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Case report

Disseminated *Nocardia farcinica* in an immunocompetent patient

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ABSTRACT

Nocardia farcinica is a gram-positive, partially acid-fast, methenamine silver-positive aerobic actinomycete that is infrequently associated with nocardiosis. The relative frequency of *Nocardia farcinica* isolates in nocardiosis is unknown but thought to be under diagnosis. It is increasingly been recognized in immunocompetent patients.

We report a case of disseminated *Nocardia farcinica* causing brain abscess in 55 year old immunocompetent man who was successfully treated with long term antibiotics.

The present report illustrates that early detection and treatment of disseminated *Nocardia farcinica* can lead to a good outcome.

Introduction

Disseminated Nocardiosis is an opportunistic infection that is usually seen in immunocompromised hosts. *Nocardia farcinica* is a rare cause of nocardiosis but is increasingly been recognized as a potentially lethal infection in immunocompetent patients (1–3). This report describes a patient with disseminated infection due to *Nocardia farcinica*.

Case presentation

A 55-year-old man presented to the emergency room with a three week history of throbbing and persistent right occipital headaches radiating to his frontal region. The headaches were not associated with any aura, photophobia, nausea or vomiting. The patient also had recurrent complaints of fevers and nocturnal diaphoresis. After presenting to a walk-in clinic and diagnosed with a presumptive viral infection. No antibiotic medication was prescribed.

His past medical history included smoking and gastro-esophageal reflux disease. There was no history of any prior headaches, tuberculosis or exposure, positive tubercullin skin tests, syphilis, gonorrhea, chlamydia, human immunodeficiency virus (HIV), malignancies, hepatitis, recent surgeries, workplace exposure or recent travel.

His physical examination showed a healthy appearing man, hemodynamically stable with a high grade fever of 39.5 °C. His neurological exam, cardiac exam, respiratory exam and abdominal exam were all normal.

Investigations revealed white blood cell count of 13.1×10^9/L (with 87% polymorphonuclear cells, 4% monocytes, and 9% lymphocytes), hemoglobin 136 g/L, platelet count 367×10^9/L and a normal serum chemistry panel including transaminases. His absolute CD4 count was 449×10 (6)/L and his HIV serology was non-reactive. Chest radiograph however revealed wedge-shaped nodular opacity measuring 3.1×3.25 cm in the left upper lobe adjacent to the pleura (Fig. 1). A lumbar puncture showed 3065×10^6/L of white blood cells (normal $0–5 \times 10^6$/L), 1.1 mmol/L of glucose (normal 2.2–3.9 mmol/L) and 1.90 g/L of total protein (normal 0.12–0.6 mmol/L). Preliminary CSF cultures did not grow any organism. The patient was then started on ceftriaxone, vancomycin and ampicillin.

A computed tomography (CT) of the chest and abdomen with intravenous contrast revealed a large spiculated $2.8 \times 4.5 \times 3.7$ cm subpleural mass in the lateral aspect of the left upper lung lobe and a smaller spiculated and eccentrically cavitary 1.4 cm nodule in the posterior and subpleural aspect of the left lower lobe (Fig. 2). There was no hilar or mediastinal lymphadenopathy. Initial computed tomography of the head was normal but a follow up Multisequence Multiplanar Unenhanced Magnetic Resonance Image (MRI) of the head with gadolinium showed a T2 hypointense lesion involving the left head of the caudate nucleus with perifocal edema suspicious for a fungal abscess (Fig. 3).

The patient's headaches and fever continued to persist so a computed tomographic guided biopsy of the large spiculated

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Fig. 1. Chest radiograph showing a wedge-shaped nodular opacity measuring 3.1 × 3.25 cm in the left upper lobe adjacent to the pleura.

subpleural mass of the left upper lobe was performed as well as repeat lumbar puncture. Both the lung tissue biopsy and the repeated CSF fluid cultures grew beaded branching gram positive bacill. Molecular studies using the Multi-Locus sequence analysis (MLSA) identified the species as *Nocarida farcinica.* Further susceptibility testing showed the organism was susceptible to amoxicillin/clavulanic acid, imipenem, linezolid, moxifloxacin and trimethoprim/sulfamethoxazole (TMP-SMX) but resistant to ceftriaxone (Fig. 4).

Ceftriaxone, vancomycin and ampicillin were discontinued and the patient was treated initially with imipenem for six weeks followed by TMP-SMX for one year.

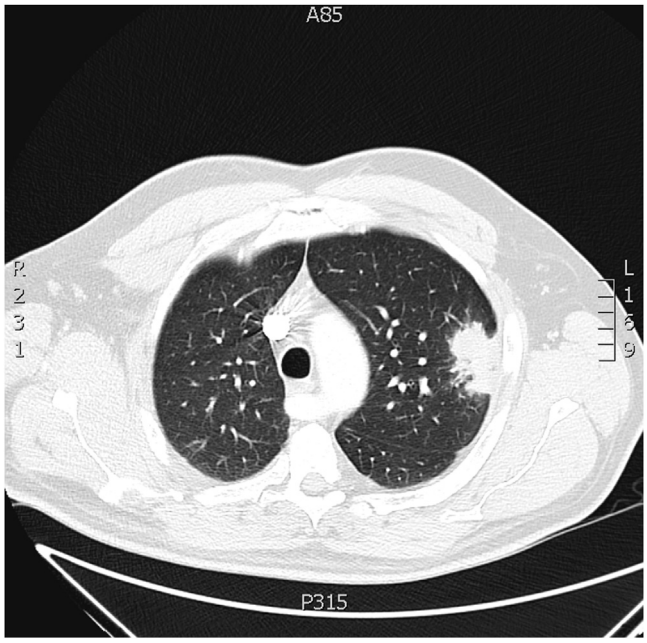

Fig. 2. Chest CT scan showing subpleural mass in the lateral aspect of the left upper lung lobe and a smaller spiculated and eccentrically cavitary 1.4 cm nodule in the posterior and subpleural aspect of the left lower lobe.

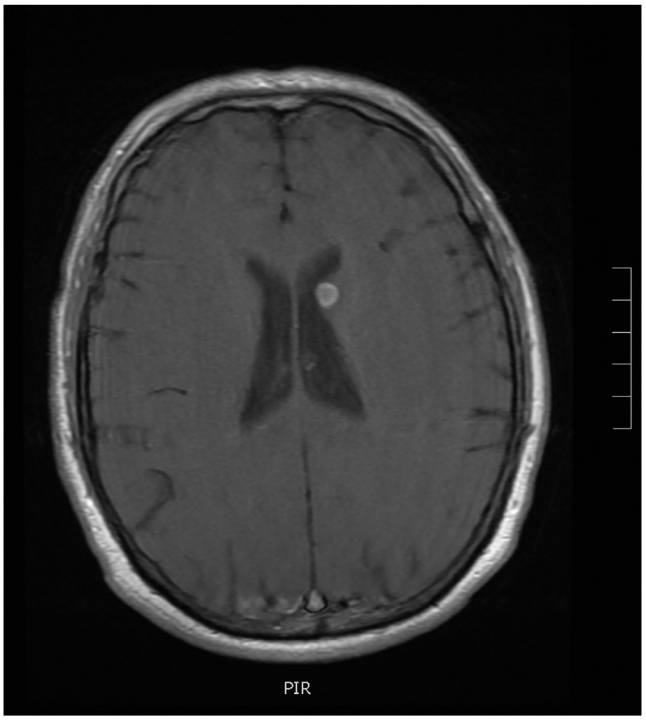

Fig. 3. MRI of the head with gadolinium shows a T2 hypointense lesion involving the left head of the caudate nucleus with perifocal edema suspicious for a fungal abscess.

Discussion

We present a rare case of disseminated *Nocardia farcinica* originating from the lungs and causing a brain abscess in an immunocompetent patient.

Nocardiosis is an opportunistic infection causing localized or disseminated disease and caused by the soil-dwelling, weakly gram-positive aerobic actinomycete Nocardia. It predominately presents as an acute, subacute or chronic pulmonary disease in immunocompromised hosts that can disseminate to any organ, forming abscesses [1]. *Nocardia asteroides* and *Nocardia brasiliensis* are the two species most frequently involved in human disease [2].

Nocardia farcinica is a gram-positive, partially acid-fast, methenamine silver-positive aerobic actinomycete infrequently

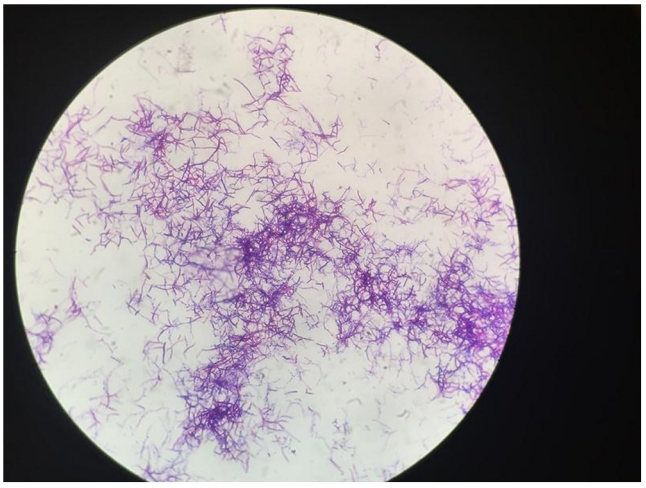

Fig. 4. CSF culture showing beaded branching gram positive bacilli.