

An Experience in Fiberopticbronchoscopy in the Diagnosis of Pulmonary Diseases

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We analysed the results of the 521 bronchofiberscopies which was carried out at the Severance Hospital during 1977-1980.

The purpose of the bronchofiberscopic procedures were diagnostic in 488 cases (93.8%), therapeutic in 18 cases (3.4%) and follow up observation in 15 cases (2.8%).

It's major role is in the diagnosis of lung cancer and the tuberculosis in our hospital.

In 190 patients of lung cancer confirmed positive typing was possible in 72.9% by bronchial biopsy, 52.6% by washing cytology.

In 48 patient with tuberculosis who was not diagnosed before bronchofiberscopy, tubercle bacilli were found in 20% by AFB smear, 51% by AFB culture and 68.4% by bronchoscopic biopsy. Complications were minimal (1.9%).
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Key Word: Fiberopticbronchoscopy.

The bronchofiberscope has been popular in diagnosing a wide variety of lung diseases since 1968 (Ikeda *et al.*, 1968). Usually it is unnecessary to use general anesthesia in adult because of minimal discomfort and risk.

So we can perform this procedures as an out patient base as well as in-patients.

MATERIALS AND METHODS

We have reviewed our short experience at Severance Hospital during 1977-1980. In our

series of 521 cases 333 were male, the youngest patient was 14 years old and the oldest 78 (Table 1).

In preparing, all patients were not allowed to take any by mouth for at least six hours prior to the procedure.

Atropine sufate (1/150 grain) and demerol (30-50 mg) would be given as a premedication. And then we would wait for a while. Four percent lidocaine will be sprayed over oropharynx with a nebulizer for the topical anesthesia.

Usually the bronchofiberscope (Machida 6TL) would be introduced through the hole of round mouth piece. And then it will be further pro-

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Table 1. Age and sex distribution

Age	Sex		Total
	Male	Female	
20	4	13	17
21 - 30	25	24	49
31 - 40	36	28	64
41 - 50	78	38	116
51 - 60	93	43	136
61 - 70	90	40	130
71 -	7	2	9
Total	333	188	521

Table 2. Purpose of the bronchofiberscopic procedures (1977 - 1980)

Purpose	No. of cases	%
Diagnostic	488	93.8
Lung cancer	284	
Endobronchial lesion	61	
Pulmonary tuberculosis	55	
To get specimen	32	
TBLB*	33	
Hemoptysis	10	
Other	13	
Therapeutic	18	3.4
Follow up observation	15	2.8
	521	100.0

* Transbronchial lung biopsy

ceeded for the exploration of tracheobronchial trees.

Bronchial biopsy or brushing and washing for cytologic examination are done as needed. And also cultures for routine bacteria and/or mycobacteria are done properly for the possible diagnosis.

RESULTS

Table 2 will illustrated why those 521 patients

Table 3. Diagnostic procedures of 199 patients of lung cancer confirmed*

Procedures	No. of cases		Diagnostic(%)
	Performed	Positive	
Bronchial biopsy	180	140	77.8
Washing cytology	156	101	64.7
TBLB	7	5	71.4
Post BF# cytology	124	57	46.0
Routine cytology	134	34	25.4

* Other diagnostic procedures including node biopsy (3), pleural biopsy (3), rib biopsy (1) and other (13).

Bronchofiberscopy

Table 4. Classification of the lung cancer (WHO criteria)

Histologic type	Sex		Total	%
	Male	Female		
Epidermoid carcinoma	67	15	82	41.3
Small cell carcinoma	34	11	45	22.7
Adenocarcinoma*	9	5	14	7.0
Large cell carcinoma	10	5	15	7.5
Combined	2	1	3	1.5
Bronchial gland tumor	1	0	1	0.5
Unclassified	25	14	39	19.5
Total	148	51	199	100.0

* Including one case of bronchoalveolar cell carcinoma

were put into the bronchoscopic procedures. Among 521 cases, 488 patients were bronchoscoped for the purpose of diagnosis. Eighteen for the therapeutic purpose and 15 for follow-up repetition of bronchoscopy.

In diagnostic trial of 488 cases we could divide into further details as follows: lung cancer was preoperative impression in 284 cases, any endobronchial lesions in 61, pulmonary tuberculosis in 55, to obtain specimen for mainly bacteriologic examination in 32, TBLB, the trans-

bronchial lung biopsy in 33, to identify the bleeding site in hemoptysis 10 and other vague impression in 13 cases.

Diagnostic bronchofiberscopy was done in 93.8%.

Table 3 will show the detail procedures of bronchoscopy in 199 cancer proven cases. Of the 199 cases, bronchial biopsy was performed in 180 cases and we could get pathological findings compatible with lung cancer in 140 cases (77.8%). In case of washing cytology, 101 cases among 156 cases revealed malignant cell (64.7%).

TBLB, the transbronchial lung biopsy was diagnostic in 5 cases among 7 cases. Post BF, the post bronchofiberscopic cytology revealed malignant cell in 57 and routine cytology before bronchoscopy were diagnostic in 25.4% only.

Over all diagnostic rate through the BF procedure were 89%.

Table 4 will show the histologic types of proven cases according to the classification of WHO. Epidermoid carcinoma occupied 41.3% of 199 cases (82 cases), and 67 cases out of 82 were male. It is the most common cell type in Korea. The next common one is small cell carcinoma which occupied 22.7% of all included 45 patients.

Unclassified cancer were 39 cases and 19.5%. Then adenocarcinoma and large cell carcinoma were 7.0% and 7.5% respectively.

There were a quite number of tuberculosis suspected in our hospital. We also tried to verify sputum status for acid fast bacilli. Sixty one cases are analyzed for this purpose. Forty six patients were thought to be pulmonary tuberculosis radiologically, and 32 patients were sputum negative before bronchofiberscopy. Fifteen cases of endobronchial tuberculosis were selected, but only 2 cases had positive sputum test and 13 had negative also before bronchofiberscopy (Table 5).

Table 5. Pre-bronchosopic sputum status for AFB

Clinical diagnosis	Sputum status before BF*		Total
	AFB (+)	AFB (-)	
Pulmonary TB	14	32	46
Endobronchial TB	2	13	15
Total	16	45	61

* Bronchofiberscopy

Table 6. Bacteriology and pathology of tuberculosis on bronchosopic specimens

Specimen	No. of cases	Positive finding	
		No. of cases	%
Pre-BF* sputum smear	45	0	0.0
BF-specimen AFB smear	35	7	20.0
BF-specimen AFB culture	39	20	51.2
BF-specimen biopsy	38	26	68.4

* Bronchofiberscopy

Diagnostic rate (40/45, 88.8%)

Table 7. Complication

Complications	No. of cases
Bleeding	3
Pneumothorax	3
Uncooperative	2
Fainting	1
Laryngeal spasm	1
Total	10/521 (1.9%)

Specimens collected by bronchofiberscopy from those 45 patients who were negative sputum before the procedures were studied as follows (Table 6): direct and concentration smears for AFB, and cultures for AFB were done. By smears we could identify AFB in 20.0% and by culture method in 51.2%. Also biopsy was done in almost all cases, and we could make a confirmative diagnosis of tuberculosis

in 68.4% of all. Total number of the cases confirmed as tuberculosis by the smear, culture or biopsy or in combination of the procedure were 40 cases. The diagnostic rate may be estimated as 88.8% (40/45 cases).

There were very little complications during and after bronchofiberscopy. Bleeding was observed in 3 cases, pneumothorax in 3 cases, fainting 1, laryngeal spasm 1, and 2 uncooperative to carry out procedure. Overall complication rate was 1.9% of 521 cases (Table 7).

DISCUSSION

Bronchofiberscopy became more popular diagnostic methodology for the respiratory disease since the development of flexible bronchofiberscope by Ikeda (Ikeda *et al.*, 1968).

It represents a major advance in the diagnosis and management of pulmonary diseases. In addition to visualization of the endobronchial tree, the biopsied material obtained through bronchofiberscope also may provide valuable cytopathologic, bacteriologic and immunologic information. Some of the advantages over rigid bronchoscopy include increased visual range, minimal discomfort to the patient, biopsy of previously inaccessible tumors and the detection of early lung cancer. Accurate diagnosis depends on cytologic evaluation as well as procedural techniques of operator. It's very important to get adequate specimens too (Zavala, 1975).

Bronchofiberscopy would be considered in many kinds of pulmonary diseases such as lung cancer (Zavala, 1975; Chaudhary, 1978; Roffins, *et al.*, 1979), tuberculosis (Danek and Bower, 1979; Sarkar *et al.*, 1980; Kim *et al.*, 1982), lung abscess (Wanner *et al.*, 1973), atelectasis (Marini *et al.*, 1979), hemothysis (Weaver *et al.*, 1979; Smiddy and Elliott, 1973), and so on. However the most common disease underwent

bronchofiberscopy is lung cancer (Zavala, 1975; Knight and Clarke, 1979). A present and the next is infectious disease such as pneumonia and tuberculosis (Sarkar *et al.*, 1980). The diagnostic purpose of the bronchoscopic procedures include lung cancer in 284 patient, endobronchial lesion in 116 patient and pulmonary tuberculosis 50 patient in our study.

In case of lung cancer, the rate of positive biopsy specimens for visible tumors is higher to the results by the rigid bronchoscope. Mitchell *et al.* (1980) reviewed that several series have shown that when tumor is visible at bronchoscopy accurate histological diagnosis can be made in 77-94%. When no tumor is directly visible the positive biopsy rate is lower. Mitchell's series revealed only 43%. Zavala (1975) reviewed that direct biopsy from the visible tumors showed 94% in positive rate and results of indirect biopsy from the invisible tumors is 71%. We could get 89% of over all diagnostic rate. In our study, the visual or non-visual conditions were not considered.

Of our 199 patients with carcinoma, epidermoid carcinoma in 41%, small cell carcinoma in 23% and adenocarcinoma and large cell carcinoma in 7% respectively.

This data was same as other's. Some authors emphasize the importance of combining forcep biopsy with brush cytology.

In patient with tuberculosis, some author performed bronchoscopy showing relatively higher diagnostic rate.

We performed the procedure in the 45 patients who were not revealed AFB on smear before the procedure.

Through the smear, biopsy and culture, the over all diagnostic yield was 88.8%. Danek and Bower (1979) and Sarkar *et al.* (1980) reported already same rate of 73-91%. They insisted that bronchofiberscopy seemed to be very valuable technique in the diagnosis of tuberculous pul-

monary disease.

Smiddy and Elliott (1973) insisted that bronchofiberscopy is particularly useful in investigating patient with hemoptysis.

The Commonest cause of hemoptysis were chronic obstructive lung disease, bronchiectasis, bronchial carcinoma and tuberculosis we performed bronchofiberscopy for the patient with hemoptysis in only 10 cases.

We could get to find the source of bleeding through the bronchofiberscope with the more experience.

There are 10 complications (1.9%) in this series. In another large multicenter series, the incidence of complications was 0.28% with a mortality of 0.01% among the 25,000 procedures (Credle *et al.*, 1974). Those findings suggested that the complication rate with the fiberscope seemed to be very low relatively to the other valuable diagnostic procedures such as percutaneous lung biopsy.

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