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 (olopatidine, OTC ketotifen)
  - Antihistamines
  - Mast cell stabilizers (cromolyn sodium)
  - NSAID’s? (diclofenac, ketorolac)
  - 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
  - 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
    - E.g. polymyxin-trimethoprim, gentamicin, sulfacetamide
  - 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

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 with rheumatoid disease
- Treatment: refer to ophthalmologist for topical steroids

Episceritis

- 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 eyedrops 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

- Treatment:
  - All cases should be referred to ophthalmologist
  - Oral acyclovir (or related compounds)
  - Topical antivirals (trifluorothymidine, ganciclovir) sometimes 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 (aciclovir, etc)
- Ophthalmology consult to rule out ocular involvement

Corneal Foreign Body

- 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

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

- 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. trimethoprim-sulfa 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

- 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
  - 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 DR

- 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

Non-Proliferative Diabetic Retinopathy

Proliferative Diabetic Retinopathy
Proliferative DR
- 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
- Treatment: Panretinal laser, sometimes vitrectomy, bevacizumab?. Guarded prognosis.

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

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Treatment of DME
- Focal laser treatment
  - Best-studied treatment
  - Validated in Early Treatment of Diabetic Retinopathy Study
- Newer treatments
  - Injected VEGF inhibitors (anti-VEGF MAb)
    - READ-2 study: ranizumab better than laser
  - Sustained-release 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

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
Red Flags – Refer Immediately

- 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

Iritis with Keratic Precipitates

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

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

Pain without Discharge

- 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
**Pain without Discharge**

- Infectious corneal ulcer
  - Usually in contact lens wearers
  - Acute or subacute onset of pain w/o 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)

**Adverse Drug Reactions**

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

- 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