CASE REPORT

Iridociliary Body Plasmacytoma: A Case-Report and a Focused Review of Literature

Plasmocitoma Iridociliar: A Propósito de um Caso Clínico e Revisão da Literatura

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ABSTRACT

Extramedullary plasmacytomas associated with multiple myeloma (MM) are rare, and involvement of the eye and adnexae is even rarer, with an incidence of less than 1%.

We describe the case of a 56-year-old male, with a history of refractory MM and sacral plasmacytoma, who presented with reduced visual acuity and redness in the right eye. Biomicroscopy revealed an amelanotic temporal and inferotemporal iris mass, involving the anterior chamber angle from 6 to 10 o'clock, with intrinsic vascularization. A presumed diagnosis of iridociliary body plasmacytoma was established, which was later confirmed by fine-needle aspiration biopsy. The tumor responded well to immunochemotherapy, and the patient became asymptomatic. However, despite treatment efforts, the patient passed away shortly after due to widespread systemic MM progression with central nervous system (CNS) involvement.

This case highlights the challenges associated with managing extramedullary disease and the need for further research and treatment strategies to address this aggressive manifestation of MM.

KEYWORDS: Ciliary Body; Multiple Myeloma; Plasmacytoma.

RESUMO

Os plasmocitomas extramedulares associados ao mieloma múltiplo (MM) são uma manifestação rara da doença, e o envolvimento do globo ocular e anexos é particularmente incomum, apresentando uma incidência <1%.

Apresentamos o caso de um homem de 56 anos, com antecedentes de MM refractário associado a um plasmocitoma do sacro, com queixas de redução da acuidade visual e hiperémia do olho direito. A biomicroscopia demonstrava uma massa amelanótica da íris com extensão ao ângulo iridocorneano nos sectores temporal e temporal-inferior, das 6 às 10 horas, com vascularização intrínseca. O diagnóstico de plasmocitoma iridociliar foi confirmado por punção aspirativa com agulha fina. A doença respondeu de forma favorável ao tratamento sistémico com imunoquimioterapia, mas o doente acabou por falecer devido à progressão sistémica do MM, com extensão ao sistema nervoso central (SNC).

Este caso clínico ilustra a natureza refractária e agressiva da doença extramedular e enfatiza a necessidade de estudos prospectivos e estratégias terapêuticas dirigidas.

PALAVRAS-CHAVE: Corpo Ciliar; Mieloma Múltiplo; Plasmocitoma

INTRODUCTION

Multiple myeloma (MM) is a plasma cell malignancy characterized by the proliferation of monoclonal plasma cells (PCs) in the bone marrow (BM). In some cases, subclones of these proliferating PCs may develop outside the BM, leading to extramedullary disease (EMD) and manifesting as soft-tissue plasmacytomas that thrive in anatomical sites distant from the BM, due to hematogenous spread.[1] Compared to isolated MM or solitary extramedullary plasmacytoma (SEMP), secondary EMD is associated with a substantially worse prognosis.[2,3]

The incidence of EMD varies considerably: at diagnosis, its incidence ranges from 0.5% to 4.8%, while in the relapsed/refractory setting, it rises to 14%.[3] Also, typical sites of extramedullary infiltration differ according to the phase of MM. At diagnosis, EMD is frequently found in the skin and soft tissues, while at relapse, it usually affects the liver, kidneys, lymph nodes, and central nervous system (CNS).[3] Very rarely it affects the eye, and orbital involvement is more frequent than intraocular involvement.[4]

The purpose of our work is to describe the rare case of a secondary iridociliary body plasmacytoma in a patient with MM. This case highlights an unusual manifestation of EMD and contributes to the understanding of this aggressive disease.

CASE REPORT

A retrospective review of clinical records assessed clinical and treatment outcomes. Informed consent to publish this case and its images were obtained from the patient's legal next of kin.

A 56-year-old Caucasian male presented to the Ophthalmology Department with complaints of reduced visual acuity (VA) and redness in the right eye (RE). The patient had a previous history of refractory IgG/kappa MM, for which he had undergone five cycles of cyclophosphamide, bortezomib, and dexamethasone (CyBorD) chemotherapy along with zoledronic acid, achieving a very good partial biological response. Shortly after concluding the last cycle of treatment, a sacral plasmacytoma was identified, and the patient started immediate local radiotherapy and switched to a second-line immunochemotherapy regimen with daratumumab, lenalidomide, and dexamethasone (DRd), which led to improvement.

During the second cycle of DRd, the patient experienced redness in his RE, followed by blurred vision. At presentation, his visual acuity (VA) was 0.1 and 0.8 (decimal scale), and his intraocular pressure (IOP) was 30 mmHg and 12 mmHg in RE and left eye (LE), respectively. Slit-lamp examination (SLE) revealed an amelanotic temporal and inferotemporal iris mass involving the anterior chamber (AC) angle from 6 to 10 o'clock, with intrinsic vascularization (Fig. 1A). A diffuse conjunctival hyperemia, AC with cells (3+), pseudohypopion (Fig. 1B) and posterior synechiae were also observed. A dilated fundus exam showed a peripheral iridociliary body lesion. LE examination was unremarkable. Ultrasound biomicroscopy (UBM) exhibited a mass involving the ciliary body, iris, and AC angle in the temporal quadrant, measuring 2.84 mm in transverse section and 2.65 mm in thickness (Fig. 1C). Ocular B-scan ultrasonography (US) excluded other posterior segment lesions.

Given the patient's underlying systemic MM and sacral plasmacytoma, a presumed diagnosis of RE iridociliary body plasmacytoma was established, and he started q4h supportive treatment with topical prednisolone 1%, timolol/dorzolamide 0.5% / 2% bid and brimonidine 0.2% bid, and oral acetazolamide (125 mg bid) and prednisolone (1 mg/kg/day).

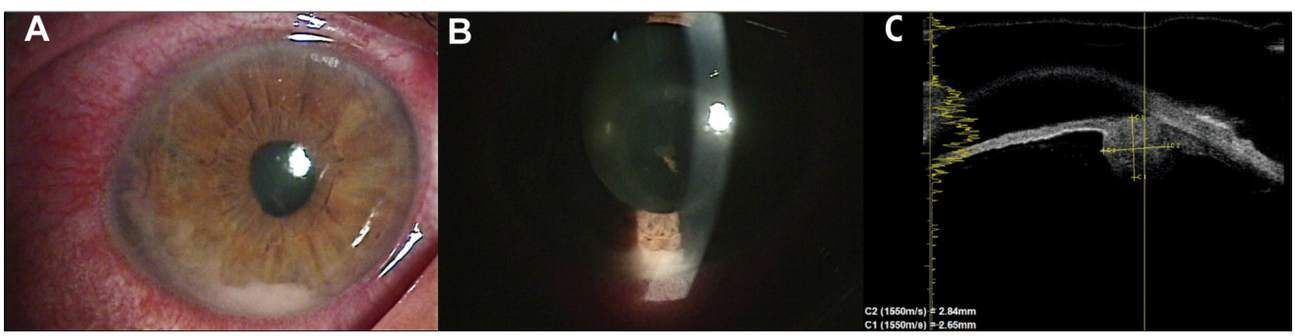

Figure 1. Iridociliary body tumor at presentation. A – Slit-lamp photograph showing a diffuse conjunctival hyperemia and an amelanotic temporal and inferotemporal peripheral iris mass, involving the AC angle from 6-10 o'clock, and intrinsic tumor vessels. B – Notice the pseudohypopion accumulated in the AC. C – UBM revealing a solid iris and ciliary body tumor, measuring 2.84 mm in transverse section and 2.65 mm in thickness.

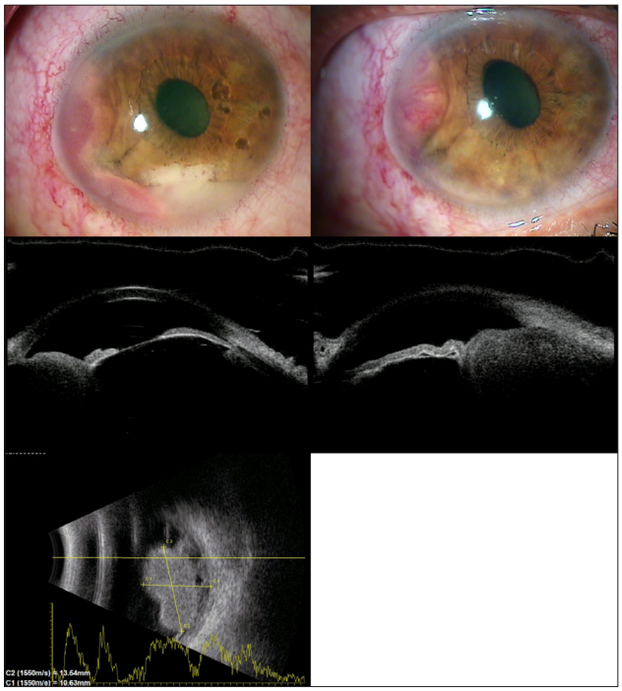

Figure 2. Slit-lamp photography of the iridociliary mass before (A) and after (B) AC paracentesis and FNAB. Notice the enlargement of the lesion since the first evaluation (Fig.1), the intrinsic tumor vessels and posterior synechiae. UBM reveals the growing iridociliary mass in axial (C) and transverse section (D), invading and closing the AC angle, and subluxating the lens nasally. E – B-scan US showing a highly reflective bilobated irregular endophytic lesion, with surrounding retinal detachment, measuring 13.64 mm, with 10.63 mm of thickness.

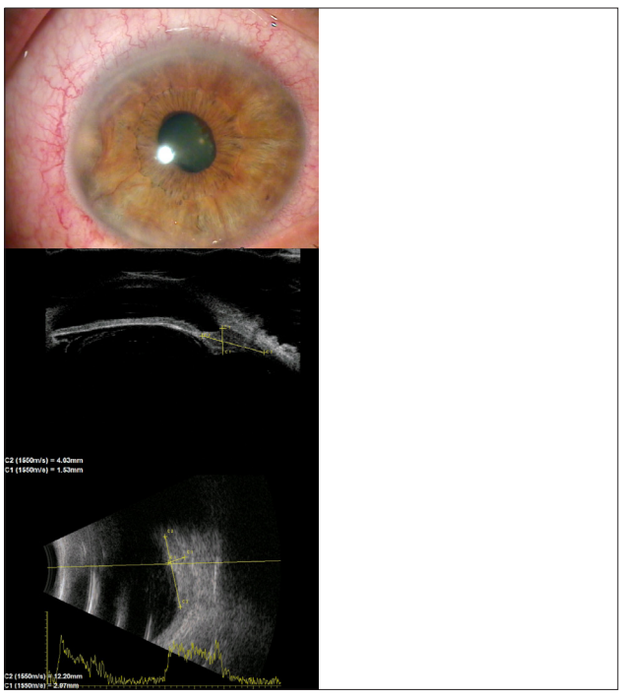

Figure 3. A – Slit-lamp photography of the iridociliary mass after the 3rd cycle of DRd immunochemotherapy, evidencing a significative regression of the tumor and its vasculature. B – UBM showing the iridociliary mass with 1.53 mm thickness and C – B-scan US of the plasmacytoma, measuring 12.20 mm, with 2.97 mm of thickness, without surrounding retinal serous detachment.

Due to the rapid growth of the tumor within 3 weeks (Fig. 2), associated with worsening AC inflammation and increasing IOP despite maximum therapy, the patient underwent aqueous humor sampling and fine needle aspiration biopsy (FNAB) of the iridociliary body mass. The biopsy confirmed the diagnosis, with immunohistochemistry identifying CD138+ plasma cells. A positron emission tomography/computed tomography (PET/CT) scan was performed at this stage, which showed hypermetabolic areas within the right eye, sacrum, spinal lytic lesions, and supraclavicular and inguinal lymph nodes.

After the initial enlargement of the iridociliary tumor (Fig. 2), it stabilized and visibly shrank to almost complete regression within one month, resulting in symptomatic improvement (Fig. 3). After the third cycle of DRd, RE VA recovered to 1.0, IOP normalized, and intraocular inflammation gradually decreased, allowing the suspension of IOP-lowering agents and steroids. At this point, a magnetic resonance imaging (MRI) confirmed the nearly complete regression of both the ocular and sacral plasmacytoma and UBM analysis reported a significant decrease in the plasmacytoma's thickness to 1.53 mm (Fig. 3).

However, shortly after, new foci of EMD were identified, involving the skin, the neck, and the intraorbital soft tissues of both orbits. The blood work showed no evidence of systemic disease recurrence, although a BM assessment was not performed. A third-line immunochemotherapy regimen with carfilzomib, pomalidomide, and dexamethasone was started along with cervical radiation therapy. Despite treatment efforts, the patient passed away shortly after due to widespread systemic MM progression with CNS involvement.

DISCUSSION

The presented case describes a 56-year-old male with a history of refractory MM and a sacral plasmacytoma, who was diagnosed with a secondary iridociliary plasmacytoma. Extramedullary plasmacytomas are rare, and involvement of the eye, adnexae and orbit is even rarer, with an incidence of less than 1%.[1] Given the complex nature of MM, EMD can affect any ocular structure, and infiltration of the orbit, conjunctiva, uvea and lacrimal gland has been described.[4-8] Clinical presentation and symptoms can be diverse, from decreased vision, proptosis, and diplopia, to corneal crystalline deposits, anterior and intermediate uveitis, vitritis, retinal vasculitis, refractory glaucoma, or opportunistic infections of ocular structures.[5-11]

There are only 18 cases of intraocular plasmacytomas described in the literature. A PubMed keyword search conducted in September 2023 for plasmacytoma/multiple myeloma and iris, or ciliary body, or iridociliary body found seven cases reported. EMD involved the ciliary body and the iris in four cases,[5,6,11,12] the iris in two[13,14] and ciliary body only in one patient.[15]

Regarding the tumors involving both the iris and ciliary body, all cases but one was unilateral and the main presenting manifestations were intraocular inflammation (75%) decreased vision (50%), increased IOP (50%), conjunctival

injection (50%) and ocular pain (25%). Three (75%) were SEMP and 1 (25%), similar to the present case, had an underlying systemic MM. The diagnosis was biopsy-proven in every patient except for the latter, where the diagnosis was presumptive. Although intraocular involvement is extremely infrequent, a presumptive diagnosis can be made in patients with known MM and compatible clinical findings. In our case, the AC paracentesis combined with FNAB of the lesion was important not only for confirming the diagnosis of plasmacytoma but also for debulking the tumor, which facilitated the management of the increasing IOP and the intraocular inflammation.

Systemic immunochemotherapy is the mainstay of treatment for MM, but radiotherapy is still recommended to treat plasmacytomas, for symptomatic control of lytic lesions and to prevent acute spinal compression.[16] Three (75%) of the 4 previously reported cases of iridociliary plasmacytomas were treated with radiotherapy. The two cases that showed good local tumor regression presented with SEMP,[6,11] while the remaining patient had systemic MM and received external beam radiation as a palliative but not curative treatment for management of secondary glaucoma.[5] One patient underwent enucleation for secondary glaucoma and poor visual prognosis.[12]

Taking into account the devastating side-effects of radiation therapy for ocular tumors, and considering the very good response achieved with second-line immunochemotherapy with DRd, the patient remained under the same treatment plan,[17] obtaining an almost complete regression of the iridociliary lesion.

Nonetheless, patients with EMD are considered to have an ultra-high-risk disease, often associated with adverse cytogenetic abnormalities, early relapses, and extremely poor outcomes.[18] Rarely, EMD may progress despite sustained complete systemic response. More often it evolves concurrently or, as illustrated in our case, precedes an aggressive systemic progression.

Bearing in mind the overall bad prognosis and low survival rate of EMD patients, the clinical benefits of complete regression of intraocular plasmacytomas should be balanced against the ocular toxicity of radiotherapy. Similarly to the case reported by Chin KJ *et al*,[5] our patient eventually died from complications associated with systemic MM progression.

This case describes an exceedingly rare manifestation of EMD involving the iris and ciliary body. It underlines the refractory nature of this disease and the challenges associated with managing EMD, highlighting the need for a multidisciplinary approach to address its manifestations. In the last decade, treatment for MM has greatly improved, but patients with EMD remain poorly represented in controlled clinical trials and specific recommendations are still lacking. The development of new treatment strategies to address these high-risk patients are needed.

CONTRIBUTORSHIP STATEMENT / DECLARAÇÃO DE CONTRIBUIÇÃO

CGM: Responsible for gathering the data, drafting the text, sourcing and editing clinical images,
investigation results, critical revision for important intellectual content.
AR: Responsible for gathering the data, drafting the text, critical revision for important intellectual
content.
RPP, LC: Responsible for critical revision of important intellectual content and final approval of the manuscript.
LV: Responsible for sourcing and editing clinical images, and critical revision for important intellectual content.
AM: Responsible for supervision of this project, investigation results, critical revision for important
intellectual content, and contributed with her expertise to the conclusion of the manuscript.
All authors approved the final version to be published.

CGM: Responsável pela recolha de dados, redação do texto, obtenção e edição de imagens clínicas,
resultados da investigação, revisão crítica do conteúdo intelectual importante.
AR: Responsável pela recolha de dados, redação do texto, revisão crítica de conteúdo intelectual importante.
conteúdo intelectual importante.
RPP, LC: Responsável pela revisão crítica de conteúdo intelectual importante e aprovação final do manuscrito.
LV: Responsável pelo fornecimento e edição de imagens clínicas, e revisão crítica de conteúdo intelectual importante.
AM: Responsável pela supervisão deste projeto, resultados da investigação, revisão crítica do conteúdo intelectual
conteúdo intelectual importante e contribuiu com a sua experiência para a conclusão do manuscrito.
Todos os autores aprovaram a versão final a ser publicada.

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