



Image Report

Cerebral toxoplasmosis in a patient with multiple myeloma

Melvin Parasram¹, Julio Arevalo-Perez²

¹Department of Neurology, Weill Cornell Medicine, ²Department of Radiology, Memorial Sloan Kettering Cancer Center, New York City, New York, United States.

E-mail: *Melvin Parasram - melvin.parasram@gmail.com; Julio Arevalo-Perez - arevalj1@mskcc.org



*Corresponding author:

Melvin Parasram,
Department of Neurology, Weill
Cornell Medicine, New York
City, New York, United States.
melvin.parasram@gmail.com

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ABSTRACT

Background: Cerebral toxoplasmosis is a rare complication of relapsed/refractory multiple myeloma (MM) after autologous stem cell transplant (SCT). Imaging characteristics can be helpful in leading to rapid diagnosis and treatment.

Case Description: A 76-year-old man with relapsed/refractory IgA kappa MM status post autologous SCT who presented to the hospital with altered mental status. His hospital course was complicated by rapid decompensation to obtundation requiring intubation. Magnetic resonance imaging (MRI) of the brain revealed numerous ring-enhancing lesions with eccentric target signs, which were concerning for cerebral toxoplasmosis. Diagnosis was confirmed with positive toxoplasma cerebrospinal fluid polymerase chain reaction test.

Conclusion: Cerebral toxoplasmosis should be considered in the differential diagnosis for MM patients who present with altered mental status and neurologic findings. The ring-enhancing lesion with eccentric target sign on MRI can be helpful in the diagnosis of cerebral toxoplasmosis.

Keywords: Cerebral toxoplasmosis, Eccentric target sign, Multiple myeloma, Neuroimaging, Neuroinfectious disease

IMAGE REPORT

A 76-year-old man with a 6-year history of relapsed/refractory IgA kappa multiple myeloma (MM) presented to the hospital with altered mental status. He was previously treated with chemotherapy, immunomodulating therapy, and autologous stem cell transplantation (SCT), and was actively being treated with carfilzomib, pomalidomide, and dexamethasone for MM. Examination demonstrated inattention and disorientation. Serum laboratory tests were unremarkable. His hospital course was complicated by rapid decompensation to obtundation requiring intubation. Magnetic resonance imaging of the brain (MRI) revealed numerous ring-enhancing lesions with eccentric target signs (arrow), which were radiographically concerning for cerebral toxoplasmosis [Figure 1, arrows]. The clinical and radiographic differential also included primary central nervous system (CNS) lymphoma or other CNS infections such as CNS tuberculosis, CNS cryptococcosis, and neurocysticercosis. Serum HIV and QuantiFERON gold were negative. Body CT/PET imaging was negative for new malignancy and evidence of lymphoma. Lumbar puncture revealed an opening pressure of 30 mmHg, WBC 17 u/L, RBC 12 u/L, glucose 57 mg/dL, protein 295 mg/dL, negative meningitis/encephalitis panel and JC virus PCR, negative CSF cryptococcal antigen test, negative CSF cytology and flow cytometry, and positive toxoplasma CSF PCR 57,900 copies/mL. The patient has never lived outside the United States of America nor has ingested undercooked pork products per family members. Clinical investigation confirmed the diagnosis of cerebral toxoplasmosis. He was treated with intravenous pyrimethamine, leucovorin, and sulfadiazine. His course was further complicated by a left greater

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than the right basal ganglia hemorrhage with intraventricular hemorrhage resulting in death [Figure 2].

Toxoplasma gondii is a common parasite leading to opportunistic infections in immunosuppressed hosts and is more commonly seen in HIV/AIDS patients. Patients with

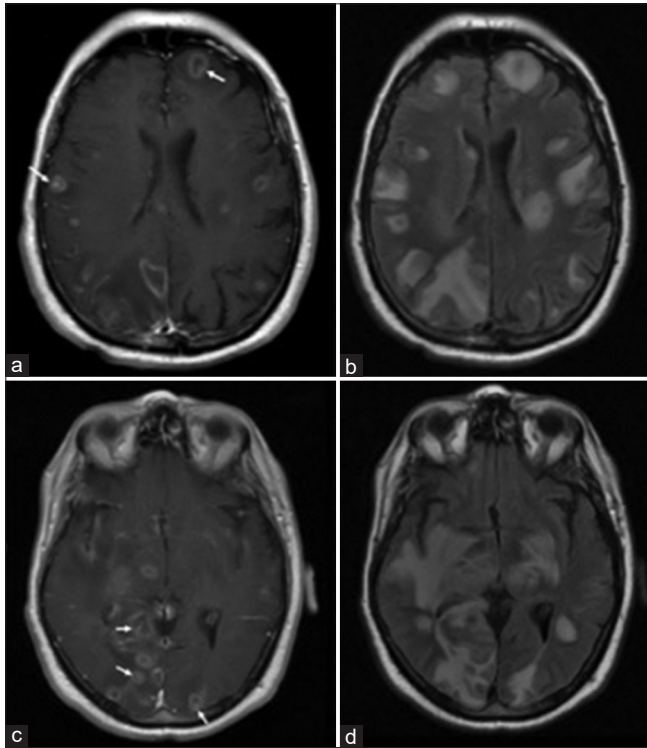


Figure 1: Postcontrast T1-weighted (a, c) and FLAIR (b, d) axial images of the brain showing multiple ring-enhancing lesions, some of which demonstrated an eccentric target sign (arrows) with associated surrounding moderate vasogenic edema.



Figure 2: Axial CT scan of the head revealing left basal ganglia hemorrhage with intraventricular extension with an enlargement of the ventricular system. A smaller right basal ganglia hemorrhage is also noted.

MM are at an increased risk for infections due to inherent dysfunction of adaptive immunity and from cytotoxic effects of treatment.^[1,5,6] Postcontrast T1-weighted MRI sequences typically demonstrate multiple ring-enhancing lesions with eccentric target sign. The eccentric target sign is considered pathognomonic for cerebral toxoplasmosis.^[4] Cerebral toxoplasmosis remains a rare complication of relapsed/refractory MM after allogeneic SCT and even rarer after autologous SCT.^[2,3,7] Cerebral toxoplasmosis should be considered in the differential diagnosis for MM patients who present with altered mental status and neurologic findings.

Declaration of patient consent

Patient's consent not required as patient's identity is not disclosed or compromised.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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