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Radiologic Assessment in Choroidal Melanoma: Integrating MRI and Ultrasonography Correlations

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Abstract **Case Report**

A 67-year-old male with chronic tearing of the right eye presented with progressive visual loss over three months. Ophthalmologic examination revealed a pigmented lesion with serous retinal detachment. MRI and ultrasonography confirmed choroidal melanoma. A metastatic workup was negative, and enucleation with silicone implant placement was performed. Histopathology confirmed the diagnosis.

Keywords: Ocular ultrasonography, MRI, choroidal melanoma, retinal detachment.

INTRODUCTION

Choroidal melanoma is the most common primary intraocular malignant tumor in adults, with potential for local invasion and distant metastasis. Early diagnosis and appropriate management are essential to prevent vision loss and systemic spread. This case report describes the clinical presentation, diagnostic findings, and therapeutic approach in a patient with choroidal melanoma.

CASE PRESENTATION

A 67-year-old male patient with no significant medical history, except for chronic tearing of the right eye, presented with a progressive decrease in visual acuity in the right eye over the past three months.

Ophthalmologic examination revealed a reduced visual acuity of 2/10 in the right eye. Intraocular pressure was normal at 13 mmHg. Examination of the anterior segment showed a grade I nuclear cataract.

Fundus examination revealed a pigmented lesion at the posterior pole, located in the inferotemporal quadrant, associated with a serous retinal detachment.

The patient underwent orbital magnetic resonance imaging (MRI), which demonstrated an intraocular mass in the posterior segment of the right eye, showing T1 hyperintensity, T2 and FLAIR hypo intensity, with a signal void on T2* sequence and intense enhancement after gadolinium administration (Figure 1 and 2).

These findings were consistent with a choroidal melanoma associated with a retinal detachment, confirmed by complementary ultrasonography (Figure 3).

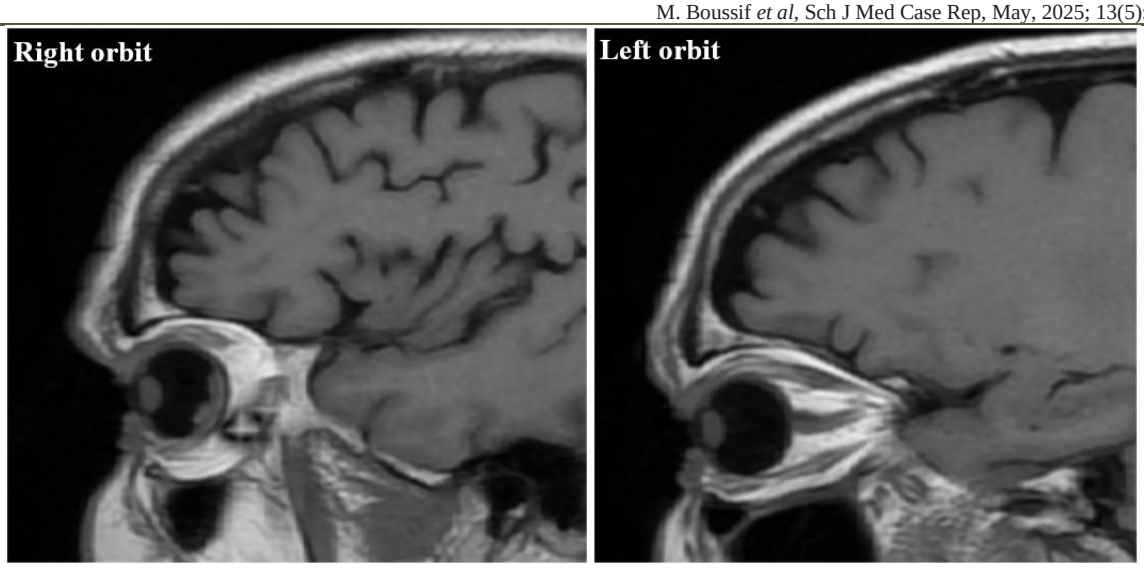

Figure 1: Sagittal sections of the right and left orbits in T1 without contrast.

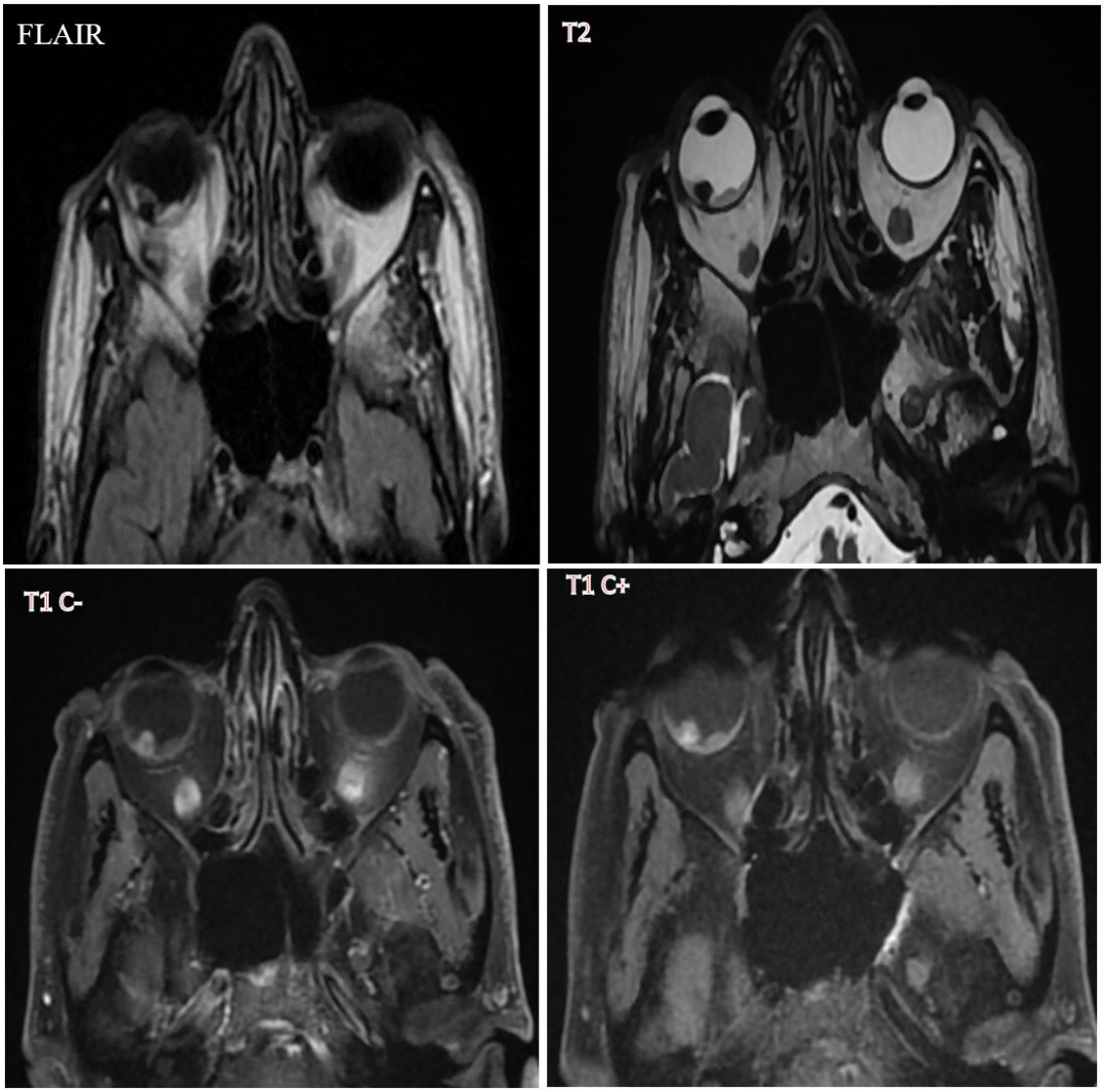

Figure 2: MRI with and without contrast showing right side intraocular choroidal mass.

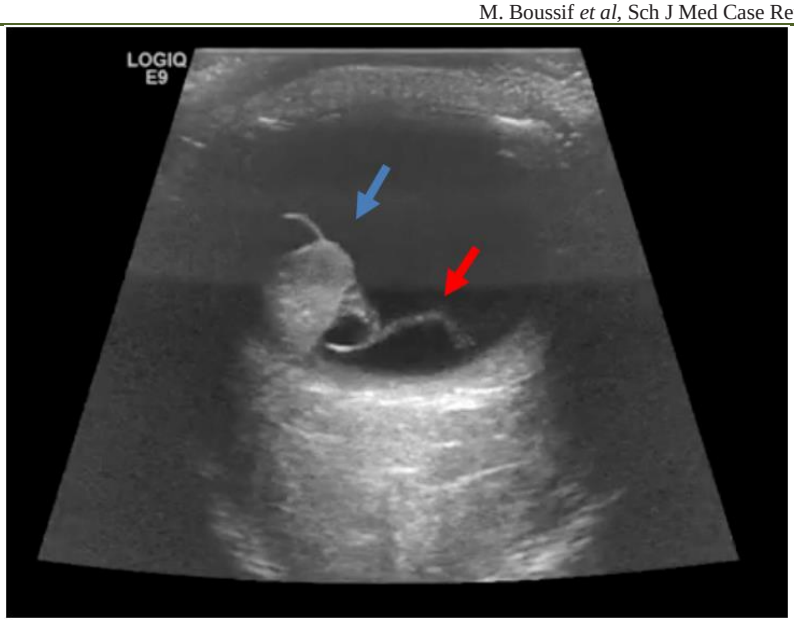

Figure 3: Ultrasound B scan showing gray opaque mass in the choroid (blue arrow) associated with a retinal detachment (red arrow)

A systemic metastatic workup, including CT scan of the chest, abdomen, and pelvis, revealed no evidence of secondary metastases.

Given the size and characteristics of the lesion, enucleation of the right eye was performed, followed by the placement of a silicone implant.

Histopathological examination of the surgical specimen confirmed the diagnosis of choroidal melanoma through morphological analysis and immunohistochemistry.

DISCUSSION

Choroidal melanoma though rare, is the most common primary intraocular malignancy in adults, accounting for approximately 90% of uveal melanomas. Despite its rarity, with an incidence of approximately 20 cases per million individuals annually, it poses a significant threat due to its potential for metastasis, particularly to the liver [1]. The case described aligns with the typical presentation of choroidal melanoma, including progressive visual impairment and the presence of a pigmented lesion with associated serous retinal detachment.

The incidence of choroidal melanoma is higher in Caucasian populations with fair skin and light-colored eyes [2, 3]. Genetic mutations play a crucial role in tumorigenesis, particularly mutations in GNAQ and GNA11, which are found in a majority of uveal melanomas [4,5] . Additionally, monosomy 3 and gain of chromosome 8q are associated with poor prognostic outcomes [5] . While ultraviolet (UV) light exposure is a well-established risk factor for cutaneous melanoma, its role in uveal melanoma remains unclear [4].

Clinical Presentation and Diagnosis

Patients with choroidal melanoma commonly present with visual disturbances, including blurred vision, photopsias, and visual field loss. In advanced cases, tumor growth can lead to complications such as exudative retinal detachment, secondary glaucoma, and severe ocular pain [3]. Diagnosis relies on a combination of clinical examination and multimodal imaging. B-scan ultrasonography remains the most sensitive modality for detecting choroidal melanoma and associated retinal detachment, while magnetic resonance imaging (MRI) provides detailed visualization of extrascleral extension [6, 7,3].

Radiological evaluation plays a crucial role in the diagnosis and staging of choroidal melanoma. Ultrasonography is the most widely used imaging modality due to its ability to assess tumor dimensions, internal reflectivity, and the presence of extrascleral extension. MRI, particularly with high-resolution 3T scanners, provides superior soft-tissue contrast and is invaluable for detecting subtle extrascleral invasion. Choroidal melanomas typically exhibit hyperintensity on T1-weighted images, hypointensity on T2-weighted images, and significant enhancement after gadolinium administration. Diffusion-weighted imaging (DWI) and perfusion-weighted imaging (PWI) sequences may provide additional prognostic information by assessing tumor cellularity and vascularity [4,6 ,7].

In the present case, the identification of a pigmented choroidal lesion associated with serous retinal detachment was corroborated by MRI findings demonstrating characteristic hyperintensity on T1-weighted images and hypointensity on T2-weighted images with enhancement following gadolinium administration. These findings are consistent with a

diagnosis of choroidal melanoma, as confirmed by histopathological analysis post-enucleation.

Differential Diagnosis

Choroidal melanoma must be differentiated from other intraocular pathologies, including choroidal nevus, disciform degeneration, choroidal hemangioma, and metastatic lesions. Features such as tumor thickness >2 mm, subretinal fluid, symptoms, orange pigment, and margin proximity to the optic disc, aid in distinguishing choroidal melanoma from benign nevi [1].

Management Strategies

The management of choroidal melanoma depends on tumor size, location, and the presence of metastases. Conservative approaches such as observation are suitable for small, asymptomatic tumors. For medium-sized tumors, plaque brachytherapy and proton beam therapy offer effective globe-preserving treatments with local tumor control rates exceeding 90% [4,8] . Enucleation remains the treatment of choice for large or locally invasive tumors, as was the case for our patient. For patients with metastatic disease, systemic therapies such as tebentafusp have emerged as promising treatments, though outcomes remain limited [8, 9].

Prognosis and Follow-Up

Prognosis is influenced by tumor size, genetic profile, and the presence of extraocular extension. Despite treatment of the primary tumour, ~50% of patients with UM will develop metastatic disease [4]. Long-term follow-up is essential to monitor for local recurrence and systemic dissemination. For patients undergoing enucleation, regular hepatic imaging and clinical surveillance are recommended to detect metastatic disease early [2].

CONCLUSION

This case highlights the importance of early detection and comprehensive imaging in diagnosing choroidal melanoma. Enucleation remains a definitive treatment option for large tumors or those with complex features. Timely intervention and thorough histopathological evaluation are crucial for accurate diagnosis and appropriate patient management.

Conflict of interest: The authors declare no conflicts of interest.

REFERENCES

1. Shukla S, Acharya S, Dulani M. Choroid Melanoma – A Rare Case Report. J Clin Diagn Res JCDR. mai 2015;9(5):ED09-ED10.
2. Abbott DW, Simons K, Giorgadze T. Choroidal melanoma diagnosed by aspiration cytology: A case report with cyto-histologic correlation and review of the literature. Ann Diagn Pathol. oct 2019;42:39-41.
3. Singh P, Singh A. Choroidal melanoma. Oman J Ophthalmol. 2012;5(1):3.
4. Jager MJ, Shields CL, Cebulla CM, Abdel-Rahman MH, Grossniklaus HE, Stern MH, *et al*. Uveal melanoma. Nat Rev Dis Primer. 9 avr 2020;6(1):24.
5. Chattopadhyay C, Kim DW, Gombos DS, Oba J, Qin Y, Williams MD, *et al*. Uveal melanoma: From diagnosis to treatment and the science in between. Cancer. août 2016;122(15):2299-312.
6. Jaarsma-Coes MG, Goncalves Ferreira TA, Van Haren GR, Marinkovic M, Beenakker JWM. MRI enables accurate diagnosis and follow-up in uveal melanoma patients after vitrectomy. Melanoma Res. déc 2019;29(6):655-9.
7. Matet A, Malaise D. Naevus et mélanomes choroïdiens. 2022;
8. Kazemzadeh K. Choroidal melanoma treatment: a shift towards vision preservation. Med Hypothesis Discov Innov Optom. 24 janv 2025;5(3):136-44.
9. Bell DJ, Wilson MW. Choroidal Melanoma: Natural History and Management Options. Cancer Control. sept 2004;11(5):296-303.