Glaucoma monitoring in patients with a 'pseudophakic cataract'

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Abstract

Purpose To assess potential problems in monitoring glaucoma status in pseudophakic patients in whom the intraocular lens (IOL) has undergone varying degrees of opacification.

Methods Data was collected by retrospective review of the notes of such patients, who had received a hydrophilic acrylic IOL, SC-60B-0UV, after primary cataract extraction by phacoemulsification. At first, among these, patients with glaucoma were identified and notes were reviewed to identify problems with patients in whom the IOL had undergone varying degrees of opacification.

Results A total of 32 eyes with glaucoma were identified to have received the SC-60B-0UV IOL. Of these, 13 IOLs (40.6%) had undergone varying degrees of opacification. Eyes with the opacified IOLs showed decreased visual acuity (2.5 lines of Snellen acuity on average). For these eyes, visual field performance (as determined on automated field analyzers) and optic disc assessments were adversely affected giving a false impression of advanced glaucomatous field loss.

Conclusion In our experience, glaucoma monitoring is made comparatively more difficult in pseudophakic patients with cloudy IOLs. Problems are encountered during assessment of the glaucomatous optic disc due to poor view of the optic disc. On standard static automated visual fields, these opacified IOLs produce artefactual visual field defects making monitoring glaucoma and subsequent management more difficult.

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Keywords: intraocular lens; opacification; disc assessment; glaucoma; IOL exchange

Introduction

In recent years, the problem of a so-called 'pseudophakic cataract' has been coming to attention of ophthalmologists all over the world.¹ The authors apply the term to the condition in which varying degrees of opacification of intraocular lenses (IOLs) occurs postimplantation. One of these lenses is SC-60B-0UV lens (MDR incorporated, FL, USA). According to MDR, the lens manufacturing company, 56 cases of significant IOL opacification had been reported out of 75 000 implanted IOLs worldwide by May 2001.²

We describe the problems we faced in dealing with pseudophakic glaucoma patients, with varying degrees of opacification in the SC-60B-0UV hydrophilic intraocular lens, 3–4 years postoperatively (Figure 1).

Methods

Data was collected by retrospective review of notes of such patients who had received the SC-60B-0UV IOLs after primary cataract extraction by phacoemulsification (after ethical committee approval). Visual acuity, posterior capsular opacification, glaucoma status, optic discs assessment, and opacification of the IOL was monitored and recorded at various visits. Glaucomatous eyes, which had undergone IOL exchange, were also reviewed. Clinical assessment had included optic discs assessment with a Haaig–Streit slit-lamp biomicroscope and 90-dioptre or Superfield lens. In most cases, pupils were dilated. Preoperative, postoperative, and postopacification visual fields (24-2 Full threshold/ Fastpac & SITA-fast /Humphrey automated perimeter) were reviewed.

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Figure 1 Pictures of varying degrees of opacification of the SC-60B-0UV lens 'in the bag' (photographs by Dr Usman Saeed, courtesy medical illustration department, East Kent Hospitals NHS trust).

Results

In all, 165 patients and 181 eyes were identified as having received the SC60B-0UV IOL after primary cataract extraction by phacoemulsification. A patient record retrieval rate of 90.4% was achieved. Among these patients, the percentage of IOL opacification was 31%, 4-years postimplantation (56 instances of IOL opacification out of a total of 181 eyes were recorded). Eyes with glaucoma were observed to have a higher rate (40.6%) of intralenticular opacification 4 years postoperatively (13/32). The average age of these 13 patients was 84.8 years with eight females and five males.

On average, the visual acuity of these glaucomatous eyes with a cloudy IOL dropped 2.5 lines of the Snellen chart per patient.

The visual fields of these patients showed apparent progression of visual field loss, on the greyscale plot. However, total deviations and pattern deviations of the visual fields showed this to be false apparent progression of the visual field loss in at least 30% of patients (refer Table 1). Visual fields were not available in three patients because they could not cope with visual field testing with a Humphrey field analyzer.

Considerable problems with visualization of the disc were encountered with 8/13 eyes, in eyes with an opacified IOL. Both junior and senior ophthalmologists had considerable difficulty in disc assessment. In six instances the cup–disc ratio was not assessable.

Eyes that had lost more than three lines on the Snellen acuity chart, with variable degrees of opacification in the

IOL, presented a significant challenge in assessment of the optic disc (Table 1). Eyes with a relatively easier assessment were of the patients who had either stayed at the same level of visual acuity or dropped 1–2 lines on the Snellen chart. In the cases of patients with denser opacities, who had lost more than three lines on the Snellen chart, the optic disc could not be sufficiently assessed.

Four eyes with IOL opacification and glaucoma underwent IOL exchange surgery. Glaucoma status was reviewed in all four patients on follow-up (Table 2). Two patients with previous trabeculectomies developed raised intraocular pressure (IOP) after IOL exchange, which required additional antiglaucoma drugs. One patient with narrow angle glaucoma and peripheral iridotomies continues to be monitored, without any additional problems. The fourth patient developed high IOP postexchange in an eye, which was previously well controlled on topical medication. This eye needed a trabeculectomy to lower IOP.

Discussion

In our series, a higher opacification rate of the IOL, among patients with glaucoma was observed. This may have been due to the fact that glaucoma patients are reviewed regularly in clinics for glaucoma monitoring, hence a higher detection ratio in these patients. Patients with uncomplicated cataract extraction are usually discharged, if no other treatable pathology is found.

Table 1 Table showing difficulty in disc assessment, loss of visual acuity, artefactual visual field defects produced by the IOL opacification

Patient number	Disc visible	Disc difficult to assess	CD ratio	Last BCVA before onset of opacity	Last VA after IOL opacification was recorded	Artefactual visual field defect	Progression of glaucomatous visual field loss
1	No	Yes	Not visible	6/9	6/18	No	No
2	Yes	No	0.3	6/12	6/12	No	No
3	Yes	No	0.8	6/6	6/9	Yes	Yes
4	No	Yes	Not visible	6/6	6/36	VF not available	VF not available
5	Yes	No	0.95	6/9	6/12	Yes	No
6	No	Yes	0.9	6/12	6/18	No	No
7	Yes	Yes	0.3	6/6	6/18	Yes	Yes
8	Yes	No	0.95	HM	PL +	Yes	Yes
9	No	Yes	Not visible	6/9	PL +	Yes	No
10	No	Yes	Not visible	CF	PL?	VF not available	VF not available
11	No	Yes	Not visible	6/9	6/36	Yes	Yes
12	No	No	0.3	6/18	6/60	VF not available	VF not available
13	No	Yes	Not visible	6/36	—	No	No

Table 2 Glaucoma status after IOL exchange

Patient number	Age (years)	Sex	Glaucoma status	Trabeculectomy	Topical medication before IOL exchange	Visual acuity before IOL exchange	IOL exchanged	Visual acuity after IOL exchange	Glaucoma status after IOL exchange
4	66	F	Narrow angle glaucoma, YAG PI	No	Nil	6/36	Yes	6/6	Stable
6	64	F	Advanced POAG	Yes	Nil	6/36	Yes	6/9	CD 0.9, latanoprost added
9	91	F	POAG	Yes	Latanoprost	PL +	Yes	6/12	Flat bleb, trabeculectomy failure, added G.Betaxolol
13	81	M	POAG, Glaucoma worsening	No	Latanoprost, Brimonidine Dorzolamide	6/36	Yes	CF	Developed RAPD, increased IOP, needed trabeculectomy

It would be inappropriate to comment if glaucoma has a positive association with opacification of the IOL unless studies are set up comparing all subsets of patients at the same postoperative periods.

Comparison of the visual fields, of the glaucomatous eyes in our subset with opacification of the IOL, with their previous fields shows an apparent worsening of visual field defects (Figure 2). However, total and pattern deviations showed that the fields were similar and that there was no progression of glaucomatous visual field loss. The apparent difference is due to generalized reduction in sensitivity due to media opacities. Cataracts and in our case IOL opacities may cause changes in the visual fields on automated static perimetry.³ Development of cataract can also mask progressive glaucomatous visual field loss.^{4,5} Therefore, calculated

visual field loss in patients with media opacities like cataracts may not be precise, leading to a false impression of advanced visual field loss.⁶

In cases such as ours, pseudophakic glaucoma patients with opaque IOLs may be expected to exhibit the same defects in their visual fields. Although cataracts and IOL opacities can hide visual field loss, they can also produce scotomas on automated visual field analyzers. This would be true in automated perimeters, which concentrate more on areas where visual field defects are expected, that is, arcuate defects, nasal steps, etc.

Disc assessment and changes in the optic disc and the nerve fibre layer can be correlated with the progression of visual field loss.⁷ In our experience, disc assessment in our subset was not easy with moderate-to-severe opacities of IOLs. In comparison to patients with

Figure 2 Visual field of a glaucomatous eye with a clear lens (left) and subsequently recorded opacity in the IOL optic (right).

glaucoma and developing cataracts at the same visual acuity, our subset presented a substantial challenge in visualization of the optic disc. Optic disc assessment can be difficult in the presence of miosed pupils, corneal opacities, cataracts, and other media opacities such as vitreous haemorrhage. To this list we can now add opaque IOLs.

In our subset of patients, four patients required IOL exchange (Table 2). Our data indicate that patients with previously filtering trabeculectomies may need additional drugs to control IOP.⁸ Intraocular surgery and inflammation are known to significantly increase IOP and the number of glaucoma medications in eyes with pre-existing functioning filtering blebs.⁹ It may be possible to reduce the risk of failure of the bleb by reducing inflammation by the use of intensive topical steroids and possibly antimetabolites.

We recommend careful consideration of IOL exchange on a case-to-case basis, keeping in mind the glaucoma status, progression of the disease, and the effect of further intraocular surgery on a functioning trabeculectomy.

Conclusion

We prescribe caution in accepting visual field defect, on automated perimetry, as a field defect due to glaucoma. Cataracts and in our case IOL opacification cannot only hide true visual field defects, but may also produce false scotomas. In our experience, glaucoma monitoring is made more difficult with a case of opacification of the IOL. Visual field defects may appear denser and scotomas due to IOL opacities may be produced. Visual

fields should, therefore, be interpreted carefully taking into account the whole clinical picture, total and pattern deviations along with other indices.

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