

Case Report

Computed Tomography of Bronchiolitis Obliterans

Yukio Miki, Hiroto Hatabu, Masashi Takahashi, Norihiro Sadato, and
Yasumasa Kuroda

Abstract: A case of bronchiolitis obliterans was studied by high resolution CT. The morphologic changes of the lesions are described. **Index Terms:** Bronchiolitis obliterans—Bronchi, diseases—Computed tomography.

Bronchiolitis obliterans was first described by Lange in 1901. We describe the radiologic findings in a case of bronchiolitis obliterans as demonstrated by high resolution CT (HRCT).

CASE REPORT

A 56-year-old man was admitted because of fever, dyspnea, and hemoptysis. Routine laboratory tests revealed leukocytosis (white blood cell count 15,800), C-reactive protein 25.8 mg/dl, and erythrocyte sedimentation rate 76 mm/h.

Chest radiography demonstrated bilateral alveolar opacities with air bronchograms (Fig. 1). High resolution CT revealed bilateral segmental alveolar opacities with air bronchograms (Fig. 2a).

Pulsed steroid therapy with prednisolone 1,000 mg/day for 3 days was administered. Fever, dyspnea, and hemoptysis subsided. High resolution CT showed diminishment of the pulmonary infiltrates (Fig. 2b).

Three weeks after admission, fever recurred and cervical lymphadenopathy appeared. Lymph node biopsy revealed malignant lymphoma (diffuse, mixed or pleomorphic type, T-cell). Fever and lymphadenopathy disappeared following administration of prednisolone 30 mg/day for 19 days.

However, fever, dyspnea, and hemoptysis recurred soon after withdrawal from steroid therapy (Fig. 2c). An open lung biopsy revealed granulation tissue plugs within the lumen of the bronchiole and organizing pneumonia around it, compatible with bronchiolitis obliterans (Fig. 3).

Three weeks after readministration of prednisolone 30 mg/day, HRCT showed marked improvement (Fig. 2d). Chemotherapy for malignant lymphoma was initiated and the patient was discharged.

DISCUSSION

Bronchiolitis obliterans is a descriptive term for a fibrosing inflammatory process that occludes the lu-

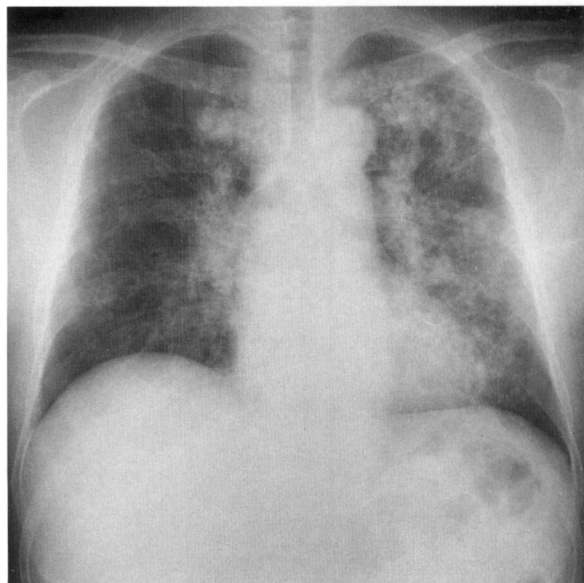


FIG. 1. Chest radiograph obtained on the day before open lung biopsy. Note bilateral multiple patchy areas of consolidation predominantly distributed at left lower lung.

From the Department of Radiology, Tenri Hospital, 200 Mishima-cho, Tenri City, 632, Japan. Address correspondence and reprint requests to Dr. Y. Miki.

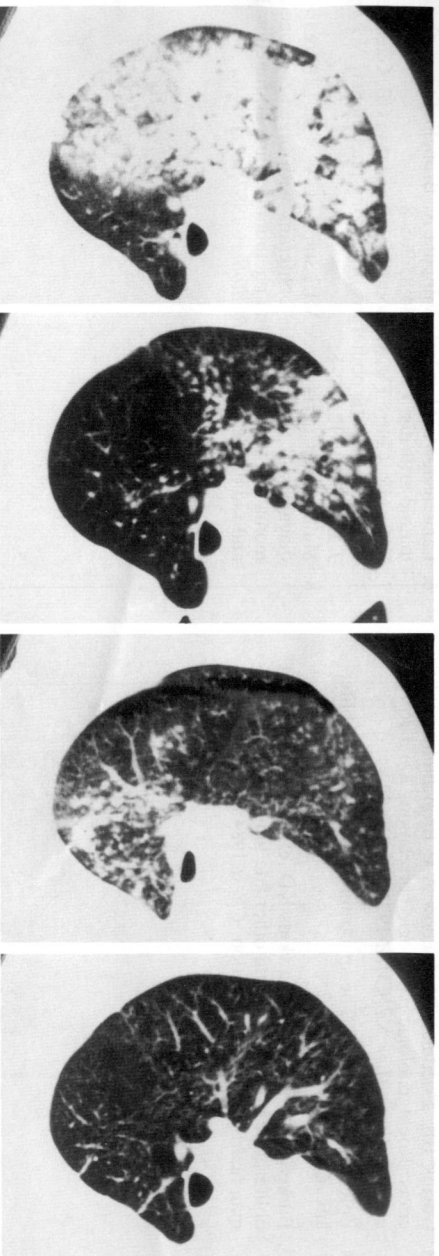


FIG. 2. High resolution CT (HRCT) of the right chest at the level of midlung viewed at window levels appropriate for pulmonary parenchyma (level - 600 HU, width 1,200 HU). **a:** Two days after admission, HRCT scan reveals segmental alveolar opacities with air bronchograms. **b:** Eight days after admission, 6 days after the initiation of steroid therapy (methylprednisolone 1,000 mg for 3 days), HRCT scan shows marked improvement. **c:** Two months after admission, HRCT reveals alveolar opacities and patchy areas of consolidation in the right lower lobe, which had been spared at first. The next day open lung biopsy was performed. **d:** Three and one-half months after admission, HRCT scan shows almost complete resolution of the abnormal shadow by steroid therapy.

mens of small airways (1). Histologically, bronchiolitis obliterans is defined by (a) the presence of granulation tissue plugs within the lumen of small airways and occasionally alveolar ducts and (b) the destruction of small airways with obliterative scarring (2).

Clinically, patients have cough, dyspnea, sputum, and fever. Both children and adults are affected, but >80% of patients are >40 years old. There is a 2:1 male predominance (3). Good response to corticosteroid therapy, especially in the idiopathic group, is noted but recurrence after discontinuation of steroid therapy occurs in one-third.

Etiologically, bronchiolitis obliterans can be classified as (a) toxic fume bronchiolitis obliterans, (b) postinfectious bronchiolitis obliterans, (c) bronchiolitis obliterans associated with connective tissue disease and organ transplantation, (d) localized lesion with bronchiolitis obliterans, and (e) idiopathic bronchiolitis obliterans with organizing pneumonia (2,4-7).

Few descriptions of the radiographic findings in bronchiolitis obliterans have been reported. Gosink et al. (3) reviewed the findings in 52 cases of bronchiolitis obliterans. Thirty-nine cases had alveolar opacities, and 18 had a predominantly nodular pattern. Two patients had a coexisting malignant lymphoma as did our case.

We report the detailed radiographic presentation of a case with bronchiolitis obliterans by HRCT. Muller et al. (8) reported CT images of two patients with bronchiolitis obliterans with organizing pneumonia which showed the patchy areas of consolidation distributed predominantly in the lung periphery.

High resolution CT provided us with a precise demonstration of the distribution and morphological change of the lesion. We selected the site of an open lung biopsy on the information.

REFERENCES

1. Katzenstein AA, Askin FB. *Surgical pathology of non-neoplastic lung disease*. Vol. 13. *Major problems in pathology*. Philadelphia: WB Saunders, 1982, p 349.
2. McLeod TC, Epler GR, Colby TV, Gaensler EA, Carrington CB. Bronchiolitis obliterans. *Radiology* 1986;159:1-8.



FIG. 3. A low power view of a biopsy specimen shows polypoid granulation tissue obliterating the lumen of the bronchiole. Localized pneumonia associated with organizing change in alveoli around the bronchiole is seen. Hematoxylin/eosin stain. $\times 46$.

3. Gosink BB, Friedman PJ, Liebow AA. Bronchiolitis obliterans. Roentgenologic-pathologic correlation. *Am J Roentgenol Radium Ther Nucl Med* 1973;117:816-32.
4. Epler GR, Colby TV. The spectrum of bronchiolitis obliterans. *Chest* 1983;83:161-2.
5. Burke CM, Theodore J, Dawkins KD, et al. Post-transplant obliterative bronchiolitis and other late lung sequelae in human heart-lung transplantation. *Chest* 1984;86:824-9.
6. Lahdensuo A, Mattila J, Vilppula A. Bronchiolitis in rheumatoid arthritis. *Chest* 1984;85:705-8.
7. Epler GR, Colby TV, McLoud TC, Carrington CB, Gaensler EA. Bronchiolitis obliterans organizing pneumonia. *N Engl J Med* 1985;312:152-8.
8. Muller NL, Cuerry-force ML, Staples CA, et al. Differential diagnosis of bronchiolitis obliterans with organizing pneumonia and usual interstitial pneumonia: clinical, functional, and radiologic findings. *Radiology* 1987;162:151-6.