11th International Meeting of the Research Institute of Ophthalmology, Cairo. 2-3 February 2017

Cataract Surgery In Different Keratoplasty Techniques

Professor Harminder Singh Dua

MBBS, DO, DO(Lond), MS, MNAMS, FRCS, FRCOphth., FEBO, FRCP, FCOptom, MD, PhD

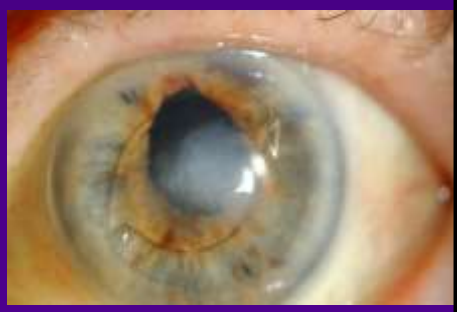
Chair and Professor of Ophthalmology

The University of Nottingham

Two Sides of the Coin

- **Impact of Cataract surgery on Keratoplasty**
- **Impact of Keratoplasty on Cataract surgery**

Cataract surgery leading to Keratoplasty

Types of Keratoplasty

- **Penetrating Keratoplasty (PK)**
- **Deep Anterior Lamellar Keratoplasty (DALK)**
- **Endothelial Keratoplasty (EK):**
  - **Descemets stripping endothelial keratoplasty (DSEK)**
  - **Descemets membrane endothelial keratoplasty (DMEK)**
  - **Pre-Descemets endothelial keratoplasty (PDEK)**

1. Biometry

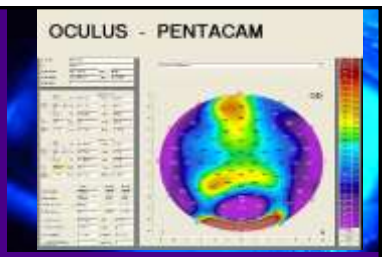
- Kertometry is often impossible

Options:

1. Standard K readings (45D or 7.5) ?
2. Opposite eye K readings ?
3. Actual (inaccurate) K readings ?
4. IOL Master or Pentacam ?

Visibility and Keratometry issues

1. Biometry

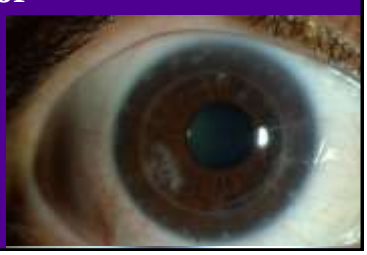


- Axial length issues

Options:

1. Keratoconus (DALK or PK): Anterior chamber depth pre-op is more than what it is going to be post-op!

2. Scarred corneas (flat corneas) (DALK or PK) Anterior chamber depth pre-op is less than what it is going to be post-op!



Need to perform IOL Master and Ultrasound measurements

1. Biometry

- **Axial length issues**

Options:

Keratoconus and flattened corneas (DALK or PK):

Consider Vitreous Cavity Length

1. Biometry

- **Axial length issues**

Guidelines of donor trephine size for KC patients using VCL as a parameter	
VCL (mm)	**Donor trephine size**
≤ 15.50	Over size graft by 0.25mm (trephine by 0.5mm)
15.50 – 16.50	Use same size graft (trephine 0.25mm larger)
≥16.50	Under size graft (trephine same size)
KC = keratoconus; VCL = vitreous cavity length: Posterior surface of lens to anterior surface of Macular	

2. Timing

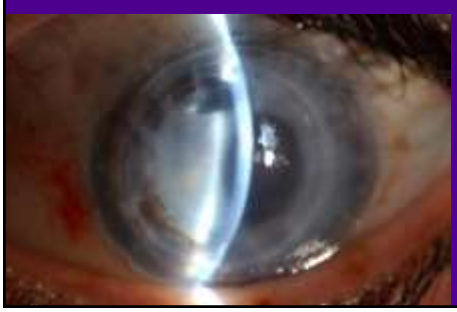
Keratoplasty followed by Cataract

- Better visibility
- More accurate biometry (DSEK induces +1 to +2 D hyperopia)
- More accuracy with power and axis of Toric implants

2. Timing

But

- Cataract surgery can compromise PK and EK endothelium: Graft Failure or Graft Rejection (raised IOP adversely affects graft)
- Have to wait till all sutures are out (important for Toric implants)



2. Timing

Cataract followed by Keratoplasty

- Graft endothelium is not put at risk
- Any surgical complication can be sorted before Keratoplasty

But

- Poor visibility may not permit this
- Unpredictable Spherical and Astigmatic Refractive outcome
- PC tear jeopardises subsequent EK
- Borderline dystrophy can rapidly deteriorate

2. Timing

Combined (Triple procedure) One operation (not two)

Penetrating Keratoplasty

- Open Sky cataract surgery is risky: Positive vitreous pressure; expulsive haemorrhage
- Continuous capsulorhexis is difficult
- In many instances this is the only option

DALK Triple

- Safe but not possible with a Type 2 Big bubble
- Effect on host endothelium is unknown

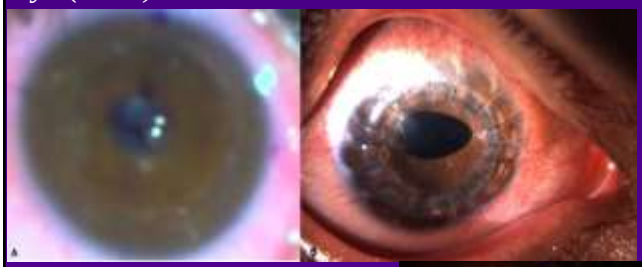
Phacoemulsification thorough DL during DALK.

Dr Ahmed Atef Zaki – Research Institute of Ophthalmology, Cairo

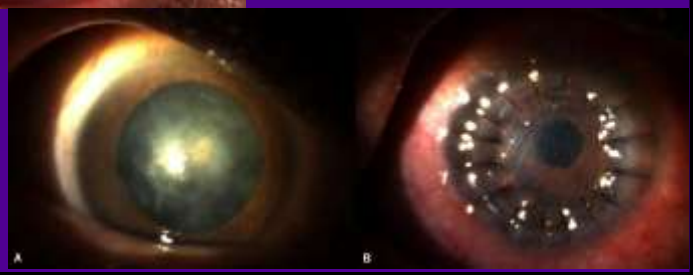
DALK TRIPLE

Clinical and Surgical Applications

Zaki AA, Elalfy MS, Said DG, Dua HS. Deep anterior lamellar keratoplasty-triple procedure: a useful clinical application of the pre-Descemet's layer (Dua's layer). Eye (Lond). 2014



DALK-TRIPLE



2. Timing

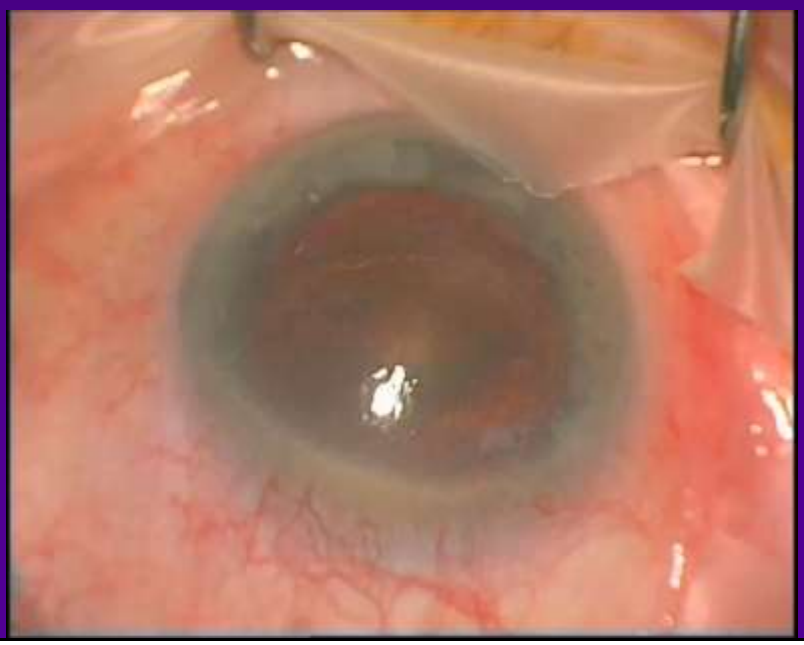
Combined (Triple procedure) One operation (not two)

Endothelial Keratoplasty

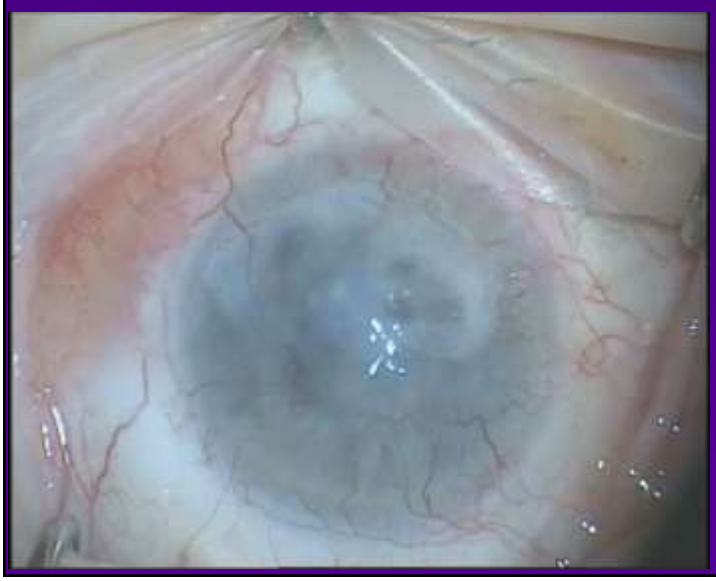
Phaco DSEK is commonly performed

- **Phaco DMEK and Phaco PDEK less so. ? Re bubbling rates are higher. Fibrin in anterior chamber makes unfolding of graft impossible.**
- **DM and or Epithelium can be removed to improve visibility for phacoemulsification**
- **Vitreous loss during Phaco can make the EK procedure difficult**

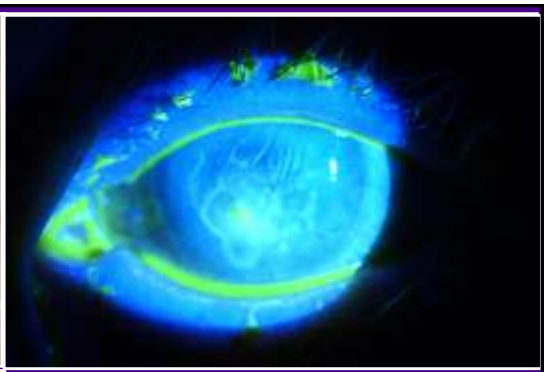
Phacoemulsification + DSEK



The less known face of Cataract Surgery and Keratoplasty



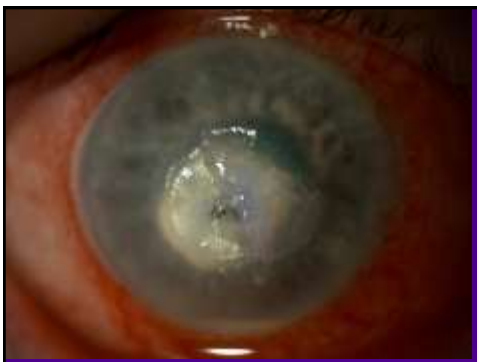
Post chemical injury: Scarred corneal stroma and endothelium, Perforation sealed with glue, Limbal stem cell deficiency and Cataract



Cataract with PK in Infectious Keratitis

Active Keratitis: Avoid cataract extraction? Risk of endophthalmitis

Glue at time of PK



Hot Graft in active perforated corneal ulcer. Cataract left alone

THANK YOU