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CHOROIDAL MELANOMA MIMICKING ORBITAL INVASION: A CASE REPORT OF ORBITAL EXENTERATION AND RECONSTRUCTION

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ABSTRACT

Choroidal melanoma is the most common primary intraocular malignancy in adults and may present a significant diagnostic challenge when associated with extensive orbital inflammatory changes. We report the case of a 63-year-old man presenting with progressive visual loss, ocular pain, and subsequent development of marked chemosis, inflammatory eyelid swelling, exophthalmos, and restricted ocular motility. Ocular ultrasonography revealed a choroidal mass measuring 15 × 18 mm associated with retinal detachment. Clinical and radiological findings raised suspicion of locally advanced disease with orbital involvement, while systemic staging showed no distant metastases. Following multidisciplinary evaluation, a total orbital exenteration was performed. Surprisingly, definitive histopathological examination revealed a mixed-cell uveal melanoma involving the choroid and ciliary body with intrascleral invasion, but without extrascleral or orbital tumor extension. Surgical margins were tumor-free and the lesion was classified as pT3b according to the AJCC 8th edition. After confirmation of adequate oncological resection, the orbital defect was reconstructed using a temporalis muscle flap covered with a skin graft, with a favorable postoperative course. This case highlights the potential for severe tumor-associated orbital inflammation to mimic extrascleral extension of choroidal melanoma, emphasizing the challenge of accurately assessing local tumor spread and the importance of careful clinicoradiological correlation before considering radical surgical treatment.

Keywords: Choroidal Melanoma; Uveal Melanoma; Orbital Inflammation; Extrascleral Extension; Orbital Exenteration; Temporalis Flap; Orbital Reconstruction.

1 INTRODUCTION

Uveal melanoma is the most common primary intraocular malignancy in adults, with the choroid representing its predominant site of origin. Although uncommon, its incidence varies considerably according to geographic and ethnic background and increases with age [1]. Most uveal melanomas are localized at diagnosis, and advances in plaque brachytherapy, proton-beam radiotherapy, and other local treatments have increasingly allowed preservation of the globe in appropriately selected patients. Nevertheless, enucleation remains an important therapeutic option for large or locally advanced tumors [1].

Despite effective local tumor control, uveal melanoma remains associated with a substantial risk of distant metastasis. Up to approximately half of patients may eventually develop metastatic disease, with the liver involved in the great

majority of cases [1,2]. Local and extraocular extension also carry important therapeutic and prognostic implications and should be carefully assessed by ocular imaging and orbital magnetic resonance imaging [1].

Extrascleral extension of choroidal melanoma into the orbit represents an uncommon but particularly challenging presentation. Patients with extensive extraocular disease may present with proptosis, pain, ophthalmoplegia, eyelid edema, or chemosis, and the associated inflammatory appearance can occasionally mimic a primary orbital inflammatory process [3]. Management depends on the extent and configuration of extraocular involvement; selected circumscribed extensions may be amenable to enlarged enucleation, whereas extensive orbital involvement may require more radical surgery [4]. Historically, the role of orbital exenteration in choroidal melanoma has remained controversial, particularly because improved local control does not necessarily translate into improved survival [5].

We report a case of choroidal melanoma presenting with severe inflammatory orbital manifestations and radiological features suggestive of extraocular extension, leading to total orbital exenteration. Unexpectedly, definitive histopathological examination demonstrated intrascleral invasion without extrascleral or orbital involvement. This case highlights the diagnostic challenge of differentiating true orbital tumor extension from tumor-associated inflammatory changes and emphasizes the importance of careful clinicroadiological assessment when determining the extent of surgical treatment.

2 CASE PRESENTATION

A 63-year-old man, originally from and currently living in Ksar Kbir, with no significant medical history, presented to the ophthalmology department with a four-month history of rapidly progressive visual loss in the right eye. His medical history was unremarkable for diabetes, hypertension, tuberculosis, previous ocular trauma, or ocular surgery. His surgical history included a left forearm fracture treated surgically in 2016. There was no relevant family history.

The condition began in March 2026 with a rapid decrease in visual acuity in the right eye, associated with ocular redness and moderate pain. The symptoms initially occurred without fever or alteration of the patient's general condition.

On initial ophthalmological examination, visual acuity in the right eye was limited to light perception, while visual acuity in the left eye was 4/10 without correction. The right eye showed diffuse conjunctival hyperemia and dilatation of the episcleral vessels. The cornea was clear, while the anterior chamber was shallow (Van Herick grade 1), with a convex iris. Intraocular pressure was 26 mmHg. A total white cataract was present, and gonioscopy demonstrated complete angle closure (Shaffer grade 0). The fundus could not be visualized. Ocular ultrasonography demonstrated intravitreal hyperechoic material, retinal detachment, and a suspected choroidal mass.



Figure 1: Preoperative aspect of the patient

Over the following months, the patient's condition progressively deteriorated. On July 6, 2026, he presented with a marked worsening over the preceding 10 days, characterized by severe ocular pain, inflammatory eyelid swelling, and restricted ocular motility.

At this examination, visual acuity in the right eye remained limited to light perception. The patient had exotropia in primary gaze and marked limitation of ocular movements in all directions. There was non-axial, non-pulsatile, irreducible exophthalmos associated with a warm, erythematous and tense eyelid swelling with pseudoptosis. Marked 360° chemosis and diffuse conjunctival hyperemia were present. The cornea showed diffuse edema, while the anterior chamber was shallow and contained a hyphema. The iris was domed, and the previously described total white cataract was ruptured. The fundus remained inaccessible.

Repeat ocular ultrasonography demonstrated a choroidal mass with vitreous convexity, measuring approximately 15 × 18 mm and located nasally. This was associated with a retinal detachment in the superonasal quadrant and vitreous hyperechogenicity.

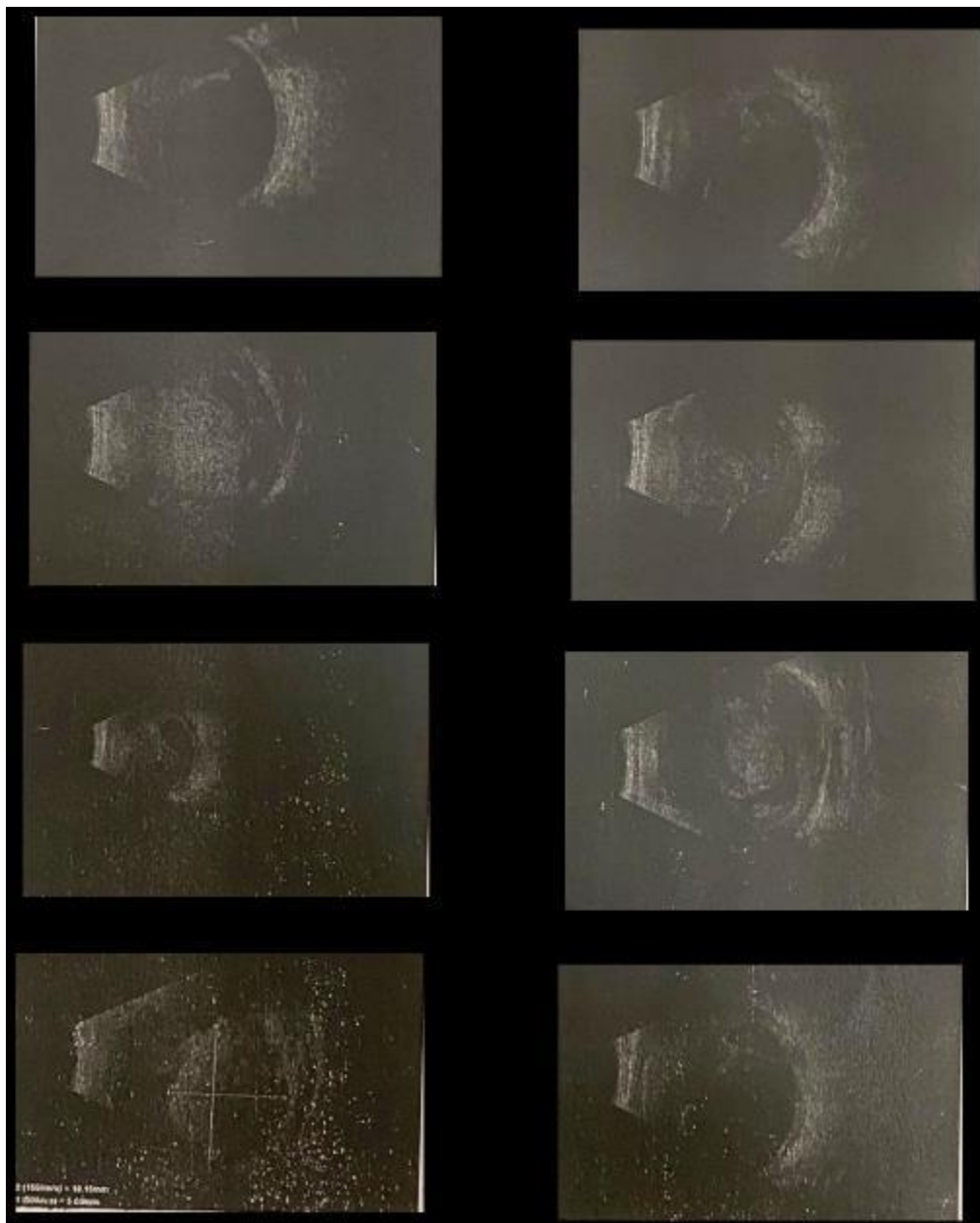


Figure 2: Ocular ultrasonography of the right eye demonstrating the choroidal mass with associated retinal detachment and vitreous abnormalities.

The patient's general examination was otherwise unremarkable. He was in good general condition (WHO performance status 0), with no palpable lymphadenopathy. Cardiovascular, respiratory, and neurological examinations were normal.

A cerebro-orbital MRI subsequently demonstrated a right medial intraorbital mass measuring 1.4 × 0.9 cm, adjacent to a thickened sclera showing intense gadolinium enhancement. The lesion was associated with infiltration of the preseptal tissues, eyelid, medial rectus muscle, and superior rectus muscle. Mild exophthalmos was noted, with no evidence of optic nerve invasion. The radiological appearance was initially considered suggestive of an inflammatory pseudotumor.

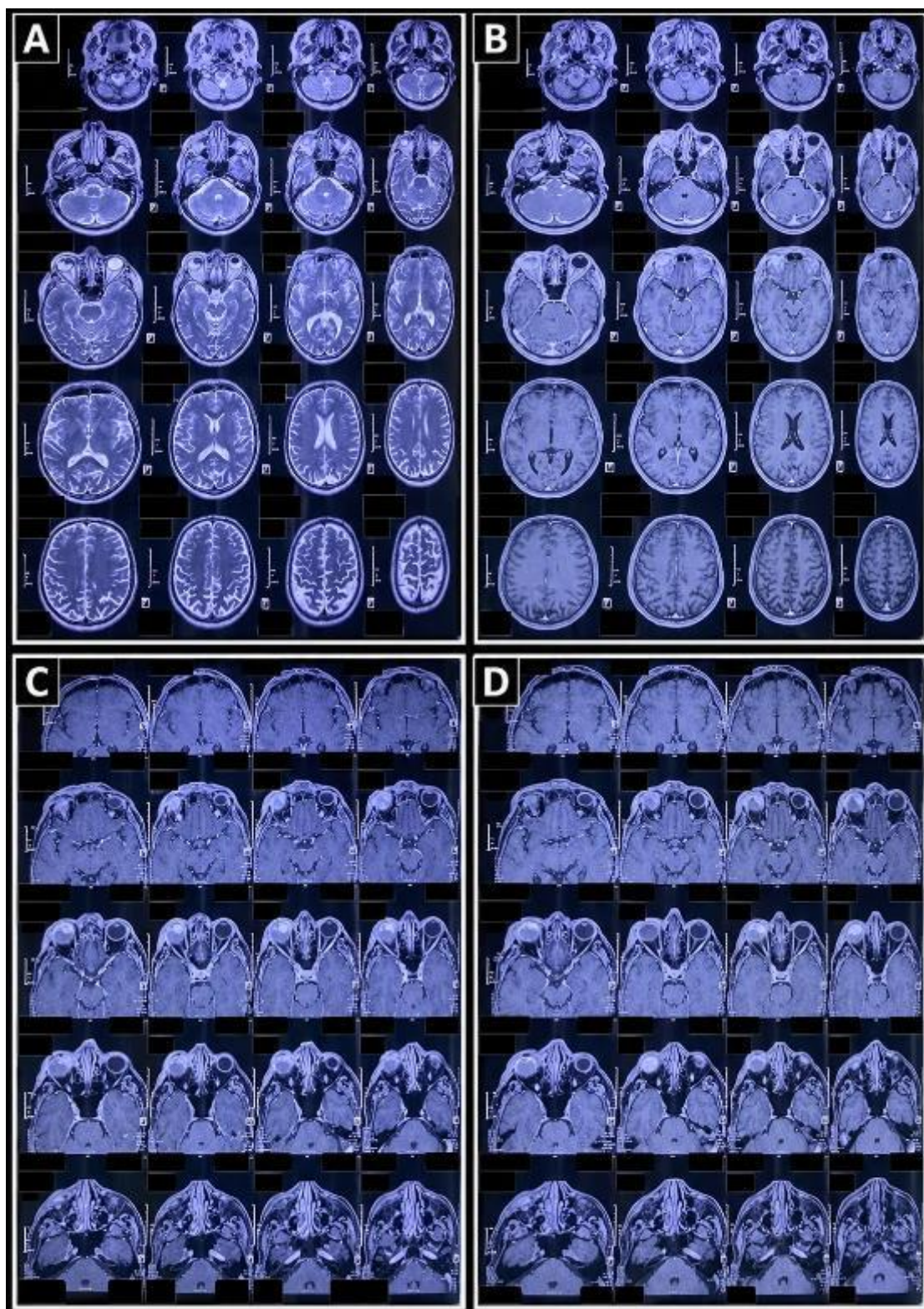


Figure 3: Orbital MRI findings in our patient

Given the presence of a choroidal mass associated with progressive ocular destruction and clinical and radiological evidence of orbital soft-tissue involvement, a diagnosis of locally advanced choroidal melanoma with orbital extension was subsequently considered.

Following completion of the diagnostic and staging work-up, the case was discussed at a multidisciplinary meeting involving the ophthalmology, plastic and reconstructive surgery, and oncology teams. Thoracoabdominopelvic computed tomography performed on July 7, 2026 showed no evidence of distant metastatic disease. In view of the locally advanced choroidal melanoma with orbital involvement, surgical management was recommended. Neoadjuvant radiotherapy, particularly proton-beam therapy, was considered but was not available at our institution. The

multidisciplinary team therefore recommended surgical treatment, with the choice between enucleation and orbital exenteration depending on the extent of local involvement and intraoperative assessment. The therapeutic strategy was discussed with the patient, and surgery was undertaken after obtaining written informed consent.

3 SURGICAL MANAGEMENT

The patient underwent a right total orbital exenteration under general anesthesia. The procedure was performed with an oncological intent to achieve complete removal of the locally advanced tumor and involved orbital tissues. The orbital contents were excised en bloc and the surgical specimen was submitted for definitive histopathological examination.



Figure 4: Intraoperative findings during right orbital exenteration. Sequential operative photographs illustrating the orbital exenteration and the resulting orbital defect.



Figure 5: Macroscopic appearance of the surgical specimen. Gross examination of the orbital exenteration specimen submitted for definitive histopathological assessment.



Figure 6: Photographs illustrating the patient 10 days post orbital extirpation

3.1 Histopathological Findings

Definitive histopathological examination of the exenteration specimen confirmed a uveal melanoma arising from the choroid and involving the ciliary body. The tumor displayed a mixed cellular pattern composed of epithelioid and spindle cells, arranged in compact sheets, with moderate-to-marked cytonuclear atypia, mitotic figures, abundant melanin pigmentation, and areas of tumor necrosis. The tumor measured 1.7 cm in maximum basal diameter and 0.9 cm in maximum thickness.

Tumor infiltration of the ciliary body and sclera was identified; however, the involvement remained intrascleral, with no histological evidence of extrascleral extension. The orbital soft tissues, orbital muscles, optic nerve, and cornea were free of tumor. No vascular emboli or perineural invasion were identified. All surgical margins were tumor-free, with a deep margin of 1.3 cm and a closest lateral margin of 0.7 cm at the medial aspect. The tumor was classified as pT3b according to the eighth edition of the AJCC TNM classification.

3.2 Delayed Reconstruction

Definitive reconstruction of the orbital defect was intentionally deferred pending histopathological confirmation of adequate oncological resection. Histopathological examination demonstrated tumor-free surgical margins, with no involvement of the orbital tissues, extraocular muscles, or optic nerve. Following confirmation of complete oncological excision, definitive reconstruction of the orbital defect was undertaken.

The reconstruction of the orbital defect was performed using a temporalis muscle flap to provide well-vascularized tissue coverage of the exenterated orbital cavity. The flap was transposed into the orbital defect and subsequently covered with a skin graft, providing definitive coverage of the reconstructed cavity.



Figure 7: Photographs illustrating the temporalis muscle flap and skin graft

3.3 Postoperative Course and Follow-up



Figure 8: Clinical Appearance 22 Days Postoperatively

The postoperative course was favorable, with no major surgical or systemic complications. The patient remained clinically stable following the procedure, and postoperative monitoring showed satisfactory evolution of the reconstructed orbital region. No complications were observed after the exenteration nor during the immediate postoperative period. The patient was subsequently referred for continued oncological surveillance.

4 DISCUSSION

This case illustrates an important diagnostic and therapeutic challenge in the management of choroidal melanoma: severe orbital inflammation may mimic true extrascleral tumor extension. In our patient, the rapid progression toward painful exophthalmos, marked chemosis, eyelid inflammation, and severe limitation of ocular motility, together with MRI findings suggesting infiltration of adjacent orbital structures, raised strong suspicion of locally advanced melanoma with orbital involvement. This clinicoradiological presentation ultimately led to orbital exenteration. However, the subsequent histopathological findings did not confirm the extent of extrascleral invasion initially suspected, highlighting the potential discrepancy between radiological appearance and actual tumor spread. Such inflammatory presentations are uncommon but particularly important because edema and reactive changes involving orbital tissues may be difficult to distinguish from malignant infiltration on imaging. This distinction has major therapeutic implications, as orbital exenteration is a radical and mutilating procedure whose indication should rely on convincing evidence of extensive orbital involvement. In retrospect, our case raises the question of whether the inflammatory component contributed to an overestimation of tumor extension and therefore emphasizes the importance of careful clinicoradiological correlation and, whenever feasible, histological confirmation before undertaking radical surgery. Definitive reconstruction was intentionally delayed until the oncological status had been clarified histologically; once adequate tumor control was confirmed, the defect was reconstructed using a temporalis muscle flap covered with a skin graft, with a favorable postoperative course and no major complications. The principal lesson from this case is therefore that an inflammatory orbital presentation associated with choroidal melanoma can closely simulate extrascleral extension and potentially influence the choice toward unnecessarily aggressive treatment, making accurate assessment of true orbital invasion essential before considering exenteration.

5 CONCLUSION

Choroidal melanoma may occasionally present with marked orbital inflammatory changes that closely mimic true extrascleral tumor extension, both clinically and radiologically. This case highlights the difficulty of determining the actual extent of the disease before surgery and the potential consequences of overestimating orbital invasion. Given the morbidity

associated with orbital exenteration, careful correlation between clinical findings, imaging, and histopathology is essential when considering such radical treatment. Severe orbital inflammation should therefore be recognized as a potential diagnostic pitfall in advanced-appearing choroidal melanoma.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Disclosure of conflict of interest

The author declares no conflicts of interest regarding this manuscript.

Statement of informed consent

Informed consent was obtained from the individual included in the study.

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