

Presented by: Julie A Tyler, OD, FAAO



STRAIGHT
OUTTA
SFL

Cases compiled by: Julie A Tyler, OD, FAAO and Thuy-Lan Nguyen OD
Nova Southeastern University College of Optometry

Introductions:

◆ Dr. Tyler – Shire

Credentials: Chief of Module for The Eye Care Institute -Davie, Nova Southeastern University

Presentations: Cases will be presented in Grand Rounds style with diagnosis discussed after case

Goals:

- Case-based presentation
- Focus will be on uncommon ocular conditions in various South Florida patient populations
 - *Included will be the latest recommendations for systemic and imaging evaluations when indicated based on underlying etiologies for the ocular presentations encountered*

Ruthless Road

30 YO Haitian male:

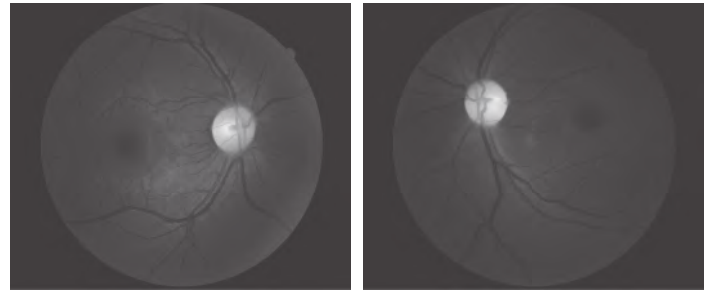
- C/O vision loss and swollen eyelid OS x 16 days
- History of recent motorcycle accident (not wearing a helmet), treated and released from local ER
- Medical history unremarkable
- No medications, no known drug allergies

- BCVA OD: 20/20, **OS: No Light Perception**
- Pupils:
 - OD: round, reactive, **OS: fixed, dilated, (+) APD**
- SLE: OD: unremarkable
 - OS: (+) upper lid contusion and abrasion
 - OS: (+) subconjunctival hemorrhage
 - OS: (+) trace cells in AC

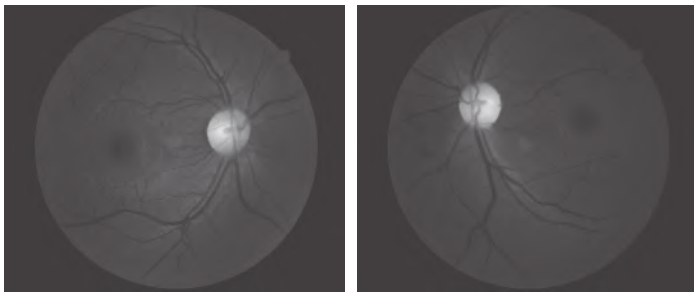
Dilated fundus examination

- OD: ONH pink and distinct, .3 CD ratio, macula Flat and intact, peripheral retina intact 360
- OS: ONH pale, .40 CD ratio, macula flat and intact, peripheral retina intact 360

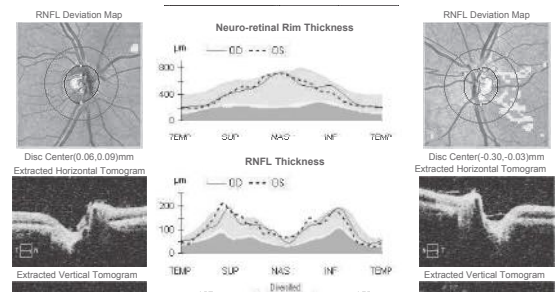
Ruthless road



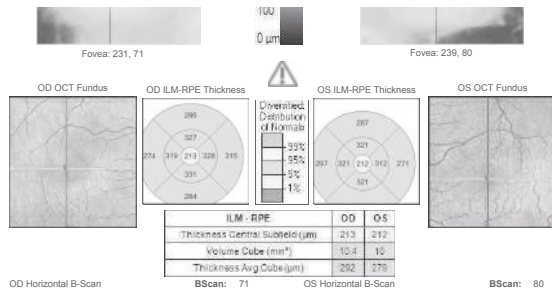
Ruthless road



Ruthless road



Ruthless road



DX: Traumatic Optic Neuropathy

Treatment

- Refer to ER for CT / MRI to rule out additional traumatic brain injury or concussion
- Refer to neuro-ophthalmology for evaluation and confirmation
- Pt advised on permanent nature of vision loss
- Pt advised on polycarbonate specs for full time safety

Traumatic Optic Neuropathy

1 week later

- ER performed CT/MRI, cleared and released
- Neuro-ophthalmology evaluated and agreed with diagnosis, cleared and released
- Patient reports no changes in symptoms
- Patient counseled
- Family counseled
- RTC prn or 6 months

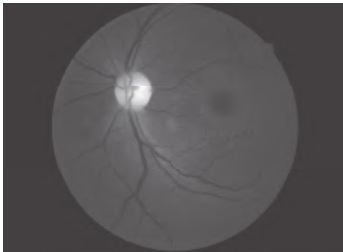
Traumatic Optic Neuropathy

6 month re evaluation

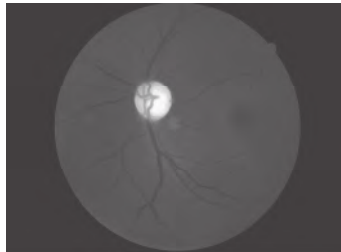
- BCVA OD: 20/20, OS: No Light Perception
- Pupils:
 - OD: round, reactive, OS: fixed, dilated, (+) APD
- SLE:
 - Lids/ Lashes: OD clear, OS scarring on upper eyelid and forehead
 - Otherwise, unremarkable OD, OS

Traumatic Optic Neuropathy

OS nerve initial presentation ~16 days



OS nerve at 6 months



Traumatic Optic Neuropathy

- Sudden decreased vision corresponding with a traumatic event
- AKA, *Indirect traumatic optic neuropathy* if trauma was not directly to the optic nerve (i.e. head trauma)

Symptoms

- Blurred vision to complete vision loss
- Generalized pain (head / body / face) associated with trauma

Other Ocular Signs

- Reduced vision
- Afferent Pupillary Defect
- Reduced color vision
- Possibly normal anterior segment
- Reduced visual fields
- Pale optic nerve
- Normal CT/MRI

Possible additional findings

- Swollen eyelids
- Subconjunctival heme
- Eyelid contusions
- Angle recession
- Orbital fracture
- Commotio Retinae

Traumatic Optic Neuropathy

Demographics

- Approximately 80% male
- **Median Age 33.5 years**
- 2/3 associated with significant head injuries
 - 63% due to motorized vehicle accidents
- Other common mechanisms of injury
 - Bicycle accident
 - Fall
 - Assault

Traumatic Optic Neuropathy



OCT and Traumatic Optic Neuropathy

Acute vs Chronic

- Retinal nerve fiber layer may thicken immediately after trauma *and then progressively thin for months*
- Potential Long term consequences
 - Traumatic Brain Injury (TBI)

Visual Evoked Potential

- VEP not needed for diagnosis in most cases
- In questionable cases, VEP may confirm diagnosis
- VEP may help in predicting outcome

CT / MRI of Traumatic Optic Neuropathy

- Typically no fractures of optic canal, but other skull fractures are common
- Posterior orbital fracture is associated with poorer visual outcomes compared to anterior fractures
- MRI of optic nerve typically normal
- MRI to rule out other traumatic brain injuries

Treatment for Traumatic Optic Neuropathy

- High dose IV corticosteroids
 - No significant improvement in vision, but elevated risk for death after head trauma
- Levodopa
 - Neuro-protective
- Surgery: Optic canal decompression
 - Controversial due to risk of vision loss, CSF leak and meningitis
- Transcorneal electrical stimulation (TES)
 - May increase choroidal blood flow and stimulate neuro-protective substances

Treatment for Traumatic Optic Neuropathy

- Typically NO treatment
- PREVENTION IS KEY
- Examples:
 - Wearing Helmets
 - Wearing protective eyewear



Florida Helmet (No Helmet) Law 316.211

- (1) A person may not operate or ride upon a motorcycle unless the person is properly wearing protective headgear securely fastened upon his or her head
- (2) A person may not operate a motorcycle unless the person is wearing an eye protective device over his or her eyes of a type approved by the department

Florida Helmet (No Helmet) Law

- (3)(b) NOTWITHSTANDING SUBSECTION (1), A PERSON OVER 21 YEARS OF AGE MAY OPERATE OR RIDE UPON A MOTORCYCLE WITHOUT WEARING PROTECTIVE HEADGEAR SECURELY FASTENED UPON HIS OR HER HEAD IF SUCH PERSON IS COVERED BY AN INSURANCE POLICY PROVIDING FOR AT LEAST \$10,000 IN MEDICAL BENEFITS FOR INJURIES INCURRED AS A RESULT OF A CRASH WHILE OPERATING OR RIDING ON A MOTORCYCLE

Universal Helmet Laws

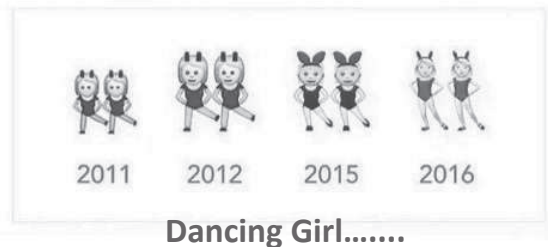
- In the US, there are 20 states plus Canada that require universal helmet use for all motorcycles including Florida's neighbors – Alabama, Georgia, Louisiana and Mississippi
- Beware if you are planning on riding out of Florida



Virginia Helmet Laws



the dancing emoji girls are growing up so fast 🙄



Dancing Girl→

- 22 year old white female presented with a 2 day history of red eye OS
- Patient complained of watery discharge and irritation with mildly decreased vision; (+)FBS
- (-) Ocular history, (-) Contact lens wear
- Pt denies systemic conditions and medications

DANCING GIRL→

Additional HPI:

No previous history of red eye; (+) Foreign body sensation [FBS]; (-) photophobia;(-)concurrent symptoms of URI/ UTI

Upon questioning,

- Unsure of exposure to others with a red eye
- Why? How? Occupation.....

DANCING GIRL →

Objective evaluation

- BVA: 20/20 OD, 20/30 OS
- CF: FTFC OD, OS
- EOM: SAFE OU
- PUPILS: equal, round, reactive (-)RAPD
- External evaluation: **(+) Pre-Auricular Node**
- SLX - OD: Lid/lashes, conj, cornea, iris – no pathology noted



DANCING GIRL →

OBJECTIVE FINDINGS → OS Slit Lamp findings:

- Lid/lashes: Debris & serous discharge noted;
 - **(+) Follicles noted**
- Conjunctiva: **Grade 3 injection, diffuse**
- Cornea: Clear (-) NaFl stain or RB
- Iris, Sclera: No pathology noted
- Anterior chamber: No cells or flare

DANCING GIRL: DIFFERENTIAL DIAGNOSIS →

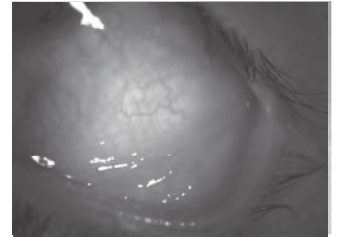
Traditional Differential Diagnosis: "STRAIGHT OUTTA SOUTH FLORIDA":

- Adenoviral infections
- Herpes simplex viral infections → Conjunctivitis, epithelial dendrites, stromal reactivation, etc
- Chikungunya conjunctivitis
- Zika related conjunctivitis



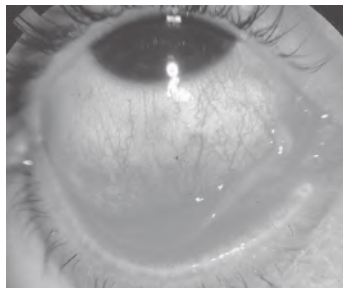
- **Many Serotypes** → Emerging new classification system
- Transmitted by respiratory and ocular secretions, contaminated "fomites" (i.e. - eye droppers, mascara bottles)
- **CONTAGIOUS**
- Often history →
 - Concurrent upper respiratory infection (URI)
- or
- Close contact with someone suffering from "pink eye"

Adenoviral conjunctivitis



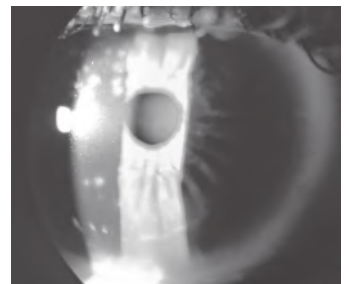
Epidemic keratoconjunctivitis (EKC)

- When adenoviral infection spreads to the cornea
- Serotypes 8,19 and 37
- As the condition progresses: Subepithelial infiltrates, corneal erosions, pseudomembranes
- Peel pseudomembranes manually every 2-3 days



Epidemic keratoconjunctivitis (EKC)

- **Can lead to long-term photophobia and reduced vision**
- **Treatment considerations:**
 - Palliative
 - Consider topical corticosteroids
 - Others: PVI (Betadine), Zirgan, Hypochlorous acid



FOR YEARS I TRAVELLED TO ORLANDO AND OTHER "TOURIST DESTINATION SPOTS" AND DID NOT SEE THIS.....



Chikungunya Virus and Zika Virus



THOSE DARN MOSQUITOS...OR IT NEVER FREEZES IN SOUTH FLORIDA...AND WE ARE SURROUNDED BY WATER



Chikungunya Virus

- PubMed – between 1994 and 2016 (22yrs)= 27 references → SIX in 2015-2016, 2017 to Jan 2018 = 11 more references
- Chikungunya is a self-limited, systemic viral infection
 - SYMPTOMS similar to LYME disease: joint pains, fatigue, etc
 - Becoming a greater health problem in the US in the past few years as the range is no longer limited to India and Africa but has spread throughout the Caribbean

Mahendradeas P, Avadhani K, Shetty R. Chikungunya and the eye: a review. J Ophthalmic Inflamm Infect. 2013 Feb 11;3(1):35.

CHIKUNGUNYA AND THE EYE



- Prior to 2006, chikungunya virus was reported from affected areas in...
- From 2006-2013, studies reported chikungunya virus from affected areas in...
- In late 2013, the first case of chikungunya virus spreading to people in...
- Beginning in 2014, chikungunya virus spread to areas in the Americas...

Features	Reference
Conjunctivitis	[48]
Epididitis	[43]
Non-granulomatous anterior uveitis	[45,49]
Granulomatous anterior uveitis	[45,49]
Keratitis	[49]
Retinitis with vitritis	[45,49,73]
Bilateral neuroretinitis	[49,51,52]
Multifocal choroiditis	[49,53]
Optic neuritis	[51,53,54]
Retrolubar neuritis	[49,53,54]
Exudative retinal detachment	[45,49]
Panuveitis	[49]

positive tests for chikungunya virus in the Caribbean countries and the virus are being reported from affected areas in the Virgin Islands.



- CDC website: <http://www.cdc.gov/chikungunya/geo/united-states.html>
- Mahendradeas P, Avadhani K, Shetty R. Chikungunya and the eye: a review. J Ophthalmic Inflamm Infect. 2013 Feb 11;3(1):35.

CHIKUNGUNYA AND THE EYE

Various Ocular Presentations → retained w/in corneal grafts

Conjunctivitis:

Mimics other viral conjunctivitis and resolves within a week → Due to self-limiting nature may be under-reported

*Anterior uveitis is by far the most common presentation

- BOTH non-granulomatous and granulomatous variants reported
- Pigmented KP and increased IOP common
- May be unilateral or bilateral

Posterior involvement = retinitis, choroiditis, neuroretinitis, and optic neuritis all possible

- CDC website: <http://www.cdc.gov/chikungunya/geo/united-states.html>
- Mahendradeas P, Avadhani K, Shetty R. Chikungunya and the eye: a review. J Ophthalmic Inflamm Infect. 2013 Feb 11;3(1):35.



THOSE DARN MOSQUITOS...OR

IT NEVER FREEZES IN SOUTH FLORIDA...AND WE ARE SURROUNDED BY WATER



Zika → First discovered in 1947. Named after the Zika forest, Uganda.

- In 1952 → First human cases were detected.
 - Because the symptoms of Zika are similar to those of many other diseases, many cases may not have been recognized
 - ZIKA Virus and eye: PubMed – 34 references → ALL IN 2016!!!
 - Since the 2016 Outbreak → 44 in 2017 thru Jan 2018
 - Various Ocular Presentations
- <https://www.cdc.gov/zika/>

ZIKA VIRUS

Diagnosis:

- Patients recent travel history
- Symptoms
- Test results (a blood or urine test can confirm)

Why Zika is risky for some people:

- During pregnancy can cause microcephaly and other fetal brain defects (including eye, hearing, impaired growth)
- Increased reports of Guillain-Barre syndrome



ZIKA VIRUS: SIGNS AND SYMPTOMS

- Fever
- Rash
- Joint Pain
- CONJUNCTIVITIS



Other symptoms include: Muscle Pain, Headache

Symptoms can last from several days to a week. Usually not sick enough to go to the hospital and very rarely die

Possible shedding of virus in tears (Mice models w/panuveitis) – Miner JJ, Sene A, Richner JM et al. Cell rep. 2016 Sep 20;16(12)3208-18.

ZIKA VIRUS: OCULAR CONSIDERATIONS

OCULAR presentations:

Active Disease

- Non-purulent Conjunctivitis
- Zika-related unilateral acute maculopathy in an adult

Infants with Congenital Zika Syndrome

- Retinal Lesions (OCT may be used to detect)
- *Is it Zika or the microcephaly → Hx w/ pigmentary maculopathy, circumscribed CR atrophy and ON anomalies

DANCING GIRL → TREATMENT CONSIDERATION

Traditional:

- **PREVENT CONTAGIOUS SPREAD!**
 - “Obvious” = towels, bedding, CL and make-up
 - Others? → COMPUTER keyboards, door handles, pens
- Palliative Care
 - Artificial tears (OTC PF AT cold q 1-2 hours while awake)
 - Cool compresses (2-3 min QID)
 - Supportive anti-inflammatory agents (eg, 600-800mg ibuprofen)
- No FDA-approved medications for treatment of adenoviral conjunctivitis



DANCING GIRL → TREATMENT CONSIDERATION

OFF LABEL Considerations:

- Zirgan 0.15% (ganciclovir) may be used off-label by some practitioners; requires informed consent; 5 g = \$300
- Consider treatment with topical antibiotic drops if (+)HIV or co- or super-infection type presentation
- New discussions considering Hypochlorous acid...
- AND supported but not approved Betadine 5% Wash....

Betadine 5% wash

- Off label Betadine 5% (povidone – iodine/ PVI), \$19.50
- Informed consent
- 18+ years old
- Considerations:
 - Symptomatic for less than 5 days
 - No ocular surgery within the last 3 mos
 - No active ocular allergies
 - **No history of hypersensitivity to iodine**



EXAMPLE REGIMENS

- 1 drop proparacaine
 - 2-3 drops Betadine 5% ophthalmic prep*
 - Pt rolls eyes in all directions behind closed lids for 45–60 secs
 - Swab excess betadine from adnexa with sterile gauze
 - Irrigate with sterile saline
 - In-office Voltaren (optional)
 - Topical steroid (e.g. Lotemax) QID x 4 days
 - NOTE: caution in EKC → SEI's resolve but rebound aggressively
- Instill 3 drops of Proparacaine/ Tetracaine
 - Instill 5 drops of Betadine 5%
 - Instruct pt to close the eye, move side to side, up and down for 60 seconds
 - Use gloved finger to spread Betadine over lid margin and lashes
 - Thoroughly wash the eye with saline until all traces of Betadine have been removed
 - Follow up 2-3 days, 4-5 days and 7-14 days post treatment

DANCING GIRL→

AND THE BEST PART.....



When I went up to the front desk to provide her an excuse for work, she was paying with a big stack of \$1 dollar bills.....

#ididntevenhavetomakeitup

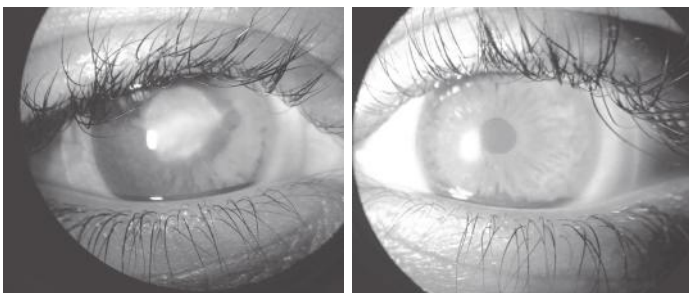
Cornea Aftermath

Cornea Aftermath

- 19 year old female referred by corneal specialist at Bascom Palmer Eye Institute for a "hard" contact lens evaluation
- History of contact lens overwear and corneal ulcer from *P. aeruginosa*. Treated with topical antibiotics
- Patient is an athlete - runs, plays basketball for college team

Cornea Aftermath

- Fit with scleral gas permeable CLs
- BCVA OD: 20/30-, OS: 20/20
- Patient education!



Cornea Aftermath

REWIND



- Prior Records from Bascom Palmer Eye Institute
 - September 2015, patient presented to BPEI Miami with complaints of eye pain x 4 days
 - VA sc OD: LP, ph NI OS: CF ph 20/60
 - SLE: OD: 7-8mm region of corneal edema with 4-5 mm central k ulcer and surrounding infiltrate with +2 conj injection and AC hypopyon
 - OS: unremarkable
 - DFE unremarkable

Cornea Aftermath

- Diagnosis
 - Corneal ulcer with hypopyon and corneal edema, likely bacterial in etiology
- Plan
 - Order corneal culture
 - Initiate treatment while waiting for results of culture
 - Fortified Vancomycin / Tobramycin igtt q1h OD, Ciprofloxacin gtt q1h OD, Minocycline PO, Cyclogyl TID OD
 - RTC 1 Day

Cornea Aftermath

- 1 Day follow up at BPEI
- Diagnosis
 - Corneal Ulcer OD, hypopyon resolved, epi defect slightly smaller, edema/infiltrate stable
- Plan
 - Continue Vancomycin/Tobramycin/Ciprofloxacin eye drops q1h OD while awake
 - Continue Minocycline PO
 - Continue Cyclogel tid OD
- RTC 3 days

Cornea Aftermath

- 4 day follow up at BPEI
- Final culture and sensitivities received:
 - Gram stain: no white blood cells seen, many Gram negative rods
 - Culture: many *Pseudomonas aeruginosa*
 - Sensitivities: Sensitive to amikacin, aztreonam, cefepime, ceftazidime, cipro, gentimycin, imipenem, levofloxacin, meropenem, piperacillin, piperacillin/tazo, tobramycin

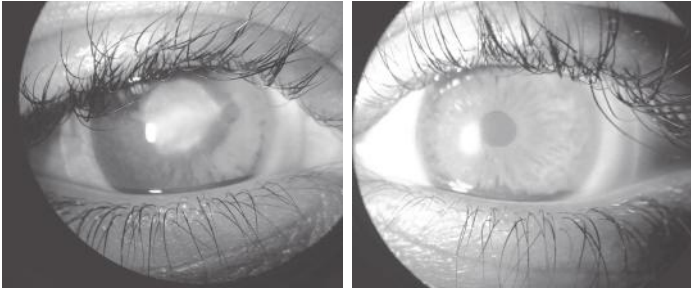
Cornea Aftermath

- 8 day follow up at BPEI
- Impression
 - Pseudomonas keratitis OD – resolved with large central scar
- Plan
 - Cipro 4 x daily for 3 days then stop
 - PF 4 x daily for 1 week then taper over 3 weeks
 - Continue care with previous eyecare provider next month

Cornea Aftermath

- 1 year re evaluation at BPEI
- Assessment
 - Pseudomonas keratitis OD resolved with large central scar
 - Pt interested in surgery (cosmetically), however thinned over area
- Plan
 - Discussed extensively regarding surgery (likely PK) however would advise against surgery given young age and extent of surgery
 - Need “hard” CL exam to determine BCVA, if CL improves vision, remain in CL, if not consider PK in future

Cornea Aftermath



Cornea Aftermath

Pseudomonas aeruginosa keratitis

- **Gram negative rod shaped bacterium**
- Most common form of microbial keratitis (MK) associated with contact lens wear / overwear
- Approximately 60% of all CL related keratitis
- Can lead to corneal perforation, corneal melt, endophthalmitis and vision loss
- Hallmark is ring abscess
 - Ring shaped accumulation of PMN (polymorphonuclear) leukocytes surrounding central corneal lesion



Central microbial keratitis (MK)

- Peripheral corneal ulcers are clinically less severe compared to central ulcers
- Faster host immune reaction near the limbus which may restrict the extent of tissue compromise
- Shorter distance for polymorphonuclear leucocytes from limbal vessels
- Central cornea less protected, more likely to progress further before host immune reaction can dampen the response

Online purchases

- Up to 60% of plano contact lenses purchased online are not an acceptable fit
- Unregulated purchase of CLs online only account for approx. 6% of patients with complications from CL wear

When to culture?

- Small peripheral corneal ulcers with no stromal involvement → *Culture optional*
- Unusual history such as trauma with vegetative matter or wearing contact lenses in a hot tub → *Culture helpful*

When to culture?

- Any large (>2 mm) central infiltrate that extends into stroma → **CULTURE**
- Any chronic ulcer that is unresponsive to broad spectrum antibiotic treatment → **CULTURE**
- Ulcers with atypical features suggestive of fungal, acanthamoebal, or mycobacterium → **CULTURE**

Why Culture?

- Identify the causative organism
- Determine sensitivity to anti-microbial agents
- Modify therapy in patients with poor clinical response to treatment
- Eliminate toxicity by eliminating unnecessary medications

Differential diagnosis

- Fungal keratitis – dull gray infiltrate with feathery borders and possible satellite lesions
- Acanthamoeba keratitis – ring shaped ulcer with perineuritis, similar to HSV keratitis, but painful
- Herpes Simplex Virus epithelial keratitis – dendritic ulcer
- Non infections ulcers – sterile infiltrates, neurotrophic ulcers, autoimmune related keratitis, allergic keratoconjunctivitis

Off label treatment for bacterial keratitis – *Approved for Conjunctivitis*

- Gatifloxacin
- Moxifloxacin
- Besifloxacin 0.6%
 - More effective against gram positive than 3rd generation fluoroquinolones

Common Causes of Bacterial Ulcers in US

- *Staphylococcus aureus* – gram positive cocci
 - Most common in a diverse population
- *Pseudomonas aeruginosa* – gram negative bacilli
 - Most common with contact lens wearers
- *Serratia marcescens* – gram negative bacilli
 - Possibly as frequent as Pseudomonas

FDA approved treatment of bacterial keratitis

- Ciprofloxacin 0.3%
- Ofloxacin 0.3%
- Levofloxacin 1.5%

Fortified antibiotics

- For severe or unresponsive infections
- Made by a compounding pharmacy
- Used in addition to fluoroquinolones
 - Fortified Tobramycin
 - Vancomycin

Corticosteroid Therapy for bacterial keratitis

- **ONLY Used in conjunction with antibiotic therapy**

Good

- Suppresses inflammation
- May reduce corneal scarring and vision loss

Bad

- May cause renewed infection
- Inhibits collagen synthesis predisposing to corneal melting
- Steroid responders

Corticosteroids for Central Corneal Infiltrate

- **Added to antibiotic therapy after 2-3 days of progressive improvement**
- Added after pathogen is identified and fungal infection ruled out
- **DO NOT USE TOPICAL CORTICOSTEROIDS** (eg, Durezol) on “suspected/unconfirmed” cases
- Check IOP within 1-2 days



Additional CL management discussions

- STOPILLEGALCLS@aoa.org



The Rash That Just won't Go Away....

Or Why you may not want to start College in South Florida

This Rash Just Won't Go Away....

19 Year Old White Male

CC:

- Irritated, painful, red eye OS
- Sensitivity to light with mild decreased VA
 - *Onset: 1 day prior*
- Ocular History:
 - (+) Contact lens wearer – Acuvue 2 week disp
 - *FBS increased with CL use*

This Rash Just Won't Go Away....

19 Year Old White Male

Medical History/Review of Systems

- Persistent Rash on torso
 - Diagnosed elsewhere as: *pityriasis rosacea*
- No medications or medical allergies noted

This Rash Just Won't Go Away....

- Persistent Rash on body
 - Diagnosed elsewhere as: *pityriasis rosacea*



This Rash Just Won't Go Away....

Ocular Examination

- Visual acuity cc: 20/20 OD and OS
- EOM: FROM OU
- CF: FTFC OD, OS
- Pupils: **Anisocoria (OD>OS [miosis]), (-) APD**
- Slit Lamp: OD within normal limits
 - **OS:** 3+ conjunctival injection, 1x1 corneal defect superior to visual axis, (+) Nafl staining
 - Fleeting views: (-) cells, flare

This Rash Just Won't Go Away....

Initial Diagnosis → Impression/Plan

- **Corneal bacterial keratitis secondary to CL overwear**
 - Moxeza™ 1 gt q15min x 1hr OS, then 1gt q1hr until 1 day follow-up
 - 1 gt **Scopolamine** in office OS
 - Non-preserved AT q1hr OS

This Rash Just Won't Go Away....

Social History

- Risk behaviors
 - Extended wear CL use
 - Swimmer
 - Just finished first year in college ... “away from home”
- Environmental considerations

This Rash Just Won't Go Away....

Follow-up Examinations

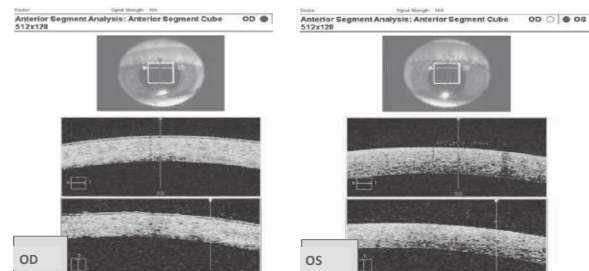
- At one day follow-up patient noted decrease in redness and discomfort
 - Now visible → *Significant anterior chamber reaction*
- **Over the next two weeks**
 - Quality of vision improved and Corneal ulcer resolved....

BUT

This Rash Just won't Go Away

Follow-up Examinations

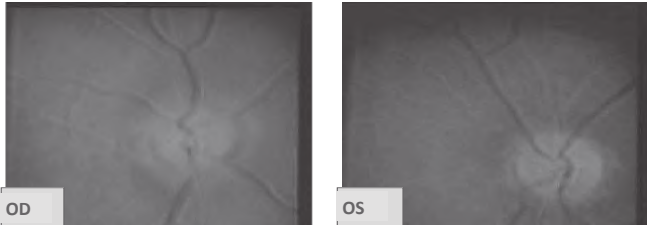
– *Interstitial keratitis* ensued and AC reaction persisted despite aggressive topical steroid regimen



This Rash Just Won't Go Away....

Follow-up Examinations

- At the two week follow-up with observation →
 - *OPTIC NERVE HEAD ELEVATION with blurred disc margins and obscuration of vessels in the right eye*



This Rash Just Won't Go Away....

Additional questioning....

- Systemic changes
 - Rash had spread to his trunk and arms



This Rash Just Won't Go Away....

Additional questioning....

- Further Assessing Risk behaviors
 - Just finished first year in college ... “away from home” ...and
 - **Unprotected sexual contact**
- Environmental considerations
 - **From Lyme, Connecticut**

This Rash Just Won't Go Away....

Differential Diagnosis

- Syphilis
- Lyme disease
- Underlying rheumatologic condition with secondary dermatologic manifestation

This Rash Just Won't Go Away....

Serology Testing and results

- CBC with differential
- RPR → **ELEVATED (1:256)** and History suggest Syphilis Dx
- FTA-ABS
- Lyme titers
- ANA

This Rash Just Won't Go Away....

Follow-up Management

- IM PCN provided by Primary Care Physician
- Co-management for ocular presentations was initiated

Additional Testing

PCP: “Syphilis doesn't usually come to the party alone”....

- Serology:
 - HIV → CLEAR results
 - Chlamydia
- MRI: Due to optic nerve head elevation → CLEAR results

Syphilis



General Information

- Characterized as **“the great imitator”**
 - Because it can manifest in any area within the eye
 - **Three different stages, variable presentations**
 - Other “great imitator” → LYME, also caused treponema
 - Thus cross reaction with FTA-ABS
- Caused by a SPIROCHETE, *Treponema Pallidum*
- May be Congenital vs. Acquired

Syphilis

ACQUIRED Infection

- Access body through mucous membranes or skin
- Reaches lymph nodes within hours and spreads throughout the body
- Transmission usually through sexual transmission
 - Initial incubation: 1-13 weeks, average 1 mo.
- **THREE stages**



Syphilis

ACQUIRED Infection → Three stages

- Primary: Chancre lesion at inoculation site (~1mo)
 - Spirochete entering blood stream and lymph system
 - Generally, genital area
 - Others (see image) : tongue
 - Appears approximately 1 month
 - Resolves 1 to 2 months



Syphilis

ACQUIRED Infection → Three stages

- Secondary: Cutaneous rash. (~1.5 to 3 months)
 - May resolve or persist for months
 - Lymphadenopathy & general malaise
 - Generalized rash
 - INVOLVES PALMS OF HANDS/SOLES OF FEET
 - **Ocular presentation ~ 10%**



Syphilis

Three stages
– Secondary:



Syphilis

ACQUIRED Infection → Three stages

- Tertiary:
 - Benign lesions of skin, bone, viscera (Gumma) @3 -10 yrs
 - Generalized rash persistence
 - Cardiac
 - NEUROSYPHILIS
 - Argyl-Robertson Pupil, Optic neuropathy, Uveitis
 - Tabes Dorsalis

Syphilis

Testing/ Diagnosis

- **Laboratory testing:**
 - VDRL (Venereal Disease Research Laboratory) or RPR (Rapid Plasma Reagin):
 - To screen and follow
 - TPHA = Treponemal pallidum hemagglutination assay
 - FTA-ABS (Fluorescent Treponemal Antibody-Absorption)
 - Will ALWAYS be positive throughout a person's life
 - May result in a cross-reactivity/false-positive w/Lyme
 - False (+) may occur in females with Lupus (SLE)

Syphilis

Treatment *

- Penicillin G IM, usually administered by injection
- Or, Tetracycline 500mg QID PO x 15 or Erythromycin
 - **Probenicid**

When worlds collide

54 year old Hispanic male

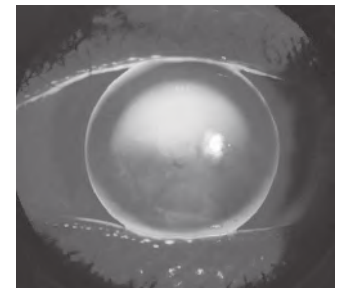
- Complains of blurred vision & eye pain OD and enlarged pupil OD x 1 wk
- History:
 - Keratoconus with gas permeable CL wear x several years
 - HIV x 5 years
 - Prior episode of Herpes Zoster Ophthalmicus
- Medications:
 - Acyclovir (maintenance), aspirin, nevirapine

When Worlds Collide

- VA with GP cls: **OD: 20/50**, OS: 20/30, PH: N/I
- Pupils:
 - **OD: 5 mm (dim), 4.5 mm (bright)**
 - OS: 3 mm (dim), 2.5 mm (bright)
 - No APD
- Biomicroscopy
 - **OD: +1 conj injection, +1 cells in AC**
 - OS: white and quiet
- IOP: **OD: 35**, OS: 14
- DFE unremarkable

When Worlds Collide

When Worlds Collide



Diagnosis

- Trabeculitis with concurrent uveitis OD associated with HZO and systemic HIV
- Keratoconus OD, OS

Treatment

- Rx Pred Forte 1% every 2 hours OD
- Discontinue CL wear temporarily
- RTC 3 days

3 day follow up

- + trace cells in AC OD.
- IOP: OD: 19, OS: 11
- Treatment:
 - Switch to Durezol q 4 hours OD
 - RTC 2 days

2 days later:

- + rare cell in AC. IOP OD: 14, OS 12

Residual anisocoria



Trabeculitis

- A variant of endothelitis
- Possibly a form of herpetic uveitis
- Obstruction of aqueous humor drainage by inflammatory cells
- Occasionally trabecular scarring with persistent glaucoma
- **Increased IOP generally responds very well to topical corticosteroids**



HIV General Stats

- When CD4 T-lymphocytes drop below 200 cells/ μ l
 - Clinically termed acquired immunodeficiency syndrome (AIDS)
 - Later stage when ocular manifestations most commonly seen
- 50-70% of pts with HIV eventually develop ocular manifestations

HIV and additional viral infections

Molluscum contagiosum

- Opportunistic Infection (OI) spread by direct contact
- Highly contagious dermatitis caused by DNA poxvirus
- Small painless umbilicated lesions where Poxvirus particles released into tears causes toxic keratoconjunctivitis

HIV and Herpes family viruses

- HZO: atypical presentations, crossing midline
- Kaposi's Sarcoma (KS): Painless vascular tumor affecting skin and mucous membranes, caused by human herpes virus (HHV) type 8

HIV and HZO

Herpes zoster

- HZO affects 5-15% of HIV patients
- Painful vesiculobullous dermatitis
- Localized reactivation of varicella-zoster virus
- Can involve any dermatome, but particularly T3 to L3 and ophthalmic division of CNV → HZO
- HALLMARK lesion: When tip of nose involved (HUTCHINSON'S SIGN) more likely corneal involvement



Kaposi Sarcoma

- Commonly seen in patients with HIV
 - 25% of HIV positive patients
 - Eyelids or conjunctiva are affected in 20%

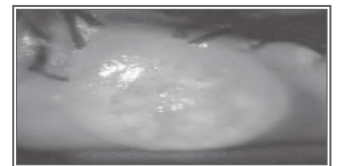
ADNEXAE signs

Differential Diagnosis of lid lesions



Kaposi's sarcoma involving lid

In some presentations, Kaposi's Sarcoma may look like a subconjunctival hemorrhage (SCH)



Molluscum Contagiosum – Superior lid, umbilicated center



Kaposi's sarcoma involving conj

Anterior manifestations of HIV

More than 50% of HIV patients have anterior segment manifestations

- Dry eyes (k sicca)
- Corneal infection (keratitis)
 - Primary or ocular complication of molluscum contagiosum
- Uveitis
- Microsporidiosis

Caused by:
protozoan parasites



HIV and dry eyes

- 10-20% of HIV patients
- Usually seen in later stages
- HIV mediated inflammation and damage to the lacrimal glands
- **Special considerations should be taken when using Cyclosporin A** due to the nature of the immunomodulating properties in an immunocompromised patient



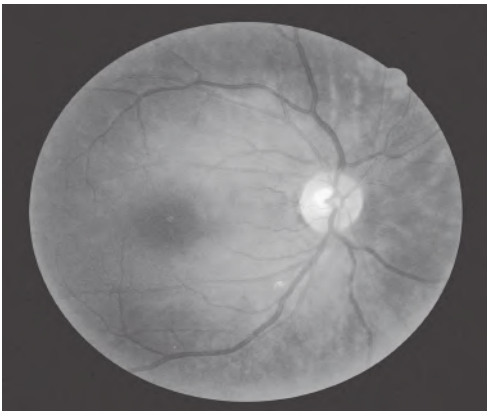
HAART: Highly active antiretroviral therapy



- Introduced 1996
- Combination of anti-retroviral drugs to decrease HIV replication and a recovery of CD4+ helper T-cell population
- Improved quality of life and reduced morbidity and mortality
- Results in fewer opportunistic infections
- Decreased occurrence of CMV retinitis & other ocular infections by 50%

HIV and The back of the eye

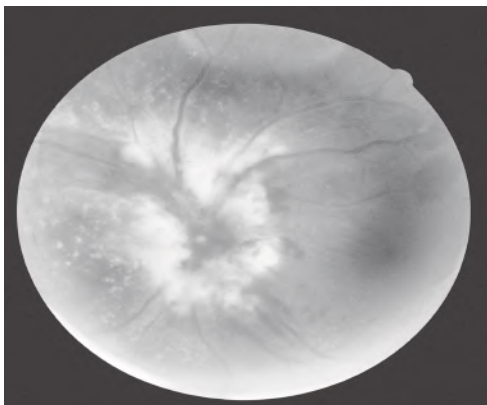
- HIV Retinopathy → Most common characteristic primary manifestation (non-opportunistic) is **COTTON WOOL SPOT**
- MANY secondary infections:
 - HIV and Herpes family of viruses (CMV, VZV, HSV)
 - Retinal manifestations incl. ARN, PORN
 - Toxoplasmosis



HIV and CMV



- **Cytomegalovirus retinitis**
 - **Most common AIDS related ocular opportunistic infection**
 - Hemorrhagic CMV: prominent edema
 - Granular CMV: satellite lesions
 - Perivascular CMV: less frequent
 - FDA approved treatments:
 - IV ganciclovir, foscarnet, cidofovir (rarely used)
 - Oral valganciclovir
 - Decrease of 75% with HAART



Other HIV vitreo - retinopathies

- Toxoplasmosis retinochoroiditis
- Ocular syphilis
- Infectious choroiditis
- Retinal microvasculopathy
- Intraocular lymphoma
- Immune recovery uveitis

A south Florida story: Botox Blues.....

43 year old white male

- Presented to urgent care clinic with “irritated” red eye OD

– HPI:

- “Bump” changed significantly in the previous 24 hrs
- Lesion in the right eye had “flipped” outside the lid
 - Approximately 2 wks of puffiness increasing size
- Overnight the lesion began to bleed
 - Stopped bleeding prior to presentation



OR AN ER STORY: FLIPPING OUT

Flipping out

- Ocular History & Medications:
 - Pt denied any complications prior to visit
 - Denies skin cancer history
- NKMA
- Systemic History:
 - Recent torn bicep tendon
 - Medication: Vicodin



Additional history:

- Pt had a hx of ear pain on left side & stye OS
 - Six weeks prior
 - Pt initially used an OTC “stye” med & warm compresses
 - Unresolved, so saw PCP
 - Prescribed Amoxicillin PO x 14 days
 - Afterwards pt developed swelling OD for which he presented



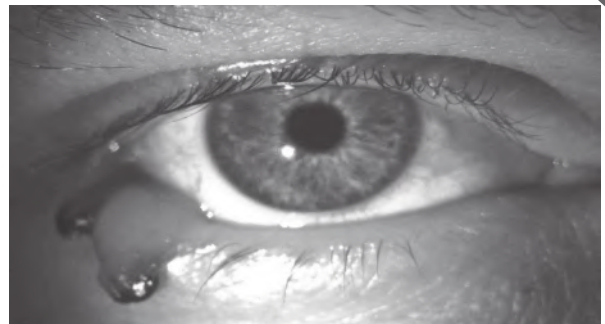
Flipping out

Flipping out

- Uncorrected visual acuity:
 - OD: 20/25
 - OS: 20/25
- Pupils, EOM, and Confrontation Fields:
 - Normal OD, OS
- General Observation:
 - Obvious lid growth protruding over lower lid OD



Flipping out



Flipping out

Flipping out



- Biomicroscopy:
 - OD: A large vascularized, lobed and stalked lesion with associated diffuse staining of the bulbar and palpebral conjunctiva
 - OS: Slightly swollen lower lid temporally (painless)
 - chronic chalazion
- Cornea – intact without NaFl staining, OU
- Anterior chamber - deep and quiet OU



Differential diagnoses for atypical conjunctival/lid lesions



- Sebaceous gland carcinoma
- Basal cell carcinoma
- Squamous cell carcinoma
- Atypical pyogenic granuloma
- Keratocanthoma

Flipping out

Flipping out



Definition:

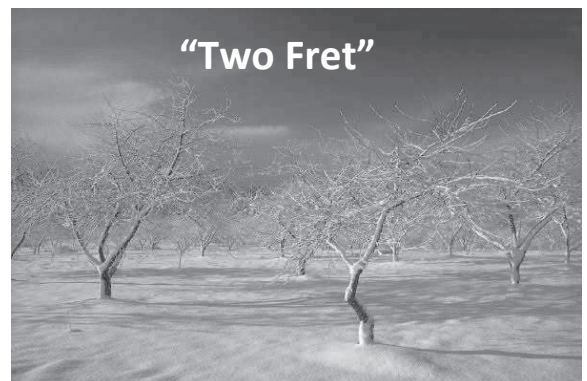
- A granuloma is a relatively small nodular inflammatory lesion that may be caused by infectious or non-infectious agents
- In regards to eye...
 - Localized changes most commonly develop from the palpebral conjunctival tissue
 - Generally seen as a small lesion on lid eversion
 - Results in a foreign body sensation
 - **Can be described as in different categories:**
 - Pedunculated v. Flat// Infectious v. Non-infectious

Flipping out



Management:

- Working (“hopeful”) diagnosis of atypical granuloma → Rx Tobradex
 - Steroid to decrease inflammation
 - Antibiotic prophylaxis due to recent bleeding
- Referral to anterior segment specialist/oculoplastic
 - Due to large size and ocular irritation recommended Surgical excision



“Two Fret”

- 68 YO Haitian male complains of blurred vision and decreased peripheral vision for several months
- LEE = several months ago
 - He was given eye drops, but stopped using because he did not understand instructions.
 - He does not know what’s wrong with his eyes
- **Patient speaks only Creole, no English. No translator.**
- No family in Florida. Family lives in New York.
- Refuses to move up north with his family because it’s “two fret” →

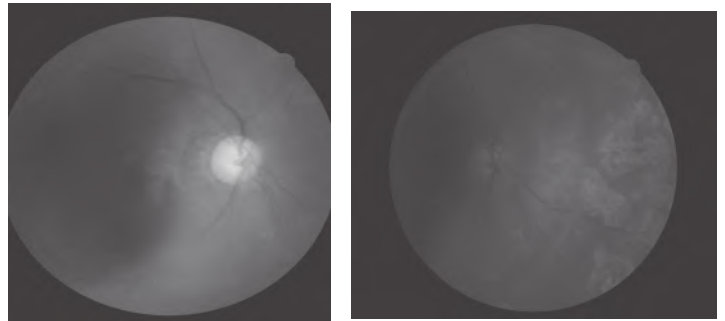
“Two Fret”

- Previous examination at NSU TECI in 2015
 - Proliferative diabetic retinopathy s/p PRP od, os
 - Primary Open Angle Glaucoma od, os
- Referred to retinal specialist
- From our clinic Rx: Latanoprost qhs od, os
- When asked, patient remembers having the exam, but never understood the diagnosis or treatment

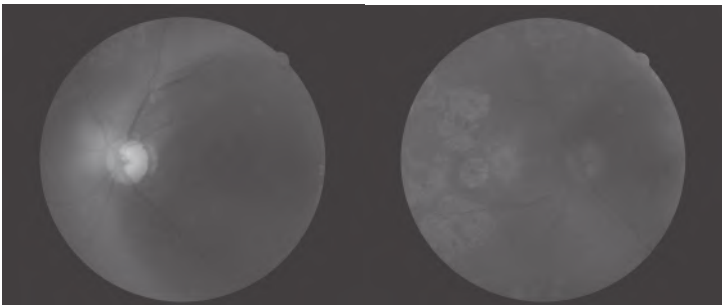
“Two Fret”

- BCVA OD: 20/40, OS: 20/200
- Pupils: Equal, Round, No APD
- Confrontation Fields: Restricted in all 4 quadrants OD, OS
- SLE: (+) iris atrophy OD, OS; (+) PC IOL OD, OS with PCO haze OD, OS
- **IOP: 28 OD, 30 OS**
- DFE
 - CD ratios: .7v/.7h OD, .7v/.6h OS
 - (+) Scattered dot blot hemes OD, OS
 - (+) CSME OD, OS with ERM OS
 - PRP scars 360 OD, OS

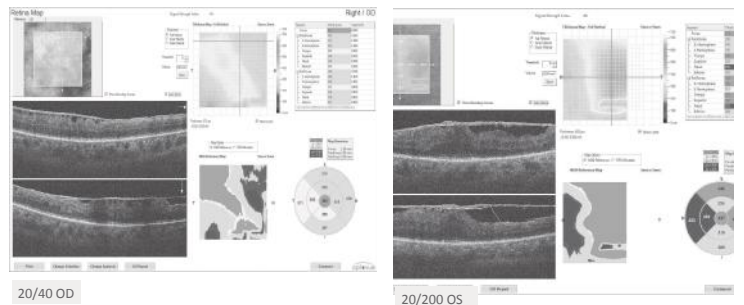
“Two Fret”



“Two Fret”



“Two Fret”



“Two Fret”

Diagnosis

- Proliferative diabetic retinopathy s/p PRP with CSME OD, OS
- Primary open angle glaucoma OD, OS
- Pseudophakia with peripheral capsular haze OD, OS

“Two Fret”

Treatment

- CSME/DME: Refer to retinal specialist
- Glaucoma: Latanoprost qhs OD, OS
 - **Benefits for this patient:**
 - COMPLIANCE and EASE of USE**
- Pt ed thru creole speaking NSU TECI receptionist
- With patient’s permission, phoned daughter in NY



Diabetes Review

- **Type 1 diabetes**
 - Due to autoimmune destruction of pancreatic beta cells and autoantibodies against insulin
 - Usually leads to absolute insulin deficiency
- **Type 2 diabetes**
 - Due to beta cell *dysfunction*
 - Leads to insulin resistance

Diabetes Updated Definition

- **Type 1.5 Diabetes**
 - AKA *double diabetes, slowly progressing Type 1 diabetes, or Latent Autoimmune Diabetes in Adults (LADA)*
 - Aspects of both Type 1 and Type 2
 - Shows auto-antibodies against insulin but does not require insulin treatment at initial diagnosis
 - Ongoing autoimmune process (type 1), but may be able to control with diet and / or oral medications (type 2)



Classifications of diabetic retinopathy

Early Treatment Diabetic Retinopathy Study (EDTRS)

- Based on grading of stereo photos of 7 fields
- Classifies diabetic retinopathy into 13 complex levels
 - 10 = absence of retinopathy
 - 85 = severe vitreous hemorrhage or retinal detachment involving the macula
- First described CSME

Classifications of diabetic retinopathy

International Clinical Disease Severity Scale

- Based on Wisconsin Epidemiologic Study of Diabetic Retinopathy (WESDR) and EDTRS
- 5 stages
 - 1 – no retinopathy
 - 2 – mild NPDR
 - 3 – moderate NPDR
 - 4 – severe NPDR
 - 5 – PDR

CSME vs DME

Clinically significant macular edema

- 1 – thickening of the retina at or within 500 microns of the center of the macula
- 2 – hard exudate at or within 500 microns of the center of the macula
- 3 – any retinal thickening 1 DD or larger within 1 DD of the center of the macula

DME (DIABETIC MACULAR EDEMA)

Focal diabetic macular edema

- Edema by focal leakage of microaneurysms surrounded by a ring circinate of hard exudate

Diffuse diabetic macular edema

- Generalized breakdown of the inner blood / retinal barrier
- MA, retinal capillaries and arterioles contribute to leakage
- Usually no hard exudates

CSME vs DME



NEWER TREATMENT Guidelines for the Tx of DME include:

- Earlier treatment recommendations
- Anti-VEGF injections

FA vs OCT

Fluorescein Angiography

- *Localizes leaking* microaneurysms or areas of capillary dropout
- Useful to differentiate diabetic macular swelling from other macular disease
- Identifies macular capillary non perfusion

Optical Coherence Tomography

- High resolution imaging of vitreoretinal interface, neurosensory retina and subretinal space
- Quantifies retinal thickness, macular edema
- Identifies vitreomacular traction

Diabetes and Glaucoma Comorbidities

- Lack of oxygen in retina causes fragile blood vessels to grow into vitreous and along the retina
- Bleeding, fibrovascular membrane → *RD*
- New blood vessel growth into angle and anterior chamber → *Neovascular glaucoma*
- **Reminder:**
NVI is not a “classic” ocular finding of POAG



Anti-VEGF for PDR and NVG

- Directly decreases the level of intra ocular vascular endothelial growth factor (VEGF)
- Causes regression of neovascularization in retina, angle and iris
- May prevent formation of irreversible synechiae in early
- Controls IOP in patients with NVI

Diabetes and POAG?

- Is DM a risk factor for POAG?
– No conclusive studies exist
- Pts with DM may get eye diseases detected more often by “routine” clinical care compared to patients without DM

HEDIS Measures: Healthcare Effectiveness Data and Information Set

Assesses the quality of diabetes management in 6 areas

1. Testing Blood Glucose level via HbA1C
2. Controlling HbA1C
3. Screening for Serum Cholesterol level
4. Controlling Serum Cholesterol level
5. Examining Eyes for retinal disease → WRITE LETTERS BACK
 - SPECIFY Dilated “RETINAL” Exam versus “Fundus”
6. Monitoring Kidney disease

Speak a little truth and people lose their minds...

Ice Cube, Straight outta Compton

Take Home Considerations: Patient education and practice growth

- Send letter to PCP
- Get family involved when permissible and when possible

Things to remember:

- **Case 1: Wear a Helmet, The problem is permanent** (especially if you are a 30-something active male)
- **Case 2: Look for the pre-auricular node and in South Florida atypical associated conditions**
 - Zika and Chikungunya anyone?
- **Case 3: STOPILLEGALCLS@aoa.org**, avoid the steroids until you KNOW it's not this little gram(-) bacteria (or fungus, or acanthamoeba...)

Things to remember:

- **Case 4: The Great Imitator has three acts;** watch for persistent rash ... especially if found on the palms of the hands or soles of the feet
- **Cases 5&7: Co-morbidities can be complicated;**
 - HZO relatively common with (+)HIV patients → Look for Hutchinson's sign for HZO to assess risk to cornea and look for CWS to identify some retinal compromise with HIV
 - There are not just two types of Diabetes Mellitus → type 1.5 in adults (LADA)
- **Case 6: Granulomas can be pedunculated or flat... or be tongue shaped or be from illegal botox.... ;)**

CONTACT INFORMATION

Julie A. Tyler, OD, FAAO
Email: jtyler@nova.edu
Phone: (954) 579-2020

