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PARAVENTRICULAR CYSTIC GERMINOMA OF THE BILATERAL FRONTAL LOBES — REPORT OF A CASE

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Abstract

A case of cystic germinoma involving bilateral frontal lobes is reported. Rarity of the site of the tumor and its clinical presentation are discussed.

INTRODUCTION

Many authors[1,2] have reported that, in Japanese series, the incidence of pinealoma is rather high compared to that of foreign countries. Most of pinealoma are so-called "two cell pattern type" pinealoma in pineal region. Friedman[3] has emphasized the close resemblance between this tumor and seminoma or dysgerminoma, and proposed the name of "germinoma", which has been widely adopted. In some instances, germinomas develop from the anterior portion of the third ventricle, namely suprasellar germinoma, or infiltrate diffusely along the entire wall of the ventricular system. However, the cases with growth into the cerebral hemispheres are seldom encountered.

The purpose of this paper is to report a case of germinoma developed in unusual site and discuss its clinical manifestations.

CASE REPORT

This unmarried man 30 years old was referred to us because of the gait disturbance, mental deterioration and incontinence of urination and bowel movement. He had been suffering from schizophrenia for more than 15 years. His two brothers were also diagnosed as having the same disease.

On March 20, 1976, he had an attack of generalized tonic convulsion with unconsciousness, but recovered without any serious sequelae. Since he

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began to complain of difficulty in walking, he was admitted to a psychiatric hospital in October, 1976. Lumbar puncture at that time revealed the increased intracranial pressure and xanthochromic cerebrospinal fluid containing numerous red blood cells. After increased weakness in his lower extremities forced him to be bedridden, he was transferred to our clinic on January 26, 1977.

Examination. On admission, he was in a slightly confused state, accompanied with apathetic countenance, acalculia and disorientation in time and place. He was able to move his upper extremities with approximately normal power. There were obvious weakness and muscular atrophy in both lower extremities. In spite of his deteriorated mental state, no sensory disturbance was observed. The superficial abdominal reflex, the knee and ankle jerks could not be elicited. The plantar response were flexor. Although ophthalmoscopically the optic discs were compatible with papilledema, other cranial nerves disclosed no abnormalities.

On the spinal tap, the initial pressure was 235 mm and there was neither pleocytosis nor increase of the protein content in the cerebrospinal fluid. EEG showed slow alpha back ground rhythm but did not any laterality or focal sign. Skull X-ray demonstrated a large pineal calcification (7×8 mm) displaced markedly downwards and backwards but just on midline. Bilateral carotid angiogram disclosed the existence of bilateral frontal masses with no midline dislocation. Ventriculography (Fig. 1) via left anterior horn revealed only a huge cystic cavity. Its contents were submitted for cytological examination. The fluid contained many large clear cells with prominent nuclei and nucleoli which were thought to be compatible with large cells of germinoma. Pneumography (Fig. 2) was performed straight, yielding another cyst communicating with right lateral ventricle. The third ventricle, though dislocated slightly downwards, aqueduct and fourth ventricle were normal with no evidence of obstruction or mass lesion.

Operation. (Fig. 3) On February 16, 1977, he underwent bilateral frontal craniotomy. According to the cystic tumor beneath them, frontal lobes were found to be soft and yellowish discoloured. On cortical incision, dark red fluid contents flowed out. At the bottom of cysts parenchymatous tumor tissue was found. The tumor infiltrated in the subependymal layer of the bilateral anterior horns, and adjoined with each other through the corpus callosum or the cingulate gyrus.

Microscopic section (Fig. 4) confirmed the same finding already obtained from the cystic fluid, illustrating tumorous tissue composed of large germinoma cells, small lymphocytes and plasma cells. Electron microscopically, large

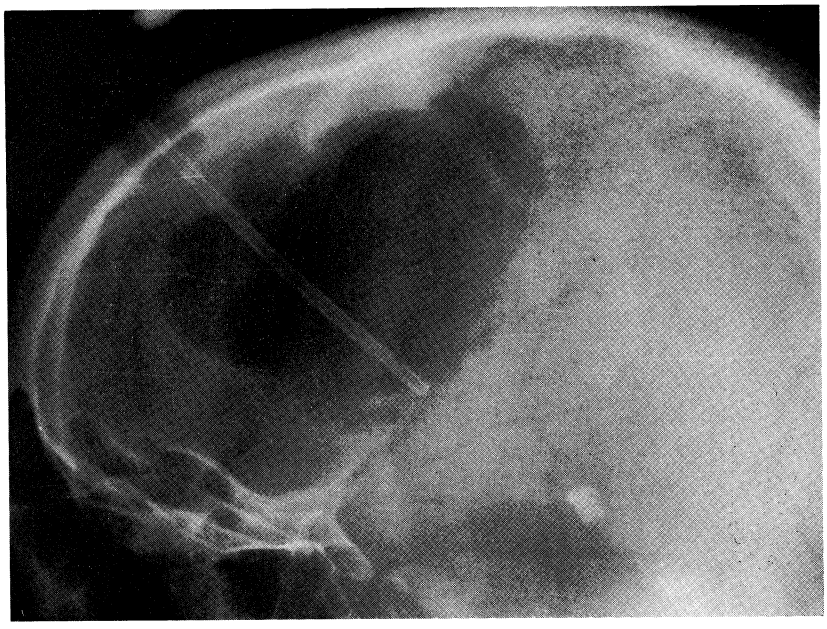

Fig. 1. Ventriculogram reveals a large cyst in the left frontal lobe not communicating with the lateral ventricle.

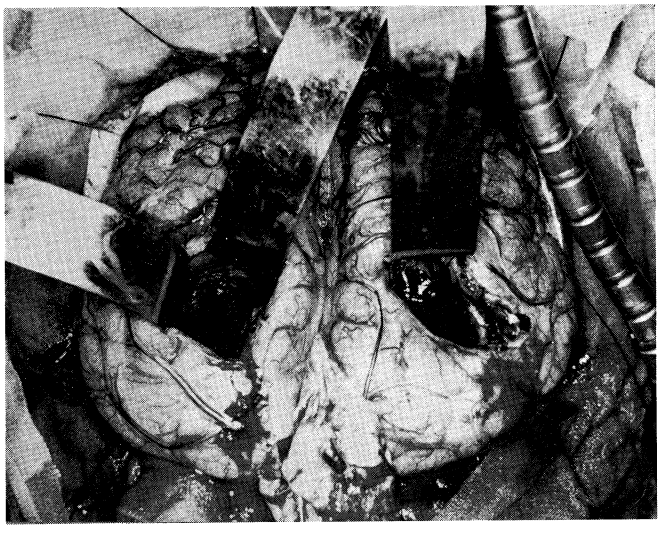

Fig. 3. Operative photograph. Both frontal lobes are exposed showing huge cysts on both sides.

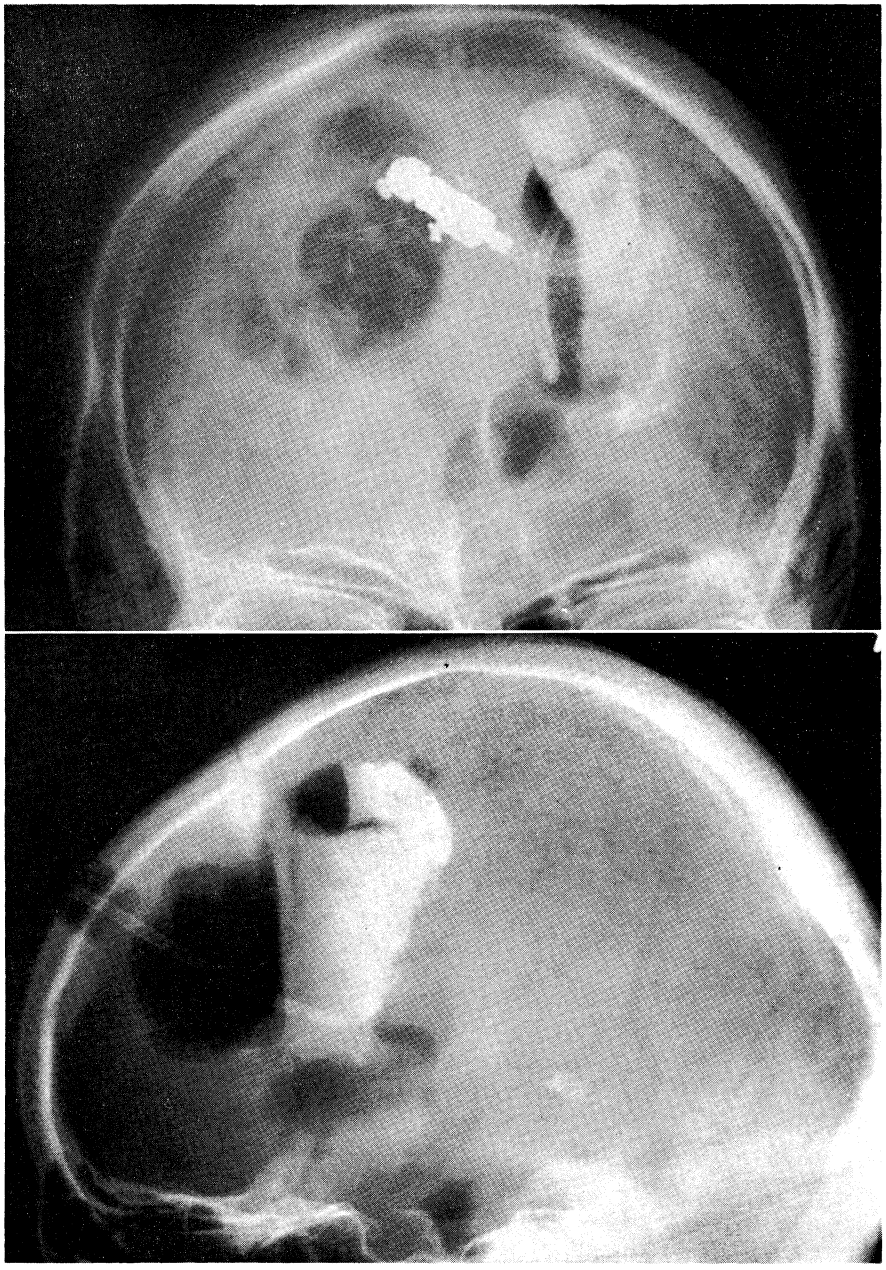

Fig. 2. Pneumoencephalogram discloses another cyst of the right side, which communicates with ventricular system. Third ventricle is also visualized without any evidence of infiltration of the tumor.

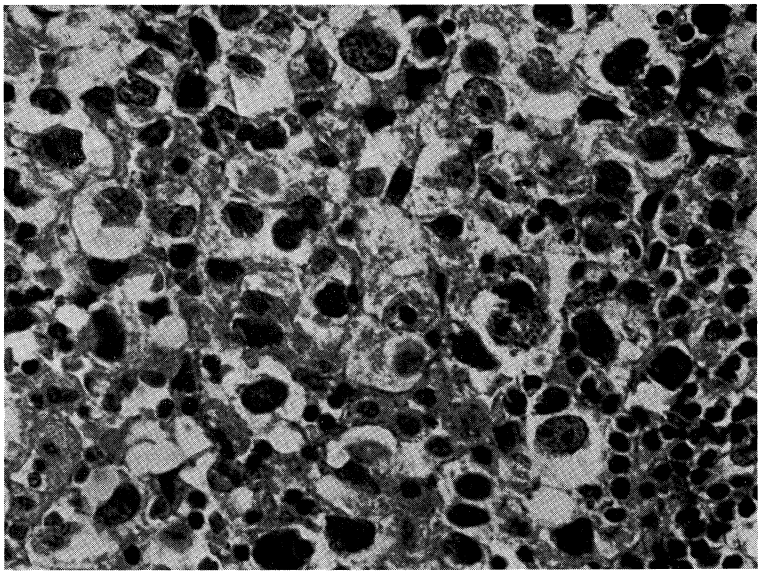

Fig. 4. Photomicrograph showing two kinds of cells, typical to the germinoma. H. E. ×504

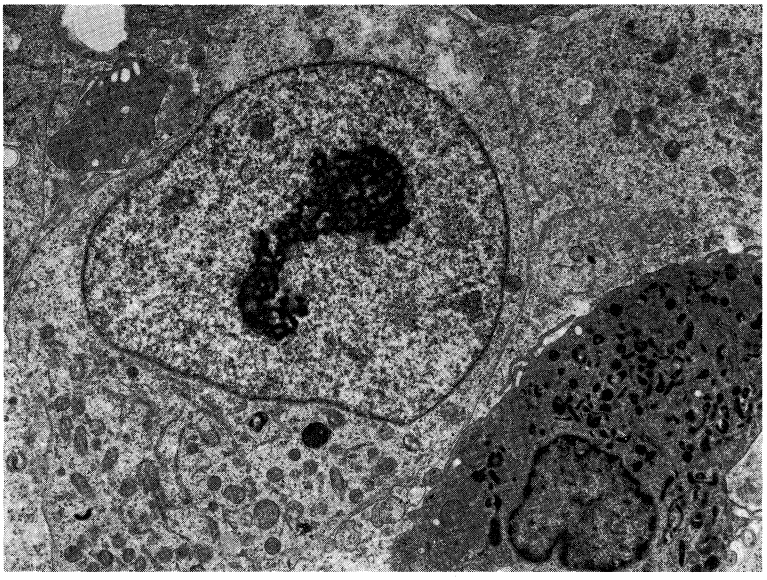

Fig. 5. Electron micrograph of large germinoma cells with prominent nuclei and nucleoli. ×4960

germinoma cells were polygonal in shape and contained occasional mitochondria, ribosomes and rough surfaced endoplasmic reticulum in their cytoplasm. The nuclei were round and pale with prominent nucleoli (Fig. 5).

Postoperative course. He received a course of radiation therapy, which was composed of 4000 rad to the entire cranial content and a booster dose to the tumor bearing region with 2000 rad. He tolerated and responded well to the complete course of radiotherapy. There was no longer any clinical sign of raised intracranial pressure. He became rational but he was compelled to be confined to bed for his disabled legs, in spite of long sustained exercise. In November, 1977, he was discharged almost in the same condition.

DISCUSSION

Most of germinomas develop in pineal region presenting with signs of hydrocephalus due to obstruction of the aqueduct, restriction of upward gaze due to involvement of the pretectal region and ataxia secondary to pressure on the cerebellum. Some of the tumors are found to be localized in the anterior part of the third ventricle and chiasmal region, which have been called " ectopic pinealomas ",[4] that is suprasellar germinomas. But on rare occasions, ectopic pinealomas grow in the cerebral hemispheres without clinical or radiological evidence of pineal tumors.

Ishii *et al.*[5] recently reported on the follow-up study of 96 patients with various types of pineal tumors, of which 67 cases were diagnosed as having two-cell pattern pinealoma. They classified the mode of the spreading into 6 forms. Types I, II and IV according to their classification, originating from the pineal region with or without extension to the third ventricle, were the most frequent types of pinealoma. In their series, three cases of the germinoma were found in the cerebral hemisphere, but in one unilateral hemisphere.

Some Japanese authors[6] stated that the germinoma arising in the thalamus and hypothalamus could cause the ipsilateral cerebral hemiatrophy. Exceptionally, only one case alike to ours has been reported previously by Kohmoto *et al.*[7] On the basis of the operative findings, we believe that the tumor originated from the paramedian area of the subependymal layer of the lateral ventricle or from the subcortex of the frontal lobes and subsequeutly infiltrated to the other side via the corpus callosum.

Symptomatologic characteristics of this patient were the increased intracranial pressure, convulsive seizure, mental deterioration and paraplegia of both legs. These neurological signs are very similar to those of callosal tumor, the signs of which are classically termed as " Bristowe's syndrome ".[8] However, it is very difficult to determine whether the tumor is confined to the corpus

callosum or spreads into the adjacent structures, because the tumors arising from the corpus callosum easily grows even bilaterally along the radiation of the corpus callosum.[9]

Inaba and Miyazaki[10] reported five cases of astrocytoma of the corpus callosum with special reference to the clinical analysis of the symptoms. They emphasized that weakness of the bilateral lower extremities is important as the initial symptom, and that it is the main point of chronology of the callosal tumor. Main constituent of the symptoms in our case may be, just the same to the primary callosal tumor, syndrome of the bilateral frontal lobes, which was caused by the tumorous infiltration into the minor forceps of the corpus callosum connecting with medial surface of the frontal lobes.

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