

Bilateral acute depigmentation of the iris.

First report on the american continent and 5 years follow up of two patients

Francisco Barraquer MD¹, Luis F. Mejía MD²

INTRODUCTION

Acquired iris hypochromic heterochromia is an unusual finding and necessitates careful study of the patient to rule out serious and treatable entities such as herpetic keratouveitis, Fuchs' heterochromic uveitis and Horner's syndrome, among other.

Bilateral Acute Depigmentation of the Iris Syndrome (BADI) is a poorly known entity, first described by Tugal-Tutkun et al in 2005 (1). To date, 28 patients with this syndrome have been described (2), all Turkish except for one French patient (3), predominantly females in their third decade of life. This is a non-progressive bilateral, asymmetric entity of abrupt onset and short course, producing geographic atrophy of the iris stroma which eventually generates a very characteristic grayish granular appearance, without iris pigment epithelium involvement, compromising mainly the peripheral and superior iris (1-3). There is slow recovery showing partial repigmentation with the passage of years (2). All cases reported to date have been brown irises. There is no association with visual acuity alterations, segmental or diffuse pupillary abnormality, or iris transillumination defects.

To our knowledge, these are the first reported cases of BADI on the American continent, and the first case worldwide with an iris angiography.

MATERIAL AND METHODS

Two asymptomatic patients were diagnosed during a regular ophthalmological exam, prompting us to review our photo archives, where we identified two other patients seen years previously complaining of spontaneous iris color change and on whom we had no diagnosis to date; these two latter patients were called and re-examined.

Laboratory tests on the two most recent patients included erythrocyte sedimentation rate, complete blood count, biochemistry, serum immunoglobulin G

and M antibodies against Herpes Simplex virus I and II, Varicella-Zoster virus, Cytomegalovirus, Epstein Barr virus, and chest x-rays. The two patients retrieved through the photo archive were not studied as they were considered to have a long standing process in resolution. An iris angiography was performed in one of the patients

RESULTS

There were two female (35 and 62 yrs old) and two male (29 and 75 yrs old) patients. The two younger patients had consulted years previously after noticing an otherwise asymptomatic change in their iris color; in the two older patients this was an incidental finding during a routine ophthalmological examination; one of these latter patients recalled having an episode of bilateral red eye during the preceding year.

The iris aspect was surprisingly similar in all four patients: brown color, irregular geographic atrophy of the iris stroma, starting at the iris root with a sharply defined internal (pupillary) border and lesser compromise of the pupillary iris; the compromised iris had a grayish powdery aspect while the non-compromised iris looked absolutely normal (Figures 1- 8); there was a sharp delimitation between the affected and healthy iris, with no pigment liberation to the anterior chamber, corneal endothelium or anterior chamber angle; pupil aspect and functionality were normal, with no distortion or motility alterations, and there were no transillumination defects. Intraocular pressure and corneal sensitivity were normal.

An iris angiography was performed in two patients (Figure 9), showing a normal circulatory timing and pattern, with radially oriented vessels, without pupillary or stromal leakage, and therefore with no signs of ischemia. The only novelty was that the iris vessels were more easily observed at the stromal iris atrophy areas due to a window defect.

Two of our patients were seen regularly for 3 and 5 years, observing a pattern of slow and gradual recovery of the initially involved iris sectors, although they never returned to complete normality (Figures 10 - 13). During this time frame, the initially unaffected area remained exactly the same (there was no enlargement of the initial insult), while the originally affected area slowly lost its gray-

Submitted: 10/09/2012

Accepted: 18/09/2012

¹ Head, Cornea Service Clínica Barraquer, Bogotá, Colombia.

² Head, Cornea Service CES University, Medellín, Colombia.

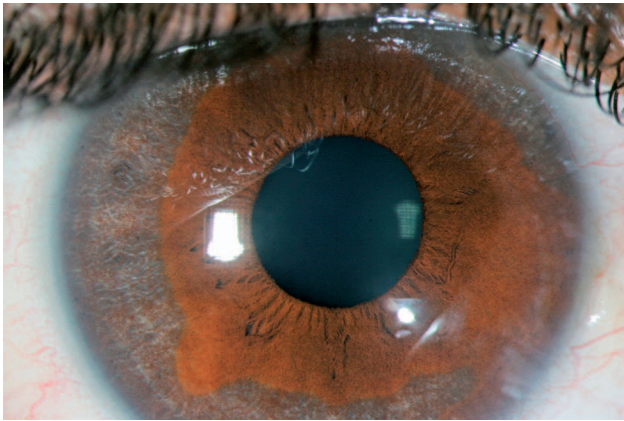


Figure 1. 29 y.o. female. Right Eye Initial presentation (2008). Note the grayish powdery aspect of the asymmetrically compromised iris stroma and the predominant compromise of the ciliary iris where only 2 hrs are spared, while the pupillary iris is intact.

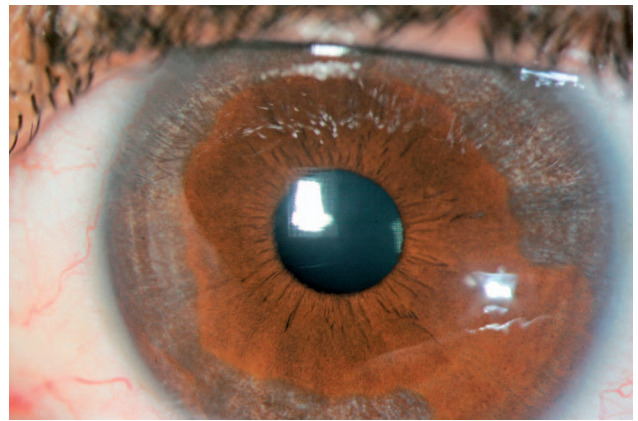


Figure 2. Same patient as Figure 1. Left Eye.

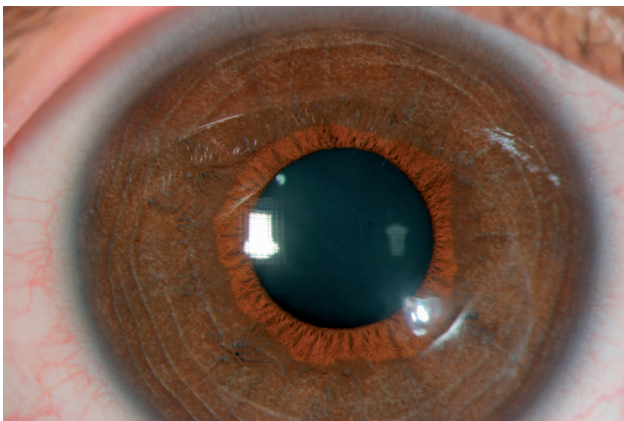


Figure 3. 16 y.o. male. Right eye. Initial presentation (2006). Same grayish powdery aspect of the asymmetrically compromised iris stroma. Note the almost complete compromise of the ciliary iris leaving only a small margin of the pupillary iris intact, more advanced on the right eye.

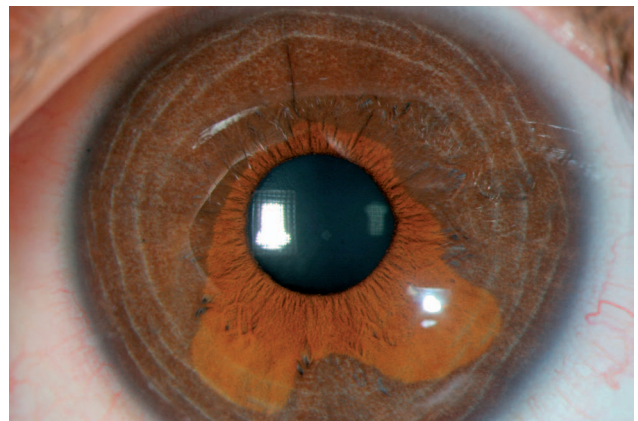


Figure 4. Same patient as Figure 3. Left Eye.

ish powdery aspect, with the iris becoming increasingly thicker and more normal in appearance.

DISCUSSION

BADI syndrome is a recently described entity, with unknown etiology and physiopathology. It predominantly affects women in their third decade with brown irises (1-3). It has a sudden onset, sometimes with red eye but otherwise asymptomatic, with bilateral and asymmetric involvement, slowly regressing without functional sequelae.

Twenty-eight cases have been reported to date worldwide, 27 in Turkey (1, 2) and one in France (3). To our knowledge, ours are the first cases reported on the American continent, and the first to undergo iris angiography worldwide. None of our patients attended our department complaining of red eye: the two younger patients did so complaining of a color change in their irises,

while in the two older patients, the condition was an incidental finding during a first time ophthalmological examination; one of these older patients is the only one with a strictly unilateral presentation, which we believe could be explained by the initial insult having occurred many years ago, during which time it has been slowly recovering until it has become unnoticeable in one eye.

The exclusive involvement of the iris stroma, in a capricious pattern not related to vascular or neurological distribution, the rare involvement of the pupillary iris, the absolute respect for the pupillary form and function and for the iris pigment epithelium, as well as the absence of any other sign of intraocular involvement (keratic precipitates, iris nodules, Tyndall, hypertension, etc.) are worth noting.

An ischemic etiology has been empirically suggested, but only now has an iris angiography been done and reported as completely normal, thereby excluding the ischemic hypothesis. Moreover, for an ischemic basis to be considered, one would expect progressive pupillary deformity and iris segmental atrophy with transillumination defects with the passage of time, which does not

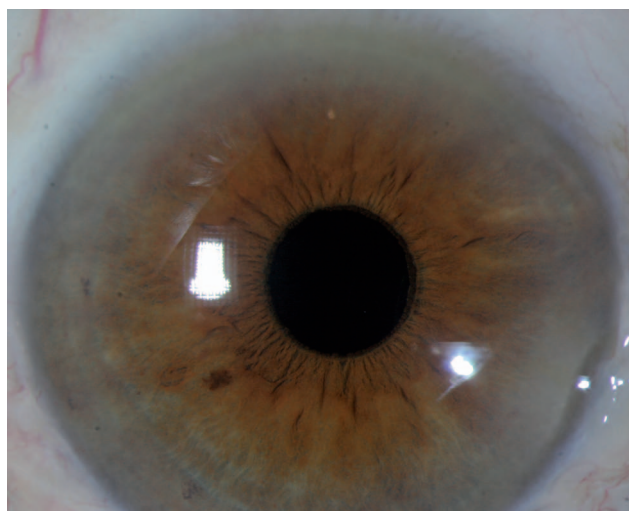


Figure 5. 76 y.o. male. This is the only unilateral case in our series. Right eye is normal.

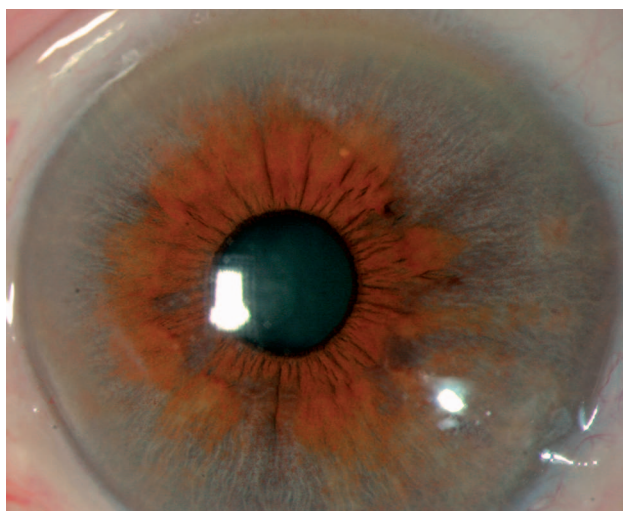


Figure 6. Same patient as in Figure 5. Left Eye. The demarcation between involved and non-involved iris stroma is less well defined, although the compromised stroma maintains the grayish powdery aspect.

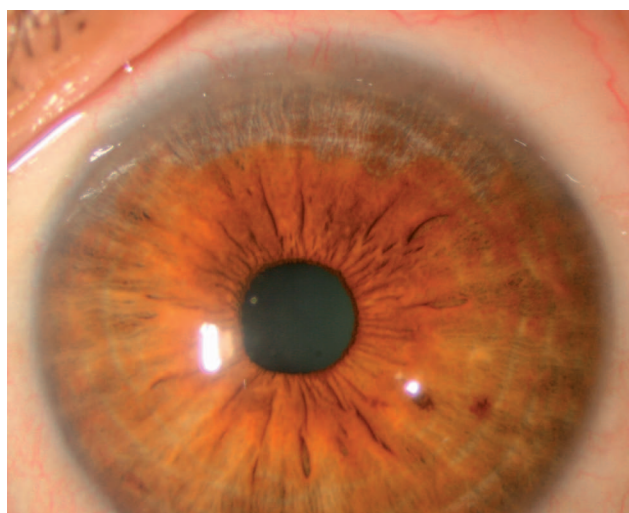


Figure 7. 61 y.o. female. Right Eye. Patient with the least involvement of iris stroma, comprising only the upper periphery. There is a very clear and sharp demarcation between involved and non-involved iris stroma.



Figure 8. Same patient as in Figure 7. Left Eye.

happen. On the contrary, in this report, as well as in a previous one (2), it has been observed that the initial iris stromal defect tends to slowly subside with the passage of time.

The reversibility of the iris pigment alterations suggest that it is not related to an active viral infection or iris inflammation, but could be the end result of some type of neuropathy.

A viral etiology (HSV, VZV) has been suggested, and some authors have empirically prescribed oral acyclovir (2, 3), but this diagnosis has never been confirmed, and it would be very unusual to have simultaneous bilateral intraocular viral involvement (4).

Among the causes of acquired hypochromic heterochromia is Fuchs' heterochromic iridocyclitis (5); however, it is unilateral in over 90% of cases, has characteristic fine PKs, involvement of the iris pigment epithelium, a chronic course over the years, and there is no regression of the hypochromia.

Pigmentary dispersion syndrome (6) has a characteristic bilateral presentation with irreversible iris transillumination defects, pigment deposition on the corneal endothelium and anterior capsule, and has a slowly progressive and irreversible course.

Acute primary ischemic iris atrophy (7) has an acute unilateral presentation with irreversible transillumination defects and pupil distortion, as a consequence of medium-sized iris vessel involvement of unknown etiology.

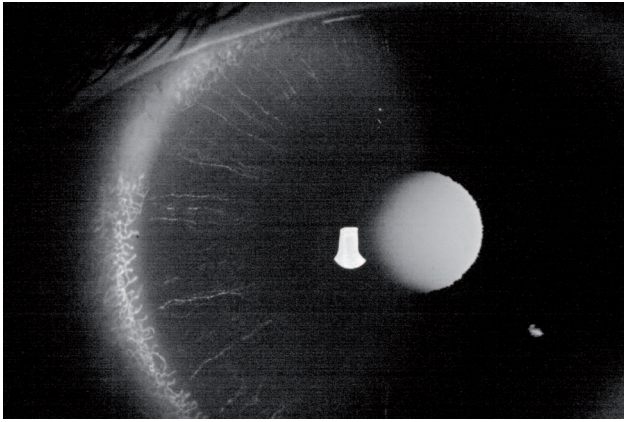


Figure 9. Right eye iris angiography, same patient as in Figure 1. Radially oriented, undisturbed, continent iris vessels, evident where there is stromal iris atrophy due to a window defect effect.

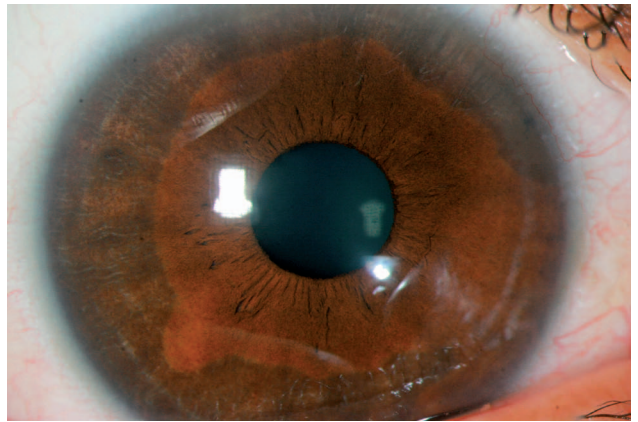


Figure 10. Same patient as Figure 1, 3 yrs after initial presentation. Right eye. There is considerable improvement of the affected iris, but still not complete; the originally involved iris is not grayish but more of a light brown color.

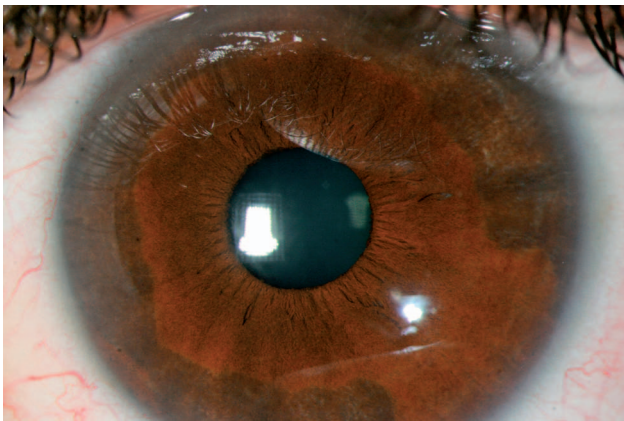


Figure 11. Same patient as in Figure 2, 3 yrs after initial presentation. Left eye.

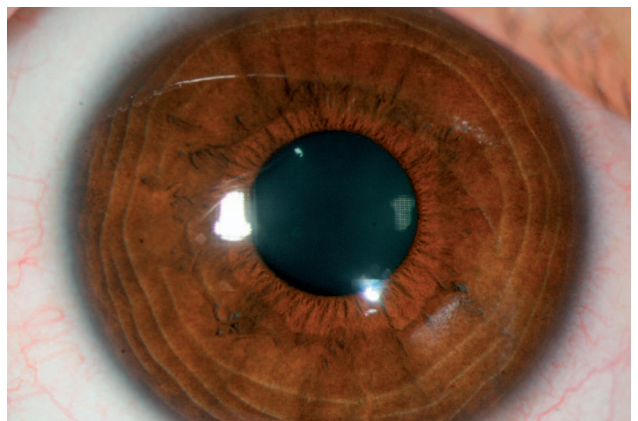


Figure 12. Same patient as in Figure 3, 5 yrs after initial presentation. Right eye. Note how although the difference between the originally involved and healthy iris is still apparent, it is much less so. While the originally involved iris has an almost normal appearance, its contraction sulci are very apparent, and it looks thinner than the uninvolved iris.

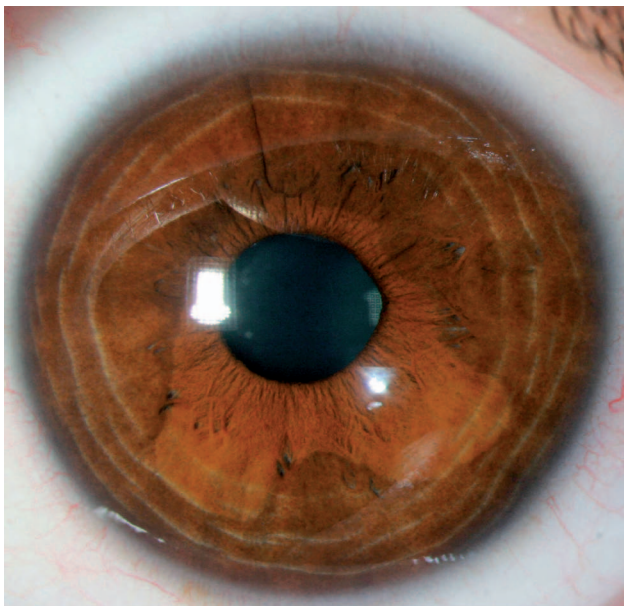


Figure 13. Same patient as in Figure 4, 5 yrs after initial presentation. Left eye.

Ito's Syndrome (Incontinentia Pigmenti Acromians) (8) is a congenital entity comprising irreversible bilateral hypochromic nevi of the iris associated with multiple dermatologic, neurologic and musculoskeletal abnormalities.

Vogt Koyanagi-Harada syndrome (9) causes iris hypochromia, but is progressive, irreversible and frequently accompanied by iris transillumination defects, pupil seclusion, chronic intraocular inflammation and choroidal involvement, among other signs.

Alterations in the sympathetic stimulation to the melanocytes of the superficial iris stroma can lead to ipsilateral hypochromia, a well known finding in Horner's Syndrome, both congenital and acquired (10). However this is strictly unilateral, and accompanied by miosis, ptosis and anhidrosis, among other signs.

Finally, iris infiltration by metastatic non-pigmented tumors can produce asymmetrical bilateral hypochromia

(11), but upon slit lamp examination the increase in the thickness of the iris involved is evident, and systemic workup will reveal the primary tumor location.

In conclusion, BADI syndrome is an entity whose etiology and physiopathology is still unknown seven years after being reported for the first time. We know it is a bilateral, asymmetric, non-ischemic, spontaneously reversible entity with no apparent ophthalmological sequelae.

Among the proposed physiopathological mechanisms, the neuropathic one seems more likely than infectious, inflammatory or ischemic mechanisms, as no evidence of microorganism involvement has been identified by PCR or other methods, there is no concomitant intraocular inflammation and the iris angiography is normal.

REFERENCES

1. Tugal-Tutkun I, Urgancioglu M. Bilateral acute depigmentation of the iris. *Graefes Arch Clin Exp Ophthalmol* 2006;244: 742–746
2. Tugal-Tutkun I, et al. Bilateral Acute Depigmentation of the Iris: Report of 26 New Cases and Four-year Follow-up of Two Patients. *Ophthalmology* 2009;116:1552–1557
3. Portmann A, Gueudry J, Siahmed K, Muraine M. Le syndrome de depigmentation bilaterale aigue de l'Iris. *J Fr Ophtalmol* 2011;34: 309-312
4. Wilhelmus KR, Falcon MG, Jones BR. Bilateral herpetic keratitis. *Br J Ophthalmol* 1981;65: 385-387
5. Jones NP. Fuch's heterochromic uveitis: an update. *Surv Ophthalmol* 1993;37: 253-272
6. Siddiqui Y, Ten Hulzen RD, Cameron JD, Hodge DO, Johnson DH. What is the risk of developing pigmentary glaucoma from pigment dispersion syndrome? *Am J Ophthalmol* 2003;135: 794-799
7. Brooks AM, West MW, Gillies WE. Acute primary ischemic iris atrophy. *Ophthalmology* 1988;95: 1234-1243
8. Fleury P, Dingemans K, de Groot WP, Oranje AP, Voûte PA, Woerdeman MJ, Delleman JW, Oorthuys JW, Verboom AJ. Ito's hypomelanosis (incontinentia pigmenti achromians). *Clin Neurol Neurosurg.* 1986;88: 39-44.
9. Da Silva F, Damico F, Marin ML, Goldberg AC, Hirata CE, Takiuti PH, Olivalves E, Yamamoto JH. Revised Diagnostic Criteria for Vogt-Koyanagi-Harada Disease: Considerations on the Different Disease Categories. *Am J Ophthalmol* 2009;147: 339-345.
10. Diesenhause MC, Palay DA, Newman NJ, To K, Albert DM. Acquired heterochromia with Horner syndrome in two adults. *Ophthalmology* 1992;99: 1815-1817
11. Brodsky MC, Casteel H, Barber LD, Kletzl M, Roloson G. Bilateral Iris Tumors in an Immunosuppressed Child. *Surv Ophthalmol* 1991;36: 217-222.

First author:

Francisco Barraquer, MD

*Head, Cornea Service Clínica Barraquer
Bogotá, Colombia*