**Uveitis:**

- Generic, broad term referring to any inflammation of the uvea (iris, ciliary body, and choroid)
- More precise terms include iritis and iridocyclitis
- The inciting event -> release of chemotactic factors/mediators that increase vascular permeability -> breakdown of the blood-aqueous barrier -> macrophages/lymphocytes/proteins = CELLS & FLARE

**Definition:**

- Uveitis refers to any inflammation of the uvea, which includes the iris, ciliary body, and choroid.

**Etiology:**

- 3 main underlying causes are:
  - Reaction to trauma
  - Autoimmune
    - Response to autoantigens
  - Response to infectious agent

**Signs/Symptoms:**

- Patient symptoms are often very similar with all of the various etiologies
  - Can be some differences

- Anterior uveitis
  - Pain, redness, photophobia

- Intermediate/Posterior uveitis
  - Floaters, mildly decreased vision from CME, etc
Patients with chronic uveitis are likely to be:

1. More symptomatic than acute uveitic pts
2. Less symptomatic
3. Symptoms are fairly equal between the two

Common patient symptoms include:
- pain – ciliary spasm
- red eye – ciliary flush
- tearing
- photophobia
- blurred vision
- Pupillary miosis

Common patient symptoms include:
- pain – ciliary spasm
- red eye – ciliary flush
- tearing
- photophobia
- blurred vision
- Pupillary miosis

Signs - Cells/Flare

- Critical signs are cells and flare in the anterior chamber
  - Cells are lymphocytes or macrophages and indicate active inflammation in the iris and ciliary body.
  - Flare is a result of protein leakage.

- Keratic precipitates
  - collections of inflammatory cells deposited on the endothelial surface of the cornea from the aqueous humor
  - fresh KP’s -> white and round
  - older KP’s -> pigmented or faded.
  - Document size, color, distribution, and # of KP’s

Signs - KP’s

- Keratic precipitates
  - cells and flare in the anterior chamber
  - Cells are lymphocytes or macrophages and indicate active inflammation in the iris and ciliary body.
  - Flare is a result of protein leakage.

- Keratic precipitates
  - fresh KP’s -> white and round
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  - Document size, color, distribution, and # of KP’s

Signs - Nodules

- Accumulation of cells on the iris are referred to as iris nodules. Two types exist:
  - Koeppe nodules are found on the pupillary border and Busacca nodules are on the anterior surface.
  - Nodules on the pupillary border may result in posterior synechiae between the iris and lens.

In the initial stages of an iridocyclitis, the patients IOP will typically be:

1. Higher
2. Lower
3. No change
Signs

- IOP must be monitored initially and at subsequent visits
  - usually a patient with acute uveitis will present with low pressure likely due to infiltration of the ciliary body and reduced aqueous secretion
  - the pressure may be elevated secondary to inflammation in the trabecular meshwork or by blockage of the angle by cells and debris
  - in addition treatment with corticosteroids can result in glaucoma due to the patient being a steroid responder.

Signs

- Every patient with uveitis should have a DFE:
  - posterior inflammation (vitreitis) may be overlooked in a diagnosed case of anterior uveitis
  - Macular area should be evaluated especially if there is any decrease in acuity
    - CME frequently results from anterior uveitis and should be suspected if decreased VA
    - Epiretinal membranes can form and distort the macular tissue.

Which of the following is/are complications of long-standing uveitis?

1. Band keratopathy
2. Cataracts
3. Glaucoma
4. 2 & 3
5. All of the above

Signs - Long-Standing Uveitis

- Cataract is a common complication of long-standing uveitis as well as chronic steroid therapy
  - most cataracts are PSC, but cortical opacities may also be seen.
- CME
- Glaucoma

Signs - Long-Standing Uveitis

- Band keratopathy is also seen in chronic conditions such as uveitis
  - it is the deposition of calcium at the level of Bowman’s and in severe cases requires chelation therapy or mechanical scraping.

Classification

- Classification is the key to the proper diagnosis and management of the uveitic patient

- Most common classifications
  - Anterior vs. Intermediate vs. Posterior vs. Panuveitis
  - Acute vs. Chronic
  - Granulomatous vs. Non-granulomatous
  - Infectious vs. Autoimmune
**Classification of Uveitis**

- 4 main questions we need answered
  - Where is the inflammation located?
  - Is disease acute or chronic?
  - Granulomatous or non-granulomatous?
  - Unilateral or bilateral?

**Answers to the 4 questions**

- 4 answered questions -> easier diagnosis and management
  - Anterior uveitis – etiology ??
  - Acute, unilateral, non-granulomatous anterior uveitis = Idiopathic, HLA-B27 uveitis, herpetic
  - Chronic, bilateral, granulomatous panuveitis = sarcoidosis, syphilis, TB

**Duane’s Ophthalmology**

- Most commonly encountered uveitic causes:
  1. Traumatic
  2. Post-surgical
  3. Anterior Idiopathic
  4. HLA-B27 associated uveitis
  5. JIA associated uveitis
  6. Fuch’s heterochromic iridocyclitis
  7. Posner-Schlossman syndrome
  8. Herpetic anterior uveitis
  9. Pars Planitis
  10. TB/Sarcoïd/Syphilis

**Which condition is NOT an HLA-B27 (+) condition linked with uveitis?**

1) Ankylosing Spondylitis
2) Rheumatoid Arthritis
3) Reactive Arthritis (Reiter’s Syndrome)
4) Inflammatory Bowel Disease

**Anterior Uveitis Work-up**

- After classification, 3 most common groups of uveitis include:
  1. Acute, unilateral (or bilateral), non-granulomatous anterior uveitis
     - Idiopathic, HLA-B27, Herpetic, Behcet’s
  2. Chronic, bilateral (or unilateral), non-granulomatous anterior uveitis
     - JIA, Fuch’s Heterochromic, Idiopathic, Herpetic
  3. Chronic, bilateral (or unilateral), granulomatous anterior uveitis
     - TB, Sarcoïd, Syphilis, VKH
A 32 yo male has a recurrent NG ant. uveitis OD. Upon questioning he states that he has had low back pain for the past 2-3 years. Which test is most important to run with this patient?

1. HLA-B27
2. ESR
3. Chest X-ray
4. Sacro-Iliac joint X-ray

1. Acute, unilateral (or bilateral), non-granulomatous anterior uveitis
   - Most common group
     - Idiopathic – most common cause of anterior uveitis
     - HLA-B27 – 2nd most common cause of anterior uveitis – nearly 20 - 50% of acute anterior uveitis pts are HLA-B27+
       - Ankylosing Spondylitis
       - Reactive Arthritis (Reiter’s syndrome)
       - Psoriatic Arthritis
       - Inflammatory Bowel Disease
       - Herpetic
       - Behcet’s

2. HLA-B27 (+) Associated Uveitis
   - Acute, rapid onset of unilateral pain and intense photophobia
   - Moderate to severe inflammatory reaction
     - 3-4+ cells
     - Hypopyon
     - Fibrin meshwork
     - Plasmoid aqueous
   - Aggressive treatment important
     - Average tx time = 6-10 weeks

3. HLA-B27 (+) conditions
   - Ankylosing Spondylitis
     - Low back pain
     - Diagnosis:
       - Abnormal S-I joint X-ray
       - Increased ESR
     - Treatment:
       - Exercise
       - Oral NSAID’s

4. HLA-B27 (+) conditions
   - Reactive Arthritis (Reiter’s syndrome)
     - “Can’t see, can’t pee, can’t climb a tree”
       - Conjunctivitis/Uveitis
       - Urethritis
       - Arthritis – lower joints
     - Dermal skin lesions
     - Diagnosis:
       - Elevated ESR
     - Treatment:
       - NSAIDS

5. HLA-B27 (+) conditions
   - Inflammatory Bowel Syndrome
     - Ulcerative Colitis
     - Crohn’s Disease
       - Stomach problems – diarrhea, bloody stools
     - GI referral – tx with diet change and immunosuppresives
   - Psoriatic Arthritis
     - Arthritis upper extremities
     - Characteristic skin lesions
Herpetic Uveitis

- HSV
  - H/O unilateral red eye
  - Corneal scarring
  - Active corneal disease
  - IOP increase & iris atrophy
- HZO
  - Characteristic skin lesions
  - Iris atrophy

In the same 8 yof, which lab test(s) would you run, and what results would confirm your suspicion of JIA?

1. ANA (+), RF (+)
2. ANA (+), RF (-)
3. ANA (-), RF (+)
4. ANA (-), RF (-)
5. HLA-B27 (+)
6. HLA-B27 (-)

2. Chronic, bilateral (or unilateral), non-granulomatous anterior uveitis

- Most common cause
  - Juvenile Idiopathic Arthritis (JIA)
    - 80% of pediatric uveitis cases are associated with JIA
    - Slow, chronic onset; mild sx’s, many chronic signs
    - ANA (+) triples the risk of uveitis – base f/u’s on this
    - RF (-)
    - Tx: NSAID’s, steroids, immunosuppresives

JIA lab tests

- ANA – very non-specific test
  - Used to confirm an autoimmune collagen vascular disease
    - Lupus and JIA
    - Weaker associations: Sjogren’s, RA, scleroderma, AS, MG
  - 15% of normals have a mildly elevated ANA (diabetics, elderly women)

JIA lab tests

- RF
  - 80% of RA pts are seropositive
  - Most often JIA patients are RF negative
    - ANA (+) and RF (-) -> significantly increased risk of uveitis in a suspected JIA patient
2. **Chronic, bilateral (or unilateral), non-granulomatous anterior uveitis**
   - More common causes
     - Fuch’s Heterochromic Iridocyclitis
     - Low-grade chronic uveitis with iris heterochromia
     - Usually unilateral – cataract & glaucoma
     - Uveitic eye is usually lighter in color
     - Idiopathic
     - Herpetic

A patient presents with a bilateral ant. uveitis w/ mutton-fat KP’s. Which lab/radiology tests should be ordered for a proper diagnosis?
1. PPD & chest X-ray
2. VDRL & FTA-ABS
3. HLA-B27
4. ACE
5. 1, 2, & 4
6. All of the above

3. **Chronic, bilateral (or unilateral), granulomatous anterior uveitis**
   - Most common causes
     - Sarcoid
     - Syphilis
     - TB

**Sarcoidosis**
- Systemic granulomatous inflammation -> unknown etiology – Young, black, females
  - Pulmonary – 95%
  - Ocular – 60-70%
  - Skin
- Diagnosis
  - Serum
    - ACE, lysozyme, calcium
  - Chest X-ray, Gallium scan, biopsy of granulomas
- Treatment
  - Immune suppression

**Syphilis**
- Infection with spirochete *T. pallidum*
  - Primary stage – Chancre
  - Secondary stage – rash palms of hands/soles of feet
    - Most ocular involvement
  - Latent and Tertiary Stage
- Diagnosis:
  - RPR or VDRL – general non-treponemal tests
  - FTA-ABS or MHA-TP – specific treponemal tests
- Treatment:
  - Penicillin

Which of the following indicates a patient has an active syphilis infection?
1. PPD
2. FTA-ABS
3. VDRL
4. ACE
Infectious disease caused by *Mycobacterium tuberculosis*
- Very rare
- Exposure/Cough/Pulmonary involvement
- Granulomatous ant uveitis, Choroiditis, phlyctenular keratoconjunctivitis

### Diagnosis
- PPD – not useful in uveitis patients
- Chest X-ray/Sputum culture

### Treatment
- Isoniazid, Rifampicin, Ethambutol, Pyrazinamide

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**TB**

**Uveitis Work-up Rule of Thumb**

- If the uveitis is:
  - Recurrent
  - Bilateral
  - Severe
  - Granulomatous OR
  - Resistant to standard treatment;
  - AND History does NOT point to a specific condition
  - Non-specific baseline eval
  - Work-up:
    - CBC
    - ESR/CRP
    - ANA/RF
    - HLA-B27
    - Lyme titer (depending on what area of the U.S.)
    - PPD/nergy panel and Chest X-ray
    - RPR or VDRL and FTA-ABS or MHA-TP
    - ACE

**Lab Work Costs**

- CBC - $9 - 12
- ESR - $5 - 7
- CRP - $18 - 24
- HLA-B27 - $36 - 49
- ANA - $15 - 21
- RF - $8 - 11
- ACE - $20 - 28
- VDRL/RPR - $6 - 8
- FTA-ABS/MHA-TP - $18 - 25
- Lyme titer - $24 - 32
- Chest X-ray - $75 - 250
- Total = $216 - 443

**Uveitis Work-up Rule of Thumb**

- If a patient presents with a uveitis that is:
  - First episode
  - Unilateral
  - Non-granulomatous
  - Mild->moderately severe AND
  - Fairly good health
  - no further work-up required

**Treatment of Uveitis**

- Treat the disease properly
  - Minimize complications of the disease itself
  - Minimize complications of the treatment
- 2 main drugs/drops
  - Cycloplegics
  - Topical Corticosteroids
Treatment

- Cycloplegia:
  - used for reduction of pain,
  - break/prevent the formation of posterior synechiae
  - also functions in the reduction of inflammation

Cycloplegics

- Common cycloplegic agents include:
  - cyclopentolate 1-2% tid for mild-to-moderate,
  - homatropine 5% or
  - scopolamine 0.25% or
  - atropine 1% bid-tid for moderate-to-severe inflammation
- most common is the use of Homatropine 5% bid

Treatment

- Steroids: necessary for the treatment of active inflammation
- Most commonly used:
  - Prednisolone acetate 1% (Pred Forte 1%)
  - Prednisolone phosphate???
  - Loteprednol etabonate 0.5% (Lotemax)
  - Drop, gel, ung

Treatment

- Durezol (difluprednate ophthalmic emulsion) 0.05%
  - Dosing QID
  - Thought to be as potent or even more potent when compared to Pred Forte q2h
  - Minimal to no shaking of the bottle
  - No BAK

Treatment

- Topical administration is most common though perocular injections and systemic meds are useful for posterior uveitis and difficult cases
- Dosing:
  - Pred Forte q1h or q2h
  - Durezol QID
  - Lotemax ung qhs

NOTE: it is crucial to taper your steroid treatment!
- You will have a rebound inflammation if you simply remove your patient from their steroids...
  - How long???
- Treat beyond the cell & flare
  - 5-7 days
1. Remember the classifications.
2. Determine if there is corneal involvement & check IOP.
3. Determine the severity.
4. Is this a chronic problem?
5. Treat strongly.

Rules For Managing Uveitis