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Research paper

Orbital Angioma: A Case Report and Literature Review

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Abstract

Orbital angioma is a rare vascular tumour that can cause exophthalmos, diplopia, and visual impairment. We report a case of orbital angioma in a patient presenting with progressive unilateral exophthalmos. Imaging and surgical intervention allowed for diagnosis and appropriate management.

Keywords: *Orbital Angioma; Exophthalmos; Orbital Surgery; Imaging.*

1. Introduction

Orbital angiomas are benign vascular malformations, accounting for less than 1% of orbital masses [1]. They can be cavernous, capillary, or mixed and often present as progressive, painless exophthalmos [2]. Diagnosis relies on clinical examination supported by imaging findings (MRI, CT scan) [3]. Treatment varies depending on size, location, and symptoms [4], [5].

2. Epidemiological Context

Orbital angioma, also referred to as orbital cavernous hemangioma or cavernous venous malformation, represents the most common benign primary orbital tumor in adults. It accounts for approximately 5–9% of all orbital tumors and up to 13–22% of benign orbital lesions reported in large surgical and radiological series [11–13].

The condition predominantly affects middle-aged adults, with a peak incidence between the fourth and sixth decades of life. A female predominance has been consistently reported, with female-to-male ratios ranging from 1.5:1 to 3:1, suggesting a possible hormonal influence on tumor development or progression [11], [14]. Orbital angiomas are typically unilateral and sporadic, with no clear hereditary pattern identified.

Most lesions are located within the intraconal space, particularly lateral to the optic nerve, which explains the frequent presentation with slowly progressive, painless axial proptosis. Because of their indolent growth, many orbital angiomas remain asymptomatic for long periods and are often discovered incidentally during imaging performed for unrelated reasons [12], [15].

Although considered congenital vascular malformations, orbital cavernous hemangiomas usually become clinically apparent in adulthood, likely due to gradual enlargement over time. Visual impairment and oculomotor disturbances occur mainly in larger lesions or those located near the orbital apex, where compression of the optic nerve or extraocular muscles is more likely [13], [15].

Understanding the epidemiological characteristics of orbital angiomas is essential for appropriate clinical suspicion, timely diagnosis, and rational therapeutic decision-making, particularly in differentiating lesions that require surgical intervention from those suitable for conservative management.

3. Clinical Observation

This is a 47-year-old female patient with no significant medical or surgical history who presented with progressive exophthalmos of the right eye that has been developing for 8 months.

The symptoms were characterised by:

Axial exophthalmos, non-pulsatile, painless.

Feeling of orbital heaviness.

No diplopia.

Visual acuity 7/10 with correction.

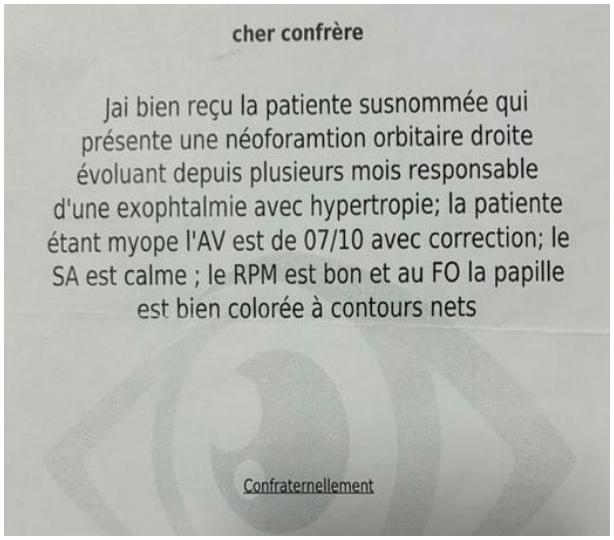
On examination:

Exophthalmos measured at 5 mm relative to the control.

Ocular motility preserved.

No chemosis or signs of inflammation.

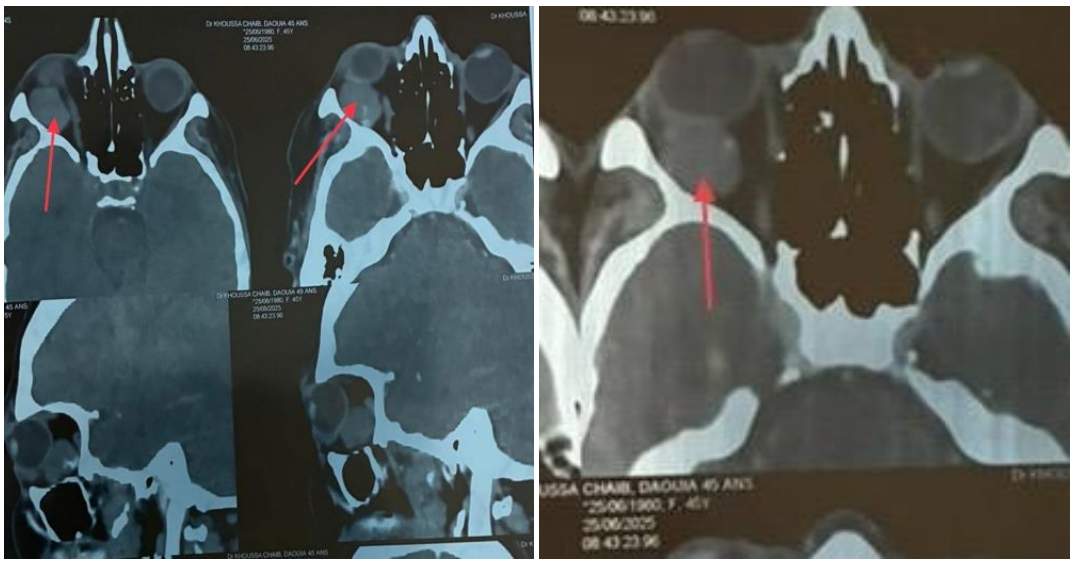
Normal fundoscopic examination.



4. Radiological Investigations

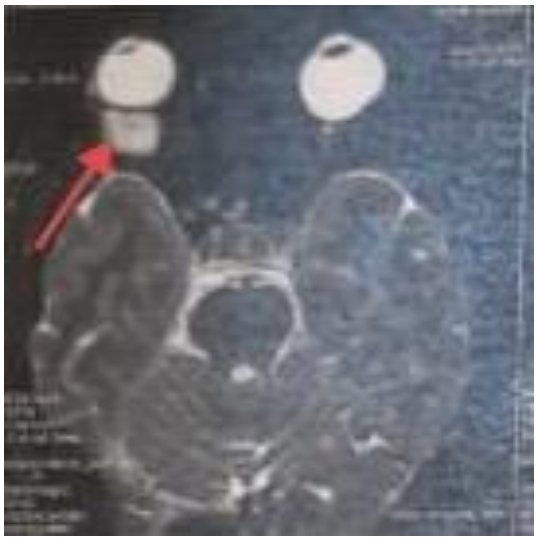
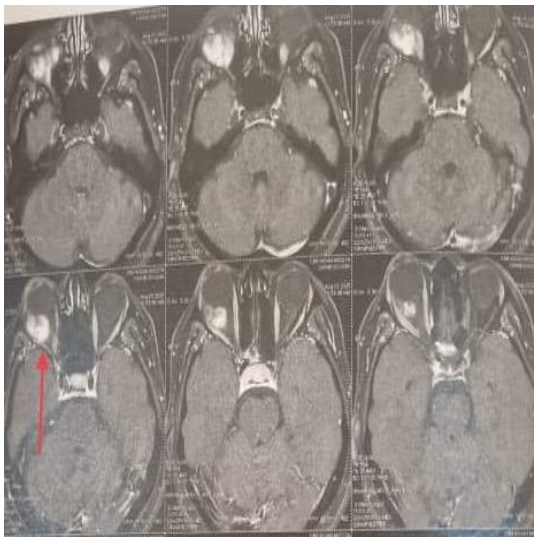
4.1. Orbital CT scan

Well-defined, homogeneous intraconal mass, displacing the optic nerve nasally.
Progressive enhancement after injection, suggesting a vascular lesion.



4.2. Orbital MRI

Right intraorbital mass centred on the lower outer quadrant, encapsulated, roughly oval in shape, with a polycyclic contour, measuring 21.5 × 16.5 mm in contact with the inferior and external oculomotor muscle.
T1 iso-signal, T2 hyper-signal, and gadolinium contrast enhancement.
No infiltration of orbital fat.
The overall picture was highly suggestive of an orbital cavernous haemangioma.

5. Management

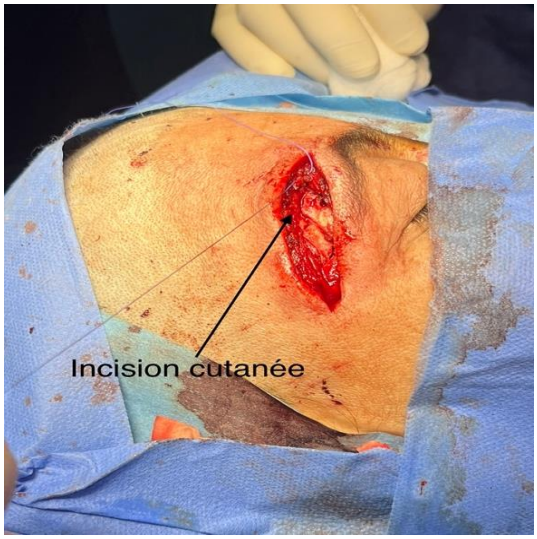
Surgical excision was indicated due to the increasing aesthetic impact.

5.1. Approach

An eyebrow approach was selected, allowing direct access to the lesion.

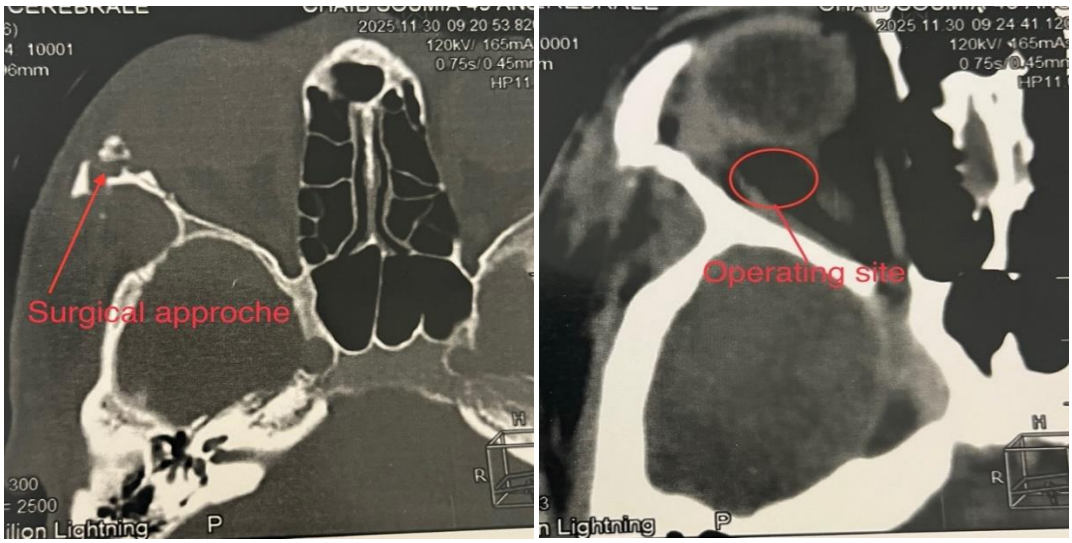
5.2. Surgical procedure

Supine position.
Head secured to headrest or Mayfield frame, slightly extended and rotated to the left.
Preparation of the face, delineation of the eyebrow.
Incision hidden in the arc of the eyebrow, 2 to 3 cm long, at the lateral part to avoid the frontal branch of the facial nerve.
Maximum respect for hair follicles to avoid scarring alopecia.
Then gentle subcutaneous dissection.
Spreading of the fibres of the orbicularis oculi muscle, subperiosteal detachment up to the roof of the orbit, and the lower frontal region.
Creation of a small 2 cm bone flap by resecting the external orbital pillar.
Gentle dissection to reach the lesion under microscopic guidance, allowing identification of an encapsulated, reddish-purple mass.
Meticulous dissection while respecting the muscles and optic nerve.
Complete excision without incident.
Blood loss was minimal.
Replacement of the flap.
Soft tissues were sutured in layers.
Careful closure of the skin with very fine sutures for an aesthetic result.



Pathological examination
Histological examination showed:
Dilated vascular cavities filled with blood.
Fibrous septa separate the compartments.

No atypical cells.
Conclusion: orbital cavernous haemangioma.
Progression
The postoperative course was uneventful.
Immediate regression of exophthalmos.
No postoperative diplopia.
Visual acuity unchanged.
At 6 months: no recurrence, good cosmetic result.



Postoperative orbito-cerebral CT scan confirmed the surgical approach and complete excision of the tumor

6. Discussion

Orbital angioma poses diagnostic and therapeutic challenges. MRI is the imaging modality of choice for lesion characterising [3]. Surgical treatment is indicated in cases of functional symptoms or complications [1], [5], and minimally invasive techniques help reduce morbidity. Postoperative follow-up is essential for the early detection of recurrence.
Most Orbital angioma, commonly cavernous hemangioma, represents the most frequent benign vascular tumor of the orbit in adults. Its management remains challenging because of its deep orbital location, close relationship with critical neurovascular structures, and its usually slow but potentially compressive growth pattern.

6.1. Role of imaging in diagnosis and surgical planning

Magnetic resonance imaging (MRI) is considered the gold standard for the diagnosis and characterization of orbital angiomas. MRI provides detailed information regarding lesion size, intra- or extraconal location, and relationships with the optic nerve and extraocular muscles. Typical signal characteristics on T1- and T2-weighted sequences, as well as progressive enhancement after contrast administration, allow reliable differentiation from other orbital masses. Recent studies emphasize that MRI is essential not only for diagnosis but also for surgical planning, guiding the choice of approach and predicting operative difficulty [3], [6].

6.2. Indications for surgical treatment

There is a broad consensus in the literature that asymptomatic or small orbital angiomas can be managed conservatively with clinical and radiological follow-up. Surgical intervention is recommended in the presence of functional symptoms or complications, including progressive proptosis, decreased visual acuity, diplopia, restricted ocular motility, or signs of optic nerve compression [1,5]. These indications are consistent with our practice, where surgery is reserved for symptomatic lesions to balance therapeutic benefit against surgical risk.

6.3. Comparison of surgical technique with the literature

Traditionally, external orbitotomy approaches (lateral, anterior, or transconjunctival) have been widely used for the removal of orbital cavernous hemangiomas, providing adequate exposure but often associated with significant morbidity. Over the past decade, the literature has increasingly favored minimally invasive and tailored approaches, adapted to the tumor's location, to reduce functional and cosmetic complications [7], [8].
In our surgical approach, tumor excision was performed through a targeted and minimally invasive route, allowing satisfactory exposure while preserving surrounding orbital structures. This strategy aligns with recent publications reporting that individualized approaches—sometimes assisted by endoscopy or combined with adjunctive techniques such as intralesional aspiration or decompression—facilitate complete tumor removal while minimizing morbidity [9], [10].

6.4. Compared with published series, our technique offers several advantages

adequate exposure despite limited surgical access,
reduced risk of postoperative diplopia and oculomotor deficits,

improved cosmetic outcome,
and rapid functional recovery.
The extent of resection and clinical outcomes observed in our case are comparable to those reported in recent studies, which demonstrate high rates of complete excision and favorable functional results when surgery is carefully planned and tailored to tumor anatomy [7–9].

6.5. Postoperative outcomes and follow-up

Postoperative complications reported in the literature are generally mild and transient, including temporary diplopia, ptosis, or ocular motility disturbances, while permanent visual impairment remains rare [8]. In our experience, postoperative evolution was favorable, with no major complications, supporting the safety and effectiveness of our approach.
Postoperative MRI follow-up is recommended to assess the completeness of resection and to detect potential recurrence, which remains uncommon after total excision. This follow-up strategy is widely advocated in recent studies and represents an integral component of standardized management of orbital angiomas [5], [10].

6.6. Conclusion of the discussion and limitations

In conclusion, our surgical technique is consistent with current trends in the management of orbital angiomas, which emphasize personalized, minimally invasive approaches guided by detailed preoperative imaging. The favorable functional and anatomical outcomes observed in our case are comparable to those reported in recent literature, supporting the safety and effectiveness of tailored surgical strategies.
However, the findings of this report should be interpreted in light of the inherent limitations of a single case study. The absence of a comparative cohort and the limited sample size restrict the generalizability of the results and preclude definitive conclusions regarding the superiority of one surgical approach over others. In addition, although postoperative evolution was favorable, longer follow-up is required to fully assess long-term outcomes and recurrence, particularly given the slow-growing nature of orbital cavernous hemangiomas. Nevertheless, this case contributes to the existing literature by illustrating a feasible surgical strategy and highlighting technical considerations that may be valuable in selected patients. Further large-scale and comparative studies are warranted to establish standardized, evidence-based management guidelines.

7. Conclusion

Although rare, orbital angioma should be suspected in any case of progressive exophthalmos. MRI and conservative surgery are the mainstays of diagnosis and treatment. Long-term monitoring is recommended [1–5].
Although rare, orbital angioma should be suspected in any patient presenting with progressive, painless exophthalmos. Magnetic resonance imaging remains the cornerstone for accurate diagnosis and preoperative planning. Surgical management is indicated in symptomatic cases and has increasingly evolved toward minimally invasive and tailored approaches, which allow complete lesion excision while minimizing functional and cosmetic morbidity. When total resection is achieved, long-term recurrence rates are low, as consistently reported in the literature. Nevertheless, given the slow-growing nature of these lesions, long-term clinical and radiological follow-up remains essential to confirm durable disease control and detect rare recurrences [1–5].

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