A TALE OF TWO CLINICS
CHALLENGING CASES FROM A COLLEGE CAMPUS CLINIC TO AN INNER CITY CLINIC

Gregory S. Black, OD
Julie A. Tyler, OD, FAAO

Nova Southeastern University, College of Optometry
**Introductions:**

- **Dr. Black** – No Disclosures

**Credentials:** Chief of Clinics for The Eye Care Institute – Broward Blvd/Fort Lauderdale, Nova Southeastern University

- **Dr. Tyler** – No disclosures

**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
Our Goals:

- Contrast & comparison of two clinics, patient populations and access to healthcare
- Case-based presentation
- Focus will be on non-traumatic, uncommon ocular conditions in various pt populations
  - Included will be the latest recommendations for systemic and genetic evaluations when indicated based on underlying etiologies for the ocular presentations encountered
CC: 54 YO HF w/ Mildly red eye for past 6 months → over the past 3 days sudden onset of concurrent significant redness & pain

- No flashes, floaters or diplopia
- No ocular history or ocular medications
- No known allergies
- No significant family history for medical or ocular conditions
- Social history significant for caffeine use, unemployed and reads as a hobby
Persistence PLUS...

- **Medical history**: Rheumatoid Arthritis (RA), Hypertension and Hypercholesterolemia, all dx 2007 → Poor general health

- **Medications**:
  - Lisinopril 5mg 1 tab/day
  - Meloxicam 7.5mg 1 tab/day
  - Lovastatin 20mg 1 tab/day
  - Folic Acid 20mg 1 tab/day
  - Prednisone 5mg 4 tab/day
  - Methotrexate 2.5mg 2 tab/day
Review of Systems – Negative

Preliminary Testing:

- **BCVA @ Distance:**
  - cc 20/20-1 OD & **20/40 OS**

- **Pupils, Confrontation Fields and Motility:**
  - Overall Expected findings OD & OS

- **Blood Pressure:** 132/87 mmHg Left arm seated

- **Goldmann tonometry:**
  - 16mmHg OD, OS
SLIT LAMP FINDINGS:
- Lids & Lashes: Clean and without debris OU
- Conjunctiva, Episclera, Sclera: Normal OD
- (+) Deep violet-blueish scleral inj. & thickening 360 OS
  - Negative blanching post phenylephrine
- Cornea: Clear OD, OS
- Anterior Chamber: Clear and quiet OD, OS
Diagnosis:

- Diffuse non-necrotizing anterior scleritis OS secondary to poorly controlled Rheumatoid Arthritis

Initiation of topical management:

- Durezol™ QID OS x 1 day then BID x 1 week OS
- Prescribed to reduce, not resolve condition due to underlying systemic condition
Systemic consideration:

- Referred back to rheumatologist
  - Complicated medical history, poor health
  - Previously established use of oral Prednisone and Methotrexate → initiation/adjustment of oral therapy needed
  - Report and phone conversation followed.
- Rheumatologist increased Oral Prednisone from 5mg QID → 20mg QID
PERSISTENCE PLUS: FIRST FOLLOW-UP 6 MONTHS LATER....

UPDATED HISTORY:

- CC- Continuing pain, redness & epiphoria OS>OD
- The patient reported symptoms were improved since initial exam but had trouble RTC as directed for 1 week FU
- Rheumatologist had maintained oral Prednisone at 20mg QID

PRELIMINARY TESTING:

- BCVA @ Distance: cc 20/20-2 OD & 20/20-2 OS
- Preliminary testing: Expected results w/o pathology OD & OS
- Goldmann tonometry: 13mmHg OD, 15mmHg OS
SIX MONTH FOLLOW-UP EXAM-
UPDATED IMPRESSION AND MANAGEMENT

- Diffuse non-necrotizing anterior scleritis OU secondary to Rheumatoid Arthritis → “improved” but now BILATERAL

- TOPICAL MANAGEMENT: Pred acetate QID x 1 day then BID x 1 week OU to reduce not resolved symptoms

- Again, Emphasized compliance with medications & follow-up with Rheumatologist
ANTEOR SCLERITIS

- **Demographics:**
  - Fourth to sixth decade of life
  - Overall, Female predilection

- **Categories - Watson and Hayreh**¹ first established in 1976
  - Diffuse vs. Sectoral
    - Diffuse = LOSS of normal radial vessel pattern; inflammation is more widespread and involving either a segment or all of sclera
  - Nodular ➔ Focal, NON-MOVING area of edema
  - Necrotizing vs. Non-Necrotizing
ALL TYPES of SCLERITIS: INFLAMMATION OF THE SCLERA

FIVE Types:

1. Anterior/Nodular (~44%)
2. Anterior/Diffuse (~40%)
3. Anterior/Necrotizing with inflammation
4. Anterior/Necrotizing without inflammation
   - also known as Scleromalacia perforans
5. Posterior Scleritis
COMMON SYSTEMIC ASSOCIATIONS

- Found in greater than 50% of cases\(^2\)
  - Rheumatoid Arthritis (RA)
  - Systemic Lupus Erythematosus (SLE)
  - Wegener Granulomatosis
  - Polyarteritis Nodosa
  - Giant Cell Arteritis (GCA)
  - Reactive Arthritis \(\rightarrow\) also known as Reiter’s syndrome
  - Ankylosing Spondylitis (AS)
  - Inflammatory Bowel Diseases (eg, Crohn’s, Ulcerative colitis)
ADDITIONAL CONSIDERATIONS....

Of interest:

- A review of 500 pts w/ scleritis & 85 pts w/ episcleritis, de la Maza MS et al reported that **scleritis** was the **presenting sign** for 38.7% of pts w/ connective tissue/vasculitic disease.

- Also, patients with scleritis were more likely to have **additional ocular complications** than those with episcleritis (45% vs. 19.8%).

  - Ocular complications measured: Decreased VA, Secondary anterior uveitis, Peripheral infiltrative keratitis & Ocular hypertension.
FURTHER CHARACTERISTICS: DIFFUSE ANTERIOR SCLERITIS

Findings consistent with diagnosis/presentation of our pt:

- Gradual onset
- Decreased VA
- Anterior scleral thickening
- Dilation of the deep episcleral vessels → blueish-purplish hue vs. “bright red”
- **Bilateral incidence 50%** (not initially but eventually….)
  - **Bilateral more common in rheumatic disease (RA)**
- Fortunately, our pt. didn’t have other complications of peripheral ulcerative keratitis, anterior uveitis or ocular hypertension
DIFFERENTIAL DIAGNOSIS

- Conjunctivitis
  - More superficial injection; often with additional findings of discharge – generally less painful

- Episcleritis
  - More superficial but may also be nodular; Blanches with phenylephrine; Much less likely associated with systemic condition

- Primary Anterior Uveitis
  - More likely to have acute symptoms of pain w/ light & findings of (+)cells/flare

- Ocular ischemic syndrome
  - Pain, mild blur, redness & possible K edema if chronic
MAKING THE DIAGNOSIS…

- Review/probe chief complaint or history responses
  - Deep and/or boring pain → May radiate to forehead
  - Changes in symptoms may correlate to changes in meds
- Examination- SLX:
  - VA often affected
  - Violet-bluish hue, significant hyperemia
  - Thickening noted with cross section
  - Evaluate with phenylephrine → will not blanch
- Additional considerations –
  - Serology & laboratory testing for systemic association
MAKING THE SYSTEMIC DIAGNOSIS...

- Recommended additional testing will depend on patient demographics, other symptoms and findings

- Common testing includes:
  - CBC with differential
  - ANA → non-specific for autoimmune conditions
  - RF → assists in diagnosing/categorizing rheumatologic diseases including RA
  - ESR → non-specific inflammatory
  - C-Reactive Protein → combined with ESR may aid in diagnosis of GCA
  - RPR/FTA-ABS → syphilis
  - Chlamydia evaluation (if reactive arthritis suspected)
  - Lyme titers (if rash c/w erythema migrans visible/described or other risk factors)
  - X-rays → Possibly chest, SI joint (back), knee, shoulder or others
RHEUMATOID ARTHRITIS (RA) DIAGNOSIS

2010 Updated Criteria for Classification of RA

- **Scoring system based on Four Categories:**
  - **Joint Distribution (0-5)**
  - **Serology (0-3)**
    - RF = Rheumatoid Factor
    - ACPA: Anti-citrullinated protein/peptide antibodies
  - **Symptom Duration (0-1)**
    - Less than OR greater/equal to six weeks
  - **Acute Phase Reactants (0-1)**
    - CRP = C-Reactive Protein
    - ESR = Erythrocyte Sed Rate
  - **Greater than or equal to 6 is diagnostic of RA**
MX AND TX FOR:
DIFFUSE ANTERIOR NON-NECROTIZING SCLERITIS

✦ Oral Non-steroidal anti-inflammatory drugs (NSAIDs)
  ✦ If used, make sure to use appropriate dosing for inflammation

✦ Corticosteroids
  ✦ **Orals** → Generally co-managed; may need to add or increase dosage for resolution
  ✦ **Topical** → Generally only adjunct therapy for sx & superficial signs/ Underlying systemic needs to be managed for resolution
  ✦ **Periorbital & sub-conjunctival Injection** if non-necrotizing
    ✦ **CONTRAINDICATED for Necrotizing types of scleritis**
  ✦ **Immunomodulatory agents** → e.g., RA pts: Methotrexate
PERSISTENCE PLUS... SUMMARY

Treatment considerations:

- Jabs\(^5\) reported that nearly 60% of scleritis patients require oral corticosteroids or immunosuppressive agents to control the disease
- Oral Steroids ~ 31.9%
- Systemic Immunosuppressive agents ~ 26.1%
CASE II: THAT’S NOT SUPPOSED TO BE THERE

INTRODUCTION

► New pt presenting to the Nova Southeastern University Eye Institute @ Broward Blvd
  ► July

► 21 YO black female w/ complaints of decreased distance vision OD for a few yrs
CASE II: THAT’S NOT SUPPOSED TO BE THERE
CASE HISTORY

- **CC** - Blurred distance vision OD x few years
- **Oc Hx** –
  - Constant right exotropia noted from 8 yrs of age
  - No history of ocular trauma
- **Med Hx** – Pt never had a physical examination.
  - Scheduled in three weeks.
- **FOHx & FMHx** - (-) Glaucoma, (-) HTN, DM
- **Mental Status** – Alert & oriented x 3
- **No medications or known drug allergies**
CASE II: THAT'S NOT SUPPOSED TO BE THERE
ENTRANCE TESTS & REFRACTION

- **Best corrected VA** - 20/200 OD, 20/40 OS
- **Extraocular motility & CVF** - Full in both eyes
- **Pupil evaluation** – Normal OD, OS
- **Cover test** – 45 pd RXT, distance and near
- **Retinoscopy** –
  - OD: -9.00 –0.50 x 180
  - OS: -11.25 – 5.00 x 010
- **Manifest Refraction** –
  - OD: -9.00 –4.00 x 040
  - OS: -10.25 – 4.00 x 010
CASE II: THAT’S NOT SUPPOSED TO BE THERE

ADDITIONAL TEST RESULTS

- **Corneal Topography** – Normal pattern OU
  - Simulated K’s- OD 40.50D @ 100 / 39.12D @ 010
    - OS 41.37D @ 074 / 39.00D @ 164

- **Blood Pressure** - 110/60 mmHg LAS

- **Goldmann tonometry** - 18 mmHg OD, OS

- **Biomicroscopy** -
  - Mild injection secondary to posterior blepharitis OU AND

  - See images
**CASE II: THAT’S NOT SUPPOSED TO BE THERE**

**DILATED FUNDUS EXAMINATION**

- **Optic nerve rim:** Pink and distinct OU
- **Cup-to-disc ratio:** .4/.4 round OU
- **Retina:** Mild myopic degenerative changes
- **Macula:** Flat and even OU, (+) FLR
- **Artery-to-vein ratio:** 2/3 OU
- **Periphery:** Flat & intact 360 degrees OU
CASE II: THAT’S NOT SUPPOSED TO BE THERE

ASSESSMENT/PLAN

A) Subluxated lens OU of unknown etiology –
  ▶ Simple ectopia lentis versus ectopia lentis secondary to a systemic association

P) Referred to Primary Care Physician for evaluation & serology to rule out systemic associations ASAP
  ▶ Return to eye clinic in one month for follow-up
  ▶ Pt educated on ocular findings, related conditions, and importance of follow-up
  ▶ Pt asked to bring in family members for ocular assessment
CASE II: THAT’S NOT SUPPOSED TO BE THERE
DIFFERENTIAL DIAGNOSIS

- Simple ectopia lentis
- Ocular trauma
- Associated with other ocular disorders:
  - Ectopia pupillae
  - Aniridia
  - Megalocornea
- Part of a systemic disorder:
  - Marfan’s Syndrome
  - Homocystinuria
  - Weill-Marchesani syndrome
  - Xanthine & sulfite oxidase deficiency
CASE II: THAT’S NOT SUPPOSED TO BE THERE
PERTINENT RESULTS OF SEROLOGY

CBC
- WBC – 3.72 Low
- NEUT % – 28.4 Low
- LYMPH % - 51.5 High
- MONO % - 19.0 High
- NEUT ABS – 1.06 Low

VIROLOGY
- Hep B Surf AG – Negative
- Hep B Core IGM – Negative
- Hep A – Negative
- Hep C - Negative

CHEMISTRY
- Glucose – 65 Low
- BUN – 12
- Creatinine – 0.8
- Iron – 95
- TSH – 0.72

IMMUNOLOGY
- RPR – Negative

MICROBIOLOGY
- Chlamydia - Negative
October

- No new ocular or visual complaints
- Blood work unremarkable
- **Best corrected VA** - 20/400 OD, 20/30- OS

**Refraction**
- **OD**: -9.00 -1.00 x 180
- **OS**: -10.75 -3.00 x 180

**Biomicroscopy**
- Crystalline lens subluxated superior nasal OD>OS
CASE II: THAT’S NOT SUPPOSED TO BE THERE
NSU CONTINUED MANAGEMENT

- Diagnosed with **Simple ectopia lentis**
  - Pt provided a spectacle prescription with polycarbonate lenses recommended
  - Referral to ophthalmology for consideration of lens extraction
CASE II: THAT’S NOT SUPPOSED TO BE THERE

DISCUSSION

- Mx of this pt was a challenge for a variety of reasons:
  - The pt had **not previously had access to health care**; thus, the nature & duration of her ocular condition, as well as any medical associations, were unknown.
  - The co-existence of a longstanding, constant RXT may contribute to the patient’s decreased vision OD.
  - Initial eval by the PCP was not complete to rule out all systemic associations.
CASE II: **ECTOPIA LENTIS**

- *Ectopia lentis* refers to crystalline lens displacement away from normal position within the center of the visual axis.

- The term *ectopia lentis* was introduced by Stellwag in his description of congenital dislocations in 1856.

- In a study of 396 Danish pts with ectopia lentis, the estimated prevalence rate was 6.4 per 100,000.

CASE II: CRYSTALLINE LENS DISPLACEMENT

- **SUBLUXATION**: Partial (vertical and/or horizontal) displacement of the crystalline lens behind the iris while still maintaining some zonular attachments to the ciliary process.
  - The crystalline lens remains w/in the sulcus (patellar fossa)

- **DISLOCATION (LUXATION)**: Reserved for cases of complete zonular detachment & “free” movement of the lens within the eye
  - Crystalline lens may enter anterior or posterior chamber
CASE II: **ECTOPIA LENTIS: COMPLICATIONS**

- Visual symptoms
  - *Decreased visual acuity*
  - *Fluctuating vision, including large variations in astigmatism*
  - *Double vision*
- Strabismus/Amblyopia
- From Subluxation to Dislocation of the crystalline lens
- Uveitis
- Cataract formation
- Glaucoma
- Retinal detachment
CASE II:
SIMPLE ECTOPIA LENTIS
- Autosomal dominant inheritance pattern
- Gene mapped to chromosome 15
  - Linked to FBN1
- Variable expression

Trauma Induced Ectopia Lentis
- Most common cause of ectopia lentis - up to 50%
- Generally presents unilaterally, often with a significant history of trauma to the head or eye
CASE II: ECTOPIA LENTIS: OTHER ASSOCIATED OCULAR DISORDERS

- Ectopia pupillae
- Congenital glaucoma
- Megalocornea
- Chronic uveitis secondary to Syphilis
- Aniridia
- (Pseudo) Exfoliation syndrome → weak zonules
CASE II: ECTOPIA LENTIS: ASSOCIATED SYSTEMIC DISORDERS

- Marfan’s Syndrome
- Homocystinuria
- Weill-Marchesani syndrome
- Xanthine and sulfite oxidase deficiency
- Less common associations –
  - Ehlers Danlos syndrome, Sturge-Weber syndrome & Crouzon syndrome
CASE II: MARFAN’S SYNDROME

- **Autosomal dominant** disorder caused by **mutations of gene** 15 that results in tall stature, arachnodactyly, cardiac abnormalities and joint laxity.
  - Soft palate variation may also be observed.
- Syndrome results in abnormalities of the lens zonules which in turn may result in **ectopia lentis** in approximately 75% of pts.
  - The crystalline lens tends to subluxate **superiorly** in Marfan syndrome.
CASE II: HOMOCYSTINURIA

- **Autosomal recessive** disorder of methionine metabolism resulting in an accumulation of homocystine and methionine measurable in the blood and urine
- Pts tend to be tall & often have learning disabilities
- **Ectopic lentis occurs in approximately 90% of pts**
- The crystalline lens tends to subluxate **inferiorly** in these pts
CASE II: WEILL-MARCHESANI SYNDROME

- An **autosomal recessive disorder**
- Pts tend to be short in stature with short fingers and toes (brachycephaly)
- Mental retardation is NOT a characteristic of this disorder
CASE II: XANTHINE & SULFITE OXIDASE DEFICIENCY

- These pts lack a co-factor for xanthine & sulfite oxidation
- Pts display mental retardation & neurological abnormalities
CASE II: MX OF ECTOPIA LENTIS

- Attempt to optically correct pt via spectacles or CL w/ surgical consult if unsatisfactory results
- Systemic eval. including cardiac evaluation, serum & urine levels for homocystine, methionine and RPR
- **Appropriate genetic counseling**
- All available blood relatives should be examined
- Close follow-up for ocular complications
CASE III: WHAT’S IN THE CENTER OF IT ALL?

54 yo Female

- CC: Decreased BCVA OU x 16 years
- POH: unremarkable
- PMH: (+)DM Type 2, Hypertension
- Medications:
  - Glyburide, metformin, lisinopril
- FOH: unremarkable, (-)blindness
CASE III: WHAT’S IN THE CENTER OF IT ALL?

- **BCVA:**
  - OD 20/200 & OS 20/40
- **Pupils:** ERRL (-) APD
- **CF:** FTFC OD, OS
- **EOMs:** Smooth, Accurate, Full and Efficient (SAFE) OU
- **SLE:** Trace cataracts OD, OS
- **Goldmann tonometry -- IOP:**
  - 16 mmHg OD, OS
CASE III: WHAT’S IN THE CENTER OF IT ALL?
CENTRAL AREOLOAR CHOROIDAL DYSTROPHY

- Hereditary retinal disorder (autosomal dominant)
- Progressive macular atrophy leading to dramatic decline in VA
- Symptomatic in 3rd to 4th decade of life
- Involves RPE and choriocapillaris, Primarily affects macula
- Results in regional, geographic areas of atrophy
- May result in absolute central scotomas
CASE III: WHAT’S IN THE CENTER OF IT ALL?
CENTRAL AREOolar CHOROIDAL DYSTROPHY

- Early: Subtle, mottled depigmentation in the post. pole
- Later: Depigmentation enlarges into well-circumscribed round area of atrophy

Stages

1. Subtle focal parafoveal pigmentary RPE changes
2. Oval-to-round, mildly atrophic, hypo-pigmented area
3. Well-demarcated RPE atrophy outside the fovea
4. The RPE atrophy involves the fovea
CASE III: WHAT’S IN THE CENTER OF IT ALL?

CENTRAL AREOLAR CHOROIDAL DYSTROPHY

- Mutations in peripherin/RDS gene
- P.Arg142Trp mutation implicated in both autosomal dominant CACD and dominant drusen
- Typically no flecks or drusen seen in isolated CACD
- Anomaly
CASE III: WHAT’S IN THE CENTER OF IT ALL?
CACD DIFFERENTIAL DIAGNOSES

- Age Related Macular degeneration
  - CACD most likely confused with ARMD
- Cone Dystrophy - bulls eye appearance
  - 1st to 2nd decade with moderate to severe vision loss
- Stargardt’s Disease
- Other macular dystrophies/conditions
CASE III: WHAT’S IN THE CENTER OF IT ALL?
CACD TREATMENT/MANAGEMENT

- Nutritional Supplementation
- Genetic counseling
- Low vision referral
CASE IV: 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
CASE IV: 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
CASE IV:
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
CASE IV:
THIS RASH JUST WON’T GO AWAY....

Initial Diagnosis ➔ Impression/Plan

- Corneal ulcer 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
CASE IV: 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
CASE IV:
THIS RASH JUST WON’T GO AWAY…. 

Follow-up Examinations

► At one day follow-up pt 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
CASE IV: 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
CASE IV:  
THIS RASH JUST WON’T GO AWAY….

Differential Diagnosis

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

Serology Testing and results

- CBC with differential
- RPR → ELEVATED (1:256) and History suggest Syphilis Dx
- FTA-ABS
- Lyme titers
- ANA
CASE IV: 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” \( \rightarrow \) LYME, also caused treponema
    - Thus cross reaction with FTA-ABS
- Caused by a SPIROCHETE, Treponema Pallidum

- May be Congenital vs. Acquired
SYPHILIS

CONGENITAL Infection ➔ SYSTEMIC TREATMENT for congenital syphilis
- Penicillin G 50,000 units/kg/dy IM or IV x 10-14 days
- Aqueous Procaine Penicillin G 50,000 units/kg/dy IM x 10-14 days
- Erythromycin 50mg/kg/day PO in 4 doses x 10-14 dys
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

- **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%
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

- Microscopic bacterial identification:
  - A surface scraping from the ulcer or chancre may be taken & identified → Generally not available in most environments
SYPHILIS

**Testing/ Diagnosis**

- **Laboratory testing:**
  - VDRL (Venereal Disease Research Laboratory) or RPR (Rapid Plasma Reagin):
    - **To screen and follow**
  - TPHA = Treponemal pallidum hemaglutination 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

18 yo African American Male

- CC: Woke up with irritation on a Friday morning - OS
  - HPI: Pt awoke in the am 4 days prior w/ ocular irritation
    - Worsening
    - (+) Moderate light sensitivity, (+)blur, (+) redness
    - (-)HA, Ocular pain
  - Initially went to ER for treatment
  - Followed up at a different eye specialist

- Ocular Medication:
  - Moxeza TID
CASE V: SO FIRST I WENT TO THE EMERGENCY ROOM…..

**History:**

- Ocular History prior to recent events: Unremarkable
  - (-) CL
- Medical History/Review of Systems
  - No remarkable health concerns or current si/sx
- No Systemic Medications
- NKMA
- Family History: Unremarkable
CASE V:
SO FIRST I WENT TO THE EMERGENCY ROOM.....

**Visual acuity** - Distance *unaided*

- OD: 20/80    PH: 20/30
- OS: 20/200   PH: 20/30

**Pupils**

- OD: Round and reactive to light, (-) APD
- OS: Round and reactive to light, (-) APD

**Motility:** Full OU

**Confrontation Fields:**

- OD & OS: Full to finger counting
CASE V:
SO FIRST I WENT TO THE EMERGENCY ROOM.....

*No improvement in VA with refraction*

- **Adnexae:** Normal OD and OS
- **Eyelids:** Capped glands, flaking OU
- **Conj/Sclera:** white & quiet OD/ 4+ injection
- **Cornea:**
  - OD: Normal endothelium, epithelium, stroma and tear film
  - OS: Geographic ulcer, mid-stromal involvement – deep, white lesion
    (+)KP’s on endothelium, scattered white spots
- **Anterior Chamber:**
  - OD: Deep & Quiet
  - OS: 4+cells/flare
CASE V: ADDITIONAL QUESTIONS

- Pt denies using any meds other than those prescribed
- Denies obtaining meds topically elsewhere

  - i.e., he didn’t steal the proparacaine
  - i.e., he isn’t using another family members medication

- Pt noted that 2 dys prior to red eye he had done outside lawn work
  - He was not wearing protective eyewear
  - He did not notice anything in his eye or scratching eye
CASE V: SO FIRST I WENT TO THE EMERGENCY ROOM.....

- **Vitreous:** Clear (-) vitreal cells OU
- **Optic Nerve:**
  - OD & OS: healthy pink rim tissue, flat & distinct
- **Maculae:**
  - Flat, sharp without hemes, exudates, pigment OU
- **Vessels:**
  - OD & OS: A/V = 2/3 without signs of posterior inflammation
- **Peripheral retina:**
  - OD & OS: Intact 360 degrees OU
CASE V:
SO FIRST I WENT TO THE EMERGENCY ROOM.....

Differential Diagnosis:

- Bacterial keratoconjunctivitis
- Viral keratoconjunctivitis
- Acanthamoeba keratitis
- Fungal keratitis
CASE V:
SO FIRST I WENT TO THE EMERGENCY ROOM…..

Additional considerations:

- Non-responsive to various antibiotics
- Pt denies CL wear or swimming in “warm lake” pool in recent days
- Corneal pattern not consistent with viral →
CASE V: SO FIRST I WENT TO THE EMERGENCY ROOM…..

Diagnosis confirmed elsewhere: **Fungal keratitis**

**Concerns:**

1) Challenging treatment & very slow recovery
2) May require corneal transplant → **Co-management encouraged**
3) **SYSTEMIC CONCERNS:**
   More likely in “immunocompromised” pt

**Initiated REFERRAL to PCP for work-up**
CASE V: 
FUNGAL KERATITIS ➔ TRADITIONAL RISK FACTORS:

• Immuno-compromised pts or pts treated using immuno-suppressive meds
• While rare in the US,

  **Fungal keratitis accts for up to 50% of ulcerative keratitis elsewhere in the world**

• Generally relies on alteration of normal epithelial barriers & has a relatively slow progression
• No predilection for age, gender or race
CASE V:
FUNGAL KERATITIS ➔ TRADITIONAL RISK FACTORS:

• So.....based on risk factors more likely expect a fungal keratitis in a Pt taking anti-inflammatory meds living in So. Florida who works outdoors

  Versus

A teenage pt who mainly plays video games & lives in Minneapolis
CASE V: FUNGAL KERATITIS ➔ TRADITIONAL RISK FACTORS:

HISTORY

• Ocular trauma, often w/ vegetation such as tree branch, leaf
• More common in agricultural/ tropical environments
• “Breakouts” assn w/ CL wear/CL solutions

PRESENTATION

• May be similar in appearance to bacterial keratitis
• Often misdiagnosed
CASE V: Fungal Keratitis → Different Presentations:

Fusarium Solani:

- Filamentous fungi, usually from trauma with vegetation (tree branch)

Signs:

- Stromal, gray-white opacity w/ feathery borders and satellite lesions (endothelial)
- Epithelium over infiltrate may be elevated leading to a defect or ulcer
- Conjunctival injection
- A/C reaction
CASE V:
FUNGAL KERATITIS → DIFFERENT PRESENTATIONS:

Fusarium Solani -- Symptoms:
• Pain, Photophobia, Red, Tearing, Discharge

Candida & others

➢ Work-up:
• Biopsy is negative for bacteria but SABOURAUD’s agar has positive cultures
• If available, confocal microscopy is a non-invasive method for accurately identifying fungal keratitis
CASE V:
**FUNGAL KERATITIS** ➔ **TREATMENT CONSIDERATIONS:**

**Treatment:**
- Natamycin 5% q1h or q2h while awake
- Additional: Brolene, Neosporin
- Cycloplegia
- Hospitalization Considered

**NO STEROIDS, NO PATCH & heals very slowly….need to follow daily!**
CASE VI:
IT STARTED WITH SOME FLOATERS I COULDN'T SWAT AWAY….

32 yo African American Male

► CC: Sudden loss of vision OS x 6 days
  • HPI: Pt stated that four days... before visual loss, saw floaters that he “tried to swat out of the way”
  • (-) Flashes
  • (-) HA, Ocular pain

► Ocular History: Unremarkable
CASE VI:
IT STARTED WITH SOME FLOATERS I COULDN’T SWAT AWAY....

32 yo African American Male

History:

- Medical History/Review of Systems
  - Withheld
- Medications: 3 “unknown” medications
- Family History: Unremarkable
- Allergies: NKMA
CASE VI: ENTRANCE TESTS
IT STARTED WITH SOME FLOATERS I COULDN’T SWAT AWAY….

Visual acuity - Distance unaided

- OD: 20/20
- OS: CF @ 1'/ PH = NI

Pupils

- OD: Equal, round, and reactive to light
- OS: 3+ APD

Motility: Full OU

Confrontation Fields:

- OD: Full to finger counting
- OS: Constriction in all quadrants
CASE VI: CLINICAL EXAM
IT STARTED WITH SOME FLOATERS I COULDN’T SWAT AWAY….

No improvement in VA with refraction or PH

- Eyelids: Capped meibomian glands OU
- Conj/Sclera: White and quiet OU
- Cornea: Normal epithelium, stroma, endothelium,
  - (-) NAFL staining
- Anterior Chamber: Deep and quiet (-) cells, flare
- Lens: Clear lens capsule, cortex, nucleus

- Intraocular Pressure
  - OD: 13 mmHG
  - OS: 13 mmHG
CASE VI: CLINICAL EXAM
IT STARTED WITH SOME FLOATERS I COULDN'T SWAT AWAY....

▶ Vitreous: Clear (-) vitreal cells OU
▶ Optic Nerve:
  ▶ OD: 0.3/0.3 Flat, sharp, healthy pink rim tissue
  ▶ OS: C/D unable to assess...
    ▶ With extensive hemorrhagic necrosis and edema and juxtapapillary exudation
▶ Maculae:
  ▶ Flat, sharp without hemes, exudates, pigment OU
▶ Vessels:
  ▶ OD: Isolated CWS along inferior arcade
  ▶ OS: Intraretinal hemorrhages with scattered CWS along arcades, superior>inferior
Pt was diagnosed with HIV/AIDS in Oct 2013

- Viral load: unknown
- CD4 count: 55mm$^3$ after initiation of HAART
  (Lowest known CD4 was approximately 20 mm$^3$)
- Medications: “Cocktail” of 3 HAART meds
Toxoplasmosis
- Classically presents w/ “yellow fundus lesion” (+) with vitritis

Syphilis
- “Great masquerader” → Variant of post. uveitis incl. chorioretinitis, retinitis & vasculitis

Cytomegalovirus Retinitis
- “Pizza fundus” with grossly hemorrhagic exudative necrotizing retina

Acute Retinal Necrosis (ARN)
- Areas of necrotic peripheral retina, sparing the posterior pole
- Prominent Vitritis & Vasculitis

Progressive Outer Retinal Necrosis (PORN)
- Areas of necrotic retina w/o vasculitis & vitritis – tends to be in p.pole
FINAL DIAGNOSIS → Cytomegalovirus Retinitis

- Visual symptoms present in vast majority of cases, including decreased vision, floaters, or scotoma

- Classic presentation
  - Anterior segment → White and quiet
  - Posterior segment →
    - Lesions appear as thickened white area of infiltrate with associated retinal hemes
    - Vitritis is minimal despite severe retinitis (secondary to low CD4 count)
  - Unilateral initially → if untreated, 50% development in contralateral
TREATMENT OF CMV RETINITIS

REQUIRES Systemic AND Ocular management

- **Systemic**
  - Ganciclovir
    - Administered IV ➔ Susceptible to resistance
    - Bone marrow suppression and neutropenia
  - Valganciclovir
    - Equivalent to Ganciclovir
  - Foscarnet
    - Administered IV
    - Effective against resistant strains of CMV
    - Renal toxicity very common due to daily catheter infusion
  - Cidofovir
    - Equivalent to Foscarnet
REQUIRES Systemic AND Ocular management

- Ocular
  - Ganciclovir implant
    - Effective local control up to 8 months
    - Used as 1st tx for immediate sight threatening disease
    - Numerous adverse effects including RD & vitreous hemorrhage
  - Intravitreal Foscarnet or Intravitreal Cidofovir
    - Weekly injections
  - Intravitreal Fomivirsin
    - Injected Bi-monthly
    - Effective for newly diagnosed and reactivated cases
GANCICLOVIR IMPLANT & CMV RETINITIS

Retrospective cohort study

- 115 pts (166 eyes) treated w/ Ganciclovir implant
  - 40% presented w/ retinitis involving macula or ONH
  - Half the cohort presented with bilateral disease
- 34% of pts experienced 1 or more vision threatening complication(s), including RD, vitreous hemorrhage, and endophthalmitis
- 40% of pts required additional implant therapy due to reactivation or persistent infection
CASE VI:
IT STARTED WITH SOME FLOATERS I COULDN’T SWAT AWAY….

- Pt was immediately referred for retinal consult
  - Ultimately ended up at Bascom Palmer Eye Institute (BPEI) in Miami, FL
    - Pt received sustained-release Intraocular Ganciclovir implant
    - Pt was also put on systemic antivirals in attempt to protect the contralateral eye
HUMAN IMMUNODEFICIENCY VIRUS (HIV) INFECTION

RETRO-virus that results in an immuno-compromised patient

- Initially was an acute disease; now, considered more of an *chronic disease*
- Different strains
- Current systemic standards
  - CD 4 count
    - Healthy person = 500 to 1500 cells/mm$^3$
    - HIV positive: 300-500mm$^3$
    - AIDS = 200 or less mm$^3$
  - Viral Load
    - Goal = undetectable
Acquired Immune Deficiency Syndrome (AIDS): Diagnosis

*Originally an Acute disease ➔ Now, Chronic disease*

**AIDS is defined as:**

- CD 4 count = 200mm$^3$ or less
- Presence of AIDS defining opportunistic infection
HIV INFECTION & THE EYE

Posterior segment manifestations –

- **HIV retinopathy** → characterized by *Cotton wool spots*
  - *Periphlebitis*
    - Inflammation of the outer coat of a vein or the tissue surrounding
- **Acute Retinal Necrosis** → ARN/ BARN
- **Progressive Outer Retinal Necrosis** → PORN

**Opportunistic infections**

- **CMV retinitis** → Reactivation of latent virus/
  
  Generally CD4 < 50mm³
- **Toxoplasmosis**
A LITTLE MORE INFORMATION ON CMV RETINITIS

- CMV retinitis results from reactivation of latent CM virus
  - Infects immuno-compromised hosts
  - Leading cause of visual loss in AIDS patients
  - CMV virus is the most opportunistic infection seen in AIDS patients, accounting for 90% of retinopathies
- Statistics:
  - Approximately 30% of AIDS pts developed CMV retinitis in the pre-HAART era
  - This percentage has drastically decreased to <10% since HAART introduction
LONGITUDINAL STUDIES OF THE COMPLICATIONS OF AIDS (LSOCA)

- Initiated to study the occurrence of ocular complications among AIDS pts during HAART era
  - 1600 patients with AIDS
  - Followed at 6 mo intervals w/ laboratory measurements of CD4, CD8, and viral load counts
- Review & Results
  - Pre-HAART era, Hoover et al investigated the incidence to be ~ 25% (CD4 <100 mm$^3$) compared to LSOCA incidence of 7%
  - Greatest risk factor for developing CMV retinitis was “severely immuno-compromised” state, specified as pts w/ CD4 counts <50 mm$^3$
HIV TESTING & MANAGEMENT

- CD-4 count/ Viral Load
  - “Expected” CD-4
  - Viral Load measurements
    - First test measured down to 10,000 copies
    - Second was able to detect down to 500 copies
    - Research testing can detect down to 5 copies
  - Management:
    - Triple “cocktail” → HAART (*Highly Active AntiRetroviral Therapy*)
    - Prophylactic Antibiotic Treatment

Topical immunomodulator: Cyclosporin A -- Special Considerations
CONTACT INFORMATION

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

Greg Black, OD
Email: gblack@nova.edu
Phone: (954) 815-2020


ECTOPIA LENTIS REFERENCES


HIV REFERENCES


