

Case Report

Brain abscess nocardiosis: case report

Abscesso cerebral por nocardiose: relato de caso

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ABSTRACT: Nocardiosis is an infection caused by *Nocardia* species, that are filamentous aerobic Gram-positive bacilli that belong to *Actinomycetaceae* family, it can cause a localized or a disseminated infection. Pulmonary disease is the most common presentation of nocardiosis in immunosuppressed patients and approximately one-third have a disseminated disease, that happens when lesions are found at two or more locations in the body. Nocardial brain abscesses are a rare central nervous system infection but has been highlighted as a differential diagnosis of brain tumors, due to the increase of the infection in deficient cell-mediated immunity patients. Even though nocardiosis represents only 2% of brain abscesses, it is an illness associated with significant mortality, present on 75% to 90% of cases. We present a case of central nervous system nocardiosis in a 59-year-old patient with a previous history of diabetes mellitus and alcoholic liver disease. The patient sought the emergency department with temporal occipital headache and mental confusion for 3 days. Imaging tests were performed that showed an oval lesion in the temporoparietooccipital region. Nocardiosis in the central nervous system was hypothesized and treatment was initiated. Despite medical support, the patient died. The lesion material was collected in which nocardiosis was diagnosed when analyzed histochemically.

Keywords: Brain abscess; Nocardiosis; Central nervous system infection; *Nocardia* species.

RESUMO: Nocardiose é uma infecção causada por espécies de *Nocardia*, que são bacilos gram-positivos aeróbicos que pertencem à família *Actinomycetaceae*, que podem causar uma infecção localizada ou disseminada. A doença pulmonar é a apresentação mais comum de nocardiose em pacientes imunossuprimidos e, aproximadamente, um terço tem uma doença disseminada, que acontece quando lesões são encontradas em dois ou mais locais do corpo. Os abscessos cerebrais causados por nocardiose são uma rara infecção do sistema nervoso central, mas tem sido destacado como um diagnóstico diferencial de tumores cerebrais, devido ao aumento de infecções em pacientes de imunidade mediada por células deficientes. Mesmo que a nocardiose em sistema nervoso central represente apenas 2% dos casos de abscesso cerebral é uma doença associada à mortalidade significativa, presente em 75% a 90% dos casos. Apresentamos um caso de nocardiose em sistema nervoso central em um paciente de 59 anos com história pregressa de diabetes mellitus e hepatopatia alcoólica. O paciente procurou o serviço de emergência com cefaléia temporooccipital e confusão mental há 3 dias. Foram realizados exames de imagem que mostraram uma lesão oval na região temporoparietooccipital. Foi realizada a hipótese de nocardiose em sistema nervoso central e iniciado tratamento. Apesar do suporte médico, o paciente evoluiu para óbito. Foi feita coleta do material da lesão no qual ao ser analisada histoquimicamente houve o diagnóstico de nocardiose.

Palavras-chave: Abscesso cerebral; Nocardiose; Infecção de sistema nervoso central; Espécie *Nocardia*.

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INTRODUCTION

Nocardiosis is an infection caused by *Nocardia* species, that are filamentous aerobic Gram-positive bacilli that belong to the family Actinomycetaceae, it can cause a localized or a disseminated infection¹. They are a part of the soil microflora and are commonly introduced through inhalation of aero particles from soil or other environmental sources and then spreads hematogenously. Pulmonary disease is the most common presentation of nocardiosis in immunosuppressed patients and approximately one-third have a disseminated disease, that happens when lesions are found at two or more locations in the body⁴. Nocardial brain abscesses are a rare central nervous system infection but has been highlighted as a differential diagnosis of brain tumors, due to the increase of the infection in deficient cell-mediated immunity patients. Even though nocardiosis represents only 2% of brain abscesses², it is an illness associated with significant mortality, present on 75% to 90% of cases³. It's a challenging diagnosis for both pathologist and clinicians, because once the abscesses are unspecific, hardly tomography or magnetic resonance imaging make possible

to make a certain hypothesis, slowing up the treatment. Here we describe a brain abscess caused by nocardia with few symptoms associated.

OBJECTIVES

To describe an uncommon cause of brain abscess in which was caused by nocardiosis.

CASE REPORT

A 59-year-old male patient with a history of diabetes mellitus and liver disease of probable alcoholic etiology with portal hypertension. Enter in the emergency room with frontal-occipital cephalalgia, fever and memory loss for 3 days. On physical examination, he presents difficulty in neck flexion. Patients is hospitalized and imaging tests are performed that show an oval lesion in the right temporoparietooccipital region. The lesion has a mixed content (hyperdense in contact with the convexity and hypodense more internally) and a vasogenic edema (Figure 1).

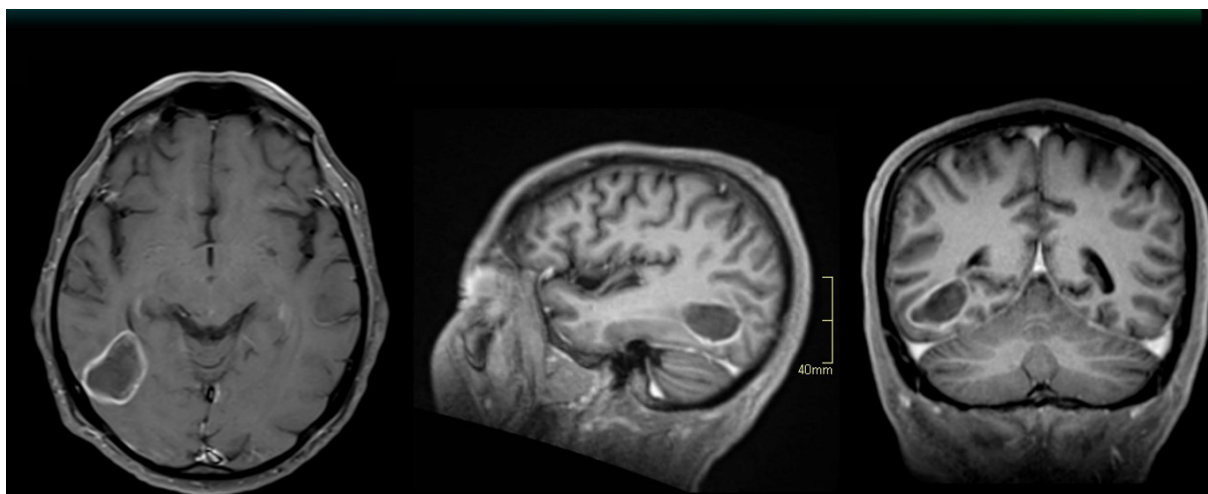


Figure 1: T1-weighted magnetic resonance image demonstrating a ring-enhancing lesion in the right temporal-parietal-occipital region, with perilesional vasogenic edema. The lesion was characterized by a core of restricted diffusion (not shown) with no signs of infiltration. A) Axial plane; B) Sagittal plane; C) Coronal plane

The liquor presents high cellularity, high proteinorrachia and high leucorrachia, with predominance of neutrophils. During hospitalization, he presented thrombocytopenia, requiring transfusion, ascites and lower limbs edema, which made impossible to surgical approach for a pathological diagnosis of the lesion. In a specialties meeting, it has been decided by empirical treatment with nocardiosis diagnosis in the central nervous system as its main hypothesis. Specific treatment with sulfamethoxazole-trimetoprim is initiated and the patient progresses with encephalitis. The medication is suspended and after 48 hours is started second-line treatment with meropenem.

The patient maintains progressive worsening, requiring orotracheal intubation, use of vasoactive drugs and ICU bed. Despite the clinical support offered, the patient progressed with cardiorespiratory arrest and died. The body was sent to the death verification service, where it was possible to collect material from the lesion and histological confirmation of nocardiosis in the central nervous system.

DISCUSSION

It's a challenging diagnosis for both pathologist and clinicians, because once the abscesses are unspecific, is

hard in CT-scan or nuclear magnetic resonance to make the nocardiosis the main hypothesis, slowing up the treatment⁴. Considering it's rarity, is important to acknowledge the disease, especially in deficient cell-mediated immunity patients, to provide early treatment, and consequently improve the clinical evolution of the patient. Even though the patient didn't had T-cell mediated suppression, he had

diabetes mellitus and cirrhosis that can cause an immune suppression and could contribute with the worsening of the case. The patient had the hypothesis of nocardia based on his imaging scans, that's demonstrate the importance of having nocardiosis as an differential diagnosis hypothesis in case of patients that's have any kind of immune suppression and present an cerebral abscess.

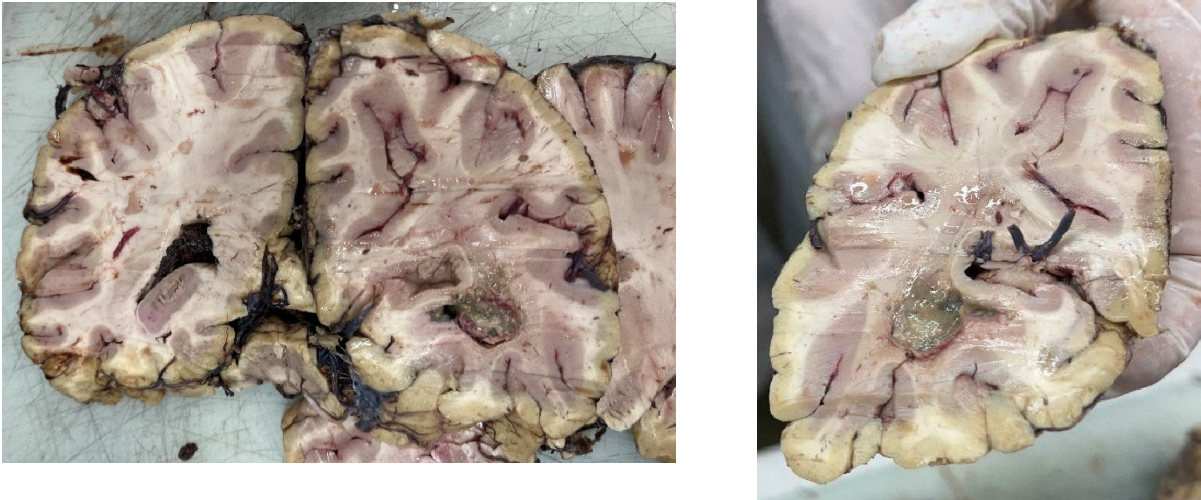


Figure 2: Photo coronal cut of the brain fixed in formalin. Right posterior temporooccipital subcortical cavitory lesion measuring 2.0 X 1.5 cm with soft-looking necro purulent content

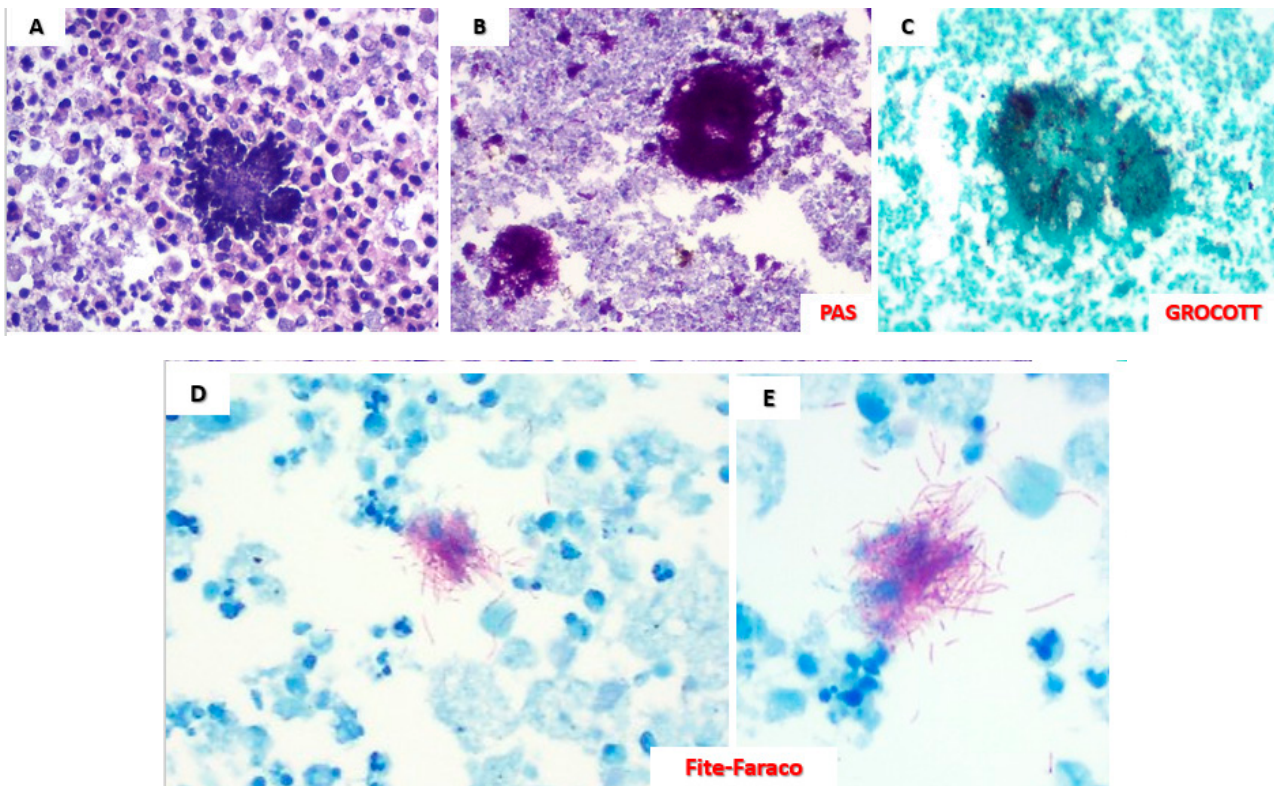


Figure 3: Histopathology exam of the brain abscess: A. neutrophil exudate and grain (HE); B. grains and cellular debris PAS; C. grain and cellular debris (Grocott); D, E. actinomyces grains (Fite-Faraco)

Author contributions: *ESM* and *HRC* - designed the study and wrote the case report; *AJR* gave the diagnosis hypothesis based on the imaging; *CLLP* - made diagnosis based on histochemical analysis; *CLLP* - read and corrected the case report; All authors read and approved the final case report.

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