



ROLE OF "CONCENTRIC TARGET SIGN" & "ECCENTRIC TARGET SIGN" IN DIAGNOSIS OF CEREBRAL TOXOPLASMOSIS.

Radiology

Dr Praveen

MD, Radiodiagnosis, Department of radiodiagnosis Indira Gandhi Medical collage Shimla.

ABSTRACT

Cerebral toxoplasmosis is one of the most common infectious causes of focal brain lesions in human immunodeficiency virus (HIV) patients. It is very difficult to differentiating toxoplasmosis from other central nervous system (CNS) lesions. Magnetic resonance (MR) imaging of the brain plays a key role in diagnosis and treatment of cerebral toxoplasmosis. Several specific signs on MRI of brain have been described in recent literature including the "Concentric target sign" & "Eccentric target sign". We report a case of successfully treated HIV-associated cerebral toxoplasmosis in which MRI shows "Concentric target sign" & "Eccentric target sign".

KEYWORDS

INTRODUCTION-

Cerebral toxoplasmosis is an opportunistic infection caused by protozoan parasite *Toxoplasma gondii*, very often present in immunocompromised patients such as those with human immunodeficiency virus (HIV). Magnetic Resonance Imaging (MRI) plays an essential role in both the diagnosis and differentiation of this disease from other focal central neurological system (CNS) lesions that occur in HIV patients. Important MRI features described in cerebral toxoplasmosis include the "concentric target sign" in T2 weighted imaging and the "eccentric target sign" in postcontrast T1 weighted sequences¹. In this article, we present a case of a 39-year-old HIV patient with cerebral toxoplasmosis in which "concentric target sign" & "eccentric target sign" were present.

Case Report-

We report a case of 39-year-old HIV male patient, presented with fever and weakness left side of body for 4days. Baseline laboratory tests revealed a very low CD4 cell count (52 cells/mm³), indicating that the patient was significantly immunosuppressed and at risk for opportunistic infection. Computerized tomography (CT) brain shows ill defined hypo density in right basal ganglia, thalamus, right temporal and occipital lobe predominantly involving white matter Figure 1(a,b). MRI of brain had shown alternating concentric zones of hypo and hyper intensity with perilesional edema in T2WI (figure 2a) & Peripherally enhancing lesions in right cerebral peduncle, right hippocampus, right occipital lobe in post contrast images (figure2b)

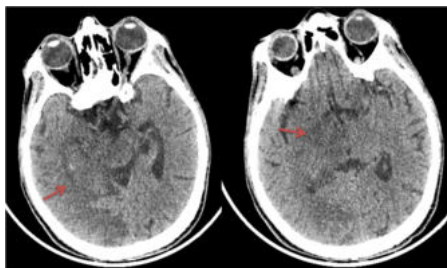


Figure1-(a,b) Ill defined hypodensity in right basal ganglia, thalamus, right temporal and occipital lobe predominantly involving white matter

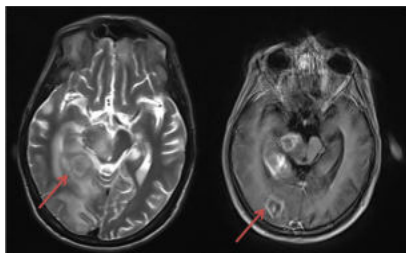


Figure 2: (a) T2 sequence demonstrating "concentric" target sign with concentric alternating hypointense and hyperintense rims **(b)** Postcontrast sequence demonstrating "eccentric" target sign with a peripheral rim of enhancement and eccentric enhancing nodule.

DISCUSSION-

Management of CNS complications in patients with HIV remains a difficult clinical challenge. MR imaging of brain and spine is key in the investigation of HIV patients who present with neurological symptoms. MRI also plays important role to differentiate it from other differentials such as primary CNS lymphoma. Other CNS differentials in HIV include cerebral tuberculosis, cerebral cryptococcus, and progressive multifocal leukoencephalopathy (PML). Differentiating toxoplasmosis from CNS lymphoma is difficult, with significant therapeutic implications. Concentric target sign on T2 weighted MR imaging is more specific than eccentric target sign on post contrast images.

R. Masamed 2009² studied 14 cases of cerebral toxoplasmosis, the majority of patients (70%) had either one or both signs while a smaller number (36%) had both signs simultaneously. Previous literature indicated that these two signs are rarely seen in the same lesion suggesting they reflect different pathological states of toxoplasma lesions in evolution.

S. Bansa 2016³ studied that eccentric target sign correlates histologically with a central enhancing core produced by inflamed vessels at the sulci surrounded by concentric zones of necrosis producing peripheral enhancing ring. The concentric alternating rings correspond pathologically to zones of haemorrhage and necrosis with foamy histiocytes and haemorrhage forming the outer zones.

CONCLUSION-

"Concentric target sign" & "Eccentric target sign" are important sign in cerebral toxoplasmosis in HIV patient. These sign helps cerebral toxoplasmosis to differentiate from other CNS manifestation inn HIV.

REFERENCES

- 1 Roche AD, Rowley D, Brett FM, Looby S. Concentric and eccentric target MRI signs in a case of HIV-associated cerebral toxoplasmosis. Case reports in neurological medicine. 2018 Feb 21;2018.
- 2 R. Masamed, A. Meleis, E. W. Lee, and G. M. Hathout, "Cerebral toxoplasmosis: case review and description of a new imaging sign," *Clinical Radiology*, vol. 64, no. 5, pp. 560-563, 2009.
- 3 S. Bansa, M. Goyal, M. Modi, C. Ahuja, and V. Lal, "Eccentric target sign of cerebral toxoplasmosis," *QJM: An International Journal of Medicine*, vol. 109, no. 8, article 555, 2016.