Intracerebral Cystic Meningioma
—Case Report—

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Abstract

A 46-year-old female presented with persistent bifrontal headache. Computed tomography revealed a large cystic tumor in the right temporoparietal area, which included a solid component. The tumor had no attachment to the dura. There was no peritumoral edema or mass effect usually found around cystic meningiomas. The solid component was totally removed. Histological examination indicated that the tumor was a fibrous meningioma. Intracerebral meningioma with a large cystic component without dural attachment should be considered in the differential diagnosis of cystic cerebral tumors.

Key words: intracerebral meningioma, cystic meningioma

Introduction

Meningiomas commonly arise from arachnoid cells and are generally attached to the dura. Meningiomas without dural connection often occur in the ventricles. Intraparenchymal meningiomas or deep sylvian psammomeningiomas are uncommon lesions, with neither dural attachments nor any relationship with the ventricles, and usually occur in childhood. Many meningiomas in childhood lack dural attachment, but the incidence is much lower than in adulthood, and most cases are intraventricular meningiomas. Here, we report an adult case of intracerebral meningioma without dural attachment included in a large cyst.

Case Report

A 46-year-old female had suffered syncopal attacks 2-3 times a year for 3 years at the age of 20 years. She had been treated with anticonvulsants and the symptoms were successfully controlled for a year. Thereafter, she had no symptoms even without medication. Twenty-six years after the first syncope attack, she was referred to our hospital for the evaluation of persistent bifrontal headache.

Computed tomography (CT) showed a 4 × 5-cm cystic tumor in the right temporoparietal area, which contained a 2 × 2-cm solid component (Fig. 1 left). The solid component appeared to be attached to the cyst wall just under the dura mater. Electroencephalography (EEG) showed lazy activity in the right temporoparietal area. The patient's headache was easily controlled by medication. She was followed up for a year with administration of anticonvulsants, then readmitted to our hospital for further evaluation and surgical resection of the tumor.

Magnetic resonance (MR) imaging demonstrated the cystic tumor in the right temporoparietal area. T1-weighted MR imaging showed slight gadolinium enhancement of the solid component, but not of the cyst wall (Fig. 1 center). The solid tumor appeared to be attached to the cyst wall just under the dura mater. T2-weighted MR imaging showed the solid component of the tumor as low intensity, and the fluid contents in the cyst as high intensity (Fig. 1 right). There were no sign of mass effect of this large cystic tumor, such as peritumoral edema or shift of the brain components to the opposite side of the tumor. Right carotid angiography demonstrated the tumor as an avascular area. No tumor staining or feeding arteries were found. The preoperative diagnosis was low grade cystic astrocytoma.

Right temporoparietal craniotomy was performed.
No connection between the surface of the tumor and the dura was found. The tumor was covered by the arachnoid membrane. There were some arterioles on the cyst surface beneath the arachnoid membrane. The tumor was embedded in the enlarged gyrus and located close to the lateral ventricle, but the cyst had no connection with the lateral ventricle. The solid component of the tumor was very hard and palpable under the cyst wall. The cyst contained slightly xanthochromic fluid. The posterior parietal artery, which is a branch of the right middle cerebral artery, was encased by the solid tumor. The tumor was too hard to completely separate from the artery, and was totally resected with part of the artery. End-to-end anastomosis of the divided artery was performed.

Histological examination of the solid tumor component demonstrated fibrous meningioma without malignancy (Fig. 2). Tumor cells showed immunohistochemical reactivity for epithelial membrane antigen (Fig. 3), and desmosome-like formations (Fig. 4). A biopsy collected around the cyst wall discovered no tumor cells, and the adjacent tissue revealed cortical neurons.

Postoperative CT identified no infarction, suggesting that the reconstructed artery was patent. Four days later, seizures were observed on the left side of the face and hand. Postoperative EEG showed sporadic spikes on the right frontal lobe. Seizures were controlled by the administration of an anticonvulsant. She was discharged from our hospital 2 weeks after the operation without neurological deficits.

Discussion

Only three adult cases of intraparenchymal meningioma without dural attachment have been reported including the present case. A 24-year-old female presented with headache and hemiparesis in the left extremities with intraparenchymal meningioma in the right frontal lobe, and a 20-year-old female with an intraparenchymal meningioma in the right temporal lobe found to be a hard and plum-sized solid
tumor without cystic components. In contrast to the previous two cases, the present tumor was accompanied by a large cyst, and was attached to the inner wall of the cyst.

Meningiomas with intra- or extratumoral cysts have been categorized as cystic meningiomas, which are also recognized as rare lesions. Only 13 patients with cystic meningioma (4.2%) occurred in a series of 313 intracranial meningiomas. The incidence of cystic meningiomas is between 1.7% and 7%. Cystic meningioma is more common in childhood than in adolescence or adulthood. The incidence of cyst formation of meningiomas is especially high in infancy. Review of 19 cases of cystic meningioma in infancy found that five of 10 described cases had no attachment to the dura. Most were located in the convexity with cysts much larger than the tumor. Male predominance and fibrous histology are also characteristics of these tumors. The tumors had a dural attachment, and the related cyst was generally large with a mass effect, resulting in an increase in the circumference of the head in infancy and intracerebral pressure in adulthood. Cystic meningiomas tend to cause edema in adjacent cerebral tissue and intracranial tension disproportionate to the size of the tumor.

Our patient had no mass sign caused by the cyst such as peritumoral edema or shift in the white matter or ventricles. The peritumoral cyst of a cystic meningioma may not be a focally dilated subarachnoid space, because no prominent sulcal pattern occurred in a previous case around the cyst. Therefore, this cyst represented merely the end stage of peritumoral edema, which is frequently observed around meningiomas. In our case, there was no peritumoral edema, but we identified the cortical neurons in the tissue adjacent to the cyst wall, which shows that there was a sulcal pattern around the cyst. Therefore, the cyst in the present case might not be part of the meningioma, but a true arachnoid cyst. The long clinical course of the present case suggests that the intraparenchymal meningioma grew slowly accompanied by a gradually expanding peritumoral cyst. However, the meningioma could have arisen from the wall of the arachnoid cyst and grew within the cyst cavity.

Cystic meningioma is difficult to distinguish from a glioma with cystic changes or a metastatic neoplasm. We must consider cystic meningioma in the differential diagnosis of intracerebral cystic tumors.

References

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