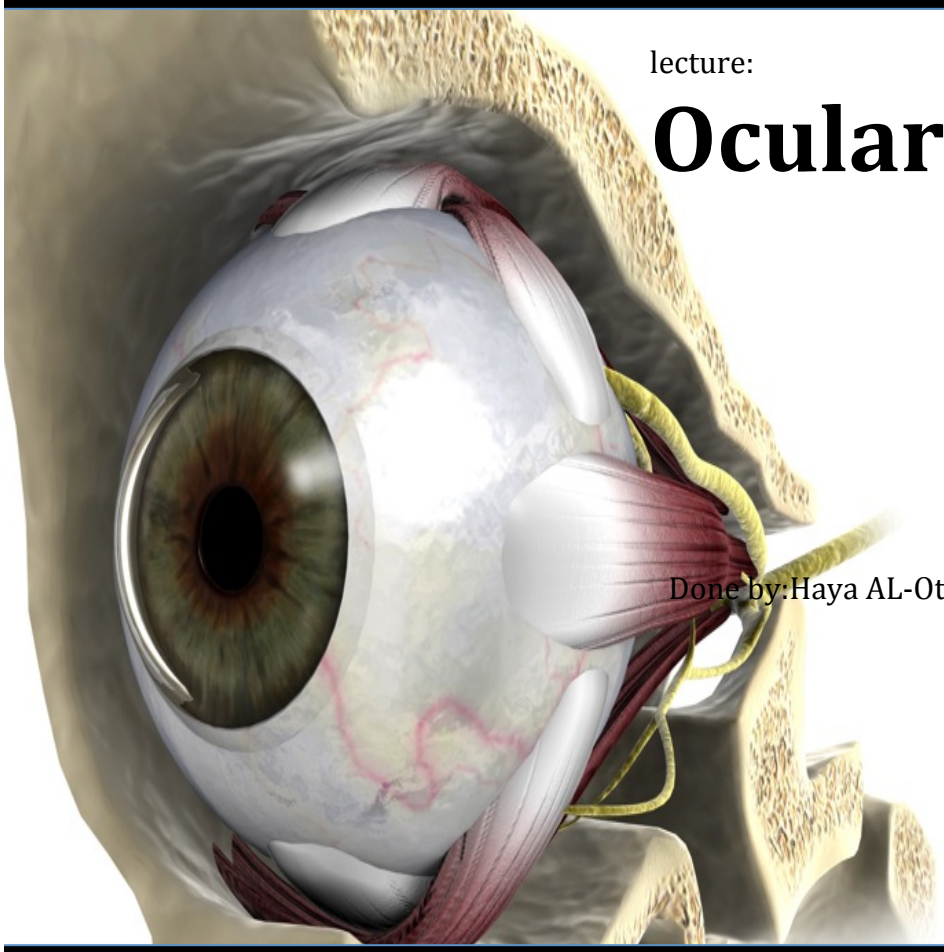
430 Ophthalmology Team



lecture:

Ocular emergencies

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The slides were provided by Prof.Mubark AL-Faran .
For further information please check 429 team work .
Important Notes in red
Copied slides in black
Doctor notes in blue .
Titles and subtitles in this color
Highlight possible MCQs mentioned or pointed by the doctor

Ocular emergencies.

❖ Introduction :

- Red eye is one of the ocular emergencies , actually red eye will give you application of what ophthalmologist have learned among their ocular emergencies .
- You should have a systematic approach while introducing any medical subject to people. for example : if you want to talk about ocular emergencies, your approach must be systematic as following :

- Definition of the disease .
- Symptoms (patient complain).
- Signs (what physicians see).
- Correlate signs &symptoms to reach differential diagnosis .
- Order the appropriate investigations .
- Find the accurate diagnosis and if you reach the final diagnosis you have to start the management .

❖ What is the most important function of the eye ?

1-The most important function of the eye is vision , and this function will be our guide in ocular emergencies because people in general whether they were young or adult they will complain of decreased / double /disturbance of vision .

2- Cosmetic (كمال خلقة الله) .

Ocular emergencies :

❖ **Sudden Loss of Vision (No Redness or Pain):**

Differential diagnosis as following :

1. Unilateral Blindness : (sudden.. without redness or pain)
   a. CRA (central retinal artery) embolus.
   b. Traumatic damage to optic nerve. Patient will come with history of trauma but without red eye.

2. Unilateral decrease in vision: (sudden.. without redness or pain):
   a. CRV (central retinal vein) thrombosis :
      - thrombosis affects the central tract of retinal vein .
      - Patient will not have complete loss of vision , the vision is decreased only the
   b. Vitreous hemorrhage :
      - Patient might be diabetic or having sickle cell disease so he might develop vitreous hemorrhage .
      - if there is bleeding the vision will disturb but it is not sudden or complete loss of vision.
   c. Acute keratoconus :
      - Keratoconus means : coning of the cornea because the protein is different from the normal so it can be more elastic leading to protrusion of the Centre of the cornea and thinning of the Descemet's membrane that will stretch until it breaks then the aqueous humour in the anterior chamber will be in the cornea leading the edema of cornea that will occur suddenly.(acute hydrops).

- So cornea will be edematous >>vision will drop suddenly .
- The vision is not good unless you corrected and Sometimes patient will not have pain .

3. Unilateral visual field loss (sudden without redness or pain)
   a. BRA (branch of the retina arty ..not the central arty) embolus.
      If it happened >> certain area of the retina will be affected so there will be unilateral visual filed loss .
   b. BRV (branch of the retina vein ..not the central vein) thrombosis
   c. RD.(localized retinal detachment .So, patient will have of some loss of visual filed at the area that had been detached.

4 .Bilateral visual decrease in vision : (sudden without redness or pain)

a. Stroke :
- Stroke can affect occipital cortex that representing both eyes so both eyes will be affected and it is partial loss of vision .

b. Hemorrhage
c. Trauma of optic radiation and optic tract : witch located posterior to optic chiasm so both eyes will be affected leading to bilateral decrease in vision.
d. I.C.P. (increase intra cranial pressure) : it will affect visual pathway in both eyes .
e. Potential carbon monoxide poisoning : it has a central effect of the brain leads to blurred vision in both eyes.

❖ **Progressive Visual Loss (Without Redness or Pain) :**

1.Cloudy vision such as in these cases :

Corneal opacity: start gradually and slowly in a progressive manner especially if there is repeated infections (keratitis) that result in corneal scar>> increases corneal opacity. Or if he has rubbing eyelashes or entropion that will increase corneal scaring by time.

Corneal dystrophy: It is an inherited disease that has many types . it usually affect both eyes.

cataract : Progressive cataract in both eyes >>progressive decrease in vision . progressive vitreous opacities . For example : in case of vitreous hemorrhage .

❖ **Cloudy Vision(With Eye Pain and Headache):**

•CACG, (closure angle glaucoma) or secondary glaucoma to rubeosis " neovascularizationare found on the surface of the iris" : this is complication of Diabetes Mellitus in the iris that obstructS angle so it obstructs aqueous humour flow .

•Optic neuritis : patient will have cloudy vision and pain on eye movement without redness.

•Endopthalmitis :

- this is inflammation inside the eye , either endogenous or exogenous .
- Endogenous means infection reaches eye through the blood from systemic disease such as brucellosis.
- Exogenous : after surgery or trauma .
- this is a serious disease that may cause loss of vision so you should detect it early .

❖ **Visual Loss (With Redness or Ocular Complaint)**

•Keratitis: inflammation of cornea.
•Iritis :inflammation of iris .
•Cyclitis :ciliary body inflammation . we can call it iridocyclitis .

Picture : patient has iritis :

- there is redness , Conjunctival ingestion .
- usually the eye is white .
- there are cells in the anterior chamber posterior to the cornea which is a part of inflammation .
- So if you diagnosed patient with iritis :(patient with visual loss +redness +pain + on slit lamp there is fine cells (Keratic precipitate) , then you Should identify the cause of iritis .

What disease can lead to iritis ?
SLE (SYSTEMIC LUPS ERYTHEMATOUS)
TB
Sarcoidosis
Herpes simplex uveitis

❖ Visual Loss **(With Hyperemia, Hypotony "means the eye is abnormally soft):**

•Choroidal detachment :

- if the choroid detached from the suprachoroidal space the eye will become soft .
- this happened usually due to leakage during surgery .

•Phthisis bulbi : (atrophy or shrinking of the eye) following trauma or chronic inflammations of the eye which obstruct the ciliary process >> decreases aqueous humour production >>low intraocular pressure >>the eye become soft (hypotony) . or after perforating injury.

❖ Visual Loss With **Hyperemia (redness of the eye) and Exophthalmos.**

•Orbital cellulitis : (inflammation in orbit >>push eye forward .
•Pulsating exophthalmos

•Cavernous sinus thrombosis . (The vinous drainage of the eye is cavernous sinus so when it is affected there will congestion and protruding of the eye)

❖ **Symptoms :**

1- Disturbance of vision :

A) ↓ V.A (visual acuity)
Is it Sudden or Gradual ?
Is it unilateral or bilateral ?

B) Abnormal V.Field :
•Unilaterlal : think about retina disease : localized retinal detachment ,optic nerve disease : optic neuritis where there is large blind spot , or unilateral chronic open glaucoma.
•Bilateral : in symmetric defects or posterior to chiasm . so think about lesions or diseases that affect chiasm or behind it and ask for CT scan or MRI.

2- Floaters :
you have to rollout retinal detachment because if there is vitreous detachment there will be adhesion between virtuous and retina so the virtuous may bring with it part of the retina .
And you have to examine for retinal detachment in case of floaters, because normally the vitreous is gelatinous and within age it will decrease and collapse and there will be some threads or cells that scape out and become floating in the posterior segment.

3-Cortical blindness ,bilateral lesions of occipital lobe.
4-Diplopia (: patient has double vision .) causes are:

- Physiologic diplopia : when you exceed your accommodation limit you will see two objects and this is normal.
- Pathological : ocular muscle weakness or nerves palsies (6th nerve palsy : the eye will not go laterally so he will see double)

5-Pain in one or both eyes or in the head " doctor did not explain it)
•Superficial FB
•Deep pain in the eye
•Headache
•Photophobia

6- Abnormal secretion from eye : this is usually not an emergency but it can help you in the diagnosis .
•Lacrimation: irritation of cornea.
•Mucus : infection or dry eye.
•Pus : infection
•Dry eye : patient will have more lacrimation.

❖ **Physical Signs described by Pt. As Symptoms :**

1. Red eye –Serious conditions such as : Keratitis –corneal ulcer – iritis

Angle closure glaucoma where there will be these signs :

•Conjectival injection : it is superficial , patient's eye is red at daytime .
•Ciliary injection : it is around the cornea , deep , patient's eye has violet colour at daytime .
•Subconj. hemorrhage .

2.**New growth :** for example :growth in the eyelid or mass around cornea like any tumor.
3.**Abnormal position of eyes or eyelids :** for example : squint (cannot see straight)
4.Protrusion of globe : look for the causes ..is it exophthalmos , cavernous sinus thrombosis or aneurysm,
5.Widened palpebral fissures : such as led retraction in graves' disease .
6.Pupillary abnormality : for example : one pupil is constricted , the other is not (afferent pupillary defect)

❖ **Causes of sudden persistent Unilateral decrease of vision (serious & very imp) :**

1.Angle closure glaucoma : emergency condition associated with redness, pain , high intraocular pressure , headache , pupil mid- dilated and fixed.
2.Iridocyclitis : associated with redness, pain, Keratic precipitate.
3.Vitreous hemorrhage : no redness, no pain , by examination you cannot see retina because it may be hidden by blood.

4.Retinal artery or vein closure :

- Retinal artery closure : signs : pale retina (ischemic)and cherry red spots because retina is supplied by central retinal artery except macula or fovea which is supplied by ...from choroid .
- Vein closure is same but you might notice hemorrhage and in late stage there will be increase intraocular pressure and other complications .

5.Optic neuritis : no redness, pain by moving eye. **It is associated with multiple sclerosis .**

❖ **Causes of gradual unilateral loss of vision**

1.Corneal opacity : no pain , no redness.
2.Glaucoma : if it is acute : there is redness and pain .. chronic : no redness or pain.
3.Cataract : no redness , no pain
4.Vitreous opacity : no redness, no pain
5.R.D : retinal detachment : no redness, no pain
6.Macular degeneration (age related macular degeneration) : no redness, no pain.

❖ **Causes of Sudden bilateral loss of vision- Uncommon :**

1.Usually after inquiry starts one eye followed by other.
It is rarely seen ..you have to be sure that the complaint is true ,
sometimes patient has mature cataract but he is not aware of it till the cataract affect the central axes of vision then he will have sudden bilateral loss of vision.

- ask about onset ?
- Was one eye had decrease in vision than the other eye before vision had been lost ?

2. if you are sure that both eyes were affected at same time there is only two causes:

a- Hysteria: cytosomatic effect.

b- Toxic effects of drugs. for examples

- Methyl alcohol causes irreversible optic nerve damage and blindness.
- The most important step in the management of these patients is to do gastric lavage immediately , but if patient comes after day or two days there will be no benefit from gastric lavage.

❖ **Causes of gradual bilateral loss of vision**

1.Any ophthalmic disorder:

- If visual acuity is decreased and Peripheral vision is intact : disorder is ant. to chiasm.
- If peripheral vision is decreased -Disorder may beat or posterior to chiasm .

❖ Pain :

a -Superficial F.B.

b- Deep severe pain: (most important)

1.Inflammation of ciliarybody

2.Rapid in IOP (ACG) especially if it is sudden .

❖ **Abnormal Secretion**: mentioned above .

1.Pus -M.P.C.

2.Tearing -? Epiphora

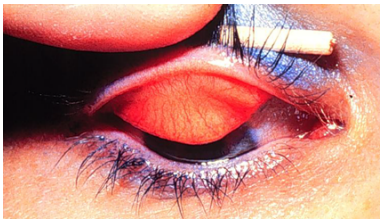
3.Dry eye, keratoconj. Sicca, etc.

❖ **Red eye :**

NONTRAUMATIC RED EYE: POSSIBLE CAUSES are : (very important)

- Conjunctivitis
- Iritis (uveitis)
- Corneal inflammation or ulcer .
- Acute glaucoma

BACTERIAL CONJUNCTIVITIS:



bacterial conjunctivitis
there is some discharge and lid crusting.

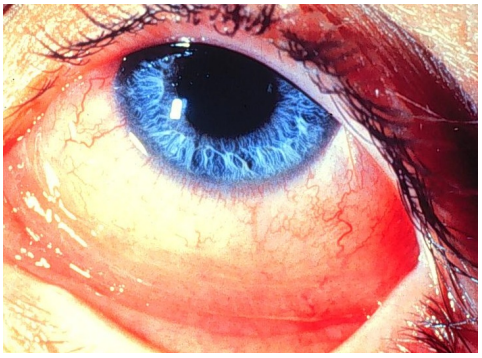
Clinical signs :

- Redness
- +/- Pain
- Conjunctivitis often bilateral
- Mucopurulent discharge and Lid crusting and eyelashes adherent to each other in case if the conjunctivitis is persist or partially treated .

Treatment :

- **First step is Take swab for culture &sensitivity**
- **Then start broad spectrum antibiotics like : topical gentamycin**
- **If the culture is positive continue on antibiotic**
- **If it is negative then change antibiotic to another one.**

❖ VIRAL CONJUNCTIVITIS :



Viral conjunctivitis
there is watery discharge .

Clinical signs :

- Usually bilateral
- Pre auricular lymphadenopathy : so you have to palpate the pre auricular lymph node .
- Conjunctival inflammation
- Watery discharge (not mucupurlent)

- **Treatment :**

Eye hygiene unless there is some infection then start antiviral .

DIFFERENTIATION OF THE COMMON TYPES OF CONJUNCTIVITIS

Clinical Findings and Cytology	Viral	Bacterial
Itching	Minimal	Minimal
Hyperemia	Generalized	Generalized
Tearing	Profuse	Moderate
Exudation	Minimal	Profuse
Preauricular adenopathy	Common	Uncommon
In stained scrapings and exudates	Monocytes	Bacteria, PMNs *
Associated sore throat and fever	Occasionally	Occasionally

* Poly morphonuclear cells

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DIFFERENTIATION OF THE COMMON TYPES OF CONJUNCTIVITIS

Chlamydial	Atopic (Allergies)
Minimal	Severe
Generalized	Generalized
Moderate	Moderate
Mild to moderate	Minimal
Common only in inclusion conjunctivities	None
PMNs*, plasma cells inclusion bodies	Eosinophils
Never	Never

* Poly morphonuclear cells

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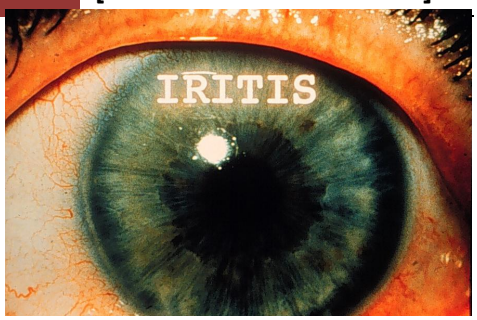


3-Iritis :

- **you have to investigate for the systemic cause**
- **start treatment with steroid to suppress inflammation .**

4-ACUTE GLAUCOMA:

Symptoms

- Severe ocular pain
- Decreased vision
- Headache, nausea/vomiting
- Abdominal pain (referred pain)

Conclusion :

Any toxic agent to the eye can cause its redness. There are three major causes that can be called serious which are :

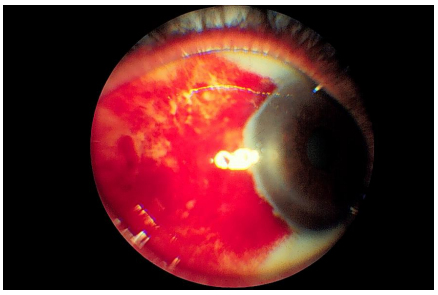
Keratitis
Iritis
Acute glaucoma

There is only one decision to make about a red eye . is it one of the major three presentations ? if it is then examination of the eye carried out in the same way every time will indicate which of the major three it is .

Normal eye

- The right eye is abnormal
- There is redness.
- the bulbul fissure is narrower in the right than left. (don not say the right eye is smaller)

- The eye is stained by rose Bengal stain **, which stained the dead tissue of the cornea.**
- **Diagnosis is : corneal ulcer** because this patient was having viral kertitist and the ignorance doctor gave him steroid which increase inflammation
- **Treatment :** take swab for culture &sensevity and give antiviral , never give steroid



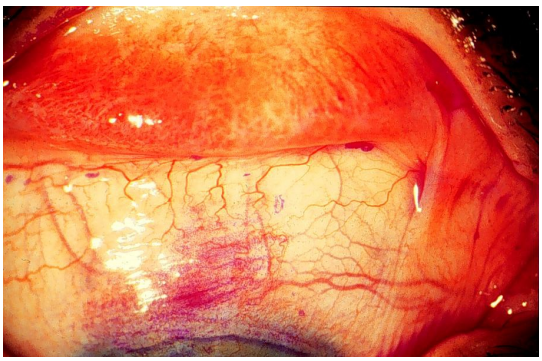
- Diagnosis : sub.conj .hemorrhage
- be sure that there is no trauma in sclera or blood diathesis (patient with blood diseases)
- it usually resolve spontaneously.

bacterial or fungal corneal ulcer:

- there is pus in anterior chamber (hyponun).
- fungal is less harmful while bacteria such as Pseudomonas aeruginosa >>after two days eye will be ruptured and gone .

Treatment :

- swab for culture and sensevity.
- start antibiotics (in this case admitted patient and start local and systemic antibiotics).

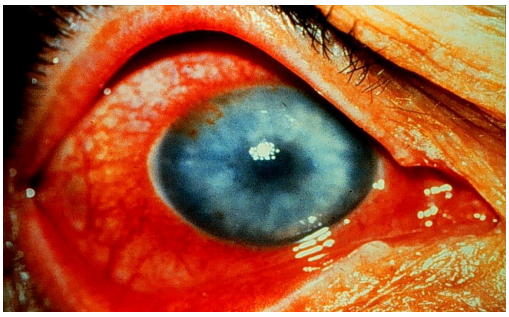


What can you see?

Rose Bengal stain shows dead cells.

Diagnosis : conj. scar "after trachoma" >>no basic film tear>>dry eye.

treatment : lubrication



clinical findings in this picture :

- redness -corneal ingection
- hypermia
- iris is .???. because of corneal edema
- high intraocular pressure
- mid-dilated fixed pupil

Diagnosis : Acute angle glaucoma.

- **treatment is :**
- systmeic not topical medication
- Give manetol -beta blockers to reduce IOP "you have to check cardiovascular statues of patient before giving IV manetol

How does manetol work ?

Manetol is Hyperosmotic agent that will suck more fluid from the eye then it decreases edema >>decreases aques production.

DIAMOX -IV ??

THEN AFTER DECREASE PRESSURE YOU CAN GIVE HIM STEROID DROPS TO RELIFED REDNESS OR ANALGESIA .

AFTER THAT WE CAN DO IRIDETOMY BY YAG LASER.

WE HAVE TO DO PROPHELACTIC IRIDETOMY FOR THE OTHER EYE .

What can you see?

- this is frozen eyen because there is no upper fornex , and upper &lower lid attached to bulble and tarsal conjectiva .
- the black is black ink to give the eye more acceptable cosmetic appearance .
- conj.is destroyed and keratinized .

patient had used alkaline subject which destroyed cornea cells and then she developed extreme degree of dry eye and end up with this picture.

What can you see?

edematous conjunctiva **shows cobblestone appearance.**

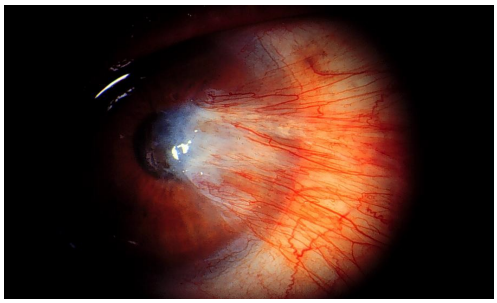
Diagnosis :
allergic conjunctivitis (virneal kretar ??)

treatment :

- anti- allergic drops : (sodium cromoglycate) stabilize mast cell so it will prevent irritation of the eye by other allergic agents.
- Don't give steroid unless under observation only .

Complications of long use of steroid :

- cataract
- infection "viral"
- steroid induced glucoma
- irreversible optic nerve damage -- blindness



Patient complain of poor vision .

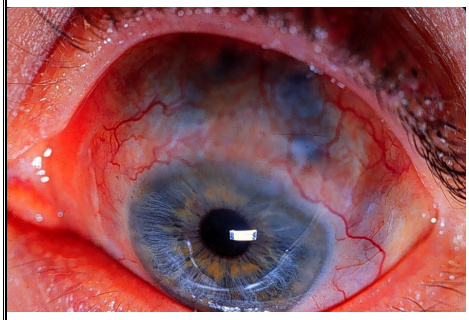
What can you see ?
red eye (remember : red eye is not diagnoses this is an expressive term .)

Diagnosis : pterygium (most often refers to a benign growth of the conjunctiva. A pterygium commonly grows from the nasal side of the sclera)

Management :

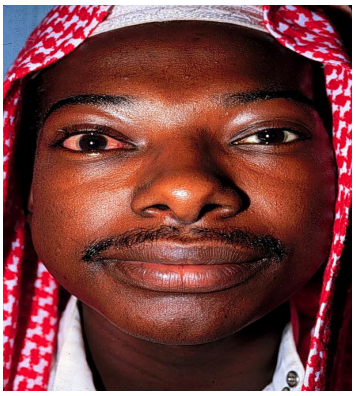
- usually we remove it when it affect vision
- we can remove it and leave some sclera
- or we can put otologes corneal graft to decrease recurrence
- recurrence is high 50%

Extra ocular causes of red eye :



sclera is thin above so we can see choroid which has blue colour because uvea tissue (ciliary body, iris and choroid) has one colour and her the iris is blue so choroid appears blue .

Diagnosis : scleritis due to rheumatoid arthritis .



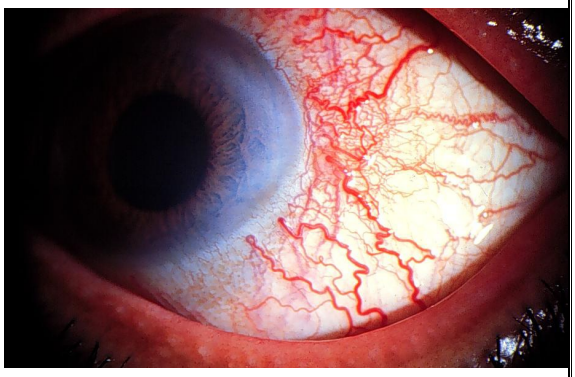
which eye is abnormal ?

- right red eye .
- wide bulbo fissure.

Diagnosis : graves' disease **(most common cause of unilateral ptosis in young people)**

why there is redness ?
due to exposure keratitis because of lid retraction .

Treatment : give lubrication and treat graves' disease



Patient has normal vision but it did not response to medication .

What can you see ?
there are congestion and blood vessels torsion.
by examination there is bruit in carotid by statoscope.

Diagnosis :

- large cavernous sinus-carotid artery fistula .
- patient was referred to neurosurgeon and all these complains disappear.

Remember the venous drainage of the eye :
opthalmic vein drains into **cavernous sinus.**