Cavernous Sinus Cavernous Hemangioma Largely Extending Into the Sella Turcica and Mimicking Pituitary Adenoma

—Case Report—

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Abstract

A 77-year-old female presented with a rare cavernous sinus cavernous hemangioma with extension to the sella turcica, neuroradiologically mimicking nonfunctioning pituitary macroadenoma. The lesion was partially removed via transsphenoidal surgery, and the histological diagnosis was cavernous hemangioma. After stereotactic radiosurgery using a cyber knife, the lesion decreased in size. Stereotactic radiosurgery may be a good option for cavernous sinus cavernous hemangioma with high risk of surgical bleeding.

Key words: cavernous sinus cavernous hemangioma, magnetic resonance imaging, pituitary macroadenoma, stereotactic radiosurgery, transsphenoidal surgery

Introduction

Cavernous hemangiomas are benign vascular malformations which may originate in any intracranial region, account for 5 to 13% of intracranial vascular malformations, and occur in approximately 0.5 to 1% of the population.^{4,13)} The most common location is the cerebral hemispheres and the typical manifestations are seizures and bleeding.^{1,18)} Cavernous sinus cavernous hemangiomas are extremely rare and account for less than 2% of all cavernous sinus tumors.^{5,8)} We treated an elderly patient with an enhanced lesion in the cavernous sinus with extension to the sella turcica under a neuroradiological diagnosis of nonfunctioning pituitary adenoma, but the histological diagnosis was cavernous hemangioma. We discuss the difficulty of preoperative radiological distinction between cavernous hemangioma largely extending into sella turcica and pituitary macroadenoma, and a useful option for treatment of the surgically high-risk cavernous sinus cavernous hemangioma.

Case Report

A 77-year-old female suffered head trauma. Computed tomography revealed a high-density mass in the sellar and left parasellar regions. Magnetic resonance (MR) imaging showed a large, lobulated lesion in the sella turcica and

left cavernous sinus, which extended into the suprasellar region and compressed the optic chiasm (Fig. 1A–C). The lesion appeared homogeneously isointense on T₁-weighted images and markedly hyperintense on T₂-weighted images. The pituitary stalk and pituitary gland were markedly shifted to the right (Fig. 1A, B). The mass was homogeneously enhanced after administration of contrast medium. The patient had no neurological deficits. Static values of thyroid-stimulating hormone, growth hormone, luteinizing hormone, follicle-stimulating hormone, prolactin, cortisol, and adrenocorticotrophic hormone were 5.42 μ IU/ml, 0.07 ng/ml, 9.2 mIU/ml, 26.7 mIU/ml, 16.6 ng/ml, 11.8 μ g/dl, and 46 pg/ml, respectively. The preoperative diagnosis was nonfunctioning pituitary macroadenoma.

Surgical exploration via a sublabial transsphenoidal approach to the sellar lesion revealed a reddish fibrous hard tumor. The tumor was vascular, and was removed piecemeal with bipolar coagulation. Intraoperative examination of frozen sections established that the lesion was a cavernous hemangioma. The tumor was partially removed to obtain specimens for histological diagnosis.

The postoperative course was uneventful. Histological examination showed the tumor consisted mainly of multiple dilated thin-walled vascular channels (Fig. 2). The histological diagnosis was cavernous hemangioma. Cyber knife treatment (marginal dose 17 Gy and central dose 21 Gy/3 fractions/week) was given. The tumor had decreased in size at 1 year after radiosurgery (Fig. 1D).

Fig. 1 A-C: Preoperative coronal T₁-weighted magnetic resonance (MR) image (A) showing a large, lobulated isointense lesion in the sella turcica and left cavernous sinus. Preoperative coronal T₂-weighted MR image (B) showing a markedly hyperintense lesion. Preoperative coronal T₁-weighted MR image with contrast medium (C) showing homogeneous enhancement of the lesion. Arrows indicate the pituitary gland. D: Coronal T₁-weighted MR image with contrast medium 1 year after radiosurgery showing decreased size of the lesion.

Fig. 2 Photomicrograph of the surgical specimen showing multiple dilated vascular channels with thin walls. Hematoxylin and eosin stain, $\times 400$.

Discussion

Extra-axial cavernous hemangiomas are rare vascular tumors, accounting for only 0.4 to 2% of the intracranial cavernous hemangiomas, and are most commonly located in the cavernous sinus or middle cranial fossa.²²⁾ The clinical signs of cavernous sinus cavernous hemangioma are headache, ocular pain, and dysfunctions of the cranial

nerves passing through the cavernous sinus, especially ptosis and diplopia. Sudden neurological deterioration in association with hemorrhage is rare.^{9,20,22)}

Cavernous sinus cavernous hemangiomas tend to grow as asymmetrical dumbbell-shaped masses occupying the middle cranial fossa and sellar lesion.²⁰⁾ Cavernous hemangiomas are difficult to differentiate from other cavernous sinus tumors like meningioma, neurinoma, or lateral extensions of pituitary adenoma. The preoperative misdiagnosis rate is reported as up to 66.7 to 87.5%.^{9,14,22)} In the present case, our preoperative diagnosis was non-functioning pituitary macroadenoma. MR imaging demonstrates pituitary adenomas are hypointense to isointense on T₁-weighted images and variable intensity on T₂-weighted images. Cavernous hemangioma may resemble pituitary adenoma, apart from the prominent hyperintensity on T₂-weighted images.^{9,12,17,20)}

Cavernous sinus cavernous hemangiomas with sellar or intracranial extension have three patterns of parasellar growth: endophytic lateral growth, endophytic medial growth, and exophytic growth.¹²⁾ In the endophytic medial growth pattern, lesions extend into the sella turcica, and can be differentiated from intrasellar cavernous hemangioma with cavernous sinus extension based on location of the major portion of the tumor.^{2-4,15,19)} In the present case, MR imaging showed that the pituitary gland was compressed to the lower right side in the sella turcica. Therefore, we speculate that the main mass of the cavernous hemangioma was located in the left cavernous sinus, and then expanded into the sella turcica.

Cavernous hemangioma is a highly vascular lesion. Despite recent advances in microsurgery, surgical removal of cavernous sinus cavernous hemangioma is often very difficult, because of the critical anatomical structures in the cavernous sinus and the risk of excessive intraoperative bleeding.^{9,16,17,20,21)} If cavernous hemangioma is suspected, frozen sections should be examined for diagnosis with partial resection after adequate preparation, since complete excision may result in serious bleeding.^{3,4)}

Adjunctive treatment of residual cavernous hemangioma with stereotactic radiosurgery may yield excellent response and avoidance of morbidity.^{6,8,10,11)} Radiosurgery can effectively reduce the rebleeding rate after the first symptomatic hemorrhage and may be useful in reducing the severity of seizures in patients with cavernous hemangioma.¹¹⁾ Various treatment approaches toward cavernous sinus cavernous hemangioma have been reported.⁵⁾ Radiosurgery is effective for cavernous sinus cavernous hemangioma.^{7-9,16,17,20)} Partial resection followed by stereotactic radiosurgery may be a useful option for the treatment of cavernous sinus cavernous hemangioma in elderly patients.

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