

CT 1

(anthracofibrosis)
CT
(n=25)
CT가 (n=10)
35 CT
(50%), (37%) (31%) 가
(37%), (31%) 가 (Tree - in - bud)
7 (70%)
(20%) 1 (4%)
(p<.01). 1cm
7 (70%)
3 (30%)
가 (p<.05).
(Tree - in - bud)
가

(anthracofibrosis)
가
1998 8 2003 3
(1, 2). 60
CT가 35
(3 - 7), 17 - 61%
(2 - 4).
(3 - 5).
69
14 , 5 CT가 1
35 54 - 92 75
가 29 (83%), 6 (17%)
2003 4 28 2003 12 3
21 (60%)

가

Electric Medical Systems, Milwaukee, WI)

7 mm, 7 mm/sec (1:1 pitch), 120 kVp, 200 mA

2 ml/sec 120 ml, 35 delay time CT 1 mm 10 mm 140 kVp, 170 mA

35 가 2

가

, 1, 7

6 (17%) 2

28 CT 7 CT Fisher's exact test

CT scan HiSpeed CT/i scanner (General

Table 1. Distribution of Bronchial Lesion of 35 Patients With Anthracofibrosis

	No. of Total sites	No. of Patients	Involved Lobe				
			RUL	RML	RLL	LUL	LLL
With active tuberculosis	23	10	4 (17%)	6 (26%)	5 (22%)	4 (17%)	4 (17%)
Without active tuberculosis	61	25	12 (20%)	20 (33%)	8 (13%)	11 (18%)	8 (13%)

Table 2. Bronchial Lesions of 35 Patients With Anthracofibrosis

	Without active tuberculosis	With active tuberculosis
No. of Total Bronchial Lesion	61	23
Diffuse Narrowing	29 (48%)	12 (52%)
Focal Narrowing	3 (5%)	1 (4%)
Wall Thickening	25 (41%)	7 (30%)
Mass-like soft tissue density	4 (7%)	3 (13%)

Table 3. Parenchymal Lesions of 35 Patients With Anthracofibrosis

	Without active tuberculosis (N = 25)	With active tuberculosis (N = 10)
Parenchymal Lesion		
Consolidation	11 (44%)	7 (70%)
Atelectasis	16 (64%)	6 (60%)
GGO	3 (12%)	2 (20%)
Tree-in-bud	0 (0%)	7 (70%)

GGO: ground glass opacity

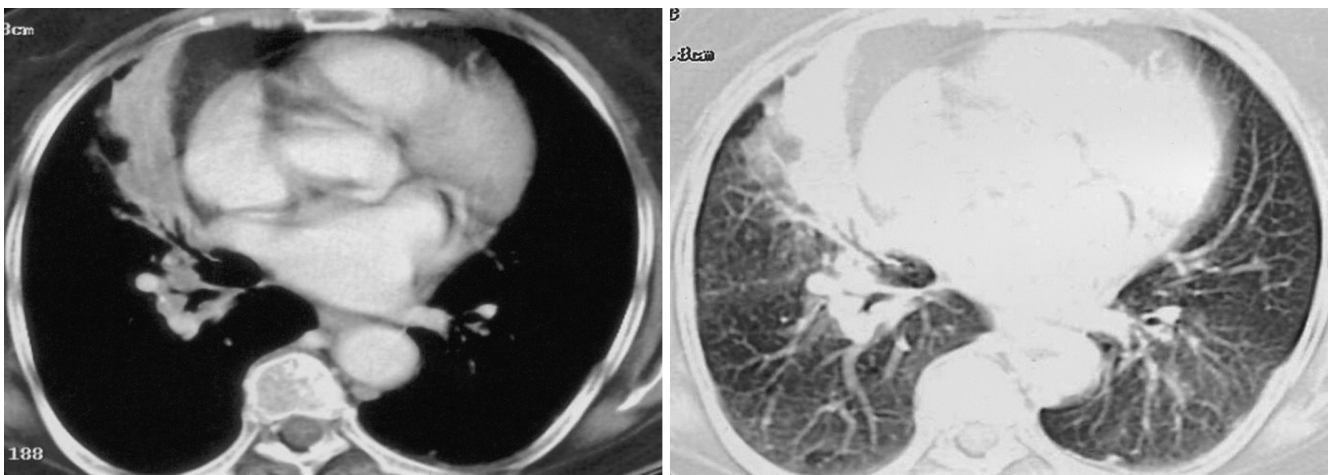


Fig. 1. A 68-year-old woman with bronchial anthracofibrosis without tuberculosis.
A. Contrast-enhanced CT scan at level of inferior pulmonary vein shows segmental atelectasis of right middle lobe without obstructing mass lesion. Note enlarged lymph nodes with or without calcification along the right middle and lower lobe bronchus.
B. CT scan with lung window setting at same level shows diffuse narrowing with mild irregularity of right middle lobe bronchus.

29 (48%),
12 (52%),
25 (41%), 7 (30%), (Table 2).
가 (Tree-in-bud)
25 (n=53), lobe 8 (n=8) bud)
61 . 10
lobe 8 (n=21), 7 (70%) Table 3 10
lobe 2 (n=2) 23 (Fig. 2), 2
20 (33%) 6 (20%) (Fig. 3) 1
(26%) 가
(Table 1). 가 (Tree-in-bud)
가 bud)

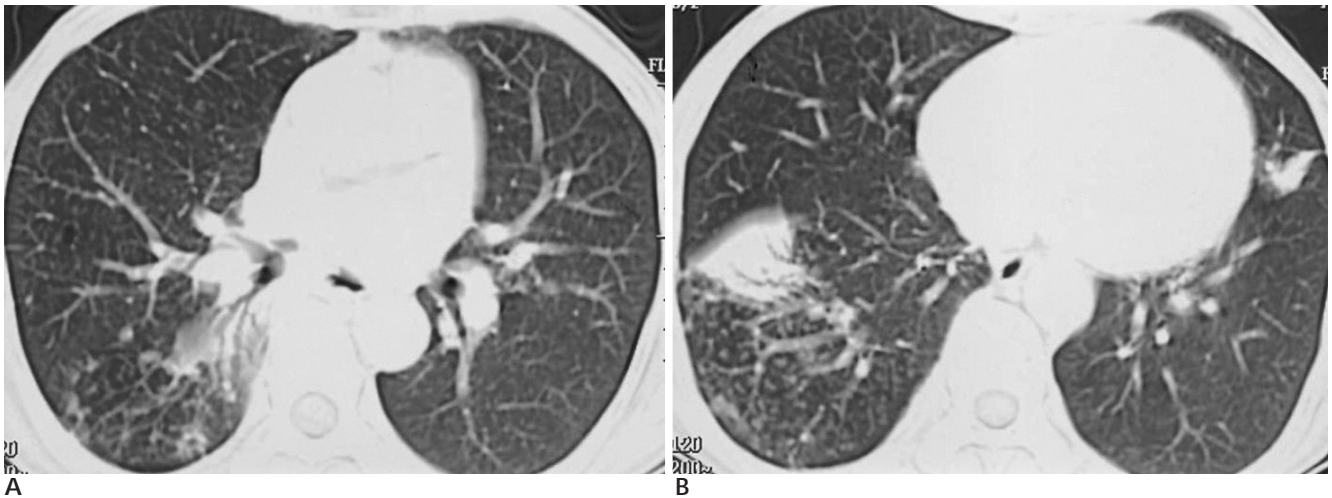


Fig. 2. A 64-year-old woman with bronchial anthracofibrosis and active pulmonary tuberculosis.
A. CT scan with lung window setting shows diffuse narrowing of right lower lobe superior segmental bronchus with surrounding consolidation.
B. CT scan at slightly lower level shows peripheral consolidation and small branching opacities in right lower lobe.

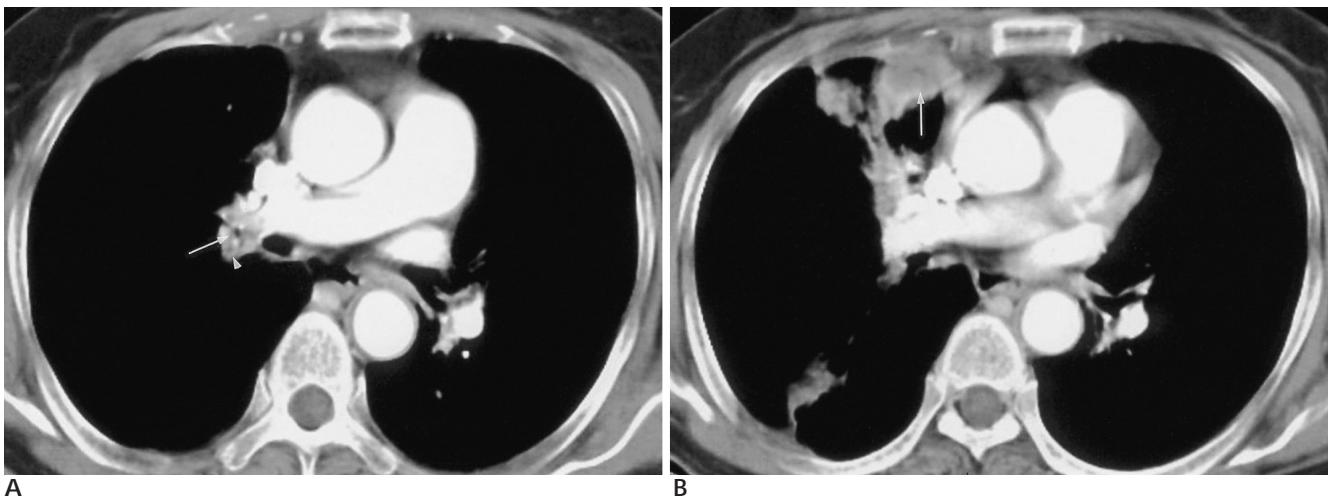


Fig. 3. A 64-year-old woman with bronchial anthracofibrosis and active pulmonary tuberculosis.
A. Contrast-enhanced CT scan shows marked narrowing of right upper lobe posterior segmental bronchus (arrow) and surrounding necrotic lymph nodes (arrowhead).
B. Contrast-enhanced CT scan at slightly lower level shows consolidation with internal low density (arrow), which presumed to indicate caseous pneumonia.

1 (4%)

1 cm (8-11).

18 (72%), 7 (70%)

가 가 3 (30%) (3-5).

(33%)

15 (60%) 5 가

(50%)

7 ((31%) 가 Kim (1),

5 , 1 , 1), 4 (3 , 1) (2)

11 (44%) 2 (가

1 , 1), 1 () 3 (30%) .

가 (Tree-in-bud)

(10). 가 1 ,

8 가 (p<0.01).

20% 가

83%가 (n=29) , 75 가

7 (20%) 가

(1, 2).

가 .

72% 70% .

7 (20%) .

가 (3-5). 35

10 (29%)

6 (17%) , 10

2

14 (40%) . (2) (33%) 가

(4) (61%) Im (12)

3 (p<0.05).

5 (50%) 15 (60%)

(2-5). 가 가 (p>0.05).

(30%) (44%) 가

(p>0.05), 가

가

(8-11).

Kim(1), (2) 가

가

가 (Tree-in-bud)

가 .

1. Kim HY, Im JG, Goo JM, et al. Bronchial anthracofibrosis (inflammatory bronchial stenosis with anthracotic pigmentation): CT findings. *AJR Am J Roentgenol* 2000;174:523-527
2. . Anthracofibrosis . 1998;39:523-527
3. Chung MP, Lee KS, Han JG, et al. Bronchial stenosis due to anthracofibrosis. *Chest* 1998;113:344-350
4. , , . anthracofibrosis . 1996;51:351-356
5. , , . 1991;14:688-693

6. Abraham GC. Atelectasis of the right middle lobe resulting from perforation of tuberculous lymph nodes into bronchi in adults. *Ann Intern Med* 1951;35:820-835
7. Strandling P. *Diagnostic Bronchoscopy*. 5th ed. New York: Churchill Livingstone, 1986;157
8. Moon WK, Im JG, Yeon KM, Han MC. Tuberculosis of the central airways: CT findings of active and fibrotic disease. *AJR Am J Roentgenol* 1997;169:649-653
9. Kim Y, Lee KS, Yoon JH, et al. Tuberculosis of the trachea and main bronchi: CT findings in 17 patients. *AJR Am J Roentgenol* 1997;168:1051-1056
10. Lee KS, Kim YH, Kim WS, Hwang SH, Kim PN, Lee BH. Endobronchial tuberculosis: CT features. *J Comput Assist Tomogr* 1991;15:424-428
11. Choe KO, Jeong HJ, Sohn HY. Tuberculous bronchial stenosis: CT findings in 28 cases. *AJR Am J Roentgenol* 1990;155:971-976
12. Im JG, Song KS, Kang HS, et al. Mediastinal tuberculous lymphadenitis: CT manifestations. *Radiology* 1987;164:115-119

The CT Findings of Bronchial Anthracofibrosis: Comparison of Cases with or without Active Tuberculosis¹

Hyung Sim Choe, M.D., In-Jae Lee, M.D., Yul Lee, M.D.

¹Department of Radiology, Hallym University Sacred Heart Hospital

Purpose: To assess the CT findings of bronchial anthracofibrosis with or without active tuberculosis.

Materials and Methods: Analysis of the CT scans of 35 patients with bronchoscopically proven anthracofibrosis revealed that 25 were negative for active tuberculosis and ten were positive. Bronchial and pleural lesions, pulmonary parenchymal lesions, and mediastinal/hilar lymph nodes were retrospectively evaluated.

Results: Common radiologic findings of anthracofibrosis included diffuse bronchial narrowing (50%), wall thickening (37%), and mass-like soft tissue density in central bronchi (8%). The right middle lobe was most commonly involved (31%). Common findings of pulmonary parenchymal lesions included consolidation (37%), atelectasis (31%), and ground-glass opacity (10%). These bronchial or pulmonary parenchymal findings were common in patients with or without active tuberculosis. Findings of multiple poorly defined small nodules, including branching opacities and consolidation with internal low density were seen only in patients with active tuberculosis ($p < 0.01$), while enlarged mediastinal or hilar lymph nodes were frequently observed in patients with or without active tuberculosis. Necrotic lymph nodes were present only in those with active tuberculosis ($p < 0.05$).

Conclusion: When CT scans depict central bronchial narrowing, wall thickening, or mass-like soft tissue density with atelectasis or consolidation, especially in older patients without a distinct central lung mass lesion, anthracofibrosis should be included in the differential diagnosis. When multiple poorly defined small nodules, including branching opacities, consolidation with internal low density or necrotic lymph nodes are observed, the possibility of concomitant active tuberculosis should be considered.

Index words : Lung, diseases
Lung, CT
Anthracofibrosis
Tuberculosis

Address reprint requests to : In Jae Lee, M.D., Department of Radiology, Hallym University Sacred Heart Hospital
896 Pyungchon-dong, Anyang, Kyungki-do 431-070, Korea.
Tel. 82-31-380-3885 Fax. 82-31-380-3878 E-mail: ijlee2003@yahoo.co.kr