



RED EYE

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- Red eye-non-specific term to describe an **eye** that appears **red** due to illness, injury, or some other condition
- Caused by enlarged, dilated blood vessels, leading to the appearance of redness on surface of eye

CAUSES OF RED EYE

■ Conjunctiva

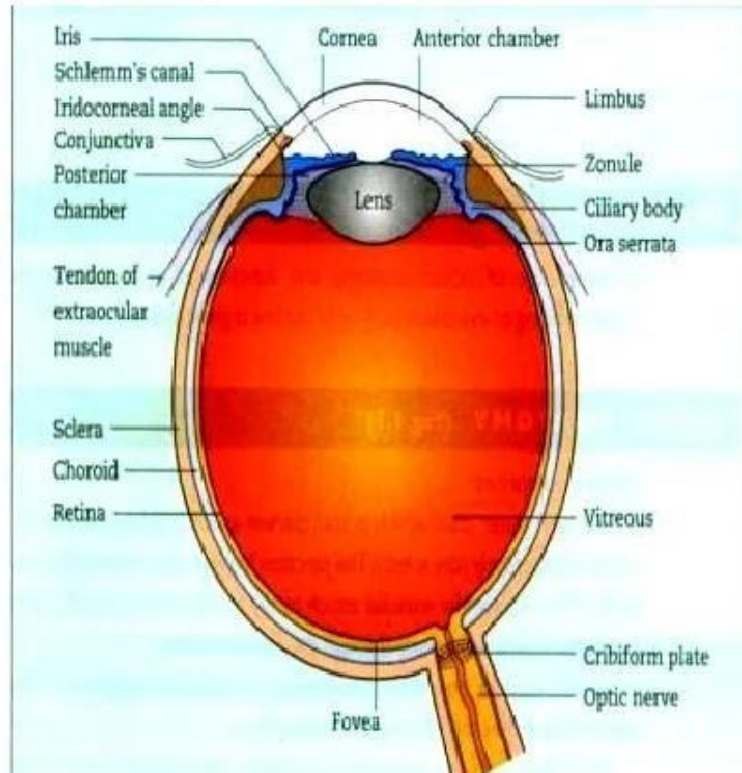
- **Conjunctivitis**
- Dry eye
- Pterygium
- Subconjunctival haemorrhage
- Trauma

■ Cornea

- Abrasion
- Foreign body
- Laceration
- **Corneal ulcer**
- Keratitis
- Contact lens wear

■ Sclera

- Episcleritis
- Scleritis



■ Iris and ciliary body

- Iritis
- **Iridocyclitis**

■ Anterior chamber

- Hyphaema
- **Acute angle closure glaucoma**

■ Eyelid

- Triachiasis
- Entropion
- Ectropion

■ Orbit

- Orbital cellulitis
- Acute dacryocystitis

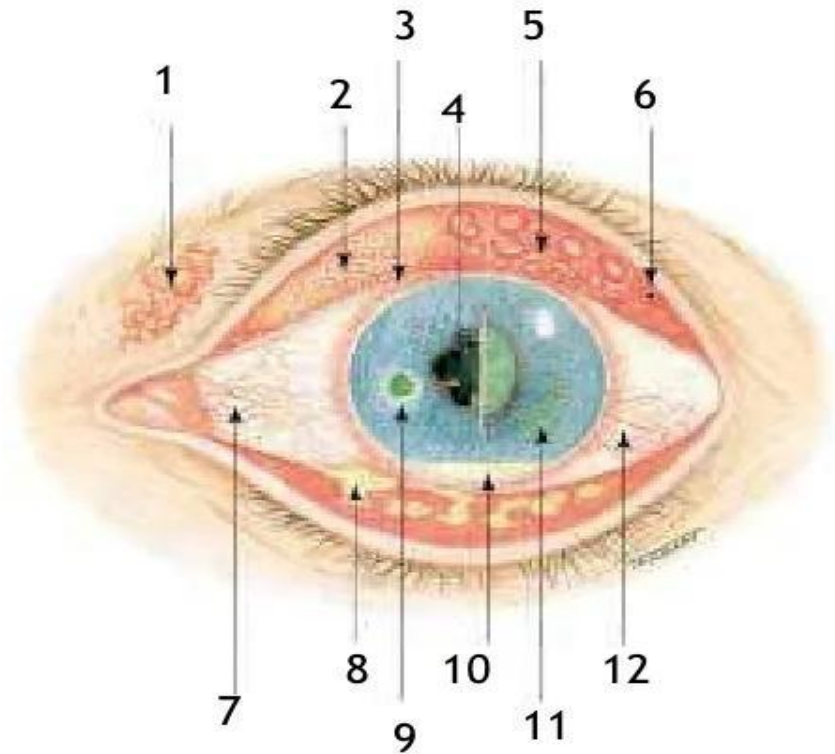
SYMPTOMS ASSOCIATED WITH RED EYE

SYMPTOMS

- Pain -corneal ulcer, iritis, acute glaucoma
- Visual loss
- Eye discharge
 - ✓ Purulent - bacterial conjunctivitis
 - ✓ Clear - viral or allergic cause
- Gritty sensation - common in conjunctivitis
- Itching - common in allergic eye disease, blepharitis and topical drop hypersensitivity
- Photophobia -panuveitis

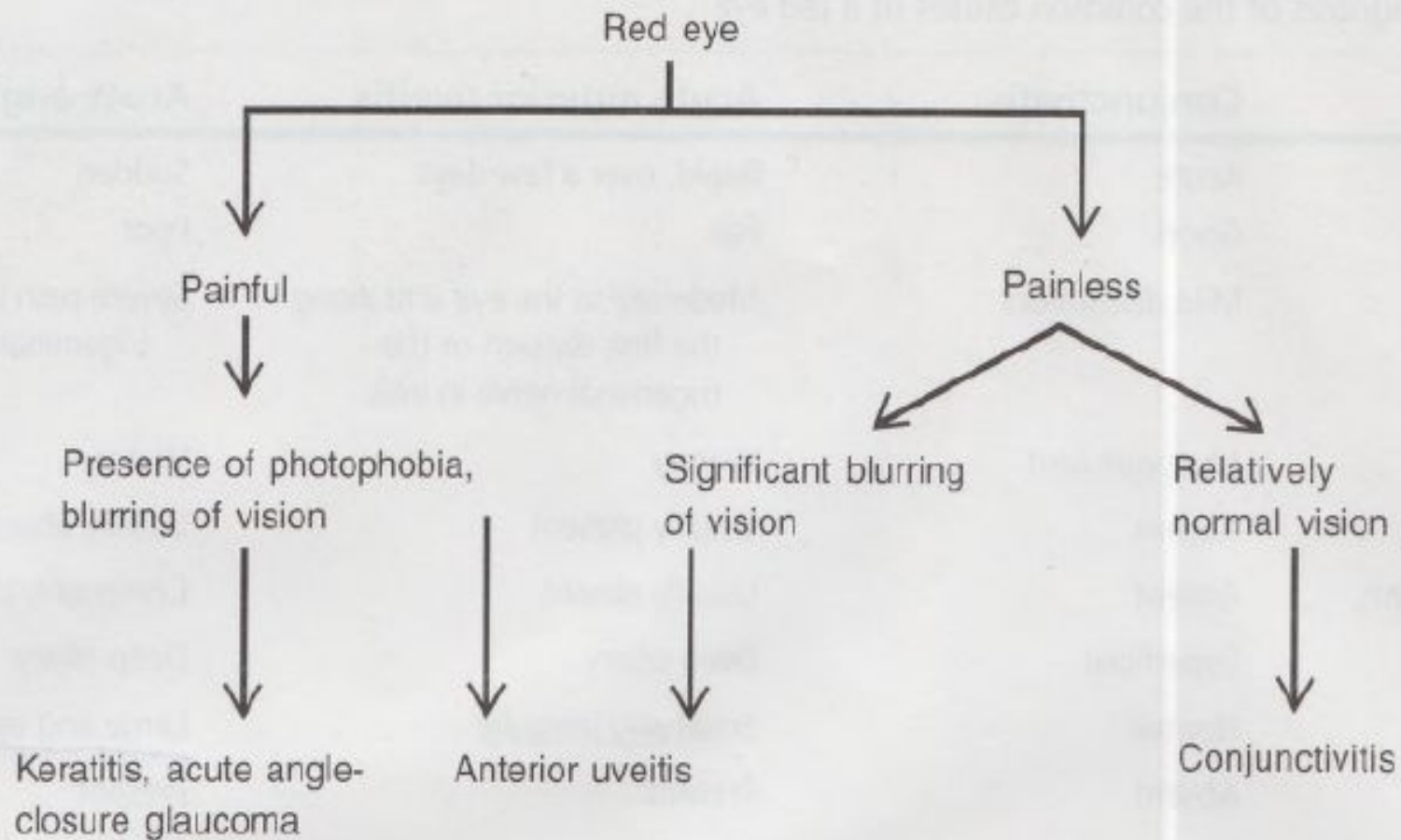
SIGNS OF THE RED EYES

1. Vesicles
2. Follicles
3. Ciliary flush
4. Irregular pupil
5. Papillae
6. Foreign body
7. Dilated conjunctival vessels
8. Discharge
9. Corneal ulcer
10. Hypopyon
11. Dendritic ulcer
12. Dilated episcleral vessels

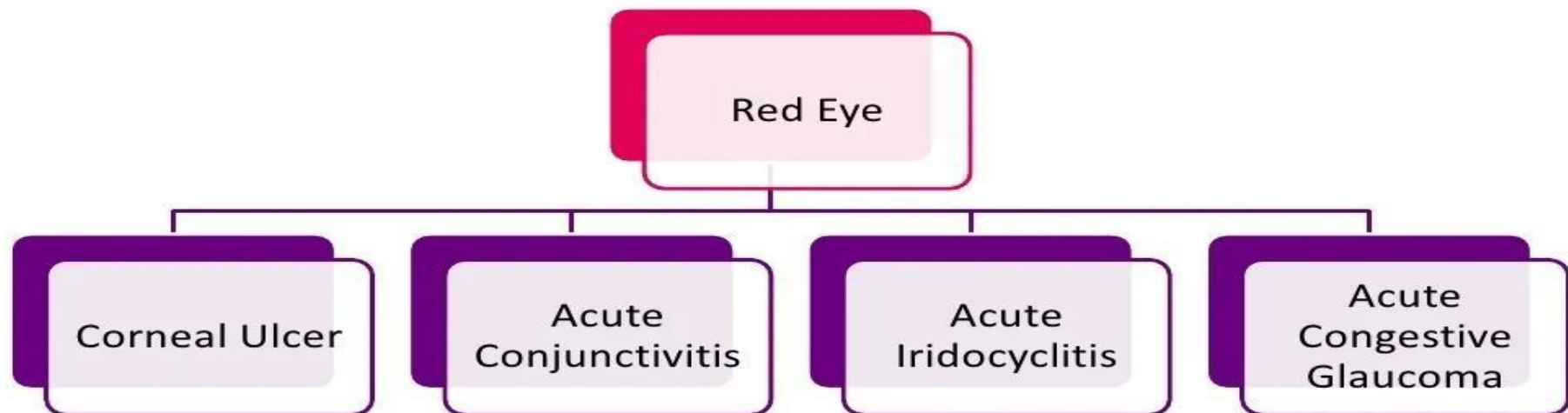


OCULAR HISTORY

- Characterize the symptoms:
- Duration - hours, days, weeks
Acute , Subacute and Chronic
- Types of discharge - clear, purulent, etc.
- Unilateral or bilateral
- Precipitating event - trauma, contact lens usage
- Previous episodes of a similar problem
- Past medical history - DM, hypertension
- Allergic history



4 MAIN CAUSES (NEED TO KNOW)



CORNEAL ULCER

Red Eye

Corneal Ulcer

- Discontinuation in normal epithelial surface of cornea a/w necrosis of surrounding corneal tissue.
- **Etiology:**
 - primary event due to bacterial, rarely viral ,fungal or protozoan infections(acanthamoeba).
 - secondary event that has compromised the eye - eg: corneal exposure, abrasion, foreign body, contact lens
 - associated with conjunctivitis, blepharitis, keratitis, vit A deficiency.
- **Symptoms :** - red eye
 - pain (main feature) → worsened by movement of eyelids persists until healing occur. (not if herpes zoster ophthalmicus)
 - photophobia
 - watery or mucopurulent discharge
- **Signs:** - normal or reduced VA (central ulcer)
 - generalized or localized conjunctival injection
 - haziness of the cornea
 - hypopyon.
- Fluorescein MUST be used to see the ulcer

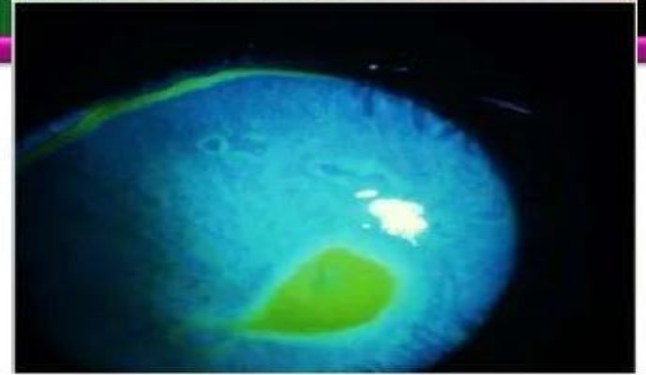
- **Investigation:**
 - usually diagnosed through clinical appearance).
 - swabs and culture to identify causative organism.
- **Management:** (urgent referral)

Drops & ointment of broad spectrum antibiotics.

Topical antiviral - for herpetic corneal infection

Cycloplegic drops - relieve pain resulting from spasm of ciliary muscle and prevent adhesion of the iris to the lens.

Topical steroids - reduce local inflammatory damage
- **Complications**
 - Decreased vision
 - Corneal perforation
 - Iritis
 - Endophthalmitis



Bacterial corneal ulcer.

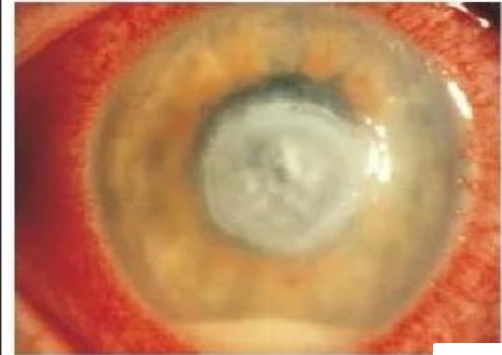


Fig. 5.7 a Clinical findings include a central bacterial corneal ulcer with hypopyon.

CONJUNCTIVITIS

Red Eye



Acute
Conjunctivitis



- Inflammation of the conjunctiva
- ACUTE vs CHRONIC
- Aetiology:

INFECTIOUS	NON-INFECTIOUS
<ul style="list-style-type: none">-Bacteria- Viral- Chlamydia- Neonatal	<ul style="list-style-type: none">-Allergic (acute vs chronic)- Toxic (due to irritants e.g smoke,dust)- due to other disease (Steven-Johnson syndrome)

BACTERIAL CONJUNCTIVITIS

- **Aetiology:**

- *Staphylococcus, Streptococcus, Pneumococcus, Haemophilus*

- **Patient presents with:**

- red eye, purulent discharge → yellow crusts, ocular irritation (gritty, burning & pain sensation).
 - History of contact with infected person. Usually unilateral → bilateral.

- **Findings:**

- Chemosis, papillae, round & reactive pupil, normal vision. Fluorescein drops → no staining of the cornea

- **Investigations:**

- not routinely done(diagnosed from the typical S&S).

- **Management:**

- usually self-limiting. Fails to resolve → conjunctival swabs for C&S.

- **General measures:**

- wipe off all discharge & not sharing towel (prevent spread of infection)

- **Specific:**

- 1)Antibiotic drops → hasten resolution (used day time, broad spectrum e.g chloramphenicol, gentamicin)
- 2)Antibiotic ointment (used at night, during sleep).



Purulent discharge



VIRAL CONJUNCTIVITIS

- **Aetiology:**
 - Adenovirus (commonest, highly contagious → epidemic), Coxsackie, Herpes Simplex.
 - Systemic infection - influenza virus, Epstein-Barr virus, paramycovirus (measles, mumps) & rubella.
- **Patient presents with:**
 - Acute onset of diffuse red eye, discharge (watery), excessive lacrimation/epiphora, photophobia & feel discomfort, cough & cold (Adenovirus→URTI)

VIRAL CONJUNCTIVITIS

- **Findings:**

- last longer than bacterial type, diffuse conjunctival injection, preauricular lymphadenopathy, follicles & chemosis, lid oedema.

- **Management:**

- Self limiting condition. Antibiotic eye drops (for example, chloramphenicol) → symptomatic relief, prevent secondary bacterial infection.
- Chronic, protracted course → persistent corneal lesions and symptoms → steroid eye drops may be indicated

VIRAL CONJUNCTIVITIS: SUPPORTIVE MANAGEMENT

- Use cold compresses & lubricants e.g. artificial tears for comfort.
- Topical vasoconstrictors & anti-histamines - for severe itchiness.
- Strict hygiene (highly contagious).



Viral conjunctivitis



Adenovirus conjunctivitis of the right eye and enlarged preauricular nodes

CHLAMYDIAL CONJUNCTIVITIS

- Different serotypes are responsible for 2 forms of ocular infections:
 - Inclusion keratoconjunctivitis
 - Trachoma
- **Investigations:**
 - Often difficult and special bacteriological tests may be necessary to confirm the clinical suspicions
 - Culture of scrapes.
 - Giemsa stain to screen for intracellular inclusion body of Chlamydia.
 - Presents of Chlamydial antigens using immunofluorescence.

INCLUSION KERATOCONJUNCTIVITIS:

- STD, serotypes D-K. Not treated adequately → chronic course (up to 18 months).
- **S+S:** palpebral conjunctival follicles, preauricular lymphadenopathy, watery/stringy mucopurulent discharge, micropannus associated with subepithelial scarring, chemosis, lid oedema
- a/w GU symptoms (vaginitis, cervicitis, urethritis) and unresponsive to antibiotics
- **Management:**
 - topical and systemic erythromycin, tetracycline (C/I neonates and pregnant women).
 - Associated venereal disease should also be treated
 - check the partner for symptoms or signs of venereal disease

TRACHOMA

- Commonest infective cause of blindness
- Serotypes A-C, chronic, endemic in unhygienic places.
- **Vector:** housefly. Encouraged by poor hygiene, overcrowded, dry, and hot climate.
- **Signs:** subconjunctival fibrosis (hallmark), diffuse inflammation papillary enlargement, follicles, trichiasis (eyelashes directed backwards), corneal scarring (recurrent keratitis and trichiasis) → blindness.
- **Management:**
 - Oral/ topical tetracycline or erythromycin.
 - Azithromycin (alternative) single oral dose.
 - Entropion and trichiasis → surgery.



Chlamydial conjunctivitis

Trachoma: scarred tarsal plate



ALLERGIC CONJUNCTIVITIS

- ACUTE VS CHRONIC (important to differentiate)
- Feat: usually both eyes. Itchiness (main feature), lid swell, conjunctival injection, chemosis
- Mostly after allergen exposure and settles after few hours
- Family history of atopy, recent contact with chemicals or eye drops usually present.
- Similar symptoms may have occurred in the same season in previous years.

ALLERGIC CONJUNCTIVITIS

➤ Types of allergic conjunctivitis:

- Seasonal allergic conjunctivitis (SAC)
- Perennial allergic conjunctivitis (PAC)
- Vernal keratoconjunctivitis (VKC)
- Atopic keratoconjunctivitis (AKC)
- Giant papillary conjunctivitis (GPC)

ACUTE ALLERGIC CONJUNCTIVITIS

- Rapid onset (IgE-mediated)
- Features: itchy, lid swelling, conjunctival injection and oedema (chemosis), lacrimation.
- 2 type:
 - seasonal allergic conjunctivitis - hay fever at time of high environmental pollen, seasonal in pattern.
 - perennial allergic conjunctivitis- caused by allergens other than pollen (eg: house dust mite), no seasonal pattern.
- Management:
 - topical antihistamine (levocabastine)
 - systemic antihistamine (terfenadine)
 - Mast cell stabilizers (e.g. sodium cromoglycate, nedocromyl, iodoxamide)

CHRONIC ALLERGIC CONJUNCTIVITIS

- VKC and AKC. GPC(not a true ocular allergic reaction).
- Often affect male children with history of atopy
- Signs and Symptoms:
 - Itchiness
 - lacrimation
 - redness both eye
 - Photophobia
 - Limbal follicles and white spots
 - giant cobblestone ~ papillary conjunctivitis coalesce
 - Ulcer and infiltration ~ vernal keratoconjunctivitis
 - Mucoid discharge ~ giant papillary conjunctivitis (allergy to foreign body)

- Management:

- Initial therapy: mast cell stabilizers or antihistamines, or agents with both properties (eg. Olopatidine)
- Topical steroids (severe cases)
- GPC → topical mast cell stabilizers. Stop for a period of time or permanently lens wear.



Chemosis



Large papillae (giant cobblestone)



CLINICAL FEATURES	BACTERIAL	VIRAL	CHLAMYDIAL	ALLERGIC
Itching	-	-	-	++
Hyperemia	++	+	+	+
Discharge	Purulent & yellow crust	Watery	Mucopurulent	Clear & stringy
Chemosis	++	±	-	++
Lacrimation/epiphora	+	++	+	+
Follicles	-	+	++	+
Papillae	+	-	±	+
Pseudomembranous / membranous	±	±	-	-
Preauricular lymphadenopathy	-	++	+	-
Concurrent keratitis	±	±	+	-
Conjunctival scraping & cytology (giemsa)	Predominantly neutrophil cellular reaction	Lymphocytes & monocytes (mononuclear response)	Mixed neutrophilic & mononuclear response (former cell type predominate) *	Eosinophil & eosinophilic granules

*Pathognomonic – basophilic cytoplasmic inclusion body

OPHTHALMIA NEONATORUM

- Neonatal conjunctivitis.
- Any conjunctivitis occurs in the **1st 28 days of life**.
Notifiable disease
- **Important:** immature eye defences → severe conjunctivitis, with membrane formation and bleeding → serious corneal disease and blindness.
- 2 important **causative agents**:
 - *Neisseria gonorrhoea* (corneal perforation)
 - *Chlamydia trachomatis* (chronic → corneal scarring)

*Exclude venereal disease in parents
- Other causes: Bact conjunctivitis (usually gram +ve), HSV (corneal scarring).



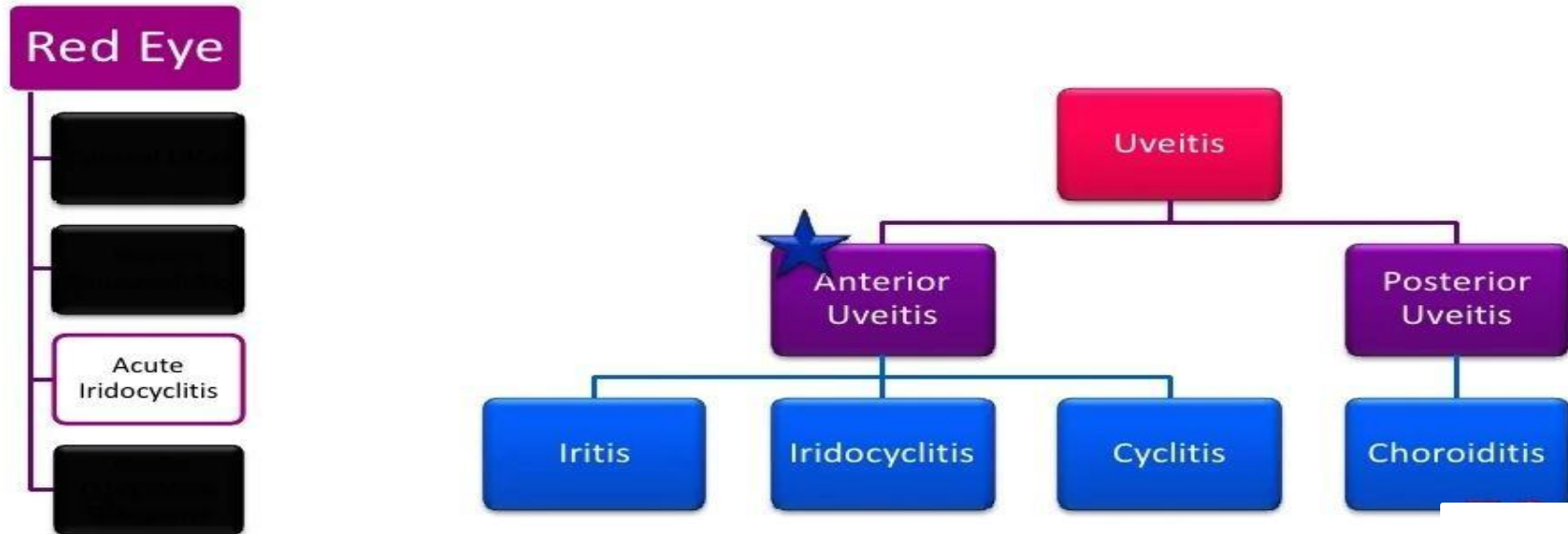
- **DDx:**
Congenital blocked nasolacrimal gland
Congenital glaucoma
- **Corneal examination** is important → exclude any ulceration.
- **Management:**
 - refer to ophthalmologist
 - Swab and send for culture test (mandatory)
 - *N.gonorrhoeae* → penicillin topically (local disease) and systemically (systemic disease)
 - *Chlamydia* → topical tetracycline ointment (local disease) and systemic erythromycin (systemic disease)
 - HSV → topical antivirals

UVEITIS



DEFINITION

Inflammation of the uveal tract (iris, ciliary body, choroid)



AETIOLOGY

- Inflammatory - due to autoimmune disease
- Infectious - caused by known ocular and systemic pathogens
- Infiltrative - secondary to invasive neoplastic processes
- Injurious - due to trauma
- Iatrogenic - caused by surgery, inadvertent trauma, or medication
- Inherited - secondary to metabolic or dystrophic disease
- Ischaemic - caused by impaired circulation
- Idiopathic - a category used when thorough evaluation has failed to find an underlying cause

SYMPTOMS

- Ocular pain
- Photophobia
- Blurring of vision
- Red eye

ASSOCIATED WITH SYSTEMIC DISEASE

- 1) sarcoidosis, TB - SOB, cough
- 2) Behcet's, psoriasis - skin problems
- 3) ankylosing spondylitis, juvenile chronic arthritis, Reiter's - back pain, arthritis
- 4) IBD - alteration of bowel habit
- 5) In AIDS
 - Cytomegalovirus
 - Human syncytial virus
 - Cryptococcus
 - Toxoplasma
 - Candida

SIGNS

- Reduced visual acuity
- Ciliary injection : diffuse superficial conjunctival hyperemia that would indicate conjunctivitis, as opposed to the circumlimbal redness of anterior uveitis. Blurred vision and photophobia are usually absent with conjunctivitis.
- Keratitic precipitates (on corneal endothelium) : in acute cases KPs may be fine and white; in chronic cases, large and yellowish. Colored or pigmented KPs suggest prior episodes of anterior uveitis.

SIGNS (cont.)

- Hypopyon
- Vessels on iris dilated
- Pigment and fibrin deposits on the anterior surface of the lens are suggestive of synechiae. The presence or absence of posterior subcapsular cataract should be well documented because PSC is a frequent complication of both the disease and the therapy.
- Posterior synechiae - irregular pupil
- Anterior synechiae - may occlude drainage angle





Marked circumcorneal congestion with contracting fibrin in the anterior chamber and a pupil in mid-mydriasis.

Posterior synechiae between iris and lens after iridocyclitis give the pupil the shape of cloverleaves



OPHTHALMIA

- Sympathetic ophthalmia (sometimes referred to as sympathetic ophthalmitis or sympathetic uveitis) is a rare form of bilateral panuveitis. It is a specific type of uveitis in response to trauma to one of the eyes.

INVESTIGATIONS

- A first episode of unilateral nongranulomatous acute uveitis can be diagnosed by history and clinical examination alone and does not need laboratory investigation.

If history and examination are normal but the uveitis is granulomatous, recurrent or bilateral, the following screening investigations should be carried out:

- Full blood count and ESR
- HLA-B27
- Antinuclear antibody
- Screening tests for syphilis and tuberculosis
- Chest x-ray

MANAGEMENT

- **General measures**

Drops to dilate the pupil (cyclopegics) such as cyclopentolate 1% or atropine 1% should be prescribed, but this is best done by a specialist as this treatment is contraindicated in narrow angle glaucoma.

- To prevent adhesion of the iris to the anterior lens capsule (posterior synechia), which can lead to iris bombe and elevated IOP
- To stabilize the blood-aqueous barrier and help prevent further protein leakage (flare).
- To relieve pain by immobilizing the iris

When using cyclopegics, the patient should be warned that the pupil will appear large and they will have a temporary problem with vision in the eye in which the drops have been administered.

- **Steroids**

Steroid eye drops such as prednisolone 1% are the first line treatment for the management of the inflammation.

In more severe cases, steroid injection or even systemic therapy may be required.

They should normally be prescribed by a specialist, as they can cause corneal ulceration when the diagnosis is herpes simplex infection, steroid glaucoma and on prolonged use, steroid cataract.

- **Adjunctive therapy**

Secondary causes should be treated as appropriate.

- **Surgery**

Removal of the vitreous may be necessary when persistent floaters severely impede visual acuity. This procedure may also be useful as a combined therapeutic and diagnostic test as, once removed, the vitreous can be analysed to exclude infection or malignancy.

COMPLICATIONS

- Posterior synechiae - these commonest complication of anterior uveitis, if numerous can cause blockage of aqueous flow leading to a rise in intra-ocular pressure and can complicate cataract operations
- Cataract
- Glaucoma
- Retinal detachment
- Neovascularisation of the retina, optic nerve, or iris
- Cystoid macular edema (swelling of the macula)

ACUTE CONGESTIVE GLAUCOMA

Red Eye



Acute
Congestive
Glaucoma

- Primary narrow or closed angle glaucoma is the most common cause for glaucoma emergency cases. In acute congestive cases, the onset is usually sudden.
- Condition in which the iris is apposed to the trabecular meshwork at the angle of the anterior chamber of the eye, the outflow of aqueous from the eye is blocked, which causes a rise in intraocular pressure (IOP)
- Immediate treatment is essential to prevent damage to the optic nerve and loss of vision.

- Angle closure may occur via 2 mechanisms. The iris may be pushed forward into contact with the trabecular meshwork, as in pupillary block or it may be pulled anteriorly, as occurs with other inflammatory conditions.
- In older people, incidence of primary ACG increases as the lens enlarges, and the depth and volume of the anterior chamber decrease.
- Patients with hyperopic eyes are more likely to have shallow anterior chambers and narrow angles, predisposed to develop ACG. Dilation of the eye may precipitate an attack of acute ACG because the peripheral iris relaxes when dilated to midposition, it may bow anteriorly and maximize iris-lens apposition, possibly causing pupillary block.

SYMPTOMS

- 1) Onset of severe ocular pain, nausea and vomiting, headache, and blurred vision is sudden.
- 2) Patients may complain of seeing haloes around lights. Haloes and blurry vision are the result of corneal edema.
- 3) The attack may have been precipitated by pupillary dilation, possibly during an ophthalmic examination. Patients with acute ACG are extremely uncomfortable and distressed.
- 4) Some patients may experience intermittent episodes of partial angle closure and relatively elevated IOP without ever experiencing a frank attack of ACG.
- 5) Patients may be totally asymptomatic, or they may report incidents of mild pain with slightly blurred vision or seeing haloes around lights. These symptoms resolve spontaneously as the angle reopens.

PHYSICAL EXAMINATION

- Examination of a patient who presents with suspected ACG should include gonioscopy, tonometry, biomicroscopy, and ophthalmoscopy.
 - Diagnosis made by gonioscopic visualization of an occluded anterior chamber angle.
 - Tonometry demonstrates an elevated IOP, which may be as high as 40-80 mm Hg.
 - Ophthalmoscopy may reveal a swollen optic disc in an acute attack or excavation if episodes have been chronic. Unilateral involvement and worsening symptoms are common in acute attacks.

- If an attack persists or if several milder incidents of angle closure have occurred in the past, peripheral anterior synechiae and adhesions may be visible between the cornea and iris. Peripheral anterior synechiae may destroy the trabecular meshwork, while adhesions may cause necrosis and permanent dilation of the iris.

MANAGEMENT

- Definitive treatment of ACG is laser iridotomy, or, if the iris cannot be accessed by laser, surgical iridectomy.
- Laser iridotomy: Treatment of choice for pupillary-block ACG is laser iridotomy. Iridotomy with an argon or Nd:YAG laser. If the cornea is extremely cloudy or the patient cannot cooperate, incisional peripheral iridectomy may be performed instead of a laser procedure.

Opening in Iris

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graph TD; A[Opening in Iris] --> B[Aqueous flow into anterior chamber]; B --> C[Iris recede to normal position]; C --> D[Opens angle]; D --> E[Relieves blockage];
```

Aqueous flow into anterior chamber

Iris recede to normal position

Opens angle

Relieves blockage



LASER GONIOPLASTY

- Laser may be used to create stromal burns in the peripheral iris. As the iris contracts, the anterior chamber angle deepens. Use laser goniotomy as treatment of ACG due to plateau iris and nanophthalmos, or use it as a temporary measure to open the angle until laser iridotomy can be performed.

MEDICAL TREATMENT

- IV acetazolamide (↓ aqueous humor production)
- B blocker (↓ aqueous humor production)
- Pilocarpine (constrict pupil)

Table 9.1 Differential diagnosis of the common causes of a red eye

Clinical features	Conjunctivitis	Acute anterior uveitis	Acute angle-closure glaucoma
Onset	Acute	Rapid, over a few days	Sudden
Vision	Good	Fair	Poor
Pain	Mild discomfort	Moderate in the eye and along the first division of the trigeminal nerve in iritis	Severe pain in the eye and entire trigeminal area
Secretion	Mucopurulent	Watery	Watery
Photophobia	Absent	Usually present	Usually absent
Coloured halos around lights	Absent	Usually absent	Commonly present
Conjunctival congestion	Superficial	Deep ciliary	Deep ciliary
Pupil	Normal	Small and irregular	Laræ and vertically oval
Tenderness	Absent	Present	Present
Depth of the anterior chamber	Normal	Normal	Shallow
Intraocular pressure	Normal	Usually normal but may be raised, sometimes low	Raised
Systemic symptoms	Absent	Referred pain	Prostration and occasional vomiting



CONJUNCTIVA

Red Eye

Conjunctiva

Cornea

Sclera

Iris and
Ciliary Body

Anterior
Chamber

Eyelid

Orbit

CONJUNCTIVA

- Thin, vascular mucous membrane/epithelium
- Conjunctival causes of red eyes:
 - Bact, viral, chlamydial, allergic conjunctivitis, ophthalmia neonatorum (will
 - dry eye, pterygium, subconjunctival haemorrhage, injury.

PTERYGIUM

- Triangular fold of conjunctiva that usually grows from the medial portion of the palpebral fissure towards & invades the cornea
- Non-malignant fibrovascular growth
- Predisposing factors:
 - Hot climates
 - Chronic dryness
 - Exposure to sun
- *Prevalent in Southern countries
- Mx - surgical removal



SUBCONJUNCTIVAL HAEMORRHAGE

- 'Extensive bleeding under the conjunctiva'
- Features: red eye, comfortable, no visual disturbance,
- Hx of **trauma**, spontaneously in **elderly patient** (compromised vascular struc in arteriosclerosis), may occur after coughing, sneezing, heavy lifting objects.
- Mx: check BP to exclude HPT (esp if occur repeatedly), usually resolve spontaneously within 2 weeks.



CORNEA

Red Eye

Conjunctiva

Cornea

Sclera

Iris and
Ciliary Body

Anterior
Chamber

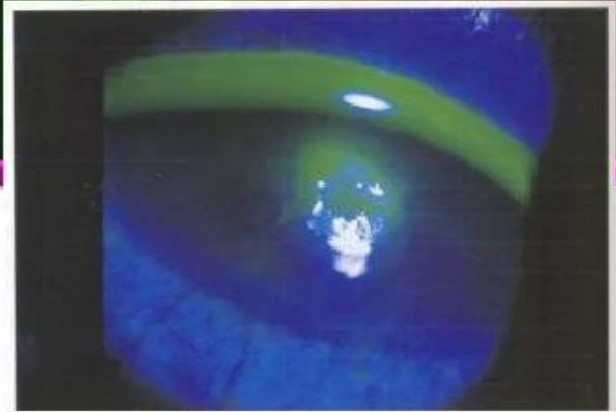
Eyelid

Orbit

- **Corneal Ulcer** (will be presented **later**)
- **Corneal abrasion**
 - epithelium defect due to trauma, contact lens
 - use fluorescein and blue light, defect shine in green.
- **Corneal foreign body**
 - foreign body in or on cornea.
 - cause intense irritation and profuse watering.

Mx

- Topical antibiotic (drop/ointment)
- Topical NSAIDs, cyclopegic
- Tight patch



KERATITIS

- Def : Inflammation of the cornea
- Type :
 - Infective
 - Bacterial
 - Viral
 - Protozoal
 - Non Infective
 - Autoimmune (eg: RA, SLE)
 - Non Autoimmune (eg: Marginal keratitis)

BACTERIAL KERATITIS

- CAUSES
 - *Staphylococcus epidermidis*
 - *Staphylococcus aureus*
 - *Streptococcus pneumoniae*
 - *Coliforms*
 - *Pseudomonas*
 - *Haemophilis*

- PREDISPOSING FACTOR
 - ☐ Keratoconjunctivitis sicca (dry eye)
 - ☐ A breach in corneal epithelium (eg following trauma)
 - ☐ Prolonged contact lens wear
 - ☐ Prolonged use of topical steroids



➤ SYMPTOMS & SIGNS

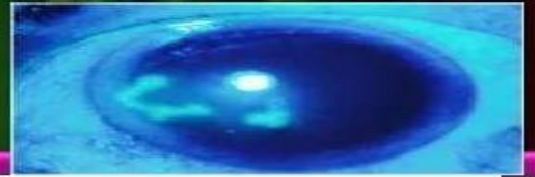
- severe pain
- purulent discharge
- ciliary injection
- visual loss
- hypopyon
- white corneal opacity, can be seen with naked eye

➤ MANAGEMENT

- Scrapes taken from base of ulcer for Gram-staining & culture
- Rx: Dual therapy of intensive topical antibiotics (eg: cefuroxime for Gram +ve bacteria and gentamicin for Gram -ve bacteria)
- Monotherapy: fluoroquinolones (eg: ciprofloxacin, ofloxacin)
- Initially by tissue adhesive (cyanoacrylate glue) and subsequent corneal graft- for severe or unresponsive disease where cornea may perforate.

VIRAL KERATITIS

- Herpes simplex keratitis
 - Causes: Type 1 or Type 2 Herpes Simplex Virus
 - Most are asymptomatic
 - Accompanied by:
 - Fever
 - Vesicular lid lesion
 - Follicular conjunctivitis
 - Pre-auricular lymphadenopathy
- Pathognomonic: **dendritic ulcer on cornea**
- Dendritic ulcer may heal without scar, but may progress to stromal keratitis, a/w inflammatory infiltration, oedema and ultimately loss of corneal transparency and permanent scarring → if severe - corneal graft
- Rx: topical antiviral (trifluridine)- heal within 2 weeks.



Herpes simplex keratitis: dendritic keratitis.

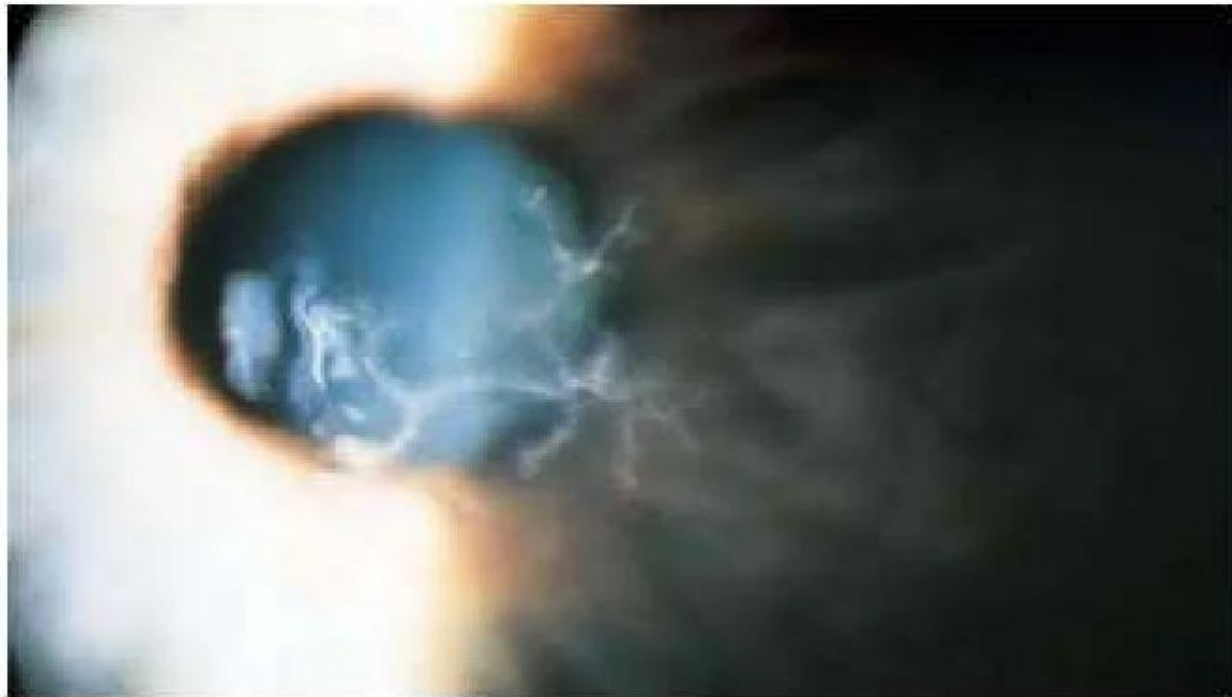


Fig. 5.8 Characteristic findings include branching epithelial lesions.

- **Herpes zoster ophthalmicus** (ophthalmic shingles)
- Cause : Varicella zoster virus
- Area affected: ophthalmic division of CN V
- Accompanied by: prodromal period with systemically unwell, vesicles, lid swelling, iritis, 2° glaucoma.
- Rx: - oral antiviral (eg: aciclovir, famciclovir) to reduce post-infective neuralgia
- topical antiviral and steroids and antibacterials to cover secondary infection for the ocular disease.

PROTOZOAL KERATITIS

- Acanthamoeba keratitis
- Commonly due to use of contact lenses and exposure to contaminated water or soil.
- Presentation: painful keratitis, redness of the eye and photophobia.
- Rx: topical chlorhexidine, polyhexamethylene biguanide (PHMB) and propamidine.

SCLERA

White fibrous outer protective coat of eye

Continuous with cornea anteriorly and the dura of optic nerve posteriorly



- Episcleritis

- Etiology

- Mostly idiopathic, rest collagen vascular dz, infections(herpes zoster,herpes simplex,syphillis),IBD

- Rx

- Self-limited
- Topical steroid if painful

- Scleritis

- Etiology

- 50% systemic

- collagen vascular dz
- Granulomatous
- Metabolic
- Infectious
- chemical/physical agents

- 50% idiopathic

- Rx

- Systemic NSAID/steroid
- Treat underlying etiology



ANTERIOR CHAMBER

Red Eye

Conjunctiva

Cornea

Sclera

Iris and
Ciliary Body

Anterior
Chamber

Eyelid

Orbit

- Anterior chamber's causes of red eyes:-
 - Hyphaema
 - is blood in the front (anterior) chamber of the eye. It may appear as a reddish tinge, or it may appear as a small pool of blood at the bottom of the iris or in the cornea.
 - Acute Congestive Glaucoma
 - (will be presented by Joo Qing)





EYELIDS

Red Eye

Conjunctiva

Cornea

Sclera

Iris and
Ciliary Body

Anterior
Chamber

Eyelid

Orbit

TRICHIASIS

- Irritation of cornea due to aberrant eyelashes grow inward with a normal eyelid position.
- May result from chronic inflammatory lid diseases(blepharitis), Steven-johnson syn, trauma,burn etc
- Rx: - topical lubricant
 - epilation with forceps
 - electrolysis for isolated lashes
 - cryotherapy
 - laser ablation
 - surgery in cases resistant to other treatment.



ECTROPION



- Eversion of the lid leads to disruption of tears flow.
- Types:-
 - Congenital
 - Involutionary (senile) ectropion
 - Affects lower lid of elderly(weak orbicularis oculi)
 - Results in epiphora
 - Cicatrical ectropion
 - Caused by scarring or contracture of skin and underlying tissue, pulling eyelid away from the globe
 - Defect may be local (trauma) or general (burns or dermatitis)
 - Paralytic ectropion
 - Caused by facial nerve palsy
 - Mechanical ectropion
 - Caused by lid edema, herniated fat or tumour on or near the lid margin which mechanically evert the lid.

Senile ectropion.



Fig. 2.8 The structures supporting the eyelid are lax, causing the lower eyelid sag outward.

ENTROPION

- Irritation of eye and cornea due to inturning, usually of the lower lid.
- Types:-
 - Orbicularis oculi muscle spasm
 - Involutionary (senile) entropion
 - Affects mainly lower lid
 - Constant rubbing of lashes in longstanding cases results in ulceration and pannus formation.
 - Cicatrical entropion
 - Both eyelids can be affected
 - Caused by severe scarring of palpebral conjunctiva, which pulls the lid margin towards the globe
 - Congenital entropion
 - Caused by improper development of retractor aponeurosis insertion into inferior border of tarsal plate.
 - Sign: inturning of entire lower eyelid and lashes with absence of lower lid crease.

Spastic entropion.



Fig. 2.7 Displaced fibers of the orbicularis oculi muscle cause the eyelashes of the lower eyelid to turn inward. Surgical intervention is indicated to correct the laxity of the lower eyelid.

ORBIT

Red Eye

Conjunctiva

Cornea

Sclera

Iris and
Ciliary Body

Anterior
Chamber

Eyelid

Orbit

ORBITAL CELLULITIS (EMERGENCY)

- Inflammation of orbital contents posterior to orbital septum
- Can cause blindness & may spread to cause brain abscess.
- Often arises from adjacent ethmoid sinus. (facial, tooth infection/trauma)
- Cause: *Haemophilus influenzae*
- Symptoms & signs:
 - ☐ painful eye
 - ☐ periorbital inflammation and swelling
 - ☐ reduced eye movement
 - ☐ conjunctival injection
 - ☐ possible visual loss
 - ☐ systemic illness and fever
- Rx: intravenous broad spectrum antibiotics

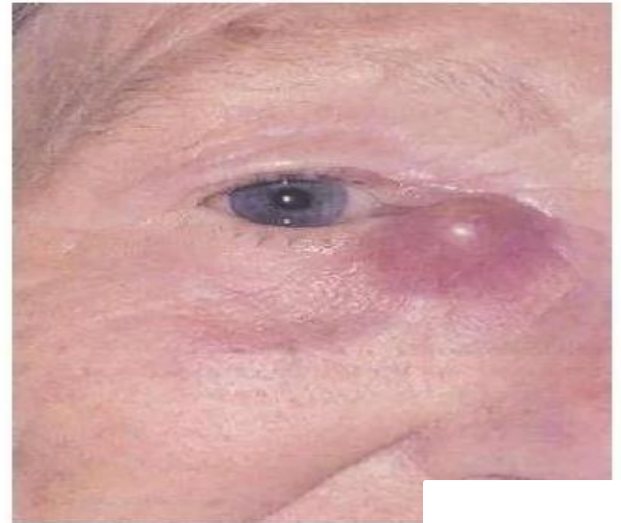


Panophthalmitis

- ❖ Purulent inflammation of all layers of the eye

Acute dacryoadenitis

- ❖ Inflammation of the lacrimal gland



THANK YOU