

## Neurosurgeons Need to Always Rule Out a Possible Presence of a Nocardial Abscess which can Mimic a Brain Tumor. Initial Nocardia Specific Acid-Fast Staining of Aspirate Followed by Speciation Confirmation Via Advanced Molecular Diagnostics and Culture are a Must

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“*Nocardia* infections are, however; indeed quite severe they carry the highest mortality rate among all bacterial cerebral abscesses”.

Nocardial infections are frequently difficult to recognize, and thus there often occurs misdiagnosis and which is why there is sadly an underestimation of its presence [1].

*Nocardia* cerebral abscess is infrequent and occur in approximately 1 - 2% of all cerebral abscesses [2]. *Nocardia* infections are, however, quite severe they carry the highest mortality rate among all bacterial cerebral abscesses, with mortality rates as high as 55% and 20% in immune compromised and immunocompetent patients, respectively [2].

The literature has cited instances where Nocardial abscesses have mimicked brain tumors [2,3]. What is rather interesting is that the MRI imaging of the patient’s brain revealed a “left frontal lobe lesion with surrounding vasogenic edema suspicious for metastatic brain tumor” [3]. This patient was immunocompetent [3] and a craniotomy was performed, however, initial microscopy with gram-stained prep failed to reveal the presence of organisms. Molecular Diagnostics in connection with traditional culture therefore must be made of the aspirate [1-3]!! In all cases where *Nocardia* is suspected one must always perform an acid-fast stain. Treatment involving surgical evacuation and long-term antibiotics always needs to be started without delay to avoid the risk of morbidity (2,3).

It must be remembered that Nocardial Cells are acid-fast but not alcohol-acid fast as are Mycobacterial cells such as *Mycobacterium tuberculosis* and the Nontuberculous Mycobacteria when stained via the tradition Kinyoun Acid-Fast Staining Protocol. Thus, to achieve Nocardial Acid-Fast Staining of staining one must destain with 1% sulfuric acid rather than the classical acid-alcohol [4,5].

A more sensitive version of the acid-fast staining involves the use of the fluorochrome auramine-O with a fluorescence microscope [4].

An important point that must be always understood is that even though the classical image of *Nocardia* is that of an organism displaying branching filaments, quite often initial microscopy preps obtained from the initial clinical isolates only reveal the presence of bacillary and/or coccoid forms [5]. That is why it is extremely important to perform Nocardial Acid-Fast Staining on the initial aspirate. Nocardial filaments fragment easily, and often one might be seeing only bacillary or coccoid forms [5]. The use of slide culture techniques enable one to see the classical undisturbed *in situ* classical image of branching nocardial filaments [5].

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