Comparison of posterior capsule folds following intracapsular implantation of three types of intraocular lenses with different haptic design

Reviewer: 1
1. exclusion criteria: pseudoexfoliation is not excluded. Age range selection is too big.
2. Capsulorhexis is manual. So, the anterior capsule capsulorhexis area is a not controlled variable
3. better if this study were prospective. Retrospective and cohort?
2 Material is not the same, and this is a very important risk factor for anterior capsule opacification.
4 Angles between optic and haptics is not described in the different IOLs.
5 IOLs length is not described.

Response to Reviewer 1:
We very appreciate your careful reading of our manuscript and valuable suggestions. We have carefully considered the comments and have revised the manuscript accordingly. The comments can be summarized as follows:
1) Pseudoexfoliation should be excluded and age range selection is too big.
2) The anterior capsule capsulorhexis area is a not controlled variable.
3) Better if this study were prospective. Retrospective and cohort?
4) IOLs material and angle between optic and haptics should be described.
5) IOLs length should be described

Response to Specific Points: First, "Pseudoexfoliation" and "age younger than 40 years" have been added into exclusion criteria, which is more rigorous and also allows the patients included in this study remain the same as before. Second, we agree with the point that the anterior capsule capsulorhexis area is a not controlled variable and we changed with a more reasonable statement "A capsulorhexis was created, aiming for good centration and a 5.0 mm diameter". For the third question, it was a good question. According to the definition of retrospective cohort study: The retrospective cohort study compares groups of individuals who are alike in many ways but differ by a certain characteristic in terms of a particular outcome [2]. Data on the relevant events for each individual are collected from existing records and can immediately be analyzed [3] to determine the relative risk of the cohort compared to the control group. In this study, we collected the relevant date from existing records, which is regularly accumulated in our research group. So we carefully distinguished this study as a retrospective cohort study. For the fourth and fifth question, we appreciate your attentive reading and we added this informations of IOLs material and angle between optic and haptics and IOLs length in Table 1 according to your suggestion. After searching for evidence from existing researches, we add the discussion about the possible influences of IOLs material and angle between optic and haptics in part 4: "In addition to this theory, some other differences between the two types of IOLs may give alternative explanations, such as optic material. The optic material of AMO Tecnis ZCB00 IOL is mainly hydrophobic acrylic, while the optic material of Bausch&Lomb AO is mainly hydrophilic acrylic. Hydrophilic acrylic IOLs have better biocompatibility, which is dependent on the molecular interactions between the biomaterial surface and surrounding tissues. With hydrophilic acrylic optic material, posterior capsule membrane may stick more closely to IOLs. Thus result that posterior capsule fold is less likely to form in eyes with Bausch&Lomb AO IOLs. The IOLs length and angle between optic and haptics also differ slightly in two types of IOLs. But from existing researches
there is no concrete evidence being found to prove such slight differences can effect the properties of IOLs in capsule.” has been added in the bottom of page 3 and the head of page 4.

**Reviewer 2**

The authors aimed to compare the incidence of posterior capsular fold among different types of intraocular lens (IOL) to determine risk factors of posterior capsular fold. The subject of this study is quite interesting and novel, but several points and questions need to be explained and answered.

First, I wondered if this manuscript was noble, because similar results was showed in the previous article that they had referred in the discussion section. The authors need to comment something different from the previous article.

In introduction, the authors commented that the capsular folds have direct impact on postoperative visual acuity in cataract surgery. I wonder why they did not show if the postoperative visual acuity was affected by the presence of capsular folds in their patients.

In method, they commented that patients were examined 2 days postoperatively after dilating pupils with Mydrin-P. However, such an early check-up is unusual, which makes their study look a prospective study. I wondered if they regularly check-up the postoperative patients two days after cataract surgery and if this study was really retrospective.

I wondered what the meaning of incomplete posterior capsule was. The authors have to define this term in detail.

They have to describe the components of eye drops instead of commercial name such as Mydrin-P in methods.

In previous study, they checked if there were capsule folds intraoperatively instead of 2 days postoperatively. They have to show the effect of different check-up date on the incidence of capsule fold.

In table 2, the parameters of X-Y axis had better being changed. The horizontal row needs to have types of IOLs.

In the discussion, the authors commented that this study used single-blind method. However, the observer who evaluated the capsule folds at two days after surgery still knew which IOL had been implanted in the subject. They had better taking photographs of capsule folds and letting the independent observer evaluate the posterior capsule. Such a limitation should be described in the discussion section.

Minor grammar errors needs to be corrected.

“such as aspheric surface, negative spherical aberation (SA), square edge, an optic diameter of 6.0mm” should be changed to “such as aspheric surface, negative spherical aberation (SA), square edge, and optic diameter of 6.0mm” In the 3rd line of page 2.

Reference


**Response to Reviewer 2:**

Thank you for the kindly response to my manuscript and saying this study is interesting and novel, which is quite inspiring. We also appreciate your constructive questions and suggestions for this study. We have carefully considered the comments and have revised the manuscript accordingly. What follows is a brief and cursory discussion of the various issues raised:
In part (1) of your comments, you wondered if this manuscript was noble, because similar results was showed in the previous article that had referred in the discussion section. That previous article compared incidence of posterior capsule folds in MA60BM IOLs and SA30AL IOLs, which have different haptics materials. Our study achieved a similar outcome indicating the influence from haptics materials. However, we also compared incidence IOLs with different haptics number and explored other influencing factor. Also, our study had a larger sample and explored IOLs that are frequently used currently. So actually we go further than that previous article.

In part (2) of your comments you expressed your doubt that" why they did not show if the postoperative visual acuity was affected by the presence of capsular folds in their patients". As cited in part of introduction:" Previously studies have found nd: yag laser release incision of posterior capsular folds can significantly improve the visual acuity [5-6], indicating that posterior capsular folds have direct impact on postoperative visual acuity in cataract patients." Accumulated evidence have demonstrated the impact of posterior capsular folds on visual acuity. Having this relation provided, the reasons of posterior capsular folds formation deserve to be explored. As discussed above, the attempt here is to compare the incidence of posterior capsule folds among the three types of intraocular lens (IOL) and determine risk factors, aiming to propose a general principle of posterior capsular folds formation. What is more, under the condition of dilating pupils, the visual acuity of patients was not accurate results. So, from these reasons, the issue of visual acuity was not included in this study.

In part (3) of your comments you indicated that" 2 days postoperatively check-up makes the study look a prospective study". In fact, since patients have the full right to select which types of IOLs to be implanted, thus making prospective random patients division difficult to conduct. So in our research group, we regularly check-up the postoperative patients two days after cataract surgery and keep records of all the doubtful abnormal details. In this study, we collected the relevant data from existing records, which is regularly accumulated. Two days after cataract surgery is usually the time when the inpatients leave hospital.

Then in part (4) of comments, you pointed out that the meaning of incomplete posterior capsule should defined in detail. " Incomplete posterior capsule" means posterior capsule has coloboma or get impaired for any reason. In revised manuscript, we also added this explanation in part of 2.1 Patients.

In part (5) of comments you suggested that we should describe the components of eye drops instead of commercial name such as Mydrin-P in methods. It was a scrupulous and fair suggestion. We replaced "Mydrin-P" with the "Tropicamide-Phenylephrine ophthalmic solution", which you can check in the part of 2.4 Assessment of posterior capsule folds.

In part (6) of comments, you suggested that we should show the effect of different check-up date on the incidence of capsule fold, like previous study1. It is a reasonable ideal. Relevant data in this study was collected from existing records. But the conditions of outpatients were not regularly recorded, so the incidences of capsule folds when 1 week, 15 days or 1 month postoperatively were not counted. Even though, in June this year we tried to recall all the included patients for a long-time check-up, the dropouts rate is far greater than 30%. After patients leave hospital, re-examination is economy consuming for many of them, for the reason of long distance or bad health condition. Check-up of different time postoperatively is not feasible to conduct in this study. So we decided to focus on the collected regularly recorded data about the incidence in short term of two days postoperatively.
In part (7) of comments you pointed out that the parameters of X-Y axis had better been changed. We agree with this suggestion and have revised it, which you can check in the part of 3.1 The basic characteristics of patients.

In part (8) of comments you indicated that "the observer who evaluated the capsule folds at two days after surgery still knew which IOL had been implanted in the subject." It is a fair comment. We described this limitation in the discussion section. For this reason, single-blind method cannot be conducted completely well, so we deleted it accordingly.

In last part of comments, you point out two minor grammar errors. We have corrected them that "such as aspheric surface, negative spherical aberration (SA), square edge, an optic diameter of 6.0mm" has been changed to "such as aspheric surface, negative spherical aberration (SA), square edge, and optic diameter of 6.0mm" in the 3rd line of page 2; Reference 1 has been corrected as "Blomquist PH, Kelly JL. Posterior capsule folds and removal of ophthalmic viscosurgical devices. J Cataract Refract Surg 2002;28:1565-7."

References
2. "Definition of historic cohort study - NCI Dictionary of Cancer Terms".