

# **Descemet Membrane Endothelial Keratoplasty: Challenges and Lessons Learned After First 10 Cases**

**ASCRS 2014 Electronic Poster**

**Kashif Baig, MD, MBA, FRCSC**

**Abdulmajeed Aljaethen, MD**

**Salina Teja, MD**

**Ronan Conlon, MD**

**University of Ottawa Eye Institute**



uOttawa



drbaig.ca

# Financial Disclosure

**Drs. Aljaethen, Teja, Conlon:** No disclosures

**Dr. Baig:** See below

Financial Interest/ Affiliation	Name of Company(s)
Grant/Research Support	Allergan, Bausch & Lomb, Merck, Moria
Employment/Honoraria/Consulting Fees/Travel Expenses	Alcon, Allergan, Bausch & Lomb, Labtician
Major Stock Shareholder	None
Member: Advisory Panel, Standing Committee, Board of Directors	Allergan, Bausch & Lomb
Other Financial or Material Interest	None



uOttawa



drbaig.ca

# DMEK Study

## Background

- DMEK may be a superior alternative to DSAEK

## Purpose

- To describe the lessons learned during early learning curve of the DMEK procedure

## Methods

- Retrospective study of our first 10 DMEK surgeries (review of charts and surgical videos)

## Results

- 10 patients (topical anesthesia): 7 Fuchs dystrophy, 3 pseudophakic bullous keratopathy
- All 10 tissues cut by surgeon; 1 tissue loss
- Partial and total detachments = 60%
- Repeat EK needed = 3

## PRE-OPERATIVE

PATIENT SELECTION

INFERIOR LASER PI

## GRAFT PREPARATION

PEELING

TISSUE > 50 YEARS OLD

DMEK/DALK SAME DAY

TRYPAN BLUE SOAK

## HOST PREPARATION

LARGER SCORE

NO DESCEMET'S TAGS

## GRAFT INJECTION

PLASTIC/GLASS INJECTOR

SUTURE WOUND

## GRAFT UNFOLDING

TECHNIQUES

SLIT BEAM

FULL AIR FILL

## POST-OPERATIVE

AS-OCT

DETACHMENTS

## Patient Selection

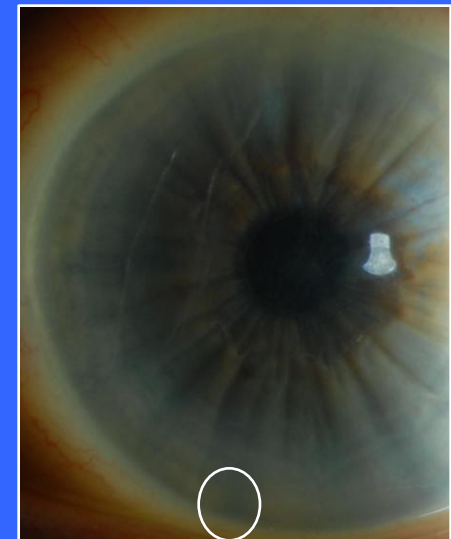
- Need good view of DMEK tissue through cornea (only mild-moderate corneal edema)
- DMEK may not be good option in iris defects, aphakes, tubes
- DMEK peeling can be done to "rescue" DSAEK and UT-DSAEK perforations



Aphakic, aniridic, unicameral, tubed eye with mild corneal edema

## Laser Iridotomy

- Inferior laser peripheral iridotomy done pre-op
- One less step in DMEK surgery
- Reduces risk of intra-operative hyphema
- Ensure patency during surgery with instrument



Inferior iridotomy



## PRE-OPERATIVE

PATIENT SELECTION

INFERIOR LASER PI

## GRAFT PREPARATION

PEELING

TISSUE > 50 YEARS OLD

DMEK/DALK SAME DAY

TRYPAN BLUE SOAK

## HOST PREPARATION

LARGER SCORE

NO DESCEMET'S TAGS

## GRAFT INJECTION

PLASTIC/GLASS INJECTOR

SUTURE WOUND

## GRAFT UNFOLDING

TECHNIQUES

SLIT BEAM

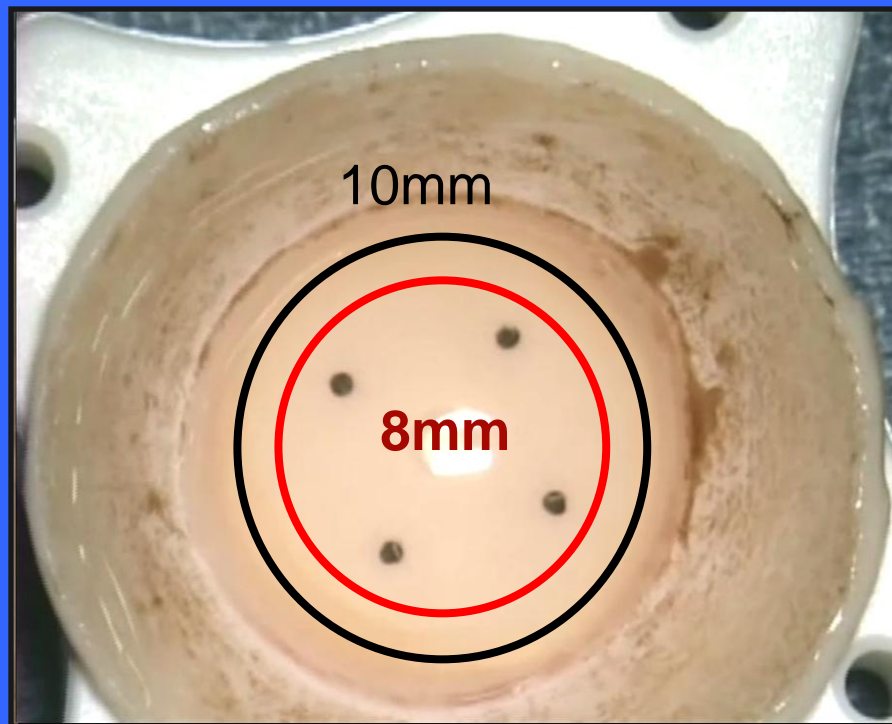
FULL AIR FILL

## POST-OPERATIVE

AS-OCT

DETACHMENTS

- SCUBA technique using one forceps to peel
- Double trephine method (10mm trephine, peel, then 8mm trephine)
- Young donor cornea is difficult to strip (our one case of donor tissue loss occurred in 40-year-old cornea)
- Soak DMEK graft in undiluted trypan blue for 30-40 sec
- Can re-inject trypan blue (<10 sec) into anterior chamber to stain scroll if unfolding is taking long and DMEK tissue is losing color



## PRE-OPERATIVE

PATIENT SELECTION

INFERIOR LASER PI

## GRAFT PREPARATION

PEELING

TISSUE > 50 YEARS OLD

DMEK/DALK SAME DAY

TRYPAN BLUE SOAK

## HOST PREPARATION

LARGER SCORE

NO DESCMET'S TAGS

## GRAFT INJECTION

PLASTIC/GLASS INJECTOR

SUTURE WOUND

## GRAFT UNFOLDING

TECHNIQUES

SLIT BEAM

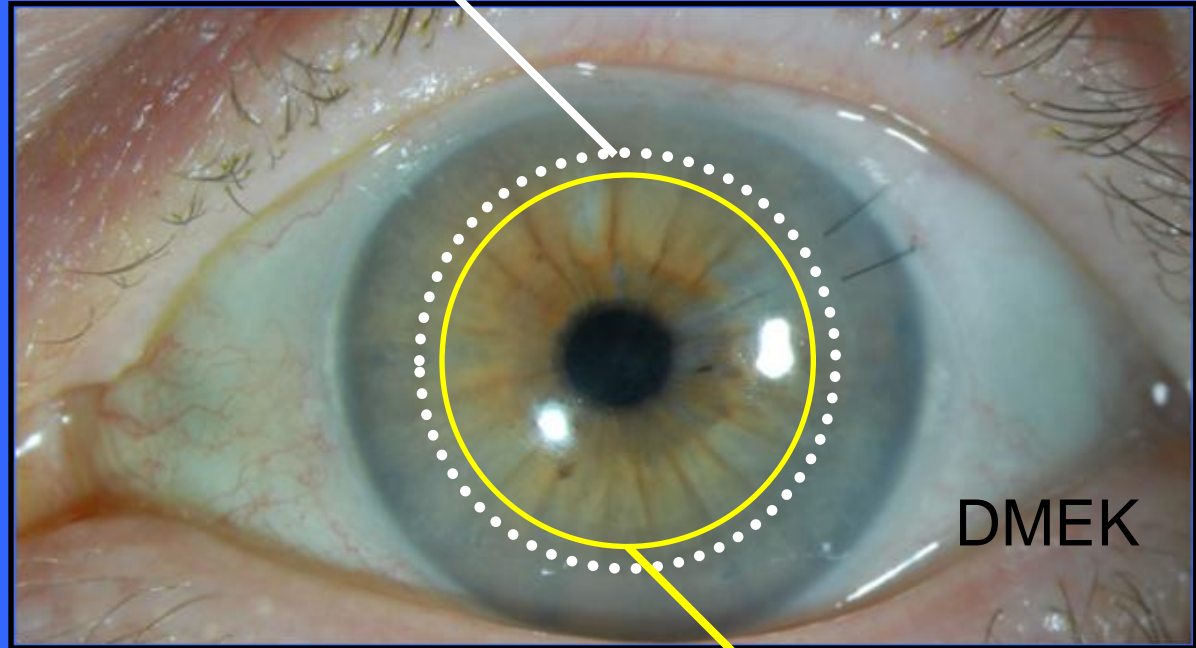
FULL AIR FILL

## POST-OPERATIVE

AS-OCT

DETACHMENTS

Score



DMEK

Graft

- Score larger than DMEK graft size
- Re-inject trypan blue into anterior chamber after scoring to look for Descemet's tags that can impair DMEK graft adherence



uOttawa



drbaig.ca

## PRE-OPERATIVE

PATIENT SELECTION

INFERIOR LASER PI

## GRAFT PREPARATION

PEELING

TISSUE > 50 YEARS OLD

DMEK/DALK SAME DAY

TRYPAN BLUE SOAK

## HOST PREPARATION

LARGER SCORE

NO DESCMET'S TAGS

## GRAFT INJECTION

PLASTIC/GLASS INJECTOR

SUTURE WOUND

## GRAFT UNFOLDING

TECHNIQUES

SLIT BEAM

FULL AIR FILL

## POST-OPERATIVE

AS-OCT

DETACHMENTS

## Plastic

### Alcon Cartridge



### Viscoject



## Glass

### DORC Set



### Modified Jones Tube



- Moving towards glass injector (? less tissue damage)
- Keep anterior chamber partially collapsed & do not over-pressurize
- Suture wound well to prevent graft ejection!





## PRE-OPERATIVE

PATIENT SELECTION

INFERIOR LASER PI

## GRAFT PREPARATION

PEELING

TISSUE > 50 YEARS OLD

DMEK/DALK SAME DAY

TRYPAN BLUE SOAK

## HOST PREPARATION

LARGER SCORE

NO DESCMET'S TAGS

## GRAFT INJECTION

PLASTIC/GLASS INJECTOR

SUTURE WOUND

## GRAFT UNFOLDING

TECHNIQUES

SLIT BEAM

FULL AIR FILL

## POST-OPERATIVE

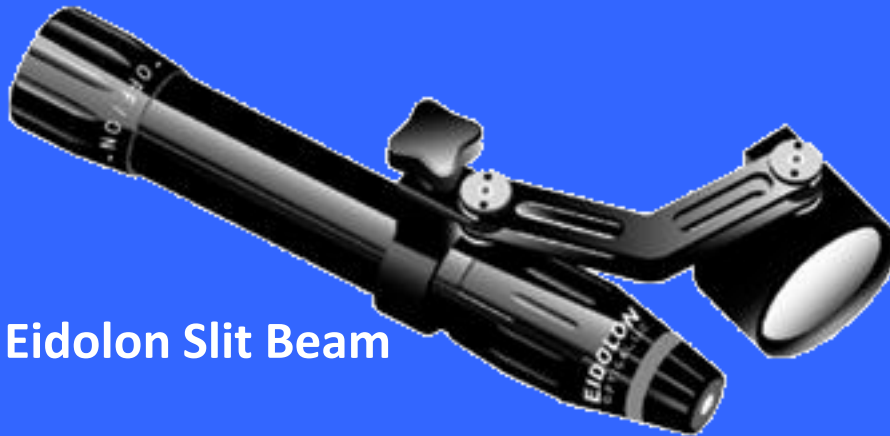
AS-OCT

DETACHMENTS

- No one technique can be used all the time
- Numerous techniques to unfold graft
- Full air fill for 1 hour & patient leaves with air bubble clearing inferior PI and inferior dilated pupil edge



ViSX Slit Beam



Eidolon Slit Beam





# DMEK Lessons

## PRE-OPERATIVE

PATIENT SELECTION

INFERIOR LASER PI

## GRAFT PREPARATION

PEELING

TISSUE > 50 YEARS OLD

DMEK/DALK SAME DAY

TRYPAN BLUE SOAK

## HOST PREPARATION

LARGER SCORE

NO DESCOMET'S TAGS

## GRAFT INJECTION

PLASTIC/GLASS INJECTOR

SUTURE WOUND

## GRAFT UNFOLDING

TECHNIQUES

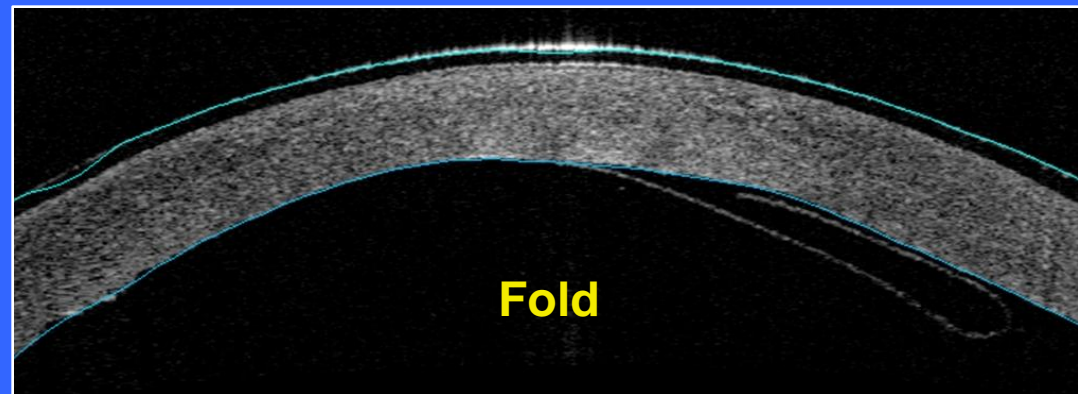
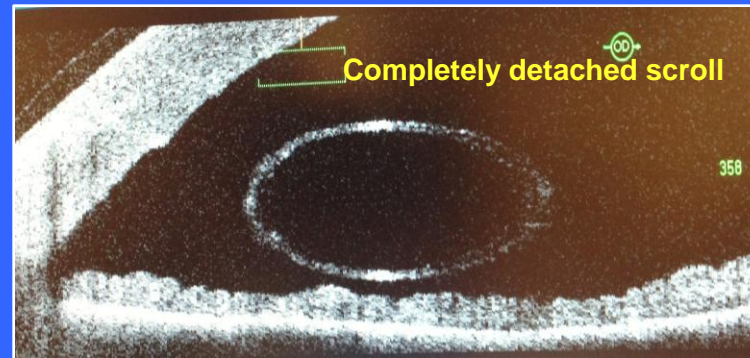
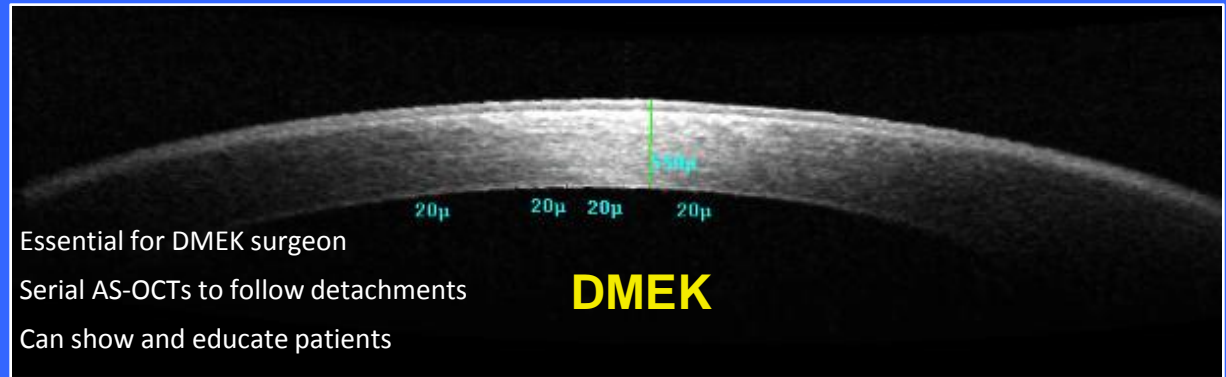
SLIT BEAM

FULL AIR FILL

## POST-OPERATIVE

AS-OCT

DETACHMENTS



uOttawa



drbaig.ca

## PRE-OPERATIVE

PATIENT SELECTION

INFERIOR LASER PI

## GRAFT PREPARATION

PEELING

TISSUE > 50 YEARS OLD

DMEK/DALK SAME DAY

TRYPAN BLUE SOAK

## HOST PREPARATION

LARGER SCORE

NO DESCEMET'S TAGS

## GRAFT INJECTION

PLASTIC/GLASS INJECTOR

SUTURE WOUND

## GRAFT UNFOLDING

TECHNIQUES

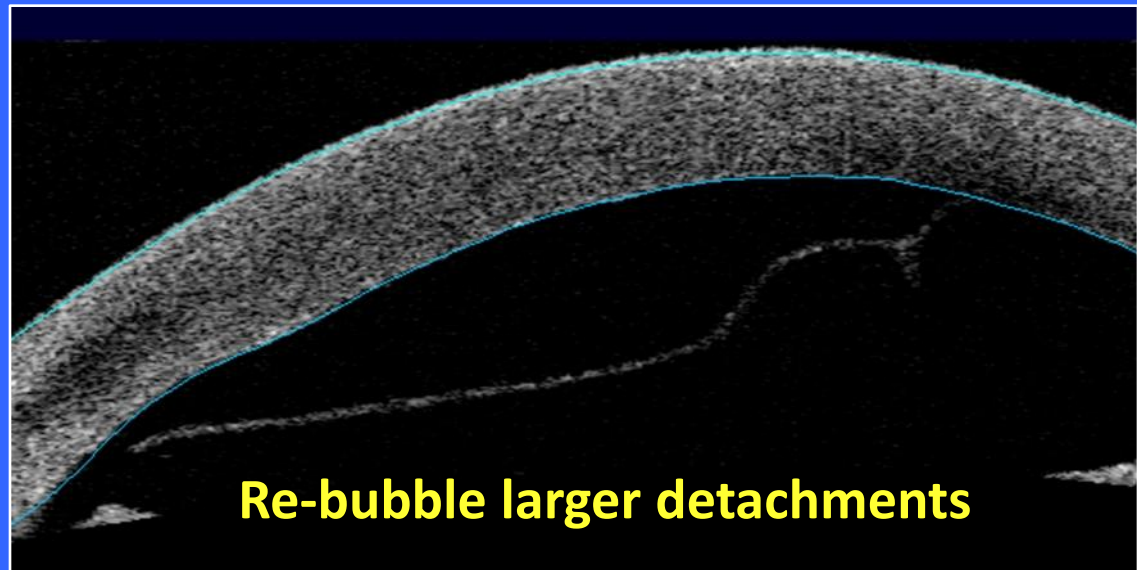
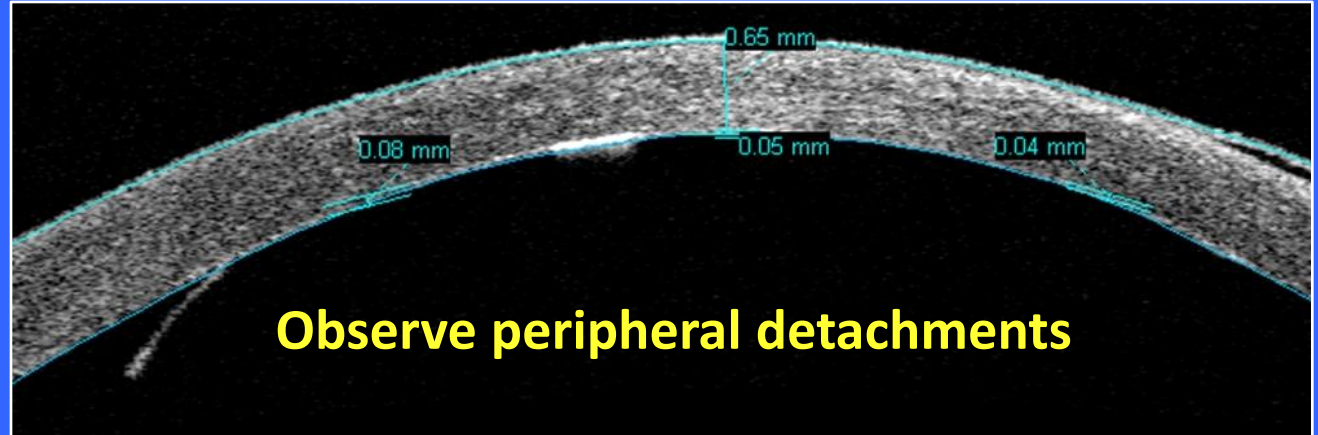
SLIT BEAM

FULL AIR FILL

## POST-OPERATIVE

AS-OCT

DETACHMENTS



# Lessons From First 10 DMEK Cases

- **Pre-Operative**

- Patient selection
- Inferior laser PI before OR

- **Graft Preparation**

- SCUBA / one forceps
- Tissue > 50 years of age
- Two partial trephines
- DMEK / DALK same day
- Soak well in trypan blue

- **Host Preparation**

- Score larger than graft size
- No Descemet's tags

- **Graft Injection**

- Plastic vs glass injector
- Suture wound well after insertion

- **Graft Unfolding**

- No one way: combination of techniques
- Can use separate slit beam
- High pressure fill for a few minutes
- New instruments

- **Post-Operative**

- AS-OCT
- Can observe peripheral detachments



# Cornea, Anterior Segment, and Refractive Surgery Team at the University of Ottawa Eye Institute

## Attendings

- Kashif Baig, MD, MBA
- Bruce Jackson, MD
- George Mintsioulis, MD
- Setareh Ziai, MD

## Clinical Fellows

- Samer Abuswider, MD (2009-11)
- Setareh Ziai, MD (2011-12)
- Abdulmajeed Aljaethen, MD (2012-13)
- Season Yeung, MD (2013-2014)
- Joshua Teichman (2013-14)

## Research Fellows

- Mustafa Kapasi, MD (2011-12)
- Salina Teja, MD (2012-13)
- Ronan Conlon, MD (2013-14)

## Technologists

- Sabrina Taylor, COMT
- Emily Wong, COMT
- Olga Plekhanova, COMT

## Research

- Melanie Lalonde, PhD
- Gail Kayuk, BSc ART
- Annelise Saunders, LLB

