Asymptomatic haptic migration of phakic anterior chamber intraocular lens through the peripheral iridectomy

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ABSTRACT • RÉSUMÉ

Objective: Case series of haptic migration in patients with angle-supported phakic anterior chamber intraocular lens (PAC-IOL: Phakic6H) through the superior peripheral iridectomy (PI).

Methods: Charts of 23 patients (35 eyes) with at least 6 months' postoperative follow-up were retrospectively reviewed. Evaluation included preoperative and postoperative cycloplegic and manifest refractions, uncorrected visual acuity (UCVA), best-corrected visual acuity (BCVA), slit-lamp examination, fundoscopy, corneal topography, and biometry.

Results: Mean UCVA was 1.67 ± 0.30 (1.17–2.00) for all 35 eyes preoperatively and 0.35 ± 0.25 (0.00–1.00) postoperatively ($p < 0.001$; 95% CI 1.21–1.44). BCVA had a mean of 0.31 ± 0.26 for all 35 eyes preoperatively, and a mean of 0.22 ± 0.25 postoperatively ($p < 0.001$; 95% CI 0.04–0.14). Haptic migration into the superior PI was noted in 8 eyes (23%). The first migration was noted 2 years postoperatively and the last 8 years after implantation (mean, 5.6 ± 2 years). There was no statistically significant difference in the BCVA and UCVA before and after haptic migration. Follow-up ranged from 8 months to 8.5 years.

Conclusions: Angle-supported PAC-IOL implantation resulted in significant improvement in both UCVA and BCVA. However, there is a 23% incidence of haptic migration in our series with no sequelae on BCVA or harmful effect on the intraocular structures. This IOL movement may be explained by changes in aqueous dynamics at the level of the PI leading to migration of the haptic into the area of least resistance.

Objectif : Étudier des cas de migration de l'haptique dans le site de l'iridectomie périphérique (IP) supérieure après l'implantation de lentilles intraoculaires phaques (LIOP) à support angulaire dans la chambre antérieure (Phakic 6H®).

Méthodes : On a examiné rétrospectivement les dossiers de 23 patients (35 yeux) ayant fait l'objet d'au moins 6 mois de suivi postopératoire. Éléments évalués: réfraction sous cyclоplégie et réfraction manifeste préopératoires et postopératoires, acuité visuelle non corrigée (AVNC), meilleure acuité visuelle corrigée (MAVC), examen à la lampe à fente, fondoscopie, topographie cornéenne et biométrie.

Résultats : L'AVNC moyenne était de 1,67 ±0,30 (1,17-2,00) avant l'intervention et de 0,35 ±0,25 (0,00-1,00) après l'intervention (P <0,001; IC 95 %, 1,21-1,44). La MAVC moyenne était de 0,31 ± 0,26 avant l'intervention et de 0,22 ± 0,25 après l'intervention (P <0,001; IC 95 %, 0,04-0,14). Il y a eu migration de l'haptique dans le site de l'IP supérieure pour 8 yeux (23 %). La première migration a été notée 2 ans après l'intervention et la dernière, 8 ans après l'implantation (moyenne de 5,6 ± 2 ans). Il n'y avait pas d'écart statistiquement significatif entre les MAVC et les AVNC avant et après la migration de l'haptique. La durée du suivi allait de 8 mois à 8,5 ans.

Conclusions : L'implantation de LIOP à support angulaire dans la chambre antérieure a donné lieu à une amélioration significative de l'AVNC et de la MAVC. Cependant, il y a eu parmi les cas étudiés une incidence de 23 % de migration de l'haptique, sans séquelles pour la MAVC ni effet nocif sur les structures intraoculaires. Le déplacement des LIO pourrait découler de variations de la dynamique aqueuse au niveau de l'IP, entraînant une migration de l'haptique vers l'endroit où la résistance est la moindre.

Since their introduction into the refractive armamentarium, phakic intraocular lens (IOL) have carried the potential of correcting high refractive errors for patients not suitable for laser refractive surgery. The introduction of the phakic anterior chamber IOL (PAC-IOL) in the 1950s by Strampelli and Barraquer offered a broader range of treatable ametropia, fast visual recovery, more stable refraction, and better visual quality.[1,2] The surgery, however, had setbacks that led to abandonment of the procedure because of the higher rate of intraocular complications.[3–9] Reported complications included angle fibrosis, corneal endothelial decompensation,[10,11] and pupillary ovalization.[12,13] It was not until the 1980s that Fechner and Baikoff reintroduced phakic IOLs as well as new sites for their implantation.[5,7]

Currently, there are 3 recognized types of phakic IOLs, classified according to the site of implantation: anterior chamber angle fixated, anterior chamber iris fixated, and posterior chamber (PC) IOL.[3] Iris fixated IOLs were introduced in the 1980s based on Jan Worst's iris claw design.[3,14] These IOLs had the advantage of optimal distance from the crystalline lens, almost no compromise of corneal endothelium, no contact with angle structures, optimal lens centration, no compromise in iris vascular integrity, and no pupil ovalization. PC-IOLs received great interest since their introduction by Fyodorov in 1986.[3,15] They offered the advantage of being placed far from the anterior chamber structures and were only visible by slit-lamp examination. First-generation PC-IOLs had a high incidence of anterior chamber inflammation and cataract

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Table 1—UCVA and BCVA visual acuity in eyes pre– and post–anterior chamber implantation of the Phakic6H IOL (N = 35)

Visual Acuity	Pre-Op*	Post-Op*	*p*
Mean UCVA	1.670 ± 0.311 (1.17–2.00)	0.346 ± 0.250 (0.00–1.00)	<0.001
Mean BCVA	0.309 ± 0.255 (0.00–1.17)	0.217 ± 0.246 (0.00–1.17)	<0.001

UCVA, uncorrected visual acuity; BCVA, best-corrected visual acuity; IOL, intraocular lens.
*Data are shown as mean ± SD (range).

formation. Later generations with improvements in material and design were approved.[3,15] After abandoning their usage in the 1950s, angle-supported PAC-IOLs were reintroduced in 1980. Since then, various modifications have been introduced by manufacturers to reduce the rate of complications as well as the restricted patient selection.

In our article, we report a series of haptic migration of angle-supported PAC-IOL through the peripheral iridectomy (PI), with the possible inducing factors and outcomes of this phenomenon in patients implanted with the Phakic6H (Ophthalmic Innovation International, Inc, Ontario, Calif., USA) IOL. To our knowledge, this is the first reported case series describing this particular finding.

Methods

We retrospectively evaluated 32 patients in whom an angle-supported PAC-IOL (Phakic6H) was implanted between October 2003 and April 2008.

Patient selection criteria for the procedure included a stable refractive error for more than 6 months, an anterior chamber depth greater than 3.0 mm, an endothelial cell count greater than 2500 cells/mm^2, contact lens intolerance, best-corrected visual acuity (BCVA) of 1.20 logMAR or better, no evidence of cataract formation, and a corneal thickness not suitable for laser refractive surgery. The risks and benefits of the procedure were explained to the patients.

Preoperative evaluation included uncorrected visual acuity (UCVA) and BCVA in logMAR, manifest and cycloplegic refraction, slit-lamp examination, dilated fundus examination, and tonometry. Additional tests included specular microscopy and A-scan (Tomey Corporation, Noritakes-shinmachi, Nagoya, Japan) for anterior chamber depth.

Data entry and statistical analysis were performed using SPSS 22.0 for Windows (SPSS Inc, Chicago, Ill., USA). Paired-samples *t* tests were performed to compare means between 2 groups. Significance was defined as $p \leq 0.05$. Data are shown as mean ± standard deviation (range) unless otherwise stated.

All surgical procedures were performed by the same surgeon (E.L.W.) under general anaesthesia. The eye and surrounding surgical field were prepared in the standard manner for intraocular procedures. A paracentesis site was created 90 degrees from the incision site, and viscoelastic was injected. A 6.25-mm superior corneal incision was created, followed by a surgical iridectomy superiorly. The nonfoldable Phakic 6H lens was introduced into the anterior chamber and implanted at 6–12 o'clock orientation, with careful attention to proximity to the crystalline lens, iris, and endothelium.

The wound was sutured with 10-0 nylon after verification of an open angle, and sutures were buried. Antibiotic ointment was applied, and the eye was patched.

Patients were examined the next day, the patch was removed, and patients were started on ofloxacin 3 mg/mL, prednisolone acetate 10 mg/mL, and fucidic acid 1% ointment, until the next visit after 1 week. Fucidic acid 1% ointment was stopped, and ofloxacin and prednisolone acetate were tapered over a 1-month period.

Results

Forty-six eyes of 32 patients were initially included in the study. Eleven eyes of 9 patients were lost to follow-up (minimum 6 months) and were excluded from the analysis. A total of 35 eyes (18 right and 17 left) of 23 patients were included in the final data analysis. Of the 23 patients, 14 (60.9%) were males and 9 (39.1%) were females ranging in age from 18 to 41 years (mean 29.4 ± 7.76 years).

The power of PAC-IOL used ranged from −18.5 D to + 9.5 D. Postoperative intraocular pressure (IOP) was measured at a mean of 13.37 ± 1.716 mm Hg (10–17 mm Hg). UCVA had a mean of 1.67 ± 0.30 (1.17–2.00) for all 35 eyes preoperatively and 0.35 ± 0.25 (0.00–1.00) postoperatively ($p < 0.001$; 95% CI 1.21–1.44). Similarly, BCVA had a mean of 0.31 ± 0.255 (0.00–1.17) for

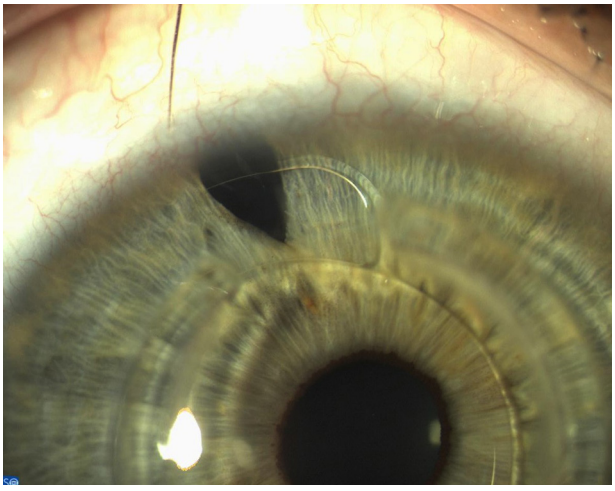

Fig. 1—Haptic migration through the superior peripheral iridectomy.

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