A TALE OF TWO CLINICS:

CHALLENGING CASES FROM A COLLEGE CAMPUS CLINIC TO AN INNER CITY CLINIC

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**Introductions:**

- Dr. Black – No Disclosures

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- Dr. Tyler – No disclosures

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**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
PERSISTENCE PLUS...

- 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
PERSISTENCE PLUS...

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
ANTERIOR 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 → 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 ³ 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
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%
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
CASE II: THAT’S NOT SUPPOSED TO BE THERE
NSU FOLLOW-UP ➔

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 x180
  - **OS:** - 10.75 –3.00 x 180
- **Biomicroscopy**
  - Crystalline lens subluxated superior nasal OD>OS
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 AREOLAR 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 AREOULAR 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 AREOULAR CHOROIDAL DYSTROPHYSIS

- 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” → LYME, also caused by 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%
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

- 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 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*

CASE V:
SO FIRST I WENT TO THE EMERGENCY ROOM.....

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
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.....
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
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
  (\textit{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
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
TREATMENT OF CMV RETINITIS

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**
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
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ECTOPIA LENTIS REFERENCES


HIV REFERENCES


