

ACUTE VISUAL LOSS

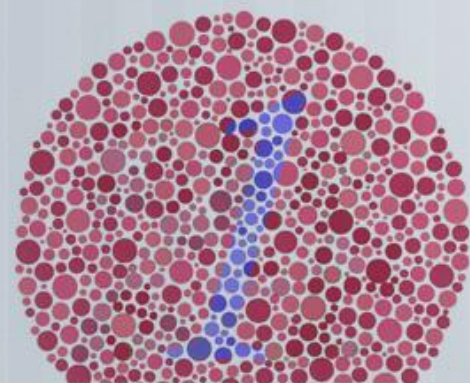
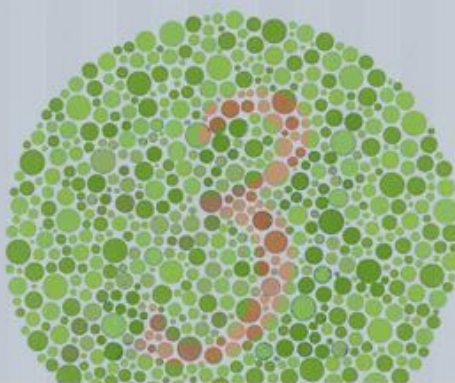
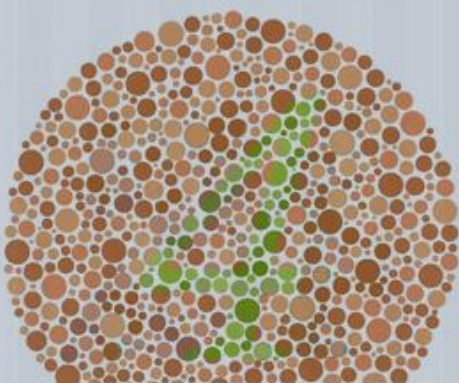


431
Teams
medical students

Ophthalmology Team

Done By:

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Acute Visual Loss

Sources: The slides, the lecture recording, and Lecture Notes - Ophthalmology 11th Edition

Classification of acute visual loss:

- i. Media opacities
- ii. Retinal disease
- iii. Optic nerve disease
- iv. Visual pathway disorders
- v. Functional disorders
- vi. Acute discovery of chronic visual loss

Most common causes of acute visual loss:

1. Acute glaucoma
2. Central retinal artery occlusion
3. Central retinal vein occlusion
4. Retinal detachment
5. Optic neuritis

Important questions in the history:

- Is it transient or persistent? (Transient such as migraine or TIA)
- Is it monocular or binocular? (Optic neuritis is usually monocular)
- Did it occur suddenly or developed over hours, days or weeks? (Vascular causes develop within minutes to hours)
- What is the patient's age and general medical condition? (Angle-closure glaucoma affect patients older than 40)
- Did the patient have normal vision in the past and when his was vision last tested?

Examinations:

- Visual acuity
- Visual fields (Confrontation test)
- Pupillary reactions (Any lesion affect optic nerve from the retina until the lateral geniculate body should have afferent pupillary defect)
- Ophthalmoscopy (Normal cup:disc ratio is 0.3)
- External examination of the eye with a pen light
- Tonometry to measure the intraocular pressure.(normal: 10-21 mm Hg, ocular HTN: 22-29, glaucoma: ≥ 30)

I: Media Opacities

If there is an opacity whether in the cornea (corneal scar), pupil, lens (cataract), vitreous body (vitreous hemorrhage) or retina, there will be visual loss. Thus, **absent red reflex indicates media opacity**.

Corneal Edema:

The most common cause is increased intraocular pressure, which occurs in angle-closure glaucoma.

Doctor Essam has opened other slides for Glaucoma, chronic glaucoma is better covered in another lecture, and acute glaucoma is covered in this lecture

Glaucoma:

Any type of glaucoma will, eventually, cause optic neuropathy due raised intraocular pressure. It usually affects the visual field, and only affects the visual acuity when the central visual field is involved.

Chronic Glaucoma:

Chronic glaucoma is **painless** (because of gradual increase in IOP) and present late when the macula (central vision) is affected.

Risk factors:

- Family history
- Age
- Black race
- Myopia
- Diabetes mellitus
- Hypertension

Presentation:

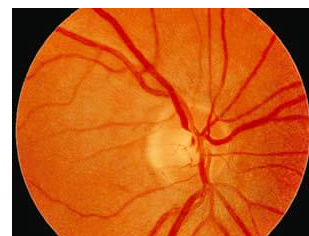
- Visual field defect
- Raised IOP
- **Optic disc cupping**

Diagnosis:

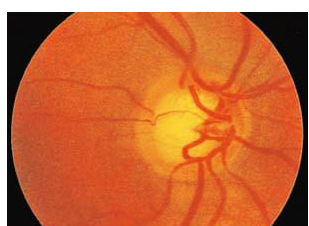
- Intraocular pressure.
- **Optic disc**. The most important, because there is normal tension glaucoma, and the patient might not notice any visual loss until it affects the central vision.
- Visual field.

Treatment:

- Medical treatment
- Laser treatment
- Surgical treatment



Normal optic disc



Glaucomatous optic disc

Acute Angle-Closure Glaucoma:

Acute glaucoma is **painful** loss of vision.

Risk factors:

- **Age > 40**
- **Hyperopia**
- Female gender
- Short stature

In hyperopia the anterior chamber depth is shallow, and the lens after the age of 40 loses its elasticity and increases in size and this will narrow the angle and make it prone to angle-closure glaucoma.

Stages of primary angle-closure glaucoma: **This is an old classification, and the Doctor said you do not need to know this**

- Prodromal stage: pupils dilate in the dark, which will narrow/close the angle, increasing the resistance of the aqueous flow from posterior to anterior chamber, therefore increasing the IOP causing ocular pain. If the patient turns on the light at this stage pain will be relieved.
- Intermittent stage: the same concept of prodromal stage, but here the patient has borne the pain for some time, causing some parts of the adhesion not to open after turning on the light.
- Acute angle-closure glaucoma: if the pain was ignored.
- Chronic angle-closure glaucoma: multiple attacks.
- Plateau iris syndrome: **closure of the angle secondary to a large or anteriorly positioned ciliary body.**

Presentation:

Symptoms:

- **Severe ocular pain**
- Sudden loss of vision
- Photophobia
- Watering

Signs:

- **Conjunctival redness**
- **Corneal edema**
- **Dilated pupils**
- Shallow anterior chamber
- Hyperemic disc

Diagnosis:

Gonioscopy is the gold standard for diagnosing angle closure.

Treatment:

Laser peripheral iridotomy

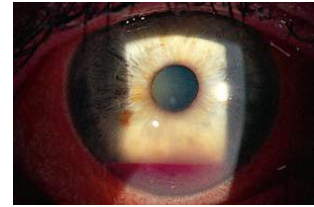
Intraocular pressure can be reduced with topical and systemic medications, laser treatment and surgery.



Hyphema:

Blood in the anterior chamber.

Caused by **trauma to the eye**, bleeding disorders, or any disease causing neovascularization (tumors, DM, intraocular surgery and chronic inflammation)

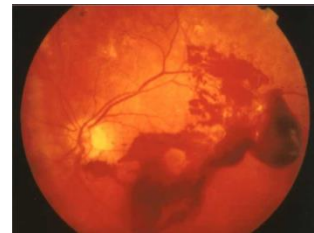


Vitreous Hemorrhage:

Blood in the vitreous body.

Caused by **trauma**, diabetic retinopathy, vein occlusion, hypertension, or subarachnoid hemorrhage.

Diagnosis: **Absent red reflex**, and confirmed by slit lamp. The vitreous hemorrhage can also be seen in B scan.



II: Retinal Diseases

Retinal Detachment:

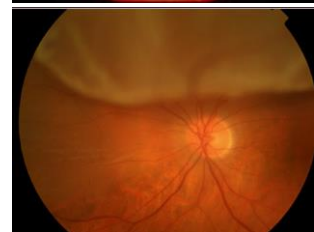
Separation of the retina from the choroid.

could be partial or complete detachment, and could involve or spare the macula.

Types:

1. Rhegmatogenous (rupture) retinal detachment
2. Tractional retinal detachment: **fibrous tissue caused by inflammation or neovascularization (diabetic retinopathy) pulls the sensory retina from the retinal pigment epithelium (RPE).**
3. Exudative retinal detachment: **fluid accumulating underneath the retina without the presence of a break.**

Rhegmatogenous (rupture) retinal detachment



Risk factors:

- **High myopia**
- Iatrogenic vitreous loss following cataract surgery
- Retinal detachment of the other eye
- Severe eye trauma

Presentation:

- Painless loss of vision
- **Floaters and flashing lights**
- **Macula sparing retinal detachment causes visual field defect.**
- **Macula involving retinal detachment causes marked drop in visual acuity.**

Diagnosis:

- Swinging flashlight test will show **afferent pupillary defect**.
- Ophthalmoscope will show dilated pupil and elevated folded retina.

Treatment:

Vitreoretinal surgery

Retinal Vascular Occlusions:**Central/branch retinal artery occlusion:****Risk factors:**

- IHD
- Hyperlipidemia
- Platelet disorders

Usually embolic in origin:

- Fibrin-platelet embolus
- Cholesterol embolus
- Calcific embolus.

Presentation:

- **Sudden**, painless, complete/partial **loss of vision** (only light perception)

Diagnosis:

- In acute stage, **retina is edematous (swollen and white)**, and **fovea is red (Cherry red spot)**.
- In chronic stage, retina is atrophic (pale)

The visual loss is irreversible after 1 hour

Treatment:

- Vasodilators
- Digital ocular massage
- Paracentesis, to releasing of aqueous and lowering IOP
- Breathing into a paper bag to increase CO₂ levels

*Differentials for cherry red spot:

- Niemann-Pick disease.
- Tay-Sachs disease

Central/branch retinal vein occlusion:

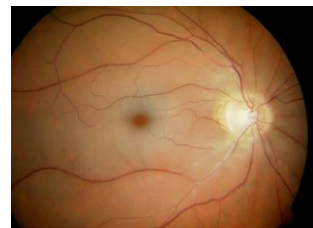
Risk factors: HTN

Presentation:

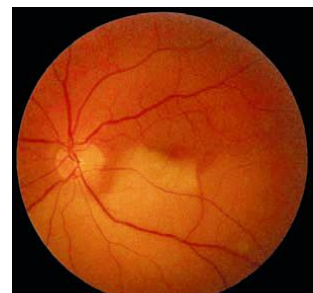
- Sudden painless loss of vision (less acute than arterial occlusions)

Diagnosis:

- Ophthalmoscope will show:
 - swollen optic disc
 - **Cotton wool spots**
 - Diffuse **retinal hemorrhages**
 - Dilated and tortuous retinal veins
 - Arteriovenous nipping



Central retinal artery occlusion



Inferior branch retinal artery



Ceteral retinal vein occlusion



Superior branch retinal vein

Treatment:

- Retinal laser treatment
- Intravitreal steroid injections

III: Optic Nerve Diseases

Optic Neuritis:

Inflammation/demyelination of the optic nerve

Risk factors:

- Female gender
- Multiple sclerosis

Presentation:

- Acute loss of vision, usually monocular
- Pain on eye movement (in retrobulbar neuritis)
- +/- Associated symptoms of MS



Diagnosis:

- Markedly reduced visual acuity (usually recovers after the MS attack)
- Reduced color vision
- Hyperemic swollen optic disc (might be normal if retrobulbar neuritis)
- Swinging flashlight test will show afferent pupillary defect. If APD is not present, then it is not optic neuritis

IV: Visual Pathway Disorders

Discussed in another lecture

V: Functional Disorders

Hysterical or malingering visual loss, diagnosis of exclusion

VI: Acute discovery of chronic visual loss

Some people discover the chronic monocular visual loss when they cover the good eye.

VI: Cortical Blindness

Normal fundal examination, APD must be absent (normal pupillary reaction)

Summary

Causes of acute visual loss:

1. Acute glaucoma (**Painful**)
2. Retinal detachment (**Painless**)
3. Vascular (arterial / venous) occlusion (**Painless**)
4. Optic neuritis (**Painful on moving the eyes**)

Glaucoma

Acute glaucoma	Chronic glaucoma
Affect female Hyperopic	Affect black people Myopic
Acute increase in IOP	Gradual increase in IOP
Painful	Painless
Hyperemic disc	Cupping disc

	Definition	Risk factors	Presentation	Diagnosis	Treatment
Acute glaucoma	Primary acute angle-closure glaucoma	-Age > 40 -Hyperopia -Female gender	-Severe pain -Loss of vision -Watering -Conjunctival redness -Corneal edema -Dilated pupils -Hyperemic disc	Gonioscopy	Laser peripheral iridotomy
Retinal detachment	Separation of the retina from the choroid	-High myopia -Post cataract op vitreous loss -Retinal detachment of the other eye -Severe trauma	-Painless loss of vision -Floaters and flashing lights	-APD -Dilated pupil and elevated folded retina	Vitreoretinal surgery
Retinal artery occlusion	Embolic in origin	-IHD -Hyperlipidemia -Platelet disorders	Sudden painless loss of vision	-Swollen and white optic disc -Fovea is red (Cherry red spot)	-Breathing into a paper bag -Paracentesis -Vasodilators
Retinal vein occlusion		HTN	Sudden painless loss of vision	-Swollen disc -Cotton wool spots -Retinal hemorrhages -AV nipping	-Retinal laser treatment -Intravitreal steroid injections
Optic neuritis	Inflammation of the optic nerve	Female gender Multiple sclerosis	-Acute loss of vision -Pain on eye movement	-Reduced visual acuity & color vision -Hyperemic swollen disc -APD	

MCQs:

Q1: A 23 - year - old female presents with loss of vision in the right eye over 3 days, she also complains that the right eye is painful when she moves it. She is otherwise fit and well, with no past ocular or medical history. Examination reveals an acuity of counting fingers in the right eye, 6/6 in the left. The eye is white, the pupils equal and reactive to light, but a right relative afferent pupillary defect is present. Examination of the fundus is normal. What is the most likely diagnosis?

- A- Central retinal vein occlusion
- B- Acute glaucoma
- C- Optic neuritis
- D- Posterior cerebral artery occlusion

Q2: A 72 - year - old man with a previous diagnosis of glaucoma presents with a sudden loss of vision in the right eye. There is no pain. He is hypertensive. There is a family history of macular degeneration. Examination reveals a visual acuity of counting fingers in the right eye, 6/6 in the left. The eye is white, intraocular pressure is not raised. The pupils are equal and no relative afferent pupillary defect is present. Dilated fundoscopy reveals a swollen optic disc and multiple hemorrhages scattered over the retina. The retinal veins appear dilated and tortuous. What is the most likely diagnosis?

- A- Central retinal artery occlusion
- B- Central retinal vein occlusion
- C- Retinal detachment
- D- Giant cell arteritis

Correct answers:

Q1: C

Q2: B