

Complications of Descemet Membrane Endothelial Keratoplasty: A Chart Review

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Background & Purpose

- Descemet membrane endothelial keratoplasty (DMEK) replaces a patient's Descemet membrane and endothelium with healthy donor tissue upon endothelial disease.¹
- DMEK utilizes a thinner graft than older techniques, such as Descemet stripping automated endothelial keratoplasty (DSAEK),¹ resulting in decreased recovery time.²
- However, there are still complications associated with DMEK including graft detachments or poor focal graft adhesion, requiring re-bubbling, or DSAEK.³
- This study is a retrospective chart review assessing the incidence of complications associated with DMEK performed by a surgeon at a single centre.

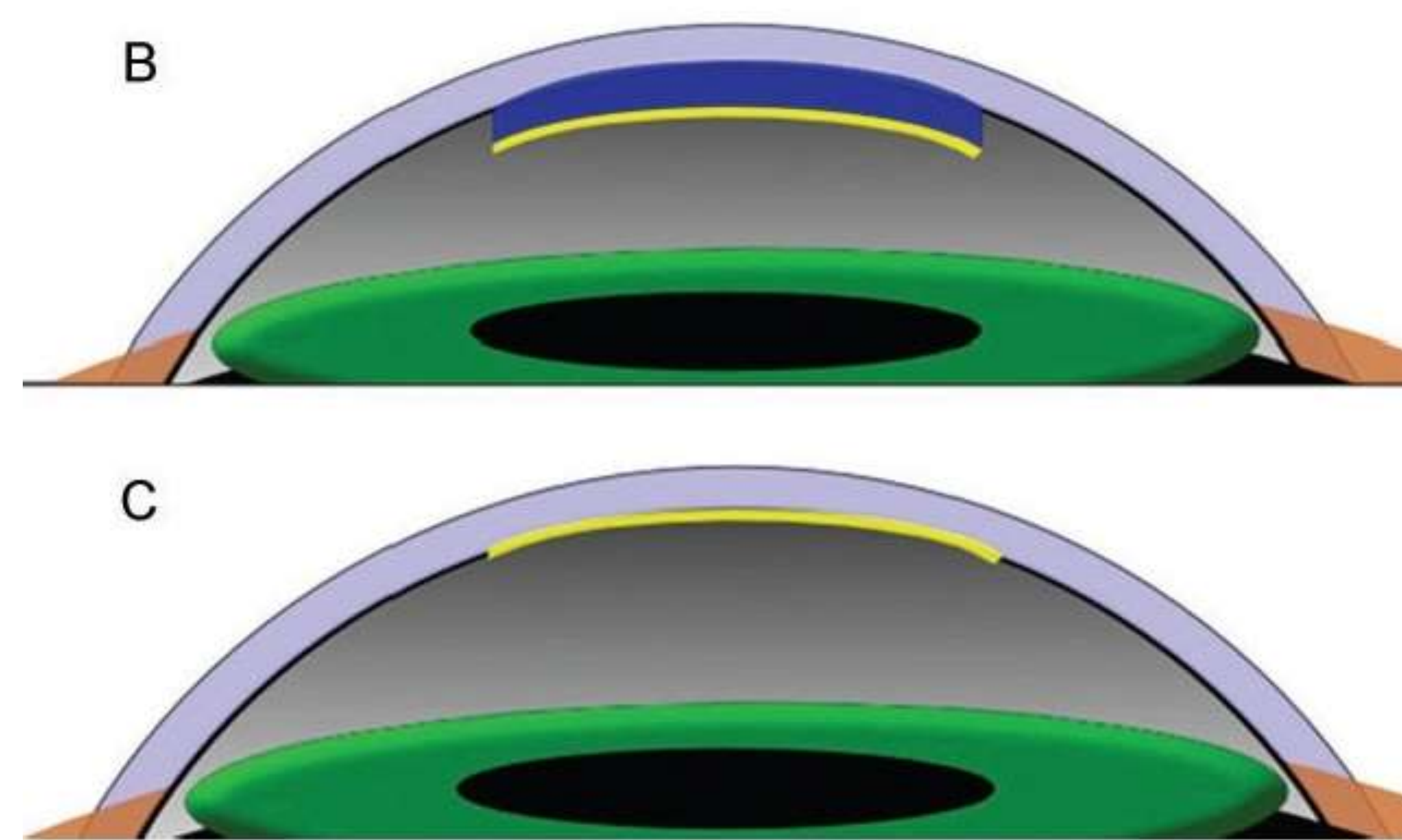


Diagram 1. Image B depicts DSAEK, Image C depicts DMEK.¹

Methods

- Twenty eyes (19 pseudophakic, 1 phakic) in 14 patients underwent the DMEK procedure between May 2017 and January 2023.
- Patients' visual acuity, intraocular pressure, and complications were recorded 1 day, 3-5 days, 7 days, 14 days, 3 months, 6 months, 1 year, and 2 years post operation (if possible).

Results

Table 1. Complications reported by each of 20 procedures. Certain eyes had more than one complication each.

	DMEK (Arm 1) (n=20)
Rebubble	8 (40%)
High IOP (≥ 22) (# of eyes)	7 (35%)
Graft failure \rightarrow DSAEK	4 (20%)
Inflammation (redness, tearing, irritation, light sensitivity)	2 (10%)
Allergic response	1 (5%)
Temporal edema	1 (5%)
No reported complications	6 (30%)

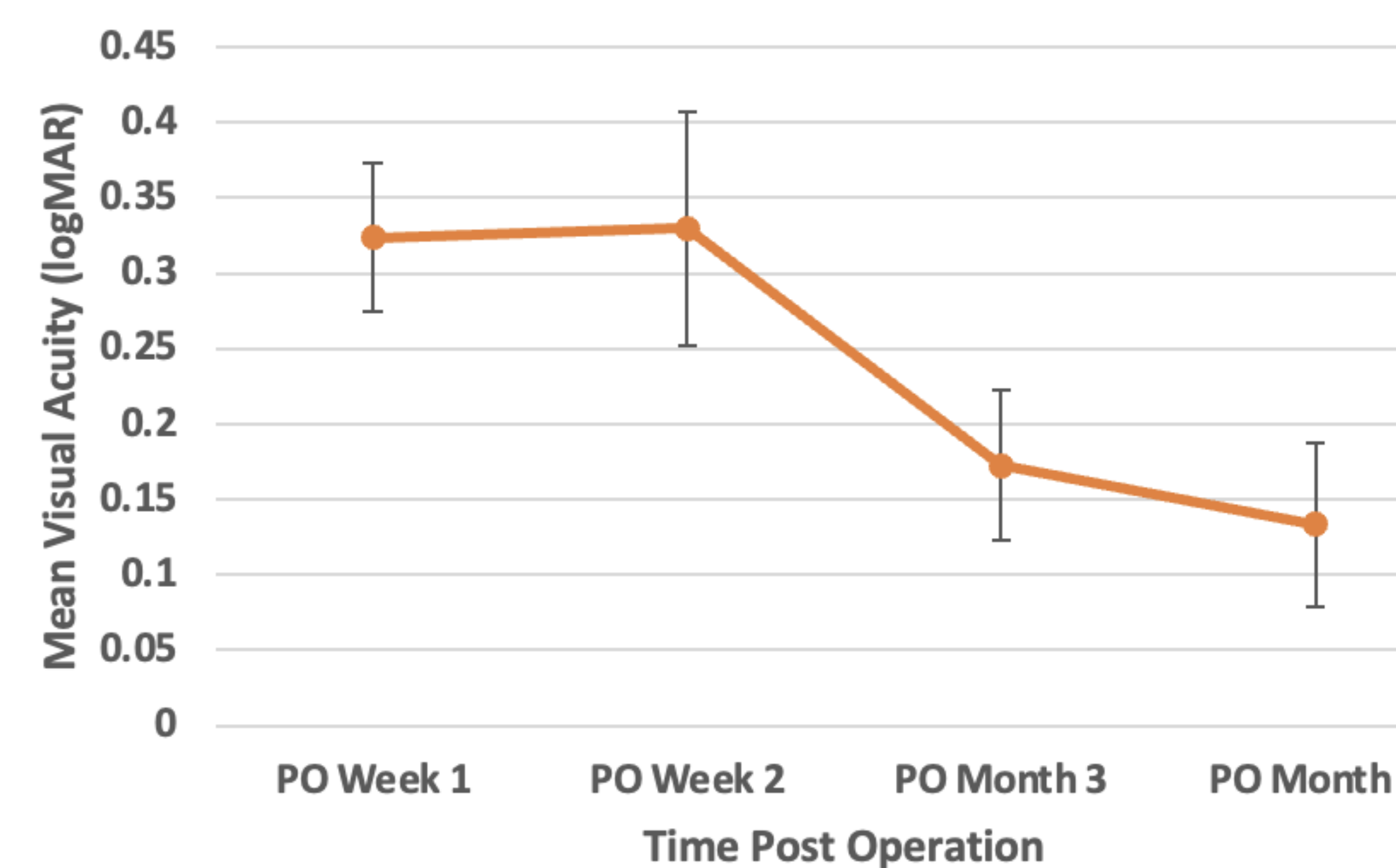


Figure 1. Mean visual acuity (logMAR) at 1 week, 2 weeks, 3 months, and 6 months post operation. Error bars signify standard error of the mean.

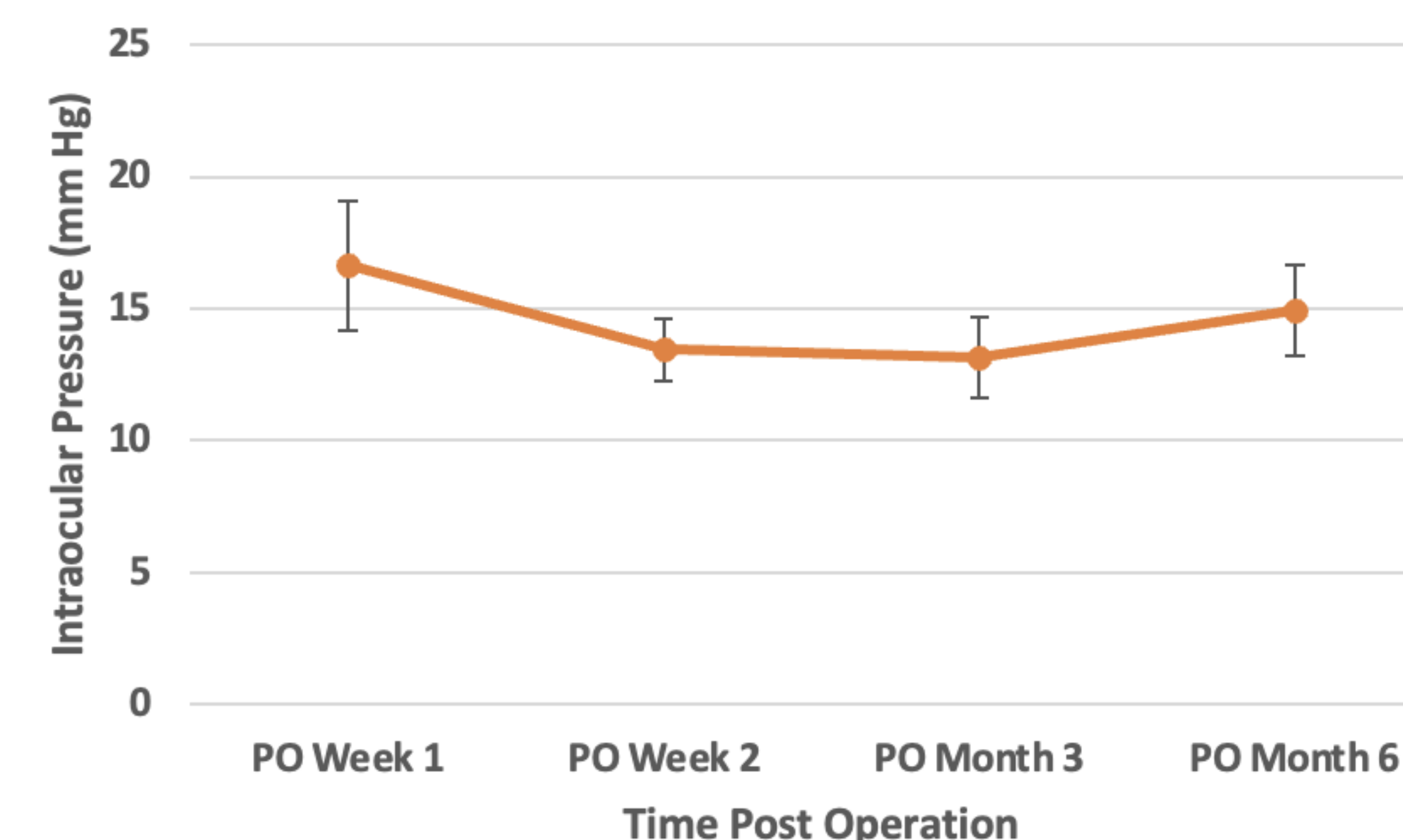


Figure 2. Mean intraocular pressure (mm Hg) at 1 week, 2 weeks, 3 months, and 6 months post operation. Error bars signify standard error of the mean.

Results cont.

- The mean visual acuity was statistically different between week 1 post-operation and 3 months post-operation ($P=0.03997$) and between week 1 post-operation and 6 months post-operation ($P=0.01534$).
- The mean intraocular pressure was not statistically different between week 1 post-operation and 3 months post-operation ($P=0.2322$) and between week 1 post-operation and 6 months post-operation ($P=0.5686$).
- Some patients were unable to give a measurable Snellen visual acuity score and were scored using hand motion (HM) or counting fingers (CF).

Discussion & Conclusion

- The most common complication was graft detachment or poor graft adhesion requiring rebubbling and high intraocular pressure above 21 mm Hg. No complete graft detachments occurred, all cases requiring rebubble were due to poor focal adhesion.
- Only visual acuity changed statistically significantly between 1 week and 3 months or 6 months post-operation.
- Since some patients were given HM or CF visual acuity scores 1 week post-operation and earlier, their visual acuity scores were not factored into the statistical analysis and the data overestimates the visual acuity of patients prior to week 2.
- This data provides a baseline upon which future research may use to compare complications associated with DMEK operations alone and DMEK combined with other procedures such as cataract surgeries.

References

1. Fernandez MM, Afshari NA. Endothelial keratoplasty: from DLEK to DMEK. Middle East African Journal of Ophthalmology. 2010 Jan;17(1):5.
2. Dapena I, Ham L, Melles GR. Endothelial keratoplasty: DSEK/DSAEK or DMEK-the thinner the better?. Current opinion in ophthalmology. 2009 Jul 1;20(4):299-307.
3. Quilendrino R, de Mora MR, Baydoun L, Ham L, van Dijk K, Dapena I, Oellerich S, Melles GR. Prevention and management of Descemet membrane endothelial keratoplasty complications. Cornea. 2017 Sep 1;36(9):1089-95.