

## Pulmonary Localization of *Enterocytozoon bienewisi* in an AIDS Patient: Case Report and Review

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***Enterocytozoon bienewisi* is an agent of intestinal microsporidiosis leading to malabsorption syndrome and diarrhea in AIDS patients. Respiratory tract microsporidiosis due to *Encephalitozoon* spp. has been reported. To date, however, only two cases of pulmonary involvement of *E. bienewisi* have been documented for patients with intestinal microsporidiosis. We report here another pulmonary localization of *E. bienewisi* in a human immunodeficiency virus-infected patient. Clinical features of these three cases are reviewed. *E. bienewisi* can colonize the respiratory tract but could be considered a simple carriage associated with an intestinal infection.**

### CASE REPORT

In December 1998, intestinal microsporidiosis (*Enterocytozoon bienewisi*) was diagnosed in a 37-year-old French human immunodeficiency virus-positive male for the first time. Spores were repeatedly (three times) found in the fecal smears performed by the modified trichrome staining method. The patient received loperamide (8 mg/day) and albendazole (400 mg twice a day). This treatment led to clinical improvement, including reduction of diarrhea (one to two bowel movements per day). However, microsporidian spores continued to be shed in feces. Five months later, the patient was hospitalized for a 2-month history of progressive fever, diarrhea with 10 bowel movements per day, body weight loss (5 kg in 6 months), nightly chills, general malaise, and chronic sinusitis. On admission, physical examination showed fever, oropharyngeal candidiasis, malnutrition, and hepatomegaly. No respiratory symptoms were noted. The leukocyte count was  $2.06 \times 10^9$ /liter with  $0 \times 10^9$  CD4 cells per liter. Antiretroviral therapy with lamivudine and zidovudine was replaced by therapy with didanosine, zalcitabine, and abacavir because of virologic and immunologic failure. At the same time, the viral load was 5.2 log<sub>10</sub>. A chest roentgenogram was normal, and a computed tomography scan showed a retroesophageal adenopathy. Fibroscopy with bronchoalveolar lavage (BAL) fluid was then performed because of persistent fever of undetermined cause. The blood gases were normal. The BAL sediment showed a low number of microsporidian spores, with 0 to 10 spores per field (magnification,  $\times 1,000$ ). Some of these spores were intracellular and measured 0.9 to 1.2  $\mu\text{m}$  in length. Microsporidian spores were also identified in stool samples but not in a urine sediment. The identification of *E. bienewisi* was confirmed by PCR (6), and the patient was included in a double-blind randomized study of fumagillin (Agence Nationale de Recherche sur la SIDA 090 study) (7). At the same time, *Mycobacterium avium* complex

(MAC) bacteria were isolated from three blood cultures. Therapy with clarithromycin (1 g/day), ethambutol (800 mg/day), and rifabutin (450 mg/day) was initiated and led to clinical improvement and sterile blood cultures. One year later, microsporidian spores continued to be shed irregularly in feces. The frequency of diarrhea was reduced, and the patient gained weight. The CD4 count was  $20 \times 10^9$ /liter.

The microsporidian protozoon *E. bienewisi* was first described in 1985 for the small bowel of a Haitian patient with AIDS (3). Since this first report, *E. bienewisi* has been recognized as one of the agents of chronic diarrhea in AIDS patients (3). Extraintestinal localization is uncommon. However, *E. bienewisi* can also spread to the biliary ducts and nasopharyngeal epithelium, thereby causing some cases of cholangitis and rhinosinusitis (4, 8). Respiratory tract microsporidiosis has rarely been reported and is mainly due to *Encephalitozoon* sp. (9). To date, two cases of pulmonary involvement of *E. bienewisi* have been documented for patients with intestinal microsporidiosis (2, 10).

**Discussion.** The most prevalent microsporidium-associated disease continues to be chronic diarrhea with wasting syndrome, commonly caused by *E. bienewisi* (3). Pulmonary microsporidiosis is rare and mainly due to *Encephalitozoon* species (9). To our knowledge, only two cases of pulmonary involvement with *E. bienewisi* have been reported for patients with chronic diarrhea, persistent cough, nonpurulent sputum, dyspnea, and wheezing (2, 10). It remains unclear whether the presence of *E. bienewisi* spores in the respiratory tract could be associated with respiratory or other symptoms. To date, the pathogenesis of *E. bienewisi* in the lung is not completely understood (5). Since our patient did not present any respiratory symptoms, the detection of *E. bienewisi* in the BAL fluid in this case more likely represents a simple colonization of the lung. The MAC bacteria recovered from the blood cultures and the intestinal microsporidiosis likely explain the other clinical symptoms such as fever, weight loss, and diarrhea. Interestingly, in the other two reported cases, *E. bienewisi* was also found in association with MAC bacteria. However, in

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those two previous cases, MAC bacteria were isolated from the BAL samples from patients with respiratory symptoms and interstitial infiltrates shown by chest roentgenogram (2, 10). These symptoms could be explained by MAC and not by *E. bienewisi*.

It remains unclear whether pulmonary *E. bienewisi* is acquired by inhalation, regurgitation, direct orofecal contamination, or hematogenous dissemination from the intestine. For other human microsporidian species for which animal models exist, the oral and the inhalation routes have been demonstrated elsewhere (1). In addition, in our patient chronic sinusitis could have represented the origin of the pulmonary dissemination since sinonasal infections due to *E. bienewisi* have also been documented previously (3). However, neither microbiological nor histological investigations for sinonasal infection were performed in our case.

Our case suggests, as do the other cases in the literature, that the detection of *E. bienewisi* in the respiratory tract could be considered a simple carriage associated with an intestinal infection. However, further clinical observations and investigations are needed to clarify whether microsporidian species may display pathogenic properties in the lung or whether they are always commensal organisms.

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