

Disseminated nocardiosis complicated by multiple brain abscesses and pleural empyema in a young diabetic man: a case report

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Key words

Nocardiosis • Brain abscesses • Pleural empyema • Disseminated nocardiosis

Summary

Nocardiosis is a life-threatening infection usually affecting immunocompromised patients. Very rarely it presented with intracranial abscesses and pleuro-parenchymal infections. We herein report a very challenging case of a 34-year-old obese and diabetic man

affected by disseminated nocardiosis with multiple brain abscesses and pleural empyema. Despite rare, this entity should be taken into account by the pathologists and urgently communicated to clinicians in order to promptly start an effective treatment.

Introduction

Nocardia is a gram-positive, partially acid-fast, methenamine silver-positive aerobic actinomycete, which are generally found in soil, water and air¹. It usually colonizes the respiratory tract and gastrointestinal tract causing corresponding symptoms, such as coughing, expectoration, hemoptysis and skin abscesses, which are considered as nocardiosis.

Nocardiosis is a vital, but often ignored, infectious disease in immunocompromised hosts, which is particularly serious in the absence of timely diagnosis and therapy. This infection very rarely occurs in immunocompetent patients, often affected by chronic pulmonary disease. This report describes a young patient presented with multiple brain abscesses and pleural empyema caused by multi-drug resistant *Nocardia* infection.

Case report

A 34-year-old, obese and diabetic man presented with acute onset of left hemiplegia, fever, cough and headache. Encephalic computed-tomography (CT) scan revealed multiple expansive, solid and necrotic lesions involving the frontal, temporal and parietal right lobes

(Fig. 1A). Thoracic CT-scan disclosed atelectasis of the left inferior lobe associated with left loculated pleural effusion suspected for empyema (Fig. 1B). Blood exams revealed leucocytosis (white-blood-cell: 12.52 mg/l/mmc, reference rate: 4.00-10.90 with 87.9% of neutrophilic granulocytes). In emergency setting, the patient underwent neurosurgical evacuation of brain abscesses; moreover, a chest tube was placed and large-broad antibiotic therapy (Linezolid and Meropenem) was started. Microbiological cultures of pleural effusion and brain abscesses revealed the presence of *Streptococcus intermedius*. Transesophageal echocardiography was negative for endocardial vegetations. On the basis of microbiological results, specific antibiotic therapy with Ceftriaxone and Metronidazole was administered. Three days later, a brain CT-scan revealed a severe worsening of the cerebral oedema, and, accordingly, an emergency decompressive craniotomy was performed.

In the meantime, the histological and cytological examination of pleural effusion and brain abscesses evidenced Grocott methenamine silver-positive filamentous bacteria with right-angle branching and "chinese-letter" features, suggesting *Nocardia* infection (Fig. 2A-B). On the basis of the pathological diagnosis, specific microbiological cultures were performed confirming the presence of *Nocardia*. The diagnosis of pleural and cerebral

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Fig. 1. Right temporo-parietal abscess (yellow arrow) of 3.8 cm at brain CT scan (A); Left empyema associated with atelectasis of the left lower lobe (red arrow) at chest CT-scan (B).

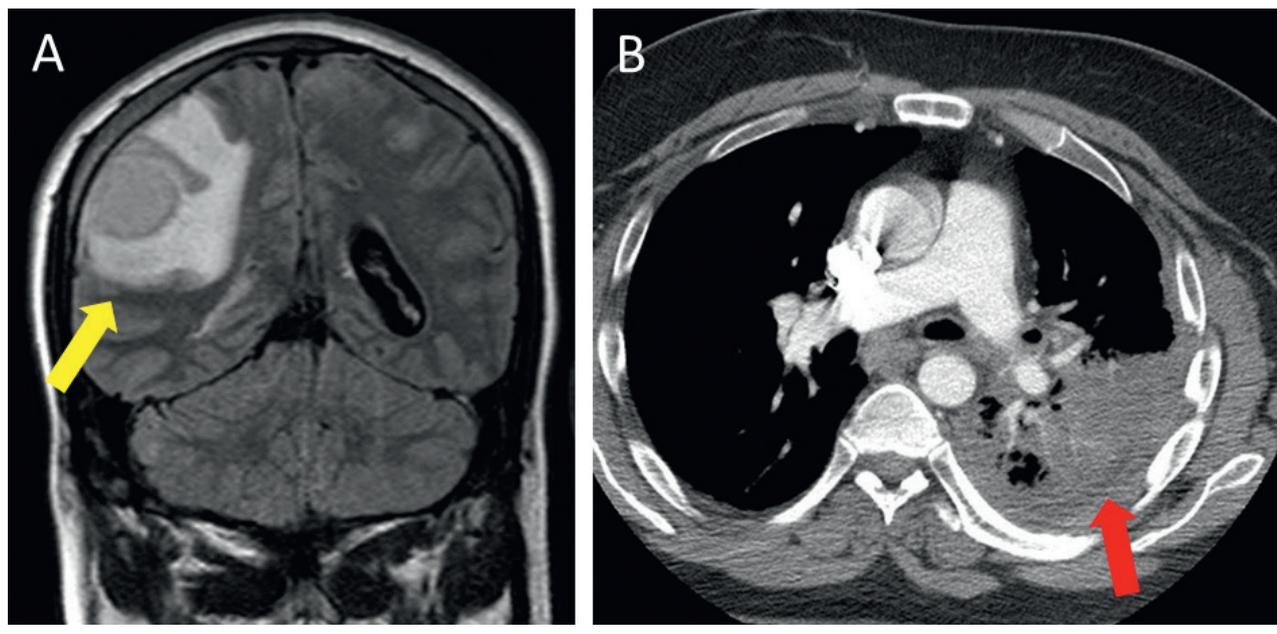
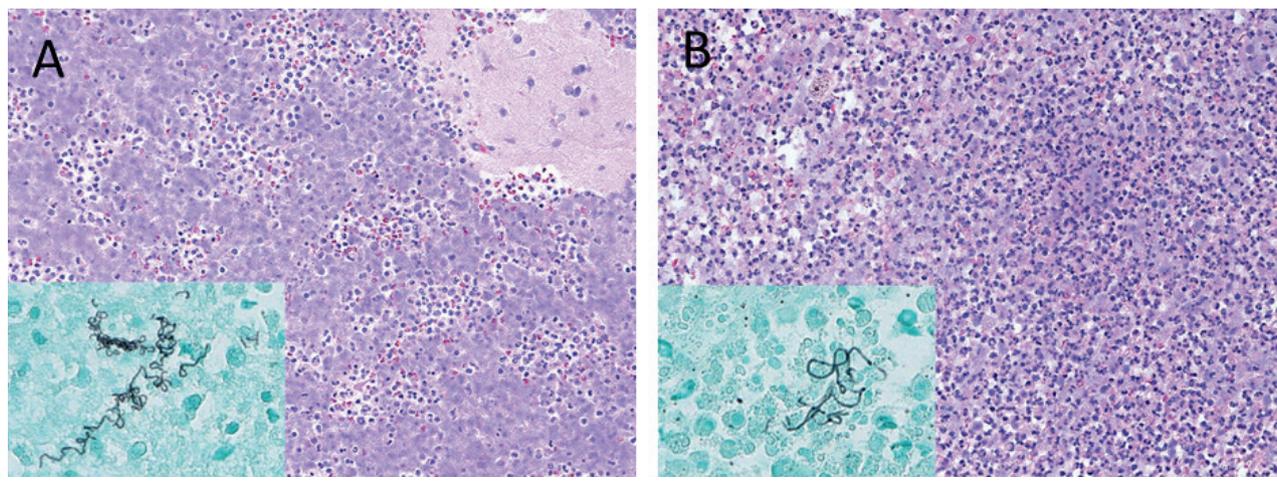


Fig. 2. Pathological examination (Hematoxylin & eosin) of material obtained from neurosurgical evacuation of brain abscesses (A) and of pleural effusion (B) revealed necrosis with numerous neutrophilic granulocytes, lymphocytes and filamentous bacteria consistent with *Nocardia* spp. disclosed with Grocott methenamine silver stain (inserts).



nocardiosis was then definitively made. Considering the age of the patient, the clinical severity and the frequent multi-drug resistance of *Nocardia*², endovenous therapy with Linezolid and Meropenem was continued for 6 weeks. The symptoms rapidly improved along with a radiological reduction of brain lesions and resolution of pleural effusion and pulmonary atelectasis.

Discussion

Nocardiosis is an opportunistic infection that mainly affects immunocompromised patients, such as patients with acquired immunodeficiency syndrome (AIDS), as

well as patients with long-term steroid use or transplant recipients, but can also involve immunocompetent patients; in particular, as reported in some clinical series³, diabetic patient represent a third of the “healthy” population affected by *Nocardia*.

It has previously been reported that *Nocardia* are capable of causing disseminated disease that can readily enter the bloodstream and spread throughout the body, including the skin, lung, central nervous system and abdominal organs¹; its mortality rate is extremely high (31%) especially when the cerebral parenchyma is involved^{1,2,4}. In the present case, due to the clinical onset of left hemiplegia, fever, cough and headache, we performed a CT scan of the

Brain that revealed multiple expansive, solid and necrotic lesions involving the frontal, temporal and parietal right lobes. The dissemination involved also the pleural cavity where a loculated pleural emphyema was observed. In this setting a timely diagnosis is pivotal to promptly start an effective treatment^{5,6}. Indeed, the definitive diagnosis of Nocardiosis could be challenging and a significant time lapse (up to 6 weeks) could be needed to establish a specific microbiological diagnosis⁶. *Nocardia* spp. infection can be observed and confirmed by subculture and positive microscopic detection of a branching gram positive rod and modified acid-fast stain (Fig. 2).

Since pathologist could be the first and only one in facing with *Nocardia* filaments, an urgent communication to clinicians is mandatory to promptly start effecting treatment in this life-threatening infection.

Contributors

MCM made the diagnosis, took the picture and drafted the report. CL assessed the patient and drafted the report.

GR made the diagnosis and drafted the report. FL analysed imaging and drafted the report. All authors read and approved the final report.

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