Severe pigment dispersion after iris-claw phakic intraocular lens implantation

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A 23-year-old female patient presented 3 months after the implantation of an Artisan® phakic intraocular lens with a severe depigmentation of the iris and peripheral anterior synechiae. Explantation of the intraocular lens and goniosynechialysis were performed. Eleven months after the explantation appearance of the iris significantly improved. There was no loss of lines of corrected distance visual acuity. Severe pigment dispersion after the implantation of an Artisan® phakic intraocular lens may happen and may require explantation of the lens. Iris depigmentation may improve with time.

Key words: Case reports, iris, phakic intraocular lenses, phakic intraocular lens adverse effects, pigment epithelium of the eye

Pigment dispersion may occur following iris-claw phakic intraocular lenses (pIOLs).[1-8] Herein, we report a case of

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a unilateral severe pigment dispersion associated with an Artisan® pIOL (Ophtec, Groningen, The Netherlands).

Case Report

A 23-year-old female patient consulted seeking for refractive surgery. Manifest refraction was −11.50 −2.50 × 5° in the right eye (OD) and −11.15 −2.00 × 175° in the left eye (OS). Corrected distance visual acuity (CDVA) was 20/30 in both eyes. OD endothelial cell count (SP-3000p, TOPCON, Tokyo, Japan) was 3250 cells/mm^2, anterior chamber depth (ACD), measured from the endothelium to the crystalline lens (OCT VISANTE, ZEISS, Jenna, Germany) was 3.00 mm, and crystalline lens rise (CRL) was 380 µm.[5,8] OS results were endothelial cell count 3299 cells/mm^2, ACD 2.97 mm, and CRL 260 µm. No signs of pigment dispersion were found in either eye. Since she had an ACD deeper than 2.9 mm and healthy corneal endothelium, she was considered a good candidate for iris-claw phakic pIOL, which is the type of pIOL used in our institution. It was explained to the patient that residual astigmatism could persist after the surgery. The patient underwent iris-claw pIOL (Artisan®) in November 2015 in both eyes. Superior iridectomies were performed in both eyes.

On the 1st postoperative day, un-CDVA (UCDVA) and CDVA were 20/30 in OD, with a refraction of −0.25 −0.50x 40°. OS had a UCDVA of 20/40, a refraction of +0.25 −2.25 × 160°, and a CDVA of 20/30. pIOLs were well positioned in both eyes.

One week after the surgery UCDVA was 20/25 and 20/40 in OD and OS, respectively. OS improved with a correction of Plano −2.00 × 155° to 20/25. The corneas were transparent, there were no signs of intraocular inflammation, pIOLs were stable in good position, and IOP measurements were normal. She then returned to her hometown in a neighboring country.

Three months later, the patient consulted referring noting a change in the color in her OD. She reported that a few days before she had experienced redness and pain. She had been already seen by an ophthalmologist in her country that prescribed timolol 0.5%. At the moment of examination in our institution, she was already asymptomatic. UCDVA was 20/20 and 20/30 in her OD and OS, respectively. At slit-lamp examination in OD, a conspicuous depigmentation of the peripheral iris was found [Fig. 1a]. pIOL was in correct position and well fixated to the iris. Examination of OS revealed iris-claw pIOL and only minimal pigment deposits in the optic [Fig. 1b]. IOP was 15 and 16 mmHg. Gonioscopy showed discontinuous peripheral anterior synechiae (PAS) in all quadrants (>180°) in OD and open angle without PAS in 360° in OS. Endothelial count was 3 309 cells/mm^2 in OD and 3 056 cells/mm^2 in OS. A diagnosis of severe pigment dispersion was done. Explantation of the pIOL and goniosynechialysis were performed in the OD.

First day postoperatively, the cornea was transparent and there were no signs of significant intraocular inflammation. The 2nd day, the eye was quiet, and intraocular pressure was 9 mmHg. She then traveled to her country the next day [Fig. 2a].

Three months later, refraction in OD was −12.00 −1.00 × 75° reaching a CDVA of 20/30. The eye was quiet and the areas of iris depigmentation were less noticeable.

Eleven months after the explantation of the pIOL in OD, refraction was −12.25 −0.50 × 0° reaching a CDVA of 20/30. OD endothelial cell count was 3 179 cells/mm^2. The patient chose to wear a contact lens in OD and not to explant the pIOL in OS. The appearance of the iris significantly improved [Fig. 2b]. In OS, UCDVA was 20/30 and with a refraction of −0.75 −0.25 × 0° reached 20/20. pIOL was in good position, and there were no signs of pigment dispersion. Unfortunately, explanted lens was not sent to the company for a detailed examination of any physical flaws, such as rough surface/tight claw or insufficient vaulting.

Discussion

Pigment dispersion has been reported as a complication of Artisan™ pIOL, mainly in hyperopic eyes.[1-8] It has been hypothesized that the cause of this could be ocular movements that in turn produce friction between the lens and iris.[5,8] Baikoff *et al*. introduced the term CLR, defined as the distance between the anterior pole of the lens and the line that connects the 3 clock hours and the 9 clock hours of the recess angle.[5,8] The larger the CLR, the greater the pressure exerted on the iris due to the "sandwich effect" between the crystalline lens and the pIOL. In their studies, Baikoff *et al*. considered a cutoff of 600 µm of CLR in patients with Artisan™ pIOL and concluded that higher values could present a greater risk of

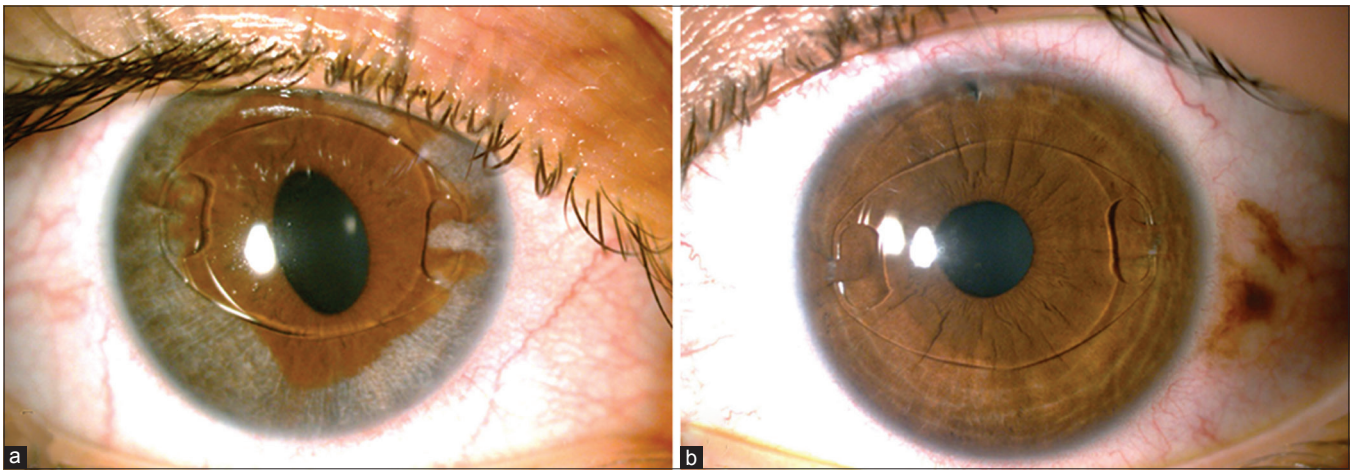

Figure 1: (a) Right eye with the Artisan® phakic intraocular lenses *in situ* and a very severe pigment dispersion, 3 months after the implantation. (b) Left eye had only minimal pigment on the phakic intraocular lens optic

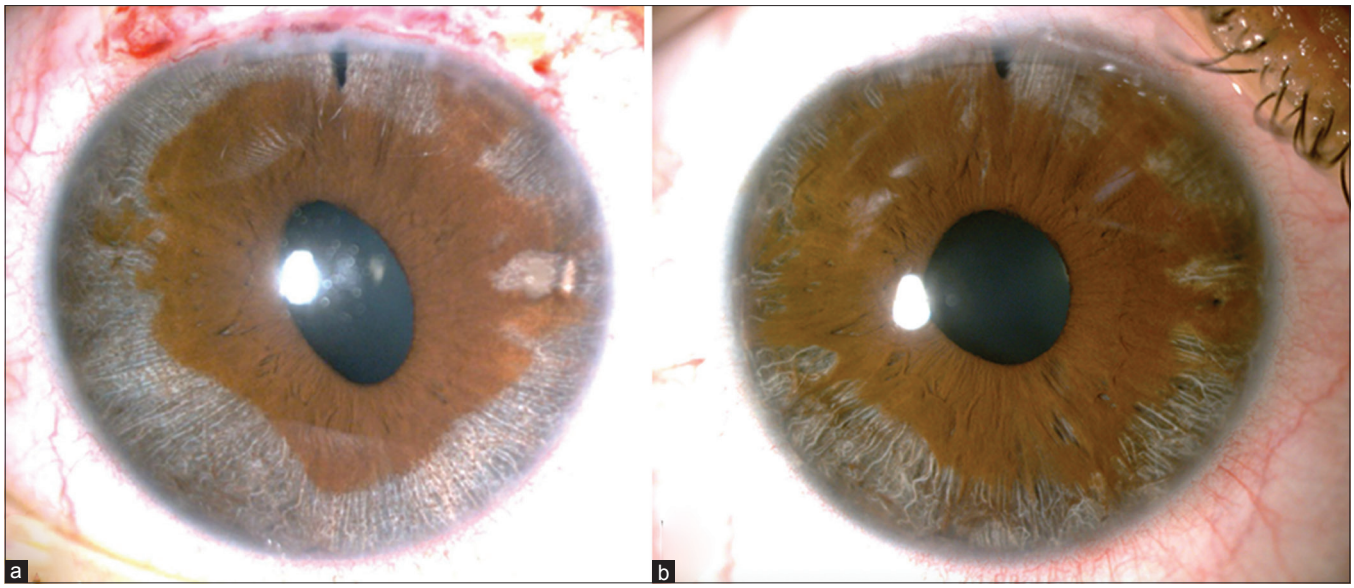

Figure 2: (a) Right eye 1st day after phakic intraocular lens explantation. (b) Eleven months later, the iris depigmentation significantly improved

dispersion. In our patient, the OD had a higher CLR before pIOL implantation (OD: 380 μm and OS: 260 μm), but neither of the two eyes surpassed the value of 600 μm preoperatively.

In one previously published case, secondary glaucoma presented after pigment dispersion in a myopic eye with an iris-claw pIOL.[2] When a significant dispersion of pigment occurs, the only option is to remove the lens. Fortunately, in our case, results were good. The eye did not lose lines of vision and final loss of endothelial density was only 2.2%.

Compared with the other reported cases, our patient showed the worst changes in the iris stroma (possibly related to the light brown color of her iris). However, iris appearance improved significantly 11 months after the explantation.

The Artisan™ lens has been a very good option, and patients with myopia are largely satisfied after the lens implant;[1,4] however, it is very important for surgeons to keep it in mind and warn patients that complications, such as pigment dispersion, can occur and may lead to the need to explant the lens.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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