



# Partial Descemet Membrane Overlap Due to Previously Grafted Descemet Membrane Remnant: A Case Report

Pureum Choi<sup>1</sup>, Kyu Young Shim<sup>2</sup>, Jong Hwa Jun<sup>2</sup>

<sup>1</sup>*Keimyung University School of Medicine, Daegu, Korea*

<sup>2</sup>*Department of Ophthalmology, Keimyung University School of Medicine, Daegu, Korea*

Dear Editor,

In case of graft failure after Descemet membrane endothelial keratoplasty (DMEK), repeat DMEK can be performed if there are no contraindications [1,2]. However, repeat DMEK has a risk of failure to remove the previous graft, which can lead to graft detachment or re-bubbling after DMEK [2,3]. We report a case with clinical features of partially overlapped DM. We also provide clinical guidance for descemetorhexis of firmly attached DM and prophylactic maneuvers to reduce complications when DM overlap is inevitable. Written informed consent was obtained from the patient for the publication of this report and any accompanying images.

A 78-year-old female patient experienced vision fluctuation after DMEK approximately 5 years previously. At the initial presentation, the visual acuity of the right eye was counting finger 10 cm, and the cornea was swollen. Corneal opacities were observed in the lower half of the cornea (Fig. 1A). Repeated DMEK was planned because scarring of the stroma was minimal. Intraoperatively, the previously grafted DM was firmly attached to the posterior stroma in the inferior half area and could not be completely removed. After a preloaded DMEK lenticule (Eversight) with a diameter of 8.5 mm was injected and unscrolled,

room air was injected and maintained in a supine position for 30 minutes. At postoperative day 1, linear detachment was observed at the border of the remnant DM and showed a slight increase until the 2nd week after surgery (Fig. 1B). At 6 weeks after surgery, DM detachment completely resolved, but a thickening of the DM-by-DM overlap was observed (Fig. 1C). At 5 months after surgery, the new DM was well attached, but DM overlap remained, and significant posterior astigmatism was observed (Fig. 1D–1G).

A recent large-scale study of repeat DMEK [3] described previously grafted DM being more firmly attached to the posterior stromal surface than the naive DM; remnant DM can lead to graft detachment or re-bubbling postoperatively. Histopathologically, fibrous scar tissues are formed between grafted DM and recipient stroma in the early postoperative period, and DM detachment and reattachment process can strengthen scar formation [4]. In our case, during descemetorhexis for repeat DMEK, the lower half of the DM with some opacity was firmly attached, probably due to suspected DM reattachment or endothelial damage due to previous DMEK. The remaining lower half of the DM caused temporary postoperative focal detachment, which was completely resolved without any intervention at 6 weeks. Moreover, partially remaining DM did not cause a significant effect on visual acuity except coma aberration.

A case series of overlapped DM with histopathological evaluation [4] reported that peripheral overlapping DMs did not cause a significant detachment owing to the fibrous scar tissue made between host and donor DM interface in case the whole DM was not scraped. Conversely, DM de-

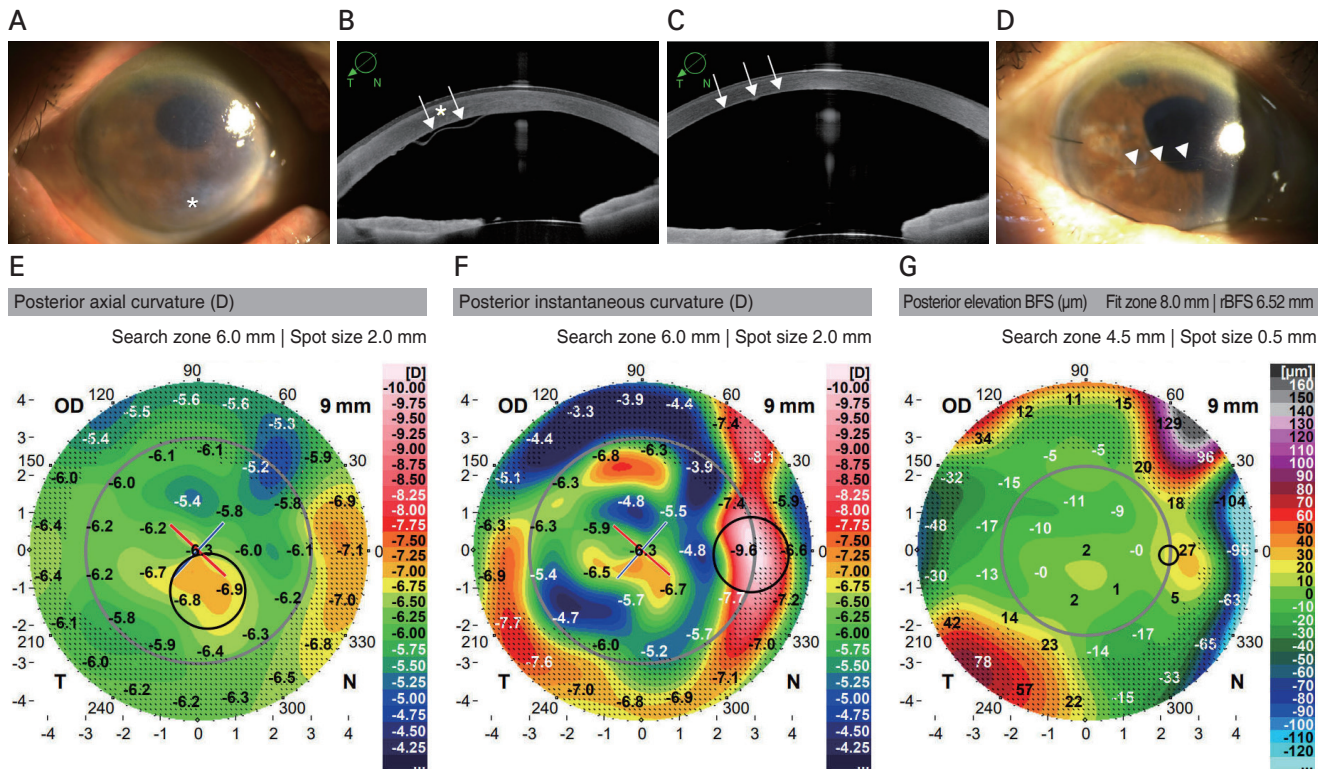
Received: September 25, 2023 Final revision: December 9, 2023

Accepted: December 27, 2023

Corresponding Author: Jong Hwa Jun MD, PhD. Department of Ophthalmology, Keimyung University School of Medicine, 56 Dalseong-ro, Daegu 41931, Korea. Tel: 82-53-258-4545, Fax: 82-53-258-4558, Email: [junjonghwa@gmail.com](mailto:junjonghwa@gmail.com)

© 2024 The Korean Ophthalmological Society

This is an Open Access journal distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.



**Fig. 1.** Preoperative and postoperative photography of slit-lamp examinations. (A) At initial presentation, diffuse corneal edema with focal thick opacity is identified inferiorly (asterisk). (B) Anterior-segment optical coherence tomography (AS-OCT) image at 2 weeks after surgery. Descemet membrane (DM) detachment is observed around the residual DM (arrows). Due to the function of endothelial cells of residual DM, only minimal increase in corneal thickness is observed despite DM detachment (asterisk). (C) On the AS-OCT image at postoperative 6 weeks, DM detachment has completely disappeared, but thickening and tiny fold of DM are observed due to the overlap of the two layers of DM (arrows). (D) At 5 months postoperatively, the DM detachment completely disappears, but the remaining DM border is observed on slit-lamp microscopy (arrowheads). (E–G) Scheimpflug images show still minimal elevation of the posterior corneal surface at the inferior half area at 5 months. D = diopters; OD = right eye; T = temporal; N = nasal; BFS = best fit sphere.

tachment happened when only the posterior part of DM was scraped. Therefore, it is recommended that descemetorhexis be performed thoroughly, preferably by filling the anterior chamber with air bubbles using trypan blue dye to obtain good visibility of remnant DM structures. However, in case DM is attached too firmly to be removed because unnecessary damage to the posterior stroma also causes unexpected haziness in the posterior stroma-DM interface, it is recommended to try to attach the healthy DM over the remnant DM rather than attempt excessive descemetorhexis. Furthermore, in case graft detachment would be expected due to remaining DM, providing a full air filling or long gas retention after inferior iridotomy and maintaining a supine position for more than 60 to 120 minutes would be suggested to minimize graft detachment.

**Conflicts of Interest:** None.

**Acknowledgements:** None.

**Funding:** None.

## References

1. Alio Del Barrio JL, Bhogal M, Ang M, et al. Corneal transplantation after failed grafts: options and outcomes. *Surv Ophthalmol* 2021;66:20–40.
2. Agha B, Shajari M, Slavik-Lencova A, et al. Functional outcome of repeat Descemet membrane endothelial keratoplasty (DMEK) for corneal decompensation following graft failure after primary DMEK. *Clin Ophthalmol* 2019; 13:477–82.
3. Baydoun L, van Dijk K, Dapena I, et al. Repeat Descemet membrane endothelial keratoplasty after complicated pri-

- mary Descemet membrane endothelial keratoplasty. *Ophthalmology* 2015;122:8–16.
4. Muller TM, Verdijk RM, Lavy I, et al. Histopathologic features of Descemet membrane endothelial keratoplasty graft remnants, folds, and detachments. *Ophthalmology* 2016; 123:2489–97.