Neurol Med Chir (Tokyo) 47, 240～241, 2007

Parietal Intradiploic Encephalocele

—Case Report—

Yoshifumi TSUBOI, Nakamasa HAYASHI, Kyo NOGUCHI*, Masanori KURIMOTO, Shoichi NAGAI, and Shunro ENDO

*Departments of Neurosurgery and *Radiology, Faculty of Medicine, University of Toyama, Toyama*

Abstract

A 66-year-old man presented with a parietal intradiploic encephalocele manifesting as dizziness in June 2001. Skull radiography showed lytic change involving the right parietal bone. Computed tomography with bone window showed bone destruction associated with the right frontal lesion. Magnetic resonance imaging demonstrated a lesion in the parietal intradiploic space continuous with the right frontal lobe. The lesion was located near the central sulcus, so surgical biopsy carried the risk of motor dysfunction. Single photon emission computed tomography (SPECT) showed the same pattern of cerebral blood flow as normal brain tissue, so the neuroimaging diagnosis was encephalocele. The present case indicates that surgery may not be necessary in the absence of symptoms and neurological deficits. SPECT is very useful to identify encephalocele.

Key words: intradiploic encephalocele, single photon emission computed tomography

Introduction

Encephaloceles are generally regarded as midline cerebral anomalies, consisting of herniation of cerebral tissue through a dural defect.[3] The incidence of this malformation has been estimated at one in every 3000 to 10,000 live births.[5,6] The great majority of encephaloceles are located in the occipital area,[6] and are rarely reported in the area of the parietal bone. We treated a patient with cerebral herniation into the diploic space of the right parietal bone. Single photon emission computed tomography (SPECT) was useful in the diagnosis of this lesion.

Case Presentation

A 66-year-old man complained of dizziness in June 2001. His past history and family history were uneventful. He had no history of head trauma. The patient was alert and had normal vital sign. General physical examination found no abnormalities. He had no neurological deficit. Skull radiography showed lytic change involving the right parietal bone. Computed tomography (CT) demonstrated a defect in the right parietal bone (Fig. 1). Magnetic resonance (MR) imaging showed a lesion in the parietal intradiploic space continuous with the right frontal lobe appearing as isointense on T_1-weighted and T_2-weighted images (Fig. 2). T_1-weighted MR imaging with gadolinium revealed no enhancement of the lesion.

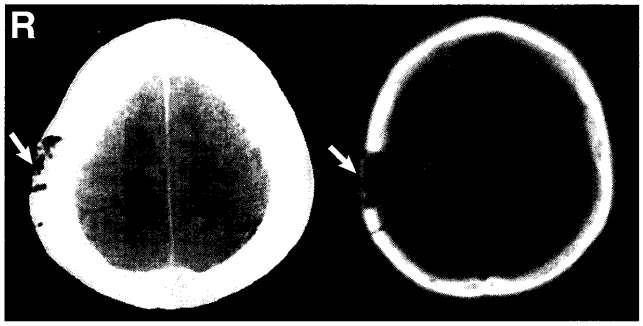

Fig. 1 Computed tomography scans showing a defect (*arrow*) in the right parietal bone.

The differential diagnosis included multiple myelomas, metastatic bone tumor, and brain tumor. Thoracic and abdominal CT detected no tumor lesion. Blood examination found no abnormalities. Tumor markers and Bence Jones protein were negative. Surgical biopsy carried the risk of motor dysfunction, because this lesion was close to the central sulcus. SPECT showed the same pattern as

Received August 30, 2006; Accepted March 8, 2007

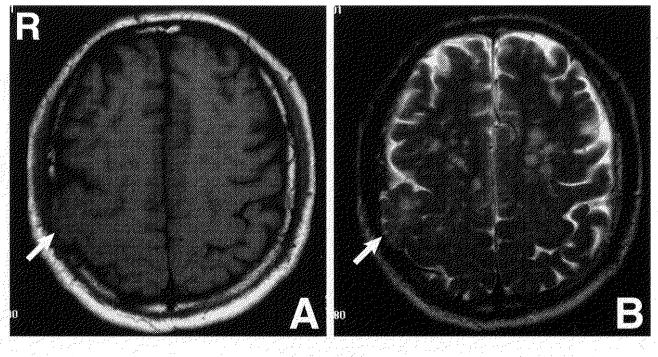

Fig. 2 **T_1-weighted (A) and T_2-weighted (B) magnetic resonance images showing an isointense lesion (*arrow*) in the parietal intradiploic space continuous with the right frontal lobe.**

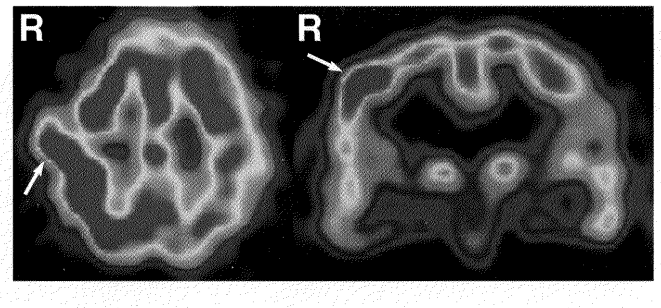

Fig. 3 **Single photon emission computed tomography scans revealing the same pattern (*arrow*) as normal brain tissue.**

normal brain tissue (Fig. 3), so the neuroimaging diagnosis was encephalocele. Five years after the diagnosis the patient remained in good clinical condition without neurological deficit.

Discussion

The present patient presented with cerebral herniation through a dural defect into the diploic space of the right parietal bone. Three cases of intradiploic encephalocele of vault lesion have been reported with the diagnoses based on surgical biopsy.[3,7,8] Most cephaloceles are inborn developmental disturbances and manifest in early childhood. The present case of encephalocele in an adult was not previously identified because neurological deficit and abnormality of appearance were absent. Cranial vault lesions are more frequently associated with other malformations than anterior lesions.[1] In the present patient, there were no other malformations.

Various etiologies can be considered for the present lesion. Herniation of cerebral tissue may occur after surgery,[4] but this patient had no history of operation. A variant of the well-known growing skull fracture can also be excluded, because these fractures involve both the inner and outer tables.[8] Congenital encephalocele is less likely, because these are usually midline and not laterally located, and extend through both the inner and the outer tables.[8] Therefore, the etiology of the present lesion is not clear. Experimental teratology has related the development of encephalocele to exposure to trypan blue, irradiation, excess of vitamin A, folic acid antagonists, triamcinolone, and malnutrition.[5]

The different diagnosis includes head trauma, multiple myelomas, dermoids, epidermoids, metastatic bone tumor, arachnoid cyst, eosinophilic granuloma, and brain tumor.[3,4] CT, MR imaging, radiography, and angiography have recently been used in the evaluation of encephalocele. In particular, MR imaging provides better information on the site and nature of the lesion as well as on associated malformations.[2] However, histological findings are essential to determine the definite diagnosis of encephalocele. In the present case, the neuroimaging diagnosis of encephalocele was based on the SPECT findings.

Surgery is indicated both for diagnosis and for treatment of encephalocele in most cases. However, the present case shows that surgery may not be necessary in the absence of neurological deficit if this lesion is located near a motor area. SPECT may be very useful to identify encephalocele.

References

1) Crech T, Reinprecht A, Matula C, Svoboda H, Vorkapic P: Cephaloceles — experience with 42 patients. *Acta Neurochir* (*Wien*) 134: 125–129, 1995
2) Gulati K, Phadke RV, Kumar R, Gupta RK: Atretic cephalocele: contribution of magnetic resonance imaging in preoperative diagnosis. *Pediatr Neurosurg* 33: 208–210, 2000
3) Kosnik EJ, Meagher JN, Quenemoen LR: Parietal intradiploic encephalocele. *J Neurosurg* 44: 617–619, 1976
4) Martinez-Lage JF, Lopez F, Piqueras C, Poza M: Iatrogenic intradiploic meningoencephalocele. Case report. *J Neurosurg* 87: 468–471, 1997
5) Martinez-Lage JF, Poza M, Sola J, Soler CL, Montalvo CG, Domingo R, Puche A, Ramon FH, Azorin P, Lasso R: The child with a cephalocele: etiology, neuroimaging, and outcome. *Childs Nerv Syst* 12: 540–550, 1996
6) Mealey J, Dzenitis AJ, Hockey AA: The prognosis of encephaloceles. *J Neurosurg* 32: 209–218, 1970
7) Patil AA, Etemadrezaie H: Posttraumatic intradiploic meningoencephalocele. *J Neurosurg* 84: 284–287, 1996
8) Peters J, Raab P, Marquardt G, Zanella FE: Intradiploic meningoencephalocele. *Eur Radiol* 12 Suppl 3: S25–S27, 2002

Address reprint requests to: Nakamasa Hayashi, M.D., Department of Neurosurgery, University of Toyama, 2630 Sugitani, Toyama 930–0194, Japan.
e-mail: nakamasa@ms.toyama-mpu.ac.jp