

Case Report (Open access)

Nocardial Cerebellar Abscess in an Immunocompetent Male-A Case Report

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ABSTRACT- Nocardial brain abscesses are a rare central nervous system infection with high morbidity and mortality. Infection is acquired through inhalation or direct inoculation, which then spreads hematogenously to other organs. They are usually associated with immunocompromised patients but may appear in otherwise healthy individuals. They should be considered in the differential diagnosis of brain abscesses. Serological tests are not useful. Culture reports are important in establishing a diagnosis. Early diagnosis, evacuation and long term treatment might help in reducing significant morbidity and mortality. Here we present a case of nocardial cerebellar abscess in an immunocompetent male.

Key-Words: Cerebellar abscess, Nocardiosis, Immunocompetent male

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INTRODUCTION


The genus *Nocardia* is a ubiquitous group of environmental bacteria that usually manifest as an opportunistic infection in immunocompromised hosts and critical infection in immunocompetent patients is extremely rare [1]. Immunocompetent patients usually develop localized cutaneous lesions such as cellulitis, abscesses, sporotrichoid forms of infections [2]. Immunocompromised patients present as pulmonary, cutaneous or disseminated nocardiosis [3]. Disseminated disease is defined by the presence of two or more organs infected by *Nocardia* and is characterized by hematogenous spread of microbes into brain, eye, bone, joint, heart, kidney, skin or other organs and tissues. Nocardia cerebral abscess (NCA) is rare, constituting approximately 1-2% of all cerebral abscesses. *Nocardia asteroides* is responsible for up to 86% of all nocardial infections [4]. Cerebral abscess of *Nocardia* carries considerably higher mortality rates of 55% and 20% in immunocompromised and immunocompetent patients, respectively [5]. If left untreated, disseminated nocardiosis has a mortality rate of greater than 85% [3].

Nocardiosis has the ability to disseminate any organ, most commonly the central nervous system (CNS) and has a tendency to relapse or progress despite being given the appropriate therapy. Here we present a case of brain (cerebellar) abscess by *Nocardia* species in an immunocompetent male.

CASE REPORT

A fifty year old male, farmer by occupation, was admitted to our hospital with complaints of headache and difficulty in speaking for twenty days. The patient was asymptomatic 2 months prior to the presentation and then developed fever and headache. He was diagnosed with tuberculosis by a local doctor and was started on anti tubercular treatment (ATT). He developed multiple episodes of emesis. He went to a Medical College where he was diagnosed as a with left upper lobe pneumonia with glioma. His condition did not improve and hence was referred to our hospital. On admission, he had fever, headache, slurred speech, vomiting and blurred vision.

On examinations; pupils were sluggish in reaction and normal in size. The patient's consciousness level was 12 (E4V2M6) on the Glasgow coma scale (GCS) [6]. His heart rate was 65bpm, blood pressure 124/85, SpO₂ 96%, respiratory rate 16/min, hemoglobin 15.1gm/dl, total count 9.37X10⁹/L, (N60%, L30%, E04%, M06%), platelet 244.00X10⁹/L. Direct, indirect, total bilirubin was within normal limit. Serologically patient was non reactive to HIV, HBsAg, HCV. Liver transaminases (SGOT, SGPT) raised

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slightly, urea 55 mg/dl, routine CSF examination revealed a cell count of 20 with predominance of lymphocytes (100%).

The patient did not have a history of hypertension, diabetes, coronary artery disease and seizures. MRI Brain with contrast performed a day after admission revealed a right (Rt) cerebellar space occupying lesion (Fig.1). Rt paramedian suboccipital craniectomy with removal of the abscess and decompression was performed.

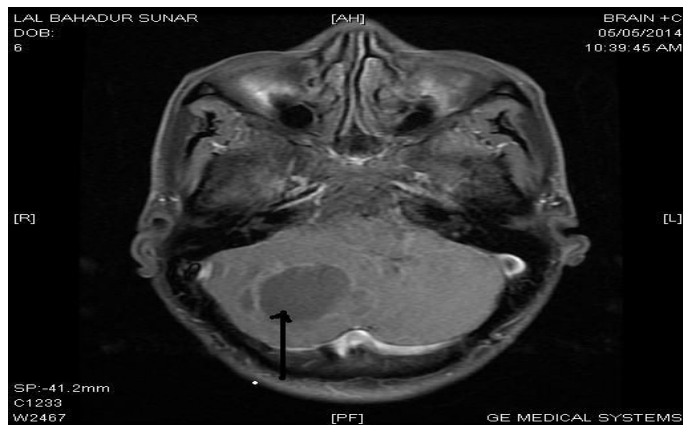


Fig.1: MRI brain showing large irregular shaped intra axial lesion in Rt cerebellar hemisphere surrounded by oedema. Post contrast study showing peripheral enhancement

The abscess was sent for AFB smear, fungal elements, culture/sensitivity and histopathology. Acid fast staining showed partially acid fast thin filamentous branching structure morphologically resembling *Nocardia* sp. (Fig. 2). A modified acid fast staining (MAFS) with 1% acid alcohol was done which showed acid fast structures. Gram stain showed Gram positive thin beaded branching filamentous structure. Pus was then inoculated onto blood agar, sabourauds dextrose agar, brain heart infusion agar (BHIA) and BHIA with blood at 37°C and 25°C. It grew dry white colonies on day three at both temperatures. Growth was reconfirmed using MAFS. Tubes were further incubated for pigment production and were checked every two days. Orange pigment production was noted on the eighth day.

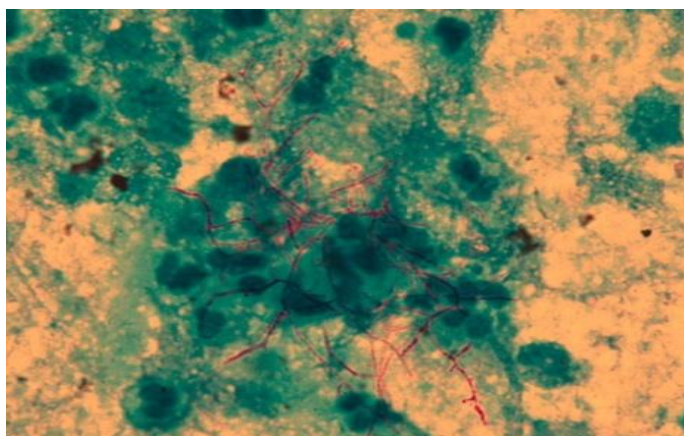


Fig. 2: Showing thin branched filamentous acid fast structures

The histopathological examination report revealed cerebellar abscess with filamentous structures morphologically consistent with *Nocardia*.

After identification ATT was stopped and he was started imipenem, cilastin and amikacin intravenously. His condition started improving. He was followed without any complains.

DISUSSION

Nocardia an opportunistic gram positive, branched, filamentous aerobic bacterium first described by Edmond Nocard in 1888 [7]. The organism enters the body by airborne route causing infections of the lung or by skin inoculation causing localized skin infections. From lung the infection can be disseminated to the CNS by hematogenous spread [8]. CNS infections occur in 44% of patients with systemic nocardiosis [7]. The etiological factors responsible for systemic nocardiosis include chronic lung disease, malignancies, diabetes mellitus, alcoholism, immunosuppressive state, organ transplant, renal disease, tuberculosis, collagen vascular diseases, preceding operations, chronic lung disease, trauma.

The incidence of disseminated nocardiosis is increasing with the advent of acquired immunodeficiency syndrome, due to advancements in the diagnostic techniques and in the treatment strategies leading to long term survival of the immunocompromised patients. However, due to its rarity it is seldom kept as a primary diagnosis and is often mistaken for malignancy. In Forty percent cases of NCA lung infections present with non specific sign and symptoms and usually go unnoticed with no involvement of other organs. In these cases involvement of lung can only be confirmed on imaging [7]. Most of the cases (57%) are supratentorial but cerebellar abscesses are also reported in few studies [9-11].

The morbidity and mortality related to NCA was 30% as compared to 10% for other abscesses. [8-11]. Patients undergoing craniotomy with excision have better survival than patients treated with aspiration alone (76% vs 50%) and 70% among patients undergoing non-operative therapy. The incidence of single Nocardial brain abscesses was 54 % [9]. The mortality rate was reported to be 33% in patients with single abscesses and 66% in those with multiple abscesses [4,12].

Although many cases of NCA have been reported so far, but still cerebral nocardiosis is misdiagnosed as brain malignancy or other pathological lesions. Diagnosis of *Nocardia* solely depends on microbiology techniques. Adequate and appropriate sample should be obtained and sent to the laboratory as soon as abscess is suspected. It is important to obtain cultures from tissue biopsies when disseminated infection is considered. Gram stain showing filamentous branched gram positive bacilli is the most sensitive method for diagnosis. Further, it can be seen as acid fast structures in MAFS [3].

Early diagnosis and treatment is required and the possibility of nocardiosis should be considered in all brain abscesses. Serological tests are not helpful and only cultures can establish a diagnosis of nocardial abscess. Once confirmed empirical sulfonamides should be started. Various other antibiotics like imipenem, minocycline, linezolid, amoxicillin/clavulanate, third generation cephalosporins have been tried for treatment of nocardiosis with good outcome. Due to recurrence of disease, prolonged therapy is advocated even after cure^[8].

The antibacterial agents most active are the sulfonamides such as trimethoprim-sulfamethoxazole, others being amikacin, minocycline and imipenem. If individuals are allergic to sulpha drugs or present themselves with disseminated nocardiosis a combination of amikacin and ceftriaxone should be considered. It is recommended that immunocompetent patients should be treated for at least six months. In case of brain abscess high dose intravenous antibiotics for 3-6 weeks followed by oral antibiotics for 12 months is recommended. No randomized trials have been performed to determine the most effective antibiotic regimen for nocardiosis. However, trimethoprim sulfa methoxazole is considered the mainstay of therapy since most studies have shown a favorable susceptibility to this antibiotic^[3].

CNS nocardiosis usually results after pulmonary nocardiosis but pulmonary infection or other focus of infection could not be substantiated in this patient at the time of admission. Since the patient was a farmer and was diagnosed as a case of pneumonia, inoculation or inhalation can be suspected. In this patient, an early diagnosis with the help of smear examination and culture confirmation made institution of appropriate antibiotics possible. The patient was followed without any complains.

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