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Intra Orbital Cavernous Hemangioma: A Case Report and Review of the Litterature

M. El Khalifa[1*], M. Mekouar[1], Y. Bouktib[1], A. Elhajjami[1], B. Boutakioute[1], M. Ouali Idrissi[1], N. Cherif Idrissi[1]

[1]Departement of Radiology, Mohamed VI University Hospital, Cadi Ayyad university, Marrakech, Morocco

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***Corresponding author:** M. El Khalifa
Department of Radiology, Mohamed VI University Hospital, Cadi Ayyad university, Marrakech, Morocco

Abstract **Case Report**

Cavernous hemangioma is the most frequent benign primary vascular tumor of the adult orbit. It typically presents around the age of 42 and shows a clear female predominance. This slow-growing tumor does not regress spontaneously and most often arises within the intraconal space in a retrobulbar location, although extension into the extraconal compartment is possible. Clinically, the tumor manifests as a gradually progressive, non-reducible, non-pulsatile exophthalmos that is usually painless unless complications arise. A decrease in visual acuity is observed in approximately two-thirds of cases. Diagnosis is easily confirmed by imaging—particularly MRI—which allows precise localization of the lesion in relation to the optic nerve and extraocular muscles. Imaging findings are crucial for planning the optimal surgical approach. Surgical excision is typically performed en bloc and is often straightforward due to the well-defined, encapsulated nature of the tumor. The choice of surgical route depends primarily on the size and especially the location of the lesion. The functional prognosis is favorable, and recurrence is rare. We report a case of orbital cavernous hemangioma revealed by progressive exophthalmos and diplopia in a 42-year-old patient.

Keywords: Cavernous Hemangioma, Intra Orbital, Vascular Tumor, MRI, Surgery.

INTRODUCTION

Cavernous hemangiomas of the orbit are uncommon vascular tumors, accounting for approximately 4.5% to 7.4% of all primary and secondary orbital tumors. Despite their relative rarity, they remain the most frequently encountered benign orbital tumors in adults. These lesions exhibit a clear female predominance, with a peak incidence typically occurring between the fourth and fifth decades of life.

Clinically, orbital cavernous hemangiomas are characterized by slow growth and a prolonged preservation of both visual acuity and ocular motility. They are generally well-encapsulated, making them amenable to surgical dissection and excision. Despite their frequent location in the retrobulbar space most often within the intraconal compartment, an area of considerable anatomical complexity and limited surgical accessibility these tumors are associated with a favorable functional and aesthetic prognosis.

CASE REPORT

We report the case of a 42-year-old female patient with no significant past medical history, who presented with a progressively developing left-sided unilateral exophthalmos over a two-month period. The condition was associated with ipsilateral visual acuity reduction and binocular diplopia.

On admission, clinical examination revealed a conscious patient (Glasgow Coma Scale score: 15/15), with no sensory or motor neurological deficits. Ophthalmologic assessment demonstrated a left axial exophthalmos that was non-reducible, painless, non-pulsatile, and without bruit on auscultation. No inflammatory signs were noted on inspection. Visual acuity was estimated at 7/10 in the left eye and 10/10 in the right eye. Ocular motility was preserved in all directions of gaze.

Orbital magnetic resonance imaging (MRI) revealed a well-defined, intraconal orbital mass with an ovoid configuration, measuring 29 × 17 mm. The lesion appeared hypointense on T1-weighted sequences and hyperintense on T2-weighted images, with no diffusion restriction on ADC mapping. Post-contrast sequences showed heterogeneous enhancement with a delayed and progressive filling pattern. The mass exerted a compressive effect on adjacent structures, displacing the

optic nerve medially (with preserved signal), the lateral rectus muscle laterally, and causing anterior displacement of the globe, consistent with grade I exophthalmos. A mild thickening of adjacent soft tissues was also observed, with no involvement of the other extraocular muscles.

The patient underwent complete en bloc surgical excision of the lesion via a transcranial (superior) approach. Intraoperatively, the mass was well encapsulated, firm in consistency, and displaced the left optic nerve medially without evidence of infiltration.

Histopathological examination of the surgical specimen confirmed the diagnosis of an intraorbital cavernous hemangioma.

The postoperative course was uneventful, marked by complete resolution of the exophthalmos. The patient developed a transient palpebral ecchymosis and chemosis on the left side, both of which resolved spontaneously within a few days. No postoperative ptosis was observed. The clinical outcome remained favorable, with full recovery of left visual acuity and no evidence of local recurrence.

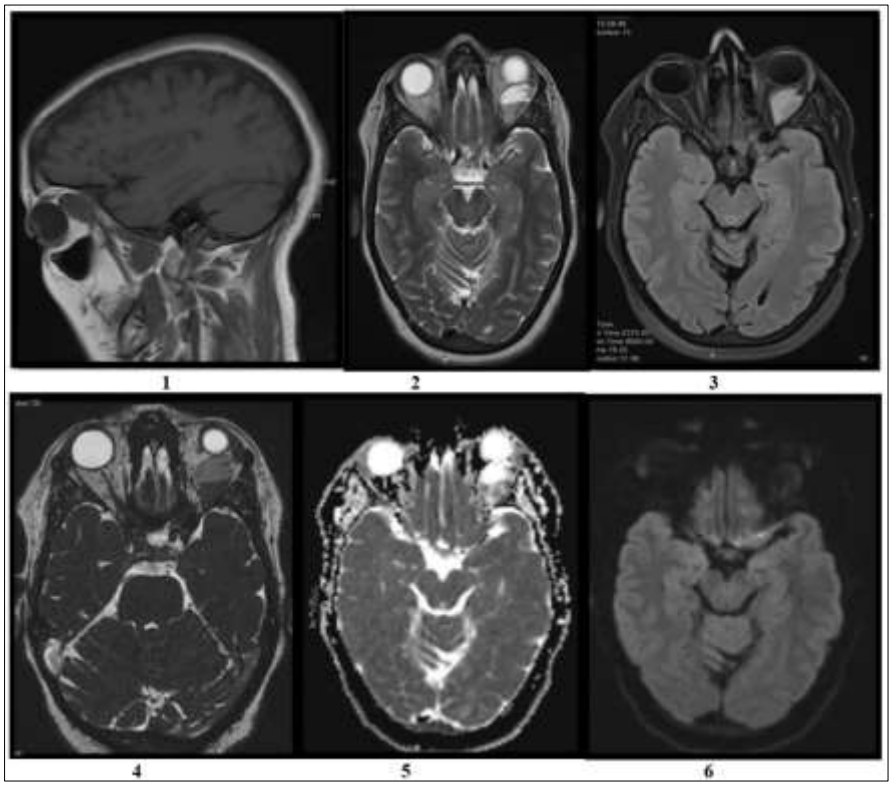

Figure 1: Orbital magnetic resonance imaging (MRI) revealed a well-defined, intraconal orbital mass with an ovoid configuration, measuring 29 × 17 mm. The lesion appeared hypointense on T1-weighted sequences (1) and hyperintense on T2-weighted images (2) and Flair (3), with no diffusion restriction on ADC mapping (5,6)

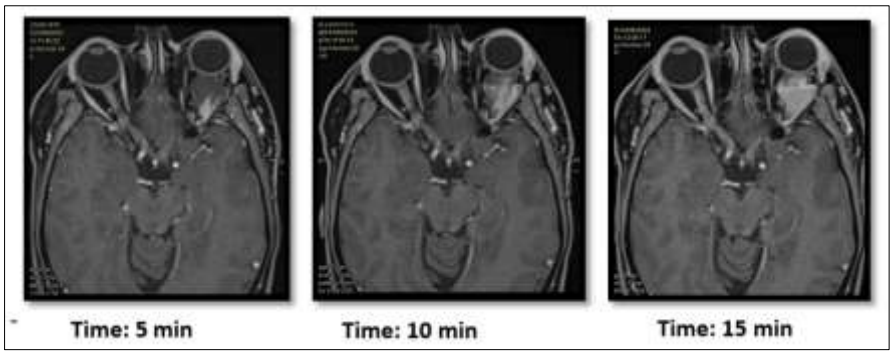

Figure 2: Post-contrast sequences showed heterogeneous enhancement with a delayed and progressive filling pattern

DISCUSSION

Cavernous hemangiomas of the orbit are rare benign vascular tumors, accounting for approximately 4.5% to 7.4% of all orbital tumors, whether primary or secondary. However, they represent the most common type of benign primary orbital tumors [1]. These lesions typically present in adulthood, with a mean age at

diagnosis of 42 years, and show a marked female predominance, affecting approximately 70% of cases [2].

Etiopathogenesis and Histological Features

Cavernous hemangiomas are congenital vascular malformations [3], consisting of blood-filled vascular spaces, most commonly located in the intraconal space, although extension to the extraconal and even extraorbital spaces is possible [4]. These lesions are typically deep-seated and not clinically palpable. Unlike capillary hemangiomas of infancy, they do not exhibit spontaneous regression.

Macroscopically, the lesion appears as an ovoid, sometimes multifocal mass with smooth, polycyclic borders and a purplish hue, surrounded by a well-defined fibrous capsule. Histologically, it is composed of large, dilated vascular spaces lined by flattened endothelial cells, encapsulated within a dense fibrous stroma [5].

Clinical Presentation

Clinically, orbital cavernous hemangiomas most commonly present with progressive, painless, non-pulsatile proptosis, which may be axial or non-axial depending on the tumor's location (intra- or extraconal) [6]. In some cases, the diagnosis may be incidental. Intraconal lesions can compress the posterior aspect of the globe, leading to hyperopia. Although rare, optic nerve compression may occur, resulting in decreased visual acuity [7], sometimes associated with choroidal folds or papilledema on fundoscopic examination.

Imaging Findings

Imaging plays a pivotal role in the diagnostic work-up. On ultrasonography, the lesion appears as a well-defined, homogeneous, hyperechoic mass with slow-flow vascular channels demonstrated on color Doppler. On computed tomography (CT), the tumor is encapsulated, well-circumscribed, and slightly hyperdense with mild contrast enhancement, generally less than that of adjacent extraocular muscles.

Magnetic resonance imaging (MRI) is the modality of choice. On T1-weighted sequences, the lesion is isointense to extraocular muscles, while on T2-weighted images, it appears as a markedly hyperintense, almost fluid-like structure [8], often described as a "globe behind the globe" appearance. Contrast enhancement is initially heterogeneous, producing the characteristic "caput medusae" or "flowering apple tree" appearance [9], with delayed homogenization at around 5 minutes post-injection.

Management

Surgical excision is the treatment of choice, particularly for lesions exceeding 25 mm in diameter due to their potential mass effect on surrounding orbital structures, especially the optic nerve [10]. The surgical approach, either transconjunctival or transcutaneous, is determined based on the lesion's location and aims for complete en bloc resection. Recurrence is rare, and there is no known risk of malignant transformation.

CONCLUSION

Orbital cavernous hemangioma is a rare, slowly progressive benign tumor, yet remains the most common benign primary orbital neoplasm. Its diagnosis is based on a combination of typical clinical and radiological features, with MRI being particularly valuable in preoperative assessment. En bloc surgical excision remains the gold standard treatment, generally yielding excellent functional and cosmetic outcomes.

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