

# Avoiding Mistakes with DSAEK

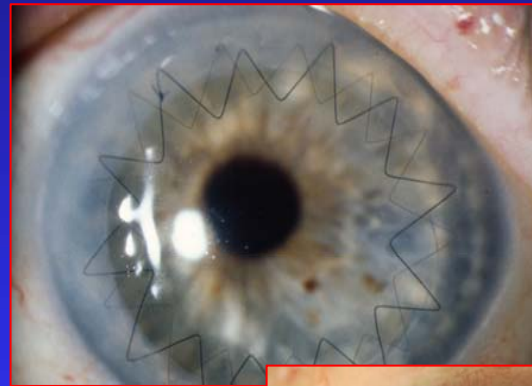
## Pearls for the Converting Corneal Surgeon

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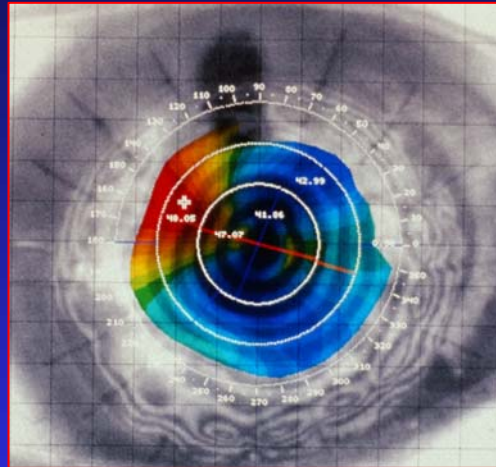
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# PK vs. DSAEK

## Refractive surprise !!



**Surgeon:** *“Your graft is crystal clear, Mr. Jones!”*

**Patient:** *“So how come I can’t see, Doc?”*

# DSAEK technique

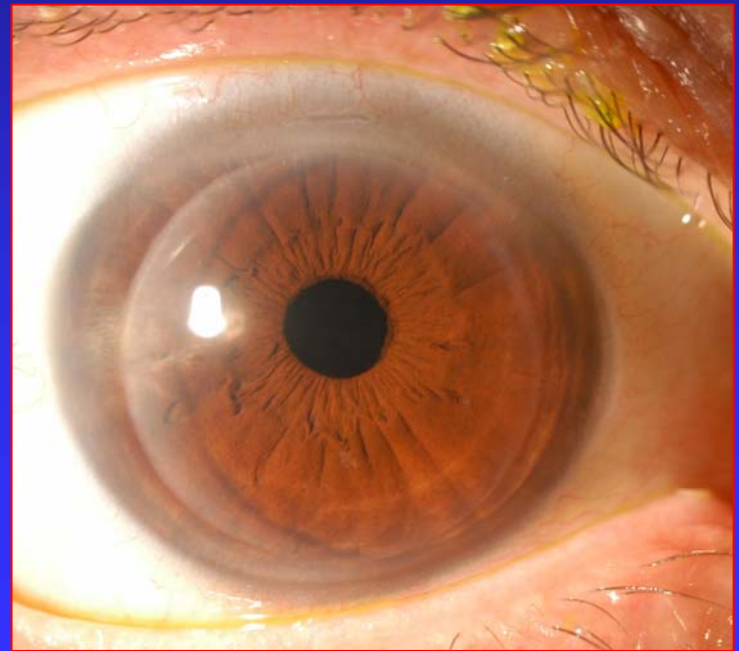
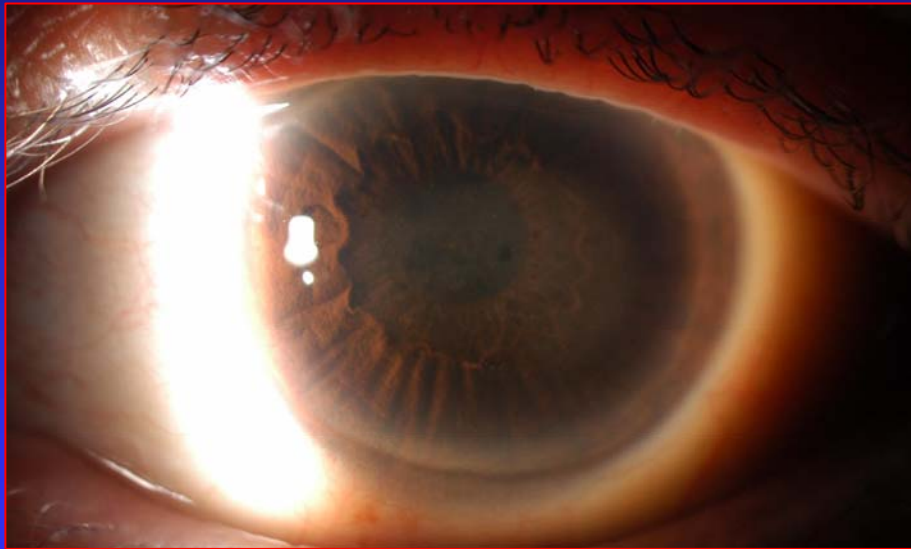
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- 1. Removal of recipient's Descemet's membrane with dysfunctional endothelium**
- 2. Microkeratome-assisted preparation of donor tissue (posterior stromal lamella with Descemet's / endothelium)**
- 3. Transfer of donor tissue into host, and air tamponade**

# PK vs. DSAEK

Descemet's stripping endothelial keratoplasty

DSAEK



# DSAEK: Advantages

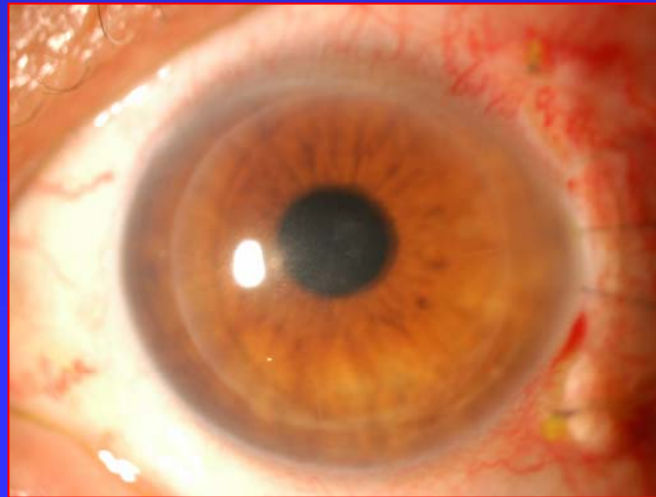
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1. Rapid visual rehabilitation
2. ?Decreased allograft rejection
3. No permanent sutures
4. Intact globe (resistant to trauma)
5. Small hyperopic shift

# DSAEK: Disadvantages

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1. **Totally new procedure for the corneal surgeon technically demanding**
2. **Steep learning curve with high incidence of dislocation**
3. **Lamellar interface no 20/20 ...yet !**



# DSAEEK: Donor dislocation

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1. Patient selection
2. Tissue preparation
3. Surgical technique
4. Retained viscoelastic
5. Inverted endothelial graft
6. Endothelial dysfunction
7. Unknown (delayed endothelial pump function recovery) !



# DSAEK: Personal Results

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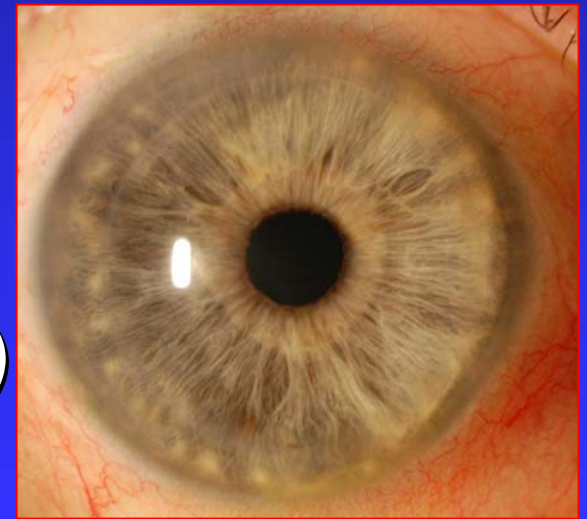
- ◆ 91 grafts (Oct 05 - Apr 07 Hannush)
- ◆ Pre-op dxs: Fuchs', PCE (pseudophakic corneal edema) / PBK (pseudophakic bullous keratopathy)
- ◆ Pre-op VA:  
20/50 - CF 1 ft



# DSAEK: Personal Results

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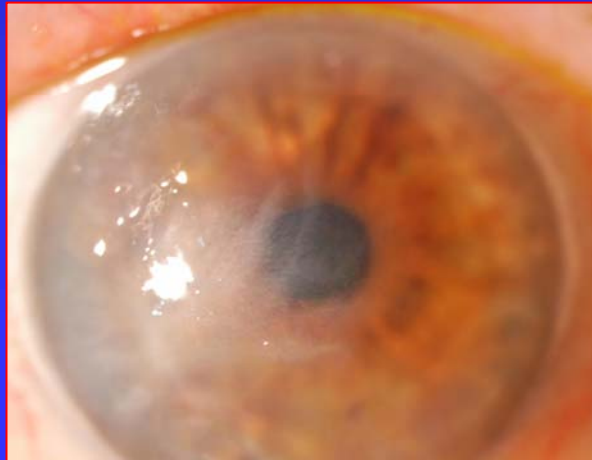
- ◆ Follow up: 1 week to 18 months
- ◆ Dislocation rate: 9 of 91 (2 in last 40)
- ◆ Eight rebubbled successfully, one repeat DSAEK, two PK
- ◆ Post-op VA 20/25 - 20/80
- ◆ Three graft rejections  
(two reversed with meds.)



# DSAEK: Patient selection

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- ◆ Important during early cases
  - Choose:
    - ✓ Pseudophakic eyes with posterior chamber intraocular lens implants and, if possible, intact capsules



# DSAEK: Patient selection

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**Critically important during early cases**

**Avoid :**

**Patients with anterior chamber implants**

**Patients with direct communication between anterior chamber and vitreous cavity  
(monocameral eyes)**

# DSAEK: Patient selection

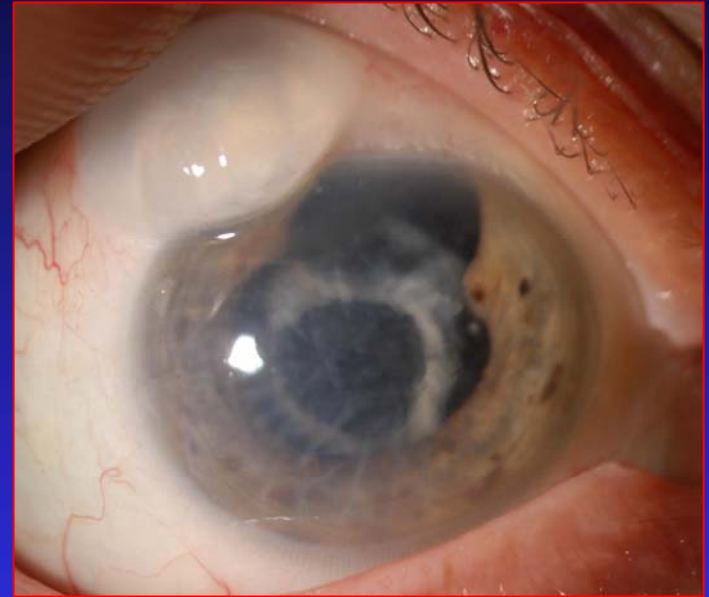
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Avoid :

**Phakic patients**

**Patients with  
large blebs**

**Patients with synechia**



# DSAEK: Donor tissue selection

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**Cell count  $\geq$  2500 cells/mm**

**☯☯ Scleral rim: 15.5 mm shortest diameter**

**Note: consider allowing tissue to warm up to room temperature before start of procedure**

# DSAEK: Preparation of donor tissue

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- ◆ Do not proceed unless artificial chamber properly pressurized
- ◆ Do not proceed unless artificial chamber properly pressurized
- ◆ Avoid chamber collapse

# DSAEEK: Preparation of donor tissue

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**Remember to remove epithelium**

**Use a 250, 300 or 350  $\mu\text{m}$  head**

**Mark stromal side of donor button  
with “S” or “Z” to help with  
orientation**

**Punch with endothelial side up**



# DSAEK: Preparation of donor tissue

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- ◆ **Mark edge and center of donor if donor tissue is eccentrically placed on artificial chamber, make appropriate adjustment before punching donor button**
- ◆ **Position resected cap under posterior lamellae before placing on punching block**

# DSAEK: Pre-op patient preparation

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- ◆ **Regional block (consider 100% topical glycerin drops or epithelial removal of host)**
- ◆ **Mannitol (consider if positive P<sup>o</sup>)**
- ◆ **Topical dilating drops (2.5 % phenylephrine) to obtain red reflex**

# DSAEK : Pearls for the converting surgeon

DSAEK after cat/iol 1m

QuickTime™ and a  
DV/DVCPRO - NTSC decompressor  
are needed to see this picture.

# DSAEK: Intra-operative

- ◆ Scleral tunnel or corneal incision
  - internal lumen peripheral to proposed donor button location
- ◆ Place Paracentesis to allow for controlled air release during burping
- ◆ Make Paracentesis perpendicular to corneal plane so that internal lumen is peripheral to donor button

# DSAEK: Intra-operative

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- ◆ **Determine size of incision (3.2 - 5.2) early in procedure to avoid having any blood in anterior chamber just before donor button insertion**
- ◆ **Use chamber maintainer or Healon**
- ◆ **When scoring with reverse Sinskey avoid unnecessary pressure on stroma**

# DSAEK: Intra-operative

- ◆ Use 90° stripper to strip Descemet's membrane. It usually comes off rather easily
- ◆ Gently scrape peripheral aspect of host posterior stroma to potentially improve adherence
- ◆ Inspect stripped Descemet's membrane



◆ Irrigate Healon out completely!



◆ Irrigate Healon out completely!!

# DSAEK : Pearls for the converting surgeon

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DSAEK 20s


QuickTime™ and a  
DV/DVCPRO - NTSC decompressor  
are needed to see this picture.

# DSAEK: Intra-operative

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- ◆ **Place drop of Healon on donor endothelium before folding into 60/40 taco**
- ◆ **When inserting donor button into AC watch for chamber collapse; use second instrument to prevent retraction of donor button out of eye. Consider use of chamber maintainer if not already in eye (control with foot pedal; avoid free flow)**

# DSAEEK: Intra-operative

- ◆ When reforming AC inject on stromal side of button to create fluid wave onto endothelial side (Ocean Spray™ Cranberry Juice wave effect) 
- ◆ If no response, use two reverse Sinsky hooks to unfold
- ◆ Confirm “S” or “Z” mark is in correct orientation

# DSAEK : Pearls for the converting surgeon

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DSAEK 50s

QuickTime™ and a  
DV/DVCPRO - NTSC decompressor  
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# **DSAEEK: Intra-operative**

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- ◆ **Place 10-0 nylon suture in surgical incision. If wound construction is less than ideal (incompetent valve) place sutures before any AC irrigation to avoid extrusion of button**
- ◆ **Inject air for tamponade. Make sure air is posterior to donor button. If air is entrapped anterior to button remove and start again**

# **DSAEK: Intra-operative**

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- ◆ **Position (center) button with reverse Sinsky hook**
- ◆ **Place as much air in AC as possible ( 80-90% fill) to achieve good tamponade (30-50 mm Hg). Avoid rock hard eye. Check for LP. The globe will remain firm until burping**

# **DSAEK: Intra-operative**

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- ◆ **Vent interface, preferably with diamond blade (look for egress of fluid or small movement of donor button.) Vents may be further manipulated with Sinskey hook**
- ◆ **Close conjunctiva with 8-0 Vicryl suture**
- ◆ **Place atropine 1% and antibiotic, tape and shield**

# DSAEK : Pearls for the converting surgeon

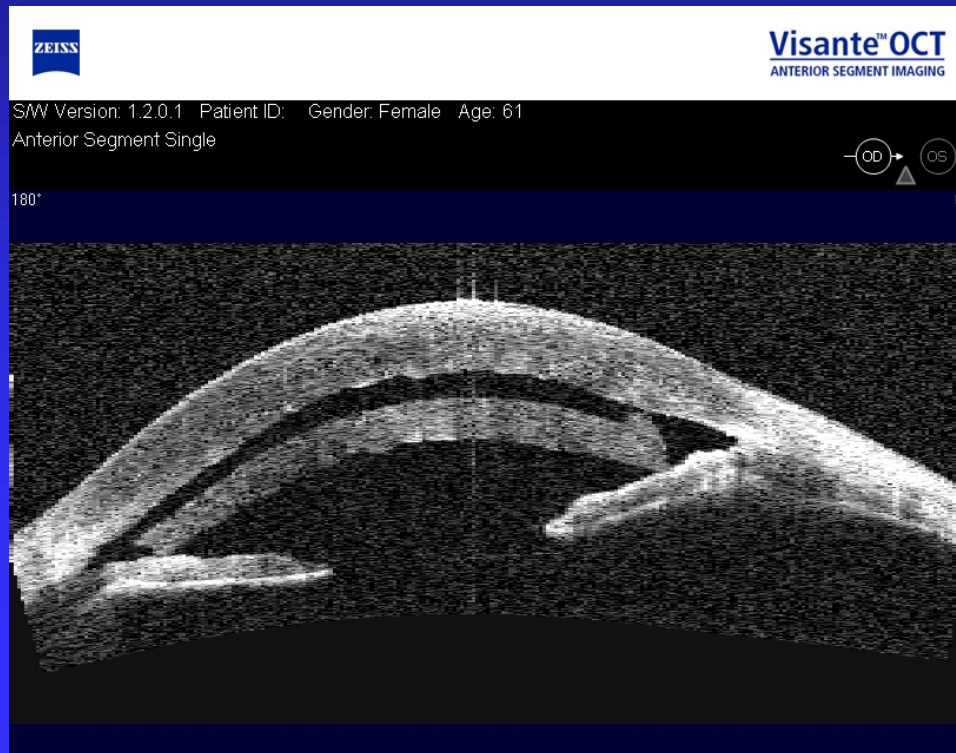
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DSAEK 17s

QuickTime™ and a  
DV/DVCPRO - NTSC decompressor  
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# DSAEK: Intra-operative

- ◆ **Transfer patient to PACU. Patient to lie supine for 30- 60 minutes**



# **DSAEK: Immediate post-op**

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- ◆ **Confirm position of donor button at slit lamp**
- ◆ **Burp air out of Paracentesis until inferior air bubble meniscus clears the inferior pupillary margin to break pupillary block**

# DSAEK: Immediate post-op

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- ◆ If unable to burp, may need to insert 30 gauge cannula or needle into AC to remove air  
Caution: make sure tip of needle or cannula is posterior to donor button
- ◆ In the event of excessive manipulation, offer Avelox™  
400 mg qd x 5
- ◆ Patch and shield

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# DSAEK: Post-op Day 1

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- ◆ Expect 30% air bubble. If not, consider posterior migration of air into vitreous cavity  
Expect VA: 20/200 - CF @ 6 ft
- ◆ If  $VA \leq CF$  @ 4ft look for donor button dislocation
- ◆ Inspect donor button for apposition and centration
- ◆ If well apposed but decentered do not manipulate

# DSAEK: Post-op Day 1

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- ◆ If dislocated posteriorly consider rebubbling AC same day or after 5-7 days for endothelial pump recovery
- ◆ Instruments for rebubbling: 3 cc syringe, 30 gauge cannula or needle, lid speculum, sharp blade, and 2 reverse Sinsky hooks. Offer Avelox 400 mgs po qd x 5

# Case Presentation

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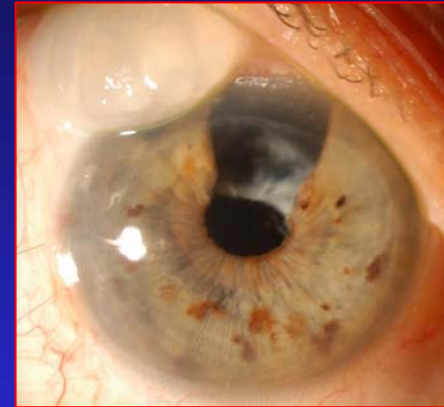
- 12/29/05 DSAEK
- 12/30/05 bubble gone, migration into filtering bleb, button dislocated
- Rebubble!
- 12/31/05 button still dislocated, rebubble again!!
- 01/01/06 VA 20/200
- 03/05/06 VA 20/30



# Descemet's stripping automated endothelial keratoplasty



**DSAEK**



# DSAEK: Post-op Day 1

**Start post-operative steroids and antibiotics. Consider NSAID if combined procedure with cataract removal**

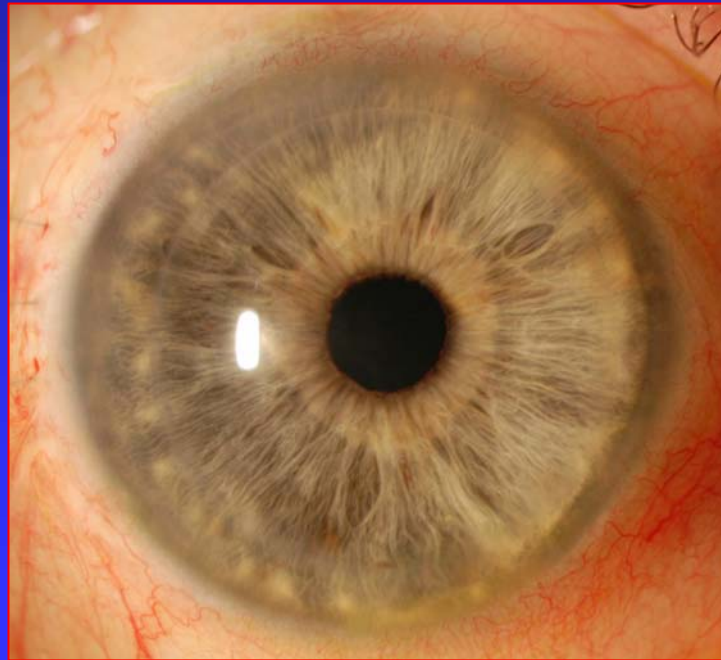
- ◆ **Follow up in one week**



# Conclusions

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**DSAEK is becoming the preferred method for endothelial replacement in patients with Fuchs' dystrophy and corneal endothelial dysfunction**



# Conclusions

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- ◆ **Command of pre-, intra-, and post-operative management, especially of button dislocation, is essential to success of the procedure !**
- ◆ **DSAEK is here to stay !!**

# Conclusions

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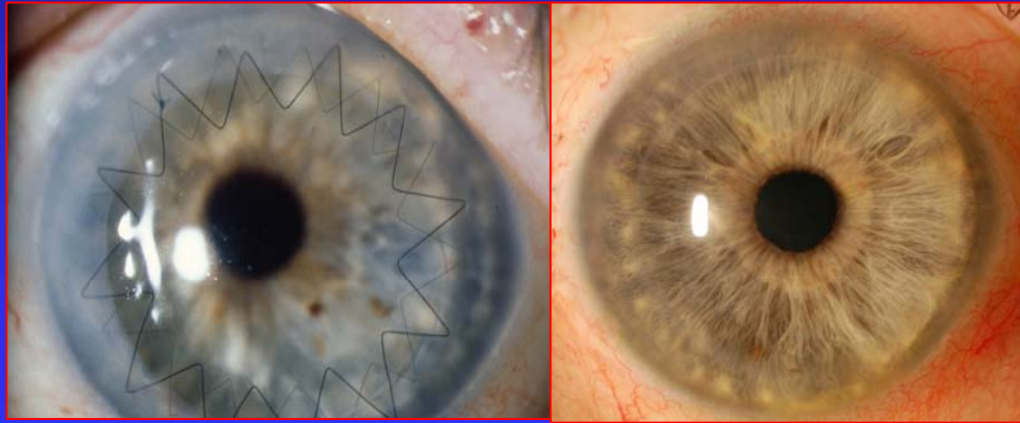
- ◆ **Command of pre-, intra-, and post-operative management, especially of button dislocation, is essential to success of the procedure !**



- ◆ **DSAEK is here to stay !!**

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# Avoid the mistakes we made in Transition to DSAEK: Pearls for the Converting Corneal Surgeon



Thank you

# Some Mistakes I have made

## Patient selection

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- **Cornea too hazy**
- **Cornea vascularized**
- **Regraft**
- **Aphakia**
- **AC lens**
- **Synechia with shallow a/c**
- **Filtering bleb (relative)**

# Some Mistakes I have made

## Button Preparation

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- While putting cornea on artificial anterior chamber cornea stuck to forceps
- Rim too short
- Loss of chamber when starting cut
- Collapse of chamber removing button from artificial anterior chamber
- Movement of button while removing from aac

# Some Mistakes I have made Button Preparation

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- **Check IOP to monitor for cut**
- **Cutting button make sure correct head ie need corneal thickness**
- **Make sure Moria is in correct direction (letters facing you)**
- **Avoid markings on instruments used for cutting donor**
- **Before removing button from aac remember to turn fluid on**

# Some Mistakes I have made Operation

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- Not having eye centered (sutures)
- Wrong place for incision
- Not cauterizing completely
- Forgetting to place corneal vents
- Folding incorrectly
- Not having Taco in forceps correctly
- Not removing tissue correctly

# Some Mistakes I have made Operation

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- Failure to remove Descemet's
- Pressing too deeply into Descemet's
- Failure to check for removal of Descemet's
- Failure to use trypan if unsure
- Making vents too small, too large or too shallow

# Some Mistakes I have made Operation

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- Place too much air in anterior chamber
- Not placing suture into taco when unable to open
- Failure to suture in right place
- Poor centration of button

# Some Mistakes I have made Operation

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- Too many Paracenteses
- Inability to raise intraocular pressure
- Too few sutures to close wound
- Wound too small
- Wound too large?

# Some Mistakes I have made Post-op

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- Not inform the patient that the first post-op visit may be four hours
- Suturing button because of dislocation
- Not giving graft rejection sheet
- Failure of patient to understand duration of Pred Forte<sup>R</sup>

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# Overall Summary

- **Fantastic surgical procedure**
- **Light years better than PK**
- **Loaded with new complications**
- **Complications for the most part may be managed and less severe than those of Penetrating Keratoplasty**