ABC of Eyes

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THE RED EYE

Symptoms and signs

EQUIPMENT

- Snellen eye chart
- Bright torch with blue filter
- Magnifying aid—for example, loupe
- Paper clip to help lid eversion
- Fluorescein eye drops

The “red eye” is one of the commonest ophthalmic problems presenting to the general practitioner. An accurate history is important and should pay particular attention to vision, the degree and type of discomfort, and the presence of a discharge. The history, together with a good examination, will permit the diagnosis to be made in most cases without recourse to specialist ophthalmic equipment.

The patient's symptoms give many clues to the cause of the red eye. The most important are pain and visual loss, which suggest serious conditions such as corneal ulceration, iritis, and acute glaucoma. A purulent discharge suggests a bacterial conjunctivitis, whereas a clear discharge suggests a viral or allergic cause. A gritty sensation is common in conjunctivitis, but the presence of a foreign body must be excluded, particularly if only one eye is affected.

Bacterial conjunctivitis without discharge.

Anterior uveitis with ciliary flush around cornea and irregular stuck down pupil.

Scleritis.

Important physical signs to look for in a patient with a red eye.

Acute angle closure glaucoma with red eye, semi-dilated pupil, and hazy cornea.

Corneal abscess (*pseudomonas*) in contact lens wearer.

Foreign body.

Conjunctivitis

Conjunctivitis is one of the commonest causes of an uncomfortable red eye. Conjunctivitis itself has many causes, including bacteria, viruses, chlamydia, and allergies.

Bacterial conjunctivitis

History—The patient usually has discomfort and a purulent discharge in one eye that characteristically spreads to the other eye. The eye may be difficult to open in the morning because the discharge gums the lashes together. There may be a history of contact with a person with similar symptoms.

Examination—The vision should be normal after the discharge has been blinked clear of the cornea. The discharge is usually mucopurulent and there is uniform engorgement of all the conjunctival blood vessels. There is no staining of the cornea with fluorescein.

Management—Chloramphenicol eye drops should be instilled hourly for 24 hours, decreasing to four times a day, and chloramphenicol ointment applied each night for a week to hasten recovery. Patients should be advised about general hygienic measures—for example, not sharing face towels.

Purulent bacterial conjunctivitis.

Viral conjunctivitis.

Viral conjunctivitis

Viral conjunctivitis is commonly associated with upper respiratory tract infections and is usually caused by an adenovirus. It is the type of conjunctivitis that occurs in epidemics (pink eye).

History—The patient normally complains of both eyes being gritty and uncomfortable. There may be associated symptoms of a cold and cough. The discharge is usually watery. This type of conjunctivitis usually lasts longer than bacterial conjunctivitis and may go on for many weeks. Photophobia and discomfort may be severe if the patient goes on to develop discrete corneal lesions.

Examination—Both eyes are red with diffuse conjunctival injection and there may be a clear discharge. Small white lymphoid aggregations may be present on the conjunctiva (follicles). Small corneal opacities may give rise to pronounced symptoms, but these are difficult to see without high magnification.

Treatment—Viral conjunctivitis is generally a self limiting condition, but chloramphenicol eye drops and ointment provide symptomatic relief and help prevent secondary bacterial infection. Viral conjunctivitis is extremely contagious and strict hygienic measures are important for both the patient and the doctor—for example, washing of hands, sterilising of instruments, and so on. In view of the chronic course of some cases the patient may return for further treatment, but steroids must not be given without ophthalmological supervision.

Chlamydial conjunctivitis

History—Patients are usually young with a history of chronic bilateral conjunctivitis with a mucopurulent discharge. There may be associated symptoms of venereal disease.

Examination—There is bilateral diffuse conjunctival injection with a

Chlamydial conjunctivitis.

Viral conjunctivitis.

Infantile conjunctivitis.

Large papillae in allergic conjunctivitis.

● Prolonged use of topical steroids can cause glaucoma and cataracts

mucopurulent discharge and many lymphoid aggregates in the conjunctiva (follicles). The cornea is usually inflamed (keratitis) and an infiltrate of the upper cornea (pannus) may be seen.

Management—The diagnosis is often difficult, and special bacteriological tests may be necessary to confirm the clinical suspicions. Treatment comprises tetracycline ointment and oral tetracycline 250 mg four times a day for at least a month. Associated venereal disease should also be treated. World wide, trachoma is one of the major causes of blindness. In developing countries infection by *Chlamydia trachomatis* results in severe scarring of the conjunctiva and the underlying tarsal plate. The eyelids turn in and permanently scar the already damaged cornea.

Conjunctivitis in infants

Conjunctivitis in young children is extremely important because the eye defences are immature and a severe conjunctivitis with membrane formation and bleeding may occur. Serious corneal disease and blindness may result. Conjunctivitis in an infant less than 1 month old (ophthalmia neonatorum) is a notifiable disease. Such babies must be seen in an eye hospital so that special cultures can be taken and appropriate treatment given. Venereal disease in the parents must be excluded.

Allergic conjunctivitis

History—The main feature is itching. Both eyes are usually affected and there may be a clear discharge. There may be a family history of atopy or recent contact with chemicals or eye drops. Similar symptoms may have occurred at the same time in previous years.

Examination—The conjunctivae are diffusely injected and may be oedematous (chemosis). The discharge is clear and stringy. Because of the fibrous septa that tether the eyelid (tarsal) conjunctivae, oedema results in round swellings (papillae). When these are large they are referred to as cobblestones.

Treatment—Topical antihistamine and vasoconstrictor eye drops provide short term relief. Sodium cromoglycate eye drops prevent degranulation of mast cells but they need to be used for several weeks to achieve maximal effect. Oral antihistamines may also be used, particularly the newer compounds that cause less sedation. Topical steroids are effective, but should not be used for long without ophthalmological supervision because of the risk of steroid induced cataracts and glaucoma.

Episcleritis and scleritis

Episcleritis.

Conjunctiva, sclera, and episclera.

Episcleritis and scleritis differ from conjunctivitis in that they usually present as a *localised* area of inflammation. The episclera lies just beneath the conjunctiva and adjacent to the tough white scleral coat of the eye. Both the sclera and episclera may become inflamed, particularly in rheumatoid arthritis and other autoimmune conditions, but no cause is found for most cases of episcleritis. Episcleritis is essentially self limiting; scleritis is much more serious as the eye may perforate.

History—The patient complains of a red and sore eye that may also be tender. There may be reflex lacrimation but usually no discharge. Scleritis is much more painful than episcleritis.

Examination—There is a localised area of inflammation that is tender to the touch. The episcleral and scleral vessels are larger than the conjunctival vessels. Scleritis is characteristically much more painful than episcleritis, and the signs of inflammation are usually more florid.

Scleritis.

Management—Any underlying cause should be identified. Although episcleritis is essentially self limiting, steroid eye drops hasten recovery and provide symptomatic relief. Scleritis is much more serious, and all patients need ophthalmological review.

Corneal ulceration

Dendritic ulcer stained with fluorescein and illuminated with white light.

Dendritic ulcer stained with fluorescein and illuminated with blue light.

Corneal abscess with pus in anterior chamber (hypopyon).

Marginal corneal ulcer stained with fluorescein and illuminated with blue light.

Corneal ulcers may be caused by bacterial, viral, and fungal infections; these may occur as primary events or be secondary to an event that has compromised the eye—for example, abrasion, contact lens wear, or use of topical steroids.

History—Pain is a prominent feature as the cornea is an exquisitely sensitive organ, though this is not so when corneal sensation is impaired—for example, after herpes zoster ophthalmicus. Indeed, this lack of sensation may be the cause of the ulceration. There may be clues such as similar past attacks, facial cold sores, a recent abrasion, or the wearing of contact lenses.

Examination—Visual acuity depends on the location and size of the ulcer, and normal visual acuity does not exclude an ulcer. There may be a watery discharge due to reflex lacrimation, or a mucopurulent discharge in bacterial ulcers. Conjunctival injection may be generalised or localised if the ulcer is peripheral, giving a clue to its presence. Fluorescein must be used or an ulcer may easily be missed. Certain types of corneal ulceration are characteristic. If there is inflammation in the anterior chamber there may be a collection of pus present (hypopyon). The upper eyelid must be everted or a subtarsal foreign body causing corneal ulceration may be missed. Patients with subtarsal foreign bodies sometimes do not recollect anything entering the eye.

Management—Patients with corneal ulceration should be referred urgently to an eye hospital or the sight may be lost. Management depends on the cause of the ulceration. The diagnosis may usually be made on the clinical appearance. The appropriate swabs and cultures should be arranged to try to identify the causative organism. Intensive treatment is then started with drops and ointment of broad spectrum antibiotics until the organisms and their sensitivities are known. Injection of antibiotics into the subconjunctival space may be given to increase local concentrations of the drugs. Cycloplegic drops are used to relieve pain due to spasm of the ciliary muscle, and as they are also mydriatics they prevent adhesions of the iris to the lens (posterior synechiae). Systemic steroids may be used to reduce local inflammatory damage not caused by direct infection, but the indications for their use are specific and they should not be used without ophthalmological supervision.

Iritis, iridocyclitis, and anterior uveitis

The iris, ciliary body, and choroid are embryologically similar and are known as the uveal tract. Inflammation of the iris (iritis) does not occur without inflammation of the ciliary body (cyclitis) and together these are referred to as iridocyclitis, or anterior uveitis. Thus the terms are synonymous.

Several groups of patients are at risk, including those who have had past attacks of iritis, and those with a seronegative arthropathy, particularly if they are positive for the HLA-B27 histocompatibility antigen—for example, a young man with ankylosing spondylitis. Children with

Anterior uveitis/iritis with ciliary flush but pupil not stuck down.

Anterior uveitis with ciliary flush and irregular pupil.

seronegative arthritis are also at high risk, particularly if they have only a few joints affected by the arthritis. Their uveitis may be relatively asymptomatic and they may suffer serious ocular damage if they are not screened. Sarcoidosis also causes chronic anterior uveitis, as do several other infections including herpes zoster ophthalmicus, syphilis, and tuberculosis.

History—The patient who has had past attacks can often feel an attack coming on before physical signs are present. There is often pain in the later stages, with photophobia due to inflammation and ciliary spasm.

Examination—The vision may initially be normal but later it may be impaired. Accommodation may be affected, there may be inflammatory cells in the anterior chamber, cataracts may form, and adhesions may develop between the iris and the lens. The affected eye is red with the infection being particularly pronounced over the area covering the inflamed ciliary body (ciliary flush). The pupil is small because of spasm of the sphincter or irregular because of adhesions of the iris to the lens (posterior synechiae). Inflammatory cells may be deposited on the back of the cornea (keratic precipitates) or may settle to form a collection of cells in the anterior chamber of the eye (hypopyon).

Management—If there is an underlying cause it must be treated, but in many cases no cause is found. It is important to ensure that there is no disease in the rest of the eye that is giving rise to signs of an anterior uveitis such as more posterior inflammation, a retinal detachment, or an intraocular tumour. Treatment is with topical steroids to reduce the inflammation and prevent adhesions within the eye. The ciliary body is paralysed to relieve pain, and the associated dilatation of the pupil also prevents the development of adhesions between the iris and lens that can cause "pupil block" glaucoma. The intraocular pressure may also rise because inflammatory cells block the trabecular meshwork, and antiglaucoma treatment may have to be given if this occurs. Continued inflammation may lead to permanent damage of the trabecular meshwork, cataracts, and oedema of the macula.

Acute angle closure glaucoma

Acute angle closure glaucoma.

Features

- Pain
- Haloes round lights
- Impaired vision
- Fixed semidilated pupil
- Hazy cornea
- Age >50
- Eye feels hard
- Unilateral

Acute glaucoma should always be considered in a patient over the age of 50 with a painful red eye. The diagnosis must not be missed or the eye will be permanently damaged. The mechanism is dealt with in the chapter on the glaucomas.

History—The attack usually comes on quite quickly, characteristically in the evening when the pupil becomes semidilated. There is pain in one eye, which can be extremely severe and may be accompanied by vomiting. The patient complains of impaired vision and haloes around lights due to oedema of the cornea. The patient may have had similar attacks in the past that were relieved by going to sleep (the pupil constricts during sleep, so relieving the attack).

Examination—The eye is inflamed and tender. The cornea is hazy and the pupil is semidilated and fixed. Vision is impaired according to the state of the cornea. On gentle palpation the eye feels harder than the other eye. The anterior chamber seems shallower than usual, with the iris being close to the cornea. If the patient is seen after the resolution of an attack the signs may have disappeared—hence the importance of the history.

Management—Urgent referral to hospital is required. Emergency treatment is required if the sight in the eye is to be preserved. If it is not possible to get the patient to an eye hospital straight away, intravenous acetazolamide (Diamox) 500 mg should be given, and pilocarpine 4% should be instilled in the eye to constrict the pupil. The pressure must first be brought down medically and a hole then made in the iris surgically (iridectomy) or with a laser (iridotomy) to restore normal aqueous flow. The other eye should be treated prophylactically in a similar way. If treatment is delayed adhesions may form between the iris and the cornea (peripheral anterior synechiae) necessitating a full surgical drainage procedure.

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