Intraocular Graft Unfolding Techniques in Descemet membrane endothelial keratoplasty (DMEK)

**Purpose**
To define and evaluate various Descemet membrane graft unfolding techniques in DMEK

**Materials & Methods**
Retrospective video analysis of 100 consecutive DMEK cases

Outcome measures:
Best Corrected Visual Acuity (BCVA), Endothelial Cell Density (ECD), Complications ≥ 6 months

Unfolding methods were categorized into four basic techniques (Technique I, II, III, IV)

Statistical regression analysis

**Unfolding Techniques I-IV**

- **‘Double roll’**
  - Technique I: Standardized no-touch technique
  - ‘Roll with average tightness’

- **‘Single roll’** (partly unfolded)
  - Technique II: ‘Dirisamer technique’
  - ‘Tight roll’

- **‘Loose roll’**
  - Technique III: ‘Dapena maneuver’

- **‘Single sliding cannula maneuver’**
  - Technique IV: ‘Single roll’ (partly unfolded)

Each technique used either as stand-alone or in combination with one or more techniques

**Results**

- Technique I was used in 73% of surgeries either as stand-alone or in combination with one or more techniques
- Combination of techniques were used in 44%
- Auxiliary techniques were used in 62%
- None of techniques I-IV correlated with BCVA, ECD or postoperative complication rate (P>0.1)

**Conclusion**

- DMEK may be facilitated by using controlled techniques for unfolding the Descemet membrane graft, either as a stand-alone technique or in various combinations
- Choosing the most ‘suitable’ technique will make DMEK safer and easier
- Without compromising the result or affecting the final outcome

**DMEK steps before graft unfolding**

1. **Graft preparation**
   - Try to achieve a ‘double roll’

2. **Graft implantation**
   - Try to inject already correctly oriented

3. **Check graft orientation**
   - Correct orientation with endothelium on the outside: graft curls are facing up, tip of cannula turns blue

**Auxiliary techniques**

1. Flushing the graft to turn it from ‘upside down’ orientation
2. Manual centration of the graft with a cannula
3. ‘Bubble bumping’ to unfold inward folds after graft lifting

Watch the videos on the unfolding techniques here on www.youtube.com (keywords: NIIOS, DMEK)