Red Eyes, Red Spots, and Red Flags

Essential Knowledge of Eye Disease

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Seeing Red

- Red Eyes
  - Common reason for primary care visits
- Red Spots
  - Diabetic retinopathy
  - Other causes of retinal hemorrhage
- Red Flags
  - Diagnoses you don’t want to miss

Required Tools

Evaluating the Eye Patient

- History
- Visual Acuity (with current glasses)
- Pupils
- Motility
- Confrontation visual field
- Slitlamp or flashlight exam
- (Intraocular pressure)
- Fundus exam
The Red Eye

What is the primary symptom?
- Itching and burning
- Discharge
- Redness
- Foreign body sensation
- Eyelid swelling
- Pain without discharge

Primary Symptom: Itching and Burning

- Blepharitis
- Allergic Conjunctivitis

Blepharitis

Seborrheic Ulcerative

Acne Rosacea w/Blepharitis
**Blepharitis**

- **Seborrheic** – accumulation of desquamated skin and oils on lids/lashes
- **Ulcerative** – chronic staph colonization

**Treatment:**
- Eyelid hygiene: warm compresses, lid scrubs
- Erythromycin ointment in ulcerative cases
- Allergy drops if coexisting allergic conjunctivitis
- Doxy or minocycline if underlying rosacea

**Allergic Conjunctivitis**

- **Chronic itching and burning**
  - May be seasonal
  - May be associated with specific allergens

**Clinical features**
- Conjunctiva injected, sometimes edematous
- Chronic watery or mucoid discharge
- Numerous papillae on tarsal conjunctiva (inside the eyelid)

**Allergic Conjunctivitis: Tx**

- **Topical medications**
  - Steroids (risk of cataract and glaucoma)
  - Multiple-site agents (Pataday, OTC Zaditor)
  - Antihistamines
  - Mast cell stabilizers (Crolom)
  - NSAID’s? (Voltaren, Acular)
  - Artificial tears
Primary Symptom: Discharge

- Viral conjunctivitis:
  - Watery discharge (may be thicker in a.m.)
- Bacterial conjunctivitis:
  - Purulent discharge
- Allergic conjunctivitis:
  - Mucoid discharge

Viral Conjunctivitis

- Presenting symptoms:
  - Watery discharge (may be thicker on awakening), redness, irritation
  - Acute or subacute onset
  - Often recent URI
  - Usually unilateral
  - Vision only mildly affected
  - May have mild pain and photophobia
  - Etiology: adenovirus, many others

Viral conjunctivitis: Tx

- Treatment:
  - **Handwashing** to prevent spread
  - Artificial tears
  - Sunglasses when outside
  - Cool compresses
  - Refer if worsening, vision blurred, or if not resolved in 1-2 weeks
Bacterial Conjunctivitis

- Clinical features
  - Purulent discharge
  - Mild irritation
  - Frequent in pediatric age group
  - Etiology: staph, strep, many others

- Treatment
  - Self-limited: antibiotic eyedrops are optional
  - Refer if severe or persistent, or if signs of eyelid cellulitis develop

Primary Symptom: Redness

- Subconjunctival hemorrhage
- Pterygium/pinguecula
- Episcleritis

Subconjunctival Hemorrhage

Treatment: Reassurance, not referral

Pterygium and Pinguecula
**Pterygium and Pinguecula**

- **Pinguecula**: hyperplasia of sun-damaged conjunctiva, medial or lateral to limbus
- **Pterygium**: abnormal conjunctiva loses contact inhibition, partially covers cornea
- **Treatment**:
  - Eyedrops: antihistamines, vasoconstrictors, NSAID, avoid steroids
  - Surgery: excise pterygium, place conjunctival autograft to prevent regrowth

**Episcleritis**

- Painless dilation of episcleral vessels, usually in one sector of one eye
- Usually benign and self-limited
- Occasionally associated w/rheum disease
- **Treatment**: refer to oph for topical steroids
- **Scleritis**: more intense dilation of deep scleral vessels, severe pain

**Primary Symptom:**

- Foreign Body Sensation
- Dry Eyes
- Herpetic Keratitis
- Foreign Body
Dry Eyes

- Clinical presentation
  - Chronic dryness, irritation or tearing
  - May have associated dry mouth
  - Exam findings subtle

- Multiple etiologies
  - Decreased aqueous secretion with age
  - Unstable tear film due to blepharitis
  - Autoimmune destruction of accessory lacrimal glands, e.g. in rheumatoid arthritis

Dry Eyes: Treatment

- Treatment:
  - Tear supplementation
  - Punctal plugs or permanent occlusion
  - Treat associated blepharitis
  - Cyclosporine gtt (Restasis) in severe cases

Herpes Keratitis

- Clinical presentation
  - Acute or subacute onset
  - Mild irritation, vision usually normal
  - No discharge (may have mild tearing)
  - Key exam finding: dendritic corneal staining with fluorescein
Herpes Keratitis

- Treatment:
  - All cases should be referred to an ophthalmologist
  - Oral acyclovir (or related compounds)
  - Topical antivirals are now rarely used
  - Topical steroids for deep corneal involvement or herpetic iritis
  - Permanent corneal scarring may develop in recurrent cases
  - Corneal transplantation sometimes necessary in severe or recurrent cases

Herpes Zoster Ophthalmicus

- Vesicular rash in V1 distribution
- May have keratitis, uveitis, rarely retinitis
- History of childhood zoster infection
- Common in elderly and immunosuppressed patients
  - Consider HIV test
- Treatment: systemic antivirals (ACV, etc)
- Ophthalmology consult to rule out ocular involvement

Corneal Foreign Body
Foreign Bodies

- Speck on cornea or conjunctiva
  - May be inside eyelid – need to evert lids
  - Remove at slit lamp with foreign body spud
  - Avoid using needles – risk of injury
  - Post-removal antibiotic prophylaxis
  - NSAID drops for pain relief
  - Refer if central or deep

Primary Symptom: Swelling

- Blepharitis (already discussed)
- Chalazion or hordeolum
- Preseptal cellulitis
- Orbital cellulitis
- Proptosis

Chalazion and Hordeolum

Clinical Presentation
- Chalazion: blocked meibomian oil gland with nontender swelling
- Hordeolum: blocked sweat gland with infection and tender swelling
**Chalazion and Hordeolum**

- **Treatment**
  - **Hordeolum:**
    - Warm compresses, massage
    - Consider systemic and topical antibiotic
    - Monitor for development of preseptal cellulitis
  - **Chalazion:**
    - Warm compresses, massage
    - Steroid injection
    - Incision and drainage (from inner aspect of lid)

**Preseptal Cellulitis**

**Orbital Cellulitis**

**Preseptal and Orbital Cellulitis**

- **Preseptal Cellulitis:**
  - Pain and swelling of eyelids
  - Exam: Diffuse lid erythema, edema, tenderness
- **Orbital Cellulitis:** signs of orbital involvement
  - Proptosis
  - Chemosis (conjunctival edema)
  - Diminished vision, pupil response or motility
  - Fever
**Preseptal and Orbital Cellulitis: Tx**

- **Preseptal Cellulitis:**
  - Oral antibiotics, e.g. Bactrim DS II po bid
  - Warm compresses
  - Careful monitoring for progression
- **Orbital cellulitis**
  - CT to rule out orbital abscess
  - IV antibiotics (consider MRSA coverage)
  - Careful monitoring for progression to cavernous sinus thrombosis or brain abscess

**Contact Dermatitis**

- Erythema, non-tender edema, itching of eyelids and face
- Most common antigens: eyedrops, cosmetics
- Treatment:
  - Identify and remove offending antigen
  - Mild steroid cream/ointment
  - Mild steroid and antihistamine eyedrops if ocular involvement
  - Consider systemic antihistamine or steroid if severe

**Proptosis**
Proptosis

- **Bilateral:**
  - Most common dx: thyroid orbitopathy
  - Check thyroid labs, including Ab’s, and refer

- **Unilateral**
  - Thyroid still most common etiology
  - Ddx: orbital tumors, inflammatory pseudotumor, vascular anomalies, myopic degeneration
  - Check thyroid labs, including Ab’s, and refer

Red Spots: Diabetic Retinopathy

- **Diabetic retinopathy**
  - Epidemic of preventable blindness
  - Leading cause of blindness in working-age Americans
  - Refer all patients for annual dilated exam by an ophthalmologist

Hypertensive Retinopathy
Hypertensive Retinopathy

- Hypertensive retinopathy
  - Fundus findings similar to diabetic retinopathy
  - Not a major cause of vision loss by itself
  - When severe, the tx is to reduce the BP
  - Associated disorders may cause vision loss:
    - Retinal artery occlusion
    - Retinal vein occlusion
    - Ischemic optic neuropathy
    - Occipital stroke

Diabetic Retinopathy

- An epidemic of preventable blindness
  - At least 90% preventable with proper screening and treatment
  - Retinopathy may be present at time of DM dx
  - Retinopathy may be present even with 20/20 vision
  - By the time patients are symptomatic, permanent vision loss has occurred

Non-Proliferative Diabetic Retinopathy

- Microaneurysms (the source of edema)
- Dot, blot and flame hemorrhages
- Hard exudates (a sign of edema)
- Cotton-wool spots (a sign of ischemia)
- Treatment: usually none at this stage
  - Optimize glycemic and BP control
Proliferative Diabetic Retinopathy

Hallmark is neovascularization (NV)
- Fragile vessels that can leak, bleed and scar
- May occur on optic disc, retina or iris

Consequences of NV
- Vitreous hemorrhage
- Traction retinal detachment
- Neovascular glaucoma


Diabetic Macular Edema

Most common cause of vision loss in diabetics

Detected by stereoscopic biomicroscopy or optical coherence tomography

Leakage sites identified by fluorescein angiography

Evidence-based criteria for treatment of “clinically significant” DME
Treatment of DME

- Focal laser treatment
  - Mainstay of treatment
  - Validated in Early Treatment of Diabetic Retinopathy Study
- New treatments
  - Intravitreal triamcinolone (q 3 months)
  - Injected VEGF inhibitors (Lucentis, Avastin)
  - Sustained-release steroid implants
  - Oral PKC inhibitors? (ruboxistaurin)

Role of the Family Physician

- Diabetes
  - All diabetics need a dilated eye exam by an ophthalmologist
    - For type II, starting at time of diagnosis
    - For type I, starting within 5 years of diagnosis
- Hypertension
  - Routine monitoring every 1-2 years is sufficient, unless other risk factors are present
- HIV
  - Q 3-12 months, depending on CD4 count

Other Red Spots

- BRVO
- CRVO
- HIV Retinopathy
- CMV Retinitis

Red Spots – Other Causes

- Retinal vein occlusions
  - BRVO – localized area of hemorrhages
  - CRVO – hemorrhages throughout fundus
  - Treatment with laser, analogous to DR
- HIV retinopathy – no treatment necessary
- CMV retinitis – tx w/systemic drugs, implants
- Shaken baby, Valsalva, vitreous detachment, retinal aneurysm, trauma
Red Flags – Refer Immediately

- Sudden loss of vision
  - Retinal vascular occlusion
  - Stroke
  - Optic neuritis
  - Retinal detachment
  - Vitreous hemorrhage
  - Temporal arteritis

- Flashing lights and floating spots
  - Chronic benign floaters do not need referral
  - New floaters or flashes need immediate referral
    - May be first symptom of retinal detachment

Red Flags – Refer Immediately

- Swollen optic discs
  - Papilledema
  - Optic Neuritis
  - Temporal (giant cell) arteritis
  - Buried drusen
  - Ischemic or compressive optic neuropathy

Iritis with Keratic Precipitates
**Pain without Discharge**

- **Iritis**
  - Acute pain and photophobia
  - Physical findings may be subtle, especially without a slit lamp
  - Ciliary flush may be absent

- **Treatment**
  - Refer to ophthalmologist for intensive topical steroids
  - Coordinate systemic workup with ophthalmologist

**Angle-Closure Glaucoma**

- **Elevated IOP is the sine qua non of diagnosis**
- **Gonioscopy helpful to verify angle closure**
- **Treatment:**
  - Drugs (oral and topical) to reduce IOP
  - Laser or surgical iridotomy to relieve pupillary block
  - Prophylactic iridotomy in the other eye

- **Angle-closure glaucoma: a true emergency**
- **Signs and symptoms – any or all:**
  - Pain
  - Vision loss
  - Redness
  - Fixed mid-dilated pupil
  - Steamy cornea
  - Nausea and vomiting
Infectious Corneal Ulcer

- Usually in contact lens wearers
- Acute or subacute onset of pain without discharge
- Exam: white, yellow, or green spot on cornea
- Be sure to look before you put fluorescein in!

Acute Diplopia

- Acute diplopia – refer for urgent consult
  - Acute CN III, IV or VI palsy
    - Ischemic vasa nervorum stroke
    - Mass lesion
    - PCA aneurysm (III nerve palsy)
  - Demyelinating disease
  - Decompensation of longstanding heterophoria (e.g. congenital IV nerve palsy with decompensation)

Pain without Discharge

- Infectious corneal ulcer
  - Usually in contact lens wearers
  - Acute or subacute onset of pain without discharge
  - Exam: white, yellow, or green spot on cornea
  - Be sure to look before you put fluorescein in!

Adverse Drug Reactions

- Hydroxychloroquine (Plaquenil)
  - Dose-related “bulls-eye” maculopathy
  - Retinal exam by ophthalmologist q 6-12 mo
- Ethambutol, isoniazid
  - Optic neuropathy – pale or swollen optic disk
  - Scotoma or blindness
- Tetracycline, Vitamin A, Steroid withdrawal
  - Pseudotumor cerebri (idiopathic intracranial hypertension) – headache, papilledema
Adverse Drug Reactions

- Topiramate (Topamax)
  - Bilateral angle-closure glaucoma
  - ACG sx, blur, increased myopia
- Glitazones (Actos, Avandia)
  - 2.6-fold increase in diabetic macular edema
  - Consider other agents in pts w/mac edema
- Tamsulosin (Flomax)
  - Doubles risk of cataract complications
  - Consider oph consult prior to starting Flomax

Overcoming Ocuphobia

- Triage the red eyes
  - You can manage most of them
  - Refer the unusual or severe problems
- Prevent the red spots
  - Keep diabetics under tight control
  - Refer all diabetics for annual exams
- Recognize the red flags
  - Don’t miss treatable causes of blindness
  - Recognize ocular presentations of systemic disease