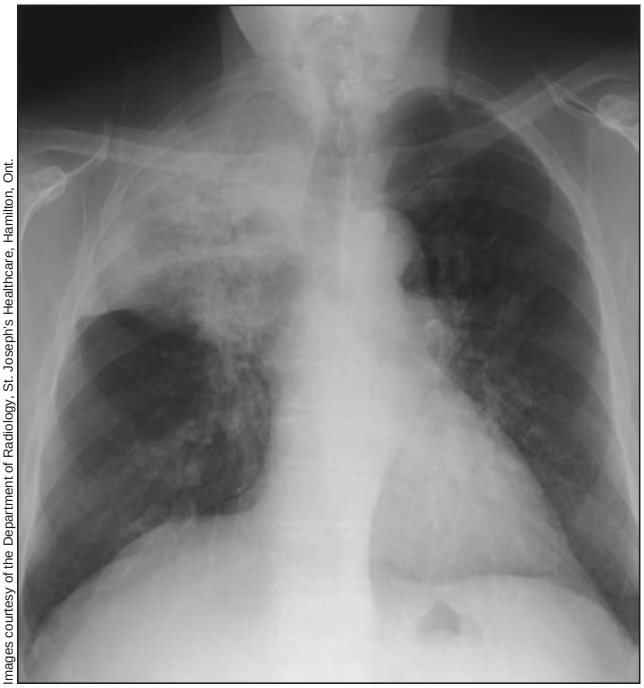
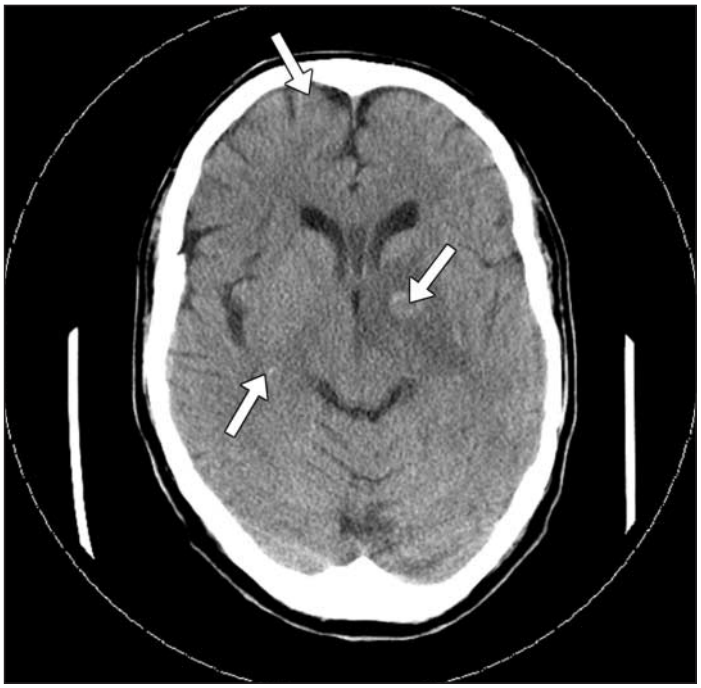
An elderly man with nonresolving cough, leukocytosis and a pulmonary mass





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A 73-year-old previously healthy man presented to a community hospital with a 2-month history of cough, fever, malaise, night sweats and weight loss. He had a smoking history of 20 pack-years and had quit 15 years before his current illness. He had no history of chest pain, hemoptysis, wheezing or exposure to tuberculosis. The diagnosis of possible community-acquired pneumonia was supported by an elevated leukocyte count (19.4×10^9/L) and a chest radiograph finding of an air-space opacity in the right upper lobe of the lungs. He was prescribed 10 days of oral clarithromycin and intravenous cefuroxime therapy, followed by 5 days of intravenous cefotaxime therapy; however, his condition failed to improve clinically or radiologically.

A fibreoptic bronchoscopy showed a polypoid mass obstructing the posterior segment of the right upper lobe, but multiple transbronchial biopsies and washings did not show any evidence of malignant disease. Results of a CT-scan-guided lung biopsy were also negative for cancer, and numerous microbiological stains and cultures were negative for bacteria and mycobacteria. A bone scan and an ultrasound scan of the abdomen appeared normal. The patient continued to experience cough, fever and anorexia and was transferred to a tertiary care hospital for an open lung biopsy.

On arrival, a chest radiograph (Fig. 1) confirmed the air-space opacities in the right upper lobe, and blood work revealed leukocytosis (19.5×10^9/L) and mild anemia (hemoglobin level 104 g/L). The Gram's staining of the sputum showed many leukocytes and few mixed organisms. Multiple blood cultures did not yield any organisms. The patient was treated empirically with simultaneous metronidazole and ceftazidime for 10 days but continued to experience fever and cough. A second bronchoscopy also showed a polypoid mass occluding the posterior segment of the right upper lobe and a small mass implanted in the right main bronchus consistent with advanced regional lung cancer. Multiple transbronchial biopsies and washings showed acute inflammatory exudates extending to the bronchial cartilage, but no malignant disease was detected.

The patient's course was complicated by acute right-sided weakness. A CT scan of the brain with contrast medium showed enhancing lesions in both cerebral hemispheres and a small lesion in the right frontal lobe (Fig. 2). Metastatic lung cancer was suspected, and the open lung biopsy was cancelled.

After 7 days, cultures of the patient's sputum showed pleomorphic, branching gram-positive bacilli resembling *Nocardia* species. The organism was subsequently identified as *Nocardia asteroides*. Tests for HIV types 1 and 2 antibodies were negative.

Intravenous therapy with trimethoprim–sulfamethoxazole (TMP–SMZ) was administered for 6 weeks; the fever and cough abated, and the patient even-

tually had a complete neurological recovery. He was discharged home with oral TMP–SMZ therapy. Six months after discharge, the antibiotic therapy was stopped because the patient was well, and his chest radiographs, blood counts and a CT head scan all showed normal findings.

Nocardia species are aerobic, nonmotile, non-spore-forming, filamentous gram-positive bacteria. They are ubiquitous, natural inhabitants of the soil.[1] Most cases of human nocardiosis (80%) are caused by *N. asteroides*.[2] Nocardiosis usually occurs in immunocompromised hosts, including HIV-positive patients, patients receiving immunosuppressive therapy (e.g., transplant recipients) and people taking long-term high-dose corticosteroid therapy. Patients with underlying malignant disease or chronic lung disease are also at risk of nocardiosis.[3–7] *Nocardia* infections have rarely been reported in immunocompetent patients.[3,4]

The infection usually starts when contaminated soil is inhaled.[1] Without treatment, this pulmonary nocardiosis can lead to disseminated disease, particularly in patients with compromised cell-mediated immunity.[8] Spread to the brain and subcutaneous tissues can also occur.[9] Chest radiographs characteristically show single or multiple nodules, a lung mass with or without cavitation, consolidation, subpleural plaques and pleural effusion.[3] Pulmonary nocardiosis is often misdiagnosed as tuberculosis, invasive fungal infection or cancer.

Delay in diagnosis is common.[2] Definitive diagnosis requires the isolation and identification of the organism from a clinical specimen. It is standard practice for clinical microbiology laboratories to discard routine cultures of respiratory specimens after 5 days of incubation. *Nocardia* species are slow-growing organisms, and the colonies may be visible only after 6–8 days of incubation.

Our immunocompetent, previously healthy patient had pulmonary nocardiosis, which presented as a nonresolving pneumonia complicated by cerebral abscess. Clinical, radiological and bronchoscopic findings suggested metastatic lung cancer, thereby delaying appropriate therapy. This case highlights the importance of not accepting a diagnosis of cancer without specific tissue evidence and of considering infectious processes as a cause of nonresolving pulmonary opacities. If nocardiosis is suspected, it is critical to communicate this possibility directly to the microbiology laboratory so that cultures may be kept beyond the usual 5 days.[10]

This article has been peer reviewed.

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