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CASE REPORT

Giraffe or leopard spot chorioretinopathy as an outstanding finding: case report and literature review

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Abstract

Purpose Presentation of two typical cases with characteristic leopard retinopathy secondary to bilateral diffuse uveal melanocytic proliferation (BDUMP) and idiopathic uveal effusion syndrome (IUES) and brief review of the literature about leopard spot retinopathy.

Case report A 43-year-old women, who was a known case of ovarian carcinoma, referred with gradual bilateral visual loss. In ophthalmic examination, subretinal fluid, multiple patchy subretinal hyperpigmented lesions and leopard spot chorioretinopathy were evident in her both eyes. Fluorescein angiography showed multiple nummular hyperfluorescent lesions surrounded by zones of hypofluorescence. Spectral domain optical coherence tomography revealed increased retinal thickness, subretinal fluid and RPE irregularities in both eyes. Enhanced depth imaging OCT (EDI-OCT) showed bilateral subfoveal choroidal thickening. During next 2-year follow-up, she underwent cataract surgery and later on developed neovascular glaucoma in her both eyes. The second case was a 45-year-old man who had developed decreased visual acuity in his left eye for 3 years. Anterior segment examination was unremarkable, and both eyes had normal intraocular pressure. No vitreous inflammation was observed. Fundoscopy revealed diffuse exudative retinal detachment in his left eye. Fluorescein angiography showed leopard spot retinopathy of posterior pole, and EDI-OCT disclosed subfoveal choroidal thickening. After exclusion of other causes of exudative retinal detachment and with diagnosis of IUES, he underwent intravitreal triamcinolone injection (2 mg) which improved his final vision to 20/40.

Conclusion Leopard spot retinopathy is an uncommon but clinically distinct manifestation of various disorders. BDUMP may present with leopard spot retinopathy, anterior uveal tract involvement and neovascular glaucoma. As EDI-OCT showed involvement and increased thickening of choroid in both cases of BDUMP and IUES, it may be better to consider such cases as leopard chorioretinopathy and categorize these entities as a member of pachychoroid pigment retinopathy disorders.

Keywords Bilateral diffuse uveal melanocytic proliferation (BDUMP) · Idiopathic uveal effusion syndrome (IUES) · Leopard retinopathy · Giraffe retinopathy · Optical coherence tomography (OCT)

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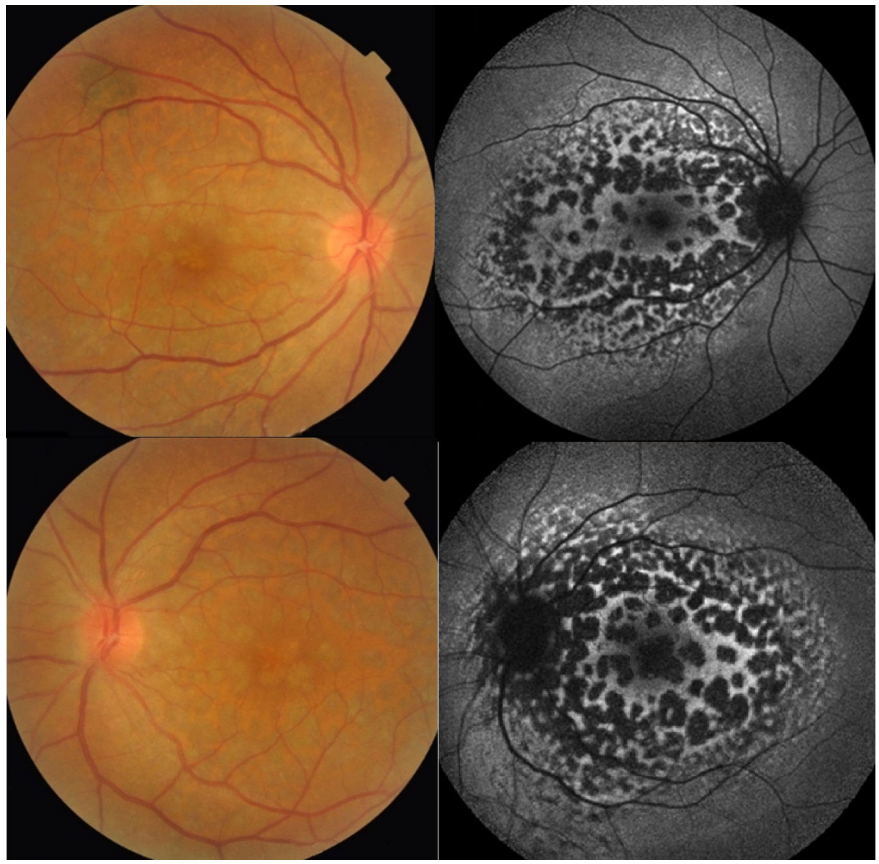

Fig. 1 For BDUMP case, fundus photographs demonstrate pigmented leopard pattern lesions. Fundus autofluorescence imaging shows patchy areas of hypoautofluorescence surrounded by zones of increased autofluorescence in a leopard spot pattern

Introduction

Leopard (also called Giraffe) spot retinopathy is a characteristic fundoscopic and angiographic finding which may be caused by heterogeneous group of disorders.

Bilateral diffuse uveal melanocytic proliferation (BDUMP) and idiopathic uveal effusion syndrome (IUES) are among disorders which are causes of leopard spot retinopathy.

BDUMP is a rare paraneoplastic disease accompanied by painless bilateral visual loss. It is characterized by multiple round-to-oval orange patches at the level of the retinal pigment epithelium (RPE), multifocal early hyperfluorescence corresponding to these patches, diffuse thickening of the uveal tract with focal nodules, exudative retinal detachment and rapidly progressive cataract [1]. Rarely anterior segment involvement with iris and ciliary body cysts formation, glaucoma, dilated episcleral vessel and shallow anterior chamber has been reported [2, 3]. Leopard pattern of the fundus is a characteristic finding in BDUMP [4, 5]. Rarely iris involvement in the form of multiple pigmented and nonpigmented placoid nodules has also been reported in this syndrome [6].

Our second case which caused unilateral leopard retinopathy was a middle-age man with diagnosis of chronic IUES. This case also showed dramatic responses with intravitreal triamcinolone injection. IUES also may be associated with leopard retinopathy [7].

Herein, we report a rare case of BDUMP with characteristic leopard fundus pattern which was also associated with iris stromal involvement, rubeosis iridis and neovascular glaucoma. Interestingly, we observed mild reduction of exudative retinal detachment in this case with injection of intravitreal bevacizumab. The second case is a middle-age man with diagnosis of chronic IUES and typical unilateral leopard spot retinopathy which improved with intravitreal triamcinolone injection. We report our enhanced

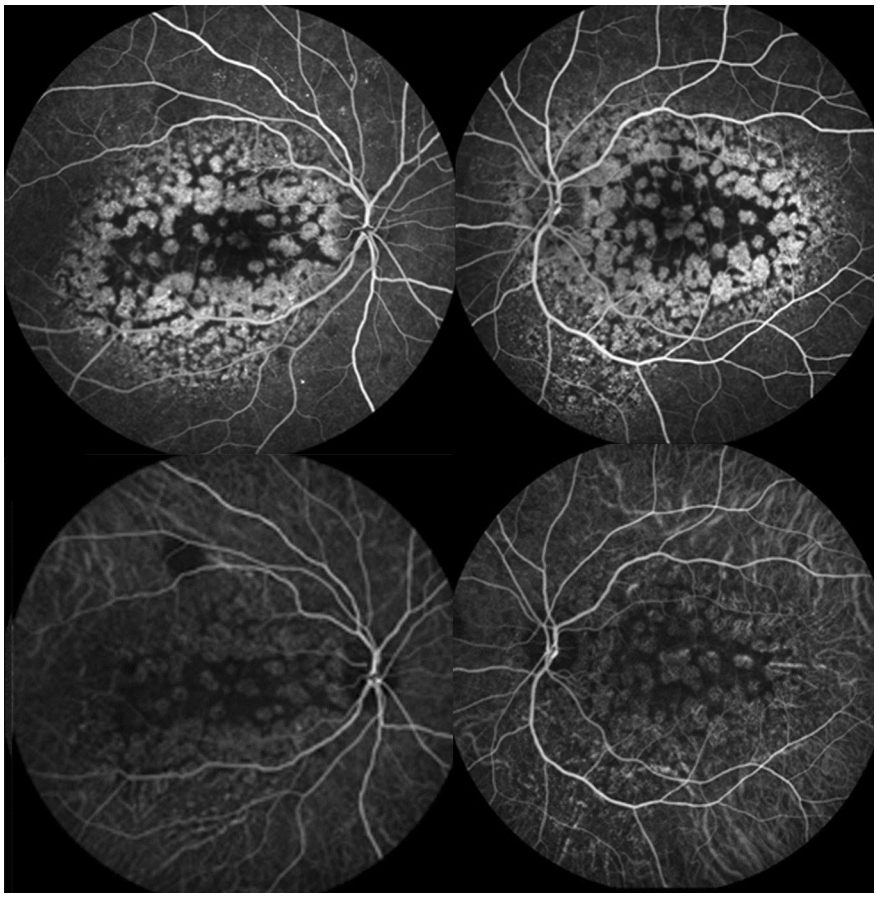

Fig. 2 For BDUMP case: fluorescein angiography (FAG) shows leopard pattern of multiple nummular hyperfluorescent lesions surrounded by zones of hypofluorescence (inverse FAF pattern). ICG (lower images) demonstrates leopard pattern hypercyanescent spots (inverse FAF pattern)

depth imaging (EDI) OCT findings of choroidal thickening in the above-mentioned cases, and we also report a brief review of the literature for other several causes of leopard retinopathy.

Case report

CASE 1: A 43-year-old woman was referred to our clinic complaining gradual visual blurring in both eyes. Six months prior visiting us, she had undergone electroretinogram (ERG), electro-oculogram (EOG), indocyanine green angiography (ICG) and fundus fluorescein angiography (FFA) for mild blurring of vision which were reported within normal limit. One year earlier, this lady had history of total hysterectomy and salpingo-oophorectomy for metastatic papillary serous carcinoma of the ovary. Following radical surgery, she had also undergone six cycles of chemotherapy with paclitaxel and carboplatin regimen.

At her initial visit to us, visual acuity was 3/10 in the right and 2/10 in the left eye. Slit-lamp examination of anterior segment was unremarkable, and there was no flare/cell in anterior chamber or vitreous cavity. Dilated fundoscopic examination revealed multiple patchy subretinal hyperpigmented lesions. These lesions were round/oval shaped with discrete borders distributed mostly in posterior pole with extension to equatorial area mimicking leopard spot pattern (Fig. 1). On fundus autofluorescence (Heidelberg Engineering, Inc., Heidelberg, Germany), the lesions in the posterior pole were hypoautofluorescent (Fig. 1). Fluorescein angiography (Heidelberg Engineering, Inc., Heidelberg, Germany) revealed leopard pattern of multiple nummular hyperfluorescent lesions surrounded by zones of hypofluorescence (Fig. 2). These lesions remained hyperfluorescent in the late phase of angiogram without significant leakage.

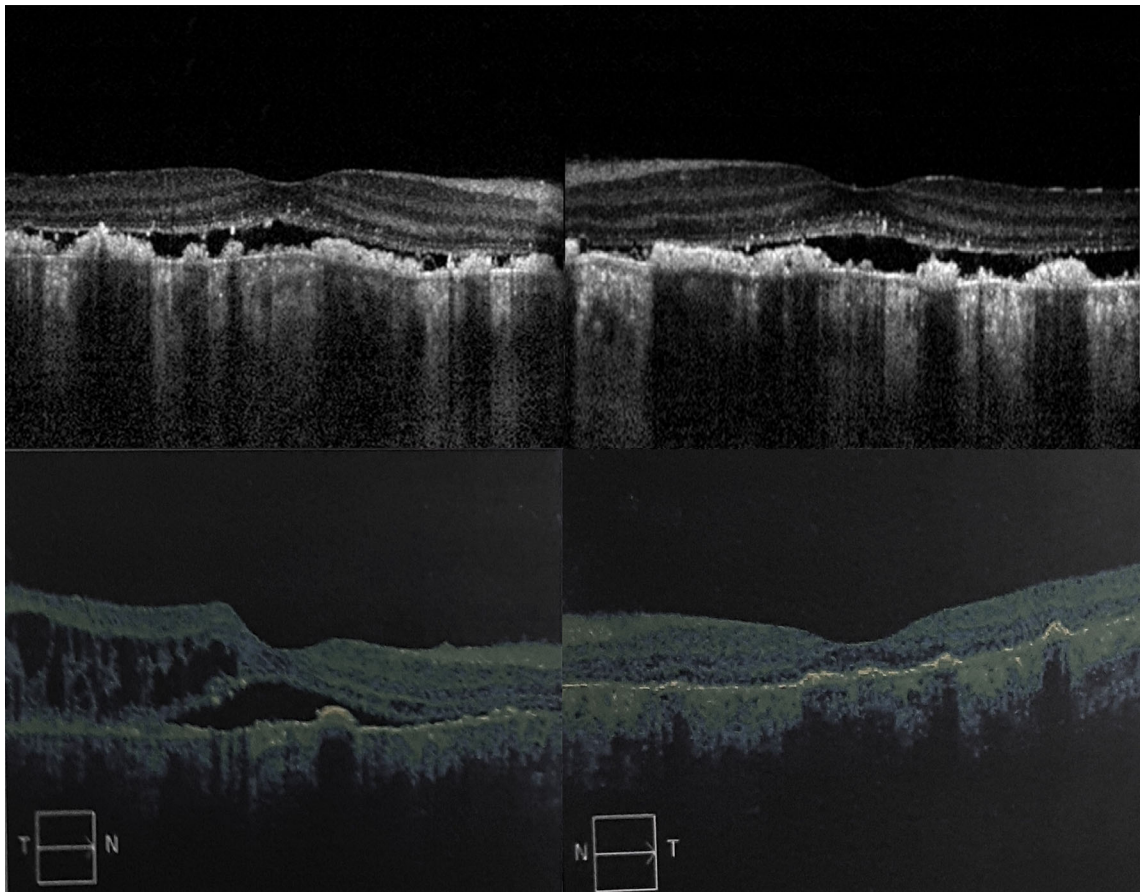

Fig. 3 For BDUMP case: SD-OCT shows neurosensory detachment, RPE irregularities with hyperreflective subretinal depositions and choroidal thickening. Following intravitreal bevacizumab injection, there is resolution of subretinal fluid specially in the left eye (Lower part)

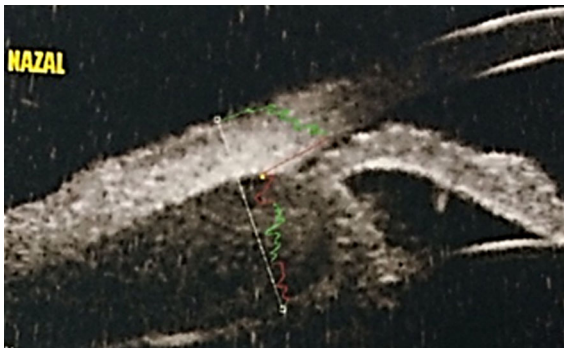

Fig. 4 Hyporeflective ciliary body cystic lesions are evident in ultrasonic biomicroscopy

Indocyanine green angiography (ICG, Heidelberg Engineering, Inc., Heidelberg, Germany) also showed leopard pattern hypercyanescent spots in early and late phases. Spectral domain optical coherence tomography (SD-OCT, Heidelberg Engineering, Inc., Heidelberg, Germany) revealed increased retinal thickness, subretinal fluid with neurosensory detachment and RPE irregularities with hyperreflective subretinal depositions in both eyes (Fig. 3). Imaging of choroid using enhanced depth imaging OCT (EDI-OCT, Spectralis, Heidelberg Engineering, Inc., Heidelberg, Germany) in the subfoveal area showed bilateral choroidal thickening. Ultrasonic biomicroscopy (UBM, ELLEX MEDICAL Inc., Adelaide, Australia) revealed multiple hypo-reflective ciliary body thickening and cystic lesions, narrowing of anterior chamber angle and hyperreflective iris lesions (Fig. 4). Visual acuity and fundoscopic findings remained unchanged during the first follow-up year. Later on, she developed mature cataract in the left eye and

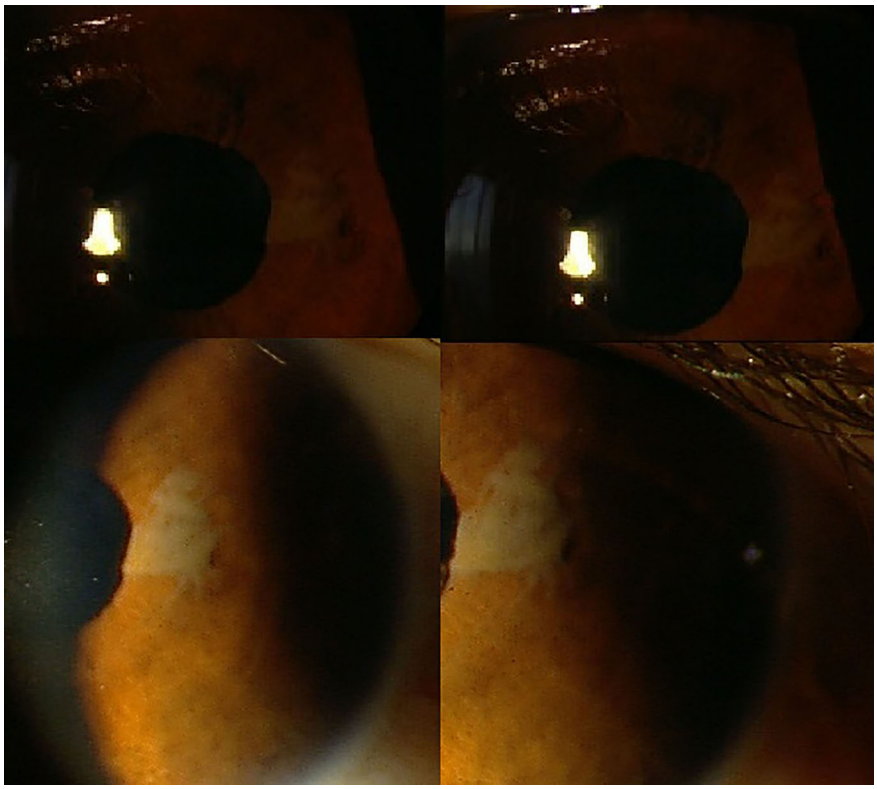

Fig. 5 Slit-lamp photography shows hyperpigmented iris lesion

underwent cataract extraction with posterior chamber IOL implantation. During the second-year follow-up, she demonstrated local recurrence of carcinoma and underwent three additional cycles of the mentioned chemotherapy regimen and at this time the visual acuity gradually decreased (to finger counting 2–3 m in both eyes); OCT also revealed increased macular thickness with bilateral subretinal fluid again. Therefore, she underwent intravitreal injection of Bevacizumab (Avastin 1.25 mg, Genentech, South San Francisco, California USA) in her both eyes for possible treatment and fortunately her left eye macular thickness responded and improved (Fig. 3).

At the final visit, a grayish lesion was observed in her iris stroma of left eye with development of rubeosis iridis and neovascular glaucoma in both eyes (Fig. 5). Unfortunately she passed away shortly after this last visit because of systemic condition deterioration.

Case 2

A 45-year-old man was referred to our clinic with long-term period of decreased visual acuity in his left eye for 3 years without any positive past systemic history. His best visual acuity was 20/20 in the right and finger counting at 3 meters in the left eye. Anterior segment examination was unremarkable, and both eyes had normal intraocular pressure without any medication. On slit-lamp examination, no vitreal cell was observed. Fundoscopy revealed exudative retinal detachment with diffuse shifting fluid involving inferior retina and posterior pole in his left eye. Subretinal fluid was evident on spectral domain OCT, and EDI-OCT showed subfoveal choroidal thickening (Fig. 6). Following one internist consult and after exclusion of other inflammatory/noninflammatory causes of exudative retinal detachment [7] and with a most possible diagnosis of idiopathic uveal effusion syndrome (IUES), he underwent intravitreal triamcinolone 2 mg (Triamcinolone acetonide, TriamHexal, 2 mg/0.05 ml, Holzkirchen, Upper Bavaria, Germany) injection which caused incredible improvement in his vision to 20/40 after 2 weeks. Following treatment subretinal fluid absorbed completely with residual subretinal fibrotic band. At this time, fluorescein angiography showed leopard spot retinopathy of posterior pole (Fig. 7). His vision (with no refractive

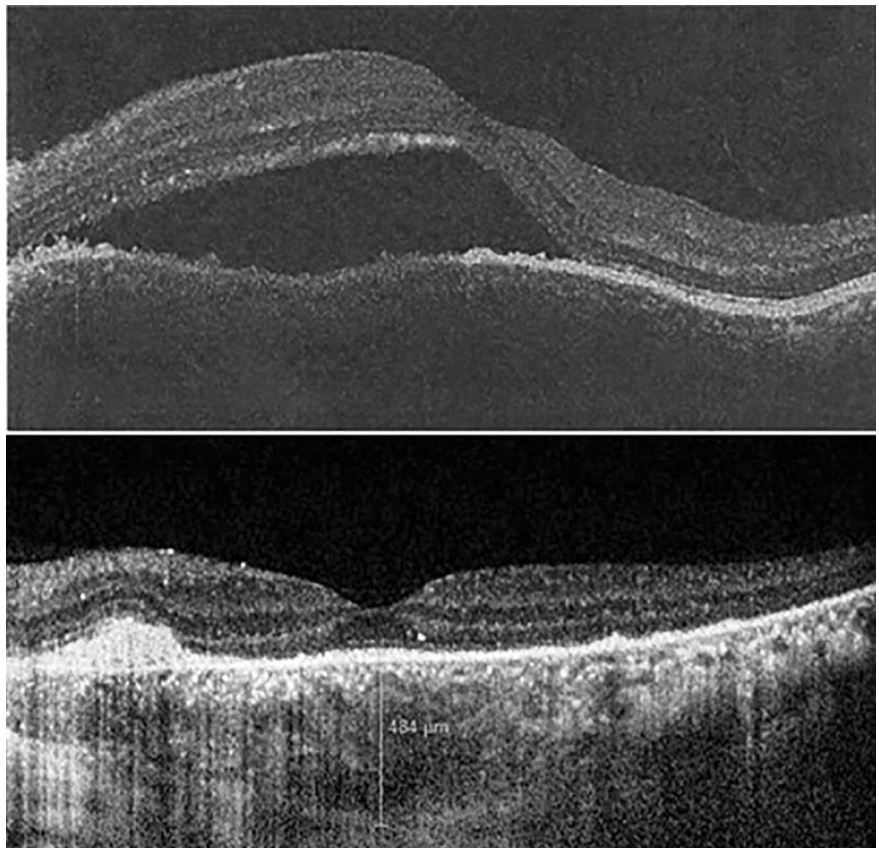

Fig. 6 In our IUES case, OCT shows neurosensory detachment and RPE irregularities in the left eye (upper image). Following intravitreal triamcinolone injection OCT demonstrates resolution of subretinal fluid, formation of subretinal fibrotic tissue and choroidal thickening (lower image)

error in both eyes) was stable up to his last follow-up visit at 1 year later.

Discussion

Several pathologic conditions have been reported which may have caused leopard (giraffe) spot pattern in fundoscopy and/or angiography, including BDUMP [4, 5], uveal effusion syndrome [7], leukemia [8], chronic central serous chorioretinopathy (CSC) [9], unilateral retinal pigment epithelium dysgenesis [10–12], infantile Refsum disease [13], organ transplant chorioretinopathy [14], beta-thalassemia [15], systemic argyrosis [16], large-cell lymphoma [17], recurrent leukemia [18], neonatal adrenoleukodystrophy [19], Walker–Warburg syndrome [20], syphilitic placoid chorioretinitis [21], psudoxanthoma elasticum [22], hypertensive choroidopathy [23] and primary intraocular lymphoma (PIOL) [24]. Regarding hematology system, leopard spot pattern has been reported in a variety of such disorders [15, 17, 18, 25]. Elschnig spots in hypertensive choroidopathy can also manifest as leopard pattern choroidopathy [23].

Most reported cases of BDUMP in the literature are associated with involvement of posterior uvea. Glaucoma, dilated episcleral vessels, iridocyclitis, shallow anterior chamber, ciliary body cysts and iris nodules have been reported as possible anterior segment involvement in BDUMP [2, 3, 6]. In this report, we presented our BDUMP case following papillary serous ovarian carcinoma with characteristic leopard spot chorioretinopathy and subsequent iris involvement with pigmented melanocytic tumor leading to development of neovascular glaucoma.

SD-OCT findings in our patient included RPE degeneration and clumping, serous neurosensory detachment, highly reflective subretinal depositions, cystic retinal edema and retinoschisis with deposition of reflective material. Such findings are in close accordance with previous report of SD-OCT findings in BDUMP cases [26].

Our patient underwent intravitreal injections of anti-VEGF with transient response of decreased

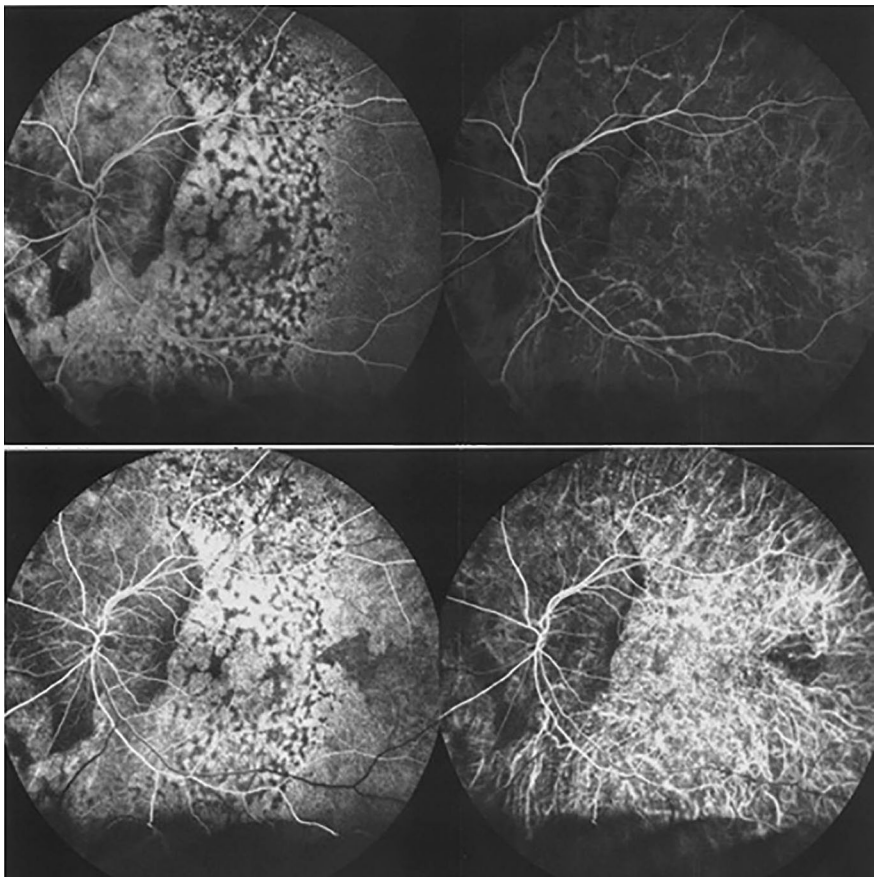

Fig. 7 In our IUES case, Leopard pattern of fluorescein angiography (left part) visible more than indocyanine green angiography (right part)

subretinal fluid. There are limited reported cases of BDUMP with anterior segment and anterior uveal tract involvement [2, 3, 6]. One of the unique findings in our case is involvement of anterior uveal by pigmented melanocytic lesion on iris surface, iris neovascularization and neovascular glaucoma. While this iris finding may be considered as metastatic lesion from underlying ovarian carcinoma, we did not have histologic access for pathologic confirmation. It has been proposed that BDUMP may have metastatic potential; for example, Duong et al. [27] have already reported a case of BDUMP associated with ovarian carcinoma and metastatic malignant amelanotic melanoma to the skin. Additionally, there is also a rare case report of ovarian tumor metastasis to iris similar to our case [28].

Uveal effusion syndrome is another rare disorder characterized with uveal effusion and serous retinal detachment causing secondary changes in RPE. This is a classic disease associated with leopard pattern retinopathy in both fundoscopy and fluorescein angiography [7]. Our case was a middle-age man with diagnosis of chronic IUES and typical unilateral retinal pigment epithelial changes (leopard spot evident on fluorescein angiography images) with reduced visual acuity. Although systemic steroids have not appeared to be effective in IUES [7], our case responded dramatically to intravitreal triamcinolone with visual acuity improvement and complete subretinal fluid absorption. Although this disease has relapsing–remitting clinical course, our case had relatively long period of remission with intravitreal triamcinolone injection. After intravitreal treatment, he had no disease relapse during 1 year of follow-up.

Furthermore, because EDI-OCT disclosed choroidal thickening in both of our cases, we believe for possible change of the term “leopard retinopthy” to “leopard chorioretinopathy” because RPE health has been postulated to be dependent on healthy choroidal circulation, and choroidal abnormality has been shown to cause RPE abnormality and dysfunction [29]. In conclusion, we suggest that leopard spot

chorioretinopathy could be categorized as a group of entities causing pachychoroid pigment retinopathy and RPE involvement is secondary to choroidal involvement. This categorization needs future accomplishment of EDI-OCT or swept source OCT study in the other cases of this type of chorioretinopathy.

Compliance with ethical standards

Conflict of interest The authors report no conflicts of interest.

Informed consent Patients signed informed consent regarding publishing their data and photographs.

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