re-operation for postoperative recurrence of lung cancer were eligible for this study. Ten were male, five were female. The ages ranged from 46 to 79 years old with an average of 61.3 years old. The frequency of operations was a total of 20, that is, the second operation in 11, the third operation in three and the fourth operation in one respectively.

The operation methods were listed in **Table 1**. Lobectomy was used for the first operative method. Thereafter, a limited operation was selected to preserve healthy lung tissues. A few cases had the third and fourth operation. These sequential surgical procedures were of benefit

to elongate the survival time. Three patients out of the four patients who underwent the third and the fourth operation survived over five years. The other one patient survived four years as shown in **Figure 1**.

The shorter the interval between the initial and the second operations, the worse the surgical outcomes in Case 13 and Case 15 as shown in **Figure 1**.

At the second operation, node dissection was performed in eight out of the 15 patients as shown in **Table 2**. Nodal involvement which was extending into the two areas of nodes(n_2) was seen in five out of the eight patients who underwent nodal dissection.

In general, the prognoses of the patients with nodal involvement were poor as shown in Case 5, 10, 11, 13 and 15 in **Figure 1**.

Table 1. Reoperative methods

Case No	1st OPE	2nd OPE	3rd OPE	4th OPE
1. (49. M)	LUL	R S2 wedge	R S1 wedge	
2. (51. F)	LLL	R S9 wedge	RLL	
3. (67. F)	RLL	R S2 wedge		
4. (52. M)	LUL	LLL (pneumo)		
5. (56. M)	RUL	L S9+10 seg	R Lower wedge	
6. (59. F)	R S8 seg	L S4 wedge	R S5 wedge	R S6, LS6 wedge
7. (79. M)	RUL. sleeve	L S6 wedge		
8. (65. F)	RLL	R S2 wedge		
9. (69. M)	LUL	LLL (pneumo)		
10. (59. M)	RLL	L S1+2 seg		
11. (71. M)	RLL	LLL		
12. (60. M)	LUL. sleeve	LLL		
13. (53. F)	LUL	RUL		
14. (63. M)	RLL	L S3 wedge		
15. (70. M)	LUL	RML		

* age: 2nd ope

Table 2. Nodal involvement at reoperation

Case NO	2nd OPE	3rd OPE	4th OPE
1. (49. M)	/	/	
2. (51. F)	/	/	
3. (67. F)	/		
4. (52. M)	/		
5. (56. M)	n2	/	
6. (59. F)	n0	/	/
7. (79. M)	/		
8. (65. F)	/		
9. (69. M)	n0		
10. (59. M)	n2		
11. (71. M)	n2		
12. (60. M)	/		
13. (53. F)	n2		
14. (63. M)	n0		
15. (70. M)	n2		

The disease stages in the initial operation were shown in **Table 3**. All except two were stage I. According to histologic types, adenocarcinoma was in 12 and squamous cell carcinoma was in the other three. Nodal involvement extending to two areas (n₂) in the two patients was a main factor of progression in the disease stage as shown in **Table 3**. It is needed for early cancer to make the survival time longer by means of repeated operations.

Changes in lung function of %VC and FEV_{1.0} were compared between prior to and after operations. The values of %VC were apparently reduced although the values of %FEV_{1.0} were not so fluctuated as shown in

Table 3. Disease stages at initial op.

CASE NO	TNM	STAGE	1st OPE	PATHO
1. (47. M)	T ₂ N ₀ M ₀	I	LUL	adeno, well, n0
2. (46. F)	T ₁ N ₀ M ₀	I	LLL	adeno, well, n0
3. (62. F)	T ₁ N ₀ M ₀	I	RLL	adeno, well, n0
4. (52. M)	T ₁ N ₀ M ₀	I	LUL	adeno, mod, n0
5. (54. M)	T ₁ N ₀ M ₀	I	RUL	adeno, mod, n0
6. (58. F)	T ₁ N ₀ M ₀	I	R S8 seg	adeno, well, n0
7. (77. M)	T ₃ N ₀ M ₀	III	RUL, sleeve	sq, mod, n2
8. (55. F)	T ₁ N ₀ M ₀	I	RLL	adeno, well, n0
9. (58. M)	T ₁ N ₀ M ₀	I	LUL	sq, well, n0
10. (46. M)	T ₁ N ₀ M ₀	I	RLL	adeno, well, n0
11. (69. M)	T ₂ N ₀ M ₀	I	RLL	adeno, well, n0
12. (57. M)	T ₁ N ₀ M ₀	I	LUL, sleeve	sq, well, n0
13. (53. F)	T ₂ N ₀ M ₀	III	LUL	adeno, poor, n2
14. (59. M)	T ₂ N ₀ M ₀	I	RLL	adeno, mod, n0
15. (69. M)	T ₂ N ₀ M ₀	I	LUL	adeno, poor, n0

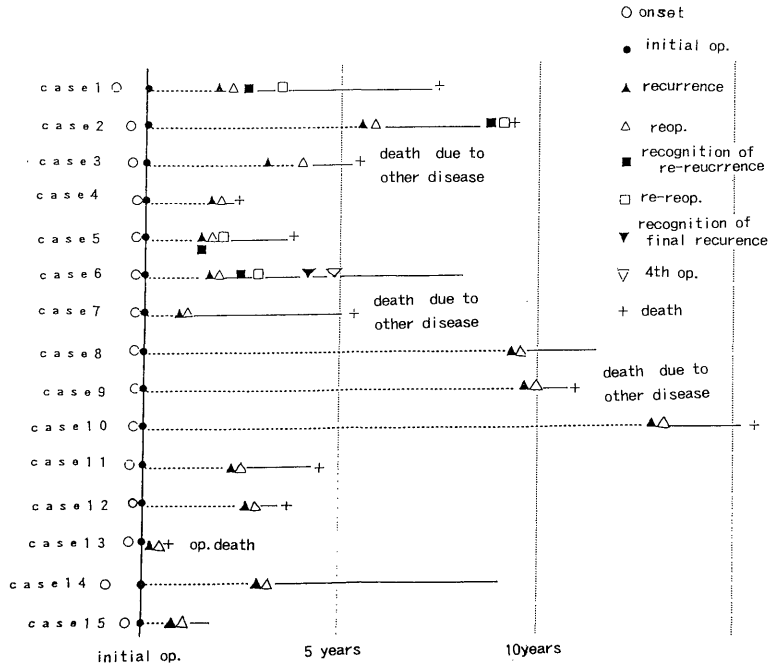


Fig. 1. Prognosis after reoperation

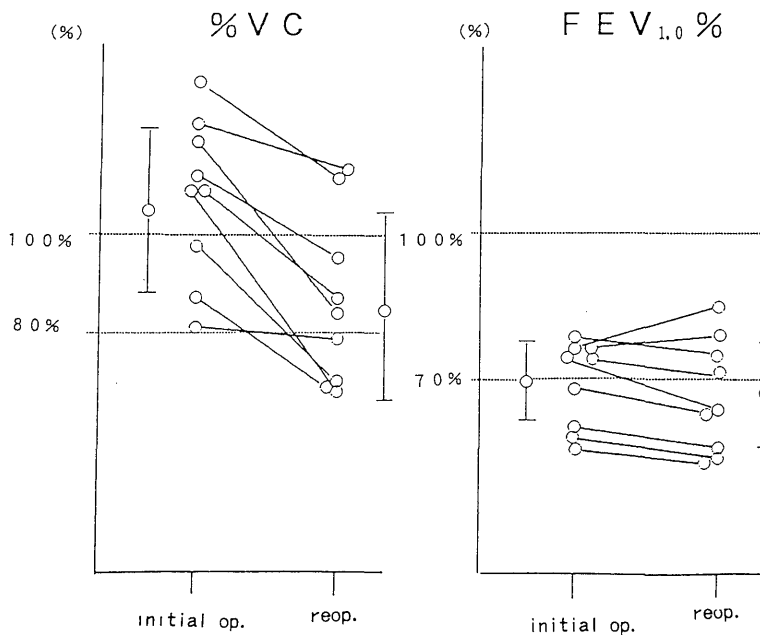


Fig. 2. %VC and FEV_{1.0}%

Figure 2.

Postoperative survival curves were indicated in **Figure 3** in comparison with the time from the initial and the repeated operations. It was

obviously showed that the survival time over five years was improved by the repeated reoperations.

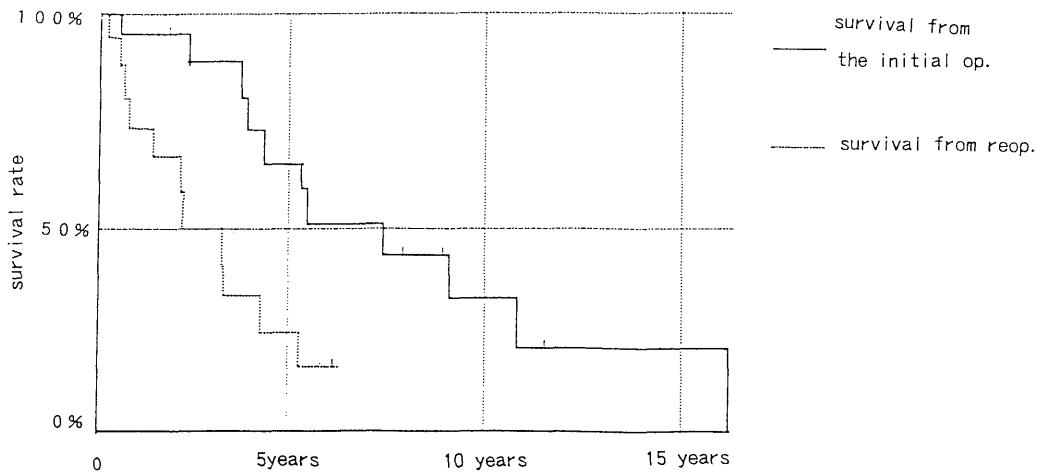


Fig. 3. Survival curve in patients with reoperation

DISCUSSION

The surgical outcome for lung cancer was not necessarily satisfied even if lung cancers of stage I were operated upon. Williams¹⁾ reported that a five year survival rate in stage I lung cancer was 56% although a three year survival rate was 70%. In general, a three year survival rate in stage I lung cancers is favorable²⁾. In contrast, a five year survival rate has become worse. It is a reflection that complete cure from cancer could not be achieved even in stage I lung cancer.

Immerman³⁾ reported in patients with surgery for stage I and II lung cancer that most common sites of local recurrences were the ipsilateral thoracic cavity, supraclavicular and mediastinal nodes, and also the incidence of recurrence in T_1N_0 patients was 13%, that in T_2N_0 10.5%, that in T_1N_1 and T_2N_1 41% respectively.

According to histologic types, adenocarcinomas more frequently occur recurrence rather than squamous cell carcinoma.

It is characteristic of squamous cell carcinoma that high possibility of resection is predicted only for localized recurrence even in advanced cancer.

In this series, surgery for recurrence was mostly indicated for patients with stage I lung cancer at the time of the initial operation. The prognosis of the second operation is closely

associated with the presence of nodal involvement.

In fact, reoperation is of great value to make the survival time of recurrent patients longer. Surgeons should pay attention to high frequency of multicentric cancers⁴⁾.

The diagnostic criteria are not made clear as to whether asynchronous cancer is metastatic or double cancers⁵⁾ when histology is almost the same.

As far as the histologic type of the second tumor is similar to that of the initial tumor, it is difficult to distinguish. Physicians should pay attention to the presence of recurrence if the tumor is solitary and is disregarded as the tumor metastasized from other organs. Fairly surgical result would be predicted by complete resection.

However, the existence of nodal involvement is one of the major factors which affects long-term survival.

Surgeons should attempt to eradicate the tumor to obtain better outcome, whenever possible.

Neptune⁶⁾ reported that two patients out of 15 who underwent reoperation survived more than five years and Gabler⁷⁾ stated that two patients out of 17 with reoperation for recurrence survived, over five years. Jensik⁸⁾ also emphasized that segmentectomy for recurrence is advisable not only for anticipation of life span but also for preservation of pulmonary function.

In this series, the surgical outcome for recurrence encourages surgeons to try to do with aggressive attitude.

REFERENCES

- 1) Willams D. E., Pairolero P. C., Davis C. S. *et al*: Survival of patients surgically treated for Stage I lung cancer. *J. Thorac. Cardiovasc. Surg.* **82**: 70-76, 1981.
- 2) Maratini M and Beattie E. J.: Results of surgical treatment in Stage I lung cancer. *J. Thorac. Cardiovasc. Surg.* **74**: 499-505.
- 3) Immerman S. C., Vanecko R. M., Fry W. A. *et al*: Site of recurrence in patients with Stage I and II carcinoma of lung resected for cure. *Ann. Thorac. Surg.* **32**: 23-27, 1981.
- 4) Woolner L. B., Fontana R. S., Cortese D. A. *et al*: Roentgenographically occult lung cancer. Pathologic findings and frequency of multicentricity during a 10 year period. *Mayo Clinic Proc.* **59**: 453-456, 1984.
- 5) Martini M and Meland M. R.: Multiple primary lung cancers. *J. Thorac. Cardiovasc. Surg.* **70**: 606-612, 1975.
- 6) Neptune W. B., Woods F. M. and Overholt R. H.: Reoperation for bronchogenic carcinoma. *J. Thorac. Cardiovasc. Surg.* **52**: 342-350, 1986.
- 7) Gabler A and Leibig S.: Reoperation for bronchial carcinoma. *Thorax.* **35**: 668-670, 1980.
- 8) Jensik R. J., Fabor L. P., Kittle C. F. *et al*: Segmental resection for lung cancer. *J. Thorac. Cardiovasc. Surg.* **66**: 563-572, 1973.