

4

THE RED EYE

OBJECTIVES

As a primary care physician, you should be able to determine whether a patient with a red eye requires the prompt attention of an ophthalmologist or whether you can appropriately evaluate and treat the condition.

To achieve this objective, you should learn to

- Obtain an accurate ocular history
- Perform the nine basic diagnostic steps
- Recognize the danger signs of a red eye
- Describe the treatment for those cases you can manage and to recognize the more serious problems that should be referred
- Describe the serious complications of prolonged use of topical anesthetic drops and of corticosteroids

RELEVANCE

A primary care physician frequently encounters patients who complain of a red eye. The condition causing the red eye is often a simple disorder such as a subconjunctival hemorrhage or an infectious conjunctivitis. These conditions either will resolve spontaneously or can be treated easily by the primary care physician. Occasionally, the condition causing a red eye is a more serious disorder, such as intraocular inflammation, corneal inflammation, or acute glaucoma. A patient with one of these vision-threatening conditions requires the immediate attention of an ophthalmologist, whose specialized skills, knowledge, and examining instruments are needed in order to make correct therapeutic decisions.

BASIC INFORMATION

Red eye refers to *hyperemia* or injection of the superficially visible vessels of the conjunctiva, episclera, or sclera. Hyperemia can be caused by disorders

of these structures or of adjoining structures, including the cornea, iris, ciliary body, and ocular adnexa. Specific disorders are discussed in the next section.

DISORDERS ASSOCIATED WITH A RED EYE

Any patient who complains of a red or painful eye should be examined to diagnose the condition as one of the following:

- **Acute angle-closure glaucoma** An uncommon form of glaucoma due to sudden and complete occlusion of the anterior chamber angle by iris tissue (Figure 4.1); serious. The more common chronic open-angle glaucoma causes no redness of the eye. (See Chapter 3 for a discussion of glaucoma.)
- **Iritis or iridocyclitis** An inflammation of the iris alone or of the iris and ciliary body; often manifested by ciliary flush (Figure 4.2); serious.
- **Herpes simplex keratitis** An inflammation of the cornea caused by the herpes simplex virus (Figure 4.3); common, potentially serious; can lead to corneal ulceration.
- **Conjunctivitis** Hyperemia of the conjunctival blood vessels (Figure 4.4); cause may be bacterial, viral, allergic, or irritative; common, often not serious.
- **Episcleritis** An inflammation (often sectorial) of the episclera, the vascular layer between the conjunctiva and the sclera; uncommon, without discharge, not serious, possibly allergic, often tender over the inflamed area.
- **Soft contact lens-associated** Inflammation can be superficial and easily resolved or a vision-threatening infection. Referral to an ophthalmologist is advised to interpret the subtle slit-lamp findings.
- **Scleritis** An inflammation (localized or diffuse) of the sclera (Figure 4.5); uncommon, often protracted, usually accompanied by pain; may indicate

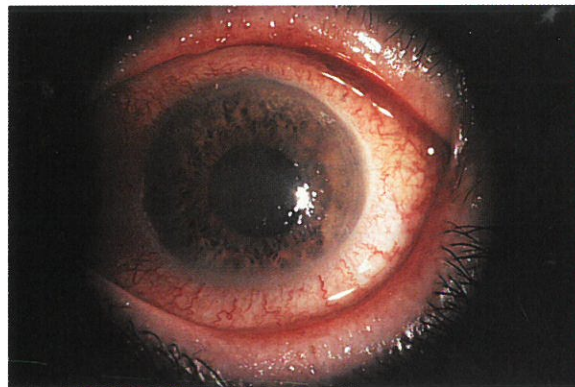


FIGURE 4.1 Acute angle-closure glaucoma. The irregular corneal reflection and hazy cornea suggest edema. The pupil is mid-dilated; the iris appears to be displaced anteriorly, with shallowing of the anterior chamber. These findings plus elevated IOP are diagnostic of acute angle-closure glaucoma.

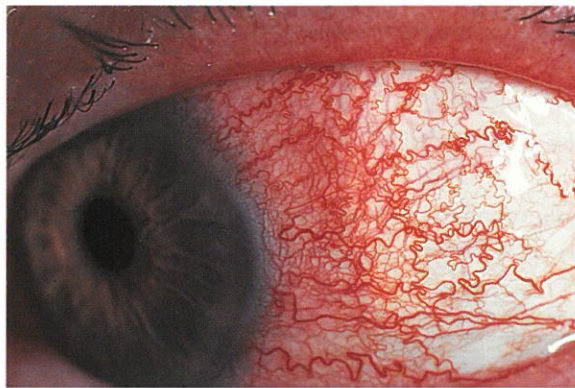


FIGURE 4.2 Ciliary flush. Dilated deep conjunctival and episcleral vessels adjacent and circumferential to the corneal limbus cast a violet hue characteristic of ciliary flush and best seen in natural light.

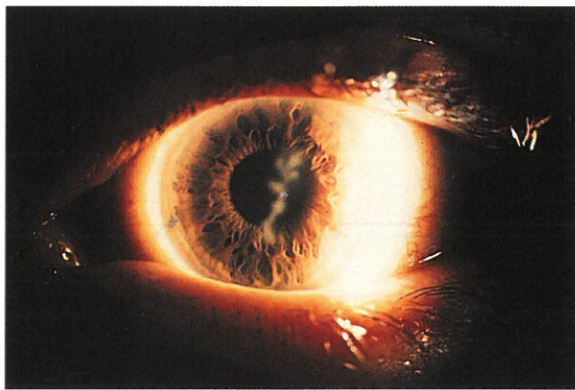


FIGURE 4.3 Herpes simplex keratitis. In the center of the cornea is an irregular, dendritic (branchlike) lesion of the corneal epithelium.

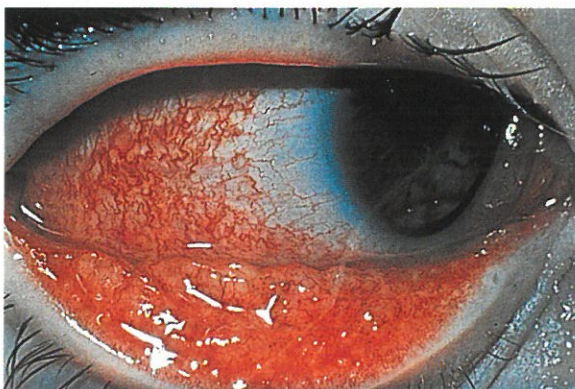


FIGURE 4.4 Conjunctivitis. The hyperemia seen here is produced by a diffuse dilation of the conjunctival blood vessels. The dilation tends to be less intense in the perilimbal region, in contrast to the perilimbal dilation of deeper vessels characteristic of ciliary flush.

serious systemic disease such as collagen-vascular disorder; potentially serious to the eye.

- **Adnexal disease** Affects the eyelids, lacrimal apparatus, and orbit; includes dacryocystitis (Figure 4.6), stye, and blepharitis. Red eye can also occur secondary to lid lesions (such as basal cell carcinoma, squamous cell carcinoma, or molluscum contagiosum), thyroid disease, and vascular lesions in the orbit.

- **Subconjunctival hemorrhage** An accumulation of blood in the potential space between the conjunctiva and the sclera (see Figure 5.10 in Chapter 5); rarely serious.
- **Pterygium** An abnormal growth consisting of a triangular fold of tissue that advances progressively over the cornea, usually from the nasal side (Figure 4.7); usually not serious. Localized conjunctival inflammation may be associated with pterygium. Most cases occur in tropical climates. Sur-

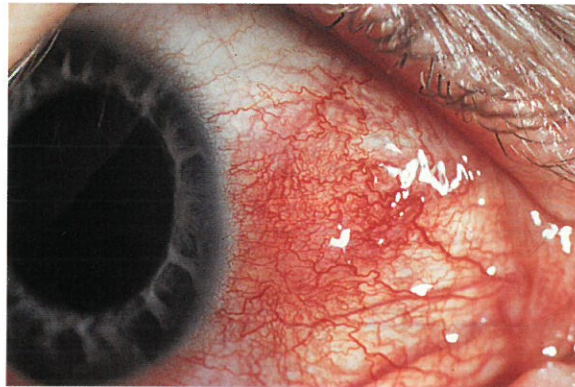


FIGURE 4.5 Scleritis. This localized, raised hyperemic lesion is characteristic of scleritis, which is associated with collagen, vascular, and rheumatoid diseases. Episcleritis appears flat, involves more superficial tissue, and is usually not associated with serious systemic disease. The cause of episcleritis may be allergic.



FIGURE 4.6 Dacryocystitis. This obvious, raised erythematous mass represents an acute inflammation of the lacrimal sac, usually secondary to a nasolacrimal duct obstruction. A purulent discharge may be extruded from the lid puncta by massage over the lacrimal sac.

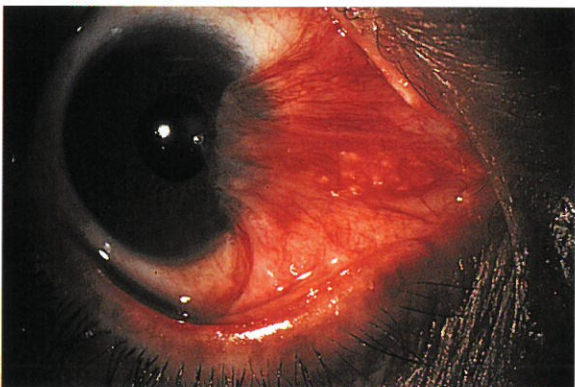


FIGURE 4.7 Pterygium. This wedge-shaped growth of vascularized conjunctiva extends onto the cornea. The initial sign of pterygium may be a localized chronic conjunctivitis.

gical excision is indicated if the pterygium starts to encroach on the visual axis.

- **Keratoconjunctivitis sicca** A disorder involving the conjunctiva and sclera resulting from lacrimal deficiency; commonly called *dry eyes*; usually not serious.
- **Abrasions and foreign bodies** Hyperemia can occur in response to corneal abrasions or foreign-body injury.
- **Corneal ulcerations** Loss of the integrity of the corneal epithelium accompanied with infection or inflammation can result in an ulcer with associated hyperemia. Often the normally clear cornea appears hazy or white in the area of the ulcer. Mucus secretions in the eye (called *mattering*) and pain are common as well as photophobia.
- **Secondary to abnormal lid function** Bell's palsy, thyroid ophthalmopathy, or other conditions can cause ocular exposure and corneal breakdown and may present with a red eye. *Lagophthalmos*, or poor lid closure, is also commonly seen in comatose patients and can result in exposure keratitis, corneal ulceration, and blindness. Eyelids that do not appose the eye well can cause exposure problems and a red eye. An eyelid that turns in toward the eye with the lashes scraping the globe surface can result in pain, photophobia, tearing, and redness of the eye.

HISTORY

When a patient presents with a red eye, taking a thorough history is essential to making the correct diagnosis and initiating appropriate management. Occasionally a red eye may indicate systemic disease; therefore, a complete medical history and review of systems is required. Additional questions to ask include the following:

- Was the onset sudden? progressive?
- What is the timeline of symptoms? hours or days? intermittent?
- Any family members with red eye recently?
- Is the patient using any over-the-counter or prescription eye medications?
- Is there a history of trauma or out-of-the-ordinary activity recently?
- Has the patient had recent eye surgery? Refer the patient to a surgeon immediately.
- Does the patient wear contact lenses? If so, does the patient sleep in the contacts; when were the contacts last changed, and has anything recently changed regarding care of the lens?
- Has the patient had a recent cold or upper respiratory tract infection?
- Has the vision decreased?
- Is there pain? If so, can the patient describe the pain?
- Is there discharge from the involved eye(s)?

- If there is discharge, is it scant or profuse? watery or purulent?
- Is the eye itching?
- Is there light sensitivity?
- Do the symptoms change with environment?
- Has the eye been rubbed or “picked at”?
- Are any other symptoms associated with the red eye?

HOW TO EXAMINE

Nine diagnostic steps are used to evaluate a patient with a red eye:

1. Determine whether the visual acuity is normal or decreased, using a Snellen chart (see Chapter 1).
2. Decide by inspection what pattern of redness is present and whether it is due to subconjunctival hemorrhage, conjunctival hyperemia, ciliary flush, or a combination of these.
3. Detect the presence of conjunctival discharge and categorize it as to amount—profuse or scant—and character—purulent (Figure 4.8), mucopurulent, or serous.
4. Detect opacities of the cornea, including large keratic precipitates (Figure 4.9) or irregularities of the corneal surface such as corneal edema (Figure 4.10), corneal leukoma (a white opacity caused by scar tissue, Figure 4.11), and irregular corneal reflection (Figure 4.12). Examination is done using a penlight or transilluminator.
5. Search for disruption of the corneal epithelium by staining the cornea with fluorescein (see Chapter 1).
6. Estimate the depth of the anterior chamber as normal or shallow (see Chapter 1); detect any layered blood or pus, which would indicate either hyphema or hypopyon, respectively. (Compare Figure 4.13, a corneal ulcer with hypopyon, with hyphema, Figure 5.3.)



FIGURE 4.8 Purulent conjunctivitis. With the lower lid everted, a creamy-white exudate is visible, highlighted by the conjunctival hyperemia.

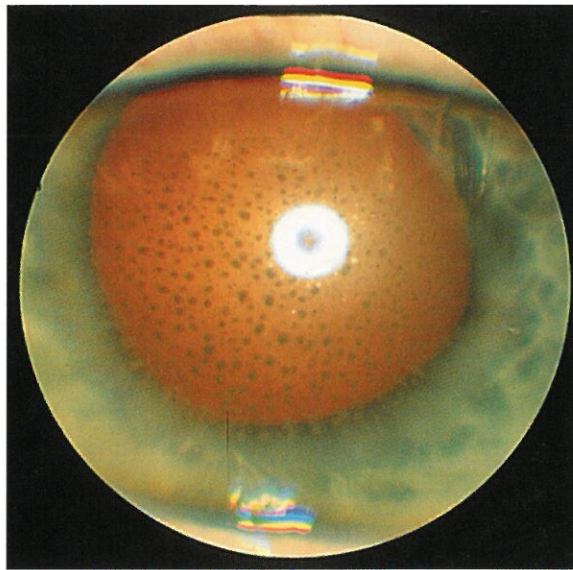


FIGURE 4.9 Large keratic precipitates. Multiple gray-white opacities on the back surface of the cornea are seen against the background of the red reflex. These precipitates can result from chronic iridocyclitis.

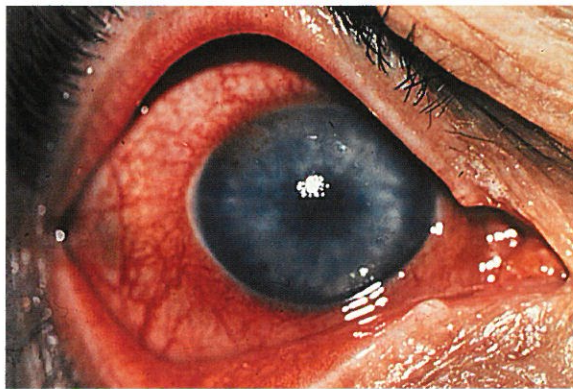


FIGURE 4.10 Corneal edema. In this fiery red eye, the normally sharp corneal reflex is replaced by a diffuse, hazy appearance. Iris details are not as clear as in a healthy eye.

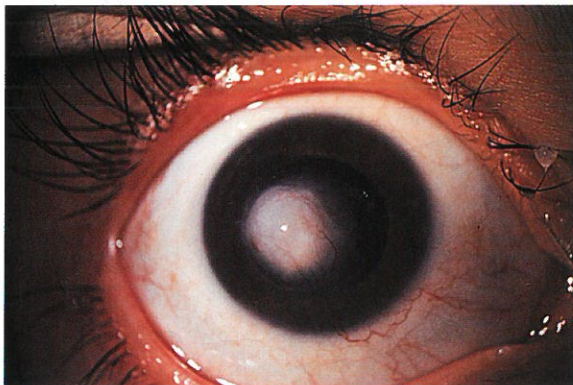


FIGURE 4.11 Corneal leukoma. This dense, white corneal scar represents fibrosis secondary to a previous corneal insult, most frequently trauma or infection. Outside the scar, the cornea is clear. If the scar encroaches on the visual axis, acuity may be impaired.

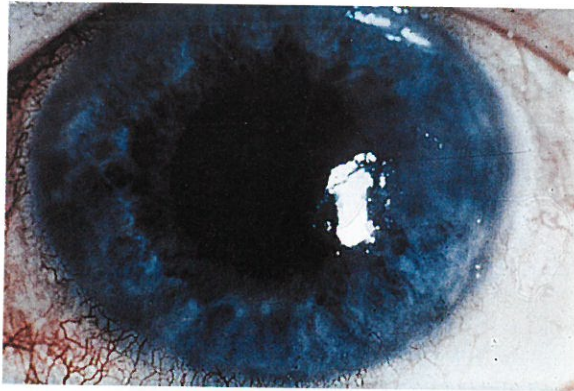


FIGURE 4.12 Irregular corneal reflection. This localized irregularity of the normally sharp corneal light reflection indicates local disruption of the corneal epithelium.



FIGURE 4.13 Corneal ulcer with hypopyon. This inflamed eye shows a white corneal opacity associated with an irregular corneal reflex. In addition, a prominent layering of purulent material appears in the inferior aspect of the anterior chamber, a hypopyon.

7. Detect irregularity of the pupils and determine whether one pupil is larger than the other. Observe the reactivity of the pupils to light to determine whether one pupil is more sluggish than the other or is nonreactive (see Chapters 1 and 7).
8. If elevated intraocular pressure is suspected, as in angle-closure glaucoma, and reliable tonometry is available, then measurement of intraocular pressure can help confirm the diagnosis. (Tonometry is omitted when there is an obvious external infection.)
9. Detect the presence of proptosis (Figure 4.14), lid malfunction, or any limitations of eye movement.

HOW TO INTERPRET THE FINDINGS

Although many conditions can cause a red eye, and the associated signs and symptoms of the various disorders overlap to some extent, several signs and symptoms signal danger. The presence of one or more of these danger signals should alert the physician that the patient has a disorder requiring an ophthalmologist's attention. Tables 4.1 and 4.2 summarize significant symptoms and signs in the differential diagnosis of a red eye.

TABLE 4.1 Symptoms of Red Eye

Symptom	Referral Advisable if Present	Acute Glaucoma	Acute Iridocyclitis	Keratitis	Bacterial Conjunctivitis	Viral Conjunctivitis	Allergic Conjunctivitis
Blurred vision	Yes	3	1 to 2	3	0	0	0
Pain	Yes	2 to 3	2	2	0	0	0
Photophobia	Yes	1	3	3	0	0	0
Colored halos	Yes	2	0	0	0	0	0
Exudation	No	0	0	0 to 3	3	2	1
Itching	No	0	0	0	0	0	2 to 3

Note: The range of severity of the symptom is indicated by 0 (absent) to 3 (severe).

In the sections that follow, an exclamation point after a sign or symptom indicates a danger signal.

SYMPTOMS OF RED EYE

Blurred Vision !

Blurred vision often indicates serious ocular disease (see “Reduced Visual Acuity” in the following section, “Signs of Red Eye”). Blurred vision that improves with blinking suggests a discharge or mucus on the ocular surface.

Severe Pain !

Pain may indicate keratitis, ulcer, iridocyclitis, or acute glaucoma. Patients with conjunctivitis may complain of a scratchiness or mild irritation but not of severe pain.

Photophobia !

Photophobia is an abnormal sensitivity to light that accompanies iritis, either alone or secondary to corneal inflammation. Patients with conjunctivitis have normal light sensitivity.



FIGURE 4.14 Chronic proptosis. The patient's right eye of this patient is proptotic, or anteriorly displaced. Marked edema (chemosis) with hyperemia of the conjunctiva is also evident, with tissue prolapse over the lower lid margin. The patient has an orbital tumor.

TABLE 4.2 Signs of Red Eye

Sign	Referral	Acute Glaucoma	Acute		Bacterial Conjunc- tivitis	Viral Conjunc- tivitis	Allergic Conjunc- tivitis
	Advisable if Present		Irido- cyclitis	Kera- titis			
Ciliary flush	Yes	+	+	+	-	-	-
Conjunctival hyperemia	No	+	+	+	+	+	+
Corneal opacification	Yes	+	-	+	-	+/-	-
Corneal epithelial disruption	Yes	-	-	+	-	+/-	-
Pupillary abnormalities	Yes	+	+	+/-	-	-	-
Shallow anterior chamber depth	Yes	+	-	-	-	-	-
Elevated intraocular pressure	Yes	+	+/-	-	-	-	-
Proptosis	Yes	-	-	-	-	-	-
Discharge	No	-	-	+/-	+	+	+
Preauricular lymph-node enlargement	No	-	-	-	-	+	-

Note: + = Usually has sign
 - = Does not usually have sign
 +/- = May or may not have sign

Colored Halos

Rainbow-like fringes or colored halos seen around a point of light are usually a symptom of corneal edema, often resulting from an abrupt rise in intraocular pressure. Therefore, colored halos are a danger symptom suggesting acute glaucoma as the cause of a red eye.

Exudation

Exudation, also called *mattering*, is a typical result of conjunctival or eyelid inflammation and does not occur in iridocyclitis or glaucoma. Patients will often complain that their lids are “stuck together” on awakening from sleep. Corneal ulcer is a serious condition that may or may not be accompanied by exudate.

Itching

Although it is a nonspecific symptom, itching usually indicates an allergic conjunctivitis.

SIGNS OF RED EYE

Reduced Visual Acuity 📍

Reduced visual acuity suggests a serious ocular disease, such as an inflamed cornea, iridocyclitis, or glaucoma. It never occurs in simple conjunctivitis unless there is associated corneal involvement.

Ciliary Flush 📍

Ciliary flush (Figure 4.2) is an injection of the deep conjunctival and episcleral vessels surrounding the cornea. It is seen most easily in daylight and appears as a faint violaceous ring in which individual vessels are indiscernible to the unaided eye. Ciliary flush is a danger sign often seen in eyes with corneal inflammations, iridocyclitis, or acute glaucoma. Usually, ciliary flush is not present in conjunctivitis.

Conjunctival Hyperemia

Conjunctival hyperemia (Figure 4.4) is an engorgement of the larger and more superficial bulbar conjunctival vessels. A nonspecific sign, it may be seen in almost any of the conditions causing a red eye.

Corneal Opacification 📍

In a patient with a red eye, corneal opacities always denote disease. These opacities may be detected by direct illumination with a penlight, or they may be seen with a direct ophthalmoscope (with a plus lens in the viewing aperture) outlined against the red fundus reflex. Several types of corneal opacities may occur:

- Keratic precipitates, or cellular deposits on the corneal endothelium, usually too small to be visible but occasionally forming large clumps; these precipitates can result from iritis or from chronic iridocyclitis (Figure 4.9)
- A diffuse haze obscuring the pupil and iris markings, characteristic of corneal edema (Figure 4.10) and frequently seen in acute glaucoma
- Localized opacities due to keratitis or ulcer (Figure 4.13)

Corneal Epithelial Disruption 📍

Disruption of the corneal epithelium occurs in corneal inflammations and trauma. It can be detected in two ways:

1. Position yourself so that you can observe the reflection from the cornea of a single light source (eg, window, penlight) as the patient moves the eye into various positions. Epithelial disruptions cause distortion and irregularity of the reflection (Figure 4.12).
2. Apply fluorescein to the eye. Diseased epithelium or areas denuded of epithelium will stain a bright green. (See Figures 1.12 and 1.13 and accompanying text in Chapter 1 for the technique of fluorescein staining.)

Pupillary Abnormalities 📌

The pupil in an eye with iridocyclitis typically is somewhat smaller than that of the other eye, due to reflex spasm of the iris sphincter muscle. The pupil is also distorted occasionally by posterior synechiae, which are inflammatory adhesions between the lens and the iris. In acute glaucoma, the pupil is usually fixed, middilated (about 5 to 6 mm), and slightly irregular. Conjunctivitis does not affect the pupil.

Shallow Anterior Chamber Depth 📌

In a red eye, a shallow anterior chamber should always suggest the possibility of acute angle-closure glaucoma (Figure 4.1). Anterior chamber depth can be estimated through side illumination with a penlight. If possible, compare the anterior chamber depth of the red eye with that of the other, unaffected eye. (See Chapter 1 for details on estimating the depth of the anterior chamber.)

Elevated Intraocular Pressure 📌

Intraocular pressure is unaffected by common causes of red eye other than iridocyclitis and glaucoma. Intraocular pressure should be measured when angle-closure glaucoma is suspected. (See Chapter 1 for the use of tonometry to measure intraocular pressure.)

Proptosis 📌

Proptosis is a forward displacement of the globe. Sudden proptosis suggests serious orbital or cavernous sinus disease; in children, orbital infection or tumor should be suspected. The most common cause of chronic proptosis is thyroid disease; however, orbital mass lesions also result in proptosis and should be ruled out early in the diagnosis (Figure 4.14). Proptosis may be accompanied by conjunctival hyperemia or limitation of eye movement. Small amounts of proptosis are detected most easily by tilting the chin up and looking from the chin over the maxilla at the relative corneal position.

Discharge

The type of discharge may be an important clue to the cause of a patient's conjunctivitis. Purulent (creamy-white, see Figure 4.8) or mucopurulent (yellowish) exudate suggests a bacterial cause. Serous (watery, clear, or yellow-tinged) discharge suggests a viral cause. Scant, white, stringy discharge sometimes occurs in allergic conjunctivitis and in keratoconjunctivitis sicca, a condition commonly known as *dry eyes*.

Preauricular Lymph-Node Enlargement

Enlargement of the lymph node just in front of the auricle is a frequent sign of viral conjunctivitis. Usually, such enlargement does not occur in acute bac-

terial conjunctivitis. Preauricular node enlargement can be a prominent feature of some unusual varieties of chronic granulomatous conjunctivitis, known collectively as *Parinaud's oculoglandular syndrome*. Cat scratch fever can present with these findings.

ASSOCIATED SYSTEMIC PROBLEMS

Upper Respiratory Tract Infection and Fever

Infection of the upper respiratory tract accompanied by fever may be associated with conjunctivitis, particularly when these symptoms are due to adenovirus type 3 or type 7 (both of which cause pharyngoconjunctival fever). Allergic conjunctivitis may be associated with the seasonal rhinitis of hay fever.

Erythema Multiforme

Erythema multiforme is a serious systemic disorder, possibly an allergic response to medication, which can result in severe conjunctivitis, irreversible conjunctival scarring, and blindness. In erythema multiforme, bull's-eye or target-shaped red lesions are found on the skin. The name *Stevens-Johnson syndrome* is given to the form of erythema multiforme associated with ocular involvement.

LABORATORY DIAGNOSIS

In practice, most mild cases of conjunctivitis are managed without laboratory assistance. This represents a compromise with ideal management but is justified by the economic waste of obtaining routine smears and cultures in such a common and benign disease. Most clinicians, after making a presumptive clinical diagnosis of bacterial conjunctivitis, proceed directly to broad-spectrum topical ophthalmic antibiotic treatment. Cases of presumed bacterial conjunctivitis that do not improve after 2 days of antibiotic treatment should be referred to an ophthalmologist for confirmation of the diagnosis and appropriate laboratory studies. In addition, in cases of hyperpurulent conjunctivitis, when copious purulent discharge is produced, conjunctival cultures and ophthalmologic consultation are indicated because of a possible gonococcal cause. Gonococcal hyperpurulent conjunctivitis is a serious, potentially blinding disease.

In doubtful cases, smears of exudate or conjunctival scrapings can confirm clinical impressions regarding the type of conjunctivitis. Typical findings include polymorphonuclear cells and bacteria in bacterial conjunctivitis, lymphocytes in viral conjunctivitis, and eosinophils in allergic conjunctivitis. Cultures for bacteria and determinations of antibiotic sensitivity are useful in cases resistant to therapy.

TABLE 4.3 Summary of Patient Instructions for Conditions Related to Red Eye

Condition	Patient Instruction
Blepharitis	Apply warm compresses and eyelid margin scrubs each morning and before bedtime. Apply ointments or take oral medications as prescribed.
Stye and chalazion	Apply warm compresses to the affected eyelid 2 to 4 times daily. Return for further evaluation if the mass fails to disappear after several weeks. Call sooner if the lid mass enlarges, becomes more tender, or begins draining purulent material.
Subconjunctival hemorrhage	Know that without treatment the hemorrhage will resolve in 1 to 2 weeks without any damage to the eye.
Viral conjunctivitis	Apply cool compresses periodically. Use artificial tears if needed. Wash hands frequently and avoid touching eyes and sharing towels. Avoid communal activities as long as discharge is present. Return for referral if symptoms appear to worsen.
Bacterial conjunctivitis	Apply cool compresses periodically and keep lids and lashes free of discharge. Use artificial tears as needed for surface irritation. Apply antibiotic eye drops as prescribed.

MANAGEMENT OR REFERRAL

The following conditions either require no treatment or may be appropriately treated by a primary care physician. Patients with chronic, unilateral blepharitis should be referred to an ophthalmologist to rule out a malignant process such as sebaceous cell carcinoma or squamous cell carcinoma.

Cases requiring prolonged treatment or those in which the expected response to treatment does not occur promptly should also be referred to an ophthalmologist. See Table 4.3 for a summary of instructions for patients to follow.

BLEPHARITIS

Response to the treatment of blepharitis, or inflammation of the eyelid, is often frustratingly slow, and relapses are common. The inflammation of the eyelid can primarily be in the anterior aspect of the lid such as in staphylococcal blepharitis or posterior aspect of the lid as in rosacea blepharitis. The mainstays of treatment are the following:

- **Lid hygiene** Warm compresses (tap water on clean washcloth) can be applied for 3 to 5 minutes, followed by eyelid margin scrubs each morning and before bedtime. If lids are oily, follow with lid scrubs using dilute baby shampoo (two drops shampoo in 2 oz water).
- **Staphylococcal infection** (Figure 4.15) May be present and should be treated with application of appropriate antibiotic ointment (bacitracin or erythromycin) to the lid margin at night for 1 week.

- **Associated acne rosacea/meibomian gland dysfunction** Should be treated with Doxycycline 100 mg twice a day and tapered to once a day for 2 months or longer. Artificial tears four to eight times a day may be applied as needed for symptoms of dryness.
- **Scalp seborrhea** Treatment with antidandruff shampoos can improve symptoms of seborrheic blepharitis (Figure 4.16).

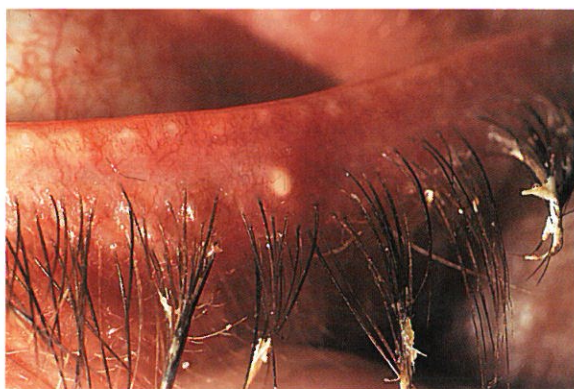


FIGURE 4.15 Staphylococcal blepharitis. Chronic staphylococcal lid infection produces inflamed, swollen lids that may ulcerate. The oily discharge binds the lashes and sometimes condenses to form a collarette around a lash.

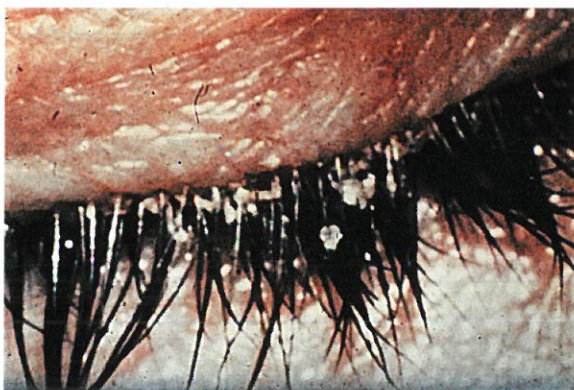


FIGURE 4.16 Seborrheic blepharitis. The dry, flaky lashes and red lid margins seen here are characteristic of seborrheic blepharitis.

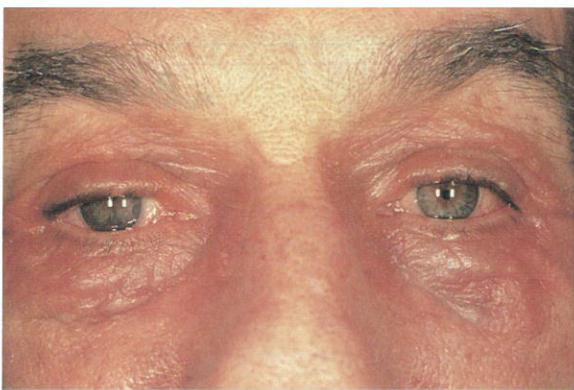


FIGURE 4.17 Contact dermatitis. Allergic contact dermatitis secondary to topical ophthalmic medication. (*Reprinted External Disease and Cornea. BCSC Section 8. San Francisco: American Academy of Ophthalmology; 2003:194.*)

Contact dermatitis (Figure 4.17) can masquerade as blepharitis. A careful history of the lid redness associated with application of medication helps make the diagnosis. For example, the glaucoma medication brimonidine can produce a red eye with erythematous, swollen lids that have a dry “leathery” texture. Any ocular medication or cosmetics can be associated with similar clinical findings. Discontinuing the offending product should result in improvement in symptoms within 48 hours, but healing may take up to 2 weeks.

STYE AND CHALAZION

A stye, or *hordeolum*, is an acute, usually sterile, inflammation of the glands or hair follicles in the eyelid. Hordeola can be categorized as external or internal, according to where the inflammation is located in the lid (Figures 4.18 and 4.19). A chalazion is a chronic inflammation of a meibomian gland in the eyelid that may develop spontaneously or may follow a hordeolum (Figure 4.20). A persistent or recurring lid mass should undergo biopsy because it may be a rare meibomian gland carcinoma or squamous cell carcinoma of the lid rather than a benign chalazion.



FIGURE 4.18 External hordeolum. This large, acute swelling, which is red and painful, involves the hair follicles or associated glands of Zeis or Moll and points toward the skin.



FIGURE 4.19 Internal hordeolum. An acute infection of a meibomian gland produces a swelling directed internally toward the conjunctiva. This figure demonstrates a discrete, circumscribed area of inflammation highlighted by a hyperemic conjunctiva.

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FIGURE 4.20 Chalazion. This large, nontender lid mass is a chronic granulomatous inflammation of a meibomian gland.

The mainstays of treatment are the following:

- Apply warm compresses to the eyelid four times a day for 3 to 5 minutes.
- Massage the lid and lash line to encourage the glands to open up and drain.
- Apply topical ocular antibiotic ointment to the lash line and over the area if there is tenderness and infection is suspected. Rarely oral antibiotics may be indicated if there is a secondary bacterial infection.
- Refer the patient for incision and curettage of the lesion if there is no resolution in 3 to 4 weeks.

SUBCONJUNCTIVAL HEMORRHAGE

In the absence of blunt trauma, hemorrhage into the subconjunctiva, the potential space between the conjunctiva and the sclera, requires no treatment and, unless recurrent, no evaluation. (See Figure 5.10 in Chapter 5.) Causes include a sudden increase in ocular venous pressure, such as occurs with coughing, sneezing, vomiting, or vigorous rubbing of the eye. Many subconjunctival hemorrhages occur during sleep. If recurrent, an underlying bleeding disorder should be considered. Blood pressure should be measured, as marked elevation can result in subconjunctival hemorrhage.

CONJUNCTIVITIS

There is no specific medicinal treatment for viral conjunctivitis, although patients should be instructed in proper precautions to prevent contagion. Here are some treatments often recommended:

- Apply cool compresses periodically throughout the day.
- Use artificial tear drops if irritation occurs.
- Apply antibiotic eye drops four to six times a day if bacterial infection is suspected (sulfacetamide, gentamicin, or any broad spectrum topical antibiotic).
- Minimize spread to other family members and co-workers (washing hands after touching eye secretions, no sharing of towels).

It cannot be emphasized too strongly that corticosteroids have limited use in treatment of infectious conjunctivitis. Eyedrops containing a combination of antibiotics and corticosteroids should be used under the close observation of an ophthalmologist.

THERAPEUTIC WARNINGS

TOPICAL ANESTHETICS

Topical anesthetics should never be prescribed for prolonged analgesia in ocular inflammations and injuries for three reasons:

- Topical anesthetics inhibit growth and healing of the corneal epithelium.
- Although rare, severe allergic reaction may result from instillation of topical anesthetics.
- Corneal anesthesia eliminates the protective blink reflex, exposing the cornea to dehydration, injury, and infection.

TOPICAL CORTICOSTEROIDS

Topical corticosteroids have three potentially serious ocular side effects:

- **Keratitis** Both herpes simplex keratitis (Figure 4.3) and fungal keratitis are markedly potentiated by corticosteroids. Corticosteroids may mask symptoms of inflammation, making the patient “feel” better, while the cornea may be melting away or even perforating.
- **Cataract** Prolonged use of corticosteroids, either locally or systemically, often leads to cataract formation.
- **Elevated intraocular pressure** Local application of corticosteroids for 2 to 6 weeks may cause an elevation of intraocular pressure in approximately one third of the population. The pressure rise may be severe in a small percentage of cases. Optic nerve damage and permanent loss of vision can occur.

The combination of a corticosteroid and an antibiotic carries the same risk. Topical corticosteroids alone or in combination with antibiotics should not be administered to the eye by a primary care physician. They can be very helpful when used under the close supervision of an ophthalmologist.

POINTS TO REMEMBER

- If visual acuity is acutely and significantly reduced, a diagnosis of conjunctivitis is extremely unlikely.
- Fluorescein should always be instilled in a red eye to test for integrity of the corneal epithelium.

- A pupillary inequality in a patient with red eye(s) is a danger signal for serious ocular disease.
- If the patient wears soft contact lenses, referral to an ophthalmologist is advised since differentiation of mild and severe complications of contact lens wear requires experienced interpretation of slit-lamp findings.
- In obtaining a history for the red eye, the examiner should document all medications applied in and around the eye and then consider them as the potential source of the red eye.

SAMPLE PROBLEMS

1. A 23-year-old teacher complains that her right eye is red and irritated. You note moderate injection of the larger conjunctival vessels, watery discharge, and a palpable preauricular lymph node.

A. From this information alone, what tentative diagnosis would you make?

Answer: The conjunctival injection and discharge suggest conjunctivitis. The serous nature of the discharge, plus the preauricular adenopathy, indicate that she has viral conjunctivitis.

B. Again based on the above information, which of the following symptoms or facts might be elicited by careful history-taking?

- a. Blurred vision
- b. Sore throat
- c. Exposure to children with colds
- d. Itching

Answer: **b** and **c**. Sore throat often accompanies viral conjunctivitis; in such cases, a history of exposure to other individuals with upper respiratory tract infections can often be elicited. Blurred vision, a danger signal of serious ocular disease, is not a feature of simple conjunctivitis. Itching is a symptom of allergic, not viral, conjunctivitis.

C. Management consists of which of the following?

- a. Corticosteroid eyedrops
- b. Broad-spectrum antibiotic eyedrops
- c. Referral to an ophthalmologist
- d. Instruction to the patient to use cool compresses and stay home from school until the redness resolves

Answer: **d**. Because the disease is contagious, the patient should be instructed to remain home from work. There is no specific medicinal treatment for viral conjunctivitis. Corticosteroids may be used only under the close supervision of an ophthalmologist.