Pyogenic Brain Abscess with Spontaneous Intraventricular Rupture

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Disclosure

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Introduction

• Brain abscess incidence varies according to the population studied, being higher in developing countries with 8% incidence.

• 0.3 to 1.3 cases per 100,000 habitants in Mexico.

• An intraventricular rupture of a brain abscess (IVRBA) is a rare and potentially fatal complication that could lead to ventriculitis, raised intracranial pressure and even death.

• Mortality rate can reach up to 80%.

• We present a case of an IVRBA treated successfully.
Methods

- 59 year old male with a past medical history of DM2 of 10 years of evolution, presented with a sudden onset headache and generalized tonic-clonic seizures.

- Initial MRI showed a left frontal lesion of 3cc volume, with ring-enhancement and surrounding edema, adjacent to the frontal horn of the left ventricle with ventricular disruption.

- Conservative treatment started with empirical IV antibiotic therapy, nevertheless, he developed symptomatic hydrocephalus.

- A right external ventriculostomy was placed and cerebrospinal fluid (CSF) showed a leukocyte count of 21,700.

- Culture positive for *Staphylococcus aureus*.

- Fifteen days later he developed a contralateral ventricular dilation, a second contralateral ventriculostomy was placed and CFS parameters gradually improved.

- Sixty days later a neuroendoscopy with interventricular septum fenestration and placement of a ventriculoperitoneal shunt was performed, remaining without recurrence at the time with 6 months follow-up.
Figure 1. T1-weighted gadolinium-enhanced magnetic resonance imaging of the brain

A) Axial image, 3cc volume frontal lesion with ring-enhancement and surrounding edema (red arrow).

B) Coronal image, the lesion is observed adjacent to the frontal horn of the left lateral ventricle, probable ventricular disruption is observed.

C) Axial image, changes of intraventricular intensity in occipital horn.
Figure 2. T1-weighted gadolinium-enhanced magnetic resonance imaging of the brain, 30 days after treatment.

A) Axial image, ependymal enhancement in both lateral ventricles.

B) Coronal image, abnormal signal is observed in Monroe foramina, which could cause interventricular communication occlusion.

C) Axial image, dilatation of the fourth ventricle is observed.
Figure 3. T1-weighted gadolinium-enhanced magnetic resonance imaging of the brain, 90 days after treatment.

A) Axial image, intraventricular septations in lateral ventricles with increased thickness of the interventricular septum.

B) Axial, fourth ventricle remains dilated.
Discussion

• An early diagnosis and treatment is crucial to a successful outcome.

• The classic symptoms of a brain abscess are headache, nausea/vomiting, fever, focal neurologic signs and seizures.

• In this case he only presented with headache and generalized tonic-clonic seizures, which occur in up to 40% of patients with brain abscess.

• No clinical signs of infection elsewhere.

• Diagnosis was made due to classic MRI findings, a ring-enhancing lesion with surrounding vasogenic edema.
The most commonly surgical intervention used is an external ventricular drain (EVD), which was needed bilaterally to compensate the ventricle dilatation. Literature review showed that intraventricular septations resulting in isolated ventricular dilatation is a late complication, often prevented by intraventricular irrigation with antibiotics in early stages.

Because in some cases of IVRBA the ventricles become loculated with fibrous bands that prevent free circulation of the CSF, neuroendoscopy may be useful in removing the debris and breaking the septations.

A study demonstrated that after three consecutive CSF culture reports reported sterile and a stable status of the patient, the EVD can be removed. In this case once infection was ruled out, a ventriculoperitoneal shunt was performed.
Summary points

• Regardless of current advances in diagnosis and treatment, IVRBA remains a dreaded complication, and specification of the best treatment hasn’t been established.

• This case was managed initially conservative, then two ventriculostomies were made and surgery performed once the ventriculitis improved completely and when CSF didn’t show any leukocytes, leading to survival with good neurological recovery.