

Coexistent Lung Carcinoma and Active Pulmonary Tuberculosis in the Same Lobe

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We observed a rare case of lung carcinoma accompanied by active pulmonary tuberculosis in the same lobe. The chest x-ray of a 49-year-old man revealed an abnormal shadow in the right upper field and a giant bulla in the left upper field. Chest computed tomography (CT) revealed a nodule with consolidation, which was not continuous in the right S3. Bronchoscopically, epidermoid carcinoma existed in the proximal right upper bronchus. In the sputum specimens, the smear was negative, but the polymerase chain reaction of *Mycobacterium tuberculosis* and culture was positive. Anti-tuberculosis treatments were administered for approximately 4 weeks, but the chest x-ray remained unchanged. Right upper lobectomy with bronchoplasty (wedge resection of the right upper bronchus) was performed, and the anastomosis was covered with an intercostal muscle flap. Lymphadenectomy of the right hilum and mediastinum was also performed. Microscopy revealed epidermoid carcinoma in the proximal tumor (pT3N0M0-stage IIB) and epithelioid granuloma with caseous necrosis, granulomatous pneumonia, exudative lesions, and fibrocaseous nodules in the distal lung. After surgery, anti-tuberculosis treatment was resumed. (*Ann Thorac Cardiovasc Surg* 2006; 12: 53–5)

Key words: lung carcinoma, active pulmonary tuberculosis, lobectomy, coexistent lung carcinoma and active pulmonary tuberculosis

Lung carcinoma is associated with tuberculosis in approximately 1-2% of cases, and pulmonary tuberculosis is associated with lung carcinoma in approximately 1-5%.^{1,2)} We experienced a rare case of lung carcinoma accompanied by active pulmonary tuberculosis in the same lobe.

Case Report

The chest x-ray of a 49-year-old man exhibited an abnormal shadow in the right upper field and a giant bulla in the left upper field. Chest computed tomography (CT)

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revealed a nodule with consolidation that was not continuous in the right S3 (Fig. 1). The right B1 was obstructed and the B2 showed stenosis caused by epidermoid carcinoma on bronchoscopy. In the sputum specimens, the smear was negative, but polymerase chain reaction of *Mycobacterium tuberculosis* and culture was positive. When the patient was admitted to our hospital 1 month after the diagnosis of lung carcinoma, his chest x-ray revealed a large nodule with the consolidation which was progressive and focusing. Anti-tuberculosis treatments were administered for approximately 4 weeks, but the chest x-ray remained unchanged. Right upper lobectomy with bronchoplasty (wedge resection of the right upper bronchus) was performed, and the anastomosis was covered with an intercostal muscle flap. Lymphadenectomy of the right hilum and mediastinum was also performed. Macroscopic findings revealed a yellowish tumor extending from the proximal bronchus to the distal, and a diffuse yellowish-brownish lesion with caseous necrosis in the distal lung (Fig. 2). Microscopy revealed epi-

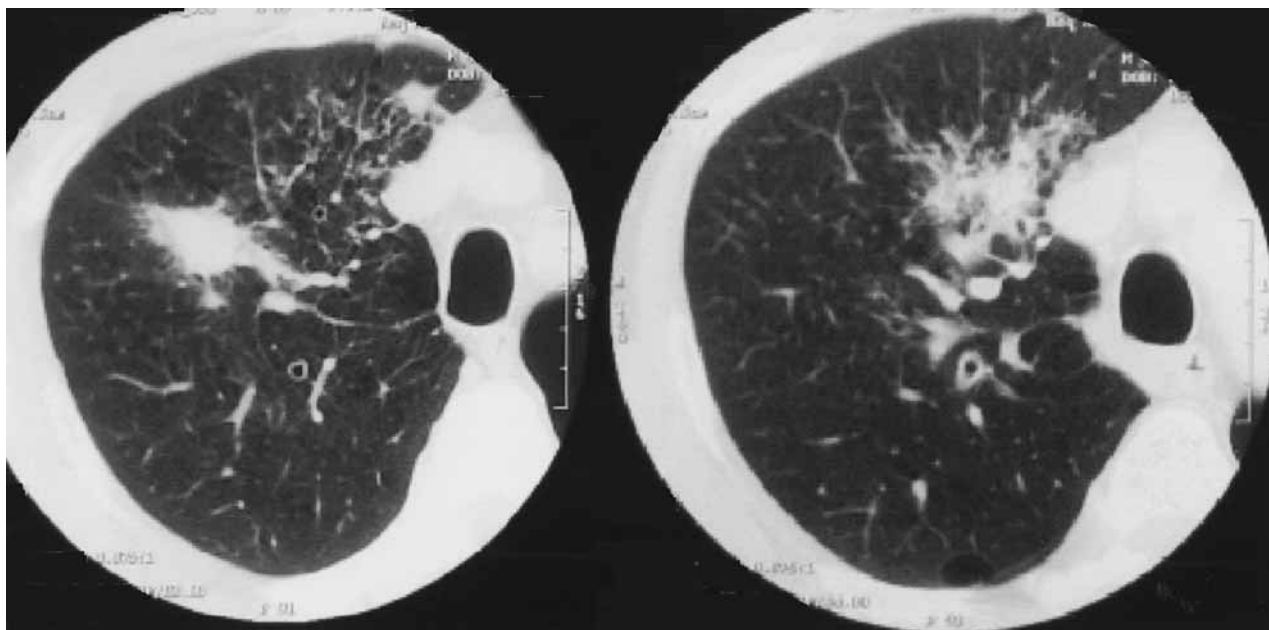


Fig. 1. Chest computed tomography reveals a nodular shadow in the right S3 and consolidation neighboring the nodule in the right S3.

dermoid carcinoma in the proximal tumor (pT3N0M0-stage IIB), and epithelioid granuloma with caseous necrosis, granulomatous pneumonia, exudative lesions, and fibrocaceous nodules in the distal lung. After surgery, anti-tuberculosis treatment was resumed. Combination regimens consisting of isoniazide (400 mg/d), rifampicin (450 mg/d), ethambutol (750 mg/d) and pyrazinamide (1,500 mg/d) for 2 months and followed by 4 months of the isoniazide, rifampicin and ethambutol were used. Postoperative complications were not seen and there was no recurrence.

Discussion

Previous reports indicated that lung carcinoma was associated with tuberculosis in approximately 1-2% of cases, and pulmonary tuberculosis was associated with lung carcinoma in approximately 1-5%.^{1,2)} The morbidity of lung carcinoma and pulmonary tuberculosis is increased in elderly patients.

There are two potential mechanisms in the pathogenesis of this association. First, it is possible that the carcinoma invaded the existing tuberculous lesions and the tuberculous lesions became active.³⁾ We found previously that tuberculous lesions became active in caseous necrosis that was invaded by the carcinoma. Second, it is possible that the tuberculosis relapsed intrinsically upon con-



Fig. 2. Macroscopic findings reveal a yellowish tumor from the proximal bronchus to the distal, and a diffuse yellowish-brownish lesion with caseous necrosis in the distal lung.

tact with carcinomatous lesions in patients with carcinoma. However, it cannot be denied that the carcinoma invaded the tuberculous lesions in the margin of the hilum carcinoma, and the tuberculous lesions became active and spread to the distal lesion of the lung. We postulated that the second mechanism applied in our case because of the clinical course and pathology findings.

We observed 61 cases of coexistent carcinoma and mycobacterium infection in our hospital between 1991 and 2003. Eleven had coexistent carcinoma and active mycobacterium infection in the same lobe. Six of 11 cases had coexistent carcinoma and active tuberculosis in the same lobe. The location was the right upper lobe in 2, the right middle lobe in 1, the right lower lobe in 2, and the left upper lobe in 1. The histology was epidermoid carcinoma in 4, large cell carcinoma in 1, and adenocarcinoma in 1. The pathologic stage was IIA in 1, IIIA in 4, and IIIB in 1. Previous reports indicated that epidermoid carcinoma occupied 40-52.2% and more than stage III occupied 50-80%.^{1,4-6)} The cases of coexistent carcinoma and active tuberculosis in the same lobe were comparative in advanced disease.

In our hospital, patients with coexistence of bronchogenic carcinoma and pulmonary tuberculosis are given anti-tuberculosis treatment for at least 4 weeks before surgery. Combination regimens consisting of isoniazide

(400 mg/d), rifampicin (450 mg/d), ethambutol (750 mg/d) and pyrazinamide (1,500 mg/d) for 2 months followed by 4 months of isoniazide, rifampicin and ethambutol have been used for patients with tuberculosis who do not have cancer. In this way, the likelihood of postoperative complications is reduced.

References

1. Kurasawa T, Takahashi M, Kuze F, et al. A clinical study on coexistence of active pulmonary tuberculosis and lung cancer. *Kekkaku* 1992; **67**: 119–25.
2. Tamura A, Hebisawa A, Tanaka G, et al. Active pulmonary tuberculosis in patients with lung cancer. *Kekkaku* 1999; **74**: 797–802.
3. Fontenelle LJ, Campbell D. Coexisting bronchogenic carcinoma and pulmonary tuberculosis. *Ann Thorac Surg* 1970; **9**: 431–5.
4. Aoki Y, Kuroki S, Hiura K, Katoh O, Yamada H. A clinical study of pulmonary tuberculosis in lung cancer patient. *Kekkaku* 1991; **66**: 727–32.
5. Vencevicius V, Cicenias S, Miliauskas P. Surgical treatment of lung carcinoma in tuberculosis patients. *Medicina* 2004; **40**: 1170–4.
6. Kim YI, Goo JM, Kim HY, Song JW, Im JG. Coexisting bronchogenic carcinoma and pulmonary tuberculosis in the same lobe: radiologic findings and clinical significance. *Korean J Radiol* 2001; **2**: 138–44.