How to take the “Recurrent” out of Recurrent Corneal Erosion Syndrome

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Disclosures
- Allergan Pharmaceuticals Speaker’s Bureau
- Bio-Tissue
- BioDLogics, LLC
- Katena/IOP
- Seed Biotech
- Johnson and Johnson Vision Care, Inc.
- Shire Pharmaceuticals

Chronic relapsing disease of corneal epithelium
Characterized by disturbance of epithelial basement membrane
- Defective adhesions
- Recurrent breakdown of corneal epithelium
  - Redness, photophobia, tearing
  - Usually at night or upon awakening
  - May be related to REM during sleep
**Recurrent Corneal Erosion Syndrome**

- Relatively common condition
  - Many cases have past history of trauma
  - Corneal dystrophies
- Management can be frustrating for both patient and doctor
  - Patient discouraged because of recurrent pain and decreased vision
  - Doctor disheartened by inability to cure disease

**Differential Diagnosis**

- Self – inflicted corneal injury
- Exposure keratitis
- Recurrence of Herpes Simplex Keratitis
- Neurotrophic Keratitis
- Roughening of tarsal plate
- Foreign bodies under tarsal plate

**Recurrent Corneal Erosion**

- Recognized as a disease entity for over 100 years
  - First report published in 1872 by Hansen
    - “Intermittent neuralgic vesicular keratitis”
  - Von Arlt published same phenomenon 2 years later
- 1900: Szili reported epithelial irregularities and gray dots associated with recurrent erosion
- 1901: Stood suggested trauma to epithelium and anterior stroma resulted in an inability of new epithelium to form normal attachments to the injured anterior Bowman’s layer
- 1921: Vogt described fine white dots on Bowman’s layer, NaFl staining, and an irregular epithelial surface with localized edema

**Recurrent Corneal Erosion Syndrome**

- Age range 24-73 years
  - Highest prevalence by third and fourth decades
  - In 5 studies the mean age was 38, 42, 44, 45, 43
  - Mean age 42 ½
- Equal distribution between men and women (slight female)
- Interval between initial abrasion and first recurrence
  - 2 days to 16 years
- Family history in 3%
- 10% cases bilateral
- Pain is most common symptom (followed by)
  - Watering
  - Blurred vision

**Anatomy**

- Corneal Epithelium
  - 5-6 cell layers thick
  - 50um thick
  - Stratified squamous to
    - Basilar columnar cell
- Rapidly renewing tissue
- Which loses its surface cells into tear film
- Turnover 4-6 days
- Maintains smoothness of optical surface
- Barrier against microorganisms
- Maintains deturgescence of stroma

**Recurrent Corneal Erosion Syndrome**

- Incidence of RCE 1:150 cases following a traumatic abrasion
- Majority – 87% (one study) occur within the lower half of the cornea irrespective to the etiology
  - In close proximity to Hudson-Stahli line
- Tiredness, menopause, menstruation, and alcohol were recognized as aggravating factors
- Patients with EBMD who suffer trauma are more likely to suffer from RCE
- Despite conservative Tx, 5% of cases continue to suffer recurring episodes
Epithelial cells rest on the basement membrane - 128nm
- Lamina Lucida – made of glycoprotein laminin
  - secreted by overlying epi
- Lamina Densa – Made of Type IV collagen
  - secreted by overlying epi
- Lamina Reticularis – Made of fibronectin
  - secreted by underlying stroma

Normal adherence to BM maintained by “adhesion complexes”:
- Hemidesmosomes (arrowhead)
- Lamina lucida and densa
- Anchoring fibrils (arrows)
- Laminin
- Fibronectin
- Type IV and VII Collagen

In vivo laser confocal microscopy
- (1) irregularity in the alignment of superficial epithelial cells
- (2) gaps in the epithelial cell layers
- (3) enlargement of the basal epithelial cells
- (4) the absence or a reduced number of subepithelial nerves
- (5) brightly reflective granular structures in the basal and wing cell layers of the epithelium and in Bowman’s layer
- (6) activated keratocytes in the shallow stroma
- (7) scattered fine particles in the shallow stroma
- (8) infiltration of inflammatory cells in the mid stroma
- (9) keratoprecipitates on the corneal endothelium

None of these findings were detected in the 30 normal eyes examined.

Epithelial separation is maximal at night due to superficial edema induced by hypotonicity of tears caused by lack of evaporation

During lid closure, the surface tension of the tears will cause an adherence between the lids and corneal epithelium

Opening the eyes quickly creates a shearing force, which is greater than the force of adherence of the affected epithelium which results in epithelial avulsion

Matrix metalloproteinase (MMP)
- Name for group of enzymes that break down the structure of the extracellular matrix (collagenase)
  - Gelatinase
    - Composed of MMP-9 and MMP-2
    - Degrades collagen type IV and VII and Laminin
    - all major components of BM

Elevated levels of MMP-9 and MMP-2 have been observed in tears of patients with RCE

Increased MMP-9 and MMP-2 expression have been implicated in the pathogenesis of RCE's
- upregulation may lead to BM degradation and poor epithelial basement membrane adhesion.
- Higher than required levels of MMP may dissolve old and newly forming BM
Diabetic patients
- RCE is thought to be more common
- Deposition of AGE’s
- Advanced Glycation End Products
- Glucose cement on hemidesmosomes that anchor the basal epithelium to Bowman’s
- Anchor points are less elastic
- More prone to sloughing

Conditions associated with RCE can be classified as either primary or secondary depending on whether the BM complex abnormality is intrinsic or acquired.

Primary
- Intrinsic
  - Due to corneal dystrophies
  - ABMD
  - Reis-Buckler’s
  - Lattice, Granular, Macular
  - Bilateral and symmetrical
  - Develop in multiple locations on cornea

Secondary
- Acquired / Extrinsic
- Traumatic abrasion
  - Sudden, sharp
- Tear film abnormalities
- Eyelid pathologies
- Dry eye
- S/P LASIK
- Salzmann’s Nodular
- BK
- Following ulcers

Inherited Recurrent Corneal Erosion Dystrophy
- IC3D new classification in 2008 placed each of 25 known corneal dystrophies into 1 of 4 categories
- Epithelial recurrent erosion dystrophy (ERED)
- Franceschetti Corneal Dystrophy
  - Dominantly inherited RCE
  - Attacks of RCE early in life – 1st decade
  - Subepithelial opacities in adult life,
  - decreased frequency of recurrent erosion attacks


Epidermolysis Bullosa (EB)
- “The Worst Disease You’ve Never Heard Of”
- rare genetic connective tissue disorder that affects 1 out of every 20,000 births in the US
- There is no treatment or cure
- prominent symptom of extremely fragile skin that blisters and tears from minor friction or
- often called “Butterfly Children” because as the analogy goes, their skin is as fragile as the wings of a butterfly
- Pt’s have strong association to develop RCE

Systemic Association

- Microform
  - Duration of 30 minutes to several hours
  - Typically have intact epithelial surface
  - More frequent
  - Often associated with EBMD
  - Punctate epithelial erosions

- Macroform
  - May last for several days
  - Pain, photophobia
  - Typically traumatic in origin
  - Frank epithelial defects or large areas of edematous non-adherent epithelium

**Diagnosis**

- SLE with indirect illumination
  - Retroillumination after dilation
- Ragged greyish-staining area of epithelium
- Cellulose sponge test looking for loose epithelium
  - “positive cellulose sponge test”
- Topography

**Management Options**

- Medical – (>95% successfully managed, 70% remaining symptom free x 1 yr, 40% 4 years)
  - Promoting epithelial regeneration
  - Patching (rare), bandage contact lenses
  - Antibiotics, cycloplegics, hyperosmotics, corticosteroid
  - Oral tetracyclines
- Mechanical
  - When medical management is not successful
  - Debridement
  - Anterior Stromal Puncture (ASP)
- Surgical
  - Phototherapeutic keratectomy (PTK)
  - Diamond burr superficial keratectomy
  - Nd:YAG
  - Alcohol Delamination

**Medical Management**

- Patching vs. BCL
- Lubrication
- Cycloplegics
- Antibiotics
- Topical NSAIDs?
- Corticosteroids
- Hyperosmotics
- Oral tetracyclines

**Management**

- Bandage CL
  - Designed to relieve pain
  - Protect epithelium from eyelids
- Options
  - Acuvue Oasys (Vistakon)
  - Air Optix Night and Day (Ciba Vision)
  - Purevision (Bausch and Lomb)
- CPT Code 92071 (99070) —Fitting of a contact lens for treatment of ocular surface disease
  - Old Code 92070 used to include materials (CL)
  - Now it's just fitting of lens and need to bill for CL separately
- Other lens choices: scleral CL, collagen shield
**Management**

**Bandage CL**
- Lens should be fitted fairly tightly
- Minimum of 6 weeks is needed to allow BM remodeling to return to normal
- Six weeks continuous wear
- Concerns?

Fraunfelder F. Cabezas M. *Treatment of Recurrent Corneal Erosion by Extended-wear Bandage Contact Lens*. Cornea. Feb 2011

- 12 patients fit with EW BSCL x 3 months
- Replaced q2weeks
- Prophylactic ofloxacin BID
- All pts felt immediate relief after BSCL insertion and during 3 month period
- 75% asymptomatic after 1 year

**Medical Management**

**Lubrication**
- Gels, drops, ointments
- Reduces friction
- Maximizes health of tear film

**Cycloplegics**
- Reduce secondary inflammation
- Improve comfort
- Homatropine 5% BID

**Antibiotics**
- Prophylaxis

**Topical NSAIDs**
- Used for analgesia

**Corticosteroids**

**Hyperosmotics**
- Produce an osmotic gradient
- Promote epithelial adherence
- Minimize epithelial edema
- Occurs overnight when lids are closed

**Azasite**
- AzaSite qhs in all cases of RCE in the presence of lid disease
- Shown to inhibit MMP-9 in epithelium and endothelium
- May be better tolerated than DCN
- Off label
- Cost is concern

**Medical Management**

**Doxycycline**
- Inhibits MMP
- Improves meibomian gland dysfunction
- Doxycycline shows 70% decrease in MMP activity in corneal cultures
- No recurrences after 21.9mo follow up
- Dosage may vary
  - Sub anti-microbial dose
  - 20 mg to 50 mg BID
  - Treatment for minimum of two months following RCE

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Research shows that corticosteroids inhibit MMP-9 and other enzymes that are known to cause epithelial breakdown specifically in RCE. Lotemax qid x 2 weeks then bid x 6 weeks. Concern of long term Tx. Side Effects (check IOP within 1 month).


Focus Laboratories
2.0% Polyvinyl pyrrodilone
0.9% Polyvinyl alcohol (87% hydrolyzed)
1.8% Polyvinyl alcohol (99% hydrolyzed)

Treats all 3 tear film layers
- Lipid layer: Amisol
- Aqueous layer
- Mucin layer
Has a high oncotic pressure
- Re-establishes integrity of epithelium
- Reduces microcystic edema
- Prevents recurrent damage
Safe for CL wearers
OTC now

Bernauer et al. .......Due to thinning of the tear film, the lids might have tight adherence to the surface of the cornea overnight leading to tearing of epithelium upon wakening

Xiidra (lifitegrast ophthalmic solution 5%)
Mechanism of Action
- ICAM-1 may be over-expressed in corneal and conjunctival tissues in dry eye disease
- Lymphocyte function associated antigen 1 (LFA-1) found on surface of T-Cells
  - Integrins can contribute to T-Cell recruitment and migration
- ICAM-1 and LFA-1 are binding partners
  - Binding leads to T-Cell activation and migration
  - Contributes to release of inflammatory cytokines
- Lifitegrast binds to LFA-1 and prevents adhesion to ICAM-1

Autologous Serum
- Use first described in 1984 by Fox et al (for keratoconjunctivitis sicca)
- Unpreserved, non-antigenic
- Utilizes patients own blood serum
- Blood is drawn and serum is spun down and mixed with artificial tears.
  - Doesn’t contain red blood cells and clot factors
- Replaces individualized antibodies
**Autologous Serum**
- When applied on RCE
  - Extra supply for necessary glucose, proteins and calcium for the epithelium to migrate rapidly
  - Speeding up first phase of wound healing
  - Vitamin A and fibronectin also help speed this up
  - Affects final phases of wound healing by supplying necessary extracellular matrix components
  - Supplies growth factors that activates keratocytes to produce extracellular matrix components

**Study in 2010**
- 6x/day for 3 mo’s, followed by 4x/d for 3 mo
- Pts seen 1d, 3d, 1 week, qmo x 12, q 3mo
- 28pts (85%) no recurrence
- 2.5 years
- Recurrence rate of 15% over 30 mo period makes it viable option
- 85% success


**Diabetic Patients**
- Maintain adequate blood sugar
  - Proper diabetic control is first priority
    - HgbA1C <7%
    - 10% lower than current

Advanced Glycation End product - AGE Inhibitor?
- Benfotiamine
  - Synthetic Thiamine
  - Lipophilic analog of Vitamin B1

The Effects of Long-Term Oral Benfotiamine Supplementation on Peripheral Nerve Function and Inflammatory Markers in Patients With Type 1 Diabetes: A 24-month, double-blind, randomized, placebo-controlled trial. *Diabetes Care*. 2012 Mar 23

**Epithelial Debridement**
- Use cotton swab, spatula, spud, or jewelers forceps
- Begin by softening epithelium by instilling topical anesthetic q 15-30 sec for 1-2 min
- Work toward the center of the cornea
- Avoid pulling up or out
- Try to keep straight, firm edges
- Key is to make sure to get Bowman’s smooth
- BCL, topical antibiotics, topical NSAIDs PRN
- Oral analgesics if needed
- CPT 65435 (Removal of corneal epithelium) $103.58
- ED success 65-82% (varies)

**Mechanical and Surgical Management**
- Epithelial Debridement
- Sutureless Amniotic Membranes
- Anterior Stromal Puncture
- Nd:YAG Puncture
- Phototherapeutic Keratectomy (PTK)
- Alcohol Delamination
- Superficial Keratectomy
Sutureless Amniotic Membranes

**Pathophysiology**
- Faulty BM with poor adhesion complexes
  - Poor epithelization
  - Increased MMP

**AM Mech of Action**
- Promotes Epithelialization
- Suppresses Inflammation
- Inhibits Scarring
- Inhibits Angiogenesis
- Neurotrophic Factors
- Anti-Microbial Agent

- Innermost of 3 membranes forming the fetal membrane
- Avascular and acellular. It will facilitate epithelial healing
- Combined action helps stimulate epithelialization
- Easy to insert in the office, bed side
- Monitor healing by fluorescein and IOP by Tonopen™ without removal
- Does not interfere with antibiotic penetration
• Facilitates healing in most defects within 5-10 days at which point the membrane in the device will naturally dissolve.
  
• 65778 (the CPT code)

**Anterior Stromal Puncture**

- First described by Mclean, et al 1986
- 20-25 gauge disposable hypodermic needle
- Under slit lamp making multiple punctures through loose epithelium and Bowman’s membrane into ant half of stroma.
- Approx 15-25 punctures spaced 0.5mm apart
- Orient needle perpendicular to corneal plane
- Exert enough pressure to indent the cornea one quarter to one-third depth of A.C. (0.1mm adeq)

**Potential Side Effects**

- Corneal perforation
- Scarring due to deep penetration
- Best utilized for pts w periph etiology
- Microbial keratitis
- Anterior uveitis
- DLK in post-LASIK patients
- Sub epithelial fibrosis
- Following Bullous Keratopathy
- Delayed 1-2 years
  * Most likely pre-exisiting
  * Tx w Superficial Keratectomy to remove membrane

- CPT 65600 (multiple punctures of anterior cornea) $499.79
- ASP with Needle 60-88%

**Anterior Stromal Puncture**

- Believed that breaching of Bowman’s stimulates a more secure bonding of epi to the underlying BM, Bowman’s and stroma
- Following ASP
  - BSCL (2 weeks)
  - Fluoroquinolone AB
  - Steroid
  - Non presv Art tears

**ND:YAG Laser Puncture**

- Similar in concept to anterior stromal puncture
- Study by Katz et al retrospectively studied 8 patients with RCE treated with the Nd:YAG laser
  - used 0.4- to 0.5-mJ pulses applied to the region of Bowman’s layer through an intact epithelium
  - all 8 patients (11 eyes) had resolution of their symptoms after treatment w f/u 21.2
- Benefits
  - Shallow, reproducible, translucent
- Concerns
  - Needs epi off for full breach into stroma

**Superficial Keratectomy**

- Total superficial keratectomy w blade or diamond knife.
- Dystrophic epi and BM are peeled in one continuous sheet leaving undisturbed Bowman’s
- SK with blade 67-82%
- SK with Diamond burr 75-100%
Superficial Keratectomy

- Superficial Keratectomy
- Amoils Epithelial Scrubber
  - Handle with battery operated motor
  - Rotates a disposable, circular brush
  - Originally designed to remove central epithelium prior to PRK
  - Effective for treating recalcitrant RCE
  - Applied for longer duration to central and peripheral cornea

Figure 1. (Hodkin) The end of the AES with the attached rotary brush held above a patient’s eye. During the procedure, the patient’s head is rotated slightly toward the operative eye and irrigation solution is dripped onto the cornea while the brush is maneuvered to debride the corneal surface.

88% success

Phototherapeutic Keratectomy (PTK)

- Use of excimer laser to smooth Bowman’s
- Epithelium removed manually or with blade / alcohol
- Often used for recalcitrant cases

Objective
- remove enough of the superficial Bowman’s layer to permit formation of a new basement membrane with adhesion structures

- Technique
  - Debride the epithelium in the involved area
  - Use large spot size (5 mm)
  - Apply 16 pulses
- No optical effect is seen with such a superficial ablation

Phototherapeutic Keratectomy (PTK)

Transepithelial PTK (t-PTK)

- Same as PTK, though excimer is used to remove epithelium
- Holzer et al showed 80% had no RCE for 6-20 months
- No statistical significant change in refraction

- Ardjomand et al modified epithelial removal
  - Hinged at 12 o’clock

Higher success rate in secondary cases (trauma)
Can be combined with PRK in appropriate cases

Alcohol Delamination

- Quick, safe and economical
- Performed in controlled setting
  - Epithelium very sensitive to alcohol
  - 20% ethanol for >30sec
  - Splits epi from stroma at level of Lamina lucida (lv) and densa (stays)
  - Proteinaceous or cellular debris is removed
  - Collagen VII remains
  - Allowing new anchoring fibril formation

Mencucci R. Dua H. et al. Alcohol delamination in the treatment of recurrent corneal erosion: an electron microscopic study. BJO 94.2010
17 pts failed conservative tx
83% success first year
Corneal Cautery
Conjunctival Flaps

Substance P-derived peptide
- Sensory neurotransmitter released from the trigeminal nerve during healing
- Confocal microscopy showed alterations in corneal nerves similar to neurotrophic corneas
  - Authors had previous success tx neurotrophic
  - Promoted epithelial migration and healing
- Case report of 1 pt (32yo female) who suffered trauma RCE
- Failed med management, BSCl and Autologous serum
  - Experienced 26 RCE episodes
  - Topical 4x/d combining 250 μg/mL of substance P-derived peptide
  - with 1 μg/mL of insulin-like growth factor I
  - Resolution of defect noted in 11 days
  - Tx D/C after 2 mo’s
  - 11 months no recurrence

More studies needed

Substance P-derived peptide
- Resolution of defect noted in 11 days
  - Tx D/C after 2 mo’s
  - 11 months no recurrence

Botox
- Limited data
- Patients with RCE may have absent or weak Bell’s phenomenon
- Injections to orbicularis
- Superior, both nasal and temporal
- Mechanism of improvement
  - Decreasing effect of orbicularis during REM sleep in patients with abnormal Bell’s phenomenon

Umbilical Cord Serum
- Umbilical cord blood was collected from mothers who underwent vaginal delivery or Cesarean delivery
- Blood was collected from the umbilical vein after fetal delivery
- A volume of 200 to 250 mL of umbilical cord
**Umbilical Cord Serum**
- Compared to AS, UC serum
  - higher concentration of essential tear components
  - many growth factors
    - such as Epidermal Growth Factor, Vitamin A, and Transforming Growth Factor-β, and neurotropic factors, such as Substance P, insulin-like growth factor-1, and nerve growth factor
- 35 pts, f/u 14 mo, tx 4-6x/d entire time
- 83% success


**N-Acetylcysteine**
- NAC is a derivative of cysteine
  - which inhibits collagenase irreversibly
  - It is believed that NAC inhibits MMP-9 in a similar fashion.
  - A study in 2012 showed that NAC reduces MMP-9 production in human corneal epithelial cells, and inhibits cell migration.
  - Making it a viable therapeutic option for RCE

**Obscure treatment?**
- Hypnosis
  - Treatment and prevention of RCE
  - 1 case study using hypnosis and suggestions
  - Patient remained symptom free for 20 months

**Stepwise Approach**
- Medical Management
  - Bandage CL
  - Epithelial debridement
  - Autologous Serum
  - Surgical Intervention

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- Medical Management
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**Controlled Studies on RCE**

Medical Combination Tx

- Muro ung qhs >>> FreshKote gtts TID >>> Lotemax qid x 2 weeks then bid x 6 weeks >>> AzaSite
- Muro ung qhs >>> FreshKote gtts TID >>> Lotemax qid x 2 weeks then bid x 6 weeks >>> DCN
- Muro ung hs >>> FreshKote gtts TID >>> Autologous Serum >>> DCN
- Lotemax >>> DCN

Mechanical Combination Tx

- Epi debridement >>> Amniotic Membrane >>> >>> Autologous Serum >>> DCN
- Epi Debridement >>> EW BSCL 12 weeks >>> DCN >>> Lotemax
- ASP >>> BSCL 12 weeks >>> DCN >>> Lotemax

Surgical Combination Tx

- When to refer???:
  - After repeated medical and mechanical management failure
- Alcohol Delamination >>> BSCL x 12 weeks >>> DCN >>> Lotemax
- SK >>> BSCL x 12 weeks >>> DCN >>> Lotemax, AzaSite

Audience Treatment Options

- Oral and Topical Vitamin C
- Put on a SCL prior to Bed
- Faith Healing
- Breast Milk
- Using Honey
Case Presentation

47 wm. Don E
- OHx
  - EBMD OS>OD and Hx
  - Trauma OS with RCE OS
- Ongoing RCE approx qom, but mild disturbance each morning x 2 years
- Had Debrided cornea 6 mo prior but still experiencing RCE
- MHx
  - Obstructive Sleep Apnea
  - HTN
  - Migraines

Case Presentation

- Ant stromal puncture
- BSCL x 3mo
- DCN 20 mg BID PO x 3 mo
- Lotemax QID for 2 weeks, BID for 4 weeks (6 wks total)
- No recurrences after 20 months

Case Presentation #2

- 35 year old Caucasian female, Sheila F.
- Initial visit ~ 3 years ago
  - Traumatic corneal abrasion OD
  - Treated with antibiotics, lubrication
  - Healed completely within 3 days

Case Presentation #2

- Patient returns 6 months later with RCE
- Treated with BCL, antibiotics, lubrication
- Resolution within 1 week
- Recurrences ~ 4 months

New treatment recommended:
- BCL x 3 months, replacing every 3 weeks
- Lotemax BID OU x 1 month, FreshKote 2-4x/day
- Doxycycline 20 mg BID x 2 months
- Recurrences ~ 12 months
Case Presentation

A 55 year old female with history of mascara brush trauma several years prior suffering repeated bouts of recurrent erosions for years.

She reports at this visit complaining of difficulty upon wakening with redness, tearing, photophobia, pain and blurred vision OD.

BVA 20/30 OD, 20/20 OS

Slit lamp examination
- irregular epithelium with a large epithelial defect OD.
- Dx with a recurrent corneal erosion
- Combined four treatment modalities together
  - Corneal debridement
  - AmbioDisk dehydrated amniotic membrane
  - Extended wear BSCL
  - Topical corticosteroid
  - Oral doxycycline.

Case Study

WR, 50 year old male

Initial visit August 2011

Presented with c/o foreign body/irritation OD

Medical Hx: HTN, hyperlipidemia

Ocular Hx: Unremarkable
Case Study

Clinical Exam (September 2012)
- BCVA 20/20 OD, OS
- Slit lamp exam
  - Blepharitis/Meibomitis
  - DFE
  - Unremarkable

Clinical Exam (July 2013)
- Presents with c/o symptoms of RCE OD
- Cornea clear OD/OS
- Treatment: Start Muro 128 ointment QHS OD

Case Study

Clinical Exam (August 2013)
- Patient more symptomatic
- Change treatment course

Case Study

Clinical Exam (March 2014)
- New Plan

Case Study

Clinical Exam (August 2013)
- Patient more symptomatic
- Change treatment course

Case Study

Clinical Exam (August 2013)
- Patient more symptomatic
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Clinical Exam (August 2013)
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Debrided cornea
ProKera Slim AM inserted

Doxycycline 20 mg BID x 2 months
Lotemax gel TID OD x 1 month
Summary

- Commonly encountered in optometric practices
- Pay close attention to type of RCE (Primary vs Secondary)
- Lots of options when treating RCE
  - Remember the anatomy
- Don’t give up hope
  - Always something different to try
- Best option is a combination Tx with a minimum of 4 individual tx options
  - Trial and error to find the best combo for each patient

Thank you

Please feel free to contact us:
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