Author's response to reviews

Title: Late-Onset Secondary Pigmentary Glaucoma Following Foldable Intraocular Lenses Implantation in the Ciliary Sulcus: A Long-term Follow-up Study

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Author's response to reviews: see over
Editors, BMC Ophthalmology

Dear editors,

We are re-submitting our revised manuscript, entitled “Late-onset pigmentary glaucoma following foldable intraocular lenses implantation in the ciliary sulcus: a long-term follow-up study” to BMC Ophthalmology. We appreciate the positive statements from the reviewers and appreciate the reviewers’ constructive suggestions. In this revised manuscript, we have made some changes as suggested by the editors and reviewers.

We understand and agree to pay for the charges associated with color printing if this paper is accepted by BMC Ophthalmology.

**Editorial Formatting Request**

1. **Table 1 contains identifying information - needs to be merged or authors need to confirm they received consent to use this.**
   We have merged the data of the patients and resent a new Table 1.

**Reviewer #1**

1) **The table n° 2 describes 14 eyes of 13 patients while the Authors say that 10 eyes of 10 patients have been enrolled.**
   The table in the previous manuscript was a wrong table. We have corrected it.

2) **In the same table are described 2 cases of piggyback IOL, while in the text there is no mention of such cases. Also some of the references describe cases of piggyback implant. It seems not correct to put together results of piggyback IOLs as the anterior lens is easily pushed against the iris posterior surface.**
   We have removed the 2 cases of piggyback IOL implant and also other complicated cases. That’s why the current manuscript included only 10 eyes of 10 cases.

3) **In the written text it is not clear what is the real clinical course: the follow-up is calculated from the cataract surgery or the referral? How much time there is between surgery and diagnosis and how much between diagnosis and referral? And what has been exactly the therapy in each case? There are only 10 cases, perhaps a table with some more detailed information could help.**
The follow-up period was defined as the time from the referral visit to the last visit. We have added the definition of follow-up period in P.7 line 13-14. The time of IOP elevation was defined as the time that elapsed between the initial cataract operation and the onset of chronic IOP elevation more than 21 mmHg. The information was shown in table 1 and P.7 Line 11-13. The exact method of therapy for each patient was shown in table 2.

4) It is not clear why so many eyes had low vision at referral? Glaucoma in advanced stage or complications from cataract surgery as corneal decompensation or CME? The high IOP at referral, corneal edema, lens subluxation and advanced glaucomatous optic nerve damage could be the causes of poor VA at referral. The IOPs of these patients may have fluctuated before they became symptomatic with uncontrolled IOP elevation, and this in turn could have led to advanced glaucomatous optic neuropathy prior to referral. Two eyes had lens subluxation and 6 eyes had chronic iridocyclitis. Finally, fluctuations of the IOPs in these patients were frequently noted despite medical and surgical interventions. All of these factors can lead to poor visual prognoses of our patients. The cause of low vision at referral was discussed from P. 13, line 13 to P. 14 line 2.

5) IOP was severely elevated in almost all eyes. Why only 4 had surgery aimed to lower the IOP? And why the visual result was so low in cases well compensated by medical therapy? IOP were controlled by medical therapy initially, but large IOP fluctuation was observed in some cases. We believed this is due to pigment dispersion associated with IOL movement, so we chose to perform IOL exchange only. If the IOP is still under poor control, trabeculectomy could be performed later. The IOP in some patients became stable after IOL exchange only. In the cases with poor IOP control, IOL exchange and trabeculectomy was performed at the same time for better outcome. The patients with normal IOP under medical therapy usually refused to have further surgery because they suffered from poor visual result after the cataract surgery. That is why only 4 patients had surgery aimed to lower the IOP. We believe there is still IOP fluctuation even if the IOPs were controlled normally by medical therapy in our clinics. The glaucoma is still progressing after long-term follow up; therefore poor visual outcome was resulted. It was discussed from P. 13, line 13 to P. 14 line 2.

6) Almost all the cases were single piece hydrophobic acrylic IOLs. Perhaps the title should refer to foldable single piece IOLs and not simply to foldable lenses.
One case used silicon IOL, so “foldable IOL “seems to better describe single piece IOLs and silicon IOL.

7) Considering the high percentage of complicated implants and the very low visual acuity, it is not clear in the text if the authors are warning against a complication mainly due to the kind and site of the implant even if correctly performed, or against implanting an IOL in unproper way: 30% of vitreous incarceration, at least one case of iris-optic contact, elevated IOL mobility. If the complication of vitreous loss is properly managed, the rate of pigmentary glaucoma could be reduced. However, there is still a risk of such complication if such IOL was placed in the sulcus because of its design and unstable IOL position. The information is added in P. 12 line 3-5.

8) In the 2 cases of early IOP elevation, what is the mechanism? Why is there an elevated IOP only few days after surgery? The iris chafing and pigment dispersion seems unlikely to work in such a short period and probably there has to be a more directly surgery related mechanism. Do the Authors believe there is something common between early and late IOP elevation in these cases? Early IOP elevation might mainly result from the inflammation associated with the improper management of surgical complications such as vitreous incarceration. At the later stage, IOP elevation in the patients with sulcal foldable IOL implantation may be resulted from chronic iridocyclitis and pigment dispersion. The mechanisms of IOP elevation in the early & late stage were further discussed in P. 14 line 3-9.

Reviewer #2

The paper is an interesting contribution about onset of secondary pigmentary glaucoma after acataract surgery complications. The subject is well-known, but type of patients and follow-up duration make this a valuable contribution. My comments are the following:

- Methods: patients with a diagnosis of primary pigmentary glaucoma were excluded. Did the authors perform just a gonioscopy of the fellow eye in order to rule this out? The cornea, iris, lens, and angle status of the fellow eyes were all evaluated by slit-lamp examination and gonioscopy to rule out the diagnosis of primary pigmentary glaucoma. This was revised in P.6 line 13-15.

- Methods: please define initial and final IOP
The definition of initial and final IOP was described in P. 7 Line 7-8.

- **Did the authors have any information about preop IOP in the 10 patients?**
  We have excluded the cases who had glaucoma prior to undergoing the cataract operations. None of the 10 patients included in the current study had prior diagnosis of glaucoma. The information was shown in P. 6, line 11-13.

- **Results: please describe IOP elevation.**
  IOP elevation was defined as “IOP elevation more than 21 mmHg”. The information was added in P.7 Line 11-13.

- **How often were the patients checked after cataract operation? Please report this in the methods.**
  We followed up these patients 1 day, 1 week, 3 weeks and 2 months after cataract surgery. However, these cases are all referral cases. We did not know the follow-up schedule of previous surgeons.

- **Patients might have IOP elevation also due to other reasons, e.g. inflammation, iritis, presence of vitreous in the angle, angle damage after bad positioning of the IOL haptic, etc. Please discuss.**
  Multiple mechanisms associated with IOP elevation was further discussed in P. 14, line 3-16.

**The discussion about management of cataract surgery complications is very interested but can be shortened.**

The discussion about management of cataract surgery complications was shortened. The revision is shown from P. 15, line 14 to P. 16, line 2.

After this revision, we hope you will deem this paper acceptable in the BMC Ophthalmology.

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