Case Report
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Retinoblastoma in Adolescence: Report of an Unusual Presentation

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Abstract

Herein, we report the clinical, pathologic and photographic findings of a 16 year-old girl who presented with gradual enlargement of a vascularized, hemorrhagic peripapillary mass that eventually led to vitreous hemorrhage and rubeosis iridis. Histopathological findings after enucleation were positive for retinoblastoma. The patient did not have any metastasis during her 20 months of follow up.

Keywords: Eye, Tumor, Differential diagnosis, Retinoblastoma

Introduction

Retinoblastoma is the most common primary intraocular malignancy of childhood. It is secondary to uveal malignant melanoma as the most frequent primary intraocular malignancy in all age groups.[1] The typical appearance of retinoblastoma is leukocoria, eye deviation or intraocular inflammation.[2,3] About 90% of patients present before 3 years of age with one of the above-mentioned symptoms[1]; however, retinoblastoma can masquerade as other ocular and orbital conditions.[3,4] Small tumors (less than 2 mm in basal dimension) upon clinical examination appear ophthalmoscopically as slightly translucent lesions in the sensory retina.[5] Slightly larger tumors lead to dilated retinal blood vessels that feed and drain the tumor. Some larger tumors show foci of chalk-like calcification that resemble cottage cheese.[5] Herein, we report the clinical presentation, photographic and pathologic documentation of retinoblastoma in a 16 year-old girl with a vascularized and hemorrhagic peripapillary mass.

Case Report

A 16 year-old girl referred to our clinic with gradual visual loss in her left eye for several weeks duration. She had no family history of cancer. On ophthalmic examination, the best corrected visual acuity was 20/20 in her right eye and 3 meters counting fingers in the left eye. Two plus relative afferent pupillary defect was observed in the left eye. Upon examination by slit lamp, the cornea,

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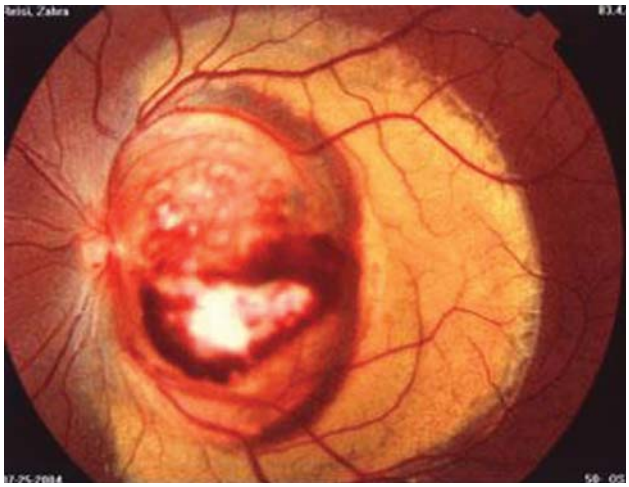

Figure 1. Color fundus photography of the lesion at the time of transpupillary thermotherapy shows a mass located juxtapapillary under the temporal retina surrounded with exudation.

lens, iris and vitreous were normal. Intraocular pressure was within normal limits in both eyes. Examination of the right ocular fundus showed normal retina and optic nerve head. In the left eye, indirect ophthalmoscopy revealed a 6×7 mm hemorrhagic vascularized lesion just temporal to the optic nerve head with approximately 3 mm elevation. B-scan ultrasonography showed a homogeneous mass with high internal reflectivity on A-scan without evidence of calcification. Systemic evaluation was done to ensure that no primary source for a possible choroidal metastasis could be found. The results were negative with the exception of a liver mass that measured about 13×14×6 mm. Fine needle aspiration of the liver mass indicated a benign lesion such as liver adenoma versus hemangioma.

The peripapillary mass enlarged gradually over the next six months and subsequently, subretinal and intraretinal exudation developed (Figures 1,2) which led to further decrease in visual acuity. With the impression of peripapillary retinal capillary hemangioma, transpupillary thermotherapy (TTT) was performed for the patient without improvement. The tumor continued to grow despite two sessions of thermotherapy during 15 months of follow up. Consequently, vitreous hemorrhage occurred along with iris neovascularization, which led to neovascular glaucoma, hyphema and total loss of vision. Finally, the patient underwent enucleation. Histopathological examination revealed small malignant tumoral cells filling the eye, forming fleurettes and Homer-Wright rosettes which favored a well-differentiated retinoblastoma (Figure 3). The optic nerve head and sclera were free of tumor. Bone marrow aspiration, bone scan and all abdominal and central nervous system imaging studies were normal. After 20 months of post-surgical follow up, there is no evidence of tumor in the left orbit, her right eye is normal and she is in good health.

Discussion

Previous reports show that in older age groups retinoblastoma presents differently leading to a delayed diagnosis due to a low level of suspicion.[6] Leukocoria is still the main presenting sign but other symptoms (such as blurred vision) are more commonly seen due to the higher ability of the grown up child to communicate.[6]

This case of retinoblastoma is of interest as the presentation was unusual in several ways:

Firstly, the tumor initially presented at the age of 16. Ninety percent of retinoblastoma cases are diagnosed before 3 years of age. The mean age at the time of diagnosis is 4 months in patients with familial retinoblastoma, 14 months in patients

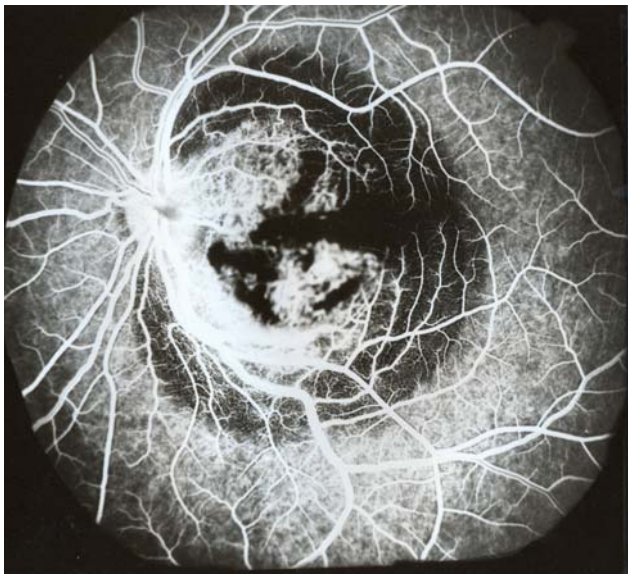

Figure 2. Fluorescin angiography of the mass at the time of transpupillary thermotherapy shows the sub-retinal mass with abnormal vessels, areas of hemorrhage and leakage.

with bilateral disease and 24 months in patients with unilateral involvement.[1] In a review of 400 cases of retinoblastoma, Shields et al. have reported that 8.5% of patients with retinoblastoma were older than 5 years, with only 0.8% of them over the age of 15 years at the time of initial diagnosis.[7] Three mechanisms have been proposed to explain a late presentation of retinoblastoma. One proposal is that the persistence of rare embryonal retinal cells may lead to malignant transformation later in life [8]; an alternative explanation is that a retinoma or retinocytoma that occurs early in life may be unrecognized until it undergoes malignant transformation; and the last suggested mechanism is that the malignant tumor may arise from previously undiagnosed spontaneously regressed/arrested retinoblastoma, which has been reactivated at a later time.[9]

The second reason for our patient's unusual presentation was the vascularized appearance of the tumor and its peripapillary location. This tumor masqueraded as a retinal capillary hemangioma. This presentation differs from typical retinoblastoma that usually appears as a translucent, gray to white intraretinal tumor.[1] In retinal capillary hemangioma, funduscopy and angiogram show dilated retinal vessels as well as subretinal fluid and exudates while the A-scan shows a highly reflective lesion.[10] In our observation, unlike typical retinoblastoma, the mass showed exudates and hemorrhage on the surface with a lack of calcification. Ultrasound findings were similar to hemangioma which was the reason for treatment with TTT.

Balasubramanya et al. reviewed 392 cases of retinoblastoma and found that 95.2% of the patients had leukocoria, proptosis, or strabismus at the time of presentation whereas only 3.3% of them had atypical features such as endophthalmitis, secondary glaucoma, uveitis, orbital cellulitis or cataracts.[3] Hyphema and iris neovascularization each were found in only 0.25% of their reviewed patients.[3] Our patient exhibited most of the above-mentioned unusual signs. Because vitreous hemorrhage is one of the manifestations of retinoblastoma, therapeutic vitrectomy should be avoided in patients with spontaneous vitreous hemorrhage in all age groups, particularly children, until the possibility of underlying retinoblastoma is excluded.[11,12] Measuring LDH in anterior chamber fluid may help to make the correct diagnosis although it is not pathognomic.[4]

The last point of interest in the present case is that atypical signs in the reported cases of retinoblastoma were associated with advanced disease.[3] All patients with atypical presentations

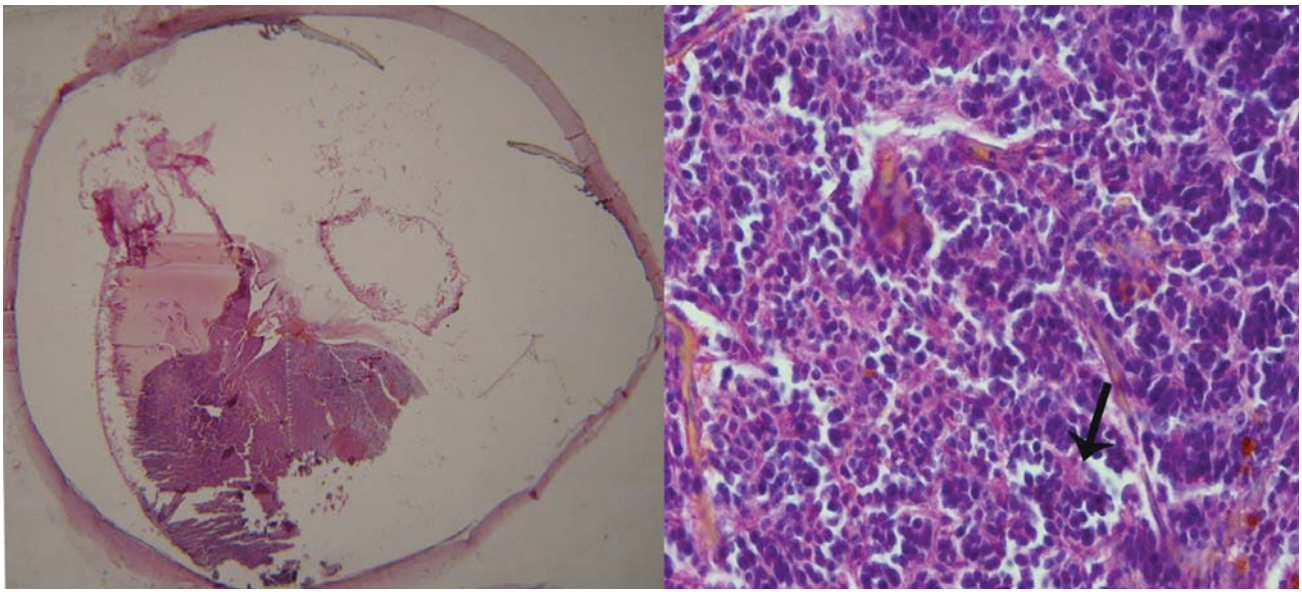

Figure 3. Left: Histopathology of enucleated globe shows a tumoral mass in the vitreous cavity. (H & E, 100×). Right: Higher magnification reveals small malignant tumoral cells forming fleurettes in some areas (arrow) (H & E, 400×).

of retinoblastoma in the study done by Balasubramanya et al. had advanced retinoblastoma.[3] In contrast, our patient initially presented with Group B of the International Classification for Intraocular Retinoblastoma and progressed very slowly to Group E at the time of enucleation[13] which was the reason for delayed diagnosis in our patient and could be considered as a diagnostic fault. However, at the time of enucleation, the optic nerve and sclera were proven to be free of tumor by histopathologic examination and there was no clinical evidence of metastasis. This is in accordance with observations in older patients with retinoblastoma who usually have no invasion or metastasis.[7]

In conclusion, clinicians should consider the possibility of retinoblastoma in patients, particularly children, who present with an atypical vascularized retinal mass or vitreous hemorrhage. Investigative methods such as additional imaging studies (i.e. MRI and CT scan), measuring LDH in the aqueous humor and FNA biopsy of suspected lesions (if possible) should be considered.[14]

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