A solitary ring-enhancing brain lesion suspected for neurocysticercosis in an adopted Indian patient with late-onset epilepsy resistant to antiepileptic treatment

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INTRODUCTION

Neurocysticercosis (NCC) is the most common neurological parasitic infection worldwide caused by the larval form of the tapeworm Taenia Solium. Infection is transmitted through either a person-to-person spread or by endogenous auto-infection, by means of fecal-oral contamination. After ingestion of the eggs, the embryos actively cross the intestinal mucosa and reach systemic circulation and then the central nervous system, where they develop into cysticerci. Parenchimal cysticerci undergo four stages of involution (vesicular, colloidal, granular and calcific stage). When the parasite begin to die, the fluid contained in vesicular cysts become turbid, the wall thicken, and an inflammatory response ensues characterized by a granulomatous reaction and perilesional edema formation (colloidal stage). This local inflammation is considered a risk factor for the onset of epileptic activity. NCC is the most common cause of acquired epilepsy, occurring in about 30% of patients with seizures in endemic regions such as in the Indian subcontinent and in large regions of the African and Asiatic continents. Few cases have been reported in Italy, the majority of which imported from endemic regions. Here we describe a case of suspected NCC.

CASE PRESENTATION

A 20-year-old man from India, was admitted to our Neurological Department in August 2014 because of a partial seizure with secondary generalisation. He had experienced a tonic contraction of the right limbs followed by loss of consciousness, generalized hypertonia and subsequent clonic contractions of upper and inferior limbs for few minutes. Ad admittance, he was conscious, orientated, afebrile, with a minimal right hemiparesis.

Hystory:

•He was born and had lived in India until he was 3 years old, when he was adopted by a Sicilian family and has been moved in Italy.

•No contacts with pigs or trips in foreign or native countries. No hystory of immunodeficits.

•Diagnosis of bipolar disorder at 17 years of age, treated with valproate.

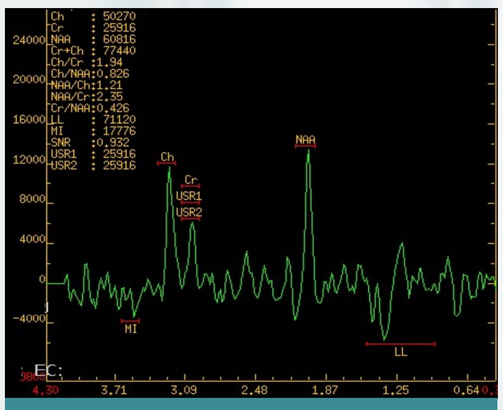
•He had recurrent seizures history since he was 18 years old treated with valproic acid and carbamazepine, without optimal seizures control.

•A CT scan performed in 2012 showed a small hypodense lesion with perilesional partially calcified alone in the left frontal hemisphere, not otherwise characterized.

Brain magnetic resonance imaging (MRI) findings:

•A 15 mm solitary ring-enhancing cystic lesion with a satellite cyst is localized at the gray matter-white-matter junction of the left frontal lobe. Lesion showed hypointensity on T1-w images and a “cyst with a dot” appearance on FLAIR sequences, surrounded by mild perilesional edema. No restricted diffusion was seen on diffusion weighted images.

•MR spectroscopy showed reduced choline and N-acetilaspartate peak, without lipid peak



MRI spectroscopy

Laboratory and others instrumental findings

•Hematologic and blood chemical tests were normal, except for a mild raise of ALT.

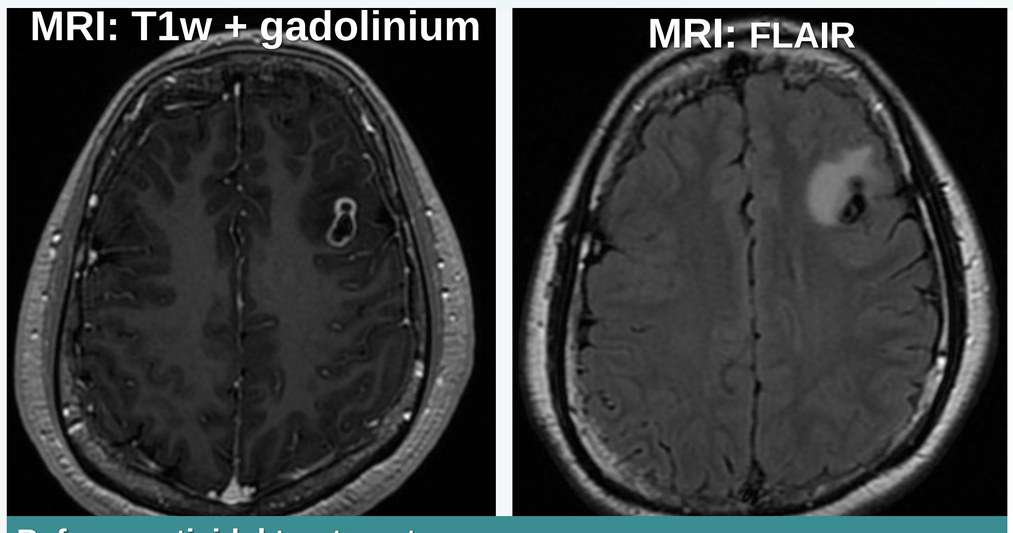
•Carbamazepine dosage was in therapeutic range.

•Cerebrospinal fluid findings were unremarkable except for 10 lymphocytes /mmc.

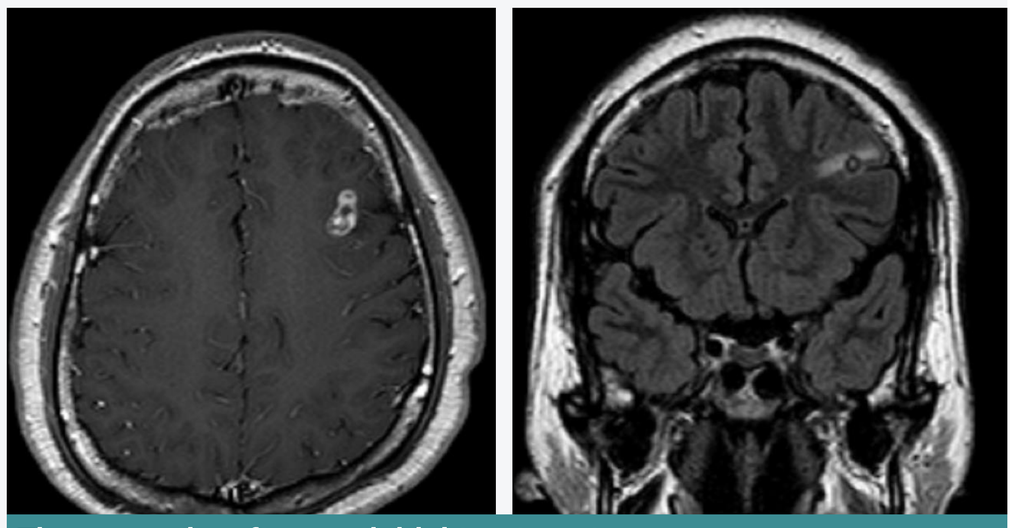
•An immunoblotting assay for detection of antibodies against T. Solium and a PCR for Mycobacterium tuberculosis on CSF gave no pathological results.

•At microbiological and stool sample analyses, no infectious agents were detected.

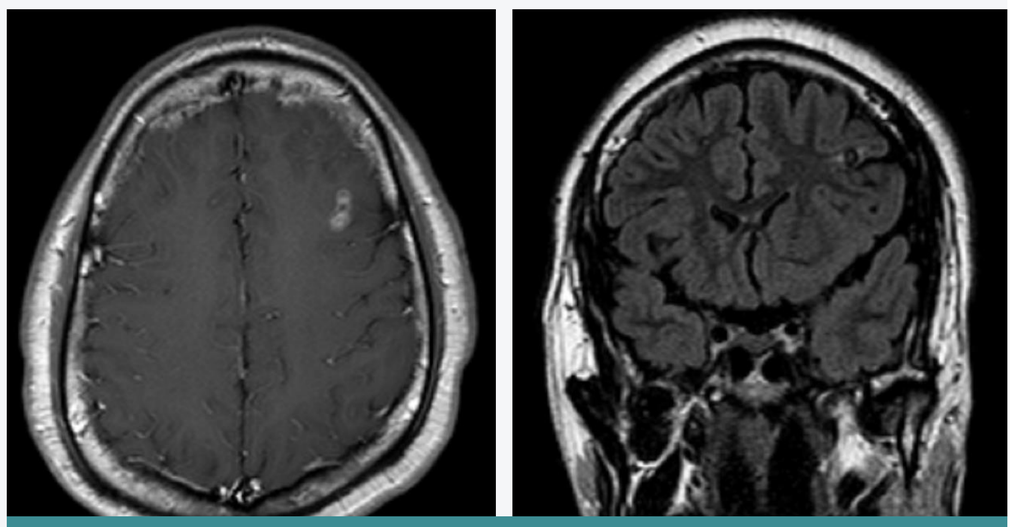
•A chest radiography and an abdominal ultrasonography were also negative.



Before cysticidal treatment



Three months after cysticidal treatment



Six months after cysticidal treatment

Course

Based on the clinical and radiological findings, a diagnosis of neurocysticercosis was supposed. He received an empiric antiparasitic treatment with Albendazole 15 mg/kg in two divided doses for 10 days in conjunction with Dexamethasone 8 mg for 15 days. Also Levetiracetam 1000 mg bid for seizure prophylaxis was started. Under anticonvulsivant therapy the patient remained seizure-free for the subsequent 13 months. The follow-up MRI scans obtained at three and six months show a progressive reduction of perilesional edema but persistence of cyst, that appear reduced in volume.

DISCUSSION AND CONCLUSIONS

Our case well illustrates features typical for colloidal stage of neurocysticercosis (NCC). Infection was probably acquired in India during the first years of life. The cyst remained viable and asymptomatic for up to 15 years and subsequently had degenerated, causing recurrent focal seizures with secondary generalisation.

•Single ring-enhancing small cystic lesions suggesting a “cyst with a dot” appearance on FLAIR MRI sequence, and surrounded by intense perilesional edema are highly suspicious for NCC, especially in endemic regions.

•Differentials diagnosis of ring-enhancing brain lesions include inflammatory granulomas caused by NCC, tuberculosis, toxoplasmosis, cerebral pyogenic or fungal abscess and sarcoidosis, as well as primary or metastatic tumor.

•The diagnosis of neurocysticercosis is based on a combination of clinical features, neuroimaging and immunological findings. Despite currently diagnostic criteria seem to be helpful for the diagnosis of NCC, it can be still a challenge in those cases with a single lesion because of the low specificity of imaging findings and the low sensitivity of immunological tests, with fewer than 50% EITB tests reported positive. Thus, negative results on serological testing do not rule out NCC, as in our case.

•Magnetic Resonance spectroscopy (MRS) can help to diagnosis of ring-enhancing lesions. A high choline peak is seen in case of primary or secondary tumors because of high cellular turnover, whereas, both the two common causes of inflammatory granulomas, NCC and tuberculoma, shows reduction in NAA and creatinine peak, as in our case. Lipid peak at MRS in the context of a ring-enhancing lesion is very specific for tuberculoma and has not been seen in NCC, which is associated to increased lactate peak.

•The negative results of the chest radiography and PCR for Mycobacterium tuberculosis on CSF, as well as the good response to treatment with anticonvulsants, corticosteroids, and cysticidal drugs, as also showed at the follow-up MRI scans, support the diagnosis of neurocysticercosis.

Although neurocysticercosis is rare in Italy and industrialized countries, the disease represent the most important parasitic disease of the human central nervous system and should be always considered in the differential diagnosis of adult-onset seizures with a single ring-enhancing cystic brain lesion, especially in travellers and immigrants from endemic areas.

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