



A case report on *Nocardia cyriacigeorgica* in renal transplant patient

Abhishek Velamuri^{1*}, Rafath Fatima¹, Shiva Priya Eswaran¹ and Srinivasa Rao Bezawada²

¹Department of Microbiology, Krishna Institute of Medical Sciences, Minister Road, Secunderabad-500003, Telangana, India

²KIMS Foundation and Research Centre, Minister Road, Secunderabad - 500003, Telangana, India

Abstract

Nocardiosis is an opportunistic infection caused by *Nocardia* species (spp). *Nocardia* species are ubiquitous environmental saprophytes occurring in the soil, organic matter, and water. A 36-year-old, female, renal transplant recipient presented with cutaneous and cerebral symptoms of disseminated Nocardiosis. Prompt diagnosis and treatment of the case resulted in a favourable outcome. Nocardiosis is an important infection in transplant recipients, which should be diagnosed early so that appropriate therapy can be instituted.

Keywords: *Nocardia*, opportunistic infections; renal transplant; solid organ transplant; disseminated nocardiosis

Introduction

Opportunistic infections are common in patients receiving immunosuppressive therapy after renal transplantation. Nocardiosis is a life-threatening opportunistic infection, affecting 0.04% to 3.5% of patients after solid organ transplant (SOT) [1]. *Nocardia* is strictly aerobic, partially acid-fast, branching, often beaded, filamentous, and weakly gram-positive bacteria [2]. Nocardiosis may be localized or disseminated, and the usual modes of transmission are by inhalation or through the cutaneous route. Disseminated nocardiosis is defined as involvement of two noncontiguous sites that may or may not include a pulmonary focus.

Case presentation

Six months post-transplant, a 36-year-old female patient presented with the chief complaint of left parotid swelling radiating in nature to the right side of the neck (only meningeal sign in this case) which lasted for more than 7 days before presentation. Associated symptoms included pain upon chewing food and experienced one episode of generalized tonic clonic seizure associated with up rolling of the eyeballs, tongue bite with bowel and bladder incontinence the day before the admission. She was a known case of hypothyroidism, hypertension, chronic kidney disease secondary to medical renal

disease of hypertension. After hemodialysis for 4 years, she received a deceased donor renal transplant in November 2023. Post transplant, her baseline creatinine was maintained at 1.6 to 1.8mg/dL.

This patient was maintained on dual immunosuppressive therapy consisting of tacrolimus and myfortic acid once daily.

Laboratory work up revealed serum creatinine was 1.70, white blood cell counts were 8,500/mm³, Chest X-ray was unremarkable, MRI brain was suggestive of well-defined edematous lesion in left occipital region (Infective focus) (Figure 1).

***Corresponding author:** Dr. Velamuri Abhishek, Department of Microbiology, Krishna Institute of Medical Sciences, Minister Road, Secunderabad-500003, Telangana, India. Email: avelamuri@yahoo.com

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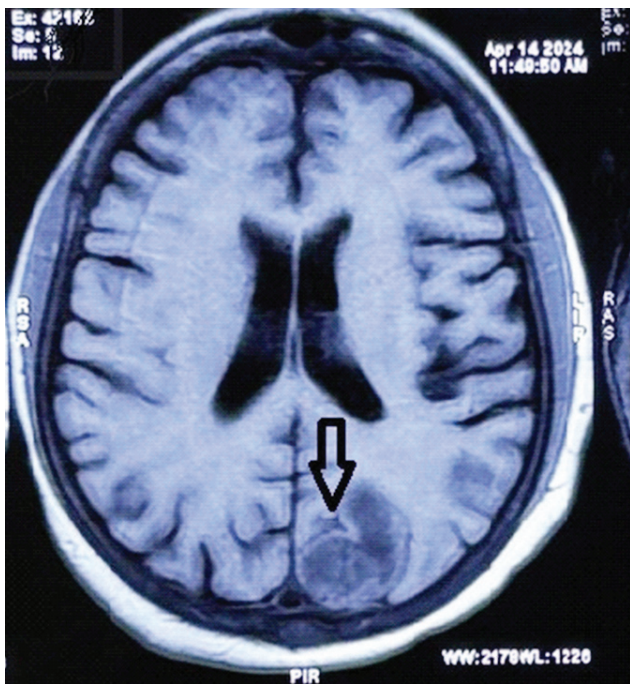


Figure 1: MRI brain showed edematous lesion in the left occipital area.

Echocardiography was negative for any underlying valvular vegetation. The patient underwent ultrasound guided incision and drainage of 5-8cc of purulent fluid from the right thigh, left parotid, left arm and right abdominal region and the samples were sent to the microbiology department for stain and culture.

Gram stain of the pus sample (Parotid aspirate) showed plenty of pus cells and moderate Gram positive thin filamentous branching bacilli morphology suggestive of *Nocardia* (Figure 2).

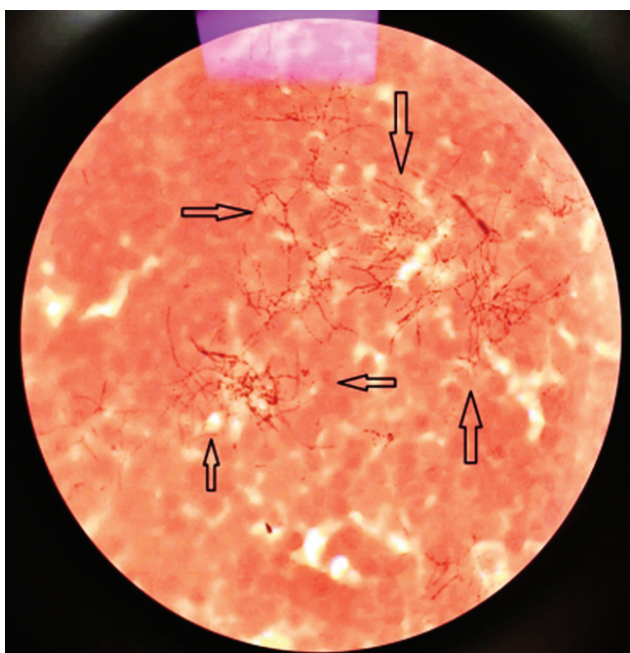


Figure 2: *Nocardia* on Grams staining.

Modified Ziehl Neelsen staining revealed acid-fast thin branching filamentous organisms suggestive of nocardiosis (Figure 3).

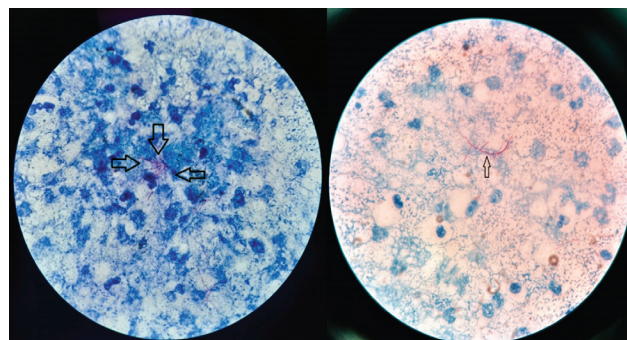


Figure 3: *Nocardia* on modified ZN staining with 1% H₂SO₄.

The sample was inoculated on blood agar, chocolate agar, and LJ media. After 48h of incubations chalky, matt, dry, crumbly, colonies grew on plates. Colonies were catalase (positive), urea hydrolysis test (positive), Simmons’s citrate (negative). The strain was identified as *Nocardia cyriacigeorgica* by MALDI-TOF.

The antibiotic sensitivity test was performed by Kirby Bauer disc diffusion method following CLSI guidelines. The isolate was sensitive to cotrimoxazole, amikacin, meropenem, imipenem, ceftriaxone and ciprofloxacin (Figure 4).

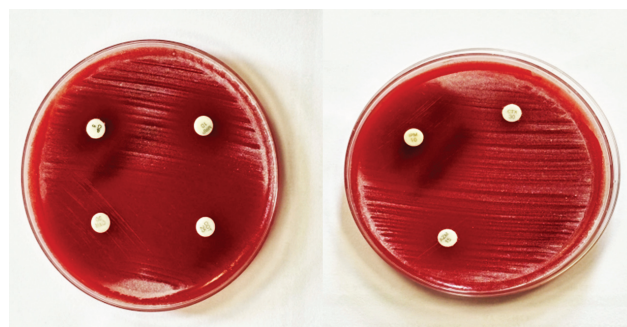


Figure 4: Kirby Bauer disc diffusion for antibiotic susceptibility testing as per CLSI guidelines.

The patient was started on Injection cotrimoxazole 80 mg IV three times a day in conjunction with injection cilastatin (500mg) + imipenem (500mg) 500 mg IV twice daily. Tacrolimus and myfortic acid were withheld for two weeks due the underlying infection. The patient’s condition gradually improved Figure 5, and she was discharged on IV and oral medications.

She was treated with the combination for 6 weeks and was advised to continue cotrimoxazole alone for a duration of 12 months with monthly review visits to the hospital for ruling out possible allograft dysfunction in the future.



Figure 5: Healed suppurative lesion over the inferior aspect of the right thigh.

Discussion

Renal transplant patients are likely to be at increased risk after immunosuppressive medications for infections [3]. Immunosuppressive therapy leads to compromised T cell and macrophage leading to *Nocardia* infection [4]. The immunosuppressive agents are initiated to prevent the solid organ transplant rejection in the initial years which if not causes significant raised susceptibility to Nocardiosis [5]. Steroid-sparing protocols with cycloserine, spared the immune compromised patients who underwent renal transplant with marked reduced incidence of around 0.7% [6].

Cutaneous lesions like ulcerations, pyoderma, cellulitis, nodules and subcutaneous abscesses manifest in renal transplant patients with nocardial infections [2, 4, 7] along with hematogenous spread [8]. The patient presented with disseminated nocardiosis which occurs when more than two non-contiguous sites are involved with or without pulmonary system involvement [9].

Standard treatment of choice for nocardiosis is trimethoprim-sulfamethoxazole (TMP- SMX) and is recommended for use in disseminated CNS infection. Some species of nocardia exhibit resistance to TMP-SMX like *Nocardia farcinica*. Other strains such as *Nocardia asteroides* and *Nocardia nova* usually have susceptibility of more than 95% and 89%, respectively. Furthermore, no significant consensus is available on the role of TMP-SMX in *Nocardia* prophylaxis [10, 11]. Mortality with nocardia infections, post-transplant are not common. A study concluded that the nocardial infection neither caused mortality nor impacted the recipient's overall survival. Early diagnosis always will suggest a favourable therapeutic outcome [12, 13]. *Nocardia cyriacigeorgica* has a good antimicrobial susceptibility pattern [14]. The patient clinically improved with TMP SMX and cilastatin + imipenem regimen.

Conclusion

Disseminated nocardiosis with systemic involvement can increase mortality in transplant patients. Early detection and appropriate medical management can result in positive outcomes. Where feasible, speciation of *Nocardia* should be undertaken to add to the knowledge base of prevalent strains.

Conflicts of interest

Authors declare no conflicts of interest.

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