Brain Biopsy for Suspected Herpes Simplex Encephalitis

—A Case Report—

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Received for publication April 1, 1983

Summary: A case with suspected herpes simplex encephalitis who had a brain biopsy because her clinical and CT findings were indistinguishable from a brain tumor is described. Significance of brain biopsy in the diagnosis for herpetic encephalitis is also discussed.

Key words: herpes simplex encephalitis—brain biopsy—CT scan—brain tumor—cerebral infarction

Introduction

With the recent advent of the computerized tomographic (CT) scan, early diagnosis of intracranial organic lesions is well established. But a diagnosis of herpes simplex encephalitis is sometimes difficult because the CT findings are non-specific. This report describes a patient with suspected herpes simplex encephalitis who had a brain biopsy because her clinical presentation and CT findings were indistinguishable from brain tumor and the significance of brain biopsy is discussed.

Case Report

A 54-year-old female was admitted to Shakaihoken Tagawa Hospital on November 10, 1981, complaining of headache. Focal seizures on the left side had occurred two months before admission, and she was deteriorating progressively. On admission, she was confused and displayed an unusual behavior. A mild hemiparesis involving the

left face and intermittent focal seizures on the left side were noted. Her vital signs were normal and there was no manifestation of meningeal irritation. A general hematological examination including electrolytes, liver and renal function test was normal. The CT scan revealed an extensive low density lesion involving the right medial temporal and parietal lobes. The right lateral ventricle was displaced to the left and a mild shift of the midline structures was observed (Fig.1). An infusion of the contrast media showed a minimum enhancement of the lesion and no other abnormal enhancement. A right carotid angiography performed seven days following admission showed neither abnormal vasculatures nor vascular lesions other than diffuse swelling of the temporo-parietal region. Anticonvulsants or sedatives had a minimum effect on the patient and a febrile episode of 38.5°C associated with leucocytosis developed for two days during hospitalization. But repeated hematological examinations and a urinalyses failed to elucidate any causative focus or organism. Due

Fig. 1. A plain CT scan taken on admission showing a low-density lesion with a mass effect in the right temporo-parietal lobe.

to neurological deterioration of the patient and uncertainty of the nature of the low-density lesion on the CT scan, brain biopsy was performed on November 20 with the probable diagnosis of a brain tumor.

A right temporal small craniotomy demonstrated an increase of dural tension and the surface of the brain appeared edematous

without abnormal coloration. The white matter was, however, discolored to yellowish brown and was similar to necrotic tissue without hemorrhagic foci. A piece of brain tissue was excised for histological examination. Postoperatively the patient had been disoriented and had a fever above 37.5°C for two weeks. The brain biopsy showed a marked leptomeningeal infiltration of lymphocytes at the perivascular space and an astrogliosis in the necrotic brain parenchyma (Fig. 2) which strongly suggested viral encephalitis. Herpes simplex virus titers in serum (complement fixation test) were 16 after the biopsy. The brain biopsy failed to confirm the diagnosis of herpetic encephalitis because of the lack of immunofluorescence, electron microscopic or culture studies. But retrospective consideration of the clinical course and the CT finding demonstrating a nonenhanced low density lesion localized to the temporo-parietal lobe on the right side in addition to the results of the brain biopsy indicated herpes simplex encephalitis. The patient's neurological status and general condition gradually improved with conservative treatment including antibiotics. The low density lesion on the CT scan gradually decreased in size. She was discharged on December 29, 1981 with no neurological deficits.

Discussion

The clinical manifestations of herpes simplex encephalitis are variable and non-specific. They include an acute, febrile illness characterized by a disturbance of consciousness with focal or generalized seizures (Olson et al. 1967). However the clinical presentation is insufficient to make a diagnosis because other infectious processes may lead to the same clinical presentation as herpetic encephalitis. The CT findings may also be nonspecific, but the characteristics of the CT have been described as a low density lesion, mass effect

Fig. 2. Brain biopsy material (H. E. stain, $\times 200$)

A marked leptomeningeal infiltration of lymphocytes at the perivascular space and an astrogliosis in the necrotic brain parenchyma suggesting viral encephalitis.

and an abnormal contrast enhancement in the temporo-parietal, medial temporal and/or insular cortex (Davis et al. 1978, Enzmann et al. 1978). In patients with non-herpetic encephalitis, the CT scans had no focal temporal lobe lesions (Enzmann et al. 1978). A low density abnormality in the temporal lobe indicating the evolution of tissue necrosis is the predominant finding in herpetic encephalitis. This is not seen until at least six days after the onset of neurological signs and/or symptoms and persists for as long as 39 days into the course of the illness. The low density region progressively increases in size and decreases in density in association with an increased mass effect as the disease progresses (Davis et al. 1978, Enzmann et al. 1978). Davis et al. (1978) reported that 50 % of patients had an abnormal enhancement pattern with contrast media which

was gyral in configuration and surrounded the sylvian fissure and opercular areas. Enzmann et al. (1978) observed that linear streaks at the periphery of the low density lesion or subarachnoid enhancement could be detected by infusion of the contrast media in the present case as reported by Claveria et al. (1976). From the clinical and CT findings, a brain tumor, cerebral infarction, herpetic and/or non-herpetic encephalitis could be considered for the differential diagnosis when the clinical presentation and CT findings were atypical.

Brain biopsy has proved to be both highly sensitive and specific, with a low incidence of complications. DiSclafani et al. (1982) recommended the use of biopsy in all cases of suspected herpes simplex encephalitis and stated that even when biopsy did not yield a firm diagnosis, the result obtained from biopsy gave useful infor-

mation for the management and prognosis in two-thirds or more of the patients. The present report also indicates that brain biopsy is an appropriate method to evaluate patients whose clinical presentation and CT findings are indistinguishable from brain tumor and other entities.

Acknowledgement: The authors are indebted to Prof. Shinken Kuramoto, Department of Neurosurgery, Kurume University School of Medicine for reviewing this manuscript.

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