1-conjuctival injection:

Dilation of the conjuctival vasculture.


1- bacterial conjunctivitis:

*Symptoms:

1. Redness (conjunctival injection).
2. ***Purulunt*** discharge.
3. Ocular ***irritation*** (NOT PAIN)

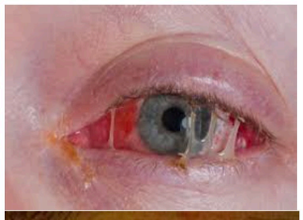
*causative organism:

Staphylococcus, streptococcus, Pneumococcus and haemophilus.

*Tx: (usually it's self limiting):

-topical Broad spectrum antibiotic eye drop (chloramphenicol)

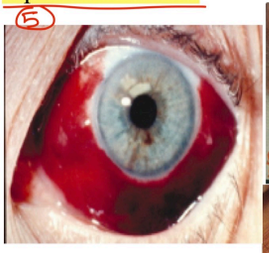
- Conjunctival swabs for culture is indicated In severe cases or if there is no resolution.

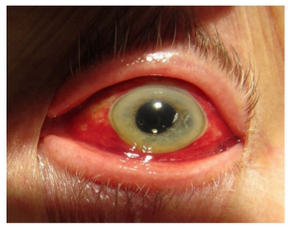



2- subconjuctival hemorrhage:

Bright red in colour because it's fully oxygenated through the ambient air through the conjunctiva.

Ddx: high blood pressure, **trauma to the eye most common cause**, or a base of skull fracture if you can't see the posterior border, warfarin or aspirin side effect.



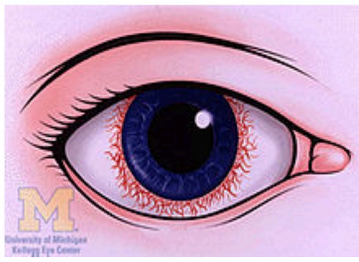



1- ciliary flush (injection).

Redness is localized to the limbus.

3 important Differential diagnosis:

- Keratitis – uveitis - acute glaucoma



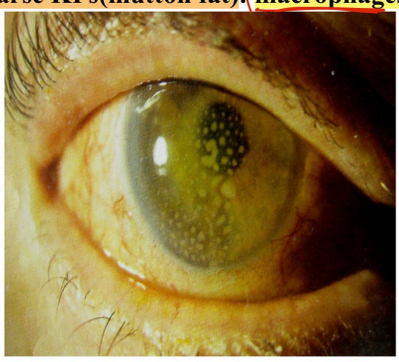

3- keratic precipitates KPs:

Deposits of cells on the corneal endothelium.

-Fine KPs: **neutrophils, lymphocytes.**

Coarse KPs(mutton fat): **macrophages**

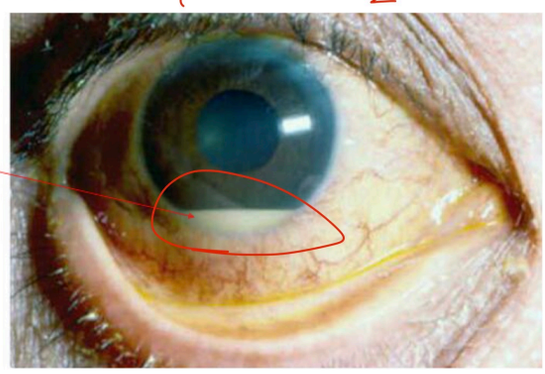




5- Hypopyon

collection of WBCs in the anterior chamber.

causes : bacterial keratitis , ant. Uveitis



1- herpex simplex keratitis:

-most common cause: herpes simplex virus type 1 (HSV1).

-primary infection it may causes conjunctivitis then followed by resolution and latency of the virus in the trigeminal ganglion.

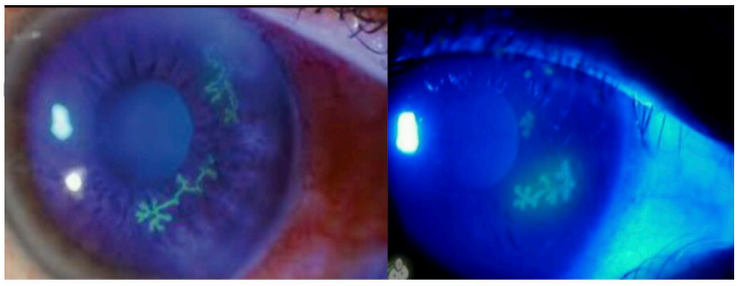
-reactivation of the virus increases if the pt is debilitated (systemic illness,immunosuppression).

It Causes Dendritic ulcer.

Maybe associated with uveitis and glaucoma.

* **Tx:** topical antivirals (Aciclovir). Topical steroids is contraindicated, they may excacerbate the condition.

Dendritic ulcer may heal with scar which may need a corneal graft to restore vision in severe cases.



Sign: Dendritic ulcer

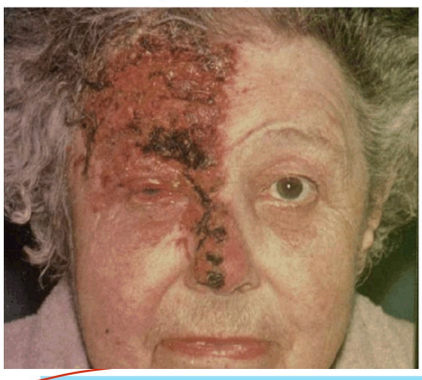
Causative cause: HSV-1

Risk factors: contact lens, prolonged steroid treatment

Ttt: Topical Acyclovir

2-Herpes zoster ophthalmicus (ophthalmic shingles):

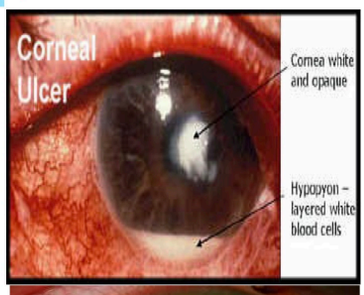
FIGURE 2. Case of herpes zoster ophthalmicus

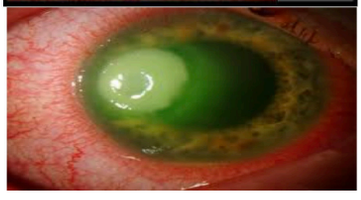


- **cause**: varicella zoster
- **ocular manifestations** : lid swelling , keratitis , iritis , secondary glaucoma , pain and vesicles at the ophthamic divion of the trigiminal nerve .
-there is usually a prodromal period where the pt is systemically unwell.

tx :
-oral antivral (acyclovir, famciclovir) within 3 days of vesicles eruption for reducing the neuralgia.
-topical steroids for ocular disease
-antibacterials to cover secondary infection.

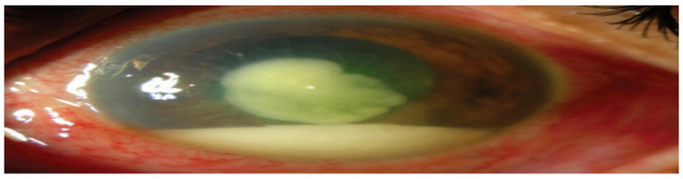
4-Bacterial keratitis





***Signs and symptoms:**
Severe pain, purulent discharge, ciliary injection (flush), visual loss(if the visual axis is involved), hypopyon(a mass of WBCs collected in the anterior chamber), white corneal opacity.

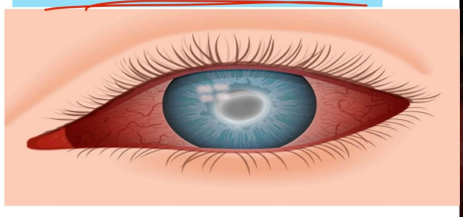
Bacterial keratitis



either fluroquinolones (ciprofloxacin, ofloxacin)as monotherapy, or combined therapy : cefuroxime against G+ve

-**3 serious findings**: hypopyon, ciliary flush, corneal cloudiness
-**Microorganisms**: staph epidermidis, staph aureus, strep pneumonia.
-**RFs**: keratoconjuctivitis sicca (dry eye),contact lens, breach in the epithelium by surgery or trauma, prolonged use of steroids.
-**TX**:topical broad spectrum antibiotics.

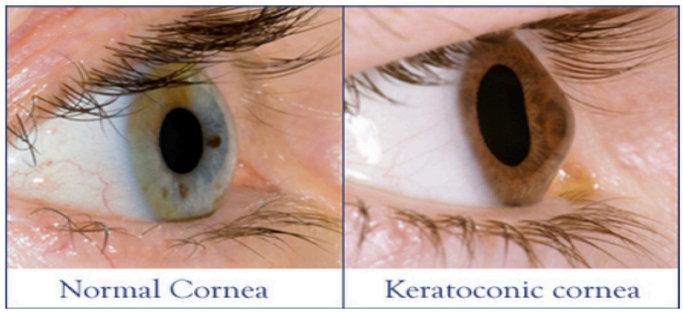
5-acanthamoeba keratitis:



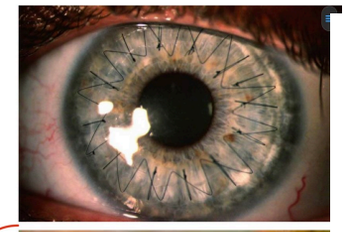
-**also named as infective keratitis.**
-**fresh water amoeba**
-**associated highly with soft contact lenses**
Extremly painful keratits with prominent infiltrated corneal nerves.
The amoeba can be isolated from the cornea or from the contact lens
Tx: Topical chlorhexidine, PHMB,propamidine.

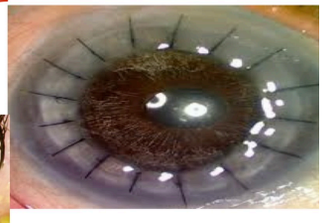
1-Keratoconus:

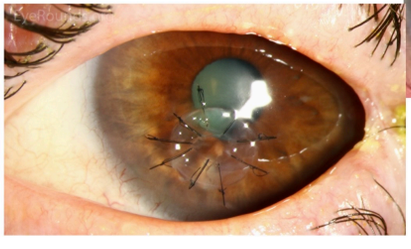
-sporadic, occasionally inherited.
sx; marked myopia, irregular astigmatism , vision loss (painless).
signs; fleisher's ring , apical scar , vogt's stiae, prominent corneal nerve.
mgt : astigmatism corrected by :glasses , contact lenses , UVA radiation in the presence with riboflavin, corneal graft.



Surgery name: corneal transplantation, corneal grafting
Indications: to restore corneal clarity or repair a perforation in these conditions:
keratoconus, traumatic scar, herpes infxn, corneal dystrophy, interstitial keratitis with marked opacity and decreased visual acuity, decompensated cornea in old ages.
-postop :steroid eye drops to prevent graft rejection.
Complications: rejection, astigmatism, endophthalmitis, recurrence of previos pathology, cataract.







-***Penetrating keratoplasty:*** When the entire cornea is replaced.
-***lamellar keratoplasty:*** when only part of the cornea is replaced.
-***Indications for penetrating keratoplasty:***
-pseudophakic bullous keratopathy(m.c.c in developed countries).
-keratoconus (m.c.c in developing countries).
-corneal degeneration.
-keratoglobus.
-Corneal dystrophy.

*Corneal graft rejection:

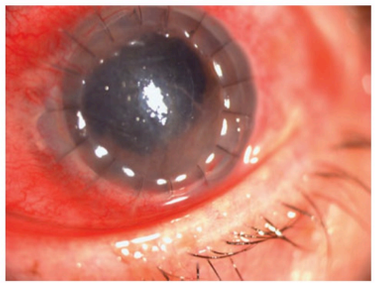
Any patient with:

Red eye, pain or visual loss and had a corneal graft must be seen urgently.

- Examination:

Graft edema,iritis, and a line of activated T-cells attacking the graft endothelium

Tx: intensive topical steroid application can restore graft clarity.



Scleritis	Episcleritis
Associated usually with RA, SLE,polyarteritis nodosa	Inflammation of the superficial layer of the sclera
Elderly, usually ass. With systemic diseases	Young age, rarely associated with systemic disease
Intense ocular pain with swelling of the sclera	Self limiting
complications: sclera thinning,keratitis,uveitis, cataract formation, glaucoma	Topical anti-inflammatory and NSAIDs

*Classification of glaucomas:

1-Primary glaucoma:

*chronic open angle.

*Acute and chronic closed angle.

2-Congenital glaucoma:

*Primary.

*Secondary to maternal rubella infection.

*secondary to inherited ocular disorders (ex:aniridia-absence of the iris).

3-Secondary glaucoma(causes):

*Trauma.

*ocular surgery.

*Associated with other ocular dx, uveitis.

*Raised episcleral venous pressure.

*steroid induced.

Chronic open angle glaucoma:

Tx:

1-Medical:

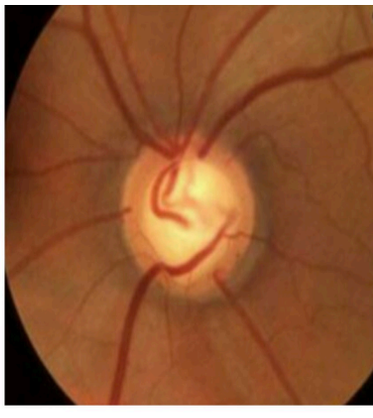
drugs ; prostaglandin , B-blocker , carbonic anhydrase inhibitor.

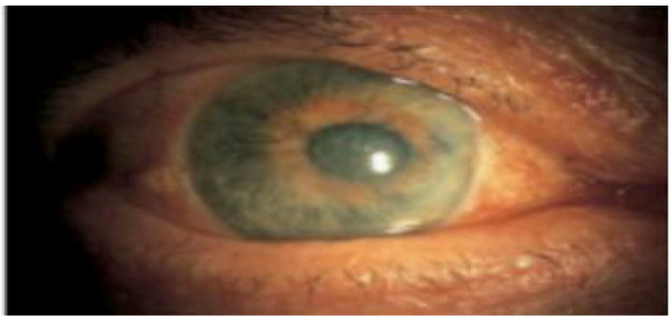
If IOP remains elvated:

2-laser tx: (laser burns to the meshwork).

3-surgical drainage procedures:

TRAB (Trabeculectomy).

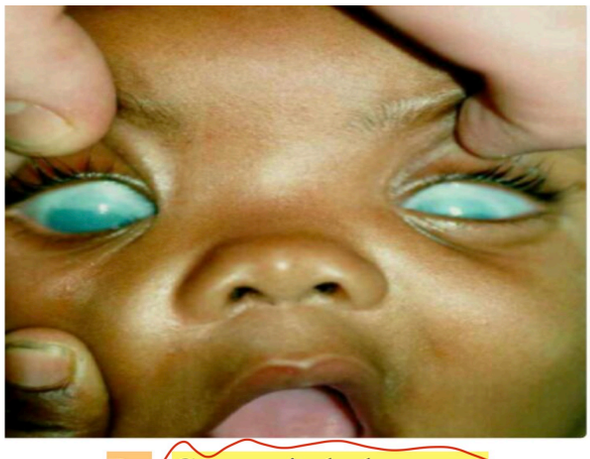




Acute closed angle glaucoma

c/p: cloudy cornea , fixed mid-dilated pupil (oval shaped).

Mgt: IV acetazolmide, topical pilocarpine , B-blocker , iridotomy by YAG laser or lensectomy



Dx: Congenital glaucoma

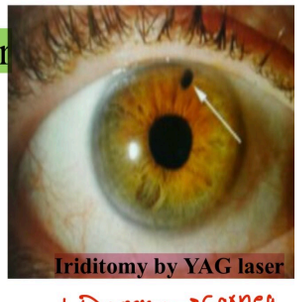
Signs: enlarged globe (buphthalmos), watering, cloudy cornea

-Procedure name :

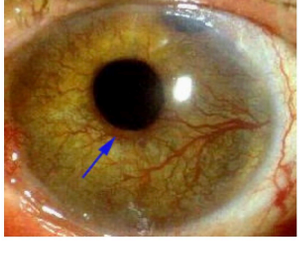
peripheral Iridotomy (by YAG laser or surgery you should differentiate btween them).

-indication: acute closed angle glaucoma, iris melanoma.

-complications: damage to the cornea and the lens, intraocular inflammation, iris bleedig, pigment dispersion .


Iriditomy by YAG laser

1. Damage → cornea Lens
2. IO inflamation
3. iris bleeding
4. Pigment depressi



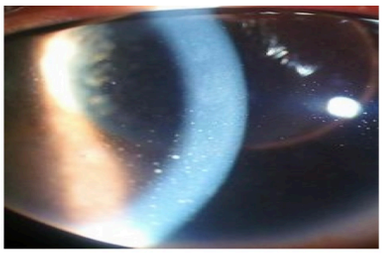
Rubeosis iridis

-is a medical condition of the iris of the eye in which new abnormal blood vessels (i.e. neovascularization) are found on the surface of the iris.

-**causes**: retinal detachment , oculae syndrome, Diabetic retinopathy

-***Mgt:*** Anti VEGF , Pan retinal photocoaagulopathy .

-It causes secondary glaucoma.



Sign: Keratic precipitate

Dx: Ant. Uveitis

Complications: Glucoma, cataract, chronic iritis

Systemic diseases may be associated with: Akylosing spondylitis

Treatment of uveitis

-***In anterior uveitis***:

-***topical*** steroids (eye drops).

-Prophylactic mydriatics (cyclopentolate) to prevent posterior synechiae formation, and relieve the pain from the ciliary spasm by dilating the pupil

-Subconjunctival mydriatics to break resistant synechiae

-***In posterior uveitis*** :

-***SYSTEMIC*** steroids or steroid injection into the orbital floor or into the sub-Tenon's space.

-specific antibacterial and antiviral to prevent visual loss from secondary infection.s

*Signs:

1- visual acuity is reduced.

(in dark room, the visual acuity may seem satisfactory, if the same test is carried in light the acuity falls as a result of glare and pubil constriction in light).

2- on direct ophthalmoscope cataract appears black against the red reflex.

3- slit Lmp examination gives further details about the exact site and shape of the cataract.

Age related cataract= commonly nuclear,cortical or subcapsular

Steroid induced=commonly posterior subcapsular.

Pigment deposition on the lens+ cataract: suggest previous inflammation

Damage to the iris: suggest previous ocular trauma.

Cataract: light scattering opacity within the lens

- it's the commonest cause of treatable blindness.
- Risk factors for ***age related (senile)cataract***:

Cumulative exposure for UV radiation, smoking, elevated blood sugar.

*Ocular conditions associated with cataract:

Trauma, uveitis, High myopia, topical mediacations (steroid eye drops), intraocular tumor.

*Symptoms:

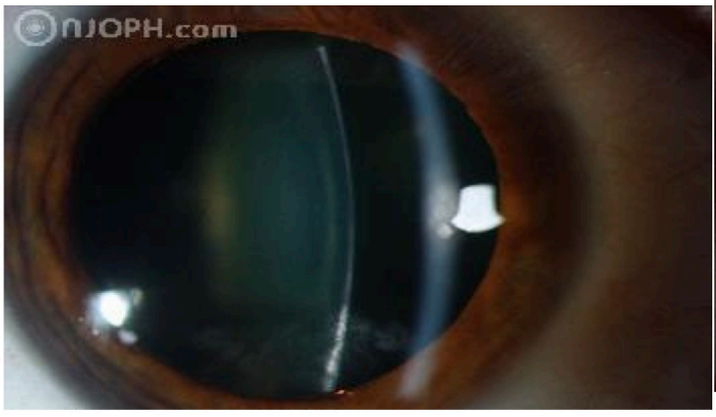
Painless loss of vision, Glare, change in refraction

-in infants, congenital cataract it may cause amblyopia (lazy eye) failure of visual maturation

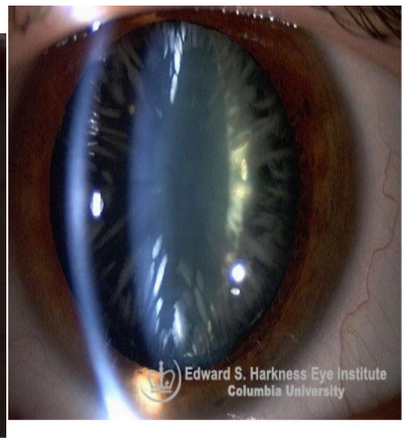
systemic causes of cataract

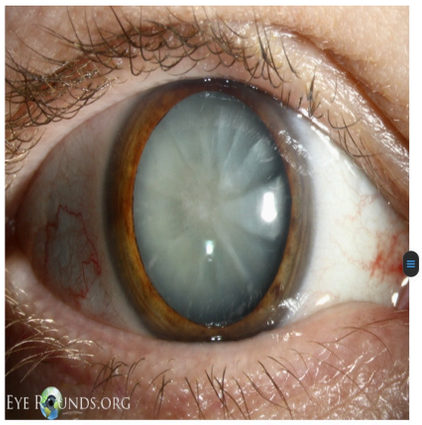
1- Diabetes
2- metabolic disorders: hypocalcemia, galactosaemia.
3-systemic drugs: steroids,chlorpromazine
4-infection: congenital rubella
5- myotonic dystrophy
6-atopic dermatitis
7-Down's, lowe's syndromes
8-congenital inherited cataract
9-X-Radiation
10-age related senile

Nuclear cataract



Posterior subcapsular cataract





Cortical cataract

*Treatment :

Surgery:

1- phacoemulsification: through limbal incision. **This is now the prefeared method.**
Sutureless , smaller incision.

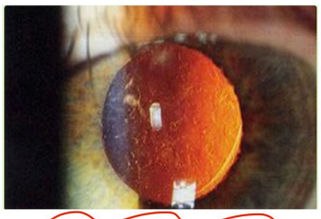
2- Extracapsular cataract extraction ECCE.

Used in cases of very hard cataract that can't be emulsified by phaco.

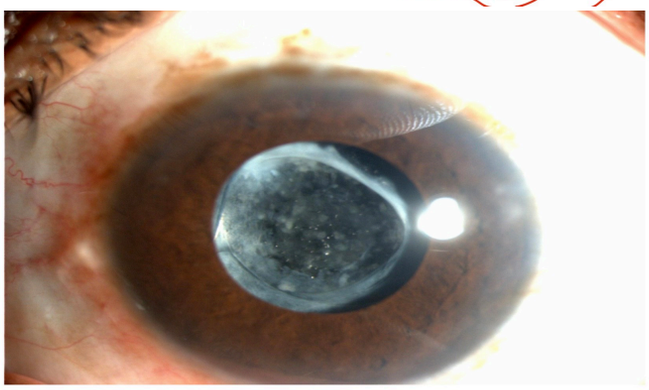
Larger incision, need sutures always.

*Indications for cataract surgery:

- Mature cataract
- Bilateral congenital cataract (to prevent amblyopia).
- If the patient is diabetic it allows clear follow-up of his retinopathy state,
- Symptoms affecting daily activities



PC Pseudophakic lens



-*Complications of cataract surgery:*

INTRA-OP

vitreous loss, iris prolapse.

-POST-OP

1- Endophthalamitis (MOST serious but rare, Emergency, within few days of surgery with painfull red eye, reduced visual acuity,hypopyon),

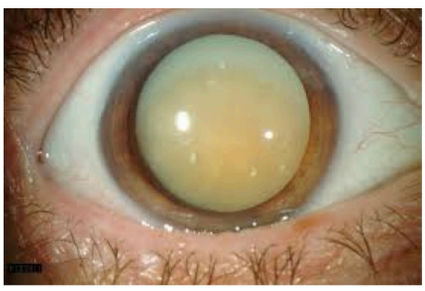
2-posterior capsule opacification *(Most Common).*

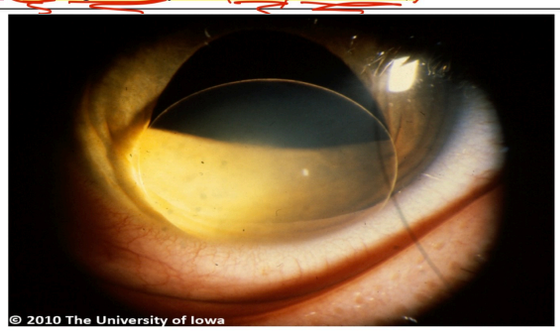
3-cystoid macular edema.

4-Retinal detachment

5-irritation and infection around the fine nylon sutures, symptoms relieved by suture removal.

Posterior capsule opacification, The most common complication of the cataract surgery.
Thickening of the back of the lens capsule that holds the artificial lens as residual cells proliferate.
treatment: laser capsulotomy with YAG (ndYAG laser).

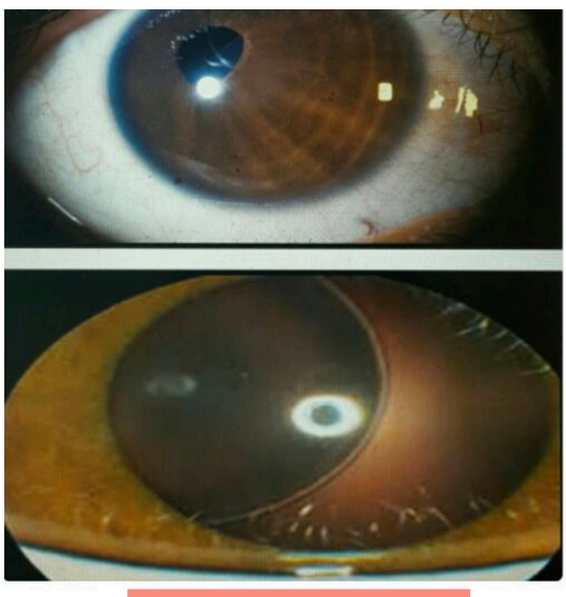




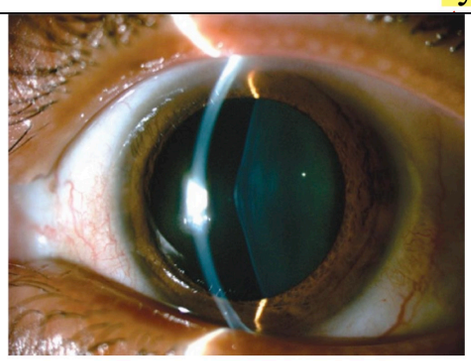
-Dx: Mature cataract
-3 types of surgeries: Phaco, ECCE, ICCE
-Intra-op complications: vitreous loss & iris prolapse
-Post-op: endophthalmitis, RD, cystoid macular edema, opacification of the post. capsule

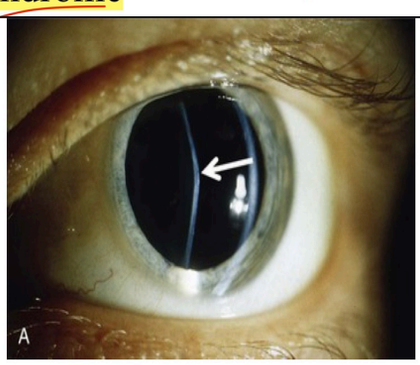
Lens detachment

causes : trauma ,metabolic disorder, homocystinurea, CT disorder, Marfan syndrome



Ectopia lentis



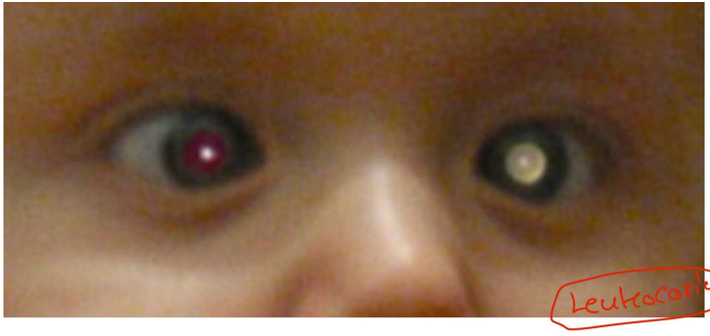


Anterior Lenticonus

-(the curvature of the anterior part of the lens increased centrally).

-seen in Alport's syndrome (AR, deafness+nephropathy).

Macular edema



Causes:

1. intraocular surgery.
2. Uveitis.
3. retinal vascular disease (e.g. diabetic retinopathy and retinal vein occlusion).
4. retinitis pigmentosa.

Leukocoria

-white pupillary reflex or absent red reflex.

-seen in retinoblastoma (1), congenital catract (2), glaucoma (3), corneal dystrophy (4).

Pathogenesis:

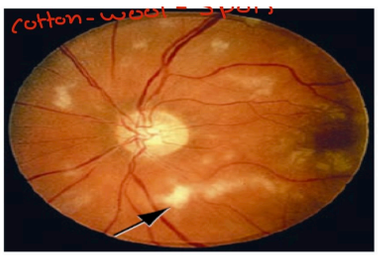
-Chronic hyperglycemia

-Usually asymptomatic and presentation is late, so regular check ups is required

-***2 types:*** non proliferative diabetic retinopathy and proliferative diabetic retinopathy (2)

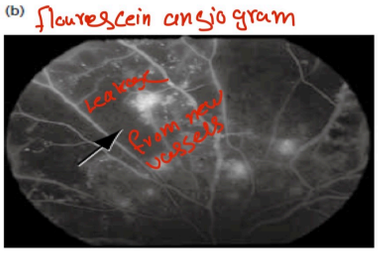
-***Visual loss is usually due to*** :

1. -macular edema.
2. -vitreous hemorrhage.
3. -retinal detachment.
4. -ischemia of the macula.



(a)

(b) flourescein angiogram



Diabetic retinopathy (non-proliferative):

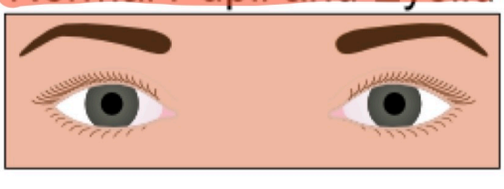
Mgt: diabetic control, anti VEGF, laser (3)

-if proliferative: diabetic control and panretinal photocoagulation.

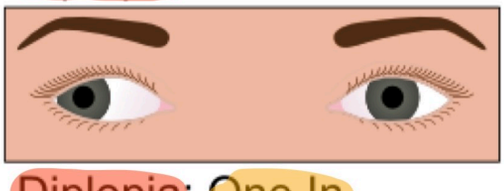
new blood vessels

يشرف الشي الشين

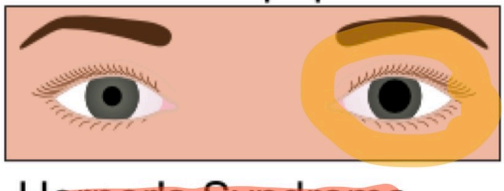
Normal Pupil and Eyelid



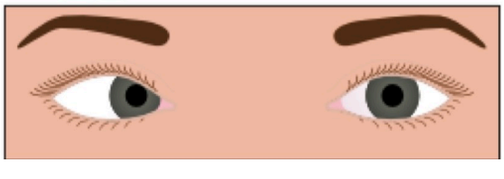
Diplopia: One Out



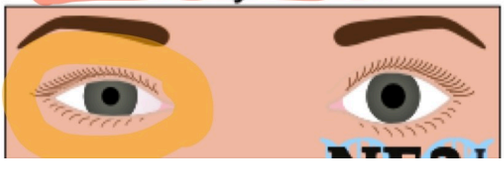
Adie's tonic pupil



Diplopia: One In



Horner's Syndrome



Diplopia

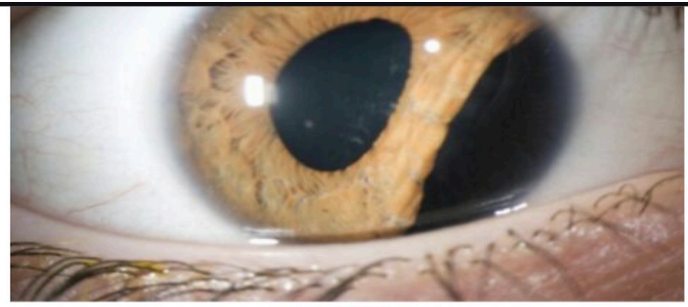
- Direction of gaze:

Paralytic cause: double vision when looking in direction of paralytic muscle, ex: 3,4&6 CN palsies

جو العين باتجاه العضلة

Restrictive cause: double vision when looking away from restrictive muscle, ex: thyroid eye disease

برا العين



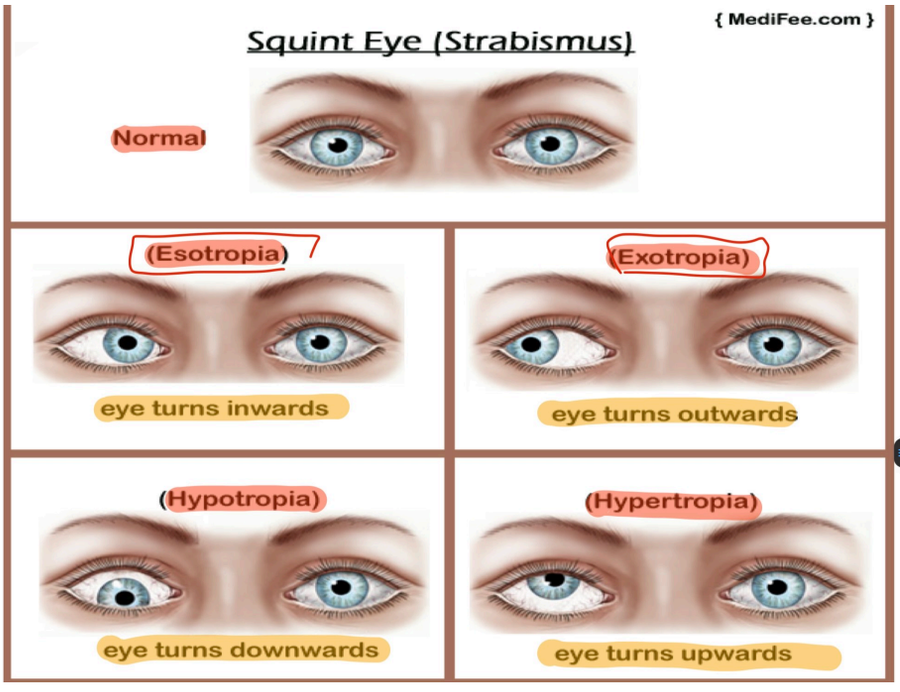
Iridodialysis

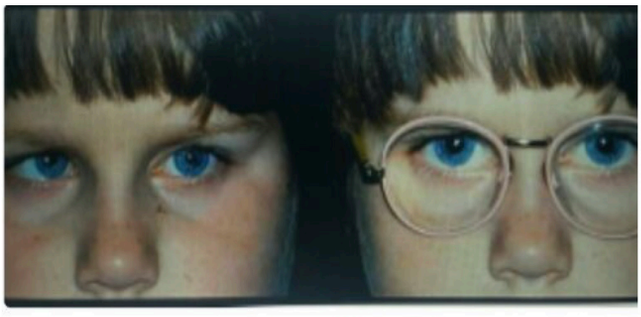
separation of iris from ciliary body , "D shaped" pupil

causes: blunt trauma , penetrating trauma , eye surgery ,

ttt: is small they are asx and need no treatment . If large and causing hyphema , then rest , steriods , pupil dilators (cyclopentolate) ²

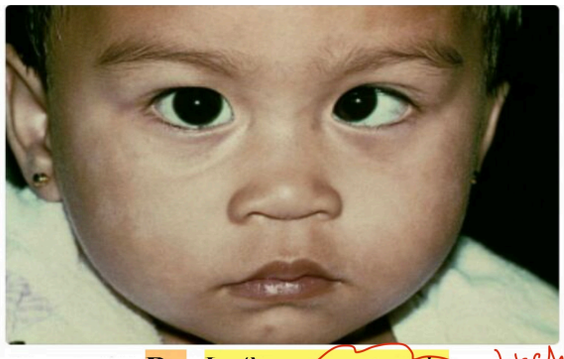
antiglaucoma acetazolmide ⁵





Dx: Fully accommodative Rt esotropia

fully accommodative Rt esotropia



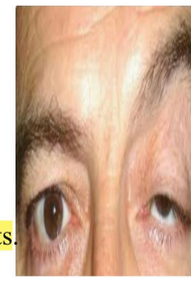
Dx: Left eye esotropia

Hischberg

Test: Hischberg test

Complication: Amblyopia

1-Ptosis:



-possible causes:

1-mechanical factors:

large lid lesions pulling the lid down, lid oedema, tethering of the lid by conjunctival scarring, structural abnormalities (ex:disinsertion of the aponeurosis of the levator muscle in elderly patients.

2- Neurological causes:

3rd nerve palsy, horner's syndrome (mild ptosis), Marcus-Gunn jaw-winking syndrome.

3-Myogenic causes:

Myasthenia gravis, forms of muscular dystrophy, chronic external ophthalmoplegia.

Signs : reduced palpebral aperature, partially covered pupil, elevated eyebrow

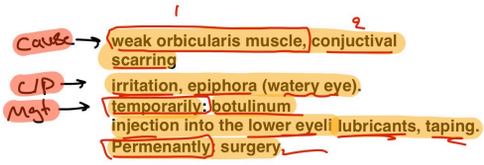
Symptoms:

Cosmetic effect, impaired vision, symptoms and signs associated with the underlying cause (asymmetric pubil in horner's syndrome. Diplopia and reduced eye movements in a 3rd nerve palsy.

Mgt:

In the absence of a medically treatable dx such as myasthenia gravis, ptosis otherwise needs surgical correction.

-in children surgery is deferred, but maybe expedited if the visual axis is covered to avoid amblyopia.



2-Entropion:

inturning of the lid margin and lashes , elderly

causes: weak orbicularis muscle, conjuctival scarring

c/p: irritation, epiphora (

Mgt:

- temporarily: botulinum
lubricants, taping.
-Permenantly: surgery

3-Ectropion:

-eversion of the lid.

-**Causes**: age related orbicularis muscle laxity, scarring of periorbital skin, facial palsy.

Signs: epiphora, dry eyes, irritation.

Tx: surgical +lubricants.

* **Blepharitis**:

-Common, inflammation of the lid margin

-***Anterior blepharitis***:

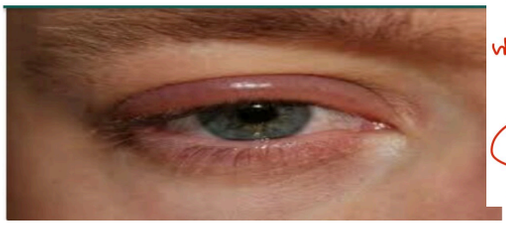
In lash line, squamous debris around eyelashes, collarette (cylendrical dandruff) Demodex frunculosis, reduced eyelashes, conjunctival injection, staphylococcus, if cornea affected=blepharokeratitis.

Small infiltrates or ulcers may form in the peripheral cornea Marginal keratitis due to an immune complex response to staphylococcal exotoxins.

-Post. Blepharitis:

Meibomian gland obstructed by squamous debris, injection of the lid margin and conjunctiva, punctate karatitis, tear film abnormalities, thick secretions.

Signs: tired itchy sore eyes.



Treatment:

-For anterior blepharitis:

1. -Lid toilet with a cotton bud wetted with bicarbonate solution or diluted baby shampoo to remove the squamous debris.
2. -topical steroids
3. -in staphylococcal infxn: Topical antibiotics (fusidic acid gel), and sometimes systemic Abx.
4. -in demodex infestation: Tea tree oil.

-For posterior blepharitis:

-Lid massage after hot bathing to express abnormal secretions ,if fails then topical azithromycin drops

1- proptosis:

-Protrusion of the eye caused by space occupying lesions.

-Exophthalmus: is specific for Graves eye Dx.

-it's measured by exophthalmometer

-if the eye is displaced directly forward= intraconal lesion(within th extraocular muscle cone). Ex:optic nerve sheath meningioma.

-if the eye is displaced to one side=extraconal lesion. Ex: tumor of lacrimal gland displaces the globe to the nasal side.

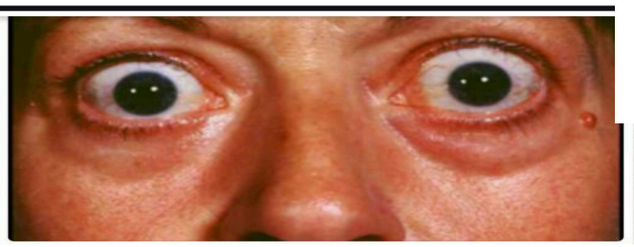
-transient proptosis: induced by increasing the cephalic venous pressure (by Valsalva).=orbital varices.

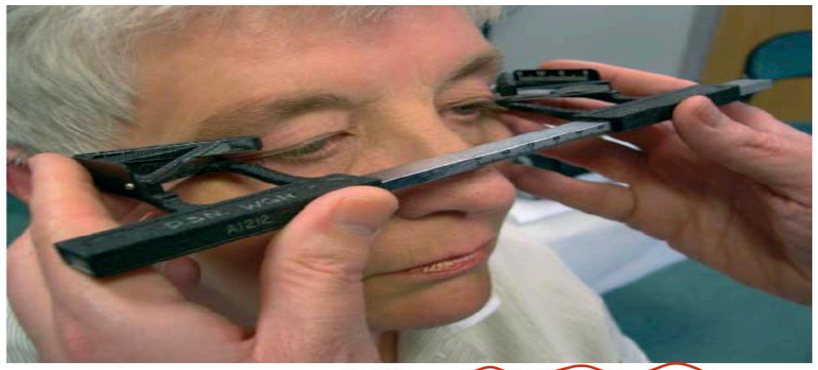
-slow progression: benign tumor.

-fast progression: inflammation, malignancy.

-pain: infxn , inflammation, malignancy.

*Investigations: CT, MRI help in diagnosing and localizing eye disease,





-Name of this tool: Hertel's exophthalmometer.

-+ve findings if:

1) readings > 21mm (NL range is 12-21).
2) a difference > 2mm between both eyes.

2-Enophthalmus:

-backward displacement of the globe.

-is a feature of an orbital Blowout fracture.

-pseudo-enophthalmus is a feature of horner's syndrome

Blowout fracture:

(more details in the trauma Section).

Mgt:

-Orbit CT scan if not possible, plain orbital radiograph.

-treatment may be delayed until the periorbital swelling has settled.

-observe the degree of enophthalmus, eye movements.

-if enophthalmus and eye movements limitation are sevre or they are cosmetically unacceptable,then surgical repair is indicated.

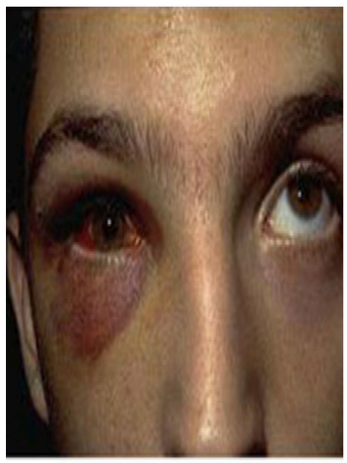


Fig. 1 Bruising around the eye is a common symptom of a blowout fracture.

3- eyelid and conjuctival changes:

-conjunctival injection and swelling =inflammation or infection process.

-infection is associated with Reduced eye movement+ erythema+swelling of the lids ***(Orbital cellulitis) Serious.***

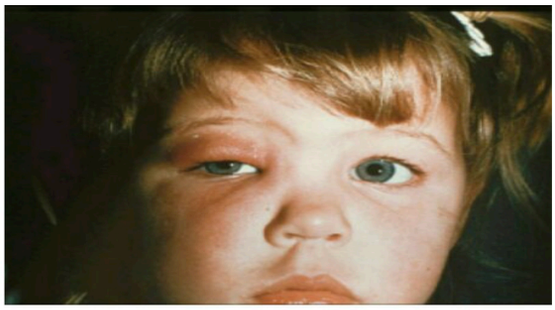
-With more anterior lid inflammation ***(Preseptal cellulitis):*** eye movements is full, the globe is not affected, thus exclude the more serious orbital cellulitis.

-Dx: LT orbital cellulitis

-Sx: ***reduced eye movements***, periorbital inflammation,swelling and painful proptosed eye.

Investigations : MRI or CT.

-Tx: Broad-spectrum IV Abx, drainage of abscess and orbital decompression if present.



Preseptal cellulitis

just involves the lid structure alone, normal eye movements, the globe is not affected.

tx: oral Abx, warm to hot compressors

*Retained IRON-containing foreign bodies may have a devastating effect on the ey ***(Siderosis oculi).***

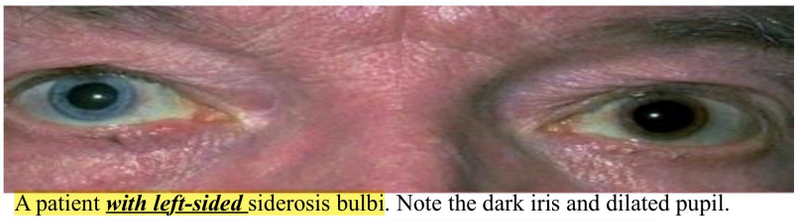
With time these signs are found:

1-heterochromia: discoloration of the iris due to pigment degeneration of the retina

2-Fixed mydriasis.

3-cataract

4-if foreign body is not detected , it may cause irreversible blindness via free radica production.



A patient ***with left-sided*** siderosis bulbi. Note the dark iris and dilated pupil.

Remember that the abnormal eye is the darker in siderosis bulbi.

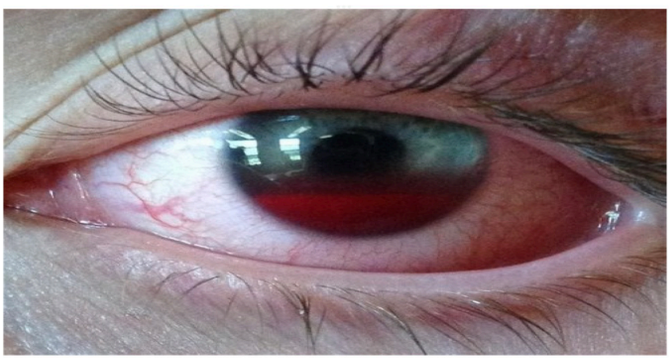
Early signs and symptoms of a chemical eye burn are:

1. Pain
2. Redness
3. Irritation
4. Tearing
5. Inability to keep the eye open
6. Sensation of something in the eye
7. Swelling of the eyelids
8. Blurred vision

Mgt:

-Irrigate the eye immediately with copious amount of neutral solution form 30 min- 2 hrs, irrigate under the upper and lower eye lids to remove foreign bodies.

-steroids, dilating drops, topical and oral vitamin C improve the healing, systemic and topical anticollagenases (ex:tetracyclines).



Hyphaema

The commonest complication is increased intraocular pressuere

Hyphaema Mgt:

1-Rest, steroid eye drops, pubil dilation (cyclopentolate). (adults in home, children may require admission for few days).

2-if medical Tx fails, then surgical mgt is required.

3- check for other complications of blunt trauma when the hyphaema settles.

chemical injury:

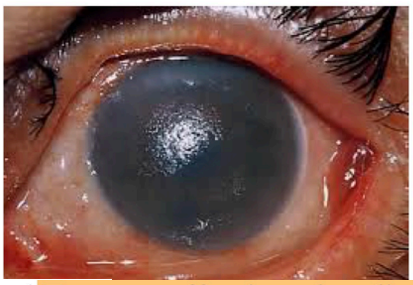
Alkali or acidic

-alkali causes more damage, because it causes liquifactive necrosis, while the acid causes coagulative necrosis.

Signs of alkali burn:

1-the conjunctiva appears white and ischaemic in severe cases

2-hazy sometimes white cornea



Factors affecting the clinical outcome:

1- type of the agent (acidic or alkaline, alkaline is more serious).

2- PH, both high alkaline ph and low acidic PH are serious.

3-concentration of the offending agent.

3-Duration of exposure.

3-duration between exposure and irrigation.

4-limbal involvement and ischaemia (may prevent regeneration because stem cells are there).

Complications:

1-loss of stem cells if involved the limbus (No regeneration)----corneal scarring (white cornea).

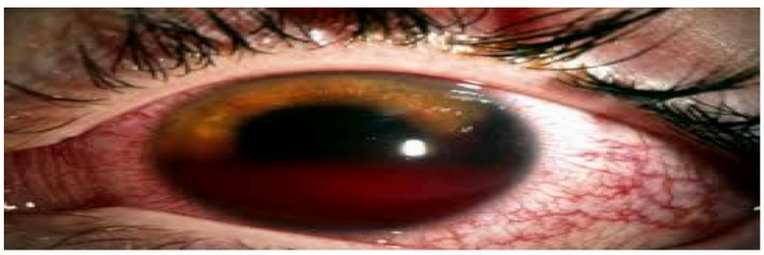
2-uveitis

3- secondary glaucoma

3-cataract

4-corneal melt (keratolysis).

4-conjunctival ischemia.

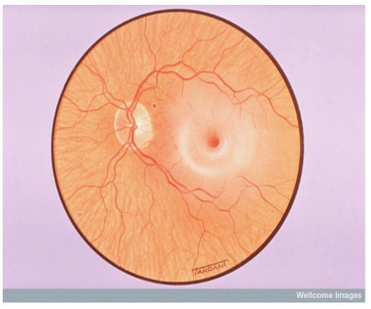


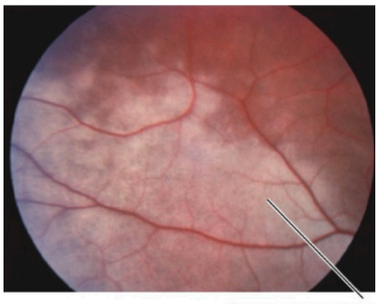
-Dx: Hyphaema

-Causes: trauma, infection (herpes), abnormal BVs on the surface of the iris.

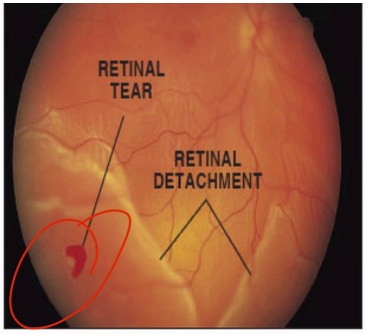
Tx: B-blockers, alpha agonists, systemic carbonic anhydrase, mannitol.

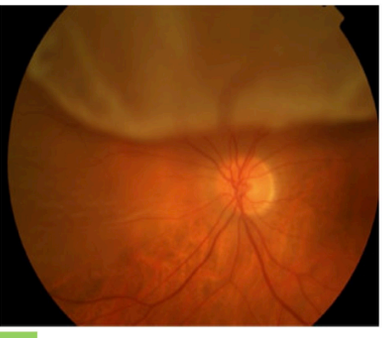
If uncomplicated,:we'll go to surgery which is AC



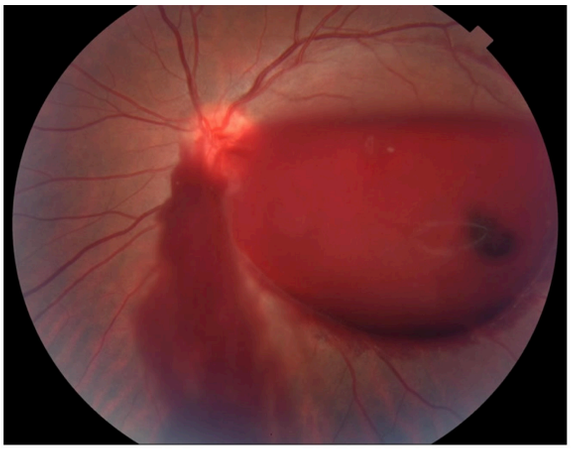


-retinal edema(commotion retinae).
-(mgt is observation)





-retinal dialysis ,detachment.
-Mgt:surgical repair.



vitreos hemorrhage
-Mgt:vitrectomy.

1-***Myopia*** (short-sightedness): high optical power, the parallel rays of light are brought to a focus in front of the retina.(usually because the eye is too long).

2-***Hypermetropia***(long-sightedness): low optical power, the parallel rays of light converge towards a point behind the retina. (usually because the eye is too short).

3-***Astigmatism***: the optical power of the cornea in different planes is not equal. Parallel rays of light passing through these different planes are brought to different points of focus.

All three types of ametropia can be corrected by

1 ***spectacle lenses:**

1- in myopia they diverge the rays, diverging lens, concave lens.

2-in hypermetropia they converge the rays, converging lens, convex lens.

3-in astigmatism: lens correct the non spherical shape of the cornea.

2 ***contact lenses: either rigid gas permeable, or soft.**

3 ***refractive surgery :**

PRK, LASIK, LASEK.

In myopia:flattening of the cornea, in hypermetropia: steepening it.

-after PRK: pain is reduced by provision of a bandage contact lens, Topical or systemic NSAIDs

-LASEK flap take longer time to heal than LASIK flap.