

Another face of bronchiolitis obliterans organizing pneumonia

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A 47-year-old man presented with an eight-day history of nonproductive cough and constitutional symptoms progressing to respiratory failure. High resolution computed tomography revealed a diffuse micronodular pattern and a 'tree-in-bud' pattern in the lower lung zones. Transbronchial biopsy showed features consistent with bronchiolitis obliterans organizing pneumonia (BOOP). After an initially difficult clinical course, the patient responded well to long term treatment with corticosteroids, including improvement of air flow obstruction. This case illustrates a variant of BOOP characterized by a comparatively acute onset, a component of proliferative bronchiolitis, an obstructive rather than restrictive pattern of pulmonary function testing and good clinical response to corticosteroid therapy.

Key Words: *Bronchiolitis obliterans organizing pneumonia; Proliferative bronchiolitis; Tree-in-bud*

Un autre aspect d'une bronchiolite oblitérante avec pneumonie organisée

Un homme de 47 ans présentait depuis huit jours une toux non productive et des symptômes constitutionnels progressant vers une insuffisance respiratoire. Une tomographie par ordinateur à haute résolution a révélé des images micronodulaires diffuses et « d'arbre qui bourgeonne » dans les régions pulmonaires inférieures. Une biopsie transbronchique a montré des caractéristiques correspondant à une bronchiolite oblitérante avec pneumonie organisée (BOPO). Après une évolution clinique initialement difficile, le patient a bien réagi au traitement à long terme aux corticostéroïdes, affichant même une amélioration de l'obstruction des voies aériennes. Ce cas illustre une variante de la BOPO caractérisée par des premiers signes comparativement insidieux, une composante de la bronchiolite proliférative, un trouble obstructif plutôt que restrictif de la fonction pulmonaire et une bonne réaction clinique au traitement aux corticostéroïdes.

CASE PRESENTATION

A 47-year-old man presented with an eight-day history of dry, nonproductive cough, myalgias, pharyngitis, chills and night sweats, and increasing shortness of breath. He had just returned from a visit to Seattle, Washington, USA, and had been in contact with a friend who had had a viral-type illness. The patient had no history of cardiopulmonary disease, was a lifetime nonsmoker and had no history of inhaling, ingesting or injecting recreational drugs. He lived in a house with two dogs and one cat, and had no occupational exposures or history of tuberculosis. In the emergency department, he was hypoxemic, with an arterial oxygen saturation of 85% on room air. The admitting chest x-ray (Figure 1) showed a diffuse, bilateral micronodular (2 mm to 4 mm) pattern, and a high resolution computed tomography (CT) scan completed the following morning showed diffuse nodular disease involving all lung zones and a 'tree-in-bud' pattern in the lower lung zones (Figure 2). Results of microbiological testing revealed negative serology for human immunodeficiency virus, and no other organisms, including *Pneumocystis carinii*, were documented on smears, blood cultures or lavage specimens. *Mycoplasma pneumoniae* and *Chlamydia pneumoniae* immunoglobulin (Ig) M titres were negative, while a C *pneumoniae* IgG titre was 1:128. Serum complement levels for C3 and C4 were normal; an anti-nuclear antibody test was negative, as were precipitins for thermophilic actinomyces.

The patient was initially treated with a combination of levofloxacin, azithromycin, trimethoprim sulfamethoxazole and prednisone. A bronchoscopy and transbronchial biopsies were performed, and histopathology revealed features of bronchiolitis obliterans organizing pneumonia (BOOP) (Figure 3). After an initially difficult course in which the patient required intu-

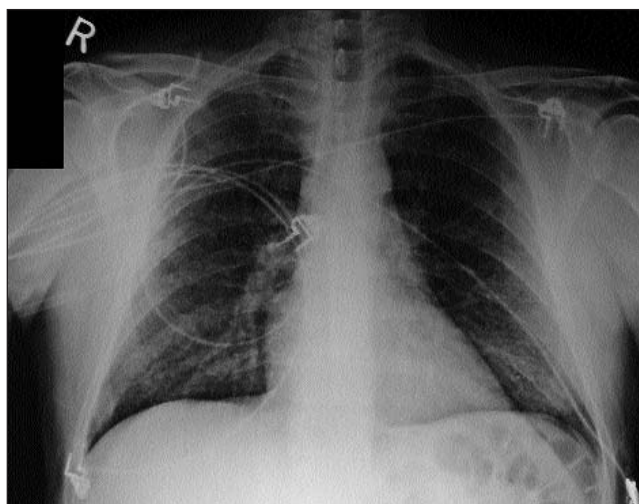


Figure 1) Admission plain chest radiograph. Note the bilateral micronodular radiodensities, more marked in the lower lung zones

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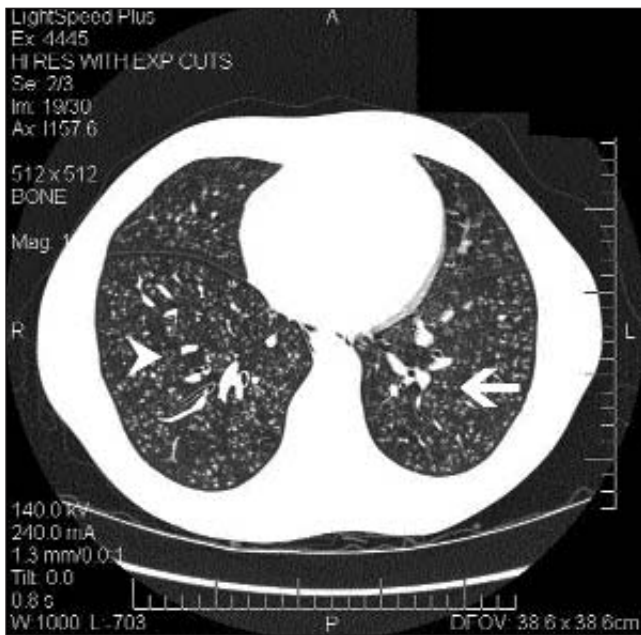


Figure 2) High resolution computed tomography image taken the morning after hospital admission. Note the diffuse centrilobular micronodularity (arrow) and branching linear opacities (arrowhead) characteristic of the 'tree-in-bud' pattern

bation and ventilation for progressive respiratory failure, he improved after extubation and initiation of therapy with intravenous methylprednisolone (Table 1). Within days of starting high dose corticosteroids, there was clearing of bilateral crackles and improvement on the plain chest film, although repeat CT scans continued to show tree-in-bud changes for several months. Spirometry showed predominantly severe obstructive lung disease that improved over six months on a tapering dose of oral corticosteroids.

DISCUSSION

This patient presented with a clinical history suggestive of an acute infection leading to respiratory failure. The radiographic findings were consistent with bronchiolitis, and the histopathology showed a BOOP-like reaction. The tree-in-bud pattern is a CT scan manifestation of severe bronchiolar disease with impaction and dilation of these airways (1). The CT scan typically shows 2 mm to 4 mm nodules and linear branching centrilobular opacities, analogous on a much smaller scale to the finger-in-glove appearance of mucoid impaction of the large airways. Bronchiolitis can be classified by etiology or by histopathology. The clinical presentation may occur after viral, bacterial, *M pneumoniae* or mycobacterial infection; from inhalational injury due to toxic fumes, gases, organic or irritant

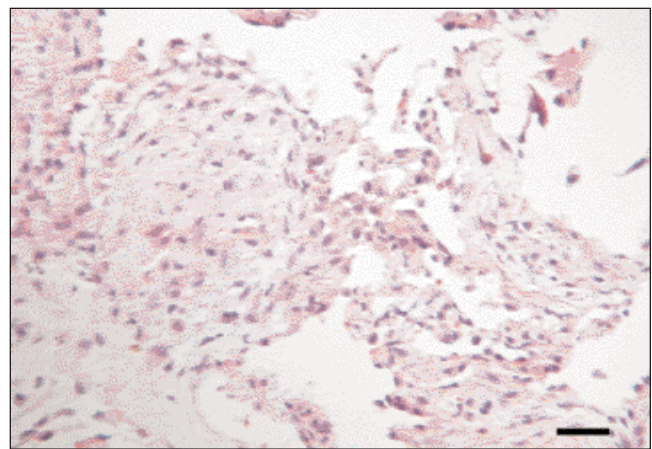


Figure 3) Photomicrograph of a transbronchial biopsy specimen, showing thickening of lung parenchyma (centre left) by pale, specialized granulation tissue typical of organizing pneumonia. (Hematoxylin and eosin stain, bar=50 μm)

TABLE 1
Serial measures of spirometry before and during steroid therapy

	Day 0	Day 3	Day 5	Day 89	Day 118
FEV ₁ (L)	1.38 (35)	1.96 (50)	2.27 (58)	3.14 (81)	3.15 (81)
FVC (L)	2.55 (53)	3.03 (62)	3.78 (78)	4.34 (90)	4.25 (88)
Ratio	0.54	0.65	0.60	0.72	0.74
FEF ₂₅₋₇₅ (L/sec)	0.64 (16)	1.21 (31)	1.18 (30)	2.14 (55)	2.39 (62)

Values in parentheses indicate per cent predicted. FEV₁ Forced expiratory volume in 1 s; FEF₂₅₋₇₅ Forced expiratory flow rate between 25% to 75% of forced vital capacity (FVC)

dusts; or secondary to drug reactions and idiopathic causes (2). The idiopathic presentation is usually more insidious, whereas the other etiologies are often acute and associated with a recognized exposure. The histopathology includes a proliferative or constrictive bronchiolitis. Proliferative bronchiolitis is the BOOP-like pattern; it is corticosteroid responsive and usually reversible (2). This patient presented with less common manifestations of proliferative bronchiolitis: a micronodular pattern on chest radiograph and predominantly obstructive, rather than restrictive, lung function tests. He had an excellent response to six months of corticosteroid therapy.

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