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Cavernous Hemangioma of the Orbit: Case Report

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Abstract **Case Report**

Cavernous hemangiomas of the orbit are rare vascular tumors, often asymptomatic at first. We present the case of a 56-year-old woman who developed left unilateral exophthalmos and a decrease in visual acuity over 12 months. Examination revealed pulsatile exophthalmos, and MRI showed a lesion suggestive of a cavernous hemangioma. It is crucial to suspect an orbital tumor in cases of exophthalmos, especially if it is painful or rapidly progressing. MRI is the preferred tool for preoperative diagnosis. The treatment consists of en bloc surgical resection, which ensures good functional and anatomical outcomes.

Keywords: Orbital, hemangioma, CT, MRI, Doppler.

INTRODUCTION

Cavernous hemangiomas of the orbit are rare vascular tumors, accounting for between 4.5% and 7.4% of all primary and secondary orbital tumors. These tumors evolve slowly while preserving visual function and ocular motility for a long time. They are well-encapsulated and have a surgically easy cleavage plane. The name derives from "angios" and "kavernos," meaning vessels and cavity, respectively. This aptly describes the lesion, which is vascular in nature and composed of multiple blood-filled cavities or "caverns," separated by thin walls of varying sizes. All these factors contribute to the good functional and aesthetic prognosis of the orbital cavernous hemangioma, despite its typical retrobulbar location, usually intraconical, in an area of great anatomical complexity and surgical difficulty.

We report a case of an orbital cavernous hemangioma revealed by exophthalmos in a 56-year-old woman [1, 2].

CASE REPORT

The patient is a 56-year-old woman with no significant medical history, who presented 12 months prior to her admission with left unilateral exophthalmos (which had a progressive onset along with a decrease in visual acuity on the same side, without other associated signs.

Upon admission, the clinical examination revealed a conscious patient (GCS 15/15), without any sensory-motor neurological deficits. The ophthalmological examination noted left exophthalmos that was irreducible, painless, pulsatile, and non-blowing on auscultation, with no inflammatory signs nearby. Visual acuity was estimated at 6/10 in the left eye and 10/10 in the right eye; ocular motility was preserved, and the fundoscopic examination showed stage II papilledema on the left. Orbital and encephalic MRI demonstrated a well-defined intra- and extra-conical lesion in the superior and internal left orbit extending to the canthus, measuring 40x30x16 mm, with heterogeneous signal characteristics, low signal on T1, high signal on T2, areas of restricted diffusion, and heterogeneous enhancement after contrast injection. It also contained areas of high signal on T1 that did not disappear on the fatsat sequence and regions of low signal on T2 (indicative of hemorrhagic foci or phleboliths).

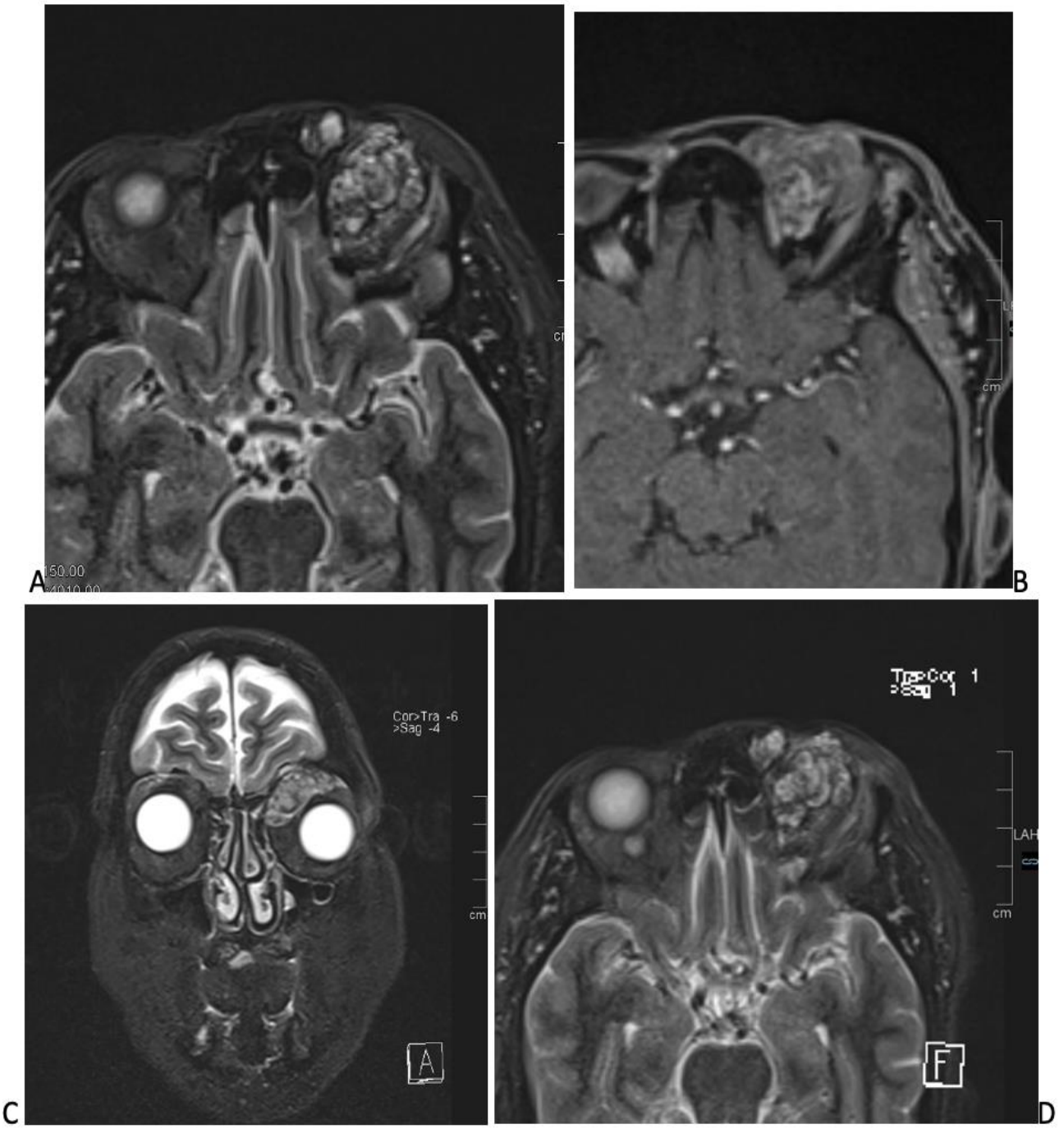

Figure 1: (A,B,C,D): Intra- and extra-conical lesion process superiorly and internally on the left, extending to the inner canthus, with hypointense signal on T1, hyperintense signal on T2, and restricted diffusion showing areas of signal void on T2* sequences, intensely and heterogeneously enhanced after contrast injection, related to phleboliths, suggestive of an orbital cavernous hemangioma

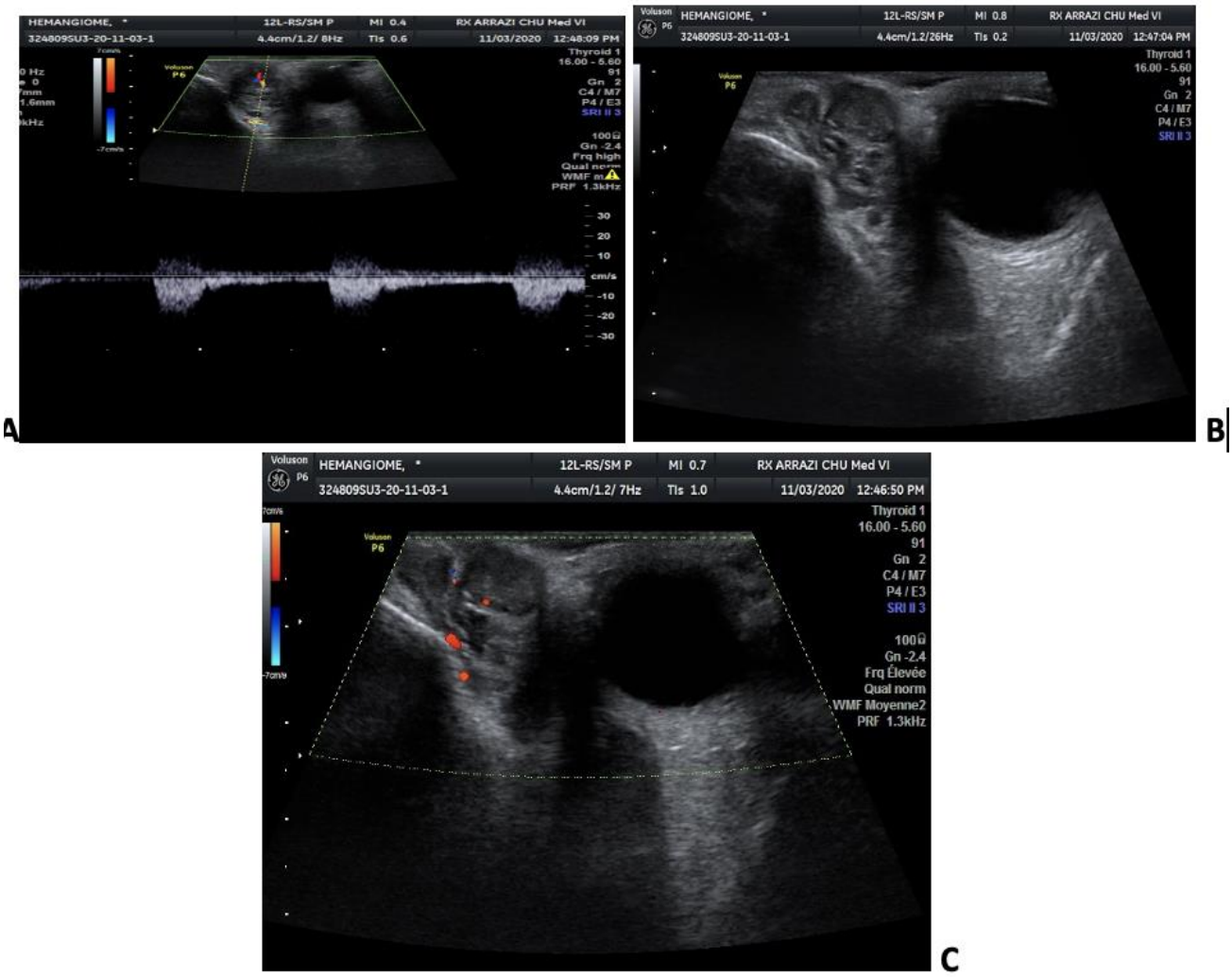

Figure 2: (A,B,C): Orbital lesion formation intra- and extra-conical, well-defined, hypoechoic, heterogeneous, vascularized on color Doppler with low resistance arterial flow

DISCUSSION

Cavernous hemangiomas are the most common benign tumors of the orbit, with a higher incidence in women, typically between the ages of 40 and 50. They are congenital vascular malformations formed by endothelial cells that develop into interconnected blood-filled cavities, often referred to as "caverns" [2].

These tumors are primarily located in the intra-conical space but can also extend into the extra-conical and extra-orbital spaces. Their deep location often complicates palpation, making the initial clinical diagnosis more challenging [3].

The diagnosis of cavernous hemangiomas in the orbit relies primarily on advanced imaging techniques, which are essential for evaluating the structure, composition, and impact of the tumor on surrounding tissues [3, 4].

In ultrasound we find a mass Appearance: On ultrasound, the hemangioma appears as a homogeneous, well-defined, and hyperechoic mass. This indicates that it reflects a significant amount of ultrasound waves, making it easily identifiable, Blood Flow: Doppler ultrasound is particularly useful for assessing the vascularization of the tumor [4].

The blood lakes within the hemangioma exhibit slow blood flow, which is typical of cavernous hemangiomas. This characteristic helps distinguish this lesion from other orbital masses that may display faster blood flow [5].

CT scans provide morphological Details: During the CT examination, the hemangioma appears as a well-defined, encapsulated lesion. The presence of a capsule often indicates the benign nature of the tumor [3, 5, 6].

Density and Contrast Enhancement: The lesion is hyperdense compared to surrounding tissues, meaning it absorbs more X-rays. After the injection of contrast material, a slight enhancement is observed, but it is less pronounced than that of adjacent muscles. This helps

confirm the vascular nature of the tumor while allowing differentiation from other types of masses that may show more significant enhancement [6].

MRI is the examination of choice for the study how the hemangioma affects surrounding structures, such as the optic nerve and ocular muscles. It allows for observation of the anatomical relationship between the tumor and these vital structures [3, 7].

Signal Characteristics: In T1-weighted sequences, the hemangioma appears isosignal compared to the muscles, indicating similar intensity. In contrast, in T2-weighted sequences, it shows hypersignal, indicating a fluid-rich composition. This almost liquid signal is highly suggestive of a cavernous hemangioma [8].

"Globe" Appearance: The hemangioma may present a distinctive "globe behind the globe" appearance, highlighting its location behind the eyeball.

Contrast Enhancement and Homogenization: Upon contrast administration, the enhancement pattern is often described as "apple tree in bloom," a characteristic that homogenizes over time, typically between 5 and 10 minutes after injection. This allows visualization of the different vascularization zones within the tumor [8].

Surgical treatment is indicated when the size of the hemangioma exceeds 25 mm due to the risk of compression on the optic nerve. Complete excision is generally the preferred approach, allowing for the removal of the tumor while preserving adjacent tissues. Recurrences are rare, and the risk of malignant transformation is negligible.

Regular clinical follow-up is essential to monitor visual function and detect any potential complications. Additional imaging studies may be performed to ensure there are no recurrences or other postoperative issues. In summary, although benign, cavernous hemangiomas of the orbit require careful management to ensure optimal functional and aesthetic outcomes [2, 9].

CONCLUSION

Any exophthalmos, especially if painful and of rapid onset, should prompt the investigation of an orbital tumor using appropriate imaging. The clinical and radiological presentations are quite stereotypical; however, current imaging techniques allow for a strong preoperative diagnostic presumption, particularly with the advent of MRI, which remains the preferred examination for exploring tumor processes in the orbit. Surgical excision en bloc is the treatment of choice for cavernous hemangiomas of the orbit, generally ensuring satisfactory outcomes both functionally and anatomically.

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