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CASE REPORT

Successful treatment with chemotherapy and corticosteroids of pulmonary *Mycobacterium abscessus* infection accompanied by pleural effusion

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Abstract We describe a 50-year-old woman with rapidly progressive pulmonary *Mycobacterium abscessus* (*M. abscessus*) infection accompanied by pleural effusion and organizing pneumonia (OP). CT scan showed consolidation, centrilobular shadows, ground-glass opacity (GGO), and cavities. A transbronchial lung biopsy showed nonnecrotizing granuloma surrounded by infiltrative lymphocyte-dominant inflammatory cells, and lymphocytes in bronchoalveolar lavage fluid (BALF) were increased. We considered OP occurred secondary to *M. abscessus* infection because clarithromycin, amikacin, and imipenem/cilastatin administration resulted in partial improvement. We added corticosteroids to the regimen, which resulted in a remarkable improvement. We report a case of pulmonary *M. abscessus* infection involving pleural effusion that responded favorably to medical therapy including corticosteroids.

Keywords *Mycobacterium abscessus* · Pleural effusion · Hypersensitivity reaction · Antibiotics · Corticosteroids

Introduction

Mycobacterium abscessus (*M. abscessus*) accounts for about 80 % of rapidly growing mycobacterial respiratory disease isolates [1]. The radiographic appearance is similar to that of the nodular bronchiectatic form of *Mycobacterium avium* complex (MAC), and little is known about infection accompanied by pleural effusion. We describe a 50-year-old woman with rapidly progressive pulmonary *M. abscessus* infection accompanied by pleural effusion treated with chemotherapy and corticosteroids.

Case report

A woman with a history of 30 pack-years of smoking had been treated by a total gastrectomy for gastric cancer at the age of 34. Chest radiography at a routine annual medical checkup 16 years later (September 2009) revealed reticulonodular shadows at the previous hospital. A first bronchoscopy was done. Acid-fast bacilli (AFB) was negative in bronchoalveolar fluid (BALF). Aspiration-related bronchiolitis was suspected because heartburn and vomiting after meals had persisted since the gastrectomy, so a low dose of clarithromycin (CAM, 200 mg/day) was administered, but the radiographic findings worsened. The second bronchoscopy did not identify significant conditions such as *Mycobacterium* infection, cancer, granuloma, or organizing pneumonia (OP), but the ratio of lymphocytes among nuclear cells in the BALF was increased to 62.3 %. She was diagnosed as having OP clinically, so oral prednisolone (PSL, 30 mg/day) was administered, and the radiologic findings gradually improved. However, after 4 months of PSL (tapered to 15 mg daily), the reticulonodular shadows on chest X-ray (CXR) had become exacerbated with widespread consolidations. A third bronchoscopy was done. AFB was negative in BALF, but 1 week later, sputum culture revealed *M. abscessus* for the first time, so PSL was withdrawn and a combination therapy using

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antituberculous drugs, macrolides, carbapenem, and amikacin was started. However, the consolidations worsened despite 2 weeks of this combination therapy, so she was referred to our hospital for more detailed examination in December 2010.

Exertional dyspnea (Hugh-Jones II) was the only obvious symptom upon admission. Body temperature was 36.6 °C, and SpO_2 was 94 % (room air). Chest auscultation revealed inspiratory coarse crackles in the left lung fields. Laboratory findings showed leukocytosis, with a leukocyte count of 16,640/μl and a Hb concentration of 10.8 g/dl. The C-reactive protein (CRP) concentration was 8.6 mg/dl and the erythrocyte sedimentation rate (ESR) was 63 mm/h. Liver and renal function tests were normal, and β-D glucan and antineutrophil cytoplasmic antibodies were within normal limits. A chest radiogram on admission showed consolidations and reticulonodular shadows in both lung fields and a new left pleural effusion. Chest computed tomography (CT) revealed diffuse nodular opacities, left-side dominant bilateral consolidations that were OP like in appearance, and left pleural effusion (Fig. 1). Human immunodeficiency virus type 1 and type 2 were negative. Smear of sputum for AFB was negative three successive times, but 2 weeks later, one of the three cultures was positive for *M. abscessus*, which was also identified in cultures of digestive juice. Findings were negative for other bacteria and fungi. The pleural effusion was exudative and lymphocyte dominant (81.7 %) with an elevated adenosine deaminase (ADA) value (79.7 U/l). Cultures for bacteria and AFB and cytology of the pleural effusion were all negative, and no monoclonality of lymphocyte surface markers was evident. A fourth bronchoscopy was done. A transbronchial lung biopsy (TBLB) specimen showed nonnecrotizing granuloma with polynesic lesions of polynuclear giant cells surrounded by inflammatory cells that were almost all lymphocytes, but smears and cultures of both the TBLB specimen and BALF were negative for AFB (Fig. 2). We diagnosed pulmonary infection with *M. abscessus* in accordance with the 2007 ATS/IDSA guidelines because sputum cultures were positive two times in total (first, at the previous hospital; second, at our hospital).

The patient was treated with CAM (800 mg/day orally), amikacin (AMK, 400 mg/day intravenously), and imipenem/cilastatin (IPM/CS, 500 mg intravenously four times daily). Two months after this regimen started, sputum cultures for AFB became negative and the CXR and CT findings including the pleural effusion had partially improved (Fig. 3a), but the CRP level remained high at 5–6 mg/dl. We suspected OP secondary to *M. abscessus* infection. This suspicion was not histologically confirmed by TBLB, but PSL treatment had induced temporary

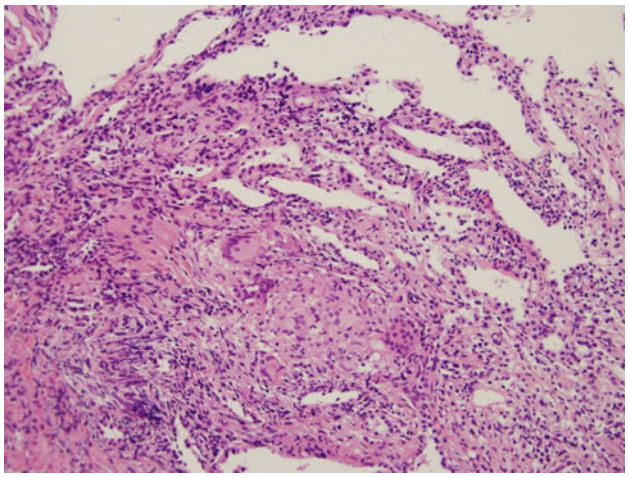

Fig. 2 Transbronchial lung biopsy (TBLB) specimens showed nonnecrotizing granuloma with polynesic lesion of polynuclear giant cells surrounded by lymphocyte-dominant inflammatory cells. Hematoxylin and eosin. ×200

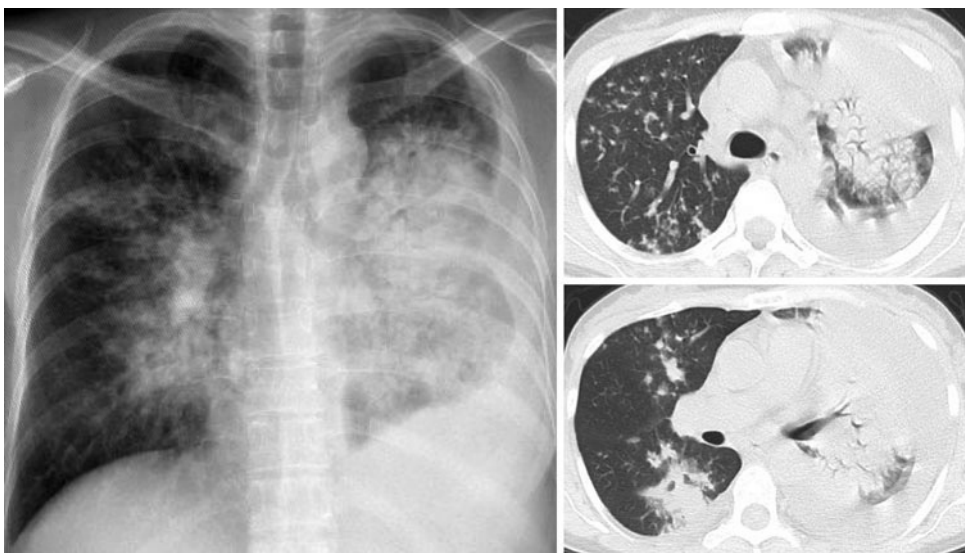

Fig. 1 Chest X-ray and computed tomography (CT) on admission showed diffuse reticulonodular opacities, left-side dominant bilateral consolidations, which were organizing pneumonia (OP) like in pattern, and left pleural effusion