

## Brief Report

## Disseminated Nocardiosis with retinal abscess in a patient treated for bullous pemphigoid



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## ABSTRACT

**Purpose:** To report a case of disseminated Nocardiosis with retinal and intracranial lesions.**Observations:** A 49-year-old woman immunosuppressed because of treatment given for bullous pemphigoid presented with altered mental status and multiple intracranial lesions on imaging. The patient was found to have multiple retinal lesions in both eyes, including a subretinal abscess in the right eye. The patient underwent brain biopsy, confirming *Nocardia farcinica* histopathologically and in culture.**Conclusions and Importance:** Ocular Nocardiosis is a rare disease with varying prognosis that requires prompt diagnosis to ensure appropriate medical therapy.

## 1. Introduction

*Nocardia* are gram positive, aerobic, filamentous bacteria that can cause severe infection in immunocompromised individuals. Disseminated Nocardiosis can be a devastating multi-system disease, including ocular involvement. We wish to report a unique patient with retinal lesions secondary to disseminated Nocardiosis.

## 2. Case report

A 49-year-old Caucasian female had altered mental status and headache for 2 days. She had been treated with cyclosporine and prednisone for bullous pemphigoid for several months. The patient's mental status deteriorated and she was sedated and intubated because of a decline in respiratory status. She remained afebrile without leukocytosis. Computed Tomography (CT) of Chest and Abdomen revealed ground glass opacities suggestive of possible right lung pneumonia. Cerebrospinal fluid (CSF) and blood cultures for bacterial, viral, and fungal etiology were negative. The patient was given intravenous vancomycin, piperacillin-tazobactam, and micafungin.

Initial ophthalmic examination of both eyes revealed a quiet anterior segment. Dilated ophthalmoscopic exam revealed a large (2 disc diameter size) elevated subretinal lesion with surrounding hemorrhage in the right eye and multiple small 1/2–1/4 disc diameter size, cream-colored lesions throughout the posterior pole and periphery in both eyes (Fig. 1A and B). There was no apparent vitritis or inflammation in either eye.

Magnetic Resonance Imaging (MRI) scan revealed numerous small

enhancing lesions throughout her brain (Fig. 2A and B). Brain biopsy and histopathology of one of the enhancing, superficial intracranial lesions revealed filamentous, gram-positive bacteria indicative of *Nocardia* (Figs. 3 and 4). Fungal cultures yielded *Nocardia farcinica*. Intravenous imipenem, bactrim, and amikacin were started due to organism sensitivity. Given the possibility of an infectious choroiditis, the following day the patient underwent bilateral vitreous tap-and-inject with amikacin (0.4 mg/0.1 ml). Vitreous gram stain, cultures and polymerase chain reaction were negative. The patient's clinical status slowly improved and, in consultation with infectious disease, she was discharged on systemic bactrim and augmentin for a one year course.

Four months after discharge, while continuing treatment, ophthalmic examination revealed visual acuity of 20/100 right eye (OD) and 20/25 left eye (OS). Anterior segment exam findings revealed mild nuclear sclerotic cataracts. Posterior segment exam revealed subretinal fibrosis in macula and superonasally OD and multiple chorioretinal scars in both eyes (OU) (Fig. 5).

## 3. Discussion

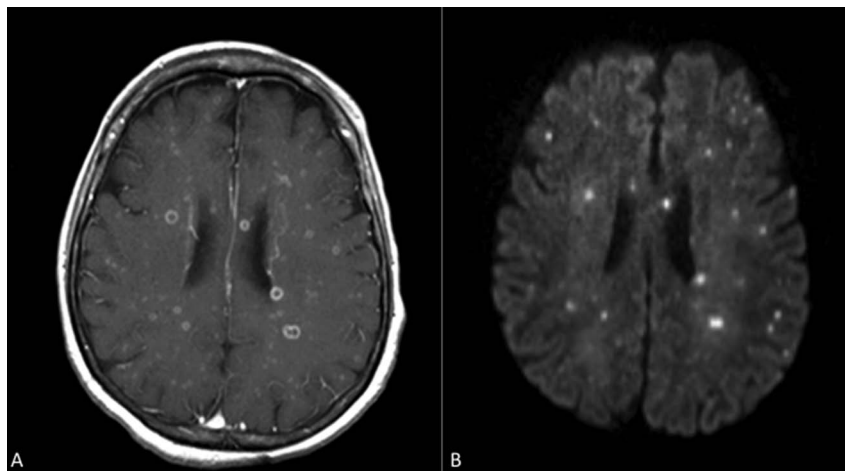
Ocular infection due to *Nocardia* is exceedingly rare, with fewer than forty cases of *Nocardia* endogenous endophthalmitis reported since 1967.<sup>1</sup> Systemically, *Nocardia* is associated most often with pulmonary infection.<sup>2</sup> Most patients tend to be immunosuppressed, as was this patient.<sup>3,4</sup> Moreover, this patient is the first to be described in the literature to have ocular Nocardiosis after the complications of immunosuppressive treatment with prednisone for bullous pemphigoid.<sup>1</sup>

Ocular manifestations of this filamentous, gram-positive bacteria

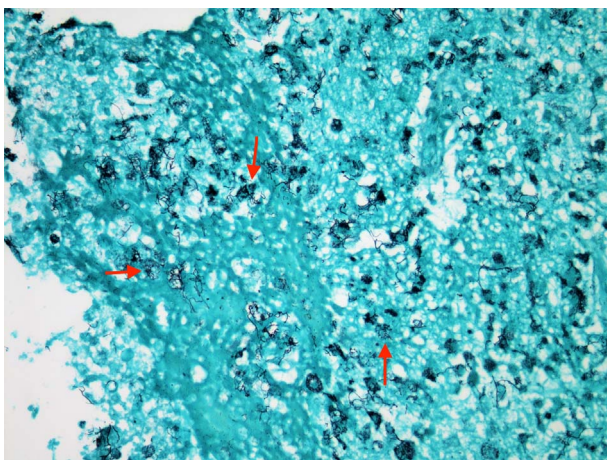
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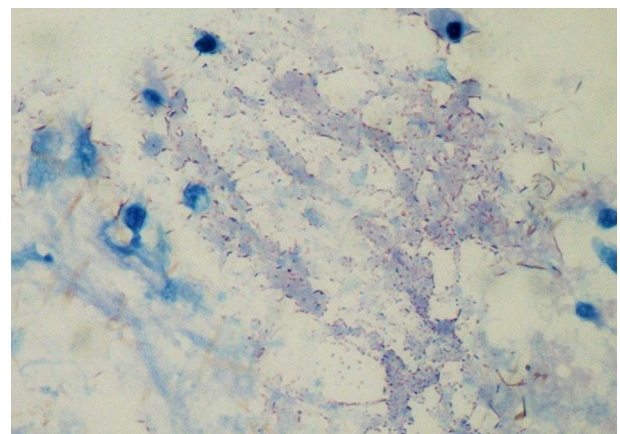
**Fig. 1.** Dilated Fundus Photographs of Right and Left Eyes  
 (A) Photograph of Right Eye revealing multiple cream colored subretinal lesions and large 2 disc diameter elevated subretinal lesion with surrounding hemorrhages  
 (B) Photograph of Left Eye revealing cream colored retinal lesion similar to right eye.



**Fig. 2.** Magnetic Resonance Imaging (MRI) Demonstrating Nocardial Central Nervous System (CNS) Infection  
 (A) Axial T1 + Contrast, Weighted image showing numerous ring-enhancing lesions  
 (B) Axial Diffusion Weighted Imaging (DWI) revealing numerous enhancing lesions.



**Fig. 3.** Histopathology of CNS Biopsy Demonstrating Nocardial Infection. Gomori methenamine silver (GMS) stain is positive for numerous branching filamentous organisms (red arrows) (40x). (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)



**Fig. 4.** Acid Fast Bacilli (AFB) stain is weakly positive for thin, beaded, slightly branching rods (40x).

range from keratitis to endophthalmitis.<sup>5,6</sup> Severity of disease and symptoms can be highly variable, making diagnosis difficult.

Presentation can range from minimal inflammation to significant vitritis and retinal detachment.<sup>2,5–7</sup> Diagnosis may be established through tissue acquisition (e.g. enucleation, subretinal biopsy), or vitreous sampling.<sup>7,8</sup> The diagnostic yield of vitreous sampling was low in this case as to the lack of apparent vitritis. MRI Brain can also

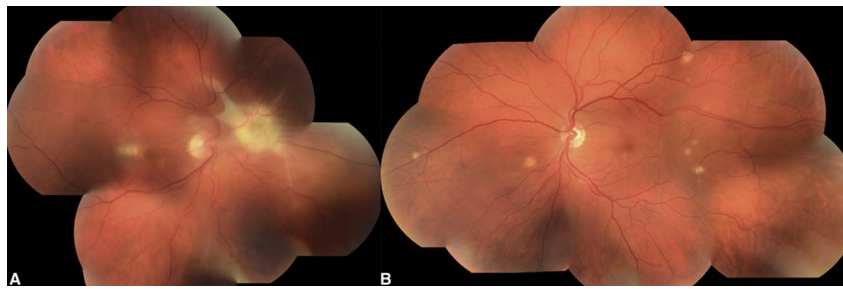


Fig. 5. Dilated Fundus Photographs of Right and Left Eyes

(A) Photograph of Right Eye revealing large 2 disc diameter area of subretinal fibrosis superonasal to disc and focal area of subretinal fibrosis in temporal macula with traction  
(B) Photograph of Left Eye revealing multiple chorioretinal scars.

demonstrate ring-enhancing lesions indicative of *Nocardia*, as in this patient.<sup>9</sup> In this case, the typical MRI findings together with positive brain biopsy established the clinical diagnosis of *Nocardia farcinica*, allowing for more appropriate antibacterial management. Treatment initially involves systemic sulfonamide therapy, as was conducted for this patient.<sup>1,7,10</sup> The prognosis in systemic Nocardiosis is guarded, in part, due to the difficulty in establishing the diagnosis and management of diffuse disease. In a review conducted in 2011 by Eschle-Meniconi et al., 10 (27%) of the reported 36 patients with ocular *Nocardia* from 1967 to 2007 died.<sup>1</sup> This patient is one of the few to survive this high mortality disease, stressing the severity and importance of early diagnosis and treatment.

#### 4. Conclusion

Ocular Nocardiosis is a rare disease often in the setting of immunosuppression and may respond to approved medical therapy after prompt diagnosis.

#### Patient consent

The patient consented to publication of the case in writing/orally.

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#### Conflicts of interest

The following authors have no financial disclosures: SP, AH, AB,

CCB.

#### Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

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