

Case Report

Imaging of Cerebral Toxoplasmosis: About a Case

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Abstract: Cerebral infection by the protozoan toxoplasma gondii, especially in immunocompromised patients, with preferential cerebral involvement of the cortico-subcortical junction, the thalamus and the NGC. MRI with gadolinium injection plays a fundamental role in the positive diagnosis and the monitoring of patients under treatment.

Keywords: Imaging – MRI - Cerebral Toxoplasmosis.

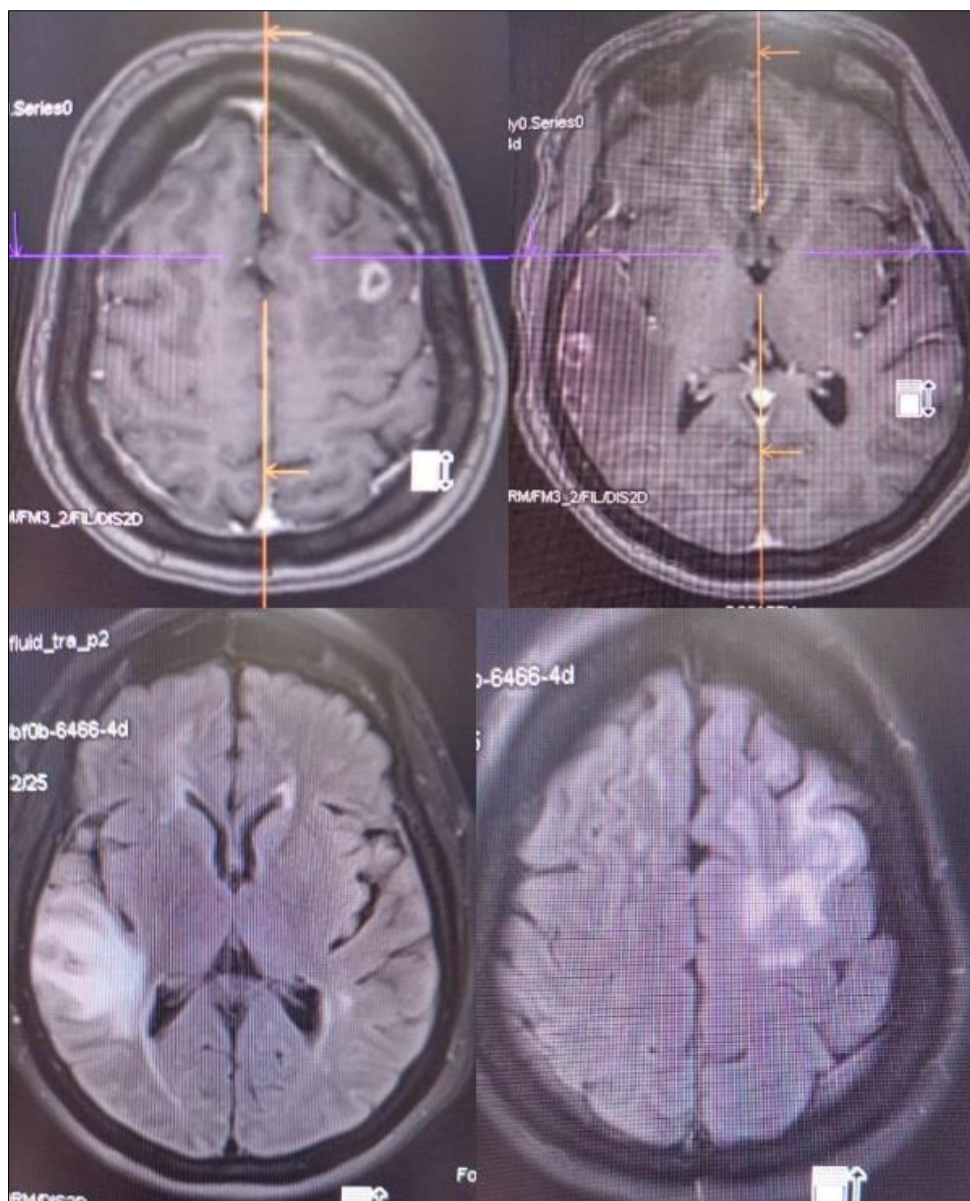
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INTRODUCTION

Brain infection by the protozoan toxoplasma gondii with preferential brain involvement of the cortico-subcortical junction, the thalamus and the NGC. The diagnosis is based on the identification of a risk area, brain lesion compatible with imaging and favorable evolution under probabilistic treatment. MRI with gadolinium injection plays a fundamental role in the positive diagnosis and the monitoring of patients under treatment.

OBSERVATION

61-year-old patient, immunocompromised, on antiviral treatment for 3 years, hospitalized in the Hepato-Gastro-Enterology department for malabsorption syndrome and who has had fever and headaches for 2 months. A CT scan done during her hospitalization showed a right temporal hypodense lesion. An additional MRI made it possible to diagnose cerebral toxoplasmosis (figure) by showing a very evocative typical appearance.



MRI in axial sections:

T2 FLAIR sequence highlighting bilateral hemispheric lesions without mass effect on the lateral ventricles.
 T1 sequence with gadolinium injection: Annular enhancement of toxoplasma cysts within the perilesional edema.

DISCUSSION

The term toxoplasmosis covers all the clinical and biological manifestations related to infection by *Toxoplasma gondii*, a protozoan. Humans are intermediate hosts of this parasite. They are mainly infected by the ingestion of poorly washed fruits and vegetables, contaminated water, or the ingestion of cysts present in smoked or undercooked meats [1].

Dissemination is hematogenous, ubiquitous in the white matter, the cortico-subcortical junction, the thalamus and the central gray nuclei.

The presence of a positive *Toxoplasma gondii* IgG serology in the serum is an important element of the diagnosis (otherwise, the infection is unlikely, but

remains possible). Performing a *Toxoplasma gondii* PCR in the cerebrospinal fluid can help in the diagnosis.

The revealing clinical signs are: fever, headaches, neurological deficits, convulsions, impaired consciousness, decreased visual acuity. Any neurological disorders in an immunocompromised patient should suggest the diagnosis [1].

Lumbar puncture is often contraindicated due to the risk of brain involvement [1].

The scanner, which lacks sensitivity, shows a hypodense lesion with enhanced peripheral shell after injection of PDC. MRI can be very useful, and makes the positive diagnosis as in our case, by showing multiple and diffuse rounded lesions, with significant perilesional

edema. These lesions appear in the form of a T1 hyposignal with nodular or annular enhancement, more rarely in an eccentric target. On the T2 sequence the lesion takes on the appearance of a necrotic mass with a concentric target. While in diffusion, the central signal of the necrosis is low, while the ADC is high. On perfusion sequences, the VSCr is very low. Spectroscopy shows a drop in NAA and a lipid peak [2, 3].

The differential diagnosis is mainly with other infectious pathologies of the brain (tuberculosis, cryptococcosis, nocardiosis, pyogenic abscesses: streptococci, BGN, anaerobes), with cerebral lymphoma, low-grade glial tumor and diffuse encephalitis with HIV, CMV, PML [2-4].

The scanner and MRI play an essential role in the diagnosis but also in monitoring the evolution.

Admission of these patients to intensive care or continuous care unit should be early if necessary. Early symptomatic treatment of intracranial hypertension is an essential factor in management. While first-line treatment includes a combination of pyrimethamine, sulfadiazine and folinic acid orally or via nasogastric tube [2-4].

CONCLUSION

Cerebral toxoplasmosis is a serious opportunistic infection of immunocompromised patients. The diagnosis to be considered in immunocompromised patients in the presence of any neurological sign. Despite a non-specific clinical picture, the MRI aspect in comparison with the CD4 count allows to suggest the etiologic diagnosis in order to start the appropriate treatment as soon as possible.

Conflict of Interest: The authors declare that they have no conflict of interest.

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