Conclusions

Simultaneous bilateral correction of post-traumatic aniridia using AI implants appears to be a promising and safe technique. It can provide not only a good clinical resolution of subjective symptoms but also a good aesthetic outcome.

Disclosure(s): The authors have no proprietary or commercial interest in any materials discussed in this article.

Appendix A

Supplementary data

This article includes online-only material. Video 1 can be found on the CJO web site at http://pubs.nrc-cnrc.gc.ca/cjo/cjo.html. It is linked to this article in the online contents of the http://dx.doi.org/10.1016/j.jcjo.2017.06.015

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Management of positive dysphotopsia in a patient with prior refractive surgery

Dysphotopsias are bothersome visual phenomena experienced by patients after cataract surgery (CS). Positive dysphotopsias (PD) appear as light-related artefacts in various forms, whereas negative dysphotopsias are usually a temporal darkness or shadow in the visual field.[1]

PD has been observed after both CS and laser refractive surgery (LRS).[2] The incidence may be as high as 49% immediately after CS.[3] Photic phenomena also cause frustration after LRS.[4] For the patient population with a history of both LRS and CS, diagnosis and management of PD may be especially challenging. We present a case of a patient with a history of LRS who, despite good objective visual acuity, experienced debilitating PD and was treated with placement of a secondary zero-power intraocular lens (IOL) in the ciliary sulcus.

Case Presentation

A 63-year-old female underwent CS in her right eye for a visually significant cataract with a refractive target for distance vision. She had undergone photorefractive keratectomy (PRK) 13 years earlier for myopia. Her medical records before and after LRS were obtained, including corneal measurements. IOL calculations were performed using several formulas for patients with prior myopic LRS.

In January 2016, she underwent uncomplicated phacoemulsification and IOL implantation (AMO ZCB00 21.5 diopter; Abbott Medical Optics, Santa Ana, Calif.) in the right eye. Best spectacle-corrected visual acuity (BSCVA) at day 1 and week 1 was 20/20-2 OD. Manifest refraction was −0.50 sphere at this time, and she denied any PD during these visits.

At 1-month follow-up, she reported flickering lights and streaks in her peripheral vision, most prominent in her temporal visual field; these were worse in bright light conditions and would remit upon closing her eyes. Uncorrected distance visual acuity was 20/25. Slit-lamp examination (SLE), including dilated fundus examination, showed a well-centred IOL and was otherwise unremarkable. She was provided education and reassurance regarding her PD and scheduled for follow-up in 3 months. However, 2 months later, she reported that her PD symptoms had worsened. BSCVA, with manifest refraction −0.25 sphere, was 20/20-2 OD. SLE was unchanged

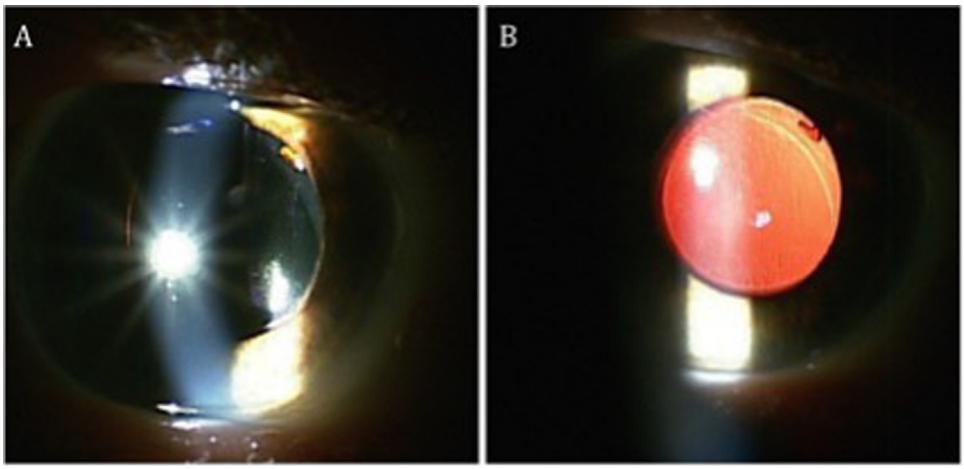

Fig. 1—Slit-lamp biomicroscopy. (A) A postoperative slit-lamp photograph of the anterior segment shows a centred single-piece posterior chamber intraocular lens (PCIOL) as well as a centred 3-piece sulcus IOL (one haptic visible). (B) The same postoperative slit-lamp photograph demonstrating the red reflex and highlighting the centred PCIOL and sulcus IOL. The image has been cropped to remove excess surroundings but is otherwise unaltered.

from prior examinations. Given her worsening PD, she was counseled about several treatment options, including continued observation, IOL rotation with horizontal orientation of haptics, placement of a nonacrylic non–square-edged sulcus IOL, or IOL exchange.

Three months after the initial CS, the patient underwent a secondary procedure in which a 3-piece silicone IOL (Staar AQ5010V 0.0 diopter; Staar, Monrovia, Calif.) was placed in the sulcus. Postoperatively, BSCVA was 20/20, and she reported that her PD had resolved. SLE confirmed a well-centred posterior chamber IOL in the capsular bag with a 3-piece IOL centred in the sulcus space without pseudophacodonesis (Fig. 1). She reported no further PD through her 6-month follow up visits. The final manifest refraction was −0.25 sphere, yielding BSCVA of 20/20.

Discussion

PD remains a significant source of dissatisfaction for pseudophakic patients. Although the majority of cases resolve spontaneously within 1 year after CS, a subset of patients experience severe and persistent PD that interferes with their visual activities of daily living.

It is believed that PD is related to IOL design, with material, optic diameter, and edge design often implicated as causative factors individually and collectively.[1,3] Our patient received a 6.0-mm square-edged acrylic IOL that likely contributed to her pseudophakic PD. Acrylic IOLs, especially those with square edges, have been associated with an increased risk for PD, likely because of the increased light reflections and refractions at the optic edge when compared with round-edged lenses.[5] In addition, IOLs with optics smaller than 6.0 mm have been associated with higher rates of PD, which is theorized to be attributable to the increased likelihood for the edge of a smaller-diameter lens to be within view.[3]

Given the transient nature of most PD, conservative measures are generally the first step of management. These measures include an observation period of education and reassurance; correcting any refractive error with glasses and/or contact lenses; and treatment of co-existing ocular surface disease, posterior capsular opacification, large pupil size, or IOL decentration.[2]

To our knowledge, the literature on treatment options for PD is scarce, although the topic has been discussed at congresses. A few studies have demonstrated the efficacy of IOL exchange.[1,2,6] More literature is available on the management of negative dysphotopsias (ND), and these options may theoretically have a role in treating PD.[7–9] One study bridges both PD and ND: The author reports piggybacking a sulcus IOL for 7 patients with severe ND, 2 of whom also had concurrent PD. Six patients experienced resolution of their symptoms. However, none had a history of LRS.[10]

The importance of these varied surgical options lies in the greater risk profile of IOL exchange, such as capsule rupture, retinal tears, cystoid macular edema, and cyclodialysis.[11] We also elected to avoid interventions such as YAG laser capsulotomy treatment to the anterior nasal capsule, given the associated risks and the paucity of evidence of efficacy in treating PD. Instead we inserted a zero-power 3-piece silicone IOL in the sulcus; this offered a less invasive option that also maintained the refractive efficacy of the original IOL.[12] We believe that this procedure improved the patient's PD symptoms because the rounded edge of the silicone optic masked the aberrant reflections and refractions occurring at the square edge of the acrylic IOL. This procedure is associated with its own share of risks, including pupillary block, pigmentary glaucoma, cystoid macular edema, IOL decentration, and uveitis-glaucoma-hyphema syndrome. However, an IOL with a round and narrow edge that has adequate angulation between the optic and haptics may help minimize these complications.[13,14] For our patient, we selected the Staar AQ5010V IOL for its narrow edge,

larger optic (6.3 mm vs 6.0 mm), and silicone material, which we believed would best correct PD, maintain refractive integrity, and minimize potential complications.

A further complexity in our case is that our patient had PD in the context of previous LRS. This affected our management strategy because she had a successful objective refractive outcome that may have been altered with IOL exchange. Instead, the zero-power sulcus IOL maintained her objective visual acuity while resolving her PD. We also note that if there had been significant refractive error, a piggyback IOL of nonzero power could have been used to achieve a desired refractive outcome.[14]

After a comprehensive literature review, we found one other case report using this procedure for the treatment of pure PD.[15] However, our case remains unique in 2 respects. First, the aforementioned case report is of a patient with an acrylic IOL of a different manufacturer more commonly associated with PD than the IOL used in our patient.[8] Second, our patient had prior PRK, which poses the additional risk of an unpredictable postoperative visual acuity and subjective photic symptoms. As seen in this case report, sulcus placement of a zero-power, rounded-edge silicone IOL effectively resolved the patient's PD, maintained her visual acuity, and avoided the trauma and/or lack of efficacy inherent in other surgical options. Thus, we postulate that this surgical option may be considered for patients experiencing PD, especially in the context of previous refractive surgery.

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Transscleral fixation of a toric intraocular lens by a slipable suture technique

In keratoplasty, astigmatic correction is crucial for achieving a favourable visual outcome. Several procedures have been introduced for astigmatic correction, including astigmatic keratotomy,[1] wedge resection,[2] and excimer laser refractive surgery.[3] Each of these procedures have limitations, including unpredictable refractive outcomes, technical difficulty, expenses, and potential complications.[4]

The toric intraocular lens (TIOL) provides a surgical option for postkeratoplasty astigmatism. The development of a foldable TIOL that can be inserted through a small incision reduces the unpredictability of surgically induced astigmatism in sequential surgery after keratoplasty.[4–6] After combined cataract extraction and keratoplasty, the incompleteness of the can-opener capsulotomy or anteroposterior capsular adhesion precludes insertion of an IOL in the bag. Two cases of transscleral fixation of a TIOL for postkeratoplasty astigmatism have been