

Endobronchial Tuberculosis : Clinical and Bronchofiberscopic Features

Jung Hee Lee, M.D., Dong Hoo Lee, M.D. and Sung Soo Park, M.D.

*Department of Internal Medicine,
Hanyang University Hospital, Seoul, Korea*

The clinical and bronchofiberscopic features of endobronchial tuberculosis in 53 patients were investigated. These patients comprised 4.7% of some 1,132 subjects who had undergone flexible bronchofiberscopic examinations. The peak incidence occurred in the third and fourth decades, a secondary peak appeared in the seventh decade, a five to six times higher incidence was noted in the female than in the male. Staining for acid-fast bacilli was positive in 67.9% of the patients' sputums and or specimens of bronchial washings. A barking cough was the most common chief complaint. Next in order were chest pain, production of mucus, dyspnea, hemoptysis, and fever. Twenty-three out of 53 patients showed abnormalities on their chest films.

The flexible bronchoscope revealed tuberculous lesions characterized by mucosal swelling or edema, redness, erosion, ulceration, hypertrophy with luminal narrowing, and cicatricial stenosis due to whitish pseudomembrane. The left lower and upper bronchi were involved most frequently.

The majority of the patients who were suffering from a barking cough were resistant to antitussive agents but were responsive to steroid combination chemotherapy with antituberculous drugs.

In conclusion, the bronchofiberscopic approach is not only helpful in the differentiation of endobronchial tuberculosis from bronchogenic cancer but it can also be used for relieving atelectasis.

Key Words: *Endobronchial tuberculosis. Bronchofiberscopic features*

INTRODUCTION

Obviously, there are many predisposing conditions leading to atelectasis.

In addition to aspiration of materials or accumulation of endobronchial secretions, we have to consider not only endobronchial lesions, such as mucosal edema, fibrous tissue, granuloma, and malignant tumor, but also extrabronchial pathology compressing an airway.¹⁾

Atelectasis is the most common complication of bronchial stenosis caused by tuberculosis.²⁾ However, it is not so easy to determine the cause of bronchial stenosis or obstruction unless

bronchofiberscopic examinations are indebted.

Since bronchogenic cancer seems to be on the increase,³⁾ we often regard certain cases of atelectasis discovered as complications of bronchogenic malignancy, but later it was disclosed endobronchial tuberculosis after examination with the flexible bronchoscope.

We present the clinical and bronchofiberscopic findings in 53 patients with endobronchial tuberculosis. Moreover, we emphasize that bronchofiberscopic examination is a very important tool for detecting endobronchial tuberculosis and making a differential diagnosis.

MATERIALS AND METHODS

Fifty three patients with endobronchial tuberculosis (4.7%) out of 1,132 subjects who had a flexible bronchofiberscopic examination at the

Address reprint requests Jung Hee Lee, M.D. Department of Internal Medicine, Hanyang University Hospital, Seoul 133, Korea

Department of Internal Medicine of Hanyang University Hospital between the beginning of March 1982 and the end of December 1985 are included in this study. For diagnostic confirmation, positive stainings of acid-fast bacilli were identified on the tissue sections, sputum, and/or specimens aspirated through endoscopic biopsy and brushing or washing-out for cytology and culture.

Prior to the bronchofiberscopic examination, each patient was premedicated with 0.25 mg atropine sulfate intramuscularly. After topical

application of 4% lidocaine around the upper airway, a Fujinon DRO-I or Fujinon DRO-IL fiberoptic bronchoscope was inserted for endoscopic observation.

Clinical information was gathered from all available medical records.

RESULTS

Age and sex distribution of our patients is shown in Table 1. Predominantly the peak incidence occurred in the third and fourth decades. A lesser peak of incidence was discernable in the 7th decade. There were 45 females and 8 males in a ratio of 5.6:1.

Stainings for acid-fast bacilli were positive in the sputum and/or bronchial washings of 67.9% of the patients. The remaining 32.1% of the patients, diagnoses were confirmed by culture or positive staining for AFB, or bronchofiberscopic biopsy specimens (Table 2).

As shown in Table 3, barking cough was the most common chief complaint (58.5%). Chest pain was complained of 20.8% of the patients, and production of mucus, dyspnea, hemoptysis, and fever were complained of in 18.9, 17, 17, and 9.4% of the cases, respectively. Findings on the chest X-ray were abnormal in twenty three out of 53 patients. No predilective lesion site was apparent on chest X-ray films (Table 4). The left lower and upper bronchi, however, are the most frequently involved, obstructive sites observed by means of bronchofiberscopy (Table 5). Endoscopic pictures

Table 1. Age and Sex Distribution of Patients with Endobronchial Tuberculosis

Age	Male	Female	Total
	N	N	N (%)
20~29	1	24	25 (47.2)
30~39	3	8	11 (20.8)
40~49	0	3	3 (5.7)
50~59	2	3	5 (9.4)
60~69	2	5	7 (13.2)
70~79	0	0	0 (0.0)
80~89	0	2	2 (3.7)
Total	8	45	53 (100.0)

Total 2. The AFB Yield from Sputum and Bronchial Washings in 36 Patients with Endobronchial Tuberculosis

Method	Positive (%)	Negative (%)
Sputum only	9.4	
Bronchial washing only	34.0	
Bronchial washing and sputum	24.5	
Total	67.9	32.1

Table 3. Symptoms in 53 Patients with Endobronchial Tuberculosis

Symptoms	N	%
Cough	31	58.5
Chest pain	11	20.8
Sputum	10	18.9
Dyspnea	9	17.0
Hemoptysis	9	17.0
Fever	5	9.4
Symptomless	2	3.8
Generalized weakness	1	1.9

Table 4. The Site of Lesions on Chest P-A X-ray in 53 Patients with Endobronchial Tuberculosis

Site	N	%
Normal	30	56.6
Abnormal	23	43.4
Left lung		17.0
Upper	2	3.8
Lower	3	5.7
Upper & lower	4	7.5
Right lung		26.4
Upper	4	7.5
Middle	2	3.8
Lower	4	7.5
Upper & middle	2	3.8
Middle & lower	2	3.8
Total	53	100.0

of endobronchial tuberculosis showed mucosal swelling, edema, redness, erosion, or occasional ulceration and loss of light reflex from granulation, along with narrowing of the lumen. Occasionally a light yellowish-white colored miliary nodule was observed. Cicatrical stenosis or obstruction covered by whitish pseudomembrane was a common finding in the patient with atelectasis caused by endobronchial tuberculosis. Thus pseudomembrane could occasionally be desquamated by bronchofiberscopy with possible relief of the atelectasis. After the pseudomembrane was desquamated, tenaceous secretions which had been exposed around the opened site were visible.

Pathological findings were essentially chronic granulomatous inflammation showing caseation necrosis, or nonspecific chronic inflammation. Squamous metaplasia was observed not infrequently. The barking cough was not responsive to antitussive medication but it did respond well to steroids along with antituberculous combination chemotherapy.

DISCUSSION

Although the early detection of endobronchial tuberculosis by identification of acid-fast bacilli is highly desirable, it is not easy to accomplish, because features of the initial chest films are usually nonspecific. Moreover, negative stainings for AFB of sputums are not uncommon. Therefore, it is thought that the bronchofiberscopic approach is mandatory for the diagnosis of endobronchial tuberculosis. The most common initial lesion of endobronchial tuberculosis is infiltration of lymphocytes into the bronchial mucosa, and the next is partial stenosis by considerable mucosal congestion and edema.⁴⁾ Development of caseous necrosis with formation of tuberculous granuloma can be found at the mucosal surface. Fibrotic change of the lamina propria as well as healing of mucosal ulcerations or erosions with or without squamous metaplasia formerly would progress to cicatrical stenosis.⁴⁻⁷⁾

The spectrum of endobronchial tuberculosis we encountered in this series of patients was somewhat characteristic. A five to six times higher incidence in females than in males was noted. The highest incidence was seen in the third decade. These results are quite different from those of another report, in which the peak incidence was noticed in old and weak females beyond 50 years

Table 5. The Site of Bronchial Lesions on Bronchosopic Examination

Involved bronchus	N	%
Left side		
Left main bronchus	4	7.5
Upper	9	17.0
Lower	10	18.9
Upper & lower	7	13.2
Right side		
Right main bronchus	2	3.8
Upper	6	11.3
Middle	5	9.4
Lower	2	3.8
Upper & middle	2	3.8
Middle & lower	5	9.4
Trachea	1	1.9
Total	53	100.0

of age.⁸⁾ However, in our study also, a late peak was noted one in the 7th decade. It is thought that the initial peak in the third decade is representative of the general situation in Korea where tuberculosis is endemic, and that the late peak of old age occurs, not because of reinfection, but as a result of the reactivation of the primary lesion when the patient is in an immunocompromised states.⁹⁾ Old age, alcoholism, prolonged therapy with steroids, diabetes mellitus, and silicosis are known as risk factors for reactivation of the primary lesion. Bronchofiberscopically, whitish pseudomembrane causing stenosis or obstruction of bronchi was a characteristic finding in the patients with atelectasis caused by endobronchial tuberculosis. This means, in turn, that bronchofiberscopy is a very useful tool in relieving atelectasis caused by cicatrical obstruction.

Since the squamous metaplasia and nonspecific chronic inflammatory change could be associated with other diseases,¹⁰⁾ microbiological confirmation from bronchofiberscopic brushing and/or washings is required.

The other feature that was nearly universal in our patients was evidence of the usefulness of medication with steroid for relieving the barking cough as also noted in other literature.¹¹⁻¹³⁾

In view of the fact that tuberculosis is one of the common endemic diseases in Korea, young, female patients, whose coughing is barking in nature and resistant to general antitussive agents, should be considered to possibly have

endobronchial tuberculosis. Furthermore, we would like to emphasize that the broncho-fiberscopic approach is a substantially useful means of making a differential diagnosis in atelectasis in old patients of cancer-risk age.

REFERENCES

1. Reinhardt K: *Atelèctasie pulmonaire gauche totale apres bronchographie*. *J Radiol Electr* 32: 470, 1951
2. Birkelo CC, Poznak LA: *The radiologic findings in tracheobronchial tuberculosis*. *Dis Chest* 11: 26, 1945
3. Krohn J: *Primary lung cancer in Korean case series*. *Acta Tuberc Scand* 56S:89, 1963
4. Medlar EM: *The behavior of pulmonary tuberculous lesions: A pathological study*. *Am Rev Tuberc Pulm Dis* 71S:1, 1955
5. Wilson NJ: *Bronchoscopic observation in tuberculous tracheobronchitis-Clinical and pathological correlation*. *Dis Chest* 11:36, 1945
6. Pierson DJ, Lakshminarayan S, Petty TL: *Endobronchial tuberculosis*. *Chest* 70:537, 1973
7. Albert RK, Petty TL: *Endobronchial tuberculosis progressing to bronchial stenosis*. *Chest* 76:53, 1976
8. Stead WW: *Pathogenesis of the sporadic case of tuberculosis*. *N Engl J Med* 277:1008, 1967
9. Case Records of the Massachusetts General Hospital (Case 32-1976). *N Engl J Med* 295:328, 1976
10. Sanderud K: *Squamous metaplasia of respiratory tract epithelium*. *Acta Pathol Microbiol Scand* 43:47, 1958
11. Rose RM, Cardona J, Daly JF: *Bronchographic sequelae of endobronchial tuberculosis*. *Ann Otol Rhinol Laryngol* 74:1133, 1965
12. Gerbeaux J, Baculard A, Couvreur J: *Primary tuberculosis in childhood*. *Am J Dis Child* 110:507, 1965
13. Nemir BL, Cardona J, Vaziri F, Rosario F: *Prednisone as an adjunct in the chemotherapy of lymph node-bronchial tuberculosis in childhood: A double-blind study*. *Am Rev Resp Dis* 75:402, 1967