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CASE REPORT

Hideo Hamada
Masanori Kurimoto
Toru Masuoka
Yutaka Hirashima
Shunro Endo
Jun Harada

A case of surgically treated acute cerebellitis with hydrocephalus

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H. Hamada (✉) · M. Kurimoto
T. Masuoka · Y. Hirashima · S. Endo
Department of Neurosurgery,
Toyama Medical and
Pharmaceutical University, 2630 Sugitani,
Toyama 930-0194, Japan
e-mail: hideo@ms.toyama-mpu.ac.jp
Tel.: +81-764-342281
Fax: +81-764-345034

J. Harada
Saiseikai Takaoka Hospital, Toyama, Japan

Abstract We report a pediatric case of acute cerebellitis with hydrocephalus requiring emergency placement of external ventricular drainage. A 7-year-old boy presented with acute development of headache, nausea and vomiting. Magnetic resonance (MR) examination revealed obstructive hydrocephalus and marked bilateral cerebellar swelling on T2-weighted imaging. After the placement of external ventricular drainage, symptoms of intracranial hypertension promptly improved, and other clinical and radiological abnormalities gradually resolved following intravenous injection of corticosteroids. Surgical treatment and timing in the treatment of acute cerebellitis are discussed.

Keywords Acute cerebellitis · MR imaging · Hydrocephalus

Introduction

Acute cerebellitis with severe cerebellar swelling and hydrocephalus is relatively rare, and patients requiring surgical procedures for this condition are very rare [1, 2, 4]. This disorder must be differentiated from brain tumors, and timely and correct treatment must be provided for it. We report the radiological features of a 7-year-old boy with acute cerebellitis and emphasize the necessity of surgical procedures to prevent fatal outcome.

Case report

A previously healthy 7-year-old boy presented with fever, headache, and vomiting 1 week after a brief upper respiratory tract illness. On admission, he was intermittently lethargic and irritable, and complained of continuous nausea and headache. His neck was supple, and a fundoscopic examination revealed no abnormal findings. There was mild right-sided dysdiadochokinesia and scanning speech. No gait testing was done because of the child's reluctance to move.

Computed tomography (CT) scanning on admission revealed a low-density area in the right cerebellar hemisphere without enhancement. There was obstructive hydrocephalus with compression of the fourth ventricle and obliteration of the basal cisterns (Fig. 1). Magnetic resonance (MR) imaging revealed increased signal on T2-weighted images in both cerebellar hemispheres, with associated swelling. There was no enhancement following the administration of gadolinium-DTPA (Fig. 2). Laboratory findings at the time of admission included leukocytosis, with a white cell count of 20,400/mm^3 and a C-reactive protein (CRP) level of 2.9 mg/dl. We diagnosed acute cerebellitis on the basis of the history of infection and the neurological findings. We concluded that the boy's symptoms originated from obstructive hydrocephalus, and therefore a ventricular catheter was initially placed at the anterior horn of the right lateral ventricle 6 h after admission, care being taken to avoid upward herniation. Of course, we planned to perform posterior fossa decompression if the symptoms did not resolve despite the control of intracranial pressure by means of this external ventricular drainage. The cerebrospinal fluid (CSF) pressure was over 25 cmH_2O, and laboratory examination of CSF revealed a protein level of 7 mg/dl, a glucose level of 120 mg/dl, and 5 white cells/mm^3. All cultures, including CSF, urine and throat swab, were negative for viruses, fungi and bacteria. Influenza A IgG antibody was 256 titers in blood and 8 titers in CSF, but PCR analysis for influenza A in CSF was negative. The patient's headache and vomiting abated promptly with ventricular drainage. Treatment with intravenous pulse injection of methylprednisolone (1 g/day for 3 days followed by dose tapering) was also started, and cerebellar signs gradually improved over the next 7 days. Se-

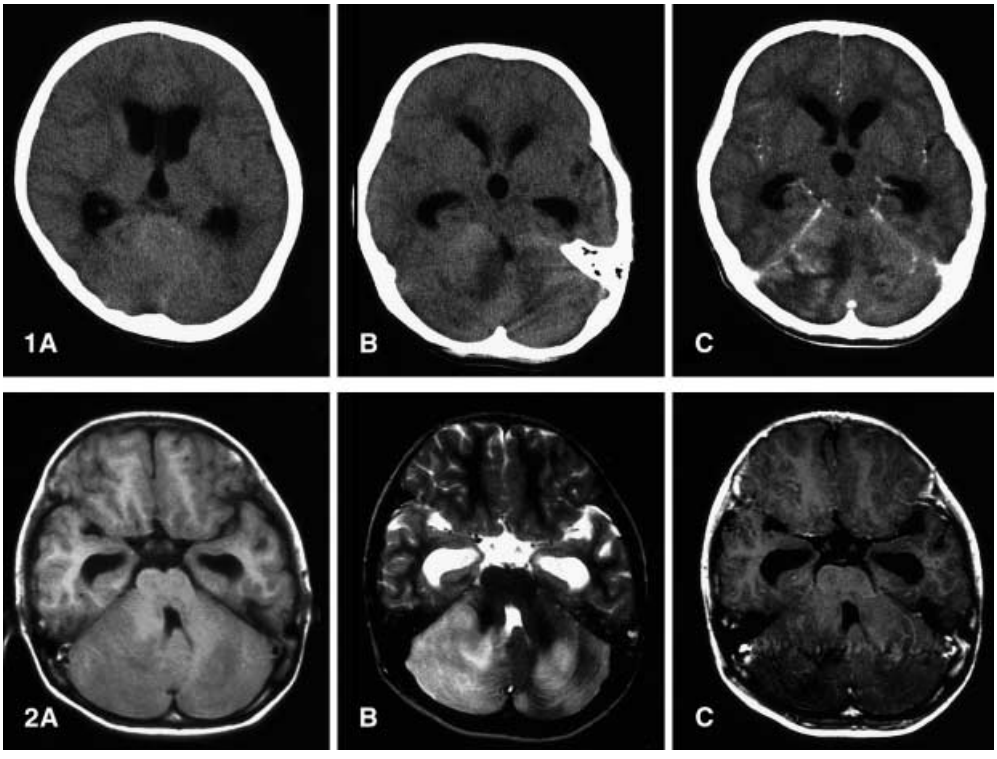

Fig. 1A–C CT scans on admission showing a low-density area in the right cerebellar hemisphere without contrast enhancement and findings of obstructive hydrocephalus: **A**, **B** plain, **C** enhancement

Fig. 2A–C MR imaging demonstrating high intensity on T2-weighted images in both cerebellar hemispheres without clear contrast enhancement. **A** T1-weighted image, **B** T2-weighted image, **C** enhancement

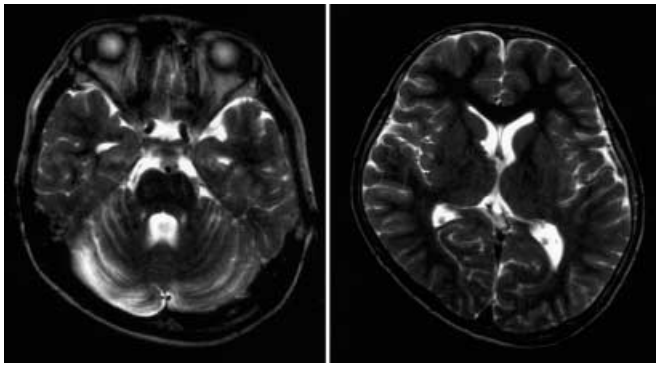

Fig. 3 MR imaging 4 months after onset revealing normal ventricular size and small areas of persistent increased signal on T2-weighted images in the right cerebellar hemisphere

rial CT scanning demonstrated gradual appearance of the fourth ventricle and basal cisterns, and an associated decrease in size of the lateral ventricle. The catheter was removed on the 7th day in hospital without recurrence of hydrocephalus, and the patient was discharged on the 14th day in hospital, with no neurological deficits.

A follow-up MRI study 4 months after admission revealed normal ventricular size and small areas of persistent increased signal on T2-weighted images in the right cerebellar hemisphere (Fig. 3). The clinical course is shown in Fig. 4.

Discussion

The term ‘acute cerebellitis’ has been used to describe a neurogenic condition featuring abnormal eye movement, myoclonic jerks, truncal ataxia, dysarthria, sick headache, scanning speech, tremor and altered mental status including loss of consciousness. This disorder typically occurs after a viral illness, is not associated with fever or signs of meningeal irritation, and often resolves spontaneously.

The diagnosis of this disorder is not difficult when the neurological findings and history of infection are noted, although differential diagnosis from brain tumors is required.

Very few patients with this condition require surgical management. In a few cases, however, such surgical procedures as posterior decompression and external ventricular drainage have been reported [1, 2, 4], and surgical treatment is sometimes required to eliminate the risk of herniation due to acute brain swelling. Perez et al. reported two pediatric cases with fatal outcome [6]. Both patients concerned died of transtentorial herniation caused by marked swelling of the cerebellum. If correct surgical management had been implemented they might have recovered.

Pulse treatment with high-dose corticosteroids is often used and is effective in this disorder [3, 5, 7]. In our case, a rapid clinical response followed emergency ven-

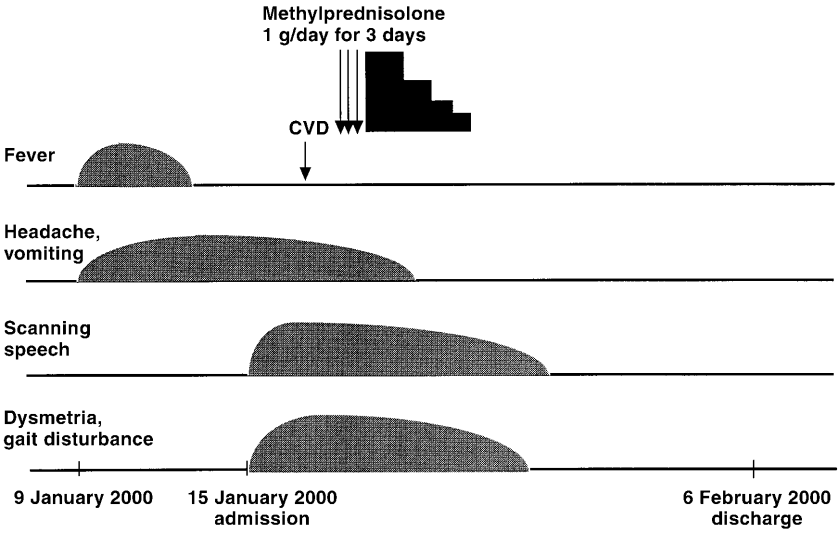

Fig. 4 Clinical course (*CVD* continuous ventricular drainage)

tricular drainage, and resolution of clinical symptoms and MR imaging changes followed the initiation of corticosteroid medication by intravenous injection. Emergency treatment, including surgical management and the initiation of high-dose of corticosteroids without delay, resulted in a good outcome in this case. Early accurate diagnosis of cerebellitis is important in ensuring appropriate treatment.

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