History
73 year old female with headache, nausea, and vomiting for 2 weeks. Leg weakness. Past history of multiple myeloma. Treated for atypical pneumonia 6 weeks prior to presentation.

Diagnosis
Nocardia asteroides abscess

Discussion
Nocardia are weakly gram-positive, filamentous bacteria found worldwide in soils. Human disease from this microbe was first described by Eppinger in 1890, after bovine disease was described by Nocard in 1888. Pathogenic Nocardia are members of the family Nocardiaceae, the aerobic actinomycetes. Dissemination is usually from a pulmonary source. Nocardia asteroides is the principal cause of systemic nocardiosis in the United States. A constellation of acute and chronic symptoms develops, ranging from headache to obtundation, pyuria, and right upper abdominal pain due to hepatic involvement. CNS infection may have no signs or symptoms or may present with focal neurological deficits, seizures, and coma. Imaging findings, particularly on MRI, can lead to the diagnosis of infection rather than tumor. T2 hypointense rings with corresponding ring enhancement and restricted diffusion are characteristic imaging features of suggestive of abscess. DW imaging has been shown to be superior to conventional MR imaging in evaluating the success or failure of abscess therapy. Further, restricted diffusion in a drained abscess has been shown to correspond to pus. Death occurs from sepsis, overwhelming pneumonia, or brain abscess, rather than the untreated underlying disease. Mortality is increased in patients with acute infection and in those with disseminated disease involving 2 or more contiguous organs or the CNS. Mortality is also increased in patients taking corticosteroids or antineoplastic agents. Treatment: Sulfa-based therapy is recommended. Trimethoprim-sulfamethoxazole (Bactrim) or a sulfonamide (sulfadiazine), given intravenously in high doses, is the treatment of choice. Linezolid has a growing literature in support of its use in combination and even monotherapy for treatment of Nocardia infections. It has good CNS penetration, is available in an oral form, and is the only antibiotic known to be active against all strains of Nocardia. Surgical therapy to drain abscesses is usually helpful (and potentially diagnostic). However, brain abscesses may respond to antimicrobial treatment without surgery. The risks of an invasive neurosurgical procedure should be balanced against the benefits of a diagnostic biopsy or potentially therapeutic drainage. MR imaging, particularly diffusion imaging, may be useful in the follow up to therapy.

Findings
CT-Non-contrast examination showes right occipital vasogenic edema with confluent isodense material extending into the lateral ventricle.
MR-T1: Hypointense right occipital lesions with surrounding edema and low signal material
(hyperintense to CSF) extending into the right lateral ventricle. T2: Lesions show ring of low signal, central and surrounding hyperintensity and material in the lateral ventricle hypointense to CSF. FLAIR: Lesions are iso to slightly hyperintense to normal brain with large amount of surrounding edema. Debris in ventricle is more conspicuous. DWI: Hyperintensity in the lesions and the material in the lateral ventricle indicating restricted diffusion that is characteristic for abscess. T1 post contrast: Ring enhancement without significant ependymal enhancement.

Reference
Bennett NJ, Domachowske J, Johann-Liang R. Nocardiosis.
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