Listeria monocytogenes Meningoencephalitis Presenting with Hydrocephalus and Ventriculitis

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A 62-year-old man had total gastrectomy for gastric cancer 14 years before presented with fever and headache during a trip to Hokkaido, Japan. Meal contents during his trip were not recorded. For one year prior to the onset, he was asymptomatic and did not take any medicine such as antiulcer agent, anticancer agent, and immunosuppressant. He was admitted on day 6 from onset with a high fever of 39.9°C and a complaint of a headache without nausea. He was alert and presented no nuchal rigidity. WBC was normal (8,000/mm³) in spite of a high CRP elevation (15.89 mg/dl). HIV antibody was negative. The brain CT imaging was normal (Fig. 1 A). About 30 hours after admission, his mental status deteriorated to semicoma rapidly and he had to be intubated. The follow-up brain CT imaging was normal, however, cere-

Figure 1. CT and MRI.
A. The initial brain CT imaging was normal.
B. The follow-up brain CT (day 8 from admission) revealed gross hydrocephalus.
C. Post-shunting MRI enhanced by gadolinium (day 10 from admission) revealed the improvement of hydrocephalus. Enhancement of ependyma of the lateral ventricle indicated the presence of ventriculitis (arrows).

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brospinal fluid (CSF) was xanthochromic and showed a pleocytosis (700/mm³, 63.6% lymphocytes, 36.4% polymorphs), high protein levels (1,060 mg/dl), and low glucose levels (4 mg/dl). Opening pressure was 130 mmH2O. Gram stain of the CSF showed gram-positive rods and then the patient was treated briefly with ampicillin (12 g daily), vancomycin (1 g daily), ceftriaxone (2 g daily), and dexamethasone (12 mg daily, 3 days). His mental status deteriorated despite these treatments. CT on day 8 from admission showed gross hydrocephalus and MRI on day 10 showed periventricular hyperintensity enhanced by gadolinium, indicating extensive ventriculitis (Fig. 1 B, C). No blockade of the CSF pathway was observed. Listeria monocytogenes was cultured from the CSF, however, the blood culture yielded no organisms. Both fungus and tuberculosis were negative. We changed antibiotics to ampicillin (12 g daily) and gentamicin (180 mg daily). In addition, an external ventricular drain was inserted into the right lateral ventricle on day 9 from admission. The change of antibiotics and CSF drainage resulted in improvement of pleocytosis and hydrocephalus. The patient was noted to be spontaneously opening his eyes and responsive to a single command. He did not need to maintain mechanical ventilation after a ventricular-peritoneal shunt, however, he remained confused and disoriented.

The most prevalent form of listeriosis in adults remains as meningitis (1). The infection routes are mainly food-borne, such as raw vegetables, dairy products, fish, poultry, and meats. However, the route remains unknown for this patient. One of the characteristics of this patient was the presence of hydrocephalus and ventriculitis. The incidence of hydrocephalus complicating L. monocytogenes meningoencephalitis in adults is about 3% (2). On the other hand, ventriculitis is very rare (3, 4). A similar case complicated by both hydrocephalus and ventriculitis was reported previously (4). That patient showed pleocytosis and a high elevation of protein in CSF. In spite of the treatment with ampicillin and gentamicin, and CSF drainage for hydrocephalus, the patient died.

The other characteristics was CSF findings; severe pleocytosis and highly elevated protein levels. In general, the CSF profile of L. monocytogenes meningitis was lower leukocyte counts and normal to mildly elevated CSF protein levels (5). Considering the clinical features of this patient and previously reported patient (4), L. monocytogenes meningoencephalitis with ventriculitis could be accompanied with pleocytosis and elevation of protein in CSF, which might impair CSF absorption, and result in hydrocephalus.

Ampicillin is considered the preferred agent for L. monocytogenes meningitis and the addition of an aminoglycoside has been recommended in some reports (2, 5). In the present patient, both clinical symptoms and CSF findings deteriorated in spite of the initial treatment including ampicillin, but improved after the concomitant use of ampicillin and gentamicin. This clinical course indicated that the initial treatment with ampicillin and gentamicin at the early stage could bring a better result. Further investigation with more patients is warranted.

References


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