Predicting Re-bubbles in Descemet Membrane Endothelial Keratoplasty (DMEK): Early Edema and Location of Graft Separations in Re-bubble v Non-rebubble Cases

Authors: Mark A. Terry, M.D.1, Ahmad Alshaarawy, M.D. 1, Christopher Sales, M.D. 1, Zachary Mayko, M.S.2, and Michael D. Straiko, M.D. 1.
1. Devers Eye Institute, Legacy Research Institute, Legacy Health, Portland, OR, United States, 2. Lions VisionGift, Portland, OR, United States.

Introduction

Re-bubbling after DMEK is a regular occurrence. Our current rate is 11%. Being able to identify when, and, if a graft needs to be re-bubbled can save patients undue stress or save a DMEK transplant.

The goal of this project was to compare location of graft separation and stromal edema levels in DMEK eyes. We identified cases that required a re-bubble for full attachment and cases that did not require a re-bubble.

Methods

100 DMEK cases with temporal clear cornea incisions had OCT performed postop at 1 day and 6 days post surgery. Nine locations (central, 2 vertical, 2 horizontal and 4 oblique) were evaluated for graft separation and edema at each location and time point. Locations of graft separation and thickness of the cornea was compared between re-bubble and non-rebubble cases.

Results

1,800 data points were analyzed. In the 100 cases, at POD1 19 eyes (19%) and at POD6 49 eyes (49%) had at least one area of graft separation that tended to be temporal and inferior in location. There were 15 re-bubble cases. Of these, at POD1, 3 eyes and POD6 15 eyes had at least one area of graft separation. The location of separation in rebubble cases however included more superior and central separations than the non-rebubble cases at both time points. At POD1 mean central pachymetry for non-rebubbles was 670 um +/- 83 and for re-bubbles was 732 +/- 103. (p = .023). At POD6 mean central pachymetry for non-rebubbles was 605 +/- 82 and for re-bubbles was 695um +/- 126. (p <.001). At POD1 and POD6 rebubble corneas were thicker (by 40 to 80 ums) in all 8 peripheral areas than eyes that were not re-bubbled.

Conclusions

The most common area of DMEK graft separation is inferior and temporal and nearly half of grafts will have some separation at six days postop. Eyes requiring re-bubble were characterized by significantly more central and peripheral edema than other cases on POD1 and distinguished at POD6 by additional superior areas of separation that were rarely seen in non-rebubble cases. Strategies for better graft support of the inferior and temporal areas (gas bubble, head positioning) may prove beneficial in preventing re-bubbles.

Figure 1. OCT image of a detaching DMEK graft and location

Financial Interest Disclosures - None

Contact: Mark A. Terry MD – M.Terry@deverseye.org