Author’s response to reviews

Title: Buffering Zone of Implantable Collamer Lens Sizing in V4c

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Author’s response to reviews:

Alja Crnej (Reviewer 1):
1. Page 8, line 130

how did you decide what was too large - what were the criteria?

for how many ICLs did you decide to change the size - and in which group they were? You need to take this into account in the statistics. Explain

-> Thank you for your comment. Normally, we followed the V4-V4c size converting nomogram. However, final implanted ICL size was decided clinically considering several factors including anterior chamber depth, white-to-white diameter, etc. The number of patients in under-sizing group was 24 eyes as we showed in the manuscript and tables.

2. page 10

manifest refraction, not manifested

-> We changed all of the words from the manuscript, figures, and tables.

3. please wrote "logMAR", not log MAR

-> We changed all of the words from the manuscript, figures, and tables.
you claim, that the major determinant is horizontal compression by ciliary body. But then you conclude that also additional inflation of V4 in the eye had the influence on the vault. Make it clearer what are determinants for the vault of V4.

-> Thank you for your comment. We thought both factors could influence postoperative vault. We divided paragraph into two and changed context.

Secondly - it does not make sense what you wrote in the lines 247 - 251 - you have to write it clearer. Do V4 ICLs also become larger in diameter when they are inflating of just thicker? Explain, how inflation happens, which ICL measures change?

-> V4 ICLs become thicker and larger in diameter when they are inflating after implantation. We clarified them in the manuscript.

<Before> “The major determinant of postoperative vault is horizontal compression of ICL by ciliary sulcus. Interestingly, in the present study the normal-sizing group showed a vault of 596.32±308.64 and the under-sizing group showed a vault of 535.42±204.51. Both groups showed acceptable vault with no statistically significant difference (p=0.442). These results mean a buffering zone of ICL sizing. If the size of the ICL is larger than the STS, a horizontal dampening effect of ciliary sulcus and vertical compression of ICL by the iris would prevent severe overvaulting. In our previous study of the V4 ICL model, when the average value of ICL size – STS was 210 µm, mean postoperative vault was 518.6 µm. However, in the present study, mean postoperative vault was 562.3 µm, even though the value of pre-converted ICL size – STS was −56 µm. According to these results, the smaller sized V4c ICL could achieve acceptable vault compared with the previous V4 model. This can be explained by the insufficient inflation of previous V4 ICL enlargement in the eyeball resulting from a time delay of enlargement of ICL in the eyeball and morphological change of ICL due to ICL softness. In other words, the V4c ICL is already inflated before implantation, so the smaller V4c ICL size could also make an acceptable vault, in contrast to V4 ICL.”

<Revised> “Horizontal compression of ICL by ciliary sulcus is one of determinant of the postoperative vault.” Interestingly, in the present study the normal-sizing group showed a vault of 596.32±308.64 and the under-sizing group showed a vault of 535.42±204.51. Both groups showed acceptable vault with no statistically significant difference (p=0.442). These results mean a buffering zone of ICL sizing. If the size of the ICL is larger than the STS, a horizontal dampening effect of ciliary sulcus and vertical compression of ICL by the iris would prevent severe overvaulting.

Another factor could be the insufficient inflation of V4 ICL in the eye. In our previous study of the V4 ICL model, when the average value of ICL size – STS was 210 µm, mean postoperative vault was 518.6 µm. However, in the present study, mean postoperative vault was 562.3 µm, even though the value of pre-converted ICL size – STS was −56 µm. According to these results, the smaller sized V4c ICL could achieve acceptable vault compared with the previous V4 model. This can be explained by the insufficient inflation of previous V4 ICL in the eyeball resulting from a time delay of enlargement of ICL in the eyeball and morphological change of ICL due to
ICL softness. In other words, V4 ICLs become thicker and larger in diameter when they are inflating, and sometimes inflate insufficiently. However, the V4c ICL is already inflated before implantation, so the smaller V4c ICL size could also make an acceptable vault, in contrast to V4 ICL.

5. page 14 lines 260 -262 - you repeating your results in the discussion - shorten or delete

-> We deleted context in the discussion which repeating the results.

<Deleted context> “These patients suffered from dysphotopsia and increased intraocular pressure above 21 mmHg after ICL implantation. Postoperative vault was measured as 1200 µm and 1060 µm respectively. Alphagan-P was administered and intraocular pressure was maintained below 21 mmHg without ICL explantation. However, dysphotopsia was not improved.”

Yasin ÇINAR (Reviewer 2):

-> Acceptance without revision