An Elderly Man with Immunosuppression, Shortness of Breath, and Eosinophilia

(See page 1464 for Photo Quiz)

Figure 1. CT scan of the lungs showing an infiltrate in the right peripheral lung (arrow).

Figure 2. Culture of sputum on blood agar demonstrating serpiginous tracks (arrow).

Diagnosis: *Strongyloides stercoralis* hyperinfection syndrome.

The striking eosinophilia concomitant with steroid therapy and immunosuppression was the clue to the diagnosis [1]. The finding of lung infiltrates and nodules on CT scanning (figure 1) is common in individuals with pulmonary strongyloidiasis [2]. Culture of sputum on blood agar demonstrated larval tracking across the agar plate, a finding shown to be sensitive for strongyloidiasis (figure 2) [3]. Gram staining of sputum revealed innumerable rhabditiform larvae characteristic of *Strongyloides* species (figure 3), which were also noted on a stool examination (figure 4). Sputum studies were negative for other bacteria, fungi, and mycobacteria, and results of all fungal serological tests were negative. A thorough evaluation of the patient’s previous laboratory test results revealed that eosinophilia was not present at the time of his initial diagnosis with chronic lymphocytic leukemia, but appeared after the patient received corticosteroid therapy in 1998.

*S. stercoralis* infection can lead to a spectrum of pulmonary syndromes, ranging from chronic cough and bronchospasm to severe pulmonary disease and acute respiratory distress syndrome [2]. Patients at risk for hyperinfection syndrome include those aged ≥65 years and those with preexisting chronic lung disease, altered cellular immunity, or chronic debilitating illness [2]. Autoinfection occurs when the rhabditiform larvae transform into filariform larvae in the gastrointestinal tract, which then penetrate the perirectal skin or the wall of the intestine and gain access to the bloodstream. Dissemination to the lungs, liver, CNS, and other organs leads to severe inflammation and organ dysfunction [4]. The highest incidences of infection in the United States have been reported from southeastern states [5].

Definitive diagnosis depends on the demonstration of *S. stercoralis* larvae in stool, duodenal fluid, or tissue specimens. As we found with our patient, Gram staining of sputum and/or bronchoalveolar lavage fluid samples may be useful for patients
with hyperinfection syndrome [6, 7]. Serologic tests, although valuable for patients with negative stool study findings, may not be reliable for immunocompromised hosts [8, 9]. Notably, our patient had negative results of Strongyloides serologic tests even in the presence of a heavy burden of parasites.

The prognosis for patients with hyperinfection syndrome is poor, with mortality rates exceeding 70% in some reports [4]. This poor prognosis may, in part, be the result of delayed diagnosis and the presence of comorbidities, such as chronic immunosuppression [4]. Ivermectin is now the drug of choice for treatment of strongyloidiasis [10], although anecdotal reports note the need for repeated courses of treatment for patients with hyperinfection syndrome.

Our patient was treated with multiple single doses of ivermectin but continued to demonstrate significant eosinophilia despite rapid improvement in his pulmonary symptoms and clearance of stool parasites. His steroid therapy was tapered, and he ultimately received a 5-day regimen of daily ivermectin at a dosage of 200 µg/kg, and eosinophilia completely resolved.

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References