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MIGRATING INTRAVENTRICULAR CYSTICERCOSIS

Magnetic resonance imaging findings

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Neurocysticercosis (NCC) is the most common parasitic infestation affecting the central nervous system (CNS)[1,2]. It is frequent cause of seizures and hydrocephalus in adults from endemic regions, including Brazil[3,4]. Brain parenchymal involvement occurs in 60 to 92% of patients with NCC, but intraventricular (IV) lesions are seen in only 7 to 20% of cases[1,5,6]. Although NCC is usually self-limited by the life cycle of the parasite, intraventricular involvement is often more difficult to manage due to obstruction of cerebrospinal fluid (CSF) pathways and ependymal inflammation[1,2].

Intraventricular neurocysticercosis (IVNCC) can produce mechanical obstruction of CSF flow anywhere in the ventricular system, resulting in hydrocephalus or focal neurological deficits. The symptoms can also result from ependymal inflammation associated with cyst degeneration, or from diffuse meningitis causing communicating hydrocephalus[1,2,7]. The intraventricular cysts may circulate freely throughout the CSF pathways or become attached to the ependyma anywhere in the ventricles, but their predilection is for the occipital horn of the lateral and fourth ventricles[1,4,7]. Although the obstruction of the CSF flow is a common cause of symptoms in patients with IVNCC, reports demonstrating the migrating cysts causing hydrocephalus are extremely rare[8,9].

We report a case of intraventricular neurocysticercosis presenting with hydrocephalus due to third ventricle obstruction secondary to migrating cysticercus.

CASE

A 29-year-old female patient presented with acute onset of severe headache and nausea. The neurological and ophthalmologic examinations were unremarkable. She referred a history of neurocysticercosis two years before, which was treated with albendazole. At that time, the MR imaging showed multiple well-defined round lesions in the frontal horn of the left lateral ventricle, which had high signal on FLAIR, T1- and T2-weighted images, showing no significant enhancement after contrast administration. These lesions were occasioning mild compression

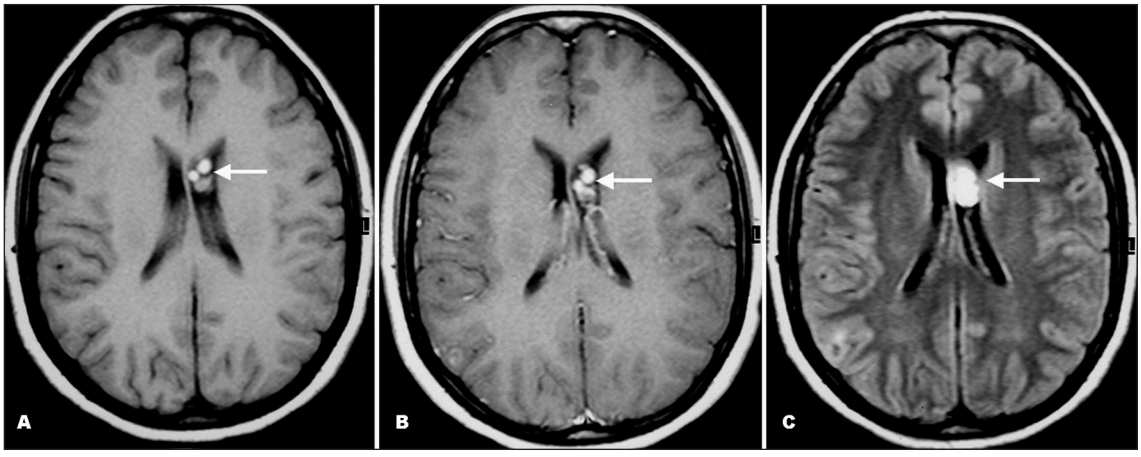

Fig 1. Axial T1-weighted pre- (A) and post-gadolinium (B) and FLAIR (C) MR images demonstrate multiple well-defined round lesions in the frontal horn of the left lateral ventricle, with high signal on both sequences, and with no significant enhancement after contrast administration (arrows).

NEUROCISTICERCOSE INTRAVENTRICULAR MIGRADA: ACHADOS DE RESSONÂNCIA MAGNÉTICA

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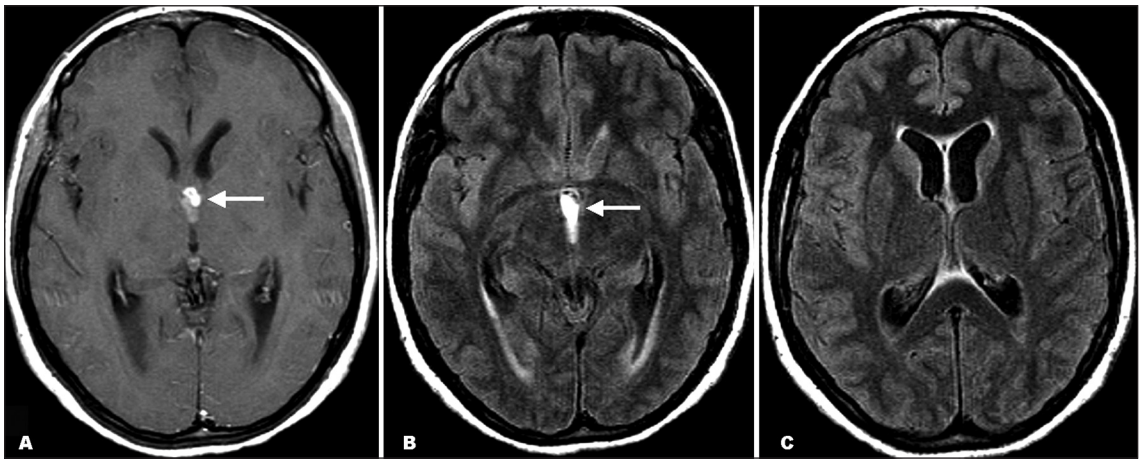

Fig 2. Axial T1-weighted post-gadolinium (A) and FLAIR (B and C) MR images show a third ventricle multiloculated mass showing mild ring enhancement after contrast administration (arrow). The lesion was obstructing the CSF flow (arrow), resulting in mild hydrocephalus and discrete ependimary transudation.

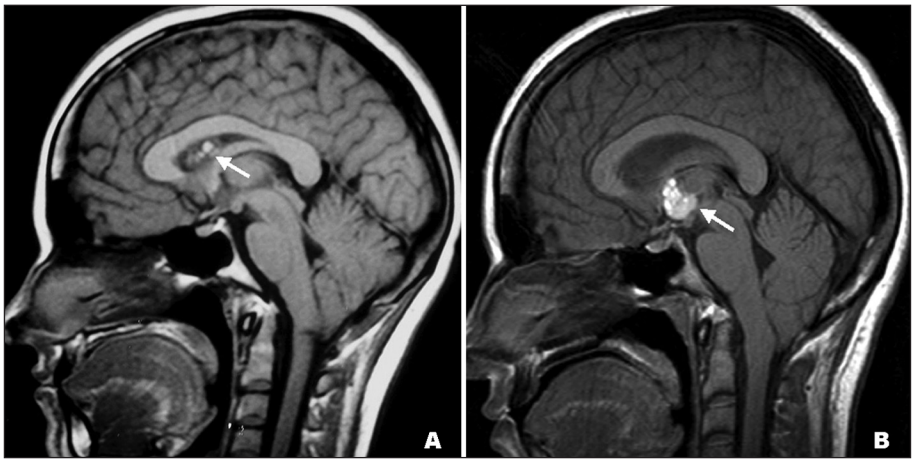

Fig 3. Sagittal T1-weighted MR images demonstrate a multiloculated lesion in the lateral ventricle (arrow) in the first exam (A), and the lesion migrating to the third ventricle (arrow) on the follow-up (B).

on the septum pellucidum. The third and lateral ventricles had normal size, with no signals of hydrocephalus (Fig 1).

Laboratorial investigation, routine blood chemistry findings were normal. The CSF revealed 94 white blood cells with 58% segmented neutrophils and 36% lymphocytes, protein level was 47 mg/dL, and glucose level was 52 mg/dL. The CSF was negative for VDRL, toxoplasmosis and HIV antibodies, and the CSF culture was sterile. The CSF immunofluorescence and ELISA tests were negative for cysticercosis antibodies.

The new MR imaging demonstrated a third ventricle multiloculated mass with high signal on FLAIR, T1- and T2-weighted images, showing mild ring enhancement after contrast administration. The lesion was obstructing the CSF flow, resulting in mild hydrocephalus and discrete ependimary transudation (Figs 2 and 3). No scolex or additional ventricular and parenchymal lesions were seen.

Because the worsening symptoms, she underwent a surgery for evacuation of the third ventricle lesion. During the surgery, several cysts were removed. However, because the severe arachnoidal and ependymal scarring, it was not possible to remove the lesion completely. The histological examination confirmed the diagnosis of racemosus cysticercosis.

The patient gave informed consent for the publication of the case.

DISCUSSION

Cysticercosis is the most common parasitic infestation of the CNS, and it is caused by *Taenia solium's* invasion in its larval stage. The CNS involvement occurs in 60 to 90% of patients with cysticercosis[4-6]. Brain parenchymal involvement occurs in 60 to 92% of cases, but IV NCC occurs in only 7 to 20% of patients[1,4,6].

The IV NCC is frequently caused by *Cysticercus cellulosae*, however *Cysticercus racemosus* can also infect the ventricular system[1,4]. The lesions are more commonly seen in the IV ventricle (54-64%), followed by the III ventricle (23-27%), the lateral ventricles (11-14%) and Sylvius aqueduct (9%)[1,2,4]. Intraventricular cysts may become symptomatic at the time of implantation secondary to

obstruction of CSF flow, with consequent hydrocephalus and the symptoms and signs of increased intracranial pressure. When involution begins, the inflammatory reaction around a dead or dying cyst produces ependymitis, scarring, obstruction, and ventriculitis[1,2,4,7].

Reports demonstrating intraventricular migrating neurocysticercosis are rare[8,9]. Thomas et al.[9] reported a 10-year-old boy, who presented with headache and vomiting of one-week duration. The MR imaging showed marked hydrocephalus, and a cystic lesion isointense to CSF, with a thin wall and a small nodule (scolex) in the left temporal horn. The contrast images performed 20 minutes later revealed migration of the cyst to the occipital horn.

In this report, we present a rare case of migrating intraventricular cysticercosis obstructing the third ventricle, presenting with headache and nausea secondary to hydrocephalus. The patient referred a previous diagnosis of neurocysticercosis, and the prior MR imaging showed lesions suggestive of NCC at the frontal horn of the left lateral ventricle. The follow-up MR imaging demonstrated a multiloculated enhancing mass in the third ventricle, with secondary dilatation of the lateral ventricles. No other lesion were seem Although a surgical approach was performed, the lesion could not be completely removed due to severe arachnoidal and ependymal scarring.

In conclusion, intraventricular neurocysticercosis is an uncommon form of the disease, which can present as migrating cysts resulting in CSF flow obstruction and hydrocephalus. The surgical treatment can be indicated, but complete resection of the cysts can be difficult due to the arachnoidal and ependymal scarring secondary to the lesions.

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