Uveitis and Glaucoma: The Seven Reasons Why IOP Can Increase in Uveitis (and What to do About It)

Course Description: This course will cover the causes and treatments of uveitic glaucoma, including clogged, inflamed, and damaged trabecular meshwork, synechiae, and steroid response.

Course Objectives: This course will teach the seven reasons why IOP can increase in uveitis, and how it can be treated:
1. Clogged Trabecular Meshwork (TM)
2. Inflamed TM
3. Damaged TM from chronic uveitis
4. Peripheral Anterior Synechiae (PAS)
5. Posterior Synechiae (PS)
6. Steroid Response
7. The eye is getting better

I. Introduction
   A. Why give this talk?
   B. What to learn from this talk:
      1. 7 reasons why IOP increases in uveitis
      2. How to treat uveitis
      3. How to treat uveitic glaucoma

II. Diagnosis
    A. How inflammation works
1. Pain
2. Redness
3. Swelling
4. White Blood Cell Migration

B. While there are multiple signs and symptoms in uveitis (pain, ciliary flush, cell, flare, photophobia, miosis), cells are what matter most diagnostically.

C. Common denominator in all uveitis: White blood cells

III. Goal of Treatment
A. Decrease symptoms
B. Prevent sequelae
C. Improve patient’s quality of life

IV. The 7 reasons why IOP can increase in Uveitis
A. Clogged Trabecular Meshwork (TM)
B. Inflamed TM
C. Damaged TM from chronic uveitis
D. Peripheral Anterior Synechiae (PAS)
E. Posterior Synechiae (PS)
F. Steroid Response
G. The eye is getting better

V. Clogged TM
A. Due to white blood cells entering spaces of TM
B. Diagnosed when there is an increase in IOP in very red, hot uveitis without synechia

VI. Inflamed TM
A. A trabeculitis causing decrease in outflow capability
B. The most likely mechanism for Posner-Schlossman Syndrome
C. Diagnosed when uveitis is very mild, no synechia, no treatment yet, and quite high IOP

VII. Damaged TM from chronic uveitis
A. This is the type of increased IOP seen in Fuch’s Heterochromic Heterocyclitis
B. Diagnosed in mild chronic uveitis without synechia

VIII. Peripheral Anterior Synechiae
A. Can cause chronic increase in IOP
B. Potential to close angle
C. Diagnosed with gonioscopy
D. Will need chronic treatment of IOP
   1. Difficult due to reduced options

IX. Posterior Synechiae
A. Causes an acute glaucoma
B. Needs Peripheral Iridotomy or Iridectomy

X. Steroid Response
A. IOP can increase because of the treatment
B. Some individuals are sensitive to corticosteroids and have this response

XI. The eye is getting better
A. With uveitis, TM can be inflamed and/or clogged which decreases outflow
B. Ciliary body does not produce as much aqueous
C. Once normal function returns, ciliary body has the potential to become normal before inflamed/clogged TM does
D. This creates more aqueous than can be filtered out through TM

XII. Treatment Goals in Uveitis
A. Reduce pain, redness, photophobia
B. Prevent sequelae (i.e. synechiae, CME, cataract)

XIII. Treatment Goals in Uveitic Glaucoma
A. Reduce IOP
B. Prevent progression of optic neuropathy

XIV. There are general circumstances in Uveitic Glaucoma. Each has its own treatment strategy
A. Acute uveitis with a moderate increase in IOP
B. Acute uveitis with a severe increase in IOP
C. Chronic uveitis with a moderate increase in IOP
D. Patient with glaucoma who gets uveitis
XV. **Treating acute uveitis with a moderate increase in IOP**
   A. Typical acute uveitis is young patient with healthy optic nerves
   B. Typical uveitis does not last long
   C. If there is a moderate increase in IOP, it will resolve with the uveitis
   D. Treatment can be more conservative since the disease is not long term

XVI. **Treating acute uveitis with a severe increase in IOP**
   A. The severe increase could be due to PAS, PS, or Trabeculitis
   B. PAS – IOP medication is usually unsuccessful
   C. PS – Needs peripheral iridotomy or iridectomy. Not likely to need IOP medication
   D. Trabeculitis rarely causes severe spike in IOP – will resolve with treatment of uveitis. May still need short-term IOP lowering medication.
   E. It is best to prevent PAS and PS. This is done through aggressive treatment of the uveitis.

XVII. **Treating chronic uveitis with a moderate increase in IOP**
   A. Due to chronic damage to trabecular meshwork (Fuch’s Iridocyclitis) and/or PAS
   B. Treat like typical glaucoma patient except:
      1. Prostaglandins are less likely to work. Could increase inflammation
      2. Cholinergics are less likely to work. Could increase inflammation
      3. ALT/SLT can increase inflammation. Difficult to do if patient already has PAS
   C. Patients frequently need filter surgery. It is risky and less likely to be successful due to an already inflamed eye

XVIII. **Treating the patient with glaucoma who gets uveitis**
   A. Glaucoma treatment may take precedent over uveitis treatment. This calls for creative ways to decrease both inflammation and IOP
   B. If the patient is on a prostaglandin, may need to discontinue it until the uveitis clears
C. If the patient needs short term reduction in IOP, until the uveitis clears, consider Diamox and/or Iopidine.

A Tailored Approach to Uveitis and Associated Systemic Conditions
Anthony DeWilde O.D.

I. Introduction
A. Why I am giving this talk
B. What to take from lecture
1. Better understanding of Uveitis
2. What to look for during the examination
3. Learn about common associated conditions
4. Learn when and how to use specialized testing for associated conditions

II. Diagnosis
A. How inflammation works
1. Pain
2. Redness
3. Swelling
4. White Blood Cell Migration
B. Common denominator in all uveitis: White blood cells

III. The Goal of Treatment
A. Improve patient’s quality of life

IV. Associated Conditions
A. What is the purpose of evaluating for associated conditions?
1. Find something that once found will help alleviate uveitis and prevent recurrence.
2. Correctly name a condition that was previously named incorrectly – leading to better treatment of non-ophthalmic condition
3. Should leave the patient better after the testing
B. We need a thoughtful approach that matches the description of uveitis with patient’s symptoms.
C. A "scatter" approach is not good medical care because:
   1. It is no more beneficial to patient than tailored approach
   2. There is added expense
   3. There is added anxiety
   4. Increase in false positives
V. **A tailored workup should be specific to your patient. It requires that you know:**

A. A working list of common associated conditions
B. The characteristics of the uveitis of those conditions
   1. Acute vs. Chronic – Can be acute and recur. Recurrent does not mean Chronic
   2. Anterior vs. Posterior (or Panuveitis)
   3. Unilateral vs. Bilateral (or Alternating)
   4. Granulomatous vs. Non-Granulomatous – Often difficult to distinguish. Look for Granulomas, Bussaca nodules or Mutton Fat KP
C. The history and physical findings that might manifest in a patient with one of these conditions
D. What specialized testing used to identify these conditions (if indicated)
E. The appropriate referral/treatment when a condition is diagnosed or suspected
F. Meshing these five areas will allow for appropriate testing and eliminate unnecessary tests. (e.g. a patient with acute, unilateral, non-granulomatous uveitis should not be tested for Sarcoid.)

VI. **Common associated conditions and their characteristics**

A. Ankylosing Spondylitis, Reactive Arthritis - Acute, anterior, unilateral, nongranulomatous.
B. Inflammatory Bowel Diseases– Typically unilateral and non-granulomatous. However, some report up to 50% bilateral. Forty percent of uveitis is anterior (40% is panuveitis, 20% posterior)
C. Juvenile Rheumatoid Arthritis– Chronic, anterior, unilateral or bilateral, nongranulomatous, asymptomatic. “White eye uveitis.”
D. Sarcoid, Tuberculosis – Chronic, anterior (can be posterior or pan), bilateral, granulomatous
E. Syphilis – “The Great Imitator”
F. Lyme – Variable, Nonspecific
G. Multiple Sclerosis – Chronic, bilateral, anterior or intermediate, nongranulomatous.
H. Herpes Simplex – Acute, unilateral, anterior, nongranulomatous.
I. Herpes Zoster - Acute, unilateral, anterior, nongranulomatous.

VII. **Signs/Symptoms, Follow-up Testing, and Treatment of Associated Conditions**

A. Ankylosing Spondylitis
   1. Lower back pain/stiffness in morning > 30 minutes, back pain improves with exercise, awakening in second half of night from back pain. All back pain is worse with rest.
   2. Sacro-iliac joint x-ray and referral
   3. Treatment typically NSAID. TNF Blockers work very well but are very expensive
B. Reactive Arthritis
   1. Most patients with Reactive Arthritis lack the full triad of “Reiter’s Syndrome.” Acute, asymmetric oligoarthritis (typically knee, ankle, foot). Can also have symptoms of urethritis, diarrhea, or cutaneous lesions (usually soles of hands or palms of hands). Musculoskeletal symptoms follow GI or GU symptoms by 2-4 weeks.
   2. Refer to Rheumatology. Laboratory tests are not indicated for diagnosis.
   3. Treatment is pain management. This includes, but not limited to, Physical Therapy, NSAID, Steroid, Anti-rheumatic medication.

C. Inflammatory Bowel Disease
   1. GI symptoms such as stomach cramps, diarrhea, bloody stools
   2. Refer to GI
   3. Treatment has a multi-step approach: Fiber, Aminosalicylates, and Corticosteroids

D. Juvenile Rheumatoid Arthritis
   2. Possible joint pain/stiffness
   3. Refer to pediatrician
   4. Treatment typically NSAID.

E. Tuberculosis
   1. Very Rare except in urban, multi-ethnic areas (i.e. New York City). Exposure to TB, chronic cough, pulmonary distress
   2. Order chest x-ray. PPD is not a sensitive test. Most do not recommend it.
   3. Refer to infectious disease
   4. Treatments include: Rifampin, Ethambutol, Corticosteroids

F. Sarcoid
   1. Skin involvement (Macules, Papules, Granulomas), pulmonary symptoms such as dyspnea or cough
   2. Order chest x-ray. Refer. ACE is a non-specific test with a poor sensitivity.

G. Syphilis
   1. Exposure, previous history or treatment, skin rash, or chancre
   2. VDRL (or RPR) and FTA-ABS (or MHA-TP)
   3. Most literature suggests that Syphilis affects posterior segment. The bulk of syphilitic uveitis is in immune compromised patients such as HIV/AIDS.
   4. If Syphilis is suspected, should see infectious disease.

H. Lyme
   1. Very rare.
2. Mostly in Western, Upper Midwest, and Northeast states.
3. Need to have very high suspicion. Usually history of rash, flu-like symptoms. Uveitis appears during early stages of disease.

I. Multiple Sclerosis –
   1. Some reports indicate up to 25% of MS patients get uveitis.
   2. Will likely already have a diagnosis of MS.

J. Herpes Simplex
   1. Associated with moderate IOP increase and stromal edema.

K. Herpes Zoster
   1. Associated with current or recent unilateral (same side as uveitis) facial lesions

L. Fuch’s Iridocyclitis - No systemic findings