Graefe's Arch Clin Exp Ophthalmol
(2006) 244: 742–746

SHORT COMMUNICATION

DOI 10.1007/s00417-005-0137-x

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Bilateral acute depigmentation of the iris

Received: 19 April 2005
Revised: 22 August 2005
Accepted: 23 August 2005
Published online: 5 October 2005

Presented at the American Uveitis Society Meeting, Ft. Lauderdale, Florida, 24 April 2004.

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Abstract *Purpose:* To report on five cases of unusual bilateral stromal depigmentation of the iris and pigment dispersion masquerading as uveitis. *Methods:* We describe the clinical features of five consecutive patients who presented with acute depigmentation of the iris stroma between June and October 2003. *Results:* Four patients were female, one was male. Age at presentation ranged from 15 to 25 years. Presenting symptoms were sudden-onset ocular discomfort and red eye in four patients and change of eye color in one patient. All patients had bilateral involvement, with a symmetrical diffuse depigmentation of the iris stroma in three cases and patchy areas of iris depigmentation in two. Other common features were mild ciliary injection (seven eyes), Krukenberg spindle (seven eyes), circulating pigment in the anterior chamber (eight eyes), and heavy pigment deposition in the angle (ten eyes). No eyes had iris transillumination defects, inflammatory keratic precipitates or inflammatory cells in the anterior chamber. Systemic laboratory work-up was unrewarding in all cases, and PCR analysis of the aqueous humor for HSV1 and 2 was negative in one patient. Four patients were treated with a short course of topical corticosteroids and three with oral acyclovir. One patient was lost to follow-up. The remaining four patients were followed up for 6–19 months with a stable clinical picture. *Conclusion:* In contrast to pigment dispersion syndrome, pigment seemed to be released from iris stroma in the five cases described here. Although patchy depigmentation of the iris resembled the lesions seen in herpetic iridocyclitis in two of the patients, symmetrical bilateral involvement and lack of intraocular inflammation were the differentiating features. The patients described here could represent a new entity or an unusual presentation of herpetic eye disease.

Keywords Iris depigmentation · Pigment dispersion · Masquerading syndrome

Introduction

Atrophy and/or depigmentation of the iris is seen in a number of inflammatory and noninflammatory conditions, including viral iridocyclitis, Fuchs' uveitis syndrome, Vogt–Koyanagi–Harada disease, Horner's syndrome, acute angle-closure glaucoma, trauma, and pigment dispersion syndrome. In this report we describe five patients who presented in the summer of 2003 with an acute bilateral depigmentation of the iris stroma and pigment dispersion in the anterior chamber. The patients had a constellation of findings distinct from other known entities.

Material and methods

We retrospectively analyzed the medical records of five patients who presented with an acute episode of bilateral iris atrophy and pigment dispersion between June and October 2003.

A complete ophthalmologic examination was performed at each visit, including best-corrected visual acuity, slit-lamp biomicroscopy, tonometry, indirect ophthalmoscopy, and gonioscopy. Routine laboratory work-up included erythrocyte sedimentation rate, complete blood count, liver enzymes, BUN, creatinine, anti-streptolysin O titer, chest X-ray, and serum serology for HSV I and II, VZV, CMV, and EBV.

Patients were treated with topical corticosteroids when they had ocular discomfort and circulating pigment in the anterior chamber. Empirical treatment with oral acyclovir 2000 mg per day was given in three patients for 2–8 weeks.

Results

Case reports

Case 1 A 20-year-old woman presented on 18 June 2003. She complained that her brown eyes had turned gray a month earlier. Her visual acuty was 1.0 OU. Slit-lamp examination was within normal limits except for a diffuse depigmentation and granular appearance of the anterior surface of the iris in both eyes (Fig. 1). In the left eye there were light brown patches inferiorly that seemed to be the only areas with normal iris architecture. The vitreous was quiet, the fundus was normal, and the intraocular pressure (IOP) was 12 mmHg in both eyes. Gonioscopy showed an open angle and pigment deposition in the trabecular meshwork. The patient was followed up for 10 months with a stable clinical picture.

Case 2 A 21-year-old woman presented on 26 August 2003 with the complaint of red eyes and mild ocular discomfort for a week in the right eye and for 3 days in the left eye. She also had a history of fever blisters a week prior to presentation. Her visual acuity was 1.0 with −2 diopter myopic correction in both eyes. Slit-lamp examination revealed bilateral ciliary injection, fine pigment keratic precipitates, and circulating pigment granules in the anterior chamber graded as 2+ in the right and 3+ in the left eye. The anterior surface of the iris had geographic areas of depigmentation and granularity with distinct margins extending from the collarette to the iris root in both eyes (Fig. 2). Dilated examination did not reveal any other pathology. IOP was 10 mmHg in both eyes. On gonioscopy, the angles were open, but heavily pigmented. With a presumptive diagnosis of atypical HSV iritis, the patient was treated with oral acyclovir and topical corticosteroids. Pigment dispersion resolved completely in 5 weeks and the patient remained stable until her last visit on 18 March 2004.

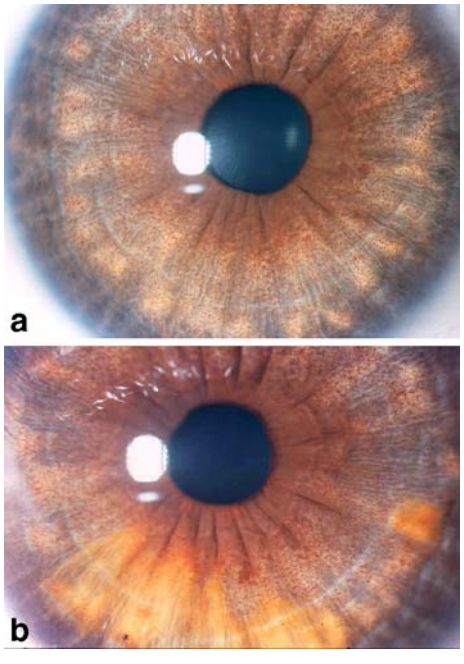

Fig. 1 Case 1. Color photographs show diffuse depigmentation and granular appearance of the iris stroma giving the iris a dull grayish appearance: **a** right eye; **b** left eye

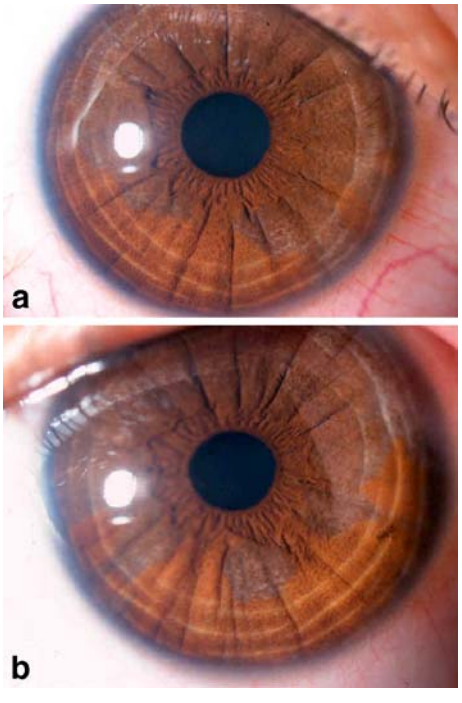

Fig. 2 Case 2. Color photographs show geographic areas of depigmentation and granularity with distinct margins extending from the collarette to the iris root: **a** right eye; **b** left eye

Case 3 A 20-year-old female presented on 29 August 2003 with the complaint of red eyes and photophobia for 2 days. She had a history of frequently recurring fever blisters. Her visual acuity was 1.0 OU. Slit-lamp examination showed mild ciliary injection, Krukenberg's spindles, 2+ circulating pigment in the anterior chamber, and patchy areas of depigmentation and granularity of the iris surface in both eyes (Fig. 3). Her IOP was 12 mmHg in the right eye and 10 mmHg in the left eye. There was pigment deposition in the trabecular meshwork. The rest of the ocular examination was within normal limits. She was first treated with topical corticosteroids. She had a recurrent episode of pigment dispersion 3 weeks later that coincided with an eruption of fever blisters. The IOP rose to 20 mmHg in the right eye and 22 mmHg in the left eye. She was then treated with oral acyclovir and frequent application of topical corticosteroids, which resulted in complete resolution of her symptoms and pigment dispersion in a month. IOP returned to 14 mmHg in both eyes and she remained stable until the final visit on 24 March 2005.

Case 4 A 15-year-old girl presented on 21 September 2003 with the complaint of redness, pain, and blurred vision in her right eye. Her visual acuity was 0.6 in the right eye and 1.0 in the left eye. There was a Krukenberg's spindle in the right eye. The anterior chamber had 4+ circulating pigment granules and chunks of pigment in the right eye and trace pigment in the left eye. The iris stroma was diffusely depigmented and grayish except for a 0.5–1 mm peripupillary band and isolated small islands that looked like iris flecks in both eyes. Gonioscopy showed heavy pigment deposition covering the angle like a carpet. IOP was 12 mmHg in both eyes. The patient was first treated with topical corticosteroids. Oral acyclovir was added when she had a recurrent episode 10 days later. Pigment dispersion resolved in a week and she remained stable for the rest of her follow-up of 6 months.

Case 5 A 25-year-old man presented on 2 October 2003 with the complaint of redness and mild pain in his left eye for 3 days. His visual acuity was 1.0 OU. He had Krukenberg's spindles, circulating pigment in the anterior chamber (1+ OD and 3+ OS), symmetrical diffuse depigmentation and granularity of the iris stroma and heavy pigment deposition in the trabecular meshwork (Fig. 4). IOP was 12 mmHg in the right eye and 9 mmHg in the left eye. He was first treated with topical corticosteroids. He had a recurrent episode 2 weeks later. An anterior chamber tap was done in the left eye. Aqueous humor PCR was negative for HSV 1 and 2. IOP had increased to 30 mmHg in the left eye at the time of his last visit on 31 October 2003. Antiglaucomatous therapy was prescribed, but the patient was lost to follow-up.

All five cases described above had an acute episode of pigment discharge from the stroma of the iris symmetrically in both eyes. Patients 1, 4, and 5 had diffuse involvement of both irides, while patients 2 and 3 had geographical or patchy areas of stromal depigmentation. Other common features were Krukenberg's spindles, circulating pigment in the anterior chamber, and pigment deposition in the trabecular meshwork. The patients did not have any sign

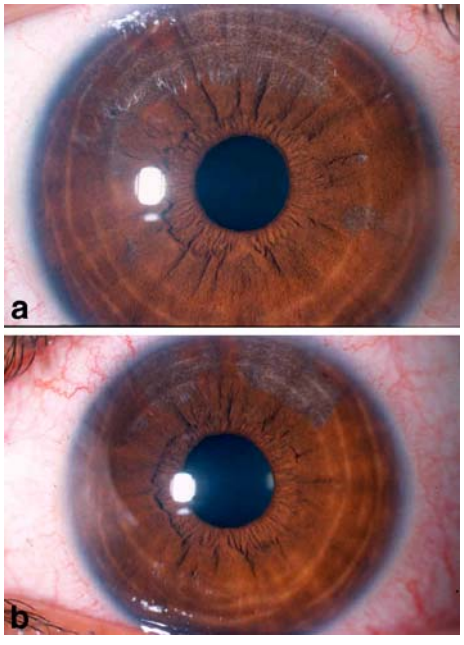

Fig. 3 Case 3. Color photographs show patchy areas of stromal depigmentation of the iris: **a** right eye; **b** left eye

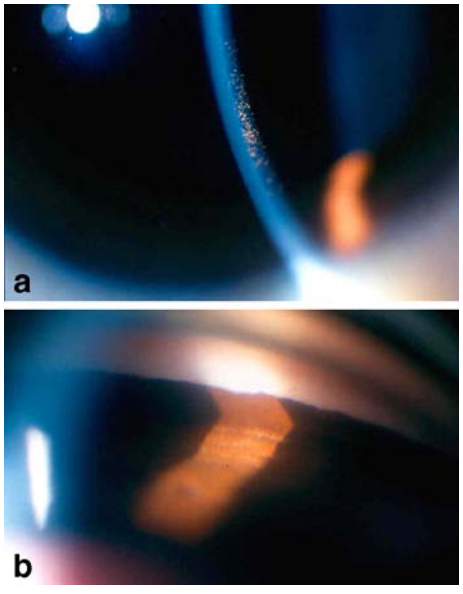

Fig. 4 Case 5. **a** Color photograph shows Krukenberg's spindle in the right eye. **b** Gonioscopic view of the anterior chamber angle in the right eye shows heavy pigment deposition in the trabecular meshwork

of intraocular inflammation. There was no iris transillumination defect. Pupillary reactions were normal. The IOP was low at the onset of the episode, but increased later in three eyes. Three patients (five eyes) had early recurrences of pigment dispersion when topical corticosteroids were tapered. Empirical treatment with oral acyclovir and reinstitution of topical corticosteroids resulted in resolution in all. None of the patients had a history of preceding viral illness. Review of systems was unremarkable except for a history of fever blisters in two patients. Laboratory work-up was unrewarding in all. We are not aware of an epidemic during the summer of 2003. We did not see any similar case before 2003 or during the summer of 2004.

Discussion

Pigment dispersion syndrome may masquerade as uveitis similar to our cases. However, pigment is liberated from the iris pigment epithelium and may deposit on the surface of the lens, iris stroma, the zonules, and along Wiegert's ligament. Iris concavity and midperipheral iris transillumination defects may be seen as well [4]. Although we can not exclude the possibility of pigment liberation from the iris pigment epithelium in our cases, the lack of additional findings of pigment dispersion syndrome and the hypochromic appearance of the iris in these originally dark-brown eyes suggest that the pigment was liberated mostly from the iris stroma. Furthermore, two patients had patchy areas of depigmentation with loss of stromal architecture distinctly separated from healthy iris stroma.

Iris atrophy and depigmentation are diagnostic features of Fuchs' uveitis syndrome. Iris atrophy tends to be stromal, causing hypochromia, and posterior synechiae do not form, similar to our cases. However, Fuchs' uveitis syndrome is unilateral in more than 90% of cases and has a chronic course with inflammatory keratic precipitates and inflammatory cells in the anterior chamber and in the vitreous [5]. Although the trabecular meshwork may become pigmented over time and secondary glaucoma may ensue, acute pigment dispersion and the heavy pigment deposition seen in our cases are not features of this syndrome.

Iris atrophy is a diagnostic feature of viral iridocyclitis that may be caused by HSV, VZV, or CMV [6–10]. Although two of our patients had a history of labial herpes, and patchy depigmentation of the iris in these cases resembled the lesions seen in herpetic iridocyclitis, symmetrical bilateral involvement, lack of intraocular inflammation, and marked pigment dispersion were the differentiating features. Furthermore, transillumination of the atrophic sectors, pupillary distortion, posterior synechiae, and spiraling of the pupil, the typical additional features of viral iridocyclitis, were not seen in our cases. Although we treated three patients with oral acyclovir and topical corticosteroids, we can not exclude the possibility that this condition had a self-limiting course as seen in the first case. Brooks et al. described a series of five patients with acute primary ischemic iris atrophy in 1988 [2]. The condition was unilateral in all of their cases and was characterized by gross atrophy of the iris with transillumination, widely dilated and distorted pupil, anterior uveitis, raised IOP, and almost total nonperfusion of the iris on angiography. Although it was described as a primary condition without any association, one of their patients had had herpetic eye disease since childhood and another had a history of herpes zoster ophthalmicus. The case reports and clinical photographs of the other three cases also imply herpetic iridocyclitis in the absence of keratitis. In a more recent report, Van der Lelij et al. proposed that recurrent unilateral anterior uveitis with iris atrophy and/or elevated IOP without concomitant keratitis was a distinct entity among herpetic eye diseases [10]. They found that it was caused by HSV in 83% and VZV in 13% of their cases that underwent anterior chamber fluid analysis. We could not obtain aqueous humor in four of our cases. We did not find HSV DNA in the patient who consented to aqueous humor tap. A herpetic etiology still could not be ruled out because we did not have access to the analysis of intraocular antibody production. Iris atrophy seen in viral iridocyclitis is thought to arise from direct viral invasion or occlusive vasculitis. Ischemic necrosis of the iris results in full-thickness iris atrophy, distortion of the pupil, and transillumination defects [6, 7]. Although we can not rule out occlusive vasculitis as we could not perform iris angiography, our patients did not have distorted pupils, sphincter or dilator dysfunction, or transillumination defects. Therefore, the condition described here seems to be different from that described by Brooks et al. [2]. Viral trabeculitis can cause an acute elevation of IOP and usually responds quickly to anti-inflammatory therapy [6]. In our patients IOP was not elevated at the onset of the acute episode, and subsequent IOP rise was presumed to be due to clogging of the trabecular meshwork by heavy pigment deposition. A circannual rhythm of ocular HSV has been reported with a peak frequency during the winter months [1, 3]. Clustering of our patients in the summer of 2003 may imply an epidemic, possibly by another virus. Although other ophthalmologists in our region have not reported similar cases, other cases may have gone unnoticed because of the self-limiting and benign course or misdiagnosed because of the unusual findings. The patients described here may represent a new entity or an unusual presentation of herpetic eye disease.

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