

# The important therapeutic approach for Cerebral Living Free Amebiasis : A case report

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## ABSTRACT

Because of non-specific symptoms and a shorter latency period, cerebral amebiasis is one of the most difficult diseases to diagnose and treat.

The few cases of cerebral amebiasis reported in the world literature mainly from Latin American countries.

There are three strains of amoebiasis may contaminate the man *Acanthamoeba* spp, *Naegleria Fowleri* who have a poor prognosis and *Balamuthia Mandrillaris*. We report a case of cerebral amebiasis in a woman of 55 years revealed by a cold and the progressive installation of neurological signs. After exploration, the diagnosis of cerebral amebiasis is made. Empirical treatment of first and second line is established with consolidated success by continuing treatment at home.

**Keywords :** Amebic Meningoencephalitis, Cerebral Abscess, *Balamuthia Mandrillaris*.

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## [ SPANISH VERSION ]

**El enfoque terapéutico importante para la amebiasis libre de la vida cerebral: reporte de un caso.**

### I. RESUMEN

Debido a síntomas inespecíficos y un período de latencia más corto, la amebiasis cerebral es una de las enfermedades más difíciles de diagnosticar y tratar. Los pocos casos de amebiasis cerebral informados en la literatura mundial, principalmente de países latinoamericanos. Hay tres cepas de amebiasis que pueden contaminar al hombre *Acanthamoeba* spp, *Naegleria Fowleri* que tiene un mal pronóstico y *Balamuthia Mandrillaris*. Presentamos un caso de amebiasis cerebral en una mujer de 55 años revelada por un resfriado y la instalación progresiva de signos neurológicos. Después de la exploración, se realiza el diagnóstico de amebiasis cerebral. El tratamiento empírico de primera y segunda línea se establece con éxito consolidado al continuar el tratamiento en el hogar.

**Palabras clave:** Meningoencefalitis amebiana, absceso cerebral, *Balamuthia mandrillaris*.

### II. BACKGROUND

Amoebas are organisms that can mainly be found in water and soil, but also in patients' noses and throats, and were first verified to cause diseases in humans in 1972. [1]

There are three amebiasis strains that are found in humans: *Acanthamoeba* spp., *Naegleria Fowleri* and *Balamuthia Mandrillaris*.

Free-living amoebas cause the following two neurological diseases: primary amebic meningoencephalitis (PAM) caused by *Naegleria Fowleri*, especially in children and young adults; and granulomatous amebic encephalitis (GAE) caused by *Acanthamoeba* spp. or *Balamuthia Mandrillaris*.

The symptoms of PAM resemble those of meningoencephalitis (fever, headache, nausea, emesis and signs of irritation of the meninges) leading to confusion, irritability, convulsions, focal neurological deficits, coma and death within a week. [2],[3],[4],[5],[6],[7]

GAE is a sub-acute, prolonged and/or chronic infection with signs of space-occupying lesions and convulsions, focal deficits such as hemiparesis, and cranial nerve lesions. Sensory alterations, headaches, stiffness of the neck and fever may or may not be present.

Most cases of amebiasis have been reported because of climate conditions in the southern United States of America, Great Britain, Australia, New Zealand, Czech Republic and India, with the highest frequencies being recorded in Latin America (Colombia, Peru and Mexico). [2],[4]

Even though the exact number of nervous system infections is unknown, in 1990 it was supposed that 72% of the around 200 cases reported until then were PAM. 28% (56 cases) were referred to as either *Acanthamoeba* or other free-living amoebas causing GAE. [15]

Magnetic resonance imaging (MRI) is imaging diagnosis depends on clinical presentation is useful in both, because allowing to observe characteristic lesions at the level of the basal nuclei. The authors aim to discuss the therapeutic approach used and to raise awareness of this very serious disease and the immediate treatment required to treat it.

### III. CLINICAL PRESENTATION

A 55-year-old immunocompetent woman of a low socioeconomic status from Coyuca, Guerrero, Mexico, living without running water or a proper sewage system, presented with a month-long history of odynophagia, a headache measuring up to 8/10 in intensity that decreased with conventional analgesics, fever, rhinorrhea, and nosebleeds that were treated using a laser due to capillary fragility. Upon neurological examination, she was found to have right-sided hemiparesis and dysphasia.

48 hours later, she presented a worsening and holocranial headache of 9/10, asthenia, myalgia, arthralgia and fever. A neurological examination demonstrated a decrease in hemicorporal strength of 2/5 on the right side and 3/5 on the left, alterations in sleep-wakefulness, aphasia, a positive Babinsky reflex and hyperreflexia on both sides.

Suspecting a brain abscess or tumor, a computerized tomography and magnetic resonance were instantly taken. Anticonvulsant and anti-edema treatment

was started and a stereotactic biopsy was taken. The macroscopical aspect of the biopsy emerged as being purulent, so we immediately started antibiotic therapy with ceftriaxone and metronidazole.

A lumbar puncture showed an elevation in polymorphonuclear leukocytes, proteins and an increase in glucose.

The result of the biopsy confirmed a free-living amoeba *Balamuthia Mandrillaris* cerebral abscess. We continued the 21-day treatment with metronidazole and ceftriaxone, and prophylactically added albendazole in case of other undetected foci, which we tried to exclude with ultrasound, chest x-ray, endoscopy and colonoscopy.

21 days later we changed the therapy to a second-line treatment for a total of 60 days using fluconazole, trimethoprim/sulfamethoxazole and clarithromycin, as it had shown a good level of efficiency against cerebral amebiasis in previous cases. [10],[11],[12],[13]. We add a table of empirical medications most used for this disease<sup>table1</sup>.

A control brain magnetic resonance was taken 21 days later, which fortunately showed a reduction in the size of the lesions.

### IV. DISCUSSION

Even though cerebral amebiasis is a really rare disease, when present it is nearly always lethal. This makes it really important to secure a diagnosis as soon as possible.

Neither clinical symptoms nor neuroimaging can distinguish amoeboid meningoencephalitis from cerebral abscesses and/or brain tumors. Therefore, surgery or a biopsy is always necessary for the definitive diagnosis. This is a low-incidence disease, thus, unfortunately, cerebral amebiasis is confirmed in the postmortem in the majority of cases.

A cerebrospinal fluid examination (CSF) in patients with cerebral amebiasis shows pleocytosis with a predominance of polymorphonuclear neutrophils, elevation of proteins, and normal or slightly decreased glucose levels. The diagnostic key in CSF is the microscopic presence of motile amoebic trophozoites (9-14 micrometers in diameter) in a fresh CSF. [6]

PAM can be diagnosed, in most of the cases, by the presence of amoebas in the CFS. [9]

In our case it wasn't possible to diagnose an amoebic infection using the CSF due to earlier treatment.

Neuroimaging (MRI and CT) shows a single or multiple hypodense lesions, compared to tumors, abscesses and cerebral hemorrhage, which are not enhanced by the contrast medium. In such cases you would observe the enhancement of acetate or succinate, and the diminishment of N-acetylaspartate in a nuclear magnetic resonance spectroscopy.

Nevertheless, a brain tissue biopsy is invaluable. It displays the presence of trophozoites or amoeba cysts. Although it is very difficult to differentiate between *Acanthamoeba* spp. and *Balamuthia mandrillaris* using an

optical microscope alone, one can find more than two cell nuclei in the trophozoites of *Balamuthia mandrillaris*, while *Acanthamoeba* spp. only have one. However, for a definite differential diagnosis, immunofluorescence or an electron microscopy will diminish any remaining doubt.

Finally, *Acanthamoeba* spp. may be cultivated easily on agar enriched with bacteria, whereas *Balamuthia mandrillaris* cannot grow on agar.

Early and correct use of the anti-amoebic drugs facilitates the abrasiveness of cerebral amebiasis. We have preference in the treatment of suspected these infections with ceftriaxone and metronidazole as initial treatment. With the diagnostic confirmation of infection cerebral amebiasis, we employ definitive antibiotic treatment with fluconazole, clarithromycin and trimethoprim / sulfamethoxazole, for three months, and at the end of antibiotic treatment should be performed MRI skull new control. If MRI brain lesions persist, continue with antibiotic treatment scheme until disappearance of all lesions, treatment can be extended to two years of treatment. It can also be used as alternative antibiotics Sulfadiazine, Anfotwericina B, flucytosine and pentamidine. (Table 1)

For our patient's first month of treatment, we used a more conservative and less aggressive anti-amoebic treatment with ceftriaxone and metronidazole. Subsequently we completed the therapy regimen using clarithromycin, trimethoprim/sulfamethoxazole, and fluconazole. Consequently, we achieved excellent results both in neuroimaging and clinical findings.

Treatment essentially consists of the aspirate is purulent secretion and / or hemorrhagic injury. It is most important to the success of the treatment step. During her neurological examination at the moment of discharge, the patient presented mobilization of all four limbs and gradual recuperation of strength (3/5 on the right side and 4/5 on the left) and speech. With continued physical rehabilitation therapy and oral anti-amoebic treatment at home to complete the 60-day treatment, she has the guarantee of being cured with a good prognosis for a high quality of life. After being discharged, she never returned to our hospital.

## V. CONCLUSION

On account of its unspecific symptoms and incubation period, cerebral amebiasis is one of the most difficult pathologies to diagnose and treat. Bearing in mind that most of these infections are predominantly lethal, it is extremely important to diagnose and treat it as quickly as possible.

An accurate medical history and understanding of the time and character of the disease's evolution, complemented with neuroimaging and surgical intervention, are essential for an early diagnostic procedure.

Cerebral amebiasis should always be considered for patients with single or multiple lesions presented with edema of the brain and atypical encephalitis.

All diagnostic methods, from hospitalization, to the extraction of biopsy material and initial treatment, are not just a challenge for neurosurgery but have to be managed by a multidisciplinary team.

## VI. DISCLOSURE

The authors have no personal, financial or institutional interest in any of the drugs, materials, or devices described in this article.

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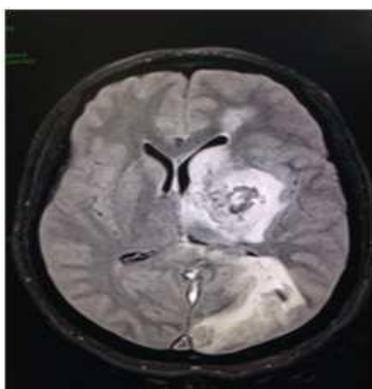
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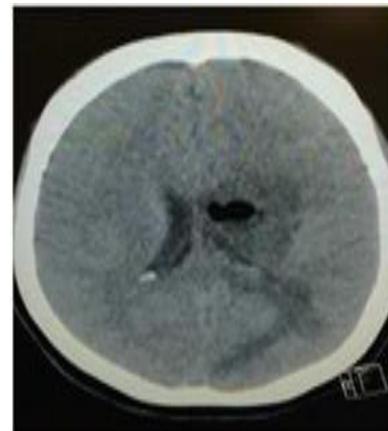
**Table 1: most commonly used anti-amoeba therapies**

Most used antibiotics							
Clarithromycin	Sulfadiazine	Fluoxysine	Fluconazole	Pentamidine	Amphotericin B	TMP - SMZ	Metronidazole
+++	++	+	+++	++	+++	++	+++
++	+	+	+	+	+	++	++
++			+	+		++	+
+			+	+		++	+

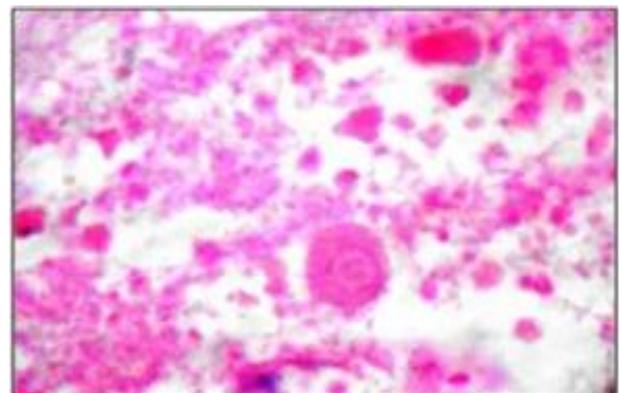
**Fig. 1:** Axial MRI FLAIR: extent of edema in the gray nuclei on the left the left parietal lobe with signs of haemorrhage and necrosis



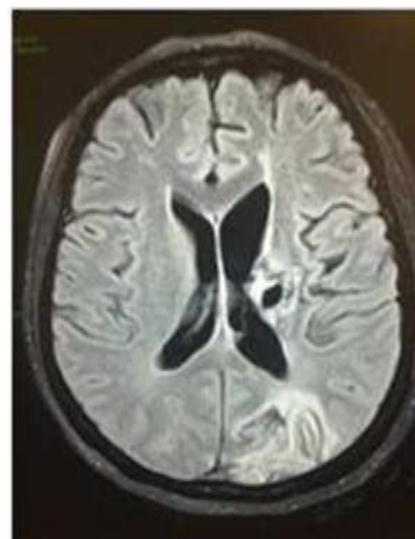
**Fig. 2** Basic cranial computed tomography control at the biopsy level was taken, and the bulk of the treatment.



**Fig. 3:** cytological study, hemalun-eosin, 100X: one can find a necrosis with submerged erythrocytes and trophozoites with a central nucleus, nucleolus and halo.



**Fig. 4:** Axial T1 MRI head with gadolinium: the majority of lesions are made visible at the resolution used.



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