Case Report

Acute Hydrocephalus in a Case of Mumps Meningoencephalitis: A Rare Occurrence

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Mumps is an acute viral illness, which presents with glandular and/or nervous system involvement. The most common central nervous system (CNS) manifestations of mumps include aseptic meningitis and meningoencephalitis. Mumps meningoencephalitis, which is characterized by fever, vomiting, nuchal rigidity, and altered sensorium, usually develops at least 3–10 days after mumps parotitis. Acute hydrocephalus secondary to mumps meningoencephalitis is rare. In experimental animal studies, hydrocephalus secondary to the aqueductal stenosis in mumps infection has been documented,[1] whereas only a limited number of human case reports are available in the literature.[2] Communicating hydrocephalus is a consequence of accumulation of inflammatory debris and obstruction of arachnoid granulations. Here we report a child who developed acute hydrocephalus following mumps meningoencephalitis and who was treated with external ventricular drainage (EVD) following which he showed exceptional recovery.

Keywords: External ventricular drainage, hydrocephalus, mumps meningoencephalitis

Introduction

Mumps is an acute viral illness, which presents with glandular and/or nervous system involvement. The most common central nervous system (CNS) manifestations of mumps include aseptic meningitis and meningoencephalitis. Mumps meningoencephalitis, which is characterized by fever, vomiting, nuchal rigidity, and altered sensorium, usually develops at least 3–10 days after mumps parotitis. Acute hydrocephalus secondary to mumps meningoencephalitis is rare. In experimental animal studies, hydrocephalus secondary to the aqueductal stenosis in mumps infection has been documented,[1] whereas only a limited number of human case reports are available in the literature.[2] Communicating hydrocephalus is a consequence of accumulation of inflammatory debris and obstruction of arachnoid granulations. Here we report a child who developed acute hydrocephalus following mumps meningoencephalitis and who was treated with external ventricular drainage (EVD) following which he showed exceptional recovery.

Case Report

A 12-year-old boy presented to emergency department with history of fever of 7 days and bilateral swollen parotids of 5 days followed by altered level of consciousness of 1 day. Fever was intermittent, moderate grade, and not associated with chills or rigors. There was no history of skin rash, seizures, headache, vomiting, sensory disturbances, or motor weakness. Systemic examination showed bilateral asymmetric swollen nontender parotids. On neurological examination, child was stuporous, moving all limbs to painful stimulus. Pupils were equal but sluggishly reactive. Fundus examination showed bilateral papilledema. Meningeal signs were positive. Complete blood count showed mild leukocytosis. Liver function tests, renal function tests, and serum electrolytes were normal. Brain magnetic resonance imaging (MRI) with contrast showed acute communicating hydrocephalus with periventricular hyperlucency [Figure 1]. Cerebrospinal fluid (CSF) analysis showed lymphocytic pleocytosis (145 cells) with mildly raised protein and normal glucose level. CSF Gram's stain, smear for acid-fast bacillus, and culture were negative. Virological screening of CSF showed positive reverse transcriptase polymerase chain reaction for mumps virus.
reaction (RT-PCR) for mumps virus ribonucleic acid (RNA). Serum mumps-specific immunoglobulin (Ig)M and IgG antibodies were positive. The child underwent EVD following which he had good recovery. A repeat computed tomography (CT) of brain carried out postoperatively showed resolution of hydrocephalous [Figure 2]. He was discharged on symptomatic treatment and was advised to regularly follow up with serial CT of brain.

**Discussion**

Mumps is an acute self-limited contagious infection caused by mumps virus, which is an RNA virus belonging to the genus Rubulavirus in the family Paramyxoviridae. CNS infection is the most common extrasalivary-gland manifestation of mumps infection. Clinically, manifest meningitis occurs in 1%-10% and encephalitis in 0.1% of mumps infections. Mumps meningoencephalitis is usually encountered 3–10 days after parotitis and is characterized by fever, vomiting, nuchal rigidity, and altered sensorium. However, mumps meningoencephalitis may precede or even occur in absence of glandular involvement.

In a study by Bang and Bang,[3] 62% of mumps cases had an increased number of cells in CSF, whereas only 28% had CNS symptoms. Acute hydrocephalus following mumps meningoencephalitis is very rare.[4] There is clinical and experimental evidence for aqueductal stenosis and hydrocephalus caused by mumps CNS infection. Timmons and Johnson[5] first proved the relationship of mumps virus with hydrocephalus following meningoencephalitis in humans. Although hydrocephalous is rare, few case reports reporting relationship between mumps encephalitis and hydrocephalus have been described. Majority of these cases had hydrocephalus secondary to aqueductal stenosis.[6] Lahat et al.[7] reported hydrocephalus in mumps meningoencephalitis secondary to obstruction in the foramen of Monro. The presence of cytoplasmatic inclusions of viral nucleocapsid-like material in the CSF of patients with mumps meningitis supports the hypothesis that mumps may cause granular ependymitis and subsequent aqueduct occlusion. Nandan et al.[8] reported the first Indian case of a hydrocephalus because of aqueductal stenosis as a consequence of mumps meningoencephalitis.

![Figure 1: MRI brain flair- fluid attenuated inversion recovery (FLAIR) axial image showing communicating hydrocephalous with periventricular hyperintensities (red arrow)](image-url)
A laboratory diagnosis is based on isolation of the mumps virus, detection of viral nucleic acid, or serological confirmation, generally by measurement of IgM antibody concentrations. In our case, the diagnosis of mumps meningoencephalitis was confirmed serologically by enzyme-linked immunosorbent assay (ELISA) test for mumps-specific IgM antibodies and by RT-PCR detection of mumps virus RNA in CSF. Ventriculoperitoneal and ventriculoatrial shunts are the treatment of choice in acute cases. Our patient was managed by EVD and had good recovery without neurological sequelae.

Mumps meningoencephalitis is usually a self-limited condition, but rarely can cause serious neurological complication. Acute hydrocephalus resulting from mumps meningoencephalitis is very rare, which was managed acutely by EVD with excellent recovery. We would like to emphasize the importance of this rare complication associated with mumps infection where in timely early intervention can prevent serious and permanent neurological sequelae.

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Conflicts of interest
There are no conflicts of interest.

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