Association of Venous Angioma and Atypical Meningioma

—Case Report—

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Abstract

A 67-year-old male presented with an atypical meningioma arising from the right tentorium associated with a venous angioma in the left cerebellar hemisphere. The venous angioma was detected incidentally during examinations for the brain tumor. The brain tumor was removed completely and the venous angioma followed conservatively. Venous angiomas associated with brain tumors should be followed conservatively, as the clinical significance and surgical indications are unclear.

Key words: venous angioma, magnetic resonance imaging, atypical meningioma, brain tumor

Introduction

Cerebral vascular malformations can be classified as cavernous angiomas, capillary telangiectases, arteriovenous malformations, and venous angiomas.^{7,8,14)} Venous angiomas are the most common vascular malformation identified on radiographic studies as well as in autopsies. A series of more than 8200 craniospinal magnetic resonance (MR) images included 50 venous angiomas.⁴⁾ These malformations are usually detected incidentally on routine MR images and their clinical significance is controversial.^{1,3,4,6,12,13,17-19,21)}

The association of venous angioma and brain tumor is rare. We report a patient with an atypical meningioma arising from the right tentorium that was associated with a venous angioma in the left cerebellar hemisphere which was detected incidentally during examinations for the brain tumor.

Case Report

A 67-year-old male presented with a 3-month history of left-sided homonymous hemianopsia. Neurological examination revealed left-sided homonymous hemianopsia and mild left hemiparesis. Computed tomography (CT) revealed a hyperdense area in the right occipital lobe and a small hyperdense nodule in the left cerebellar hemisphere. Postcontrast CT

demonstrated a heterogeneously enhanced mass lesion in the right occipital lobe and an enhanced nodule in the left cerebellar hemisphere. MR imaging with gadolinium-diethylenetriaminepenta-acetic acid demonstrated the occipital lesion as a heterogeneously enhanced mass attached to the tentorium, without perilesional edema. A cerebellar lesion was detected at the site of medullary and draining veins (Fig. 1). Left vertebral angiography showed a

Fig. 1 Magnetic resonance images with gadolinium-diethylenetriaminepenta-acetic acid revealing a heterogeneously enhanced lesion without peritumoral edema in the right occipital lobe, attached to the posterior portion of the tentorium (left), and the typical features of venous angioma in the left cerebellar hemisphere (right).

Fig. 2 Left vertebral angiogram (venous phase) demonstrating a tumor stain in the right occipital lobe and venous angioma in the left cerebellum. Multiple dilated medullary veins converge on the draining vein that drains into the left transverse sinus. Note the absence of filling of the left transverse sinus between the confluence and a draining point of the venous angioma (arrowheads).

Fig. 3 Photomicrograph of the surgical specimen showing diffuse proliferation of meningeothelial cells with frequent mitoses (arrowheads). However, there is no necrosis or brain infiltration. HE stain, original magnification $\times 400$.

tumor stain in the right occipital lobe, and dilated medullary veins in the left cerebellar hemisphere draining into the left transverse sinus. There was no filling of the left transverse sinus between the con-

fluence and the point of drainage from the venous angioma (Fig. 2).

Right occipital craniotomy was performed and the tumor was totally removed (Simpson's grade 2). Histological examination of the specimen showed diffuse proliferation of meningeothelial cells with frequent mitoses (Fig. 3). However, there was no necrosis or brain infiltration. Immunohistochemical staining showed the tumor cells were positive for epithelial membrane antigen and vimentin. Based on these observations, the diagnosis was atypical meningioma.

Postoperatively, the left-sided homonymous hemianopsia was ameliorated, and the mild left hemiparesis disappeared completely. One month after surgery he was discharged from the hospital. The venous angioma was followed conservatively.

Discussion

The association of venous angioma and brain tumor is rare and the true incidence remains unclear.^{3,6,11,17,19} Including our patient, only 15 cases of brain tumor associated with venous angioma have been reported (Table 1).^{3,6,12,18,20,21} Information was available in 13 cases, seven males and six females aged from 14 to 73 years (mean 46.1 years).

The venous angiomas and brain tumors were both located supratentorially in six cases and infratentorially in three. In another four patients including ours, one lesion was supratentorial and the other infratentorial. The associated brain tumors were meningioma in six cases, including one atypical meningioma, astrocytoma in three, acoustic schwannoma in two, glioblastoma in two, medulloblastoma in one, and ependymoma in one.

The etiology underlying the association of venous angioma and brain tumor is unclear. The venous angiomas were incidentally detected during examinations for associated brain tumors in 14 of 15 cases. In Case 1, a glioblastoma developed 1 year after the detection of the venous angioma in the same area.¹² Venous angiomas are congenital malformations or anomalies of the normal venous drainage, so we think that the coexistence of venous angiomas and brain tumors is incidental.

Surgical planning for patients with this association should consider the clinical significance of the cerebellar venous angioma. Cerebral venous angiomas have been implicated in epilepsy, progressive neurological deficits, and hemorrhage, but their clinical relevance remains controversial.^{1,3,4,6,12,13,17-19,21} Venous angiomas located in the cerebellum are frequently associated with various symptoms such as gait ataxia, diplopia, and dizzi-

Table 1 Cases of association of venous angioma and brain tumor

Case No.	Author (Year)	Age/Sex	Associated tumor histology	Location of tumor	Location of venous angioma
1	Rigamonti et al. (1988) ¹²⁾	31/M	glioblastoma	rt frontal lobe	rt frontal lobe
2	Wilms et al. (1990) ²¹⁾	unknown	astrocytoma	lt frontal lobe	cerebellum
3		unknown	astrocytoma	rt parietal lobe	cerebellum
4	Wilms et al. (1992) ²⁰⁾	49/F	schwannoma	lt CP angle	lt cerebellar hemisphere
5		35/M	schwannoma	rt CP angle	rt cerebellar hemisphere
6	Uchino et al. (1992) ¹⁸⁾	14/F	medulloblastoma	cerebellar vermis	rt cerebellar hemisphere
7		44/F	meningioma	rt sphenoid ridge	rt frontal lobe
8		66/F	meningioma	rt occipital lobe	rt frontal lobe
9		48/M	meningioma	lt occipital lobe	lt temporo-parietal lobe
10		31/M	astrocytoma	rt frontal lobe	lt frontal lobe
11		29/M	ependymoma	lt parietal lobe	rt temporo-occipital lobe
12	Crecco et al. (1995) ³⁾	51/F	meningioma	unknown	frontal lobe
13		61/F	meningioma	unknown	parietal lobe
14	Kanai and Yamada (1998) ⁶⁾	73/M	glioblastoma	lt frontal lobe	rt frontal lobe
15	Present case	67/M	atypical meningioma	rt occipital lobe	lt cerebellar hemisphere

CP: cerebellopontine.

ness, even in the absence of marked hemorrhage.^{2,5,9,10)} The risk of hemorrhage may be greater in patients with lesions in the posterior fossa than in those with lesions in other areas.^{6,13,15,18)}

The natural history of venous angiomas is relatively benign.⁴⁾ Significant symptoms attributable to venous angiomas are rare and surgical resection of these lesions is rarely indicated.^{1,4,13,16,17)} A patient with a venous angioma of which the draining vein was ligated at surgery died during the operation from brain infarction.¹⁷⁾ Therefore, an associated asymptomatic venous angioma incidentally detected in a patient with a brain tumor should be managed conservatively, irrespective of the location.

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