

CASE REPORT

Herpes simplex virus Type 1 encephalitis in an adolescent presenting with acute hydrocephalus

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Abstract

Herpes simplex virus Type 1 (HSV-1) is a human neurotropic virus causing encephalitis, corneal blindness or several peripheral nervous system disorders. Herpes Simplex encephalitis (HSE) is the most devastating clinical syndrome with severe morbidity and mortality. Hydrocephalus associated with viral meningoencephalitis is an extremely rare entity with only few documented cases, predominantly due to HSV-2 infection. HSV-1 infection of central nervous system present in the majority of the cases as encephalitis. We report a rare case of an 11-year-old child suffering from HSV-1 infection of central nervous system causing hydrocephalus without evidence of encephalitis.

INTRODUCTION

Viral meningoencephalitis leading to hydrocephalus is an extremely rare entity with only few documented cases, predominantly due to HSV-2 infection. Herpes simplex virus Type 1 (HSV-1) infection of central nervous system present in the majority of the cases as encephalitis. We report a case of HSV-1 encephalitis without clinical signs presenting with occlusive hydrocephalus.

CASE REPORT

An 11-year-old boy was presented to the emergency pediatric department with high fever (38.5°C), coughing and a 3 day vomiting history. His Glasgow Coma Scale (GCS) was 15 with no focal neurological deficits. He was initially admitted to the pediatric department and underwent a thorough examination with chest X-ray, full blood count and abdomen ultrasound, which were uneventful. Within the next hours severe headache,

confused mental status with GCS score to 13, photophobia and neck stiffness were shown. An emergent computerized tomography (CT) revealed acute hydrocephalus (Fig. 1).

An external ventricular drain was placed. Cerebrospinal fluid analysis of the intraoperative sample revealed 27 cells/ μ l, with <20 mg/dl glucose and 61 mg/dl albumin concentration, respectively. Gram-stain and culture were negative for bacteria. Moreover, cerebral spinal fluid (CSF) was sent for polymerase chain reaction (PCR) examination of HSV-1,-2, Varicella zoster Virus, Enteroviruses, West Nile and Dengue viruses. The results were positive for HSV-1.

The magnetic resonance imaging (MRI) of brain showed massive occlusive hydrocephalus (Fig. 2). He received treatment for HSV-1 encephalitis with acyclovir (30 mg/kg/d) for 21 days. Several attempts to wean off the ventricular drain were unsuccessful and he underwent a ventriculo-peritoneal shunt on the 25th day (Table 1). He was discharged in an intact neurological condition.

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DISCUSSION

Due to the fact that aqueduct is the narrowest segment of CSF pathway, it is the commonest site of intraventricular obstruction. Stenosis is responsible for 6–66% of cases of pediatric hydrocephalus. There are two peaks of distribution of age, one in the first year of life and the second in adolescence [1]. Aqueductal stenosis is not to be considered a stable condition. Often it may be tolerated for years [2] in a condition described by Oi et al. [3] as arrested hydrocephalus used for patients who may harbor an undetected stenosis. To these mechanisms accounted a partially occluded aqueduct, employment of alternative CSF pathways and alteration in CSF production [3]. It is also suggested that head injuries, subarachnoid hemorrhages or viral infections may worsen the occlusion [4].

In viral infections, the mechanism is attributed either to an ependymitis leading to desquamation of ependyma with subsequent mechanical obstruction [5] or to a cross linking between ependymal cells caused by viral particles bridges [6]. At the aqueduct location, where continuous CSF bathing with released viruses takes place, the high accumulation of particles promotes this process [6]. In addition to that the pathological

findings and subsequently the radiological ones do not prove a gliosis compared to the bacterial infections [1].

The majority of the documented cases of viral infection and hydrocephalus development are mostly attributed to HSV-2 infection, which causes usually meningitis and shows a more benign course compared with the HSV-1 [7]. One characteristic case of HSV-1 encephalitis and hydrocephalus was described by Tyagi et al. [8].

Due to the infection presence [9] and the prolonged hospitalization period of the child who might be burdened with a potential reoperation of stoma obstruction after a third ventriculo-stomy, the ventriculo-peritoneal shunt implantation was preferred.

Epitomizing the aforementioned issues, it could be concluded that by the presence of hydrocephalus without a gross obstructing intracranial lesion the suspicion of subclinically manifested viral encephalitis should be raised and thus the PCR for HSV-1 should also be included in the diagnostic tests as well, defining on the same time the optimal surgical treatment.

CONFLICT OF INTEREST STATEMENT

The authors report no conflicts of interest.

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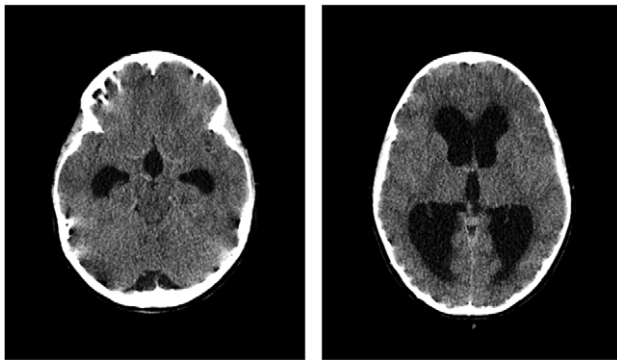


Figure 1: CT scan of the brain showed acute hydrocephalus with massive dilatation of lateral and third ventricles (at mesencephalon and thalamus levels, respectively).

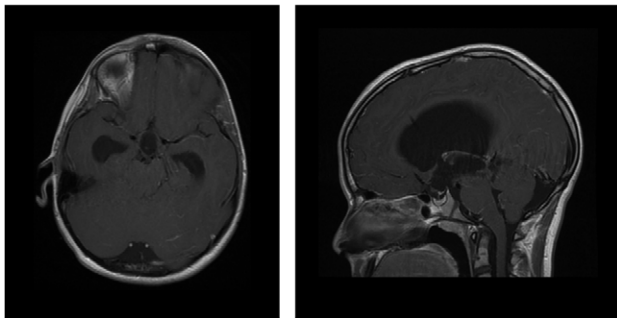


Figure 2: MRI of brain enhanced with contrast agent showing ventricular dilatation with aqueducts occlusion (axial and sagittal sequences, respectively).

Table 1 Accumulative CSF analysis results

	Day 0	First post-op. day	Fifth post-op. day	Eighth post-op. day	12th post-op. day	17th post-op. day	22nd post-op. day
CSF							
Cells	27/ μ l	5/ μ l	5/ μ l	10/ μ l	12/ μ l	2/ μ l	0/ μ l
Glucose	<20 mg/dl	68 mg/dl	50 mg/dl	57 mg/dl	54 mg/dl	60 mg/dl	54 mg/dl
Albumin	61 mg/dl	48 mg/dl	<20 mg/dl	<20 mg/dl	20 mg/dl	<20 mg/dl	<20 mg/dl
Gram-Stain	Negative	Negative	Negative	Negative	Negative	Negative	Negative
PCR	+ for HSV1						