Connecting the O's: Collaborative Care in the 21st Century

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Cecelia Koetting Financial Disclosures

"All relevant relationships have been mitigated."

Ocular Therapeutix -C
Horizon-C
Ivantis-C
Orasis-C
Otto-C
Trukera-C
LENZ-C
PRN-C,S
Kala-R
Tarsus-C,S,R
Topcon-C

Intrepid

+ Glaukos-C
+ B +L- C,S
+ Iveric-C
+ Aldura-C
+ Claris Bio-C
+ Aldeyra-C
+ Twenty Twenty Therapeutics-C
+ Dompe-C,S,R

Oyster Point/Viatris-C, S,R
Allergan/Abbvie -C,S,R
Alcon-C,S
Visus-C,S
Harrow-C,S
Thea-C,R
Bruder-C
Blinkjoy-C
SCOPE-C

KOETTING

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Why Optometric Co-management?

- High quality eye care
- Benefits to patient care
- Utilize skills and expertise of each practitioner

Benefits to patient care:
- Patient comfort
- Patient convenience
- Efficiency
- Cost effective

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Pearls on Optometric Co-management

- Get to know your surgeon
- Convey patient preferences, observations and conditions to your surgeon
- Inform your patients on your role in perioperative care
- ***Successful co-management is the result of continuous communication***

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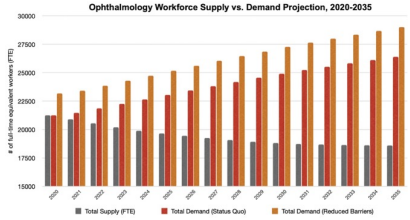
Supply and Demand: Growing Gap in Access to Medical Eye Care

- **Demand** for eye care services has been projected to increase
- **Supply of Ophthalmologists** only expected to decrease
  - From 2020 to 2035, the total ophthalmology supply is projected to decrease by 2650 full-time equivalent (FTE) ophthalmologists (12% decline)
  - Total demand is projected to increase by 5150 FTE ophthalmologists (24% increase), representing a supply and demand mismatch of 30% workforce inadequacy.



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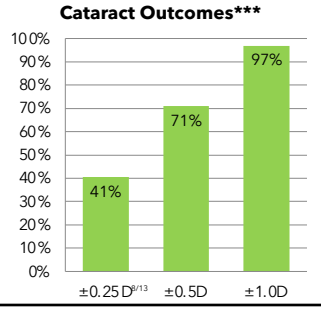
High Expectations in Cataract Refractive Surgery

- Patient expectations are at an all-time high for refractive surgery
- Positive experiences with LASIK have produced high expectations, at a minimum achieving:
  - 92.6% of LASIK patients with vision of 20/40 or better*
  - 95.4% of patients satisfied with their outcome after LASIK surgery**
- Cataract surgery outcomes may not be meeting the target of ±0.5D that is considered the standard

*"LASIK Surgery Statistics." *Docshop.com*. http://www.docshop.com/education/vision/refractive/lasik/statistics
**Solomon, K et al. (2009) "LASIK world literature review: quality of life and patient satisfaction." *Ophthalmology*. 16(4):691-701
***Graph: Data from Dr. Warren Hill & Behndig A, et al. Aiming for emmetropia after cataract surgery: Swedish National Cataract Register study. J Cataract Refract Surg. 2012;38(7):1181-6.



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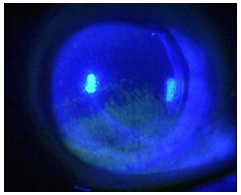
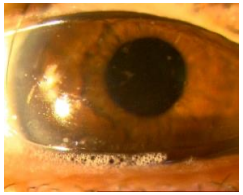
Preparation for Ocular Surgery

Optimize the Ocular Surface
Normalize the Lids
Prepare the Cornea
Eliminate Intra-ocular Inflammation
Control Glaucoma
Evaluate the Macula
Evaluate the Retinal Periphery
Patient Education





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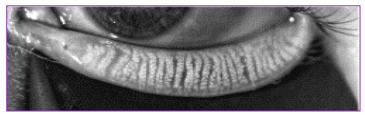
Dry Eye Disease

Chair time: blurred vision from cataracts versus DED

Cataract sx can worsen DED for months after surgery

Quality of vision may require chronic DED therapies



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ARTICLE

Prevalence of ocular surface dysfunction in patients presenting for cataract surgery evaluation

Preeya K. Gupta, MD, Owen J. Drinkwater, BS, BA, Keith W. VanDusen, BS, Ashley R. Brissette, MD, MSc, Christopher E. Starr, MD

Results: There were 120 patients (69% women), mean age 69.5 years ± 8.4 (SD). Abnormal osmolarity was found in 68 patients (56.7%), and abnormal MMP-9 in 76 patients (63.3%). Clinical findings showed that 47 patients (39.2%) had positive corneal staining on presentation, 9 patients (7.5%) had epithelial basement membrane dystrophy, and 2 patients (1.6%) had Salzmann nodules. Questionnaire data showed 54 (54.0%) of 100 patients reported symptoms suggestive of ocular surface dysfunction. In the asymptomatic group of 46 patients, 39 (85%) had at least 1 abnormal tear test (osmolarity or MMP-9) and 22 (48%) had both tests abnormal. Overall, 96 (80%) of 120 patients had at least 1 abnormal tear test result suggestive of ocular surface dysfunction and 48 patients (40%) had 2 abnormal results.

J Cataract and Refractive Surgery 2018

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Cataract Surgery and Dry Eye

- Incidence: 42% eyes at 1 week follow-up, up to 1/3 of patients after 3 months after surgery![1, 2]
- Etiology:
  - Decreased goblet cell density, age, duration of exposure to microscope light and effective phacoemulsification time[3]
  - Possibly worse with femtosecond laser-assisted cataract surgery[4]
  - Possibly grooved incision[5]
  - Medication toxicities
- No relationship to incision location

1. Ishrat S., Nema N, Chandravanshi SCL. Saudi J Ophthalmol. 2019 Jan-Mar;33(1):34-40.
2. Iglesias E, Galor A, et al., Cornea. 2018 Jul;37(7):893-898.
3. Kohli P, Handa U, et al. Int Ophthalmol. 2019 Jun;39(6):1345-1353.
4. Yu Y, Yao K,et al.. J Cataract Refract Surg. 2015 Dec;41(12):2614-23.
5. Cho YK, Kim MS. Korean J Ophthalmol. 2009 Jun;23(2):65-73.

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Effect of Tear Osmolarity on Repeatability of Keratometry for Cataract Surgery Planning

Epitropoulos, Alice T. et al. Journal of Cataract & Refractive Surgery , Volume 41 , Issue 8 , 1672 - 1677

- Significantly more variability in average K and anterior corneal astigmatism was observed in the hyperosmolar group, with significant resultant differences in IOL power calculations.
- Variability was not significantly different when subjects were grouped by self-reported dry eye.
- Measurement of tear osmolarity at the time of cataract surgery planning can effectively identify patients with a higher likelihood of high unexpected refractive error resulting from inaccurate keratometry.

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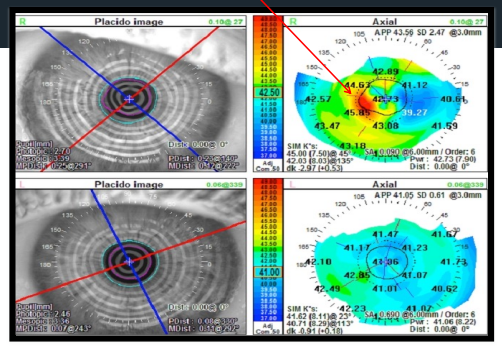
"Hot spots" and "Flat spots" are abnormal



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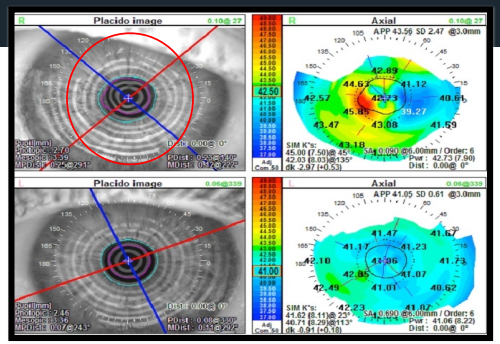
Irregularly shaped or smudgy placido disk is abnormal!



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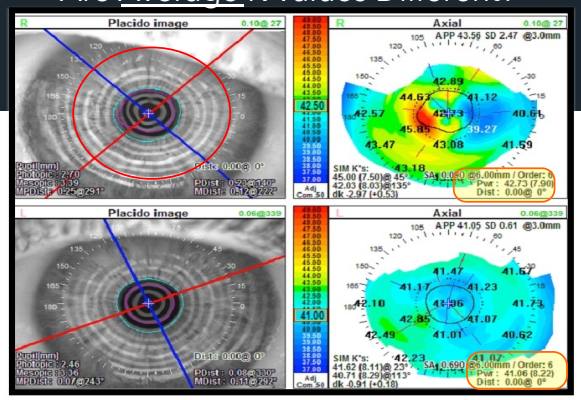
Are Average K Values Different?



Images courtesy of Elizabeth Yeu, MD

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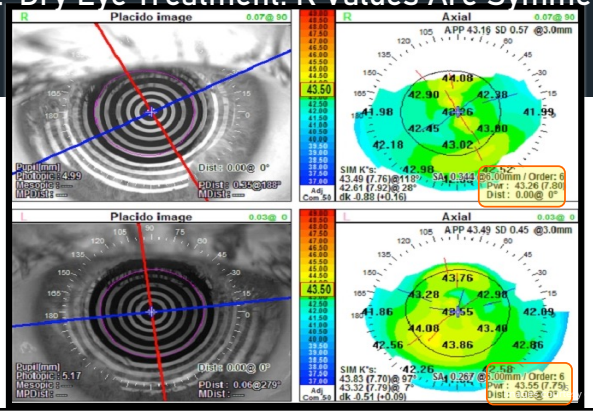
Post-Dry Eye Treatment: K Values Are Symmetrical



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Cataract Surgery and Dry Eye

Meibomian gland function can be affected after cataract surgery

- Meibomian gland function may worsen with or without structural changes after cataract surgery [6, 7]
- Alterations in MG expressibility and TBUT persist for up to 3 months postoperatively[8]

Pre-existing DED is a significant risk factor for post-op DED![7]

- Compared with the no dry eye group, dry eye group revealed significantly higher post-op ocular symptom scores, lower TBUT, higher lid margin abnormalities, meibum quality and expressibility scores.

6. Han KE, Seo KY, et al. Am J Ophthalmol. 2014 Jun;157(6):1144-1150.
7. Park Y, Hwang HB, Kim HS. PLoS One. 2016 Oct 3;11(10):e0152460.
8. El Ameen A, Pisella PJ, et al. \ J Fr Ophtalmol. 2018 May;41(5):e173-e180.

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60% of Routine Cataract Patients were ASYMPTOMATIC

50% had central corneal staining

Trattler WB, Majmudar PA, Donnenfeld ED, McDonald MB, Stonecipher KG, Goldberg DF. The Prospective Health Assessment of Cataract Patients' Ocular Surface (PHACO) study: the effect of dry eye. Clin Ophthalmol 2017; 11:1423–1430

Dry Eye in Cataract Surgery: The Big Picture

Data from the Prospective Health Assessment of Cataract Patients' Ocular Surface (PHACO) study showed just how often OSD affected patients undergoing cataract surgery. Given such data, it becomes clearer than ever that OSD treatment plays a crucial role in the success of cataract surgery.

TBUT
171 eyes (62.9%) had a tear break-up time of less than 5 seconds

CORNEAL STAINING
209 eyes (76.8%) had positive corneal staining
136 eyes (50%) had central corneal staining

SCHIRMER TESTING
132 eyes (48.5%) had a Schirmer test score of 10 or less
58 eyes (21.3%) had a Schirmer test score of less than 5

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New Research

Evaluated the effect of microscope exposure time on dry eye incidence

Determined that overall in patients undergoing SICS microscope exposure time was not significantly associated with the incidence of dry eye at 1-week or 1-month follow-up

In the phacoemulsification group, exposure time >15 min was found to be significantly associated with an increased risk of dry eye at first follow-up

Test	Pre-Op	1 week	1 month
Schirmer	27.22±4.40	12.91±2.95	24.61±6.32
TBUT	13.50±1.89	9.64±2.20	13.16±2.45
Lissamine Green Greater than 2	34.2%	97.5%	44.2%

Garg P, Gupta A, Tandon N, Raj P. Dry Eye Disease after Cataract Surgery: Study of its Determinants and Risk Factors. *Turk J Ophthalmol*. 2020;50(3):133-142. doi:10.4274/tjo.galenos.2019.45538

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-More than 1 million LASIK surgeries are performed annualy in the US

-Dry eye signs and symptoms are found in 50% of the patients who had LASIK at PO 1 week, 40% at PO 4 weeks, and 20-40% at PO 6 months (Toda et al.)

-Pre-op dry eye is considered a risk factor for the development of chronic post-operative dry eye

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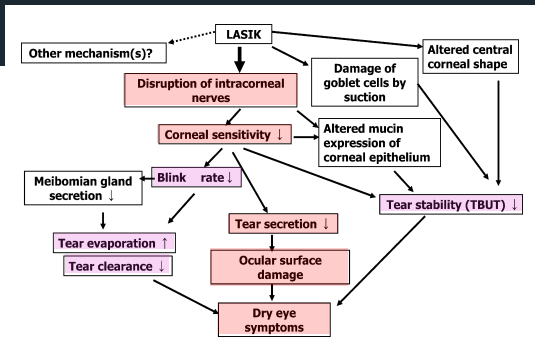
Dry Eye Disease after LASIK



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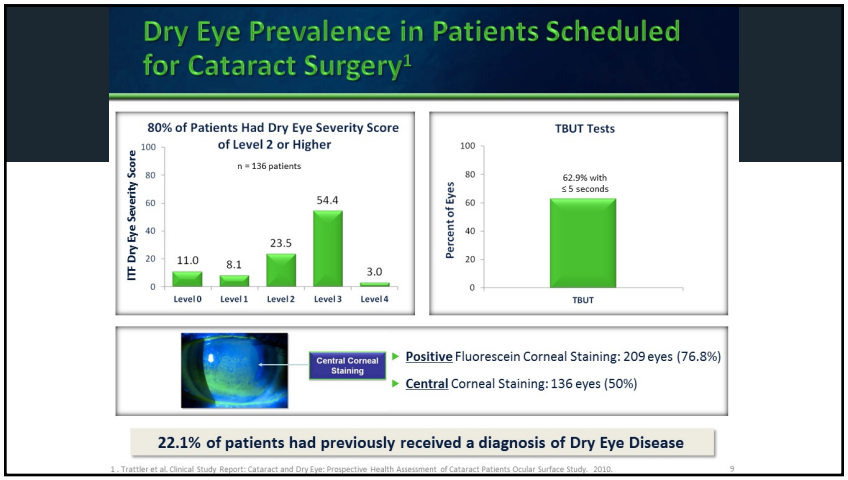
Dry Eye Prevalence in Patients Scheduled for Cataract Surgery[1]
80% of Patients Had Dry Eye Severity Score of Level 2 or Higher
n = 136 patients
ITF Dry Eye Severity Score
11.0
8.1
23.5
54.4
3.0
Level 0
Level 1
Level 2
Level 3
Level 4
TBUT Tests
Percent of Eyes
62.9% with ≤ 5 seconds
TBUT
Central Corneal Staining
Positive Fluorescein Corneal Staining: 209 eyes (76.8%)
Central Corneal Staining: 136 eyes (50%)
22.1% of patients had previously received a diagnosis of Dry Eye Disease
1 . Trattler et al. Clinical Study Report: Cataract and Dry Eye: Prospective Health Assessment of Cataract Patients Ocular Surface Study. 2010.

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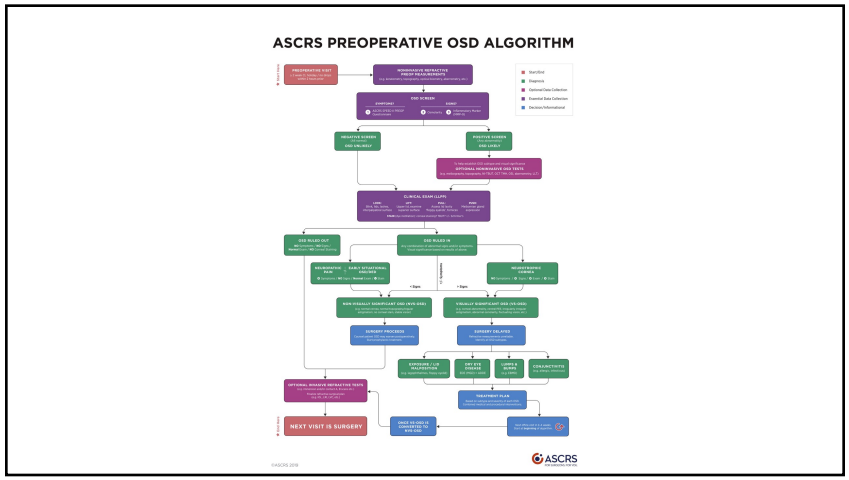
ASCRS PREOPERATIVE OSD ALGORITHM
NEXT VISIT IS SURGERY
ASCRS

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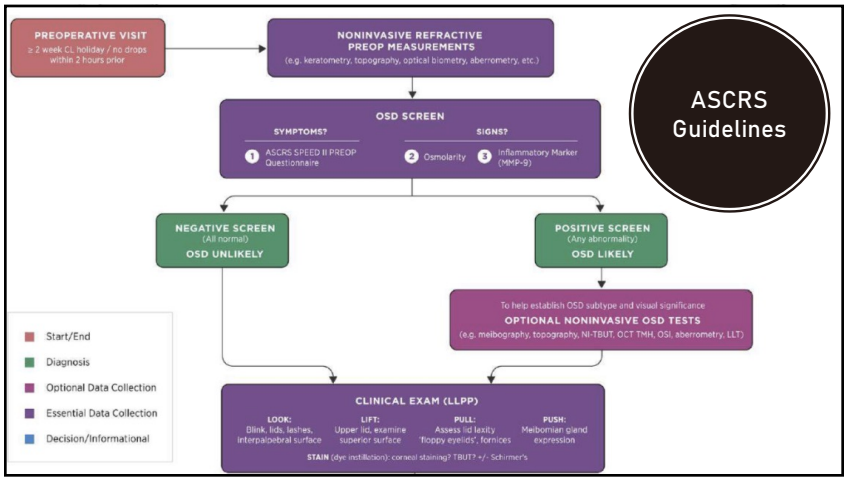
PREOPERATIVE VISIT
≥ 2 week CL holiday / no drops within 2 hours prior
NONINVASIVE REFRACTIVE PREOP MEASUREMENTS
(e.g. keratometry, topography, optical biometry, aberrometry, etc.)
OSD SCREEN
SYMPTOMS?
SIGNS?
1 ASCRS SPEED II PREOP Questionnaire
2 Osmolarity
3 Inflammatory Marker (MMP-9)
ASCRS Guidelines
NEGATIVE SCREEN
(All normal)
OSD UNLIKELY
POSITIVE SCREEN
(Any abnormality)
OSD LIKELY
To help establish OSD subtype and visual significance
OPTIONAL NONINVASIVE OSD TESTS
(e.g. meibography, topography, NI-TBUT, OCT TMH, OSI, aberrometry, LLT)
CLINICAL EXAM (LLPP)
LOOK:
Blink, lids, lashes, interpalpebral surface
LIFT:
Upper lid, examine superior surface
PULL:
Assess lid laxity "floppy eyelids", fornices
PUSH:
Meibomian gland expression
STAIN (dye instillation): corneal staining? TBUT? +/- Schirmer's
Start/End
Diagnosis
Optional Data Collection
Essential Data Collection
Decision/Informational

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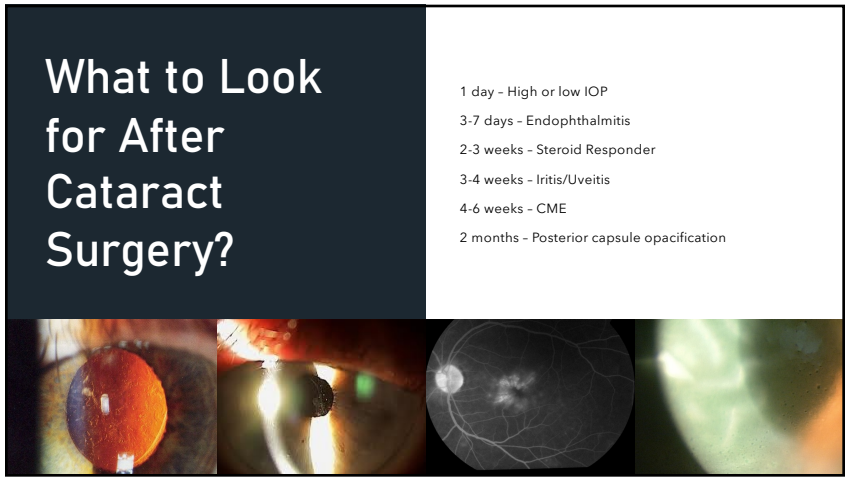
What to Look for After Cataract Surgery?
1 day – High or low IOP
3-7 days – Endophthalmitis
2-3 weeks – Steroid Responder
3-4 weeks – Iritis/Uveitis
4-6 weeks – CME
2 months – Posterior capsule opacification

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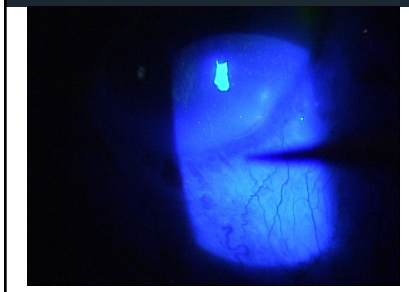
IOP Spikes



- Cause:
  - Day 1- Retained viscoelastics
  - Week 3-4 – steroid response
- Long standing glaucoma
- Treatment:
  - Topical glaucoma agents
  - Diamox
  - Osmoglyn
  - Just Burp it

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Decompression/Wound Burp: Does it Really Work?

- IOP rise occurs 5 to 7 hours after surgery
- Causes ocular pain
- Causes sight threatening complications
  - Retinal vascular occlusion
  - Progressive VF loss in advanced glaucoma
  - AION
- Controls IOP typically for 1 hour
- Additional treatment needed to protect vulnerable eyes

Hildebrand et. Al. Efficacy of anterior chamber decompression in controlling early intraocular pressure spikes after uneventful phacoemulsification. J Cataract Refract Surg 2003; 29:1087-1092.

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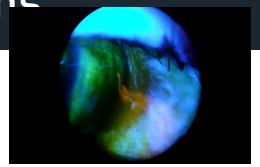
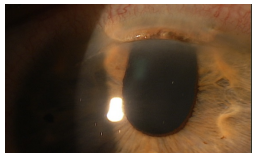
Wound Complications

- Potential for postoperative endophthalmitis
- Shallow A/C
- Low IOP
- Perform seidel test
- If A/C formed and no secondary complication from hypotony, treat conservatively
  - Bandage contact lens
  - Antibiotics – QID
  - Follow up q24h





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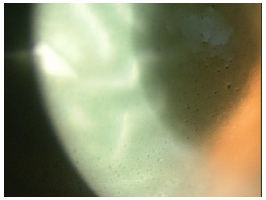
Cornea Edema

- Intraoperative endothelial shock
  - Prolonged phaco time
  - Dense nucleus
  - Endothelial health - >650 microns, Fuch's
- Appearance
  - Microcystic edema
  - Stromal folds and haze



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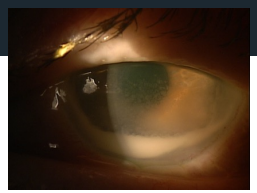
Endophthalmitis

- Inflammation of the eye
- 4+ cell and hypopyon
- Pain
- Eyelid edema
- Decreased vision
- Must see the patient
- Surgical emergency: hours (not days) make a difference



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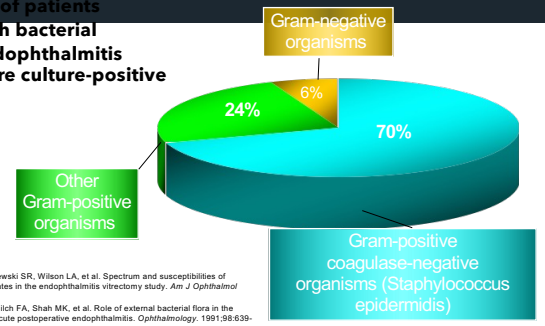
Post-Cataract Surgery Endophthalmitis

Endophthalmitis Vitrectomy Study

69% of patients with bacterial endophthalmitis were culture-positive



1. Han DP, Wisniewski SR, Wilson LA, et al. Spectrum and susceptibilities of microbiologic isolates in the endophthalmitis vitrectomy study. *Am J Ophthalmol* 1996;122(1):1-17.
2. Speaker MG, Milch FA, Shah MK, et al. Role of external bacterial flora in the pathogenesis of acute postoperative endophthalmitis. *Ophthalmology*. 1991;98:639-649

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IOL Surprises

- Greater than 1D from planned refractive result
- Poor measurements - Axial length, Keratometry, A-constant, Software program
- Mistake in the OR
- Wrong packaging
- Must identify problem within the first week*
- Treatment
  - IOL exchange

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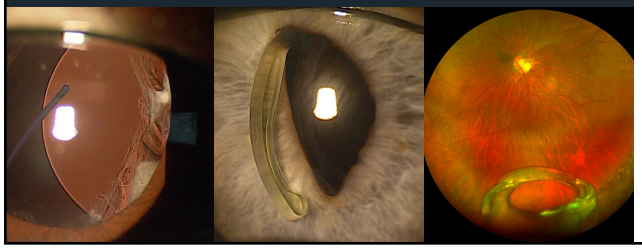
Dislocated IOL



- Consider in High Risk Patients
  - Pseudoexfolation
  - Marfans
  - Trauma
- Unrecognized zonular dehiscence
- Unrecognized tear in posterior capsule
- Treatment
  - Repositioning or IOL exchange

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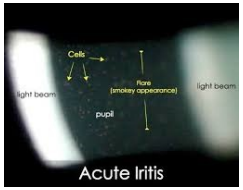
Iritis: But why won't it just go away!



Persistent iritis or reoccurrences of iritis/uveitis require a closer look at possible systemic issues

Blood work should be done

- CBC (WBC)
- ACE (sarcoidosis)
- ANA (autoimmune/SLE/JRA)
- ELISA (Lyme disease)
- ESR (elevated = inflammatory activity)
- HLA- B2& (ankylosing spondylitis, Reiters, IBD, psoriatic arthritis, RA)
- Consider chest x-ray and PPD (TB)
- FTA-ABS (syphilis)

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Cystoid Macular Edema

- CME is the most frequent cause of visual decline following *uncomplicated* cataract surgery
- Late on-set (*4 to 6 weeks* post-operatively) [1]
- Estimated to occur in 12% of low-risk cataract cases[2]
- CME development is due in part to prostaglandin-mediated breach of blood-retinal barrier[3]

1. Samiy N, Foster CS. The role of nonsteroidal antiinflammatory drugs in ocular inflammation. Int Ophthalmol Clin. 1996;36(1):195-206. 2. McColgin AZ, Raizman MB. Efficacy of topical Voltaren in reducing the incidence of post operative cystoid macular edema. Invest Ophthmol Vis Sci. 1999; 40 S289. 3. Mishima H, Masuda K, et al. The putative role of prostaglandins in cystoid macular edema. Prog Clin Res 1989;31:251-264.

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Incidence of PVD After CE

Purpose: To report the incidence of posterior vitreous detachment after uneventful state-of-the-art small-incision phacoemulsification with implantation of a posterior chamber intraocular lens

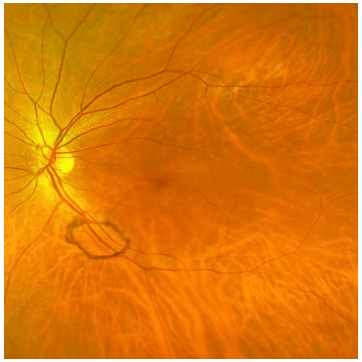
188 eyes of 188 patients

Pre-op:

- 69.1% had PVD / 30.9% no PVD

Post-op:

- 20.7% developed in one week
- 31% at one month
- 6.9% at one year
- 41.4% no PVD



Mirshahi et al. Incidence of posterior vitreous detachment after cataract surgery. J Cataract Refract Surg. 2009 Jun;35(6):987-91

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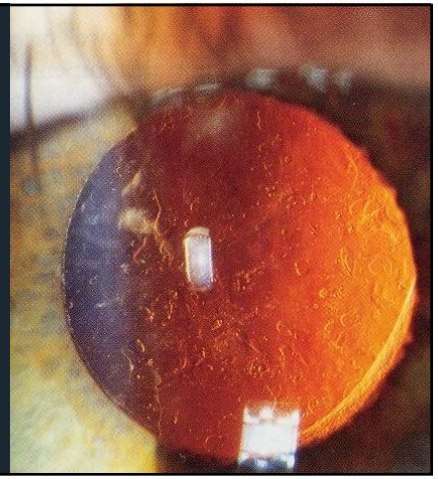
Posterior Capsule Fibrosis

Proliferation of equatorial lens epithelium along post capsule

Incidence 10-25%

Treatment- Yag Capsulotomy

- Complications – Iritis / IOP spikes / RD / CME



SCHAUMBERG D. A. et. al. A systematic overview of the incidence of posterior capsule opacification. Ophthalmology (Rochester, MN) Y. 1998, vol. 105, No. 7, pages 1213-1221

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Case #2 Twisted Toric

41 YOA white Male s/p TORIC PCIOL w/ Lensar OD

Week 1 (02/11/21) OD

DVA 20/80

MRX -0.50 +1.50 x055 20/20

Cornea clear, rare cell in AC

Dilated, lens marks @100-110 degrees (placed @95 degrees during sx)

Surgeon consulted, continue medications as directed but want to wait till fully healed before determine if further treatment necessary.

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2 weeks later ….

DVA OD 20/80

MRX -0.75 +2.00 x 055 20/20

Cornea clear, rare cell in AC

Dilated, lens marks @125 degrees

To the operating room we go, rotation of the TORIC IOL with a capsular tension ring

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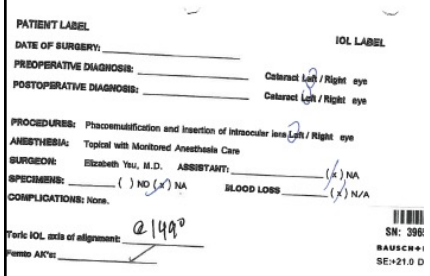
PATIENT LABEL

IOL LABEL

DATE OF SURGERY: _____

PREOPERATIVE DIAGNOSIS: _____ Cataract Left / Right eye

POSTOPERATIVE DIAGNOSIS: _____ Cataract Left / Right eye

PROCEDURES: Phacoemulsification and Insertion of intraocular lens Left / Right eye

ANESTHESIA: Topical with Monitored Anesthesia Care

SURGEON: Elizabeth Yiu, M.D. ASSISTANT: _____ (x) NA

SPECIMENS: _____ ( ) NO (x) NA BLOOD LOSS _____ (x) N/A

COMPLICATIONS: None.

Toric IOL axis of alignment: @149°

Femto AK's: _____

SN: 396

BAUSCH+

SE:+21.0 D

- Crossed Cyl effect
  - +sphere – double the astigmatism
  - ie. +100-200x130
  - Can dilate if suspicious
- Posterior corneal astigmatism
- IOL rotation
  - High Myopes increased risk

What to Look for After Toric IOL Surgery?

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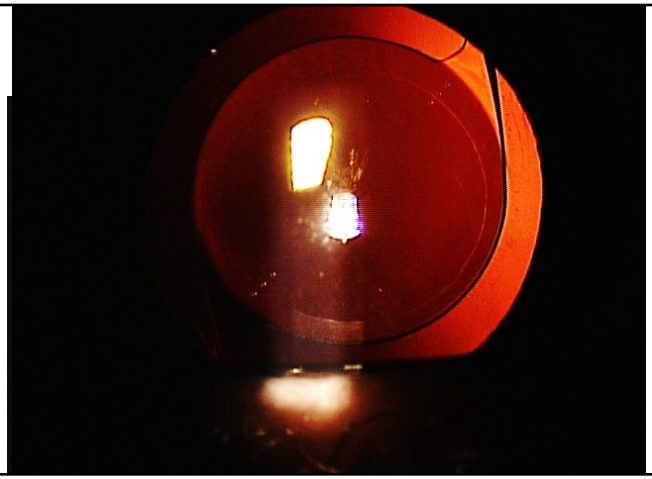

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Corneal Crosslinking

- UV light and photosensitizer to strengthen chemical bonds in the cornea
  - Oxidative deamination reaction with ends chains of collagen
- FDA Approved in the US 2016
  - Epi-off
  - Epi-On under investigation, new formula for riboflavin submitted to FDA 2024
- Indicated to help slow progression of:
  - Keratoconus
  - PMD
  - Terrien Marginal Degeneration
  - Post-refractive surgery ectasia

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Contraindications

Corneal thickness <400um (epi off)

Prior herpetic infection

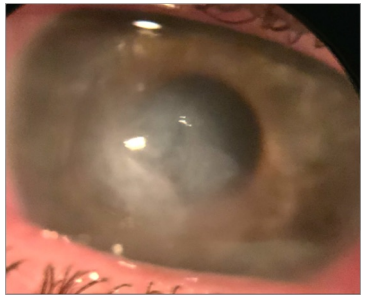
Concurrent infection

Severe corneal scarring or opacification

History of poor epithelial wound healing

Severe ocular surface disease

Autoimmune disorders



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What to Expect With CXL

Epi-On

Day 1 and Week 1
- PEE and slight haze, possible heaped central epi

Month 1
- Steepening of max K value on topography

Month 3
- Flattening of max K

Month 6
- ¾ of flattening of max K at this time

1 year
- Stabilization

Epi-off

Day 1
- Epithelial defect with THBL in place

Week 1
- Re-epithelializtion of cornea, PEE and slight haze, possible heaped central epi

Month 1
- Steepening of max K value on topography

Month 3
- Flattening of max K

Month 6
- ¾ of flattening of max K at this time

1 year
- Stabilization

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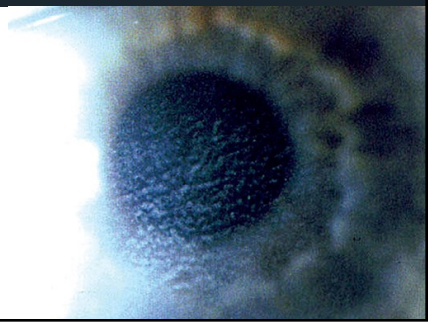
CXL Complications

Endothelial cell damage
- <400um thickness

Persistent epithelial defects (epi off)
- Mechanical, CL preservatives, topical medication
- Haze

Scarring

Infectious keratitis
- Fungi, bacteria, HSV, Acanthamoeba
- HSV vs UV light



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Long-term maintenance

- Close monitoring immediately after CXL
  - Every 3 months with pachymetry, MRX and corneal topography
  - Then decrease to yearly to monitor for any progression
- Counseling patient that mechanical rubbing of the eye can cause it to progress
  - Treat allergies
  - Treat DED
  - Treat Blepharitis/MGD

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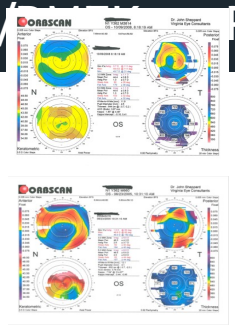
Advantages of DSEK/[illegible]PK



- Sutures
- Visual recovery
- Astigmatism / ametropia
- Epithelial complications
- Corneal allograft rejection
- Wound strength
- Globe stability
- Length of surgery
- Intraoperative complications
- Post op visits

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DSEK, PK Yield Similar Graft Survival

Price et al. Ophthalmology. 2011;118(4):725-729

- Retrospective, interventional case series
- DSEK graft survival rates
  - 95% for Fuchs
  - 76% for PBK/ABK
- PK graft survival rates
  - 93% for Fuchs
  - 73% for PBK/ABK
- Endothelial cell loss at 5 years
  - 53% in DSEK
  - 70% in PK

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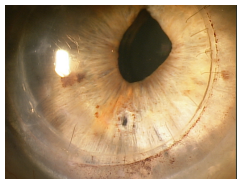
Other Indications

2.

- most common indication for keratoplasty in the U.S., comprising 40.2% of cases
  - Fuchs' dystrophy most common United States in 2014 (15,013, 21.5%)
  - Post-cataract surgery edema being second (8,529, 12.2%)
  - Keratoconus (6,981, 10.1%)
  - repeat transplants (6,811, 9.8%)



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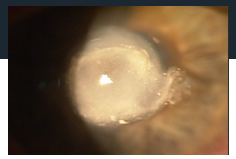
Corneal Transplant Indications / Contraindications



Indications
- Deep scarring
- Endothelial pathology
- Perforation
- Disease corneas

Contraindications
- Glaucoma…sort of
- Vascularization
- Previous graft failure…sort of

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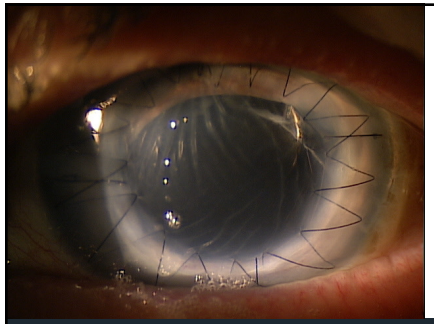

What to Expect S/P Penetraiting Keratoplasty

Day 1
- Moderate to severe stromal/corneal edema
- AC 1-2+ cell and pigment
- Poor vision and pain

Week 1
- Moderate corneal edema may still be present
- Vision is improved but still moderately decreased
- AC some inflammation present (tr-1+ cell)

Month 1
- Most corneal edema should be resolved at this time
- Refraction/Pachymetry/Atlas to monitor
- AC is quiet

Month 6
- Stabilization
- Select suture removal to decrease induced astigmatism

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Complications of Penetrating Keratoplasty

- Intraoperative complications
  - Damage to lens/iris from instruments
  - Irregular trephination of host
  - Poor graft centration onto host bed
  - Excessive bleeding from iris and wound edge
  - Choroidal hemorrhage and effusion
  - Iris incarceration in the wound
  - Damage to donor tissue during handling
- Immediate postoperative complications
  - Wound leak- Day 1 (or Later)
  - Flat chamber/iris incarceration in wound- Day 1 (or later)
  - Primary donor failure- within 2 weeks
  - Persistent epithelial defect 5-7 days
  - Endophthalmitis- 5-7 days

Taken from http://www.retinalphysician.com/article.aspx?article=100059

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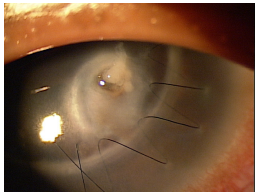
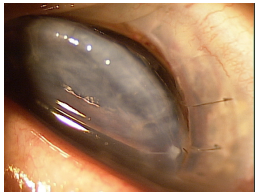
Long Term complications

- Glaucoma
- Microbial keratitis
- Suture-related problems
  - Ulcer at loose or broken suture sites
    - Endopthalmitis
  - Astigmatism
- Wound dehiscence
- Immunologic graft rejection
- Late endothelial failure
- Graft failure





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Long-term maintenance

- Long term topical steroid to decrease rejection rate
  - Usually 1gtt QD
- Monitor routinely to ensure no signs of rejection
- Control OSD
- Some patients may require oral antivirals if corneal transplant is related to scaring from prior HSV
  - Concern for Neurotrophic Keratitis
- Repeat PK may be needed after approximately 20 years

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Endothelial Keratoplasty (DSEK)

Sutureless transplant of the posterior cornea

Replaces diseased portion of cornea with donor graft

Donor tissue obtained by
- Manual dissection
- Microkeratome dissection
- Femtosecond laser

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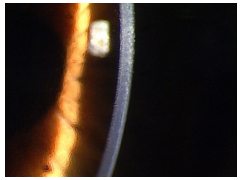
DSEK/DSAEK Exclusion Criteria

Exclusion
- Corneal scarring
- Aphakic
- Iris loss / atrophy



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DMEK

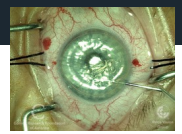
Graft of Descemet's membrane and endothelium only

Better optical outcome of 20/25 or 20/20

Difficult to manipulate

Early graft dislocation risk

Decreased risk of rejection



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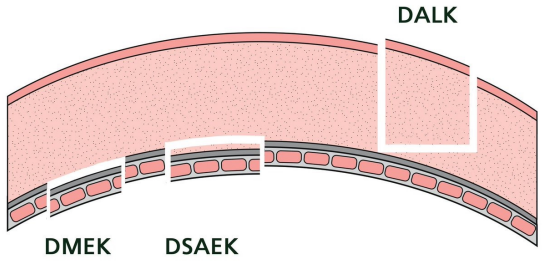
DMEK vs DSEK



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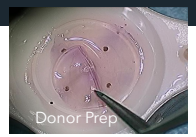
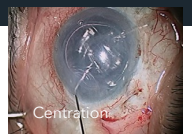
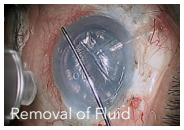
DSEK/DMEK Procedure







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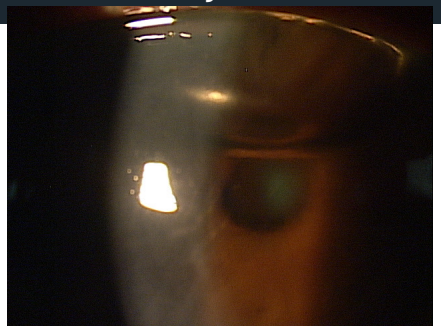
Postoperative Day One



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DSEK Average Visual Recovery

1 Day: 20/400

1 Week: 20/70

1 Month: 20/40

3 Months: 20/30

6 Months: 20/25

1 Year: 20/25-20/20

DSEK has been reported to have a hyperopic shift of around +1.00, due to the shape of the donor tissue.

http://www.dlek-dsek.com/dsekprocedure.htm

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DMEK Visual Recovery

- 3 months: 63% with vision ≥ 20/25 and 26% ≥ 20/20
- 6 months: 79–94% with BCVA ≥ 20/40 and 22–47% ≥ 20/20.
- Multiple studies have reported that DMEK causes a mild hyperopic shift of < +0.50 D after 6–12 months
- Postoperative refraction stabilizes at 3 months with no significant spherical equivalent change between 3 and 6 months postoperatively.
- Endothelial cell loss estimates following DMEK vary widely, from 32-40% at 3 months to 36-40% at 6 months. At 1 year, studies have reported EC loss of around 19–36% at 1 year.

5-year EC loss of 39% in DMEK (28 eyes) vs previous reports of DSEK (53%) vs PKP (70%) performed for similar indications

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Visual Advantages

Guerra et al.

Best corrected visual acuity in a DMEK group at 1 year of 20/24 compared to 20/32 in a DSAEK group

85% reported a better quality of vision in the DMEK eye

Endothelial cell loss at 1 year was 31% in DMEK eyes and 34% in DSAEK eyes.

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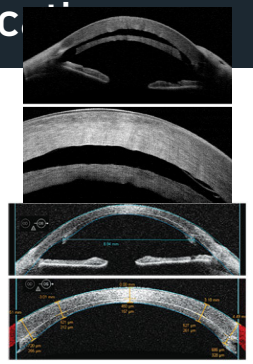
DSEK/DMEK Complic

Caused by any of the following

- Graft-recipient interface
- Fragile graft tissue
- Graft location
- Glaucoma
- Infection
- CME
- Retinal detachment



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Long-term Maintenance DMEK and DSEK

- Long term topical steroid
  - Helps decrease rejection rate
  - Steroid Lotoprednol, prednisolone acetate or flouromethalone 1 gtt QD typically
- Unknown length of graft viability
  - 20 year data is positive
  - In theory surpass PK ~20 years

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2022 DMEK Vs DSEK

- DMEK and DSAEK had comparable levels of BSCVA and patient satisfaction
- DMEK eyes reached their BSCVA sooner
  - DSAEK eyes improved over a longer time frame
- Greater number of patients had 20/25 and 20/20 vision in the DMEK group

Long-term Outcomes in Fellow Eyes Comparing DSAEK and DMEK for Treatment of Fuchs Corneal Dystrophy

Robert W Weisenthal [1], Han Y Yin [2], Allison R Jarstad [3], Dongliang Wang [3], David D Verdier [4]

Affiliations + expand

PMID: 34157279 DOI: 10.1016/j.ajo.2021.06.013

Abstract

Purpose: To compare the long-term results of Descemet's stripping automated endothelial keratoplasty (DSAEK) and Descemet's membrane endothelial keratoplasty (DMEK) in fellow eyes for treatment of Fuchs endothelial corneal dystrophy.

Methods: This study is a 2-centered, retrospective case series of 64 patients (128 eyes) with DSAEK followed by DMEK. The main outcomes measured were best spectacle-corrected visual acuity (BSCVA) and duration of time to achieve BSCVA as well as eye preference.

Results: Preoperative median logarithm of the minimum angle of resolution (logMAR) BSCVA was similar in eyes receiving DMEK 0.36 ± 0.26 and DSAEK 0.42 ± 0.34 (P = .266). The average follow-up time needed for the DMEK eyes to achieve BSCVA was faster than that of DSAEK (277 days vs 490 days, P = .0014). With long-term follow-up, the BSCVA of the DMEK eyes [0.09 ± 0.10 logMAR]

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DMEK Pulling ahead

In 2023 DMEK became the most common keratoplasty procedure in the United States

DMEK 17,116 cases

Followed by DSAEK (16,207 cases)

PK (14,486 cases).

In 2023 DMEK became the most common keratoplasty procedure in the United States with 17,116 cases, followed by DSAEK (16,207 cases) and PK (14,486 cases).

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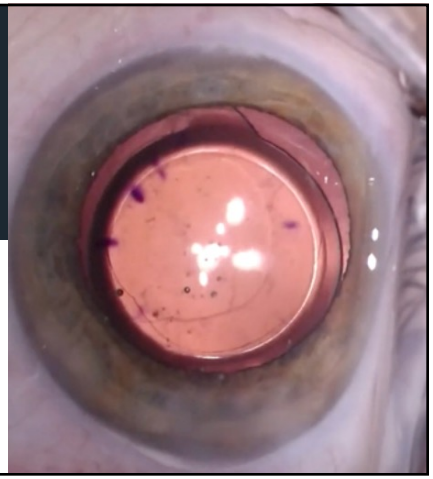
Descemet stripping only (DSO)

- Remove a smaller area of the central unhealthy endothelium and Descemet's Membrane
- Do not implant any donor tissue
- Wait to see if the surrounding endothelial cells migrate from the periphery to recover the central area.



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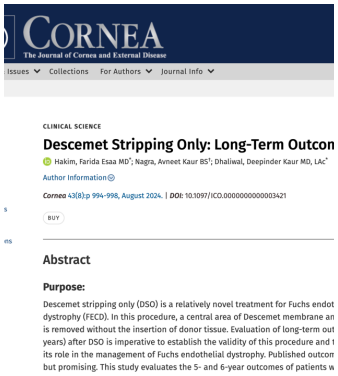
DSO: 5 year outcomes

- Of the 9/10 eyes that maintained clear corneas, BCVA of at least 20/30 at 5 years post-operatively
- At 6 years, 7/8 eyes had a VA better than 20/40
- 10/13 eyes (77%) responded and maintained clear central corneas for at least 5 years. Patients with failed DSO can achieve corneal clearance and good vision with subsequent EK.



CORNEA

The Journal of Cornea and External Disease

Issues Collections For Authors Journal Info

CLINICAL SCIENCE

Descemet Stripping Only: Long-Term Outcon

Hakim, Farida Esaa MD*; Nagra, Avneet Kaur BS†; Dhaliwal, Deepinder Kaur MD, LAc*

Author Information

Cornea 43(8):p 994-998, August 2024. | DOI: 10.1097/ICO.0000000000003421

BUY

Abstract

Purpose:

Descemet stripping only (DSO) is a relatively novel treatment for Fuchs endot dystrophy (FECD). In this procedure, a central area of Descemet membrane an is removed without the insertion of donor tissue. Evaluation of long-term out years) after DSO is imperative to establish the validity of this procedure and t its role in the management of Fuchs endothelial dystrophy. Published outcon but promising. This study evaluates the 5- and 6-year outcomes of patients w

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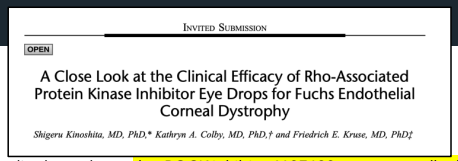
RHO KINASE INHIBITOR?



INVITED SUBMISSION

OPEN

A Close Look at the Clinical Efficacy of Rho-Associated Protein Kinase Inhibitor Eye Drops for Fuchs Endothelial Corneal Dystrophy

Shigeru Kinoshita, MD, PhD, Kathryn A. Colby, MD, PhD,† and Friedrich E. Kruse, MD, PhD‡*

- "Studies have shown that ROCK inhibitor Y-27632 promotes cell adhesion, cell proliferation, and antiapoptotic effects in cultured monkey and human CECs.5,6 Furthermore, the CEC layer can now be consistently reconstructed using regenerative medicine, that is, the administration of cultured human CECs combined with ROCK inhibitor Y-27632 into the anterior chamber for the treatment of patients afflicted with bullous keratopathy. Thus, there is now a substantial amount of conceptual evidence to support the effectiveness of using ROCK inhibitors for the treatment of specific corneal endothelial diseases and for patients afflicted with CEC injury and loss."

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ABMD/EBMD

- Abnormal production of epithelial basement membrane
  - Extends to epithelium
  - Causes multiple basement membrane layers
  - Trapped epithelial cells form Cogan microcysts
  - Can lead to recurrent corneal erosions
- Degenerative
  - Occasionally autosomal dominant
    - Transforming growth factor beta-induced gene (TGFBI) on chromosome 5q31

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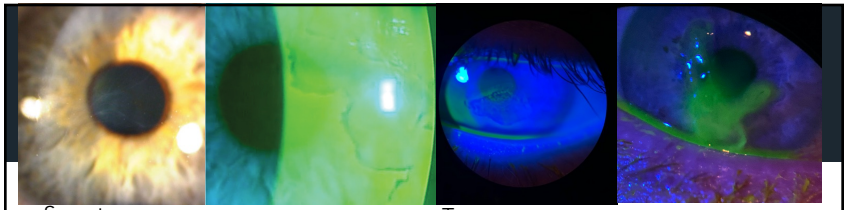

Symptoms

- Commonly asymptomatic
- Recurrent corneal erosions
  - Pain upon waking
  - Eyelids sticking to eyeball
- Distortion to vision
  - Monocular shadows or diplopia
- Increased halos or glare

Treatment

- Lubrication
- Hypertonic drops and ointment
- Pressure patching
- Topical corticosteroids
- Oral doxycycline
- Bandage soft contact lens
- Anterior stomal micropuncture
- Epithelial debridement or Lam-K
  - With diamond burr or PTK

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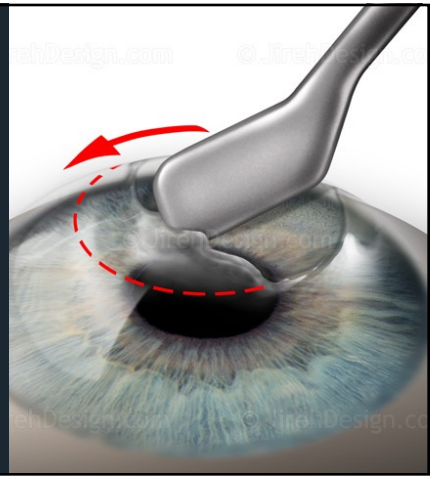
Lamellar keratoplasty

Corneal epithelium is removed down to Bowman's layer

Can be performed in slit lamp or operating room using Weck-cel sponge or scarifier blade, and cleaned up with diamond burr

After removal surface is polished with cellulose sponge, antibiotics, and THBL placed



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Lam-K Long Term Treatment

- After lam K
  - Maintain THBL for 3 months
  - Oral Doxycycline
  - Topical Antibiotics
  - Topical Steroids
  - Vitamin C
  - ASED/PRP?
  - Amniotic Membrane
- Control of ocular surface disease

- Indications for LamK:
  - ABMD
  - Salzmanns nodular degeneration
  - Band Keratopathy
  - RCE
  - Corneal scars

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Questions?

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