

A Case of Congenital Cytomegalovirus Infection Presenting with Lissencephaly

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ABSTRACT. We report here a case of congenital cytomegalovirus infection presenting with lissencephaly-pachygyria and the evaluation of neuroradiological studies of this case including ultrasonography, cranial computed tomography and magnetic resonance imaging. We propose that congenital cytomegalovirus infection during the early gestational period is one of the important causes of lissencephaly-pachygyria. Therefore, virological and immunological studies should be performed during the early neonatal period.

Key words: lissencephaly — congenital cytomegalovirus infection

It is well known that congenital cytomegalovirus (CMV) infection leads to severe neurological sequelae.¹⁾ Various abnormalities of the central nervous system have been confirmed neuroradiologically and neuropathologically in CMV infection.^{2,3)} Recently, cranial ultrasonography and magnetic resonance imaging have been widely accepted for evaluation of the intra-cranial abnormalities of congenital CMV infection.^{3,4)} As a result, it has become relatively easy to make diagnosis of intracranial lesion during the early neonatal period. We describe here a case of congenital CMV infection presenting with lissencephaly and evaluation of neuroradiological studies of this case including cranial ultrasonography (US), cranial computed tomography (CT) and magnetic resonance imaging (MRI).

CASE REPORT

A one-month-old girl was referred to us because of multiple anomalies due to congenital CMV infection. The patient was born as the first gravida 40 weeks of gestation with an uneventful pregnancy. The mother, however, felt that fetal movements had weakened during the pregnancy. Her birth weight was 2466 g and Apgar scores at one and five minutes were 8 and 9, respectively. On admission she showed microcephalus, overlapped fingers, low set ears, micrognathia and high-arched palate. She also displayed generalized hypotonia with spasticity of the lower limbs and contracture of both bilateral knee and ankle joints. She had no hepatosplenomegaly or retinopathy and otherwise no cardiac abnormalities were seen. Laboratory examinations including routine hematological and biochemical studies revealed findings within normal range

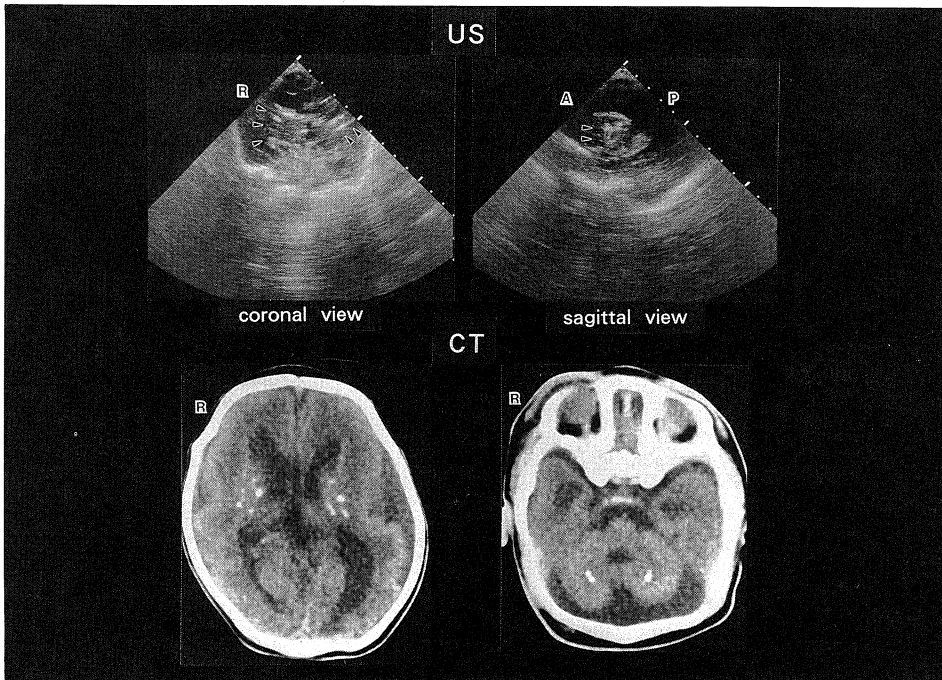


Fig. 1. Ultrasonography of both coronal and sagittal scans shows multiple high echoic lesions due to calcification. Cranial CT shows colpocephaly, a smooth cortical surface, cerebral calcification and calcification of the cerebellum as well, and cerebellar dysgenesis.

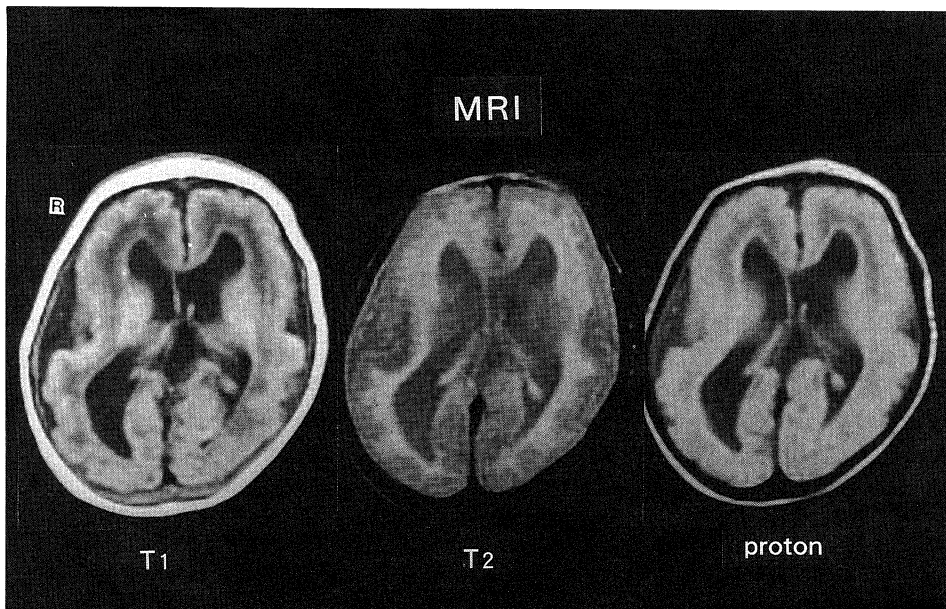


Fig. 2. MRI with T1, T2 and proton images reveals a smooth cortical surface with localized pachygyria and a marked high signal intensity of white matter with T2 weighted images. However, cerebral calcification was unclear.

and chromosomal studies were normal. Her serum IgM level, however, was 66.1 mg/dl at birth. CMV was isolated from both throat swabs and urine during the first week of life and a marked elevation of both IgM and IgG antibody titers associated with CMV was noted in her sera. Her cerebrospinal fluid indicated a slight increase in her protein level to 82 mg/dl, but CMV was not isolated. Electroencephalography revealed, however, disorganized slow waves and dysrhythmia with multiple independent spike foci. There were no abnormalities in auditory brain stem responses or visual evoked potentials. Cranial CT and US indicated marked cerebral calcification (Fig. 1). In addition, cranial CT also showed dysgenesis of the cerebellum, a smooth cortical surface, broad gyri, incomplete opercularization and colpocephaly, MRI were evaluated using both T1 (TR 450 msec, TE 30 msec) and T2 (TR 2000 msec, TE 100 msec) weighted images, and proton density (TR 2000 msec, TE 40 msec) using a 0.5 tesla system. MRI revealed thickening of the gray matters, a smooth cerebral surface with localized pachygyria and abnormal signal intensity of the white matter.

DISCUSSION

Congenital CMV infection is one of the most common congenital infections. Most patients with congenital CMV infection are asymptomatic during the neonatal period, but later a few cases develop hearing disturbances and/or behavior abnormalities. Symptomatic cases, on the other hand, exhibit serious neurological sequelae since from the early neonatal period as a result of virus-related damage to the brain.¹⁾ Various intracranial abnormalities in congenital CMV infection have been confirmed by both US and cranial CT. However, evidence of lissencephaly-pachygyria as associated with congenital CMV infection has been scanty. Lissencephaly is an abnormality of brain development characterized by incomplete neuronal migration and a smooth cerebral surface. Neuropathologically, the most frequently described form is characterized by microcephaly and a thickened cortex with four rather than six layers as anomaly in the architecture of cortical lamination.⁵⁾ The Miller-Dieker and Norman-Roberts syndromes are known to show a genetic predisposition for lissencephaly along with other characteristic clinical features.⁵⁾ However, various causes exist in other cases with lissencephaly. Recently, Hayward *et al.* described five cases of congenital CMV infection presenting with lissencephaly-pachygyria.⁶⁾ They suggested that abnormalities with lissencephaly-pachygyria in congenital CMV infection may be more common than previously been recognized. Our case also showed a smooth brain surface, thickened cortex, intracerebral calcifications, cerebellar dysgenesis and colpocephaly. Of additional interest is in fact that the case displayed characteristic facial dysmorphism. The author proposes that congenital CMV infection might be considered one of the causes of lissencephaly. Further detailed neuroradiological studies, however, are required.

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