Perioperative Care & Medications in Refractive Surgery

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LASIK – Pre-op Medications

- No routine prophylaxis recommended
- Herpes Simplex
- MRSA Carrier
- Dry Eye

Oral Antivirals

- Acyclovir (Zovirax) – 400 & 800 tabs, 200 caps
  - Zoster – 800mg po 5x day
  - Simplex – 400mg po 5x day
  - Suppressive – 400mg po 5x day
  - Pregnancy Category B
- Valacyclovir (Valtrex) – 500 & 1000 tabs
  - Zoster – 1g po q8h x 7-21 days
  - Simplex – 500mg po q8h x 7-21 days
  - Suppressive – 500mg po q8h x 1yr
  - Pregnancy Category B
- Famciclovir (Famvir) – 125, 250 & 500 tabs
  - Zoster – 500mg po q8h x 7-21 days
  - Simplex – 500mg po q12h x 7-21 days
  - Suppressive – 250mg qd x 1 yr
  - Pregnancy Category B

Donnenfeld MRSA LASIK/PRK Protocol

- Patients at Risk
  - Health care workers (physicians and hospital workers)
  - Known carriers of MRSA
  - Pt's with significant blepharitis

Donnenfeld LASIK/PRK Protocol for Patients at Risk

- *Preop*
  - Aggressive treatment of blepharitis to reduce lid colonization by staph (Hot compresses, lid hygiene)
  - SteriLid lid prep http://www.theratears.com/sterilid.aspx
  - Betadine lid preop
  - Zymaxid or Vigamox qid x 3-5 days
- *Postop*
  - Zymaxid or Vigamox QID
  - Polytrim or neosporin drops QID

Donnenfeld MRSA Protocol for all LASIK/PRK Surgery

- Betadine lid prep
- 1 drop Polytrim just before and after surgical procedure
- Pre-treat all forms of blepharitis
  - Lid hot compresses
  - Lid hygiene
  - SteriLid lid prep
  - Doxycycline
  - Azasite

Donnenfeld LASIK/PRK Protocol for Known MRSA Carriers

- Same as Patients at Risk plus
- *Preop*
  - Mupirocin gel to lid margin 5 days bid (http://en.wikipedia.org/wiki/Mupirocin)

Dry Eye & LASIK

- Pubmed Search yielded 164 citations
- Surprisingly few studies on risk factors or predicting post-op dry eye
- The majority were related to treatment of dry eye, editorials, reviews or to very specific issues such as hinge position

Schallhorn N = 32,070

- Dry eye is the most common side-effect of LVC (11.3% at 3M)
- Symptoms are related to patient dissatisfaction
- There are predictive factors:

Strongly predictive

- Gender – Females
- Procedure type – PRK
- Preop Rx – Hyperopia

Statistically significant, but little/no predictive contribution

- Age
- TBUT
- SPK
- Ablation depth
- Flap type

Dry Eye & LVC

- Significant dry eye and ocular symptoms are rare 12 months after LASIK about 7% representing a return to baseline
- Even at 12M, dry eye is related to procedure satisfaction
- Younger, lower hyperopes have the most dry eye complaints
- Older, higher hyperopes have the least dry eye complaints

Dry Eye & LVC

- Age is not an independent predictor
- LASIK reduces the risk vs PRK
- Hyperopic females with dry eye symptoms before surgery and undergo PRK are at a much higher risk
- LASIK in asymptomatic hyperopic females reduces the risk
- Hyperopic males who undergo LASIK have a lower risk than the general population

Meibomitis

- Reduce TBUT
- CL intolerance

- Azasite bid applied to lid margins
- Doxycycline 20mg, 50mg, 100mg

- Rx 100mg bid RTO 4-6 weeks
- If better 100 mg qd RTO 4-6 week
- If better 50 mg qd RTO 4-6 weeks

Dry Eye Pre-treatment

- Modify environment, medications, habits
- Artificial tears – drops, gels, ointments
- Topical Cyclosporin
- Topical Steroids
- Nutritional supplements
- Punctal occlusion

Dry Eye Pre-treatment Goal

- Minimal Symptoms
- No SPK
- Stable refraction
- Stable aberrometry
- Stable topography

LASIK Post-Operative Care

- Patient Instructions during Post Op:
  - For 1 week –
    - No Swimming or using hot tubs
    - No Makeup
    - No Sports
    - No Rubbing or squeezing the eye (some say 1- 6 months)
    - Avoid dirty environments and wear sunglasses
    - Use the fox shield at night
    - Kick boxing and karate should wait 3 months
    - Scuba diving 1 month

LASIK Post-Operative Care

- Standard Post-op Instructions:
  - Antibiotic x 1 week
    - 4th generation fluoroquinolone: Gatifloxacin
    - Possibly add Polymyxin B/trimethoprim
  - Steroid x 1 week
  - Dry eye management

LASIK Post-Operative Care

- TYPICAL MEDICATION REGIMEN:
  - Vigamox/Zymaxid qid X one week
  - Lotemax/Pred Forte
    - q2h x 2 days
    - qid X 5-7 days
  - Artificial Tears qid X 1 month
  - Restasis bid x 1 month
- Protection of the flaps
  - Fox shield QHS x 5-7 days
  - Sunglasses outdoors for 1 week
  - Limited physical activity

LASIK Post-Operative Care

- POST-OP EXAM SCHEDULE
  - Day 1
  - Day 3-5
  - Months 1, 3, 6*, and 12*
- Enhancements:
  - Post op schedule the same as a primary procedure

LASIK Post-Operative Care

- Common Early Clinical Findings:

Visual recovery is quite rapid with LASIK – usually–

- 20/25 or better day 1
- VA varies with amount of myopic correction
- VA recovery is slower with Hyperopes
  - Takes one week to get to good VA, one month to get to great VA (similar to PRK)
  - Usually No "wow" effect on the 1 day post op.
- Age, refractive error, and ocular surface conditions will also contribute to the healing rate

RS

- 31 year old male
- 12 hours S/P uneventful LASIK OU
- Patient phones with complaints of discomfort OU

"My right eye became very uncomfortable about an hour after I got home and the vision is much better currently in my left eye."

What do you tell patient

1. Go back to sleep the eye should feel better in the morning
2. Take another vicodin, that should help the pain
3. RTO now
4. Lubricate your eye and we will check you in the AM

LASIK What to Look for at Each Post Op

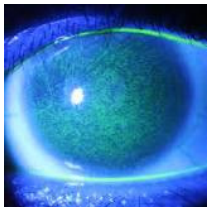
- LASIK Post Op Examination:
  - **Flap**:
    - Position: excellent, dislodged, striae, centered?
    - Clarity: clear, edema, haze?
    - Interface: clear, opacities, epithelial ingrowth?
    - Edges: smooth, rolled, eroded?
  - Interface Material
    - Debris
    - Epithelial cells/ingrowth
    - Diffuse Lamellar Keratitis (SOS)

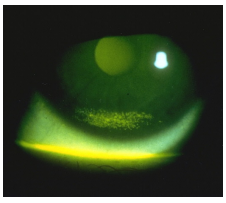
Day 1

S/P myopic Lasik
UCVA OD 20/30
OS 20/20

<u>Slit Lamp Evaluation</u>
OD SPK central 1-2+
OS SPK inferior trace

What do you tell the patient?
What is the treatment?





What do you tell the patient

A. You have a complication, both eyes are dry
B. All patients have some dryness as they heal from LASIK surgery
C. The dryness is causing your vision to fluctuate
D. Older patients always have dry eyes

What is the treatment

A. No change with drops
B. Increase artificial tears PF q1h OU
C. Add Restais bid OU (if not already)
D. Discontinue the steroid

Day One Pearls – Critical Timing

CLINICAL TESTS
- Celebration!!
- History
- UCVA OD/OS
- Slit lamp Biomicroscopy
- Review drops / instructions
- RTO 3-5 days

CLINICAL FINDINGS
- Dislodged flap*
- Flap Striae*
- Infiltrate/Infection*
- DLK "SOS"
- SPK
- Poor UCVA

* * Return to Surgery Center

SPK day 1 = 23 y/o

3-5 Days Pearls – Critical Timing

CLINICAL TESTS
- History
- UCVA OD/OS
- Dry Refraction: BCVA
  - Only if UCVA < 20/20
- Slit lamp Biomicroscopy NaFl if indicated
- Instructions/Discontinue medications
- Patient reassurance
- RTO 3 weeks
- Resume most activities and make-up

CLINICAL FINDINGS
- Flap Striae
- DLK "SOS"
- Infiltrate/Infection*
- Epithelial ingrowth
- SPK
- Refractive error
- Loss of BCVA*

* * Return to Surgey center

1 Month Pearls – Critical Timing

CLINICAL TESTS
- History
- UCVA OD/OS
- Dry Rx BCVA only if UCVA < 20/20
- Slit lamp Biomicroscopy
- Instructions, RTO 2 months

CLINICAL FINDINGS
- Flap Striae
- Epithelial ingrowth
- SPK
- Refractive error
- Loss of BCVA*

* Return to Surgery Center

3,6,12 Month Post-op Pearls

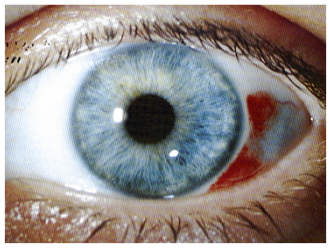
CLINICAL TESTS
- History
- UCVA OD/OS
- Dry Rx BCVA at 3 month only (nomogram)
- Slit lamp biomicroscopy
- Instructions, RTO 3-6 months

CLINICAL FINDINGS
- Epithelial ingrowth
- SPK
- Refractive error
- Flap Striae
- Loss of BCVA*

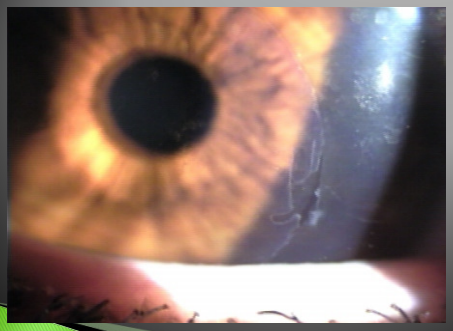
*Return to Surgery Center

Subconjunctival Hemorrhages

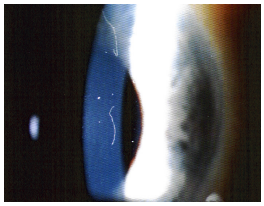
common findings on the 1 day post op LASIK patient

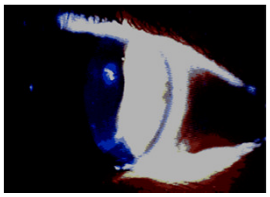


Epithelial Defect

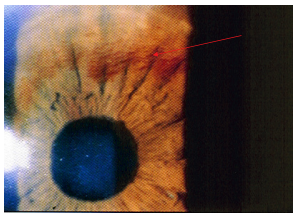


Interface Debris

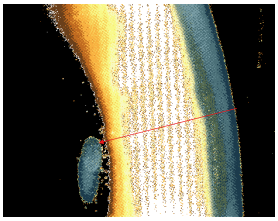




Interface Debris



Red Blood Cells in the interface.



Meibomian oil droplets in interface.

Neither are permanent

Neither cause a visual problem

Dry Eye – Most common Complication

- Cause:
  - Disruption of corneal nerves = decreased tear production
  - Goblet cell damage from pressure during flap creation
  - Change in corneal curvature
    - Changes how the tear film covers the cornea
    - More significant in hyperopic treatments

Eric Polk, O.D., and Paul M. Karpecki, O.D.Review of Optometry.9th Annual Dry Eye Report: Erase the Dryness after LASIK. Feb 2008

Dry Eye – Most common Complication

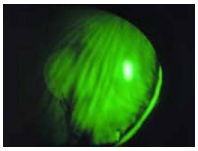
- 85% at I week post-op[1]
- 60% at 1 month post-op[1]
- 11.3% at 3 months post-op[2]
- Return to baseline by 12 months[3]

1- Eric Polk, O.D., and Paul M. Karpecki, O.D.Review of Optometry.9th Annual Dry Eye Report: Erase the Dryness after LASIK. Feb 2008
2- Schallhorn – Optical Express Data
3- Murakami, et al, Ophthalmology 2012

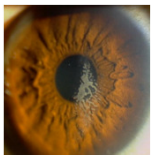
Dry Eye Management – Post-op

- Artificial tears at least qid (1-6 months)
  - Patients often present initially with NO symptoms.
  - Temporary neurotrophic effect of flap creation.
  - Reaffirm need for lubrication
- Punctal occlusion
  - Extended duration collagen plugs
- Cyclosporine 0.05 % (Restasis)

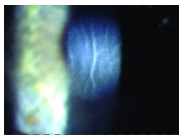
Watch for…



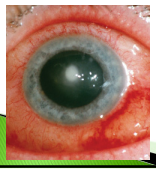
Wrinkling of the flap



Epithelial ingrowth



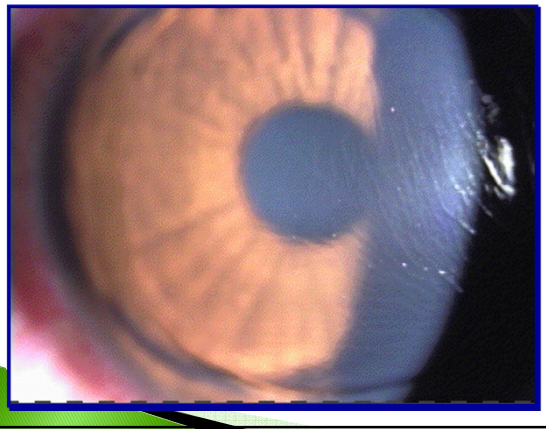
Diffuse Lamellar Keratitis (DLK) Stage 4



Bacterial keratitis
Post-Lasik/PRK: Consider Fortified Vancomycin

Patient RS

- 31 year old male
- 12 hours S/P uneventful LASIK OU
- Patient phones with complaints of discomfort OU
- "My right eye became very uncomfortable about an hour after I got home and the vision is much better currently in my left eye."



When should patient RS return to the clinic?

- Immediately
- Diagnosis: Wrinkled/Dislodged/Slipped Flap
- Plan:
  - Return to surgeon to lift and smooth flap
  - Can temporarily place a bandage contact on the eye

Patient AB

- 25 year old female
- 1 week S/P bilateral LASIK
- Painless reduced VA in left eye since surgery
- "My vision just isn't as good out of my left eye as I hoped it would be. I am seeing a lot of glare at night."

What test would you perform on patient AB at the 1 week post op visit?

A. UCVA OD and OS
B. Refraction and BCVA OD and OS
C. Slit lamp biomicroscopy
D. Tonometry
E. Dilate pupil
F. NaFl instillation

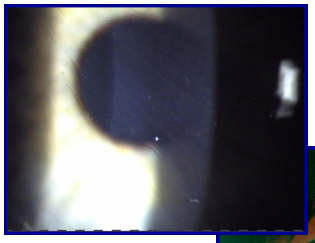
What test would you perform on patient AB at the 1 week post op visit?

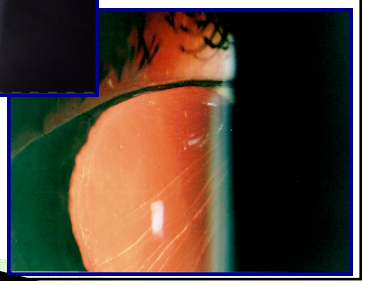
A. UCVA OD and OS
B. Refraction and BCVA OD and OS
C. Slit lamp biomicroscopy
D. Tonometry
E. Dilate pupil
F. NaFl instillation

Differential Diagnosis

- Flap Striae
- SPK/DES
- Residual refractive error
- DLK
- Infection (expect pain)
- Epithelial ingrowth (rare at 1 week)

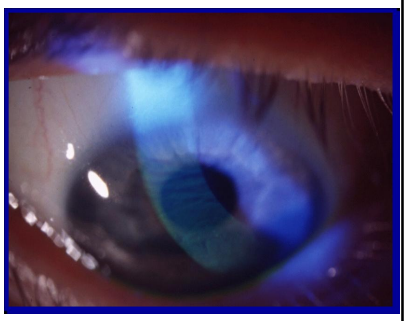
Striae

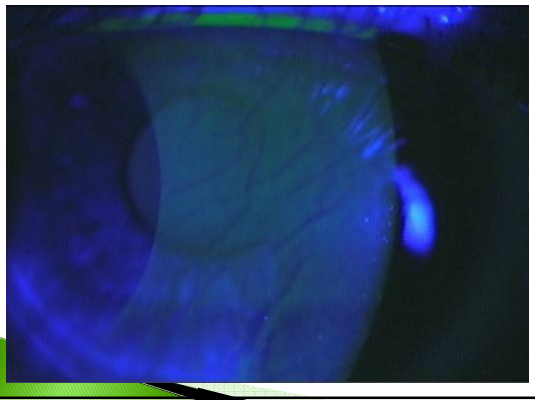




Easier to see in retroillumination over the pupil

- Flourescein makes it easier to see as valleys and mountains differentiate with negative staining





Flap Microstriae

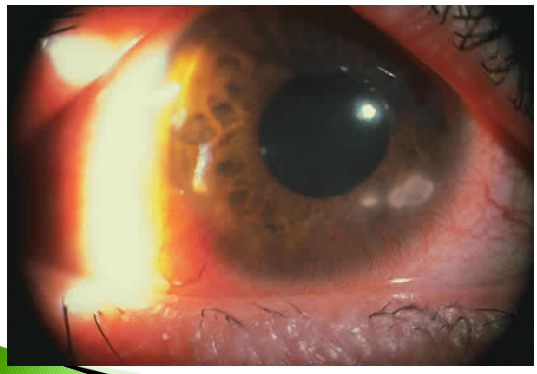
- Often not visible at 1-day check
- Onset 24- 72 hours
- Will NOT resolve without treatment
- Common with high myopia
- Common with deep ablations
- Usually find small amounts of mixed astigmatism
- **Only significant if have a loss of BCVA or a subjective complaint in the quality of vision (night glare/halo)**

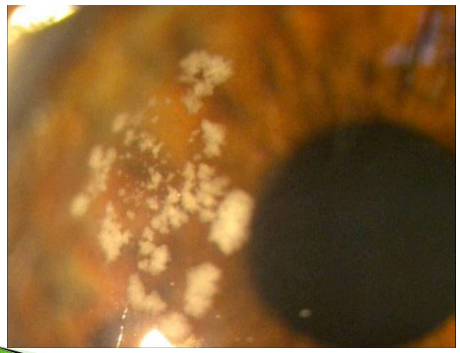
Treatment

- If treatment is necessary: flap lift and stretch
- The sooner the better

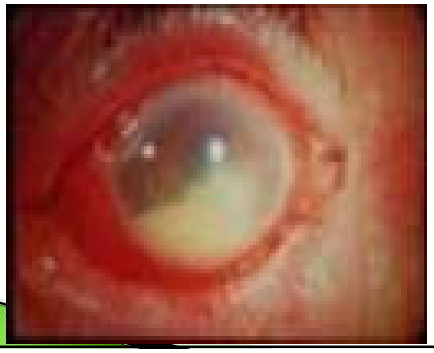
Patient MN

- 25YOM 2 days s/p bilateral Lasik
- "My right eye hurts and is sensitive to the light. My vision is getting blurry in the right eye. My left eye feels fine."
- When should you see this patient?
  - Immediately





Hopefully never gets this bad…



Plan:

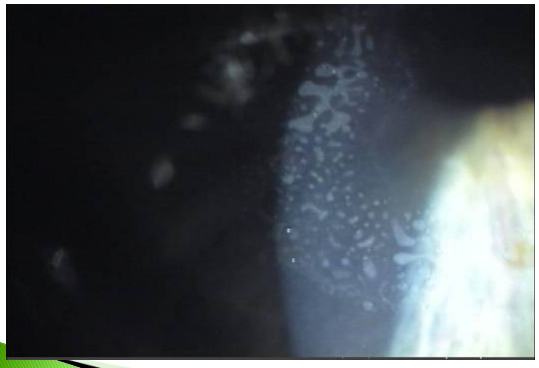
- Call your Refractive Surgery Center!!!
- Increase antibiotic (Zymaxid q1h)
- Add fortified antibiotic (Vancomycin)
- D/C Steroid
- Lift flap and culture
- Follow daily until resolution
  - (1- 2 visits per day)
- Long-term
  - Flap smoothing
  - PTK
  - Flap removal
  - PK

Patient TS

- 42 year old male
- Right eye is sore to the touch since LASIK enhancement 1 month ago
- Vision has declined in the right eye over the past week

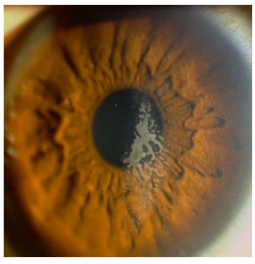
What tests would you perform on TS at the1month PO visit?

A. UCVA in OD and OS
B. Refraction and BCVA in OD and OS
C. Slit lamp biomicroscopy OU
D. NaFl instillation OU
E. Tonometry OU (only if necessary)
F. Corneal topography OU (only if necessary)
G. Wavefront Aberrometry (only if necessary)



Diagnosis?

- Epithelial ingrowth



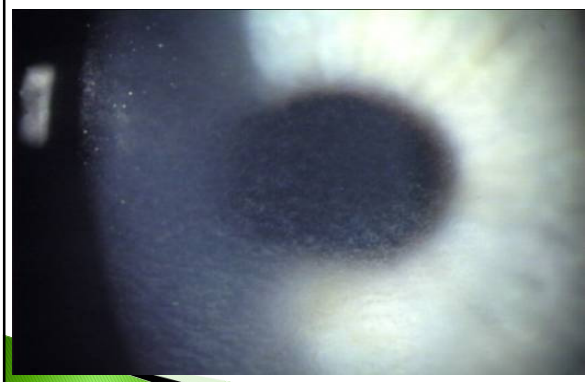
What are good reasons to treat Epithelial ingrowth?

- Epithelial cells within pupil with decreased BCVA
- Persistent flap edge staining with NaFl
- Progressive refraction or topographic changes
- Flap melt
- Persistent sore eye
- Day time glare symptoms

The majority of epi ingrowth does not need to be treated

Patient CC

- 40 year old female
- S/P bilateral LASIK x 1 week
- Patient reports a mild scratchy feeling that is getting worse.
- Slitlamp biomicroscopy reveals "cloudy haze in right cornea"



Diffuse Lamellar Keratitis (DLK)

- Begins in the periphery in the flap interface
- Looks like white "sand" particles
- Typically unilateral
- Tend to occur in outbreaks/sequential patients
- Looks like whitish sand underneath the flap
- Typically noted at day 1 or week 1 postoperative exams
- Can have late onset
  - Even years later, particularly after corneal trauma

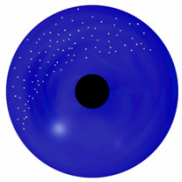
Diffuse Lamellar Keratitis (DLK)

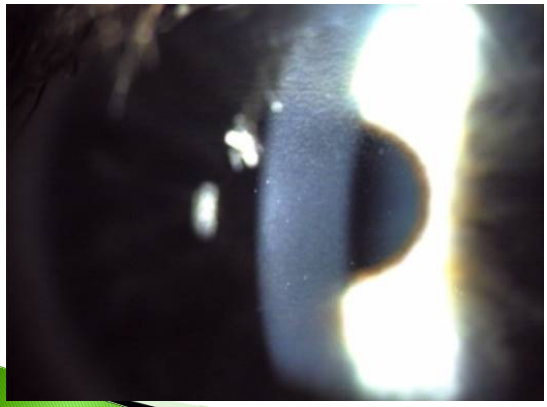
- Etiology: Unknown?
  - Bacterial endotoxins in the autoclave reservoirs
    - Contaminated sterilizer reservoir
  - Excessive corneal manipulation
  - Mold or fungal contamination
  - Trauma
  - Excessive Intralase energy (Unlikely with current Intralase)
  - Poor manufactured blades (Rarely used anymore)
- DLK is much less common now due to disposable instruments and Intralase.

	Grade 1 DLK
Signs/Symptoms	Focal, white/gray, granular material in the flap interface Normal VA
Treatment	Increase topical steroids q1h f/u every 1-3 days Taper steroid slowly (2-3 weeks)
Prognosis	Excellent

•Mild DLK may look similar to SPK, but SPK is on the surface and will stain with NaFL.

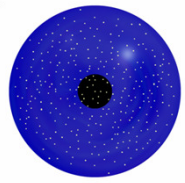
•Please report all DLK cases to your surgery center.

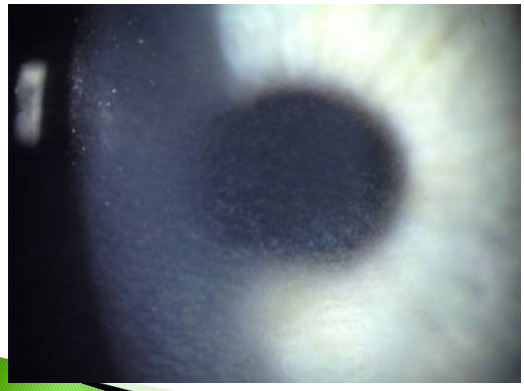




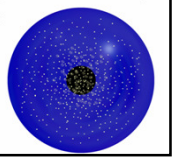
	Grade 2 DLK
Signs/Symptoms	›Diffuse, white/gray, granular material in the flap interface ›Normal VA or reduced 1-2 lines ›Mild discomfort
Treatment	›Increase topical steroids q1h ›Interface irrigation (return to surgeon) ›f/u every day
Prognosis	›Excellent after interface irrigation

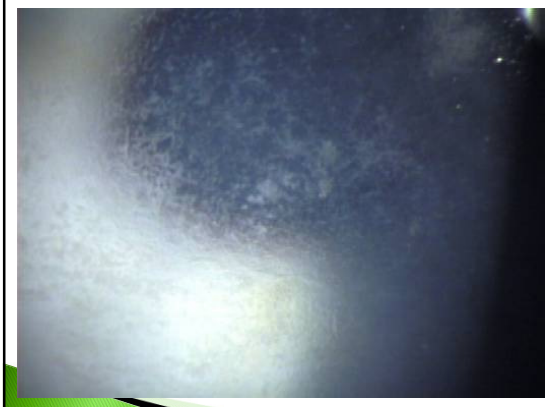
- IOP must be closely monitored during steroid treatment
  - If IOP ↑ Change to a "softer" steroid and add Glaucoma medications
    - **Steroids are <u>not</u> discontinued**



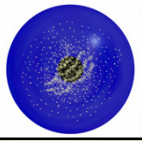


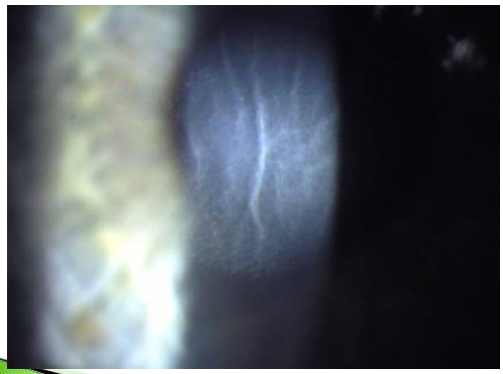
	Grade 3 DLK
Signs/Symptoms	›Diffuse,confluent, white/gray, granular material in the flap interface ›Significantly reduced BCVA (hyperopic astigmatism) ›Discomfort and possible conj injection
Treatment	›Should not get to this stage ›Increase topical steroids q1h ›Interface irrigation!! (return to surgeon) ›f/u every day
Prognosis	›Good after interface irrigation





	Grade 4 DLK
Signs/Symptoms	›Diffuse,confluent, white/gray, granular material in the flap interface ›Intense central inflammation ›Significantly reduced BCVA (hyperopic astigmatism) ›Discomfort and possible conj injection
Treatment	›Should not get to this stage!!! ›Increase topical steroids q1h ›Interface irrigation!! (return to surgeon) ›f/u every day
Prognosis	›?? Possible reduced BCVA, irregular astigmatism, residual hyperopia

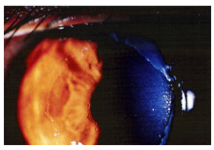


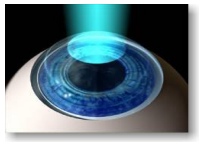


Surface Ablation PRK Procedure

Bill Tullo, OD, FAAO, Diplomate
Vice President Clinical Services
TLC Laser Eye Centers

Remove Epithelium



Surface Ablation POST-OP KITS

- Antibiotic (Zymaxid or Vigamox)*
- Steroid (Flarex, FML, Pred Forte, Durazol)
- NSAID (Acular LS, Bromday)
- Lubricants (PF)
- Fox Shields
- Sunglasses
- Post-op Instructions
- Bring their post op bag for each follow up!!!

* May be Rx'ed separately

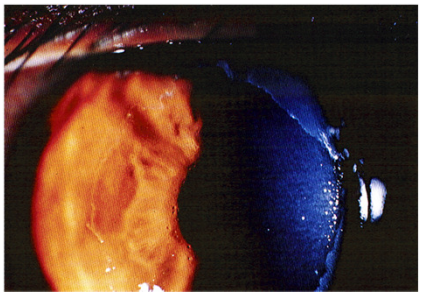
PRK Instructions to the Patient

- No makeup for 1 week
- No swimming or hot tubs for 1 week
- No exercise for 1 week
- Avoid dirty environments for 1 week
- You may shower, but avoid rubbing the eye and/or getting water or chemicals in the eye

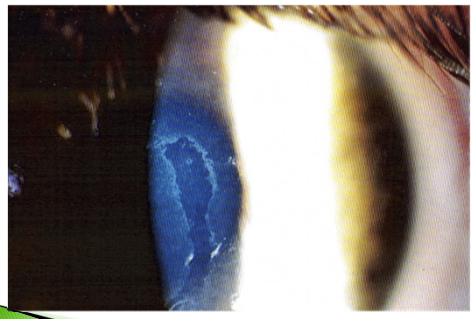
PRK Vision Expectations

- 20/40-20/80 Day 1
- 20/40-20/200 Days 2-4
- 20/30-20/80 Day 4-5
- VA rapidly improves 2-3 days after removal of BCL as epi thickens and smoothes
- Functional Vision at day 5-6
  - Expect to have driving vision
- Good vision at 1 week to 10 days
- Excellent vision at 4-6 weeks
- Healed at 6 months

24 hours post PRK ≈15% healed



3-4 days post PRK ≈80-90% healed



Bandage Contact Lens:

- Remove when epithelium is 100% closed
  - usually at day 4-5
- If in doubt: leave BCL in additional 1-2 days
- Can remove BCL (carefully!!) reassess epithelium and then replace with new BCL if necessary
  - Caution: may increase pain and slow healing
  - Always use an antibiotic if replace the BCL
- Avoid removing BCL to simply change it for a fresh lens because it looks "dirty"
- Refit BCL if too loose causing physical discomfort or too tight - "Overwear Syndrome"
- Let patient know that VA immediately after BCL removal may be worse or no change

Bandage Contact Lens:

- **When the epithelium is healed:**
  - Remove the contact lens - FLOAT - don't pull off the new epithelium
    - Have the patient use lubricating drops every minute for 5-10 minutes to "float" the lens if it does not freely move
    - The lens can then be removed by either gently dragging it inferiorly and pinching it off, or by using a forceps to remove at the slit lamp.
  - Avoid use of topical anesthesia
    - You want the patient to be able to tell you how the eye feels after the contact is removed

Re-epithelialization

- **99% of patients completely re-epithelialized by day 4 or 5**
- If epithelium <u>not</u> healed at 72 hrs:
  - Consider Infection (MRSA) or Herpes Simplex
  - Continue to monitor daily

Surface Ablation POST-OP REGIMEN

- During Epithelial Healing
  - Antibiotic & steroid until epithelium healed
  - NSAID bid X 2-4 days then D/C
  - D/C antibiotic once epithelium is healed
  - Topical anesthetic drops (only as an escape from pain, potentially can delay healing)
  - Vitamin C 500mg bid

Typical Surface Ablation POST-OP REGIMEN

- Steroid Taper:
  - 4 x day for 1 week
  - 3 x day for 1 week
  - 2 x day for 1 week
  - 1 x day for 1 week
- Preservative Free Lubricants frequently

Surface Ablation Post-Operative Care

- Post Op Visit Schedule:
  - **Daily**, until the Epithelium is filled in and the contact lens is removed
  - **1- 2 weeks** after epithelium is healed
  - **Months 1, 3, 6,**
  - Enhancement if needed at 6 months or greater

Pain Control

- Cold (Ice packs)
- Topical NSAID
- Topical Anesthetics*
- Bandage Contact Lenses
- Oral Medications
  - NSAID
  - Steroids
  - Narcotics

Ocular Pain Management

- *Topical Medications*
  - Anesthetics
  - NSAID
  - Steroids
  - Cycloplegics
  - Antihistamines
  - Artificial Tear Supplements
- *Topical Applications*
  - Bandage Contact Lenses
  - Pressure Patching
- *Oral Medications*
  - Anesthetics
  - NSAI
  - Steroids
  - Analgesics
    - Non-narcotic
    - Narcotic
  - Anti-anxiety
  - Anti-seizure

FDA Approval

- **Ketorolac tromethamine 0.4% *Acular-LS***
  - **Indicated to reduce pain, burning and stinging following refractive surgery**
  - **Dosage is 1 drop qid for 4 days**
- **Ketorolac tromethamine 0.45% – *Acuvail***
  - **Indicated for the treatment of pain and inflammation following cataract surgery**
  - **Dosage 1 drop bid for 2 weeks beginning day after surgery**

FDA Approval

- ***Bromday*** **– bromfenac 0.09%**
  - **For the treatment of inflammation and the reduction of ocular pain following cataract surgery**
  - **QD dosing for 2 weeks beginning day after surgery**
  - **Pregnancy Category C**

FDA Approval

- ***Prolensa*** **– bromfenac 0.07%**
  - **For the treatment of inflammation and the reduction of ocular pain following cataract surgery**
  - **QD dosing 1 day before surgery and then for 2 weeks beginning on the day of surgery**
  - **Pregnancy Category C**

Difluprednate 0.05% – Durezol

- FDA approved for the treatment of inflammation and pain following ocular surgery
- 1 drop qid beginning 24 hours after surgery for 2 weeks then 1 drop bid for 1 week then taper

Bandage Contact Lenses

- *Advantages*
  - Decrease pain
  - Maintain visual function
  - Administer medication
- *Disadvantages*
  - Increase inflammation risk
  - Increase infection risk
  - Increase risk of LASIK epithelial ingrowth

Patching vs. Bandage Contact Lens

- Donnefeld E, et. Al Ophthalmol 1995 Vol 102
- 165 patients randomized BCL vs PP vs BCL + NSAI drop
- No significant difference in clinical outcomes
- Very significant advantage for BCL
  - Quality of life scores
  - Return to work time
- Pain scores lower with BCL + Topical NSAI

Oral Medications

- *Advantages*
  - Peripheral Desensitization
  - Central Desensitization
  - Decending Modulation
  - No Local side-effects
- *Disadvantages*
  - Systemic Side-effects

Oral Analgesics: Narcotics

- Direct agonist affect on opioid receptor
  - Cortex
  - Brainstem
  - Spinal cord
- Indication: Moderate-Severe acute Pain
- Short term use
- Peak effect 1-2 hours after dose
- Addictive potential

Percocet

- *Dosage*
  - 2.5mg-10mg oxycodone
  - 325mg-650mg acetaminophen
  - *5.0/325mg #12 1 tab q6h PO most common*
- Do not exceed 4 gms of acetaminophen a day
- No taper needed if less than 2 weeks of treatment

Narcotic agents – Vicodin

- *Hydrocodone*
  - 5mg Hydrocodone + 500mg Acetominophen
  - Schedule III*
  - 6x more potent than codeine
    - Moderate-severe pain
  - Lower addiction than oxycodone
  - Less GI problems than oxycodone & codeine
  - Less sedation than oxycodone & codeine
  - Rx Vicodin 5/500 #12 1 tab q6h PO

Narcotic Agents – Codeine

- Codeine
  - Tylenol-3 (30mg codeine + 300mg acetominophen)
  - Tylenol-4 (60mg codeine + 300mg acetominophen)
  - Schedule III*
  - Less potent than oxycodone and hydrocodone
    - Moderate pain
  - Low addiction
  - High GI distress
  - High Sedation
  - Ceiling effect
  - Maximum daily dose
    - 360mg codeine
    - 4000mg acetominophen

Oral NSAID's – OTC

- Pain Cocktail (Off-label)
  - 225 mg Naproxin Sodium
  - 600mg Ibuprofen

1 Aleve + 3 Advil PO q8h

or

2 Aleve + 2 Advil PO q8h

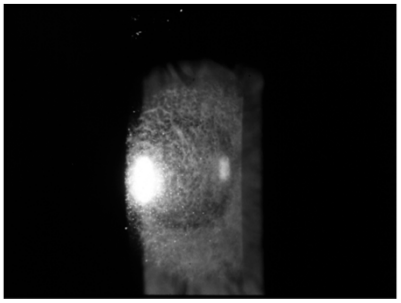
Anti-Convulsant

- Pregabalin – Lyrica
  - Similar to Neurontin
  - May have faster onset
  - Schedule V
  - 50mg, 75mg & 100mg CAPS
- Dosage 75mg q6h PO

Watch for…

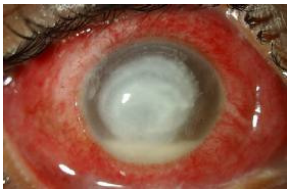
- Corneal haze
  - Keratocytes become myofibroblasts to heal the corneal wound
    - Not transparent
    - Extra-cellular matrix is disorganized and denser which scatters light
    - Consider Vitamin C 500mg bid
    - Mitomycin C (MMC)
      - Allows for less haze
      - Developed as a chemotherapeutic agent
      - Acts to stop cells from proliferating by cross-linking DNA which modulates wound healing

Corneal Haze



Watch for …..Corneal Infection

Treat same as LASIK infection



Thank You!

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