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Case Report

Cavernous malformation of the optic chiasm: An uncommon location

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Abstract

Background: Cavernous malformations (CMs) of the optic chiasm are rare lesions often presenting with acute chiasmal syndrome or a progressive visual loss. The case of a 48-year-old female with an intrachiasmatic CM is presented.

Case Description: The patient presented with an insidious history of progressive visual loss. Magnetic resonance imaging (MRI) showed a CM in the suprasellar region. The patient was operated via a right pterional approach with a complete lesion removal. The postoperative course was uneventful. Early postoperative ophthalmological examination revealed minimal improvement of the vision in the left eye.

Conclusion: The clinical, neuroradiological, and intraoperative findings are presented, along with a review of the literature.

Key Words: Cavernous hemangioma, optic chiasm, optic nerve

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INTRODUCTION

Cavernomas, also known as cavernous angiomas or cavernous malformations (CMs), are vascular malformations characterized by the presence of sinusoid-like capillary vessels containing blood in a very sluggish circulation.[6] They can develop in several locations of the central nervous system (CNS) being observed in the cerebrum, cerebellum, or spinal cord.[10] In the brain they are frequently located at subcortical sites in the frontal and temporal lobes.[1] CMs may be spontaneous or familiar lesions, the latter often associated with multiple localizations.

CM involving cranial nerves is rarely reported. Optic nerve, third, seventh, and eight nerve in the internal auditory canal and seventh nerve in the temporal bone are rarely reported locations.[2] CMs of the chiasm are rarely described and have been associated with visual symptoms as well as headache and retro-orbital pain.[11]

We present a case of an opto-chiasmatic CM along with a pertinent review of the literature.

CASE REPORT

A 48-year-old female was admitted with a 6-month history of progressive decrease in the vision. At admission, the neurological examination showed bitemporal hemianopsia and a decreased pupillary reaction to light in both eyes. Fundus oculi examination showed a light

papilla bilaterally. The patient did not complain of pituitary dysfunction.

Brain magnetic resonance imaging (MRI) showed a 2 cm hypointense lesion on T2-weighted images inside the optic chiasm in the suprasellar region. On T1-weighted images, the lesion appeared as an intraaxial lesion inside the optic chiasm without contrast enhancement after gadolinium administration [Figure 1]. The patient underwent cerebral angiography that did not reveal any vascular malformation.

Surgery was performed via a right pterional approach. The lesion was dissected out from arachnoid adherences and coagulated by using a quantum molecular resonance-based bipolar coagulation (Vesalius®). This device uses a relatively low temperature that does not exceed 45–50°C, having minimum effect on nervous tissues, nerves, and blood vessels. The cavernoma was shrunk and dissected out from the chiasma [Figure 2]. The postoperative course was uneventful. On the 5th day following surgery, the patient underwent ophthalmological examination that revealed improvement in vision on the left eye without changes in the visual field. The histopathological analysis of the resected lesion confirmed the preoperative diagnosis of CM. Five months following the operation, MRI showed complete removal of the vascular lesion [Figure 3].

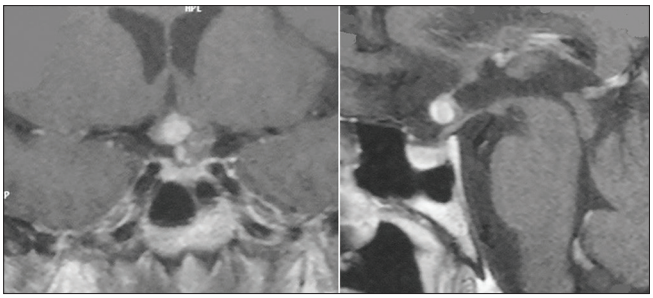

Figure 1: MRI, T1-weighted images after gadolinium administration, showing a cystic and hemorrhagic lesion in the suprasellar region adjacent to the optic chiasm

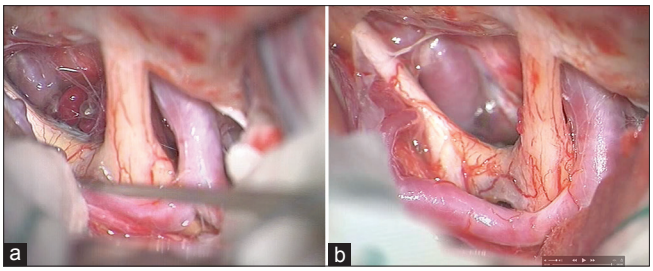

Figure 2: (a) Intraoperative image showing the cavernoma located in the most anterior part of the optic chiasm; (b) the chiasm is free of lesion at the end of the surgical procedure

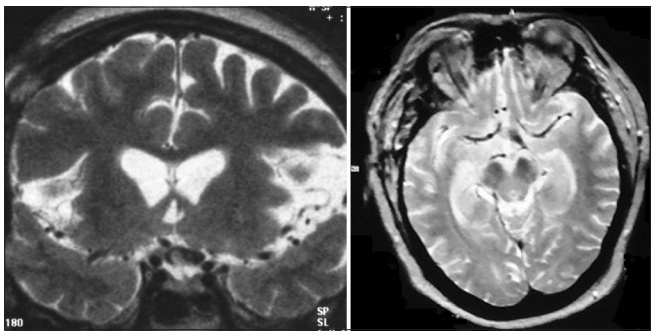

Figure 3: MRI scan performed 5 months following the after surgery revealing the complete removal of the cavernous malformation

DISCUSSION

CMs of the optic chiasm are unusual lesions. The presenting symptoms range from progressive visual loss or pituitary disturbances to chiasmal apoplexy syndrome.[1] There are no histological or radiological differences between optochiasmal CMs and those found elsewhere in the CNS. It is reasonable to assume that these lesions have a similar natural history in terms of hemorrhage rate as well as those in other locations in CNS.[4]

Symptomatic CMs of the optic chiasm are generally treated surgically. Since these tumors are intrinsic lesions, a small nerve incision is required for excision. In such a case, a gliotic interspace between the vascular malformation and the surrounding normal tissue often provides a plane for a safe cleavage.[8] Although biopsy or partial removal[3,7] has been proposed to minimize operative risk, in our opinion a total excision should be pursued to allow complete chiasmal decompression. The shrinkage of the lesion could also be an option, because it would decrease the compression on the chiasm. We believe that leaving a small portion of the shrunk lesion inside the chiasm could carry the risk of a chiasmal apoplexy. For this reason, a complete resection has to be considered as the gold standard. The pterional approach is usually reported as preferred approach for opto-chiasmatic CMs excision. Following wide sylvian fissure and basal cisterns opening, it offers wide space and good overview of the neural and vascular structures. It also does not need retraction of the frontal lobes.

However, other surgical approaches have been reported such as orbitozygomatic and subfrontal approaches[5] or direct frontal approach and eyebrow keyhole.[9] The choice of the surgical approach depends on the lesion size, disease development and familiarity of the surgeon with specific surgical approaches. We are familiar with the pterional approach in case of lesions involving the chiasmal region, because it allows a complete control of the anterior part of the circle of Willis and avoids retraction of neural structures to reach the targeted lesion. On the other hand, an anterior approach to chiasmal lesions, would give a late control of the vascular structures and a narrow surgical corridor with frontal lobe retraction.

The risk for recurrent hemorrhages and the good outcome following a complete resection suggest that CMs of the chiasm should be completely removed once diagnosed.

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