Dural Cavernous Hemangioma of the Cerebellar Falx
—Case Report—

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Abstract

A 47-year-old man presented with a rare case of dural cavernous hemangioma of the cerebellar falx incidentally detected as a mass lesion in the posterior cranial fossa. Neurological examination revealed no deficits or physical symptoms. Computed tomography demonstrated a well-demarcated hyperdense mass, with no calcification, in the cerebellar vallecula. Magnetic resonance imaging showed the extra-axial mass as homogeneously isointense on T₁-weighted images, and hyperintense on T₂-weighted images, compared to the adjacent cerebellar parenchyma that had no hypointense halo. The cerebellar vermis was slightly compressed ventrally, the adjacent brain parenchyma was not swollen, and there was no evidence of hydrocephalus. The mass and the attached cerebellar falx were homogeneously enhanced by contrast medium. The dural enhancement was considered a dural tail. No other intracranial vascular malformations were found. The preoperative diagnosis was posterior cranial fossa meningioma attached to the cerebellar falx. Median suboccipital craniotomy exposed the reddish mass attached to the cerebellar falx. The arachnoid plane was well preserved. Total en bloc resection was performed with minimal blood loss. The postoperative course was unremarkable. The resected mass had a reddish-brown mulberry appearance, with spongy cross section with multiple blood-filled spaces. Histological examination identified dilated blood-containing channels lined with flattened endothelium and separated by fibrous tissue, but no luminal thrombus or hemorrhage. The histological diagnosis was dural cavernous hemangioma of the cerebellar falx. Preoperative radiosurgery or embolization is recommended for most of the dural cavernous hemangiomas, but surgery for the present dural cavernous hemangioma of the cerebellar falx was performed safely.

Key words: vascular malformation, meningeal disease, posterior cranial fossa

Introduction

Intracranial cavernous hemangioma occurs in 0.39–0.9% of the population based on magnetic resonance (MR) imaging studies, and is thought to account for 3–13% of all intracranial vascular malformations.¹,²,³,⁵,⁸,¹⁵ Cavernous hemangioma can occur anywhere in the central nervous system, but usually in the subcortical white matter of the cerebral hemispheres.¹,²,³,⁸,¹³,¹⁵ Less common locations include the cerebellopontine angle, pineal gland, ventricles, optic nerve and chiasm, dura, and dural sinuses.⁶–⁹ Cavernous hemangiomas arising from the dura are referred to as dural cavernous angiomas or dural cavernous hemangiomas,¹,²,³,⁷,⁸,¹⁵ and arise from the dural sinuses, falx cerebri, tentorium cerebelli, internal auditory canal dura, and convexity or cranial base dura.¹–³,⁷,⁹,¹³,¹⁵¹–¹⁵ The middle cranial fossa is the most frequently reported site for dural cavernous hemangiomas, which are also called sinus cavernomas or cavernous cavernomas. Dural cavernous hemangioma is different from intraparenchymal cavernous hemangioma in its aggressive clinical course, and clinical features such as surgical difficulty and sensitivity to radiosurgery.⁶,⁷,¹¹ Dural cavernous hemangioma located outside the middle cranial fossa is very rare, with only 27 reported cases,¹–³,⁷,⁹,¹¹,¹³–¹⁵ occurring in the supratentorial convexity dura, cerebral falx, tentorium cerebelli, dural sinuses, and others.

We present the first case of dural cavernous hemangioma arising from the cerebellar falx, which mimicked posterior cranial fossa meningioma on neuroimaging studies.

Case Report

A previously healthy 47-year-old man was referred to our hospital with an incidentally found mass lesion, more than 3 cm in diameter, in the posterior cranial fossa. Neurological examination revealed no deficits or physical symptoms. Computed tomography demonstrated a well-demarcated hyperdense mass, with no calcification, in the cerebellar vallecula (Fig. 1). MR imaging showed the lesion was an extra-axial mass, appearing homogeneously isointense on T₁-weighted images, and hyperintense on T₂-weighted images, compared to the adjacent cerebellar
Fig. 1 Computed tomography scan showing a hyperdense mass compressing the cerebellar vermis, and the barely discernible fourth ventricle.

Fig. 2 A: Axial T₁-weighted magnetic resonance (MR) image showing the homogeneously isointense lesion. B: Axial fast spin-echo T₂-weighted MR image, at the same level as A, showing a hyperintense mass and the adjacent brain parenchyma without swelling. C: Axial T₁-weighted MR image with contrast medium showing marked enhancement of the lesion and the attached cerebellar falx. D: Mid-sagittal T₁-weighted MR image with contrast medium showing the cerebellar vermis was slightly compressed ventrally.

Fig. 3 A: Intraoperative photograph showing coagulation of the cerebellar falx (arrowhead) attached to the lesion (double arrowhead). The lesion was encapsulated by arachnoid membrane. B, C: Photographs of the en bloc resected mass. The mass was solid, elastic, and soft. The cerebellar falx (white arrow) continued into the mass. D: Photomicrograph of the specimen showing dilated blood-containing channels (asterisk) lined with flattened endothelium (arrows) and separated by fibrous tissue (double asterisk). No luminal thrombus or hemorrhage was observed. Hematoxylin and eosin stain, ×25.

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Minimal blood loss. The patient's postoperative course was unremarkable.

The resected mass had a reddish-brown mulberry appearance, with a spongy appearance with multiple blood-filled spaces in cross section. Histological examination identified dilated blood-containing channels lined with flattened endothelium and separated by fibrous tissue, but no luminal thrombus or hemorrhage (Fig. 3). The histological diagnosis was dural cavernous hemangioma of the cerebellar falx.

Discussion

Dural cavernous hemangiomas in the posterior cranial fossa are extremely rare, with only 14 reported cases.²⁻⁶,¹⁰,¹¹,¹³,¹⁴ The tentorium cerebelli is the most common site, with male preponderance and various symptoms. For example, a 1-month-old infant presented with a lump in the back of the head with hydrocephalus,³ and two patients presented with internal auditory canal cavernous hemangioma manifesting as facial paresis and hearing disturbance.⁶ In our case, no neurological or physical symptoms were detected. Total resection was achieved in 10 of the 11 surgical cases.³,⁵,⁷,¹³,¹⁴ The preoperative diagnosis was meningioma or cerebellopontine angle tumor in other cases. The preoperative diagnosis in our case was cerebellar falx meningioma, which is supposed to be rare.

Only 14 of 161 posterior cranial fossa meningiomas (8.8%) were cerebellar convexity or lateral tentorial...
meningiomas. Cerebellar falx meningioma is rarely described. The MR imaging appearance of cavernous hemangioma of the posterior cranial fossa dura mimics that of meningioma. Only radiological investigations cannot distinguish dural cavernous hemangioma from meningioma. Cavernous hemangiomas may tend to harbor other vascular malformations. In our patient, no other vascular lesion was found despite a meticulous radiological investigation, and the MR imaging findings were compatible with meningioma. These findings supported our preoperative diagnosis of a rare cerebellar falx meningioma.

Cavernous hemangioma consists of sinusoidal spaces lined by endothelium without elastic or muscular layers, and typically shows characteristic hyaline degeneration, thrombosis, calcification, and hemorrhage. However, the histological investigation in our case did not reveal any of these characteristic findings, which possibly supported the preoperative neuroimaging findings of homogeneous isointensity on the precontrast T1-weighted images and the absence of a very hypointense halo on the T2-weighted images.

Preoperative radiosurgery or embolization is recommended for dural cavernous hemangioma of the middle cranial fossa, but surgery for dural cavernous hemangioma outside the middle cranial fossa can generally be performed safely, as in our case.

References


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