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Case Report

Vision Loss as Presenting Symptom in Testicular Cancer: A Morbid Case Report

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Abstract
Testicular cancer is the most common malignancy in men 20–40 years old and most commonly metastasizes to the lung, liver, and brain. Choroidal metastasis from testicular cancer is exceedingly rare, and only few cases have been described in the literature. We report a patient who presented with painful unilateral vision loss as the initial presenting symptom of metastatic testicular germ cell tumor (GCT). A 22-year-old Latino man presented with a 3-week history of progressive central vision loss and dyschromatopsia, accompanied by intermittent, throbbing ocular, and periocular pain, in the left eye. Associated symptom was remarkable for abdominal pain. Examination of the left eye disclosed light perception vision and a large choroidal mass in the posterior pole involving the optic disk and the macula with associated hemorrhages. Neuroimaging showed a 2.1-cm lesion in the posterior globe of the left eye, and B-scan and A-scan ultrasonography findings were consistent with choroidal metastasis. Systemic workup revealed a mass in the left testicle with metastasis to the retroperitoneum, lungs, and liver. Biopsy of a retroperitoneal lymph node showed a GCT. Visual acuity worsened from light perception to no light perception 5 days following initial presentation. Several cycles of chemotherapy were completed, including salvage therapy; however, these treatments were unsuccessful. While vision loss due to choroidal metastasis as the initial presenting symptom of testicular cancer is rare, clinicians should consider metastatic testicular cancer in the differential diagnoses in patients with choroidal tumors, especially in young men.

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Introduction

Testicular cancer is the most common malignancy in men 20–40 years old and most commonly metastasizes to the lung, liver, and brain [1]. The uvea, compromised of the iris, choroid, and ciliary body, is the most common site for ocular metastasis. Within the uvea, 88% of metastasis is located in the choroid which has been thought to be due to its vascular supply [2]. Choroidal metastasis from testicular cancer is exceedingly rare and was not listed in a large retrospective study of 2,214 metastatic tumors to the uvea, which reported that among the most common sources of uveal metastasis were breast (37%), lung (26%), kidney (4%), and the GI tract (4%), with 16% of cases from an unknown primary site [3]. Only a few cases of metastatic testicular cancer, specifically germ cell tumor (GCT), to the choroid have been reported in the English literature. From a PubMed search using "testicle," "cancer," "metastasis," "choroid," "uvea," "ocular," and "eye," 12 cases were identified in the literature with vision loss as the initial presenting symptom, and only 4 of these 12 cases had eye pain [4–7]. We report a patient who presented with a subacute painful unilateral vision loss as the initial presenting symptom of metastatic testicular GCT.

Case Presentation

A 22-year-old Latino man presented with a 3-week history of progressive central vision loss and dyschromatopsia in the left eye, accompanied by intermittent, throbbing ocular, and periocular pain in the same eye. He denied any ocular symptoms in the right eye. In addition to his visual symptoms, he also had severe abdominal pain, which prompted emergency room visits and led to hospital admission. Ophthalmology was consulted for his vision loss. On initial presentation, vision was 20/20 in the right eye and light perception in the left eye. The pupil was normal in the right eye. The left pupil was fixed at 3 mm and had a relative afferent pupillary defect detectable by reverse. Intraocular pressure was 11 mm Hg right eye and 14 mm Hg left eye. Slit lamp examination was normal in both eyes. Dilated fundus examination was normal in the right eye. Dilated fundus examination of the left eye revealed a pale, elevated optic disk with 360° disk hemorrhage, a large elevated choroidal lesion in the posterior pole encompassing the macula and optic disk with pre-retinal (subhyaloid) and intraretinal hemorrhages in the macula, and mild serous retinal detachment surrounding the base of the elevated lesion. Fundus photograph at bedside using portable RetiCAM® imaging was attempted, but an adequate image was unable to be obtained. B-scan and A-scan ultrasonography of the left eye showed an elevated, irregular, heterogeneous, echogenic mass lesion in the posterior pole with moderate to high internal reflectivity and mild serous retinal detachment along its inferior aspect. The mass measured approximately 18.2 mm in its greatest basal dimension with a maximal thickness of 10.3 mm (Fig. 1a). Magnetic resonance imaging (MRI) T2 axial scan of the brain and orbits revealed a heterogeneously enhancing 2.1 cm × 0.8 cm lesion in the posterior aspect of the left globe with associated gradient blooming suggestive of hemorrhage (Fig. 1b).

Concurrent workup for the abdominal pain included a computerized tomography (CT) of the abdomen and pelvis, which showed a left retroperitoneal mass affecting the ureter and renal vasculature. Additional CT scans also revealed a left lower quadrant mass, a hypoattenuating focus in the right hepatic lobe, and multiple pulmonary nodules. Ultrasonography of the scrotum revealed a mass in the left testicle (Fig. 2). A nuclear medicine bone scan was unremarkable. A GCT was suspected given a considerably elevated alpha-fetoprotein (AFP) and beta-human chorionic gonadotropin (beta-hCG) at 1,610 ng/mL and 883,990 mIU/mL, respectively. Biopsy of a retroperitoneal lymph node was positive for a nonseminomatous

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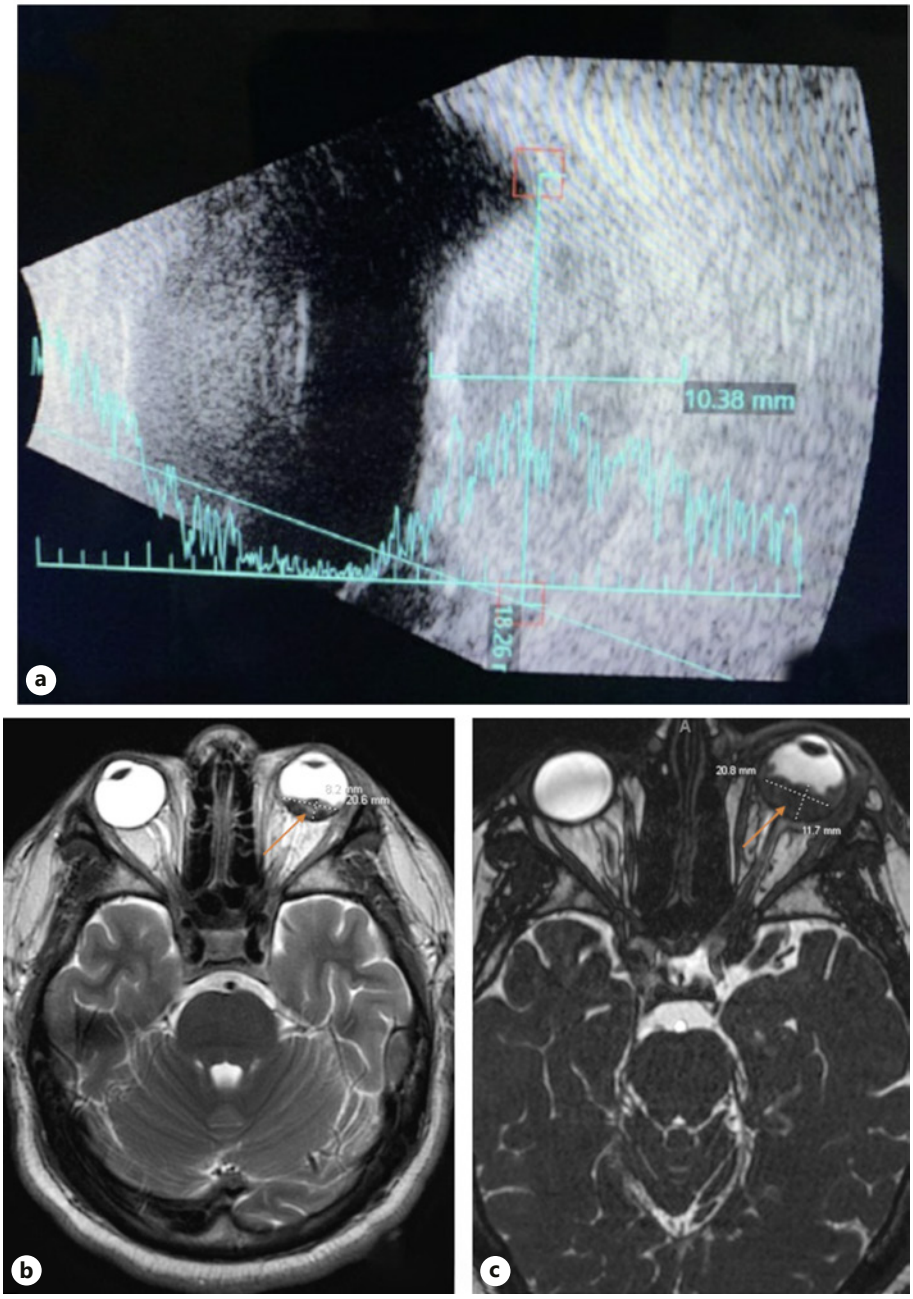

Fig. 1. a B-scan ultrasonography of the left eye showing an elevated, irregular, heterogeneous, echogenic mass (18.2 mm greatest basal dimension × 10.3 mm maximal thickness) with mild serous retinal detachment along its inferior aspect in the posterior pole. **b** MRI T2 axial scan of brain and orbits revealing a heterogeneously enhancing 2.1 cm × 0.8 cm lesion in the posterior aspect of the left globe with associated gradient blooming suggestive of hemorrhage. **c** MRI T2 axial scan 5 days after scan shown in (**b**). Interval increase of mass lesion to 2.1 cm × 1.2 cm with additional signal abnormality along the lateral margin and inferior aspect of the vitreous space, likely representing hemorrhage.

GCT with a choriocarcinoma component (Fig. 3). A diagnosis of stage III testicular cancer was made. Radical orchiectomy was deferred by the urology service, and chemotherapy was initiated.

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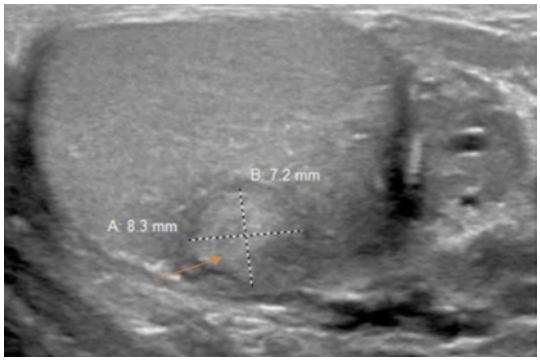

Fig. 2. Ultrasound imaging of left scrotum showing a 0.72 cm × 0.83 cm testicular mass, avascular, and hypoechoic in nature with a peripheral hypoechoic rim in the superior posterior aspect of the left testicle.

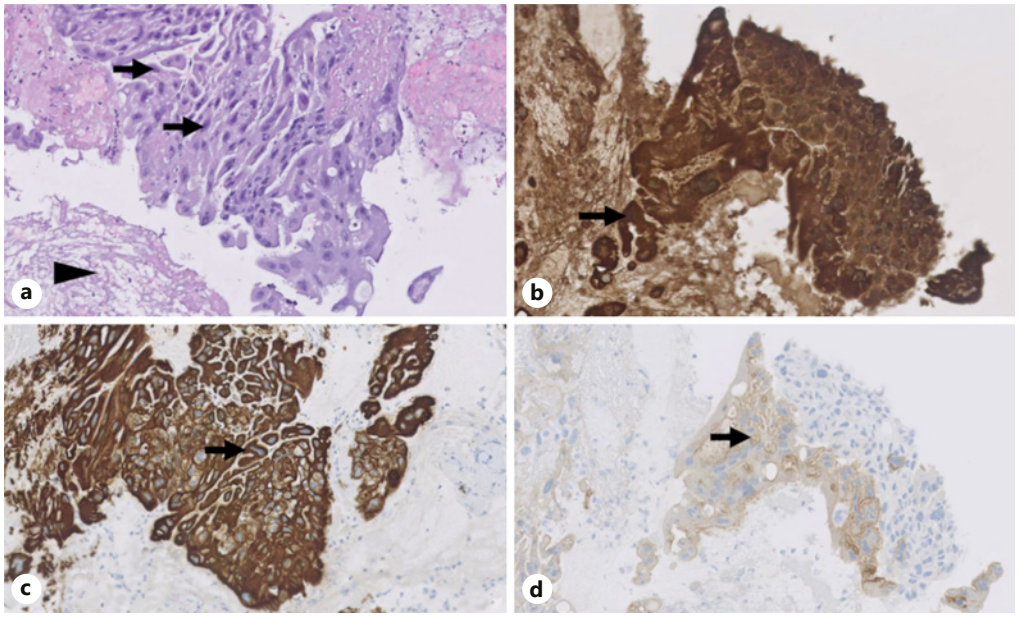

Fig. 3. Histological findings of biopsy of retroperitoneal lymph node. **a** A CT-guided core biopsy of the retroperitoneal lymph node shows malignant tumor cells (arrow) with nuclear enlargement, polymorphic nuclei, irregular membrane, and prominent nucleoli. Malignant trophoblasts are seen in the background of extensive necrosis (arrowhead) and hemorrhage (magnification, ×200). **b** Human chorionic gonadotropin (HCG) immunostaining shows strong cytoplasmic positivity (arrow) in the tumor cells (magnification, ×200). **c** Tumor cells exhibit strong membranous expression (arrow) for cytokeratin AE1/AE3 (magnification, ×200). **d** The immunostaining of glypican-3 shows positivity in tumor cell (arrow) (magnification, ×200).

Since the B-scan and A-scan ultrasonography results of the left eye mass were consistent with a choroidal metastasis, and since testicular cancer had been identified as the primary tumor, an intraocular biopsy was deferred. Five days following the initial ophthalmology consult, the patient experienced worsening intraocular pain in the left eye, and the vision deteriorated to no light perception. Dilated fundus examination revealed a dense vitreous hemorrhage in the left eye. Repeat MRI revealed an interval increase in the size of the mass and hemorrhage in the left eye (Fig. 1c). Given complete vision loss and poor visual prognosis, palliative ophthalmic care was given.

The patient was started on chemotherapy with the VIP regimen (etoposide, ifosfamide, and cisplatin) and completed four cycles. This therapy was complicated and delayed by concerns for

renal toxicity and neutropenia for which his doses were reduced. Due to treatment failure given only a partial tumor response and elevated tumor markers, salvage therapy with the VeIP regimen (vinblastine, ifosfamide, and cisplatin) was started 6 months after initiation of VIP therapy. This was discontinued after one cycle because of significant neuropathy and progression of tumor markers. Repeat brain CT and MRI performed a few weeks later for new-onset headaches, seizures, and altered mentation demonstrated numerous new hemorrhagic brain metastases. The patient then completed ten fractions of whole-brain radiation therapy which improved his mentation. Following episodes of hemoptysis, new hemorrhagic lung lesions on imaging, and worsening tumor markers, the patient was placed on hospice care. The patient passed away 7 months after the diagnosis.

Discussion

This case describes a patient whose painful unilateral vision loss was the initial presenting symptom of metastatic testicular germ cell cancer. To our knowledge, our case adds to only four previously reported cases in which painful vision loss was a presenting symptom of testicular cancer. Ultrasonography is helpful in differentiating metastases to the choroid from other intraocular neoplasms, particularly primary choroidal melanomas. A choroidal metastasis appears heterogeneous and more echogenic on B-scan and typically displays a moderate to high internal reflectivity on A-scan, whereas a choroidal melanoma appears homogeneous and acoustically hollow on B-scan and displays a low internal reflectivity on A-scan [2, 3, 8]. The B-scan and A-scan ultrasonography results of the left eye mass were consistent with a choroidal metastasis rather than a primary choroidal melanoma. Moreover, since a lymph node biopsy was positive for testicular cancer metastasis, and testicular cancer was diagnosed as the primary tumor, the mass lesions in the left eye as well as in multiple other organs most likely were metastases of testicular cancer origin rather than separate primary tumors. Therefore, an intraocular biopsy was deferred since a primary tumor already had been identified, and treatment of the primary tumor was recommended.

Overall mortality and prognosis of metastatic GCT depend heavily on both tumor markers AFP and beta-hCG and the location of metastatic lesions, and 16% of metastatic GCT meets the criteria for poor prognosis [9]. A poor prognosis requires at least one of the following: mediastinal primary, nonpulmonary visceral metastases, AFP >10,000 ng/mL, or beta-hCG >50,000 IU/L, and the 5-year survival rates for patients with poor prognosis are 48–64% [9]. Our patient had a poor prognosis, meeting two of the aforementioned criteria: nonpulmonary visceral metastases and elevated beta-hCG of 883,990 IU/L. Our patient's disease course was complicated by multiple hemorrhagic brain lesions for which he was deemed incurable by the oncology service.

Visual prognosis is often difficult to characterize but typically poor as choroidal metastases of testicular cancer are often complicated by nonrhegmatogenous retinal detachments affecting the macula or by retinal scarring from tumor regression. In our literature review, visual outcomes have ranged from blind painful eye leading to enucleation [5, 6] to 20/40 resulting from peripheral tumor location not affecting the macula with tumor regression responding to chemotherapy [10]. Our patient initially presented with light perception vision which rapidly deteriorated to no light perception vision in the affected eye. While our patient had a macula-involving mass lesion, mild serous retinal detachment, and pre-retinal and intraretinal hemorrhages but no vitreous hemorrhage at initial presentation, the choroidal mass lesion did involve the optic disk, and his poor vision at presentation was likely partly attributable to optic nerve ischemia and congestion which led to complete loss of vision with rapid tumor progression. While vision loss due to choroidal metastasis as the initial presenting

symptom of testicular cancer is rare, clinicians should consider metastatic testicular cancer in the differential diagnoses in patients with choroidal tumors, especially in young men.

Statement of Ethics

The authors have no ethical conflicts to disclose. Written informed consent was obtained from the patient's parent for publication of the details of this medical case and any accompanying images. This manuscript conforms to the tenets of the Declaration of Helsinki. This retrospective review of patient data did not require ethical approval in accordance with local/national guidelines.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

The authors You Zhou, Ardalan Sharifi, Praveena Gupta, Brittany Duong, Jing He, Arian Pourmehdi Lahiji, and Wen-Hsiang Lee attest that they meet the current ICMJE criteria for authorship. Manuscript conception, design, drafting, editing, and literature search: You Zhou, Ardalan Sharifi, and Wen-Hsiang Lee. Patient assessment and care, data collection, analysis, and interpretation: You Zhou, Ardalan Sharifi, Brittany Duong, Jing He, Arian Pourmehdi Lahiji, and Wen-Hsiang Lee. Manuscript revision and final approval: You Zhou, Ardalan Sharifi, Praveena Gupta, Brittany Duong, Jing He, Arian Lahiji, and Wen-Hsiang Lee.

Data Availability Statement

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.

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