Ocular Emergencies & Red Eye

[**Color index:** Important | Notes: **F1**, **F2** | Extra] **EDITING FILE**

Objectives:

➢ Not given.

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Resources: Slides + Notes + Lecture Notes of Ophthalmology + 435 Team + OphthoBook, Mayoclinic + Medscape + Master the boards.

Don't freak out! This lecture is 2 lectures in one!

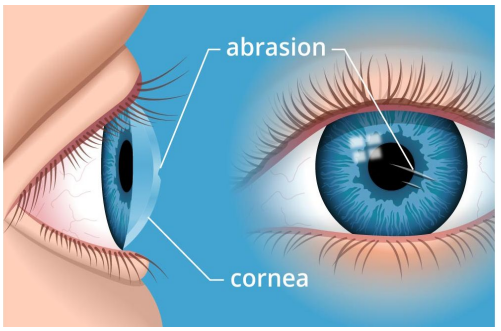
Ocular Emergencies

This lecture is so important (MCQs and future live), you may face it yourself or one of your family members لا سمح الله.

Usually the outcome in emergency cases depend on immediate intervention (how did you manage the pt earlier), so despite the specialty you choose, you need to know these principles.

General Emergencies	Orbital/Ocular Trauma
Corneal abrasion **Corneal ulcer** **Uveitis** **Acute angle glaucoma** **Orbital cellulitis** **Endophthalmitis** **Retinal detachment** **Chemical injury**	**Corneal & conjunctival foreign bodies** **Hyphema** **Ruptured globe** **Orbital wall fracture** **Lid Laceration**

Corneal abrasion:

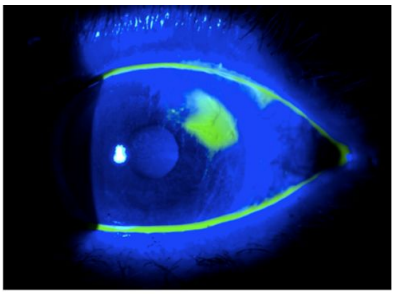


Corneal abrasions result from a disruption or loss of cells in the top layer of the cornea, called the corneal Epithelium. History of scratching the eye (fingernails or lenses). the epithelium has the ability to replicate.

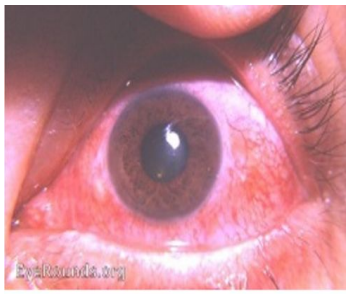
Symptoms:

- Foreign body sensation.
- Severe Pain.
- Redness.
- Tearing.
- Photophobia experience of discomfort or pain to the eyes due to light exposure

"Corneal Abrasion can lead to Corneal Ulcer if untreated"



SAQ: Fluorescein dye uptake
المنطقة الي تأخذ الصبغة هي المتأثرة

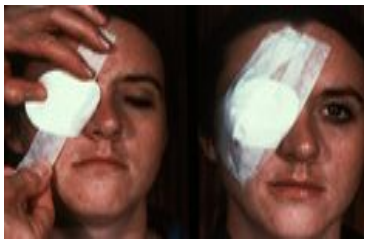


Corneal abrasion with NO opacities
القرنية صافية مو زي الالسر

Treatment: it heals within 24 hrs.

Mostly will heal by itself but we fear of infections

- Topical antibiotic "prophylactic to prevent infections"
- Pressure patch over the eye. احيانا ما يحتاج نغطيها
- Refer to ophthalmologist. See them everyday until it's gone
- Cycloplegia to dilate pupil to decrease pain.
- Important to treat to avoid infection.
- If infection is suspected do scraping biopsy to rule it out



Corneal ulcer: "microbial keratitis"

occurs secondary to disruption of the immune defence of the eye (lid and conjunctival inflammation) but is often due to trauma or contact lens wear. Can be due to Bacterial, viral, fungal or parasitic.

Symptoms:

- Ocular pain
- Redness
- Discharge
- Decreased vision
- **Corneal opacity** ± hypopyon "pus" white yellowish lesion on the cornea (ant. chamber)

Management:

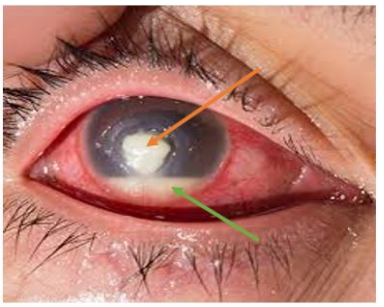
1. Prompt diagnosis of the etiology by doing corneal scraping (Slide, culture to diagnose)
2. Treatment with appropriate antimicrobial therapy are essential to minimize visual loss. كل ساعة
3. Then treat the inflammatory process.
4. Promote healing and treat the primary cause if present (e.g. lid deformity, dryness)

start by antibiotics, why ? because most common is bacterial, most serious (perforation) is bacterial, it takes long time to response if u treat as fungal.

- ➔ Gram **+ve:**
  - Mild to moderate: **Cefazolin**
  - Severe case: **Vancomycin**
- ➔ Gram **-ve:**
  - **Ceftazidime**

We give antibiotics every hour, why? because there is no immune system (no blood vessels)

Hypopyon is simply a pus collection in the anterior chamber.

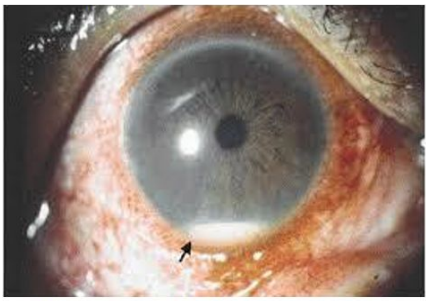


Corneal ulcer with Hypopyon

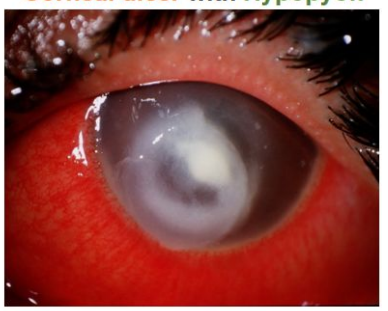
Contact lens wearer:

Any redness occurring for patients who wear contact lens should be managed with extreme caution.

1. Remove lens
2. Rule out corneal infection (i.e corneal ulcer)
3. Antibiotics for gram negative organisms (pseudomonas aeruginosa is the most common), treat it empirically as bacteria give **Ceftazidime**, if no response → antifungal, Because **Fungi** and **Acanthamoeba** are common causative organisms.
4. Do not patch
5. Follow up with ophthalmologist in 24 hours



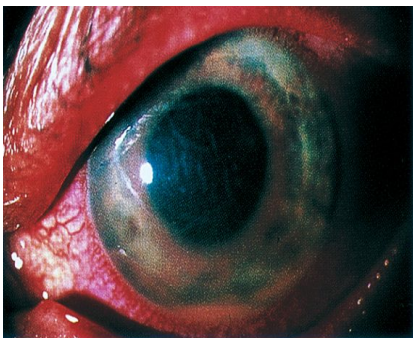
Hypopyon with No corneal ulcer



Bacterial keratitis with opacity

• Uveitis:

Inflammation of the uveal tissue **(iris, ciliary body, or choroid)**, however retina, blood vessels, optic disc, and vitreous can be involved. "the patient may have retinitis or hypopyon secondary to uveitis ".



It could be:

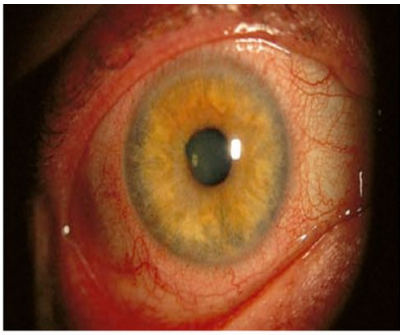
1- Anterior as iridoscleritis.
2- Posterior as choroiditis, retinitis.
3- Panuveitis (affect the anterior chamber, vitreous and retina and/or the choroid).

Etiology:

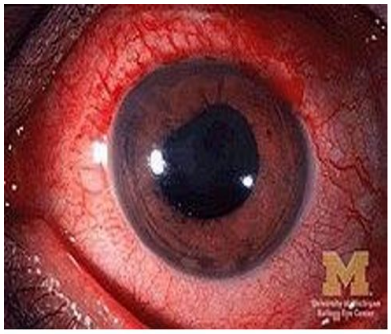
- Idiopathic 50%
- Inflammatory diseases:
  - HLA B27, Ankylosing spondylitis, IBD, Reiter's syndrome, Psoriatic arthritis.
  - Sarcoidosis (lung CT to diagnose), Behcet's, Vogt-Koyanagi-Harada Syndrome (panuveitis and ear involvement).
- Infectious:
  - Herpes virus.
  - Toxoplasmosis; transmitted through cats Poor outcome.
  - Secondary Tuberculosis; granulomatous uveitis (common in KSA, India) – give anti Tb and steroids Why? because you don't want the patient to have miliary TB.
  - Syphilis

Management:

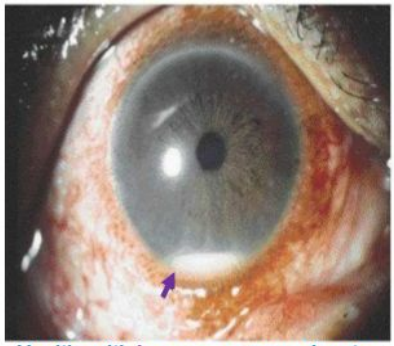
- Identify possible cause.
- Topical steroid "first".
- Topical cycloplegics to dilate pupils.
- Systemic immunosuppressive medication:
  "according to the workup,either shift to systemic or continue topical"
  - Steroid.
  - Cyclosporine.
  - Methotrexate.
  - Azathioprine.
  - Cyclophosphamide.
- Immunomodulating agents:
  - Infliximab (Anti TNF).



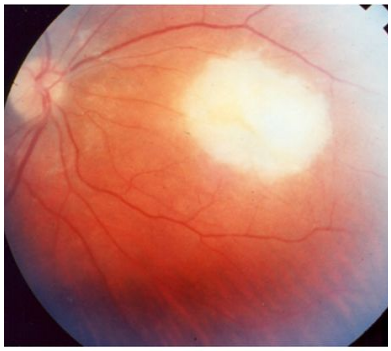
Ant. Uveitis with limbus inflammation



Uveitis



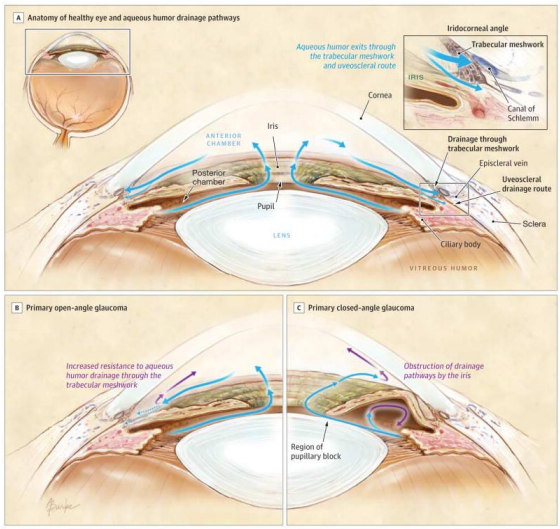
Uveitis with hypopyon secondary to Behçet disease



Patchy infiltration of uveitis secondary to toxoplasmosis

- **Acute angle glaucoma (موية زرقاء):**

Is caused by a rapid or sudden increase in intraocular pressure (IOP). High pressure inside the eye is caused by an imbalance in the production and drainage of fluid When the peripheral iris bunched up in the angel.
" Normal IOP 10 to 21 mmHg "



Result from peripheral iris blocking the outflow of fluid

Risk factor: more in hyperope pts since they have smaller eyes

symptoms:

- Pain
- Redness
- Mid-dilated pupil
- Decreased vision
- Colored halos around lights
- Severe headache or nausea and vomiting
- Increased Intraocular pressure

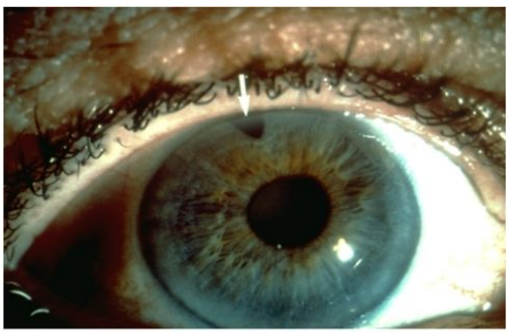
Typical history: symptoms increase while dimming the light. *Glaucoma increases at night more than morning because of **pupil dilation** at night.
e.g. patient came to the doctor complaining that he had eye pain whenever he watching a film and turn off the lights

Management:

- Medical treatment: is necessary to stabilize the eye and reduce the pressure before laser iridotomy(prevent prolapse of intraocular contents)"iv mannitol+ oral acetazolamide + topical beta blocker"
- Peripheral laser iridotomy will be curative in most cases. Aims to reduce the pressure and relieve the pain.

First reduce IOP by meds → then do iridotomy the ultimate treatment.
The prognosis depends on time of intervention. The earlier the better

Complications: Can cause severe visual loss due to optic nerve damage. The ultimate result



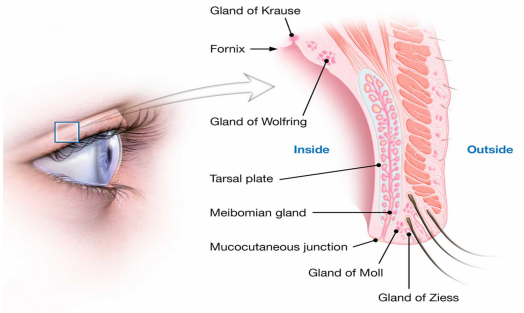
Post laser iridotomy

Halos around lights

Anatomy review:

Anatomy of upper eyelid: the septum is important as it separates the outside and inside the eye.

- Infection outside the septum is: **Preseptal cellulitis.**
- Infection inside the septum is: **Orbital cellulitis.**



• Preseptal cellulitis: *need to rule out orbital cellulitis.

also known as Periorbital cellulitis is an inflammation and infection of the eyelid and portions of skin around the eye, anterior to the orbital septum.

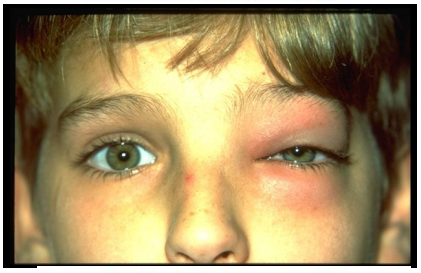
Symptoms:

- Lid swelling and erythema.
- **Normal** visual acuity, motility, pupils, and globe. Unlike Orbital cellulitis

Etiology:

- Skin wound
- Laceration
- Retained foreign body from trauma
- Vascular extension, or extension from sinuses (sinusitis) or another infectious site (e.g.,dacryocystitis, chalazion)
- Organisms:
  - Staph aureus most common
  - H.influenzae most common in < 5 yrs
  - Streptococci

Periorbital cellulitis



Periorbital cellulitis

Management:

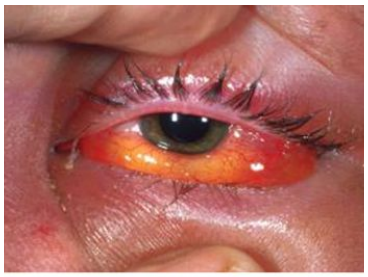
Need to be treated properly to avoid extension of the infection to the orbit which cause orbital cellulitis (inside).

- Warm compresses.(always warm for infections- we need vasodilation and subsequent increase in WBCs and chemotaxis)
- Systemic antibiotics "Augmentin" (no admission needed unless in case of a child)
- if not better or +ve history of trauma do → CT sinuses and orbit .

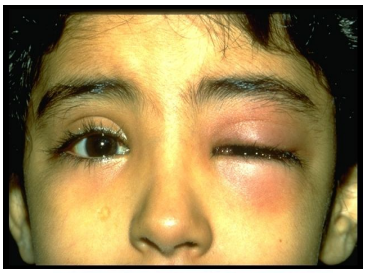
• Orbital cellulitis:

It most commonly refers to an acute spread of infection into the eye socket from either the adjacent sinuses or through the blood.

More serious than preseptal cellulitis because it may go to the brain and lead to death. Could be a consequence of preseptal cellulitis.



Orbital cellulitis

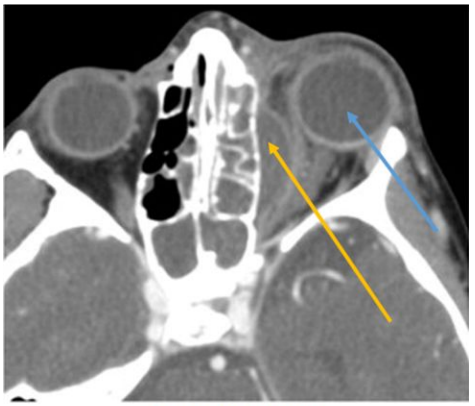


Orbital cellulitis

Symptoms: مو شرط كلهم

- Pain
- Decreased vision.
- Impaired ocular motility/double vision
- Afferent pupillary defect
- Conjunctival chemosis and injection Chemosis of the conjunctiva is a type of eye inflammation It occurs when the inner lining of the eyelids swells.
- Proptosis (bulging of the eye anteriorly out of the orbit)
- Optic nerve swelling on fundus exam

"Motility, pupil reaction, fundal exam, color vision need to be tested to check optic nerve function."



Orbital cellulitis
Collection of pus pushing the eye

Management:

- **Admission**.
- **Intravenous** antibiotics (vancomycin)
- Nasopharynx and blood cultures
- Surgery may be necessary

In case of subperiosteal abscess **Don't' drain immediately!** First give IV antibiotics until the inflammation subside, because you never know the abscess may go away spontaneously, if it doesn't go u need to drain it.
Complication: think of the brain: meningitis, abscess

• Endophthalmitis:

Endophthalmitis is the inflammation of the vitreous cavity, it's a EXTREME EMERGENCY as its a blinding disease that needs intervene within hours!
Potentially devastating complication of any intraocular surgery "Infection in vitreous cavity[1]"
Secondary to trauma or post-surgery (channel from outside to inside which cause bacterial entry and it found good environment to live in as there is no direct blood vessels in the vitreous to provide strong immunity) Sometimes the destruction is due to the inflammation not the infection itself.
Symptoms:

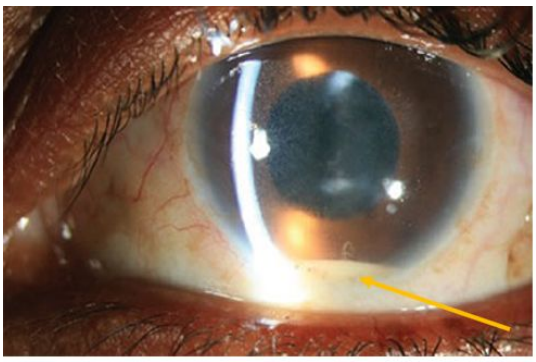
- Any **Early postoperative period** patient (within 6 weeks of surgery) complaining of PAIN or DECREASE VISION should be evaluated immediately

By looking at the eye it's sometimes difficult to differentiate between uveitis & endophthalmitis
what should we do??! **HISTORY!!!** Post surgery → Endophthalmitis
(e.g. patient Present 2-3 days post-op with Severe redness, lid edema and hypopyon on exam you find vitritis.
Management:

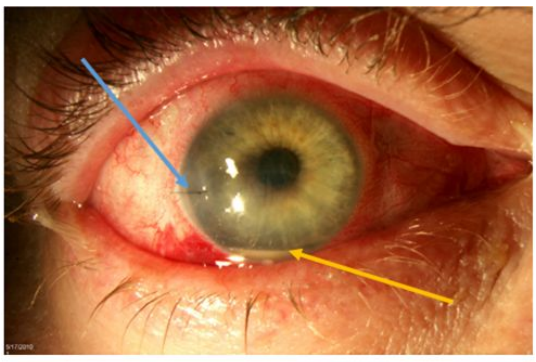
- Vitreous sample for culture.
- **Intravitreal** antibiotics injection plus topical antibiotics.

Broad spectrum antibiotics or **Vancomycin**

- In severe infection the vitreous will be like an abscess in this case surgery is needed to drain it (Vitrectomy).
- If visualization of vitreous is not possible in case of severe infection, do B scan (aka ultrasound)
- In decreased visual acuity (hand motion or less) Surgery is needed, if better give Intravitreal antibiotics only.
- Visual acuity will decide the treatment if Intravitreal antibiotics or surgery
- Do surgery – if no response to antibiotics and Endophthalmitis secondary to blebitis[2].



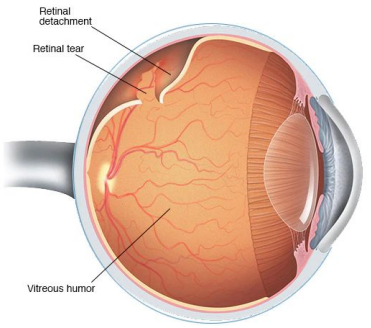
Endophthalmitis with hypopyon



Endophthalmitis (Note the sutured corneal wound and hypopyon)

[1] Other entity of endophthalmitis called "endogenous endophthalmitis, infection inside the body goes to the vitreous cavity
[2] Blebitis: is a presumed infection in or around a filtering bleb without vitreous involvement.

● Retinal detachment (انفصال الشبكية):



Separation between retinal pigment epithelium (RPE) and neurosensory layer. (neuronal layer from the pigmented layer). انفصال الطبقة الأخيرة عن التسعة اللي قبلها, not b/w retina and chroid..

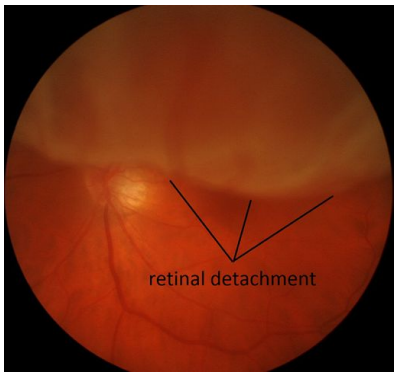
Retinoschisis: Separation between retina and choroid, no urgent intervention needed and usually congenital.

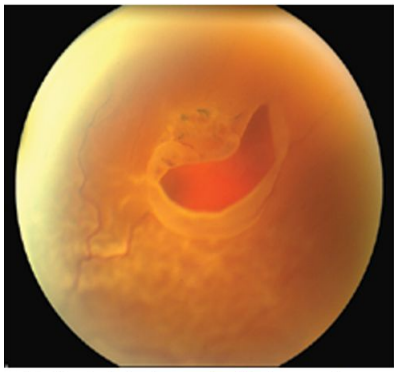
Rhegmatogenous retinal detachment: (emergency and need surgery) common in people with high myopia because they have peripheral breaks, fluid goes inside it and cause detachment.

Risk factors: people with high myopia -6 and above.

Symptoms:

- Flashes, floatersسر ابات تتحرك, a curtain or shadow moving over the field of vision.
- Peripheral and/ or central visual loss.
- History of scratching the eye
- Painless





Retinal detachment with horseshoe retinal tear

Management: Surgery Laser and vitrectomy.

The aim of the treatment is to close the causative break in the retina and to increase strength of the attachment between the surrounding retina and the RPE 'Retinal pigment epithelium' by inducing inflammation in that region.

- If involving the macula (Macula off) ⇒ poor prognosis and surgical intervention needed.
- In the periphery (Macula on) ⇒ better prognosis and can be treated by laser.

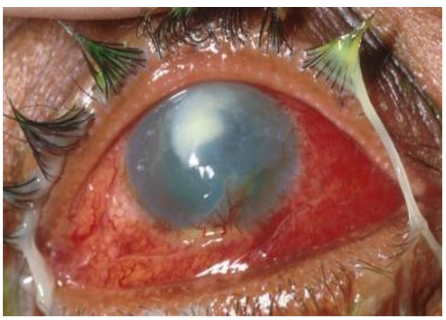
● Chemical injuries:

A vision-threatening emergency with a poor outcome. ليش نخاف منه اكثر شيء؟ cuz it could damage the stem cells

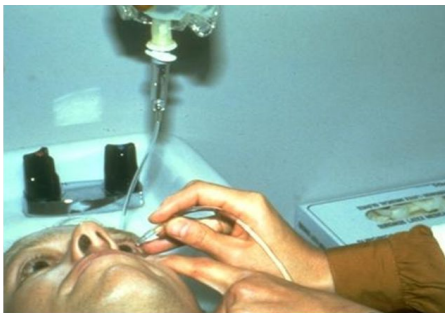
- The offending chemical may be in the form of a solid, liquid, powder, mist,vapor.
- Can occur in the home, most commonly from detergents, disinfectants, solvents, cosmetics, drain cleaners, **Alkaline** chemical injury is **worse** than acid more penetration.
- Can range in severity from mild irritation to complete destruction of the ocular surface.
- It may be aggressive and destroy eye surface "Epithelium" causing stem cell deficiency end up with blindness.
- Destruction of optic nerve common in case of glaucoma resulting from alkaline injury.

Management: poor prognosis

1. Immediate **irrigation** essential, preferably with saline or Ringer's lactate solution, for at least 30 minutes. *immediately before take history even*. اول شي نسويه
2. Irrigation should be continued until neutral pH is reached (i.e.,7.0)
3. Check for and remove foreign bodies in case of fireworks/Cement.
4. Instill topical antibiotic and anesthetic.
5. Frequent lubrications.
6. Oral pain medication.
7. Enhance healing

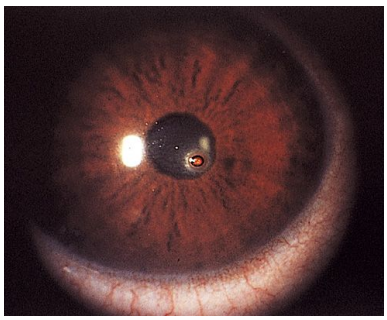


Alkali chemical burn



• Corneal & conjunctival foreign bodies:

- History of trauma
- Foreign body sensation
- Tearing

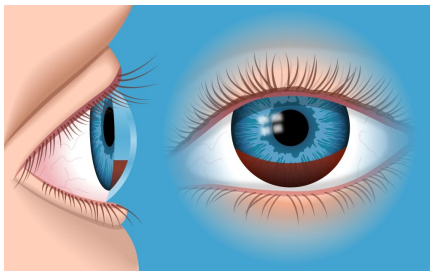


Management:

1. Instill topical anesthetic.
2. Remove foreign body.
3. Instill topical antibiotic.
4. Treat corneal abrasion.

*the foreign body could be hidden under the lid!

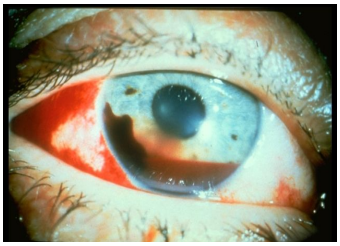
• Hyphema:



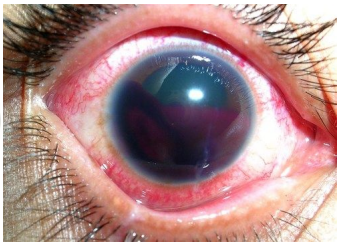
The presence of blood within the aqueous fluid of the anterior chamber.
Can occur with blunt or penetrating injury, in fact the most common cause of hyphema is "trauma".
doctors call it "8 Ball hyphema[3] " when it is filled with blood.

- Can lead to **high intraocular pressure.**
- Detailed history (Sickle cell[4]) to help in the treatment.

Management:



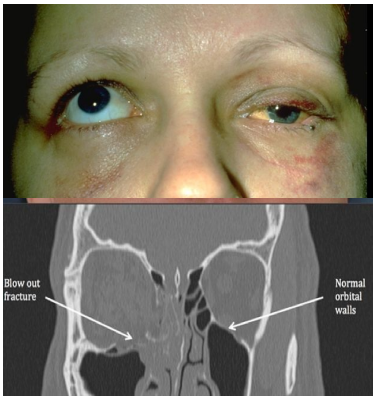
- Bed rest 2-3 days to prevent re-bleeding "no movement".
- Topical steroid to reduce inflammation
- Topical cycloplegic "Atropine" to fix the iris (pupil dilation) to prevent clotting & dislodging of the clot which cause re-bleeding.
- Anti-fibrinolysis agents (Tranexamic acid)
- Surgical evacuation "if no supentenouse resolve" usually we wait for 5 days, but in sicklers the time window is shorter we wait only for 2 days then we do surgery.



When do we take the pt to the OR?

- if increase IOP, stays more than five days and not responding to treatment.
- If total wait for 3 days if not responding and pressure more than 30 mmHg do Surgical evacuation,
- Not total wait for 5 days if pressure less than 30 mmHg.

• Orbital wall fracture:



An orbital fracture is a traumatic injury to the bone of the eye socket. These injuries are usually the result of blunt force trauma to the eye (*Blowout fracture*)
Assess ocular motility, sensation over cheek and lip
Palpate for bony abnormality (Enophthalmos; eye sinking inside)

When evaluating orbital fractures, focus on the following exam findings(from ophthobook):

1. **Vision, color:** Make sure the optic nerve isn't involved.
2. **Extraocular movements:** Usually decreased from swelling or muscle contusion, but make sure there isn't any gross muscle entrapment. If concerned, you can perform forced ductions. This involves pulling on the eye with forceps to see if the eye is mobile.
3. **Proptosis:** Measure the degree of proptosis or enophthalmos using the Hertel exophthalmometer (a fancy ruler).
4. **Palpate:** Feel along the orbital rim for step-off fractures and subcutaneous emphysema (air crepitus).
5. **Sensation:** Check sensation of the V1 and V2 sensation on the forehead and cheek. V2 runs along the orbital floor and can be damaged with floor fractures.

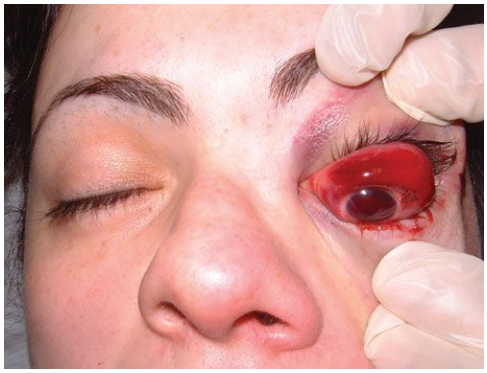
---

[3] "Eight-Ball" Hyphema. This hyphema completely fills the anterior chamber

[4] Moderate increase of IOP in sickle cell hemoglobinopathy patients may produced rapid deterioration of visual function, because sickling can lead to obstruction of the central retinal artery and profound irreversible visual loss.

- **Ruptured globe:** take the pt immediately to the OR

occurs when the integrity of the outer membranes of the eye is disrupted by blunt or penetrating trauma, the weakest part of the eye is insertion of the muscles and lamina cribrosa.

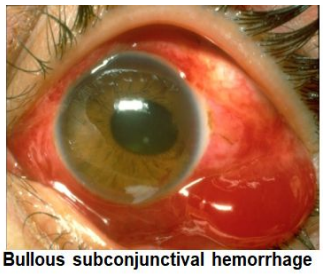


Etiology:

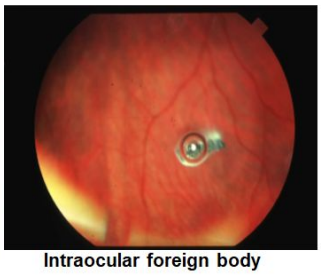
- Severe blunt trauma hit by a fist or tense ball
- Sharp object

Suspect a ruptured globe if:

- Bullous subconjunctival hemorrhage Take him to OR explore the area and suture if you leave it you'll still have infection.
- Uveal prolapse (Iris or ciliary body)
- Irregular pupil
- Hyphema
- Vitreous hemorrhage
- Lens opacity
- Lowered intraocular pressure
- Intraocular foreign body (if you have a foreign body first thing to do is take the pt t the OR to suture eye, then deal with the foreign body in another surgery you don't need to take it out immediately.)



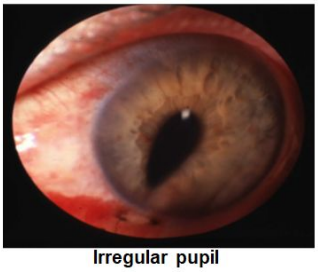
Bullous subconjunctival hemorrhage



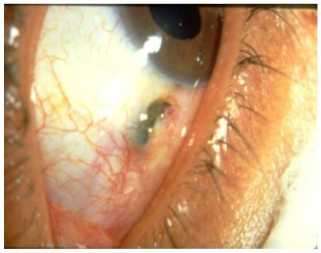
Intraocular foreign body

IF suspect a ruptured globe:

1. Stop examination.
2. Shield the eye.
3. Give tetanus prophylaxis.
4. Refer immediately to ophthalmologist.

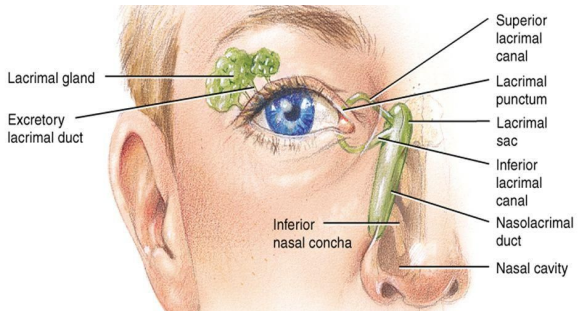


Irregular pupil



Uveal prolapse (Iris or ciliary body

- **Lid Laceration:**

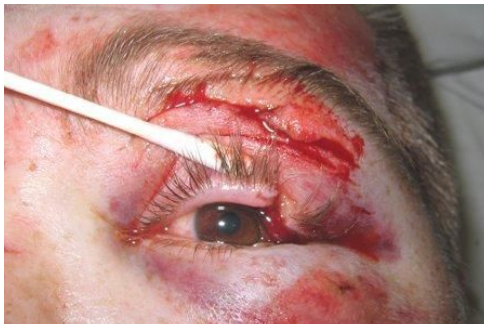


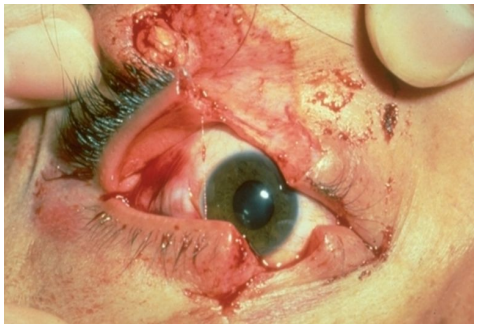
*it is not considered emergency unless it involves the canal

- Can result from sharp or blunt trauma
- Rule out associated ocular injury

غالبا العين ما راح تتأثر لكن الي يتأثر هي العضلات الي حواليها so we do surgery to realign the normal anatomy

Treatment: surgery (approximate the lids and close them following normal anatomy), If approximation is not following the normal anatomy: patient will have problems (the lids will be deformed, tearing won't be appropriate and the eye will be prone to infections).





Red Eye

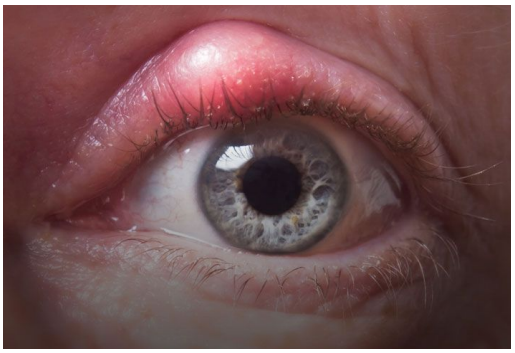
Differential diagnosis of RED eye

- ➔ **Conjunctival**
  - ◆ Blepharoconjunctivitis
  - ◆ Bacterial conjunctivitis
  - ◆ Viral conjunctivitis
  - ◆ Chlamydial conjunctivitis
  - ◆ Allergic conjunctivitis
  - ◆ Toxic/chemical reaction
  - ◆ Dry eye
  - ◆ Pinguecula/pterygium[5]
- ➔ **Lid diseases**
  - ◆ Chalazion[6]
  - ◆ Sty [7]
  - ◆ Abnormal lid function
- ➔ **Corneal disease**
  - ◆ Abrasion
  - ◆ Ulcer
- ➔ **Foreign body**
- ➔ **Dacryoadenitis**
- ➔ **Dacryocystitis**
- ➔ **Masquerade syndrome**
- ➔ **Carotid and dural fistula**
- ➔ **Acute angle glaucoma**
- ➔ **Episcleritis/scleritis**
- ➔ **Subconjunctival hemorrhage**
- ➔ **Factitious**

- **Blepharitis:**

(blef-uh-RYE-tis) is inflammation of the eyelids, usually involves the part of the eyelid where the eyelashes grow and affects both eyelids. Commonly occurs when tiny oil glands located near the base of the eyelashes become clogged.

Inflammation lid margin, Frequently associated with styes (Chronic inflammation of the lid margins), and Meibomian gland dysfunction, Adults > Children

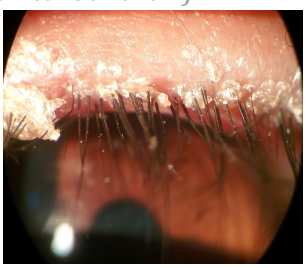


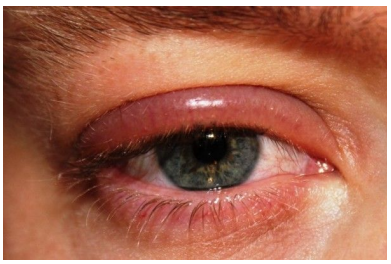
Symptoms & signs:

- Itchiness
- Soreness
- Worse symptoms in the morning
- Crusting of the lid margins in anterior blepharitis and redness in both (crust over eye lashes).
- Debris in the form of collarettes around the eyelashes (cylindrical dandruff).

Treatment:

- Lid hygiene (avoid mascara and eyeliner)
- Topical antibiotics
- Lubricants
- Warm compression





* these are the mainstay of the treatment will resolve if Not responding do surgery (eye incision and curettage)

[5] Pinguecula is a growth that looks like a yellow spot or bump on the conjunctiva. It often appears on the side of the eye near your nose. A pinguecula is a deposit of protein, fat, or calcium. Pterygium is a growth of fleshy tissue that may start as a pinguecula.

[6] A benign, painless bump or nodule inside the upper or lower eyelid. Chalazia (plural for chalazion) result from healed internal styes that no longer are infectious. These cyst-like nodules form around an oil gland (meibomian) within the eyelid, resulting in red, swollen eyelids.

[7] Also named hordeolum is an acute focal infection (usually staphylococcal) involving either the glands of Zeis (external hordeola, or styes) or, less frequently, the meibomian glands (internal hordeola).

Anterior blepharitis:
Inflammation of the lid margin is concentrated in the lash line and accompanied by squamous debris around the eyelashes.
The conjunctiva becomes injected. It is sometimes associated with a chronic staphylococcal infection. In severe disease the cornea is affected (blepharokeratitis). Small infiltrates or ulcers may form in the peripheral cornea (marginal keratitis) due to an immune complex response to staphylococcal exotoxins.

signs:

- Redness and scaling of the lid margins
- Some lash bases may be ulcerated – a sign of staphylococcal infection.
- Debris in the form of a collarette around the eyelashes (cylindrical dandruff). This may indicate an infestation of the lash roots by Demodex folliculorum .
- Reduction in the number of eyelashes.

Posterior blepharitis (or meibomian gland dysfunction)**:**
the meibomian glands are usually obstructed by squamous debris.

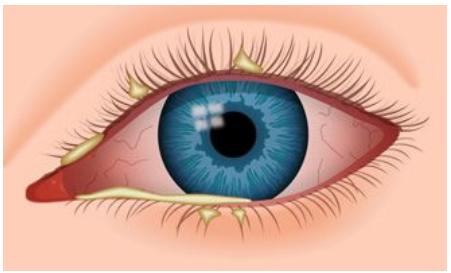
Signs:

- Obstruction and plugging of the meibomian orifices.
- Thickened, cloudy, expressed meibomian secretions.
- Injection of the lid margin and conjunctiva.
- Tear film abnormalities and punctate keratitis.

Both forms of blepharitis are strongly associated with seborrhoeic dermatitis, atopic eczema and acne rosacea. In rosacea there is hyperaemia and telangiectasia of the facial skin and a rhinophyma (a bulbous irregular swelling of the nose with hypertrophy of the sebaceous glands).

● Bacterial Conjunctivitis:

Both adults and children



Signs & symptoms:

- Redness
- Tearing
- Foreign body sensation
- Burning
- Stinging
- Photophobia
- Mucopurulent or purulent discharge
- Papillae
- lid and conjunctival edema.

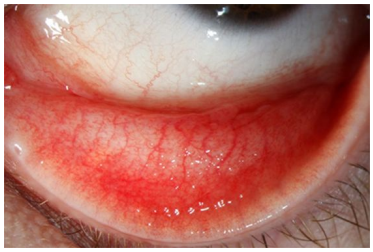
Organism: *Streptococcus pneumoniae, Staphylococcus aureus, Haemophilus influenzae, and epidermis.*

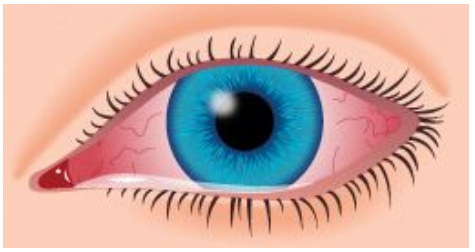
Management:

- Conjunctival swab for culture. ما ناخذ مسحه من اول مره الا بحالة طفل
- Topical broad spectrum "Fluoroquinolones:(ofloxacin, levofloxacin)"

● Viral Conjunctivitis:

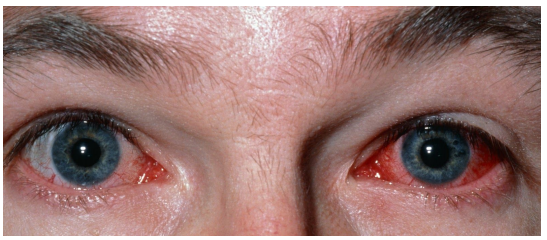
Hx of contact with someone with red eye.
"Contagious"





Signs & symptoms:

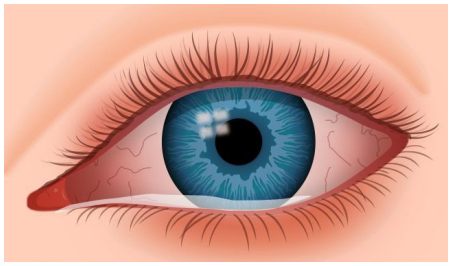
- Acute, watery red eye
- Soreness
- Foreign body sensation
- Photophobia
- Conjunctivitis is often intensely hyperaemic
- Follicles
- Haemorrhage
- Inflammation membranes
- Preauricular lymph node



Etiology: The most common cause is an adenoviral infection "URTI"
Treatment: no specific therapy but Cold compression are helpful

• Allergic Conjunctivitis:

Encompasses a spectrum of clinical condition "atopy", all associated with the hallmark symptom of **itching**
There is often a history of **rhinitis**, **sinusitis**, **asthma** and family history of **atopy**[8]

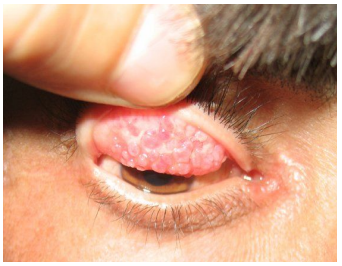


Signs & symptoms:

- Mild red eyes
- Itching
- Watery discharge
- Chemosis
- Papillary hypertrophy and giant papillae

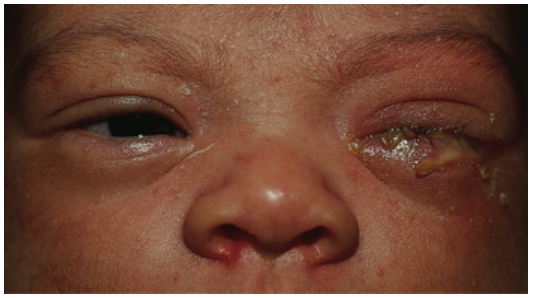
Treatment:

- Cold compress and eye rest
- Antihistamine
- Nonsteroidals
- Mast cells stabilizers
- Topical steroids (use it with caution to avoid reaching the steroid side effects)
  they'll love it and keep on using it resulting in glaucoma and cataract. (avoid it)



• Chlamydial Conjunctivitis:

Usually occur in sexually active individuals with or without an associated infection
Common in kids known as Ophthalmia neonatorum.



Signs & symptoms:

- Usually unilateral
- Tearing
- Foreign body sensation
- Lid crusting
- Mucopurulent discharge
- Follicles
- Non-tender preauricular node

Treatment: Oral tetracycline or azithromycin
If baby got infection during delivery, even the mother should be treated.

Now let's recap the differences b/w the types of conjunctivitis:

Bacterial conjunctivitis	Viral conjunctivitis	Allergic conjunctivitis	Chlamydial conjunctivitis
Mucopurulent discharge + Papillae	Watery discharge + Follicles + tender palpable Preauricular LN	Watery discharge + Papillae + nasal congestion + sneezing	Unilateral + Mucopurulent discharge + Follicles + Non tender palpable Preauricular LN

• Dry Eye:

Symptoms:

- Burning or foreign body sensation
- Trearing
- Usually bilateral

Etiology:

- Idiopathic
- Weather.
- Collagen vascular disease: Rheumatoid arthritis, sjogren syndrome
- Conjunctival scarring
- Infiltration of the lacrimal gland
- Vitamin A deficiency
- Drugs: Isotretinoin (Roaccutane) Excessive Vitamin A

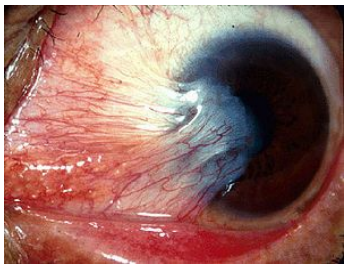
Treatment: Artificial drops

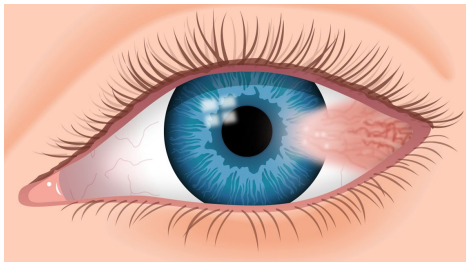
[8] Atopy refers to the genetic tendency to develop allergic diseases such as allergic rhinitis, asthma and atopic dermatitis (eczema)

• Pterygium لحمية العين:

Extension of conjunctiva, secondary to sun exposure prevention with sunglasses and lubricating with eye drops.

Fibrovascular membrane invading the cornea

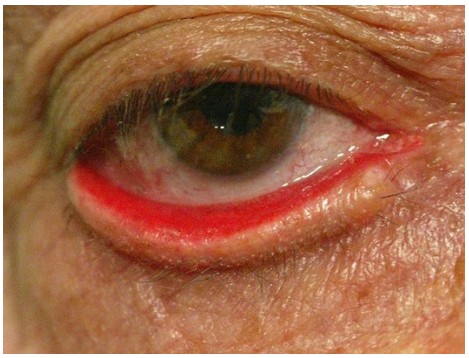




Indications of surgery:

- If affecting the central vision by involving central axis
- Suspicion of malignancy (squamous cell carcinoma)
- If it causes Astigmatism
- Cosmetic (if large)

• Lid Ectropion:



Ectropion is an eversion of the eyelid away from the globe.

causes:

- age - related orbicularis muscle laxity.
- Scarring of the periorbital skin.
- Seventh nerve palsy.

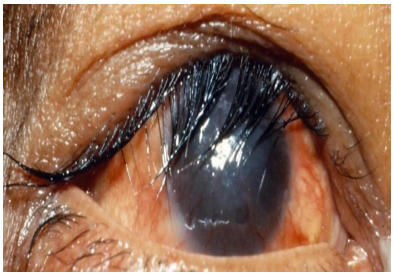
Symptoms:

- Dryness
- Redness
- excessive tearing

Treatment: Surgery by suturing the eyelid (Blepharoplasty)

The malposition of the lids everts the puncta and prevents drainage of the tears, leading to epiphora. It also exposes the conjunctiva and lower globe to dehydration . Ectropion causes an irritable eye. Surgical treatment is an effective treatment.

• Trichiasis:



Eyelashes growing toward the eye (Secondary to trachoma[9])

It is distinct from entropion (all lid inside يلف كل الجفن على جوا).

The lashes rub against the cornea and can cause irritation > abrasion > Ulcer.

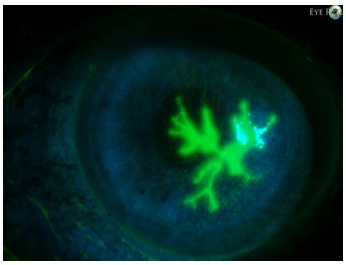
Treatment: adjust it by electrolysis

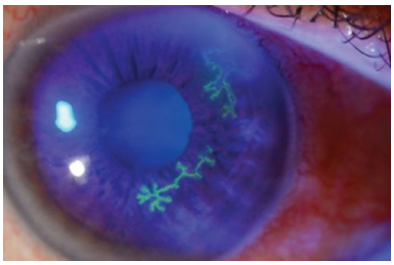
Surgery is needed in case of **Entropion**

• Infectious Keratitis: AKA corneal ulcer

Keratitis is infection of the cornea that can lead to corneal ulcer.

• HSV Dendrites (Herpes Keratitis):





Symptomes:

- Very red
- Swollen
- Painful

Management:

- **Fluorescein** staining to confirm (**dendritic pattern** seen on exam)
- Antiviral "Acyclovir"

*__NEVER__ **use steroids** for herpes keratitis, it makes the condition worse.

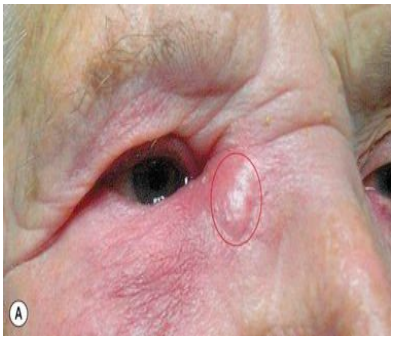
[9] Trachoma is an chlamydia trachomatis infection causes a roughening of the inner surface of the eyelids.

• Nasolacrimal Obstruction:

Can lead to Dacryocystitis:

Closed obstruction of the drainage system predisposes to infection of the sac (Dacryocystitis)

*if the lacrimal GLAND get affected we call it: Dacryoadenitis



Symptomes:

- Pain
- Redness
- Swelling over the innermost aspect of the lower eyelid
- Tearing
- Discharge

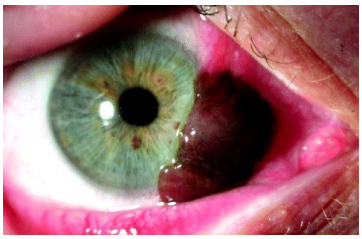
Organisms: *Staph aureus, streptococcus,* and *diphtheroids*

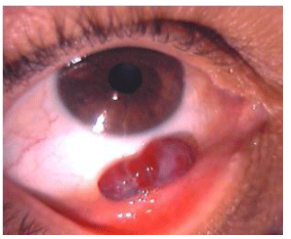
Treatment:

1. Systemic antibiotic until infection subside
2. Surgical drainage to open the lacrimal sac "Dacryorhinostomy"

lacrimal obstruction > open surgically.

Dacryocystitis > Antibiotic then later open surgically.





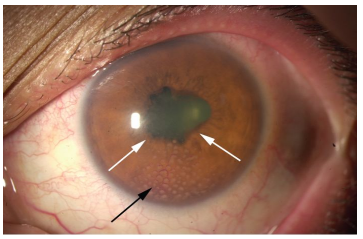
• Conjunctival Tumor:

Melanoma and can be associated with Masquerade syndrome.

• Iritis:

Associated with TB

WBC attached to the back of the cornea called **"Keratic precipitates"** النقط البيض



• Episcleritis:

This inflammation of the superficial layer of the sclera

Symptoms:

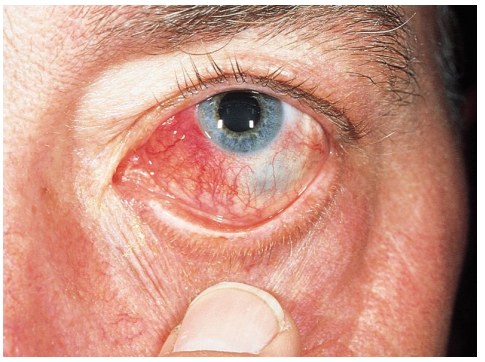
- Localized(sectorial) or diffuse redness
- Asymptomatic or mild pain/discomfort
- Usually self-limited.

Etiology: Mostly idiopathic, but Sometimes associated with gout (if so check uric acid)

Treatment: Topical or systemic NSAIDs.

• Scleritis:

This is a more severe condition than episcleritis, and may be associated with the collagen vascular diseases, most commonly rheumatoid arthritis, but also polyarteritis nodosa and SLE. It is a cause of intense ocular pain. Both inflammatory areas and ischaemic areas of the sclera may occur.



Symptoms:

- Severe Pain and tenderness (unlike episcleritis)
- Tearing
- Photophobia
- Localized or diffuse redness and swelling
- Nodules

Etiology: 30 to 60% associated with systemic disease e.g. RA

Complications: Can result in scleral necrosis (scleromalacia perforance)

scleral thinning, sometimes with perforation, keratitis, and uveitis.

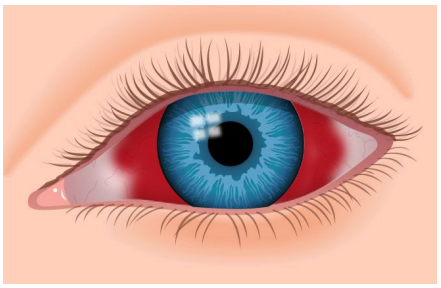
Treatment: Steroids (may need **systemic**)

Test: phenylephrine > cause vasoconstriction:

bleached > conjunctivitis.

not > scleritis.

- **Subconjunctival Hemorrhage:**



Symptoms:
- Usually asymptomatic
- Blood underneath the conjunctiva, often in a sector of the eye

Etiology:
- Idiopathic
- Valsalva (coughing or straining)
- Traumatic
- Hypertension
- Bleeding disorder

Treatment: mostly it's self limiting, but most importantly is to identify the cause, it could be the earliest sign of leukemia **(No need for treatment it is caused by trauma but if you suspect lymphoma, leukemia do CBC)**

Red Eye Treatment Algorithm

History
- Trauma
- Contact lens wearer
- Severe pain/photophobia
- Significant vision changes
- History of prior ocular disease

Exam
- Abnormal pupil
- Ocular tenderness
- White corneal opacity
- Increased intraocular pressure

YES ??! ➡ refer urgently to ophthalmologist

Is it Conjunctivitis?

History:
- Itching? → Allergy, Viral
- Exposure to person with red eye → Viral
- URTI → Viral
- Past history of conjunctivitis → Allergy
- Discharge with morning crust → Allergy, chlamydia
- Exposure to drug → Allergy

Signs:
- Discharge → Bacterial, chlamydia(depends on the nature of discharge)
- Lid and conjunctival edema → Bacterial
- Conjunctival redness
- Preauricular lymph node → Viral
- Facial or eyelid vesicles→ HSV

Summary from 435 team
Hyphema is defined as the presence of blood within the aqueous fluid of the anterior chamber. The most common cause of hyphema is "trauma". it Can lead to high intraocular pressure and usually treated with-Bed rest , Topical steroid and Topical cycloplegic . **Corneal abrasions** result from a disruption or loss of cells in the top layer of the cornea, called the corneal epithelium. the patient come with foreign body sensation, photophobia and severe pain. **Alkaline chemical injury** to the eyes is worse because it'll penetrate. Immediate irrigation is very important as management . **Inflammation of the uveal tissue** (iris, ciliary body, or choroid), retina, blood vessels, optic disc, and vitreous can be involved. and we treat it first with topical steroids . **Orbital cellulitis** More serious than preseptal cellulitis because it may go to the brain and lead to death. May be a consequence of preseptal cellulitis. **Endophthalmitis:** (extreme ophthalmic emergency) treated with Intravitreal antibiotics injection plus topical antibiotics.

Viral conjunctivitis	Bacterial conjunctivitis
Bilateral	Unilateral
Watery discharge	purulent , thick discharge
Easily transmissible	Poorly transmissible
Normal vision	Normal vision
Itchy	Not itchy
Preauricular adenopathy	No adenopathy
No specific treatment	Topical antibiotic

	Conjunctivitis	Uveitis	Glaucoma	Abrasion
Presentation	Itchy eye, dicharge	Autoimmune disease	Pain	Trauma
Eye finding	Normal pupils	Photophobia	Fixed midpoint pupil	Feels like sand in my eye
Most accurate test	Clinical diagnosis	Slit lamp examination	Tonometry	Fluorescein stain
Best initial therapy	Topical antibiotics	Topical steroids	Acetazolamide, mannitol, pilocarpine, laser trabeculoplasty	No specific therapy; patch not clearly beneficial

MCQs

30 years old girl came to uveitis clinic complaining of pain and fat keratic precipitate. -redness. Examination showed mutton What is the most common diagnosis? TB

Which conjunctivitis is least likely to occur bilaterally?

A. allergic
B. Viral
C. bacterial
D. vernal

The correct answer is (c) bacterial. Allergies are likely to affect both eyes and present with itching and watering. Vernal is a type of seasonal allergy you see in young boys. Viral conjunctivitis usually starts in one eye, but hops to the other eye as it is very contagious. Bacterial conjunctivitis can occur bilaterally, but of the available choices is most likely to occur in just one eye

A young 23-year-old black man presents with a hyphema in the right eye after blunt injury. All of the following are acceptable initial treatments except?

A. sleep with the head elevated
B. prednisolone steroid eye drops
C. cyclopentolate dilating drops
D. carbonic anhydrase inhibitor pressure drops

The correct answer is (d). For patients with hyphema (blood in the eye) advise them to avoid straining and sleep with their heads elevated to allow the blood to settle. Use steroids to decrease the inflammation and a medium-acting cycloplegic to dilate the eye for comfort and to keep the inflamed iris from "sticking" to the underlying lens. If the pressure is high, you can use pressure drops, but we avoid CAIs in African Americans as it induces RBC sickling in sickle-cell patients. You can get a sickle prep if you are suspicious for this disease.

A 7-year-old boy presents with a grossly swollen eyelid. His mother can't think of anything that set this off. What finding is most characteristic of a dangerous orbital cellulitis?

A. chemosis
B. warmth and erythema of the eyelid
C. physically taut-feeling eyelid
D. proptosis

The correct answer is (d). With any eyelid cellulitis, you must determine if the infection is pre-septal or post-septal (i.e., orbital cellulitis). While chemosis is certainly seen with orbital infection, a proptotic bulging eye is even more indicative of orbital infection. Other signs include decreased eye-movement, pain with eyemovement, and decreased vision

What location for a retinal detachment would be most amenable to treatment by pneumatic retinopexy?

A. inferior rhegamatogenous detachment
B. superior tractional retinal detachment
C. superior rhegamatogenous detachment
D. traumautic macular hole

This question covers several concepts. Rhegamatogenous detachments are the classic detachment occuring from a break in the retina. A pneumatic retinopexy is the technique of injecting a gas bubble into the eye that floats and tamponades the break. Gas bubbles require careful head-positioning and work best for superior breaks (patients can't stand on their heads for weeks for inferior breaks). The correct answer is therefore (c).

A 27-year-old contact lens wearer presents to the ER complaining of ocular irritation. On exam he has a small 2mm corneal abrasion. You should

A. treat with erythromycin ointment
B. treat with ciprofloxacin drops
C. bandage contact lens for comfort and speed reepithelialization
D. patch the eye and follow-up in 72 hours

You need to be concerned for pseudomonas infection in any contact lens wearer. Erythromycin is great stuff, but these higher risk patients should get something stronger like a fluoroquinolone (cipro). A bandage contact lens can help with painful abrasions, but I'd avoid one in this patient as the abrasion isn't big, and you typically don't patch ulcers. Patching can also be used to help with lubrication and comfort, but I never patch a potential infection, as bacteria like to grow in dark warm environments. If you decide to patch, you need to see your patient daily to make sure nothing is brewing under that patch. The most appropriate answer is (b).

10. A woman presents to you complaining of a red, watering eye for the past two days with stinging and some photophobia. Her vision has dropped slightly to 20/30. She has a history of diabetes and is taking drops for glaucoma, but is otherwise healthy. The most likely cause of her redness is:

A. angle-closure glaucoma
B. viral conjunctivitis
C. diabetic retinopathy
D. papilledema

This woman probably has a history of POAG (primary open angle glaucoma) if she is on drops. If she were to have an acute angle closure, her eye would be very painful and the vision would have gotten much worse from corneal edema. Diabetic retinopathy is usually a background finding of leaky vessels in the retina and doesn't create this picture. She merits a full eye exam, but her symptoms are consistent with "pink eye," with viral conjunctivitis being the most common cause in an adult. The correct answer is therefore (b).

A patient presents after MVA with a fracture of the orbital floor. What would be the indication for surgery in the near future?

A. double vision that worsens with upgaze
B. chemosis and moderate proptosis
C. restricted forced ductions
D. decreased extraocular movement

Floor fractures are very common and these patients always look impressively bad on exam, with marked swelling and subconjunctival bleeding. They can have decreased EOMs and proptosis from this swelling alone, which shouldn't concern you. More worrisome is entrapment of the inferior rectus muscle in the orbital floor – this entrapment can only be determined by forced ductions … grab the limbus with forceps and tug on the eye to see if movement is restricted. The correct answer is (c).

Which orbital bone is most likely to fracture with blunt trauma to the eye?

A. zygomatic
B. maxillary
C. ethmoid
D. sphenoid

The orbital floor, which is formed by the maxillary bone, is the most commonly fractured wall of the orbit. Orbital fat will commonly herniate through this bone and muscle can get stuck if the break acts like a trapdoor. The ethmoidal lamina papyracea is also often broken because it is the thinnest, but this occurs less often because of extensive bolstering. The lateral zygomatic component of the orbit is rarely broken, nor the more posterior sphenoid. The correct answer is (b)

A 32-year-old white man with a history of type-1 diabetes presents to you complaining of decreased vision. He has not seen an eye doctor in years. On exam, you find numerous dot-blot hemorrhages, hard exudates, and several areas of abnormal vasculature in the retina. Pan-retinal photocoagulation might be done in this patient to:

A. kill ischemic retina
B. tamponade retinal tears
C. ablate peripheral blood vessels
D. seal off leaking blood vessels

PRP is performed to kill areas of peripheral ischemic retina. By doing so, less VEGF is produced, leading to cessation and regression of neovascularization. While it is true that we sacrifice some of the peripheral retina with PRP, it is worth it to save important central vision. Lasers can be used to help peg down retinal tears and to help with leaking vessels … but this is called "focal laser therapy." The correct answer here is (a).

Which of the following is a risk factor for retinal detachment?

A. black race
B. male sex
C. presbyopia
D. myopia

The correct answer is (d) myopia. Myopic (near-sighted) eyes are large eyes with a stretched-out retina that is more likely to tear at the periphery. Neither blacks nor males are at higher risk of RD. Presbyopic lens hardening occurs with age and doesn't have anything to do with the retina

A 57-year-old man complains of flashing lights and a shade of darkness over the inferior nasal quadrant in one eye. On exam you find the pressure a little lower on the affected eye and a questionable Schaffer's sign. What condition would lead you to immediate treatment/surgery?

A. macula-off rhegmatogenous retinal detachment
B. epi-retinal membrane involving the macula
C. dense vitreous hemorrhage in the inferior nasal quadrant
D. mid-peripheral horseshoe tear with sub-retinal fluid

Schaffer's sign is when you see pigment behind the lens on slit-lamp exam, and occurs when a tear of the retina allows the underlying pigment to release into the vitreous chamber. A macula-off retinal detachment is unfortunate, but isn't an immediate emergency. It certainly needs to be repaired, but can wait for a few days if necessary, as the damage to the detached macular photoreceptors has already occurred. Epi-retinal membranes are common and aren't an emergency unless actively creating a tractional detachment. Vitreous hemorrhage is not an emergency either, assuming there isn't a detachment behind that blood on your ultrasound. Smaller retinal tears, however, need to be treated early to make sure they don't progress and peel off the macula. The answer is (d).

Oral doxycycline helps blepharitis patients by:

A. antibiotic tear secretion
B. changing lipid viscosity
C. inhibiting cytokine release
D. improved lacrimal gland excretion

Doxycycline changes the lipid viscosity of the meibomian gland secretions, improving oil secretion from the gland into the tear film. This superficial lipid layer is needed to keep the tears from evaporating too quickly. The correct answer is (b).

A man calls the office complaining of eye pain after splashing bleach in his eye. You should instruct him to:

A. patch the eye and immediately go to the office
B. irrigate the eye for 15 minutes and then go to the office
C. immediately apply lubricating ointment and then go to the office
D. immediately wash the eye with contact saline solution and go to the office if he notices any change in vision

The final visual outcome for a chemical burn is going to depend upon how quickly the chemical is washed out of the eye, so have your patient wash out their eye immediately! Chemical injury is one of the few eye problems that you treat prior to checking vision. The correct answer here is (b).

What antibiotic would you use in a newborn with suspected chlamydial conjunctivitis?

A. Ciprofloxacin drops
B. Erythromycin drops
C. Oral Doxycyline
D. Erythromycin drops and oral erythromycin

Chlamydia is one cause of conjunctivitis you should suspect in the newborn. Treatment involves topical drops such as erythromycin and systemic coverage because of concurrent respiratory infections these kids can develop (chlamydia infects mucous membranes and can cause pneumonitis). You don't use doxy in children (especially under the age of eight). Fluoroquinolones might work, but we don't use them in children because of theoretical bone suppression. The correct answer is (d).

OphthoBook

1. You have a contact lens wearer with a small corneal abrasion. He is in excruciating pain and requests that you pressure-patch his eye for comfort. Will this speed up healing?
Patching may speed healing by keeping the eye immobile and lubricated but you should never patch an abrasion that might fester an infection. Thus, you don't patch contact lens wearers as you don't want a pseudomonas infection brewing under that patch! If you decide to patch a patient, you should really follow them closely to make sure they don't develop an ulcer.

2. What's the easiest way to see a corneal abrasion? How often do you need to follow simple, non-infected abrasions?
Abrasions are easiest seen with fluorescein under the slit-lamp microscope, though large abrasions can be detected with only a handlight as the edges of the abrasion create a circular shadow on the iris underneath. You'll want to measure the epithelial defect and see the patient often (sometimes daily), until it heals to make sure they don't become infected.

3. What is the Seidel test?
This is a method to see if a laceration has penetrated completely through the cornea. Basically, you're using fluorescein to look for leaking aqueous fluid.

4. What findings would prompt you to take a patient with an orbital floor fracture to surgery?
If the patient has muscle entrapment or significant enophthalmos. Most patients have some degree of EOM restriction from soft-tissue swelling. Entrapment causing reflexive bradycardia would also push you toward surgery.

5. What portion of the eyelid do you worry about with lid lacerations?
If the laceration is medial (near the nose) it could involve the tear drainage pathway. These canalicular tears are more complicated to repair.

6. A patient accidentally splashes a large amount of bleach-based cleaner in her eye. What should she do?
Wash it out immediately - the faster, the better!!!! If an ambulance picks her up, have the EMTs irrigate in route, and alert the ER to irrigate her eyes as soon as she hits the door.

7. What is the best way to test the pressure in an eye with a likely open globe injury: with slit-lamp applanation or with the hand-held tonopen?
If you suspect open globe, you don't want to be mashing on the eye, so neither of these is correct. This is a trick question … hahahahaha! Seriously, though, don't push on the eye.

8. How often should a patient with a hyphema be seen and why?
These patients need to be seen almost daily for the first week to check for pressure. This is especially important on post-trauma days 3 – 5 as this is when clots begin to retract and rebleed.

9. An African American presents with hyphema after trauma. What additional workup might you consider? Are there any medications you would avoid?
You may consider getting basic coagulation labs and a sickle prep. Avoid CAIs as these promote acidosis and can worsen sickling of blood in the anterior chamber and worsen glaucoma.