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A Case of Basal Ganglia Meningioma

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We report a rare case of the subcortical meningioma located in basal ganglia without dural attachment which was successfully removed by surgery. A 15-year-old girl with two months history of slowly progressing right sided weakness and motor dysphasia had the well-circumscribed, homogeneously enhancing solid mass with peritumoral edema in the left basal ganglia without any attachment to the sylvian fissure in magnetic resonance imaging. Total resection was done without complications and the histological diagnosis of the mass was a meningothelial meningioma. The possibility of the meningioma should be considered when the well-circumscribed insular mass has characteristic peritumoral edema and surgical removal should be the treatment of choice.

Key Words basal ganglia, dural attachment, subcortical meningioma, sylvian fissure

Introduction

The incidence of meningioma predominates in middle-age in general and its occurrence in childhood is very rare.^{2, 4, 6} The origin of the meningioma is known to be an arachnoid cap cell or meningothelial cell so that it usually has the dural

attachment.^{2, 6} However, a small number of meningiomas without dural attachment have been reported.² Interestingly, most of them are found in pediatric age.² The typical location of meningioma without dural attachment was intraventricle, pineal area and sylvian fissure.^{3, 5}

We report another exceptional case of the meningioma

located in basal ganglia without dural attachment which was successfully removed by surgery.

■ Case report

A 15-year-old girl was presented with two months history of slowly progressing right sided weakness and motor dysphasia. Neurological examination of the patient revealed a right hemiparesis, right central type facial palsy and the impairment of the convergence of right eye.

The magnetic resonance imaging (MRI) revealed a well-circumscribed, homogeneously enhancing solid mass in the left basal ganglia without any attachment to the sylvian fissure (Fig. 1). T2-weighted image revealed heterogeneous mass with mild peritumoral edema only in the posterior surface of the mass. Magnetic resonance spectroscopy (MRS) demonstrated high choline peak, low NAA and creatine peak. Initial impressions of the mass were germ cell tumor, lymphoma or other malignant tumor. However, ^{18}F FDG-positron emission tomography (PET) showed hypometabolism at the mass.

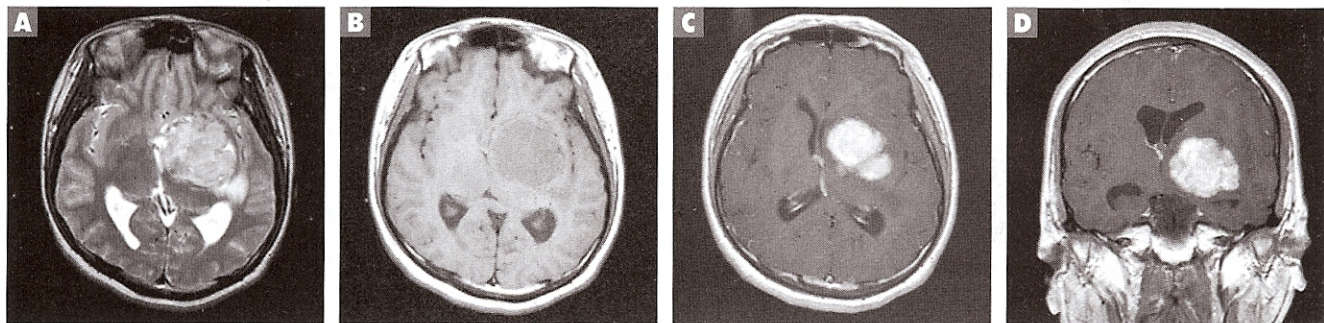
Stereotactic biopsy was performed and the histological diagnosis of the mass was a meningothelial meningioma. Based on the histological diagnosis, the patient underwent a left fronto-temporal craniotomy after angiography. Angiographic finding demonstrated that the tumor was supplied by lenticulostriate arteries of the left middle cerebral

artery (Fig. 2). After drilling out the sphenoid ridge, sylvian dissection was done and the tumor was exposed only after cortical incision on insular surface. Middle cerebral artery was on the lateral surface of the tumor. No dural or arachnoidal attachment to cisternal space could be identified around the mass macroscopically. The dissection plane between superior and anterior surface of the mass and normal brain was well preserved. However, it was relatively difficult to dissect posterior and inferior surface of the mass due to unclear tumor-brain border. The total resection of the tumor could be performed without any vascular insult. Postoperatively, the patient recovered without neurological deficit or any other complication. The histological diagnosis confirmed meningothelial meningioma again (Fig. 3). Postoperative MRI revealed no residual tumor and has showed no recurrence during 5 years after operation (Fig. 4).

■ Discussion

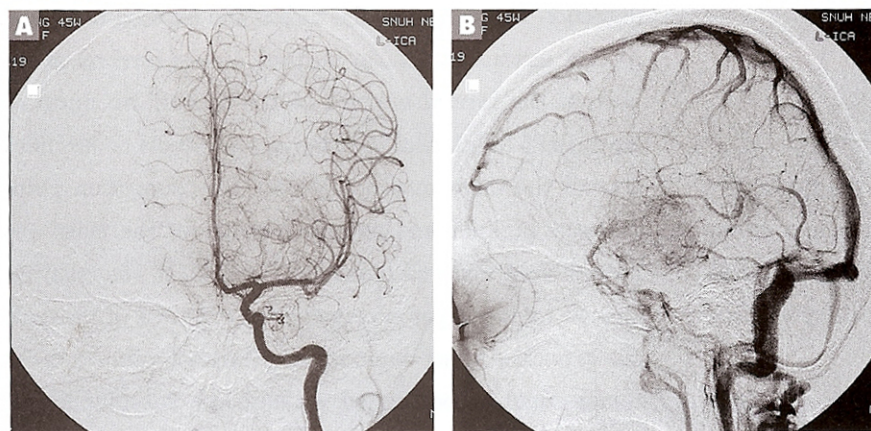
The origin of meningiomas is thought to be arachnoid cap or meningothelial cells. These cells are usually seen on the surface of the dura mater, which well explains the typical location of the meningiomas.^{2,3} However, these cells are also found at arachnoid membranes in other locations, such as the ventricular region, the pineal region and within the Sylvian fissure. The meningiomas without dural attachment were first reported in 1938 by Cushing and Eisenhardt and were

Fig. 1



- A. Axial T2-weighted image reveals heterogeneous mass in the left basal ganglia with mild peritumoral edema only in the posterior side.
B. Axial T1-weighted image reveals a hypodense signal intensity.
C, D. Axial and coronal T1-weighted gadolinium enhancing images demonstrate the tumor to be well-circumscribed, well-enhanced.

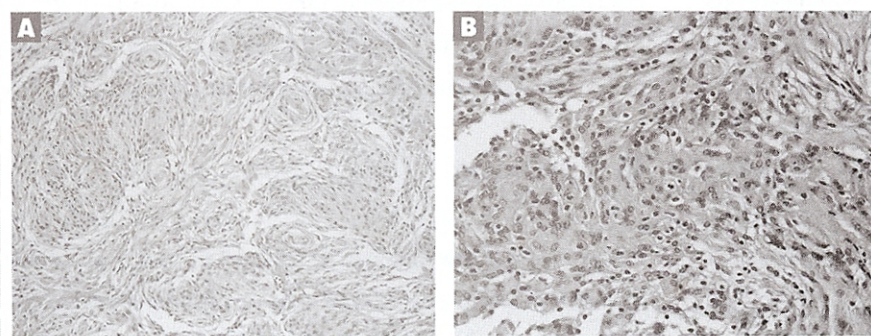
Fig. 2



Left internal carotid angiograms

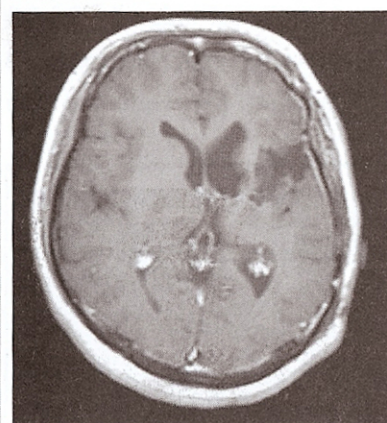
- A. The tumor is supplied by a left lenticulostriate artery.
B. The tumor staining persist into the venous phase.

Fig. 3



Photomicrographs of the tumor show a meningotheelial type meningioma with mitotic count less than 1/10 high power field. X 200, B. X 400

Fig. 4



Postoperative tissue loss on the left temporal lobe and left basal ganglia. There is no evidence of residual or recurrent tumor.

classified into the four groups: intraventricular region type, paraventricular region type, pineal region type and sylvian fissure type.⁵⁾ Among them, the meningiomas within the

sylvian fissure are extremely rare that only about 10 cases have been reported so far.²⁻⁴⁾ Chiocca and his colleagues suggested that this Sylvian fissure meningioma be originated from the arachnoid cap cells in the Virchow-Robin spaces along the cerebral vessels.^{3, 8)} Recently, a subtype of the sylvian meningioma located in insula so called a subcortical meningioma was proposed by Wada et al.⁹⁾ Only five cases of this category have been reported.^{7, 9)} The origin of subcortical meningioma is unclear. However, it is also speculated that the cells of the pia mater within the Virchow-Robin spaces of the brain sulci are the candidates.⁹⁾ The classification of the present case falls into subcortical meningiomas in that its location of basal ganglia without any relation to sylvian fissure and ventricles. Considering the vascular supply of the tumor and operative findings, the origin of the current case might be arachnoid cap cells in the Virchow-Robin space of

the lenticulostriate arteries.

When a tumor was found at the deep subcortical area of the brain without dural attachment, it is hard to think of meningioma as a possible diagnosis. Bitzer and Wada suggested that there are differences in location of the peritumoral edema between subcortical meningioma and other high-grade gliomas and metastatic brain tumors.^{1, 9)} In metastatic tumors and high grade gliomas, peritumoral edema surrounds the whole mass surface, while peritumoral edema associated with subcortical meningioma is located in the part of the tumor surface as was in the present case.

Most reported cases of the subcortical meningiomas were from Asian countries which implicates the possibility of racial differences in the incidence.⁹⁾

■ Conclusion

Subcortical meningioma is extremely rare. However, the possibility of the meningioma should be considered when the well-circumscribed insular mass has characteristic peritumoral edema. And surgical removal should be the treatment of choice.

References

1. Bitzer, M, Wockel, L, Luft, AR, Wakhloo, AK, Petersen, D, Opitz, H, et al: The importance of pial blood supply to the development of peritumoral brain edema in meningiomas. *J Neurosurg* 87:368-373, 1997
2. Chang, JH, Kim, JA, Chang, JW, Park, YG, Kim, TS: Sylvian meningioma without dural attachment in an adult. *J Neurooncol* 74:43-45, 2005
3. Chiocca, EA, Boviatsis, EJ, Westmark, RM, Short, MP, Richardson, EP, Zervas, NT: Deep sylvian fissure meningioma without dural attachment in an adult: Case report. *Neurosurgery* 35:944-946; discussion 946, 1994
4. Cho, BK, Wang, KC, Chang, KH, Chi, JG: Deep sylvian meningioma in a child. *Childs Nerv Syst* 6:228-230, 1990
5. Cushing, H, Eisenhardt, L: Meningiomas: Their classification, regional behaviour, life history, and surgical results. New York : Hafner Publishing Company, pp133-168, 1969
6. Kaplan, SS, Ojemann, JG, Park, TS: Pediatric sylvian fissure meningioma. *Pediatr Neurosurg* 36:275-276, 2002
7. Kim, CH, Park, SH, Hwang, JH, Hamm, IS: A subcortical anaplastic meningioma. *J Korean Neurosurg Soc*:235-237, 2005
8. Moon, BJ, Choi, JY, Park, YG, Chung, SS: Deep sylvian meningioma. *J Korean Neurosurg Soc* 33:218-221, 2003
9. Wada, T, Suzuki, M, Beppu, T, Arai, H, Yoshida, Y, Ogawa, A, et al: A case of subcortical meningioma. *Acta Neurochir (Wien)* 142:209-213, 2000