· Case Report ·

The diagnostic challenge of diffuse infiltrating retinoblastoma

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Abstract

• AIM: To report a case of diffuse infiltrating retinoblastoma that proved to be diagnostic challenge because of its atypical presentation.

• METHODS: We described a 10 years old boy presented with cataract and features of ocular inflammation post-operatively, and was finally diagnosed as diffuse infiltrating retinoblastoma.

• RESULTS: The masquerading features, diagnostic approach, surgical management and histopathology findings were presented. In this case, cytology study of aqueous humor cells confirmed the diagnosis while radioimaging demonstrated a limited diagnostic value.

• CONCLUSION: The case highlights the diagnostic challenge of diffuse infiltrating retinoblastoma. Ophthalmologist should be aware of the atypical presentation of diffuse infiltrating retinoblastoma and must be vigilant in managing similar cases.

• KEYWORDS: retinoblastoma; retinal neoplasms; rosette formation; eye enucleation; cataract
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INTRODUCTION

Retinoblastoma is the most common intraocular malignancy in children. It typically appears as intraocular endophytic or exophytic lesion. Leucocoria and strabismus reported to be the most frequent presenting signs[1]. While the features of a typical retinoblastoma are well described in literature, there is a paucity of information of an uncommon diffuse infiltrating subtype. This rare entity, which accounts for 1% -2% of retinoblastoma cases[2,3], is characterised by relatively flat, ill defined and plaque like thickening of retina without a discrete focal lesion[4]. The atypical presentation of diffuse infiltrating retinoblastoma frequently poses a diagnostic challenge. Masquerade syndrome is used to describe its presentation which often simulates chronic uveitis and endophthalmitis[5-7]. As misdiagnosis and delay in treatment will lead to fatal outcome, ophthalmologist should include diffuse infiltrating retinoblastoma in the differential diagnosis of a child with unexplained intraocular lesion resembling uveitis or infection[3]. We report an unusual case of diffuse infiltrating retinoblastoma presented as cataract and masquerade syndrome postoperatively. Diagnostic problem and role of common investigation techniques will be discussed.

CASE REPORT

A 10 years old boy presented to district hospital with history of reduced vision in the right eye of few months duration. The poor vision was described as generalized dimness of the sight that occurred gradually but progressively. There was no history of red eye, fever, trauma, joint pain or systemic illness. Family history of retinoblastoma was negative. During assessment, the best - corrected visual acuity (BCVA) was 1/60 in the right eye and 6/6 in the left eye. A dense cataract was noted in the right eye with an otherwise normal anterior segment. There was no mass, calcification or vitreous opacity on B - scan. Left eye examination was normal. After discussion with the care giver, lens aspiration with intraocular lens implantation was performed subsequently.

BCVA of his right eye improved to 6/12 postoperatively. There was evidence of persistent cells in anterior chamber and pseudohypopyon in the operated eye. A computed tomography scan of the orbit was done but showed an unremarkable finding. Subsequently a fundus fluorescence angiography (FFA) was done at a tertiary centre showing telangiectatic vessels which were thought to be capillary retinal angioma. The patient, however, defaulted follow-up but presented again to a district hospital 6 months later. He was referred to our centre for further management.

On presentation his BCVA was 2/60 in the right eye and 6/6 in the left eye. There was no proptosis, strabismus or leucokoria. Intraocular pressure was 40mmHg in the right eye and 12mmHg in the left eye. There was pseudohypopyon of 2mm height with the presence of clumps of whitish nodules on iris and corneal endothelium (Figure 1, 2). There was no relative afferent papillary defect. Right fundus was poorly

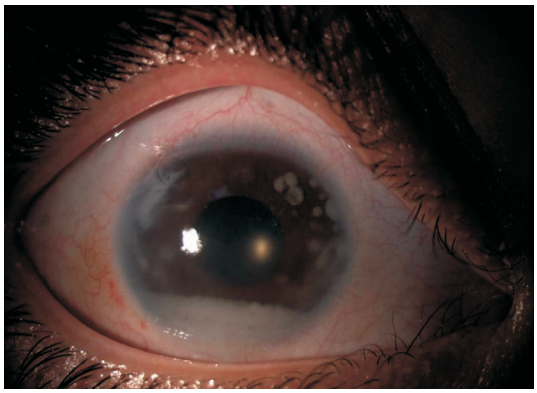

Figure 1 Pseudohypopyon in anterior chamber in the case.

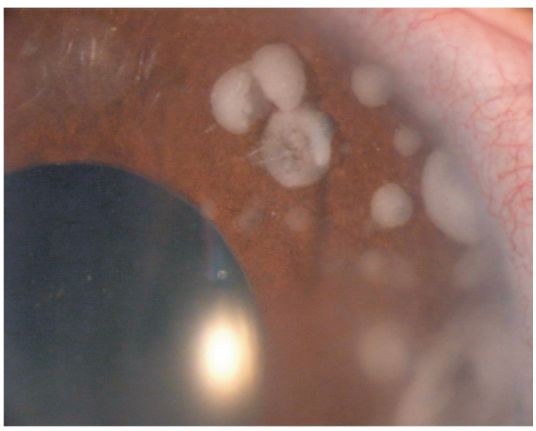

Figure 2 Tumour nodules on iris.

visualized due to anterior segment abnormalities. Ultrasound did not reveal any mass and both repeated computed tomography scan and magnetic resonance imaging showed no intraocular mass lesion or calcification. Left eye examination was normal. Subsequently, we performed ocular examination under anaesthesia and anterior chamber was hout. The cytology examination of the aqueous humour showed cluster of tumour cells with partial rosette and mitotic figure, suggestive of retinoblastoma.

Detailed systemic evaluation showed no evidence of retinoblastoma metastasis. Following sessions of counseling, we performed primary enucleation of the right eye (Figure 3) in view of extensive intraocular involvement of the tumour. The enucleated globe specimen showed irregular tumour patches located in the upper ora serrata. The histopathology examination demonstrated malignant undifferentiated tumour cells arranged in diffuse sheets with rosettes and mitotic figure (Figure 4). There was minimal tumour involvement of the choroid and sclera (Figure 5). Malignant cells were found in the aqueous humour indicating diffuse tumour seeding in the anterior chamber. However, the optic nerve was free of tumour invasion. There was no evidence of dystrophic calcification or vascular invasion in the specimen. The child showed a good recovery of post-enucleation. Postoperative adjuvant systemic chemotherapy was administered under the supervision of a paediatric oncologist. There was no evidence of new or recurrent tumour during follow-up of 2 years. He maintained good vision in his left eye and had returned to the school. Long term follow-up was arranged.

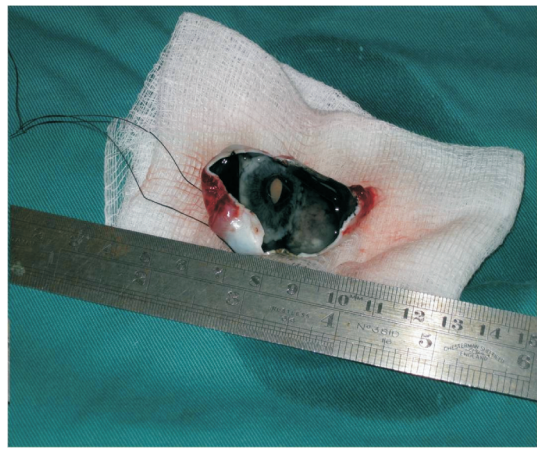

Figure 3 Enucleated globe.

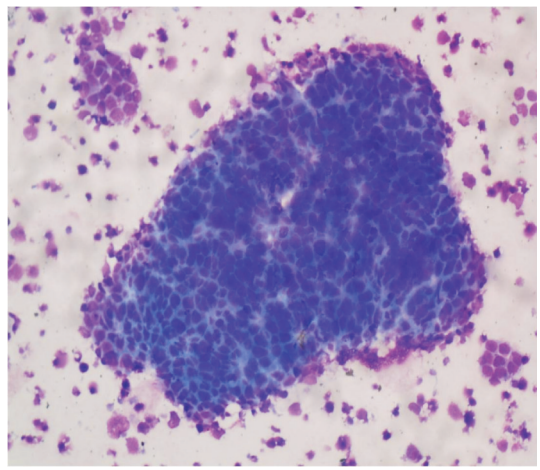

Figure 4 Histopathological examination of the enucleated globe showing rosettes formation.

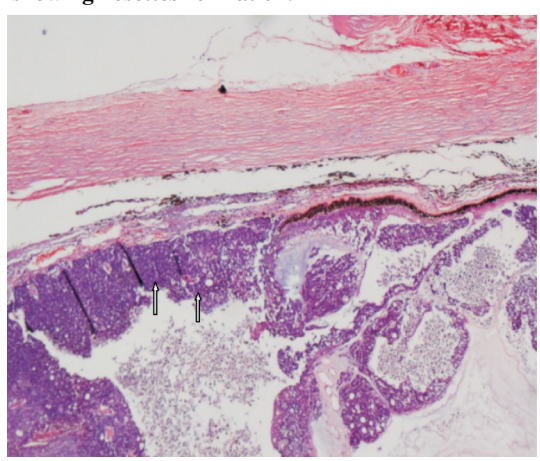

Figure 5 Histopathological examination showing infiltrating tumour with minimal involvement of the choroid and sclera.

DISCUSSION

Diffuse infiltrating retinoblastoma is a rare entity that poses diagnostic challenge to the ophthalmologist. It does not assume specific features and the presentation is frequently misleading. Unlike the typical retinoblastoma, this entity frequently occurs in older children without evidence of intraocular exophytic or endophytic mass. Masquerading is a common finding and confusion frequently occurs between inflammation, infection and other ocular pathology.

Shields *et al*[3], in a retrospective case series of 32 patients with diffuse infiltrating retinoblastoma, reported that nearly one quarter of new cases were misdiagnosed during initial presentation. In their published series, iris neovascularization and pseudohypopyon were reported to be the most common early clinical findings, which often led to the initial diagnosis of uveitis, coat disease, trauma or even unspecific retinal inflammation. All-Ericsson *et al*[6] in their case report commented that unusual ocular inflammation in older children in the absence of cataract, pain and synechia should alert clinician to suspect retinoblastoma. On the contrary, our case showed that cataract could possibly be the first presenting signs of diffuse retinoblastoma. Cataract and related poor vision might occur even earlier than other masquerading features such as recurrent pseudohypopyon.

Diffuse infiltrating retinoblastoma tends to be diagnosed at older age than typical retinoblastoma. The mean age at diagnosis for diffuse infiltrating retinoblastoma was reported to be 4 years old [3]. Diagnosis of retinoblastoma at age of 10 years old is unusual. Older age of presentation in addition to atypical appearance leads to false clinical impression of other ocular pathology. Our case highlights that even though uncommon, retinoblastoma should be in consideration when investigating a child of any age with cataract. Persistent inflammation in a post cataract surgery eye in a child unexplained by other pathology such as infection is another suggestive feature of childhood ocular malignancy.

Diagnostic imaging using ultrasonography, computer tomography or magnetic resonance imaging of the orbit and brain are commonly employed in investigating typical retinoblastoma. The imaging modalities are however unreliable in diagnosis of diffuse infiltrating retinoblastoma[8], giving the absence of a well-defined mass and a lower incidence of calcification. Therefore, it was not surprisingly that imaging result was unremarkable despite extensive intraocular infiltration of the tumour cells in our case. Just like in the case of typical retinoblastoma, a negative radioimaging result does not rule out diffuse infiltrating retinoblastoma.

Anterior chamber paracentesis was proven to be helpful in our case. The cluster of tumour cells with rosette appearance in the aquoues humour confirmed the diagnosis and justified the subsequent management including enucleation. Anterior chamber paracentesis has an estimated sensitivity of 86%[8], but it is recommended in exceptional cases only because of associated risk of tumour spread following the procedure[9]. It should not be employed in a typical case of retinoblastoma where diagnosis can be made clinically.

This case illustrated the difficulty in diagnosing diffuse infiltrating retinoblastoma. The masquerading features, atypical age of presentation and negative radioimaging finding contribute to the diagnostic challenge of this retinoblastoma entity. Anterior chamber paracentesis and aqueous humor cytology are useful but should be employed with caution. It is important for ophthalmologist to be aware of the atypical presentation of diffuse infiltrating retinoblastoma. A high index of suspicion is warranted in similar cases.

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弥漫性浸润性视网膜母细胞瘤的诊断

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摘要

目的:报告 1 例弥漫性浸润性视网膜母细胞瘤,因其非典型性临床表现而诊断受到极大挑战。

方法:患者为 1 例 10 岁男孩,患有白内障及术后眼部炎症,最终确诊为弥漫性浸润性视网膜母细胞瘤。

结果:患者行假性特征,诊断方法,手术处理,组织病理学检查。对该病例中房水细胞的细胞学研究确定了诊断结果,而放射显像诊断具有有限的诊断价值。

结论:该病例突显了弥漫性浸润性视网膜母细胞瘤的诊断难度,眼科医生应该认识到弥漫性浸润性视网膜母细胞瘤的非典型性临床表现,同时在处理其它相似病例时应特别注意。

关键词:视网膜母细胞瘤;视网膜肿瘤;花环形成;眼球剜除术;白内障