Annals of Nuclear Medicine Vol. 15, No. 2, 157–160, 2001

Bilateral crossed cerebello-cerebral diaschisis and mutism after surgery for cerebellar medulloblastoma

Takao SAGIUCHI,*,** Katsumi ISHII,* Yuki AOKI,* Sinichi KAN,* Satoshi UTSUKI,**
Ryuusui TANAKA,** Kiyotaka FUJII** and Kazushige HAYAKAWA*

*Departments of *Radiology and **Neurosurgery, Kitasato University School of Medicine*

A 7-year-old boy developed mutism after surgery for cerebellar medulloblastoma. Postoperative magnetic resonance imaging (MRI) showed atrophy of the cerebellar vermis and both cerebellar hemispheres, predominantly on the right side. Single photon emission computed tomography (SPECT) with technetium-99m-ethyl cysteinate dimer (Tc-99m ECD) revealed decreased cerebral blood flow (CBF) in the bilateral thalami, bilateral medial frontal lobes, and left temporal lobe in addition to the cerebellar vermis and both cerebellar hemispheres when mutism was manifest, indicating the existence of bilateral crossed cerebello-cerebral diaschisis (BCCCD). Circulatory disturbance in both cerebellar hemispheres secondary to tumor resection probably caused BCCCD in both cerebral hemispheres, predominantly in the left, via the dentatothalamocortical pathway (DTCP). With recovery of his mutism, CBF increased in the right thalamus, bilateral medial frontal lobes and left temporal lobe. Thus BCCCD was improved, with only a slight decrease in CBF still persisting in the left thalamus. The mechanism of mutism may have involved damage to the cerebellar vermis (the site of incision at operation), the left dentate nucleus (heavily infiltrated by the tumor) and the right dentate nucleus of the cerebellum (affected by circulatory disturbance secondary to acute postoperative edema). The SPECT findings suggested that mutism was associated with BCCCD-induced cerebral circulatory and metabolic hypofunction in the supplementary motor area mediated via the DTCP.

Key words: crossed cerebello-cerebral diaschisis, cerebellar mutism, medulloblastoma, single photon emission computed tomography, technetium-99m-ethyl cysteinate dimer