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Case Report

Nocardia Brain Abscess an Incidental Finding: Case Report

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ABSTRACT

Background: Cerebral Nocardiosis is rare but very severe infection that carries high mortality rate in immune compromised patients. It often results in intraparenchymal abscess formation which represents only 2% of all cerebral abscesses. Early suspicion and confirmation of diagnosis are required to prevent morbidity and mortality. **Case**: A 60-year-old immune compromised female patient had a fall followed by left upper & lower limb weakness. Cerebral abscess was found in right parietal region which was drained & sent for culture & sensitivity. **Conclusion**: Nocardia should be considered as one of the differential diagnosis in immune compromised patients presenting with neurological complaints. Speciation of Nocardia is very important as N. farcinica is a fast-emerging pathogen with multidrug resistance.

Key Words: *Nocardiosis, Brain abscess, immune compromised, fast emerging*

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INTRODUCTION

Nocardiosis refers to infections caused by Nocardia species. These species most commonly cause pneumonia but can also infect the central nervous system and skin. It is considered as an opportunistic pathogen with immunodeficient patients at risk. Nocardia infection comprises of 2% of all brain abscess cases [1]. Most common species causing infection are *N. asteroidscomplex* and *N. brasiliensis* [2]. Nocardia species is Gram positive, aerobic, branching filamentous thin bacilli with partial acid fastness [3]. Nocardia brain abscess is rare, slow onset, difficult to treat, often misdiagnosed and life-threatening infection specially in immunocompromised patients.

Case

A 60 years old female known case of hypertension, diabetes mellitus with ocular myasthenia gravis. She presented as an emergency to tertiary care hospital in Mumbai with altered sensorium and gave history of fall 2 days prior with weakness of left upper and lower limb. On examination patient was drowsy with left upper and lower limb weakness (power 3/5). Patient was afebrile with no other systemic abnormalities.

MRI was performed (Figure1) which was suggestive of an infective etiology and patient was started on Inj. Vancomycin, Meropenem and Metronidazole. Other investigations were within normal limits.

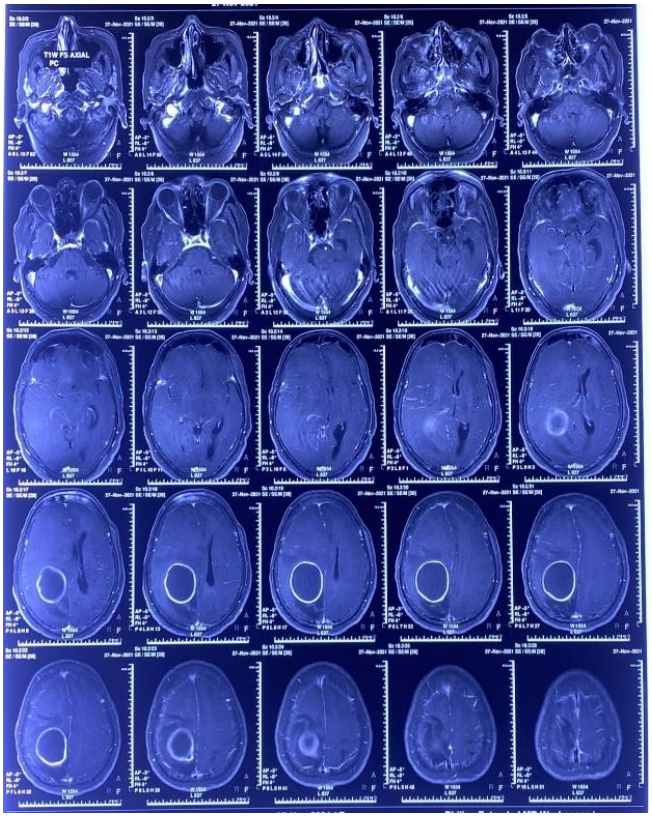
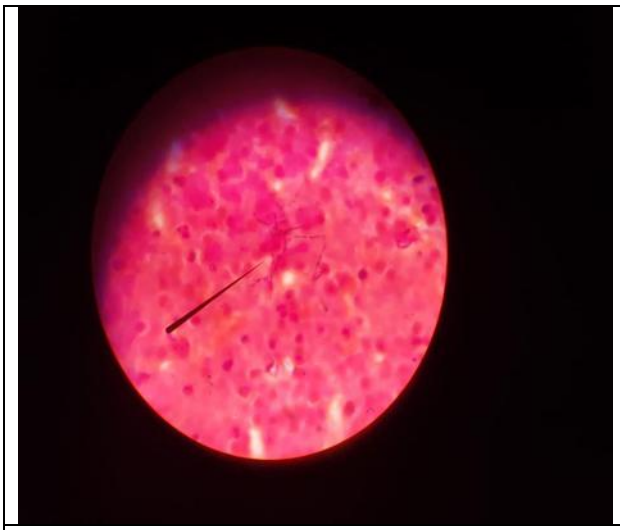


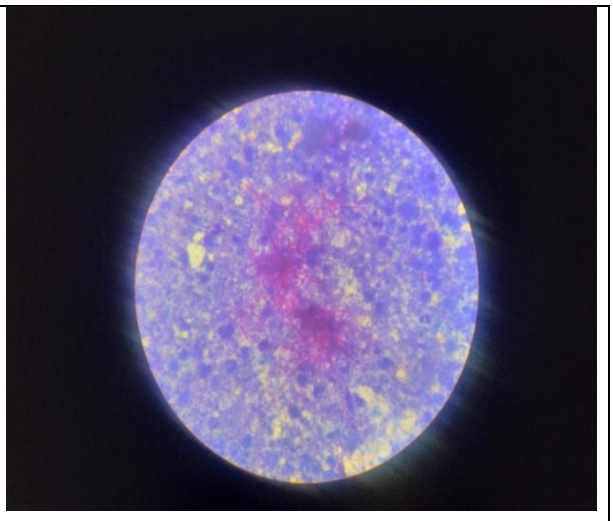
Figure 1: MRI plate showing 4.6*4.3*4.7 cm well defined peripherally enhancing lesion in right parietal lobe with midline shift of 11 mm

Four days post admission craniotomy was done and abscess was drained. The specimen was received in the Department of Microbiology for culture and sensitivity. Post op the patient was started on IV Ceftriaxone and Vancomycin.

The specimen was processed as per standard Microbiology techniques. Gram stain showed Gram positive filamentous branching bacilli with plenty pus cells (figure 2). Modified acid fast stain (1% H_2SO_4) showed filamentous branching acid fast bacilli (figure 2). Zeihl Neelson staining (25% H_2SO_4) showed no acid-fast bacilli.



Gram stain: Showing Gram positive filamentous branching bacilli



Modified ZN stain: Showing filamentous branching acid fast bacilli

Fig 2: Morphology on Gram stain and Modified ZN stain

Due to organism showing partial acid fastness provisional diagnosis suggestive of Nocardia species infection was made.

Sample was cultured on 5% Sheep blood agar, Chocolate agar, MacConkey agar, Lowenstein Jensen media and Brain heart infusion agar (Fig 3).

L J Media showing cream to buff coloured colonies

BHI Agar showing creamy, wrinkled, orange pigmented colonies

Figure 3: Colony characteristics on culture media

On 24 hour of incubation blood agar and Chocolate agar showed chalky white opaque colonies which showed Gram positive filamentous bacilli on Gram stain.MacConkey agar did not show any growth.

After 5 days of incubation, Lowenstein Jensen (LJ) medium showed cream to buff colored smooth colonies and Brain heart infusion agar (BHIA) showed creamy, wrinkled, orange pigmented colonies firmly adherent in both the media.

Nocardia was speciated by Kiska *et al*. [4] method using Gentamicin (10 ug), Tobramycin (10 ug), Amikacin (30ug) and Erythromycin (15 ug) disc. It was observed that Nocardia was resistant to Gentamicin 10 ug (10 mm), Tobramycin 10 ug (13 mm) and Erythromycin 15 ug (10 mm) and was sensitive to Amikacin 30ug (25 mm).

Based on the above susceptibility pattern and citrate non utilization, *Nocardia farcinica* was confirmed.As per CLSI guidelines (2021) antibiotic testing for Nocardia should be done by Microbroth dilution method except for Cotrimoxazole which can be done by disk diffusion method.

Antibiotic susceptibility was performed on Mueller Hinton agar (MHA) by Kirby Bauer disc diffusion method as per Saksena *et al*. [5] with prolonged incubation as Microbroth dilution was not available. On disc diffusion it was found that the isolate was sensitive to Amoxycillin+ Clavulanic acid, Meropenem, Levofloxacin, Tigecycline, Linezolid, Imipenem and Amikacin and resistant to Co trimoxazole and Cefotaxime.

Patient was given antibiotic IV Meropenem for 3 weeks as other drug seven though sensitive could not be given since they can precipitate Myasthenia crisis. Improvement in muscle power (4/5) was seen. The patient took discharge against medical advice and was advised oral therapy of Amoxy- Clavulanic acid for 1 year and was lost to follow up.

DISCUSSION

Nocardia belong to Order Mycobacterales, family Nocardiaceae. Nocardia Cerebral abscess shows variable signs and symptoms like severe headache, vomiting, limb weakness, fever, word finding difficulties, disorientation [2,3,6,7]. In the present case, history of fall followed by limb weakness was the presenting complaint of patient. Hence Nocardia should be considered as a differential diagnosis in patients with neurological complaints. Prognosis of patients is poor with nocardia abscess [6].

Most of the cerebral Nocardia abscess is found in immunocompromised patients. However, Lannotti C. et al [7] found Nocardia brain abscess in an immunocompetent patient. In the present case, the patient had history of Diabetes and Hypertension since 12 years. She also had post herpetic neuralgia for which steroid medication was started.

CT or MRI can give a presumptive diagnosis of abscess but it needs to be ruled out from tumor, space occupying lesion or abscess due to other bacterial, fungal or viral cause. Thus, microscopy and culture remain the mainstay for definite diagnosis.

Treatment in brain abscess is either aspiration of abscess (if abscess is surgically inaccessible) or complete surgical excision followed by prolonged anti-microbial therapy with broad spectrum antimicrobials. In the present case, abscess was completely drained out and post op the patient received Meropenem for 3 weeks. She could not be given the drugs like Amikacin, Levofloxacin, Tigecycline which precipitate myasthenia crisis even though found susceptible.

In the present case, source of nocardia infection is unclear. Patient was farmer by occupation so inhalation/ inoculation can be a probable source of infection. However, chest X ray was found to be normal. Since the patient was diabetic and was on steroid medication for post herpetic neuralgia, chances of disseminated infection are increased.

Speciation of Nocardia is very important as some species are reported to be multidrug resistant. *Nocardia farcinica* is more virulent and disseminates specially to neural tissue and shows more resistance to antibiotics [2].

To conclude, Nocardial brain abscess should be one of the differential diagnoses in immunocompromised patients with neurological complaints. Speciation of Nocardia is important as *N. farcinica* is fast emerging pathogen with multi drug resistance. Antimicrobial susceptibility and underlying diseases can change the treatment of the disease.

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Consent from patient- Yes

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