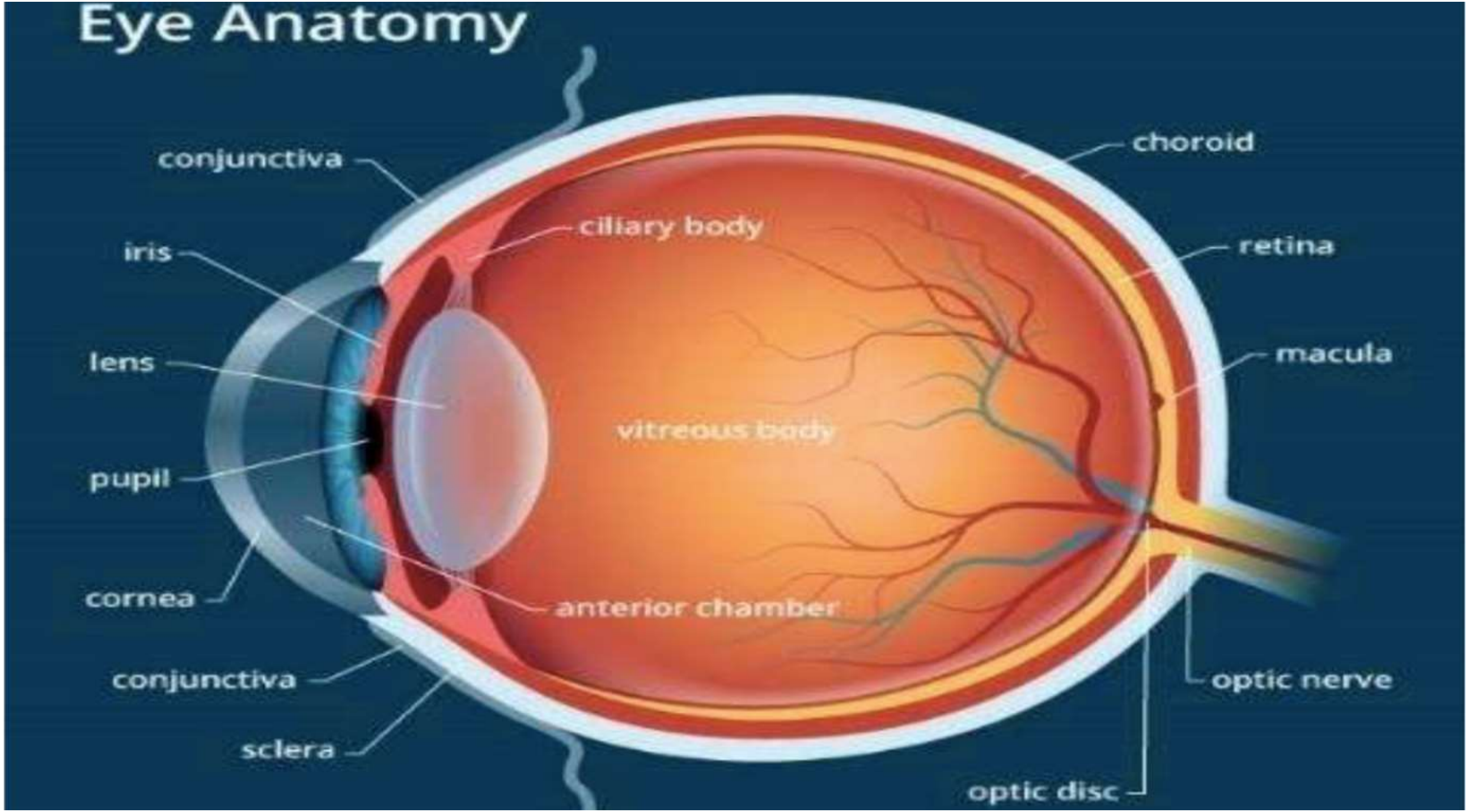
OPHTHALMOLOGY

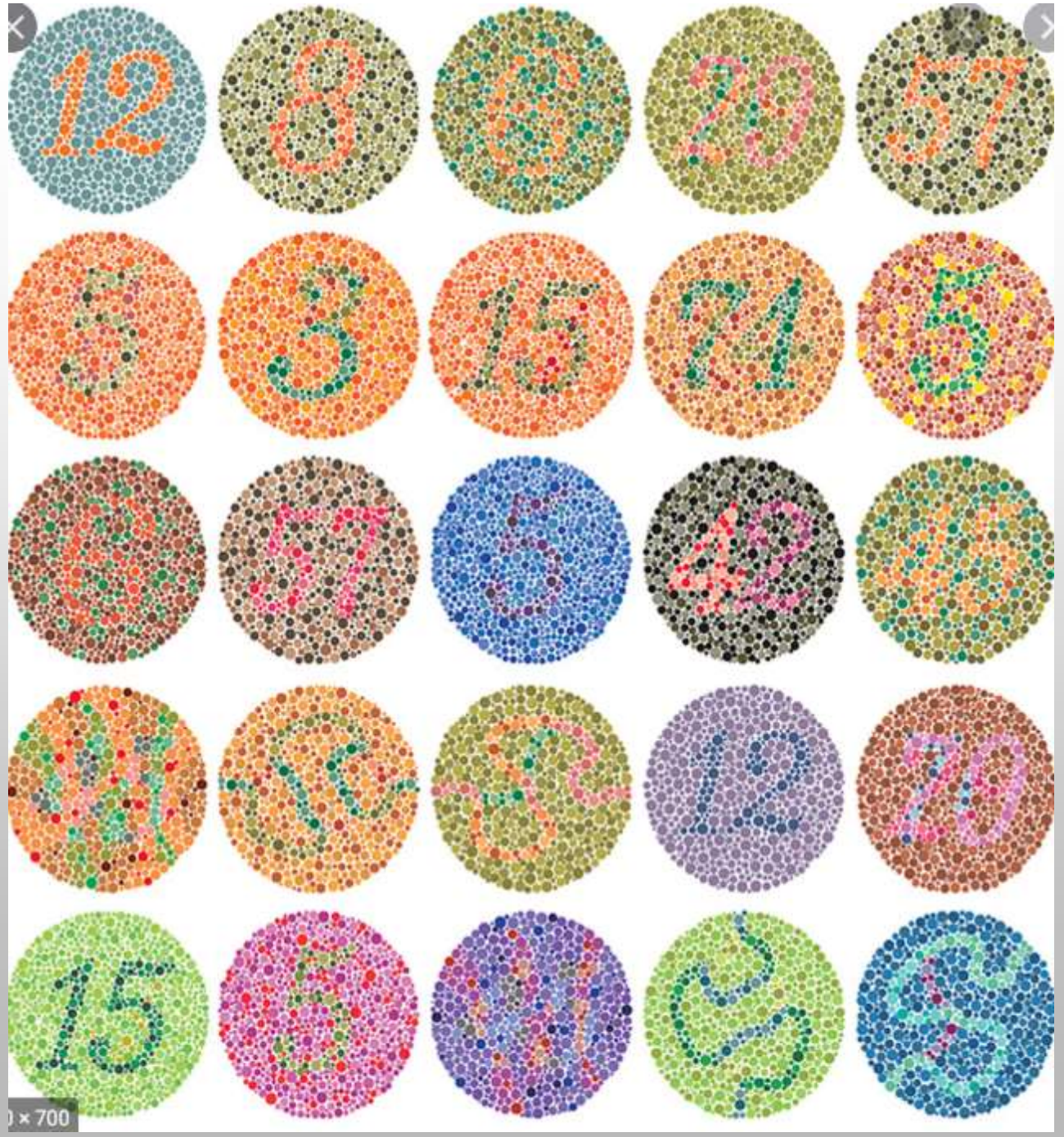
Dr. Sneh Sabhaya

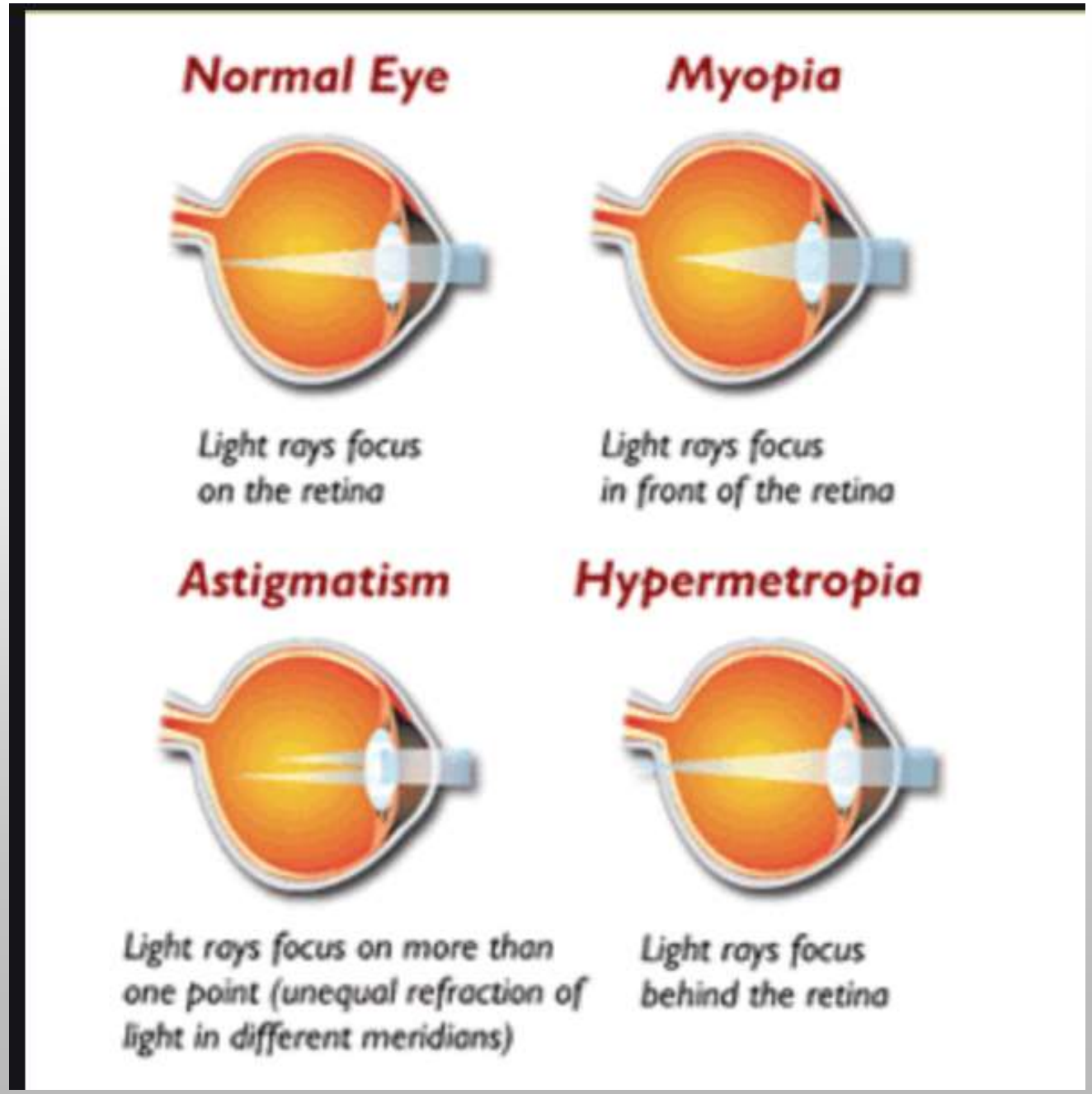

Eye Anatomy
conjunctiva
iris
lens
pupil
cornea
conjunctiva
sclera
ciliary body
vitreous body
anterior chamber
choroid
retina
macula
optic nerve
optic disc

Visual failure

- Ranges from refractive errors to full blown blindness
- In Australia, legally blind is at 6/60 bilaterally
- Minimum to drive is 6/12
- Using the Snellen chart

Ishihara colour vision test





Refractive errors

PINHOLE TEST

- Acts as a universal correcting lens
- If visual acuity is NOT normalised by looking through a card with a 1mm pinhole then defect is NOT solely by refractive error
- Exception is in some cataracts, in which pin hole might help

You are seeing Eric, a 68-year-old man, who has been having a difficulty reading his telephone book and seeing in dim light. which started three months ago and worsened progressively. His sight improves when he look through a 1mm pinhole. What is the most likely diagnosis?

1. Myopia
2. Cataract
3. Hypermetropia
4. Presbyopia
5. Chronic simple glaucoma

You are seeing Eric, a 68-year-old man, who has been having a difficulty reading his telephone book and seeing in dim light. which started three months ago and worsened progressively. His sight improves when he look through a 1mm pinhole. What is the most likely diagnosis?

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4. Presbyopia
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- Although persons with hypermetropia have the same presentation as this clinical scenario, the late age of onset is more suggestive of presbyopia . Hypermetropia usually occurs in young age.

- Persons with **bilateral cataract** have difficulty in seeing both far and near objects. Furthermore, they tend to be **visually impaired in bright light than dim light.**

- Chronic simple glaucoma presents differently with impaired peripheral visual fields initially.

You are seeing a 6 year-old child, who has been having a difficulty reading the white board at school, but has no problem whilst using his computer at home. His vision is improved with pinhole test. What is the most likely diagnosis?

1. Myopia
2. Cataract
3. Hypermetropia
4. Normal variant
5. Glaucoma

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4. Normal variant
5. Glaucoma

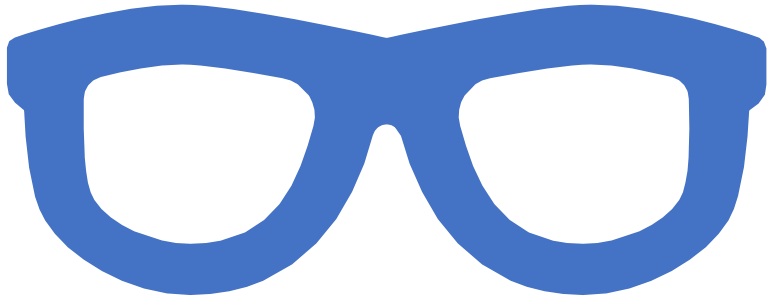
Myopia (short sightedness)

- Usually seen in teens
- Light rays focus in front of the retina

complications: macular degeneration or retinal detachment

Management

- Glasses with **concave** lenses
- Contact lenses
- Laser surgery



Hypermetropia (long sightedness)

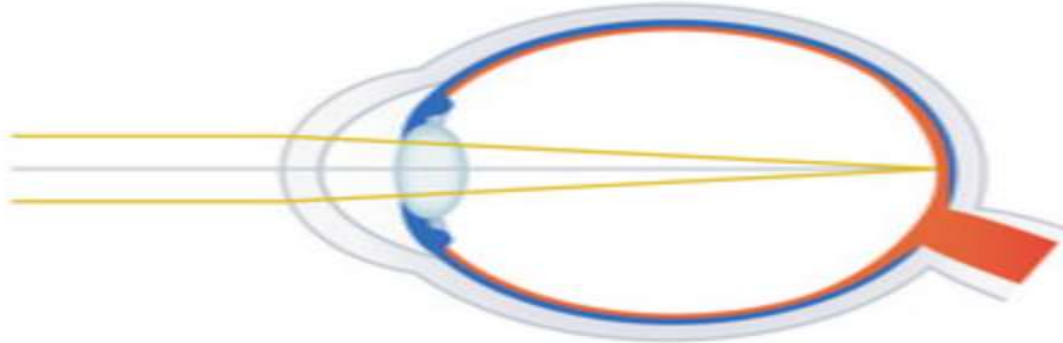
- Seen in 30+
- Light rays focus behind the retina

Complication- most common is closed angle glaucoma

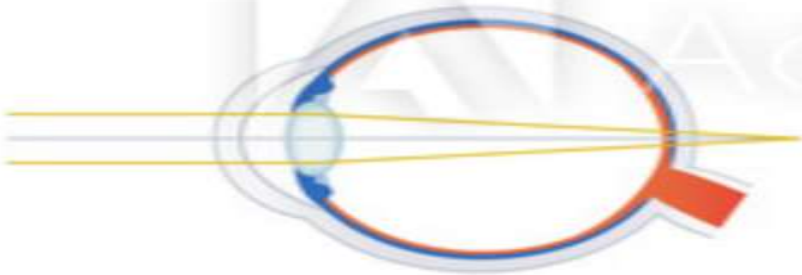
Management

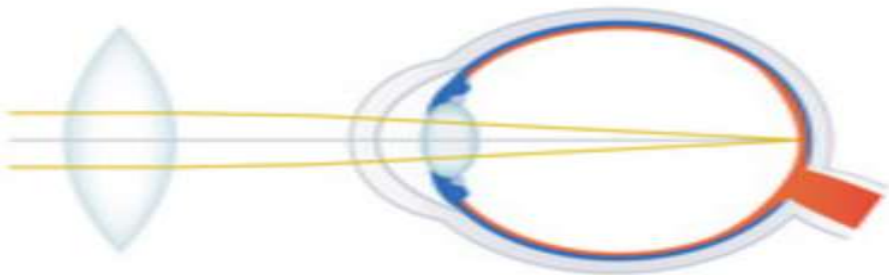
- Glasses with **convex** lenses
- Surgery

Normal Vision

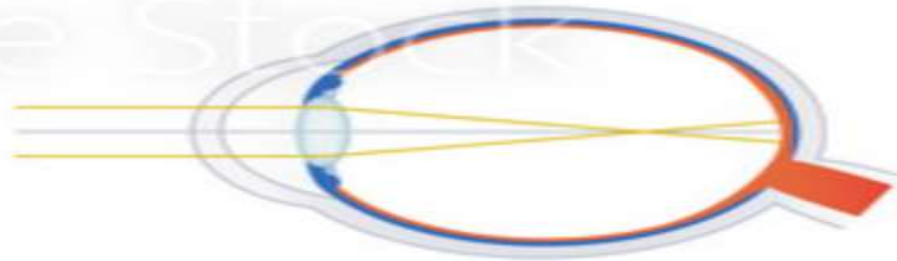


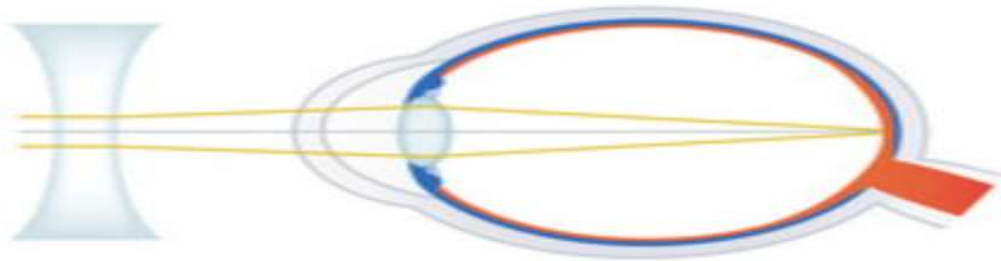
Hyperopia

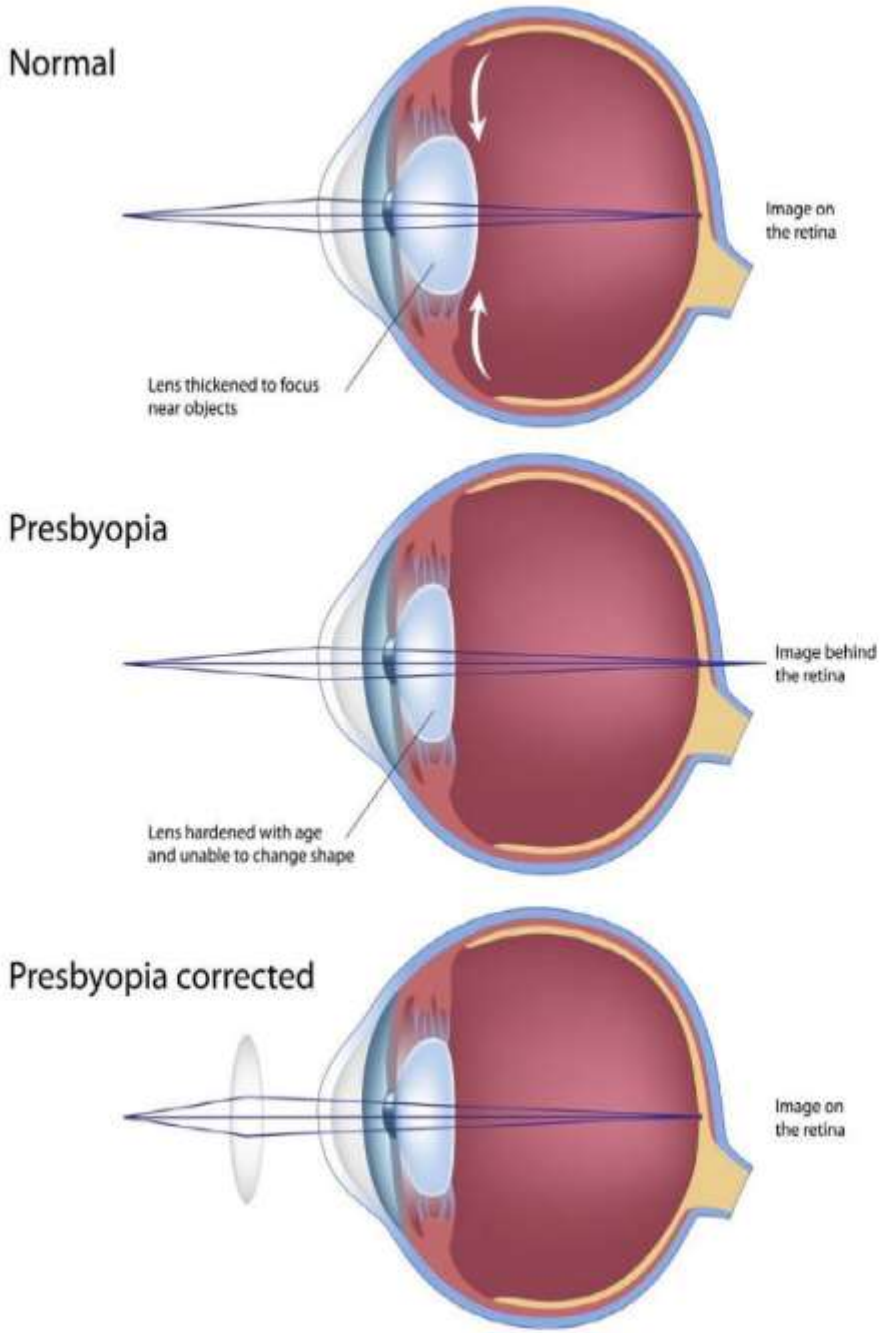




Myopia







Presbyopia

It is physiological (weakening of muscles of accommodation)

- Similar presentation to Hypermetropia
- Much older patients

Clinical features

- Eye strain and difficulty **seeing in dim light**
- Problems in focussing on small objects and fine prints
- Difficult to switch focus from close to distant objects and vice versa.
- Headache after prolonged reading which may be relieved by rest

Management-

For patients with isolated presbyopia- Convex glass

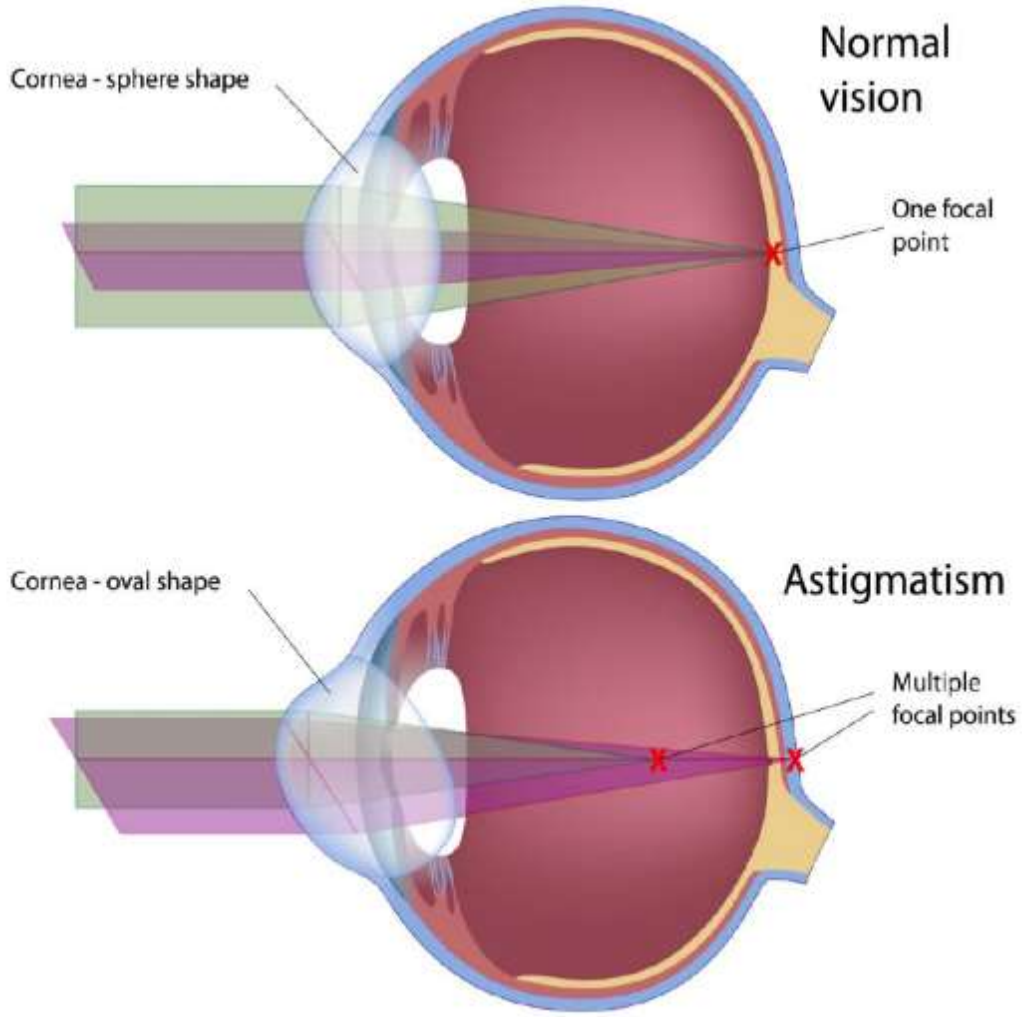
For patients with associated myopia- Multifocal glass

Astigmatism

Light rays focus on more than one point (unequal refraction of light in different meridians)

- Blurring of vision due to changes in the **shape of cornea**

Management- Corrective lens more curved in one meridian



Vision loss

Table 77.4 Causes of sudden loss of vision[7]

	Bilateral	Unilateral	
		Transient	Permanent
Vascular causes	Occipital cortex ischaemia Pituitary apoplexy Homonymous hemianopia—vascular	Amaurosis fugax Transient ocular ischaemia Retinal emboli Malignant hypertension	Central retinal artery occlusion Central retinal vein occlusion Vitreous haemorrhage Ischaemic optic neuropathy
Other causes	Bilateral optic neuritis Toxic damage to optic nerve: • methanol • ethanol • tobacco • lead Leber optic atrophy Quinine poisoning of retina Cerebral oedema Occipital lobe trauma Craniopharyngioma Hysteria	Acute angle closure glaucoma Uhthoff phenomenon Papilloedema Posterior vitreous detachment	Optic neuritis Retinal detachment Optic nerve compression Carcinomatous optic neuropathy Intraocular tumour

AMAUROSIS FUGAX

In Latin –Amaurosis (darkening) and Fugax (fleeting)

Transient loss of vision in one eye (unilateral)

Painless

Loss of vision can be partial or complete due to transient **occlusion of retinal artery**.

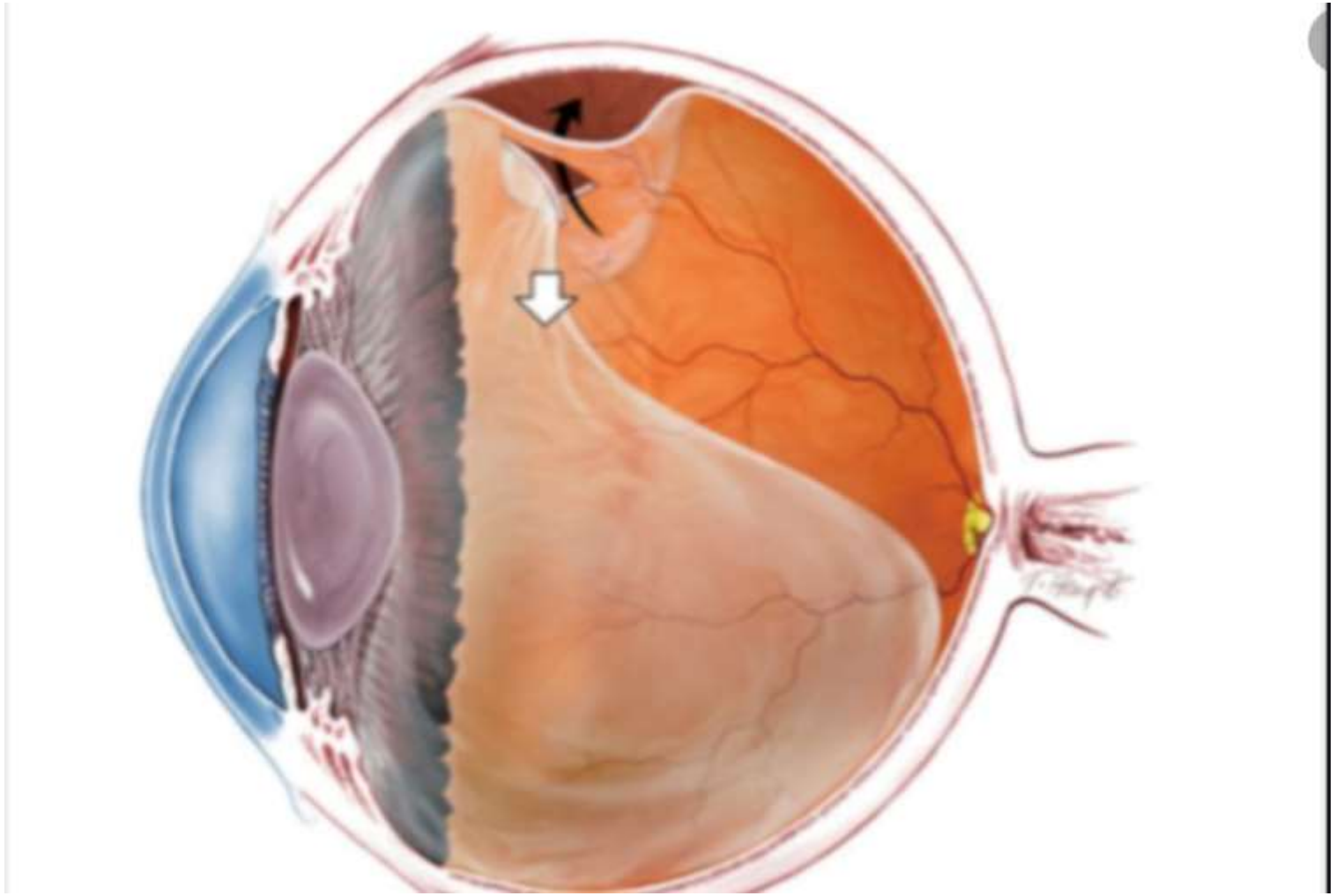
AMAUROSIS FUGAX

- LASTS: <60 mins
- DUE TO: occlusion of retinal artery
- CAUSED BY: embolus from an atheromatous carotid artery
- Could be accompanied by transient hemiparesis
- Source must be investigated (↑↑chance of STROKE)
- **Ix**- carotid duplex, echo
- If this investigations prove unfruitful, but the suspicion is high (eg. an embolus can be seen in a retinal arteriole) the patient may require more sensitive investigation such as transoesophageal echocardiogram or computerised tomography (CT) angiography looking for more proximal carotid artery disease

A patient comes to the ED with repeated episodes of blurring of vision for a few weeks with floaters. He now says that a curtain has come over his sight.

What is the most likely cause?

1. Amaurosis Fugax
2. Retina detachment
3. Carotid Artery occlusion
4. Post-convulsive icteric status
5. Central retinal vein thrombosis



Guess now

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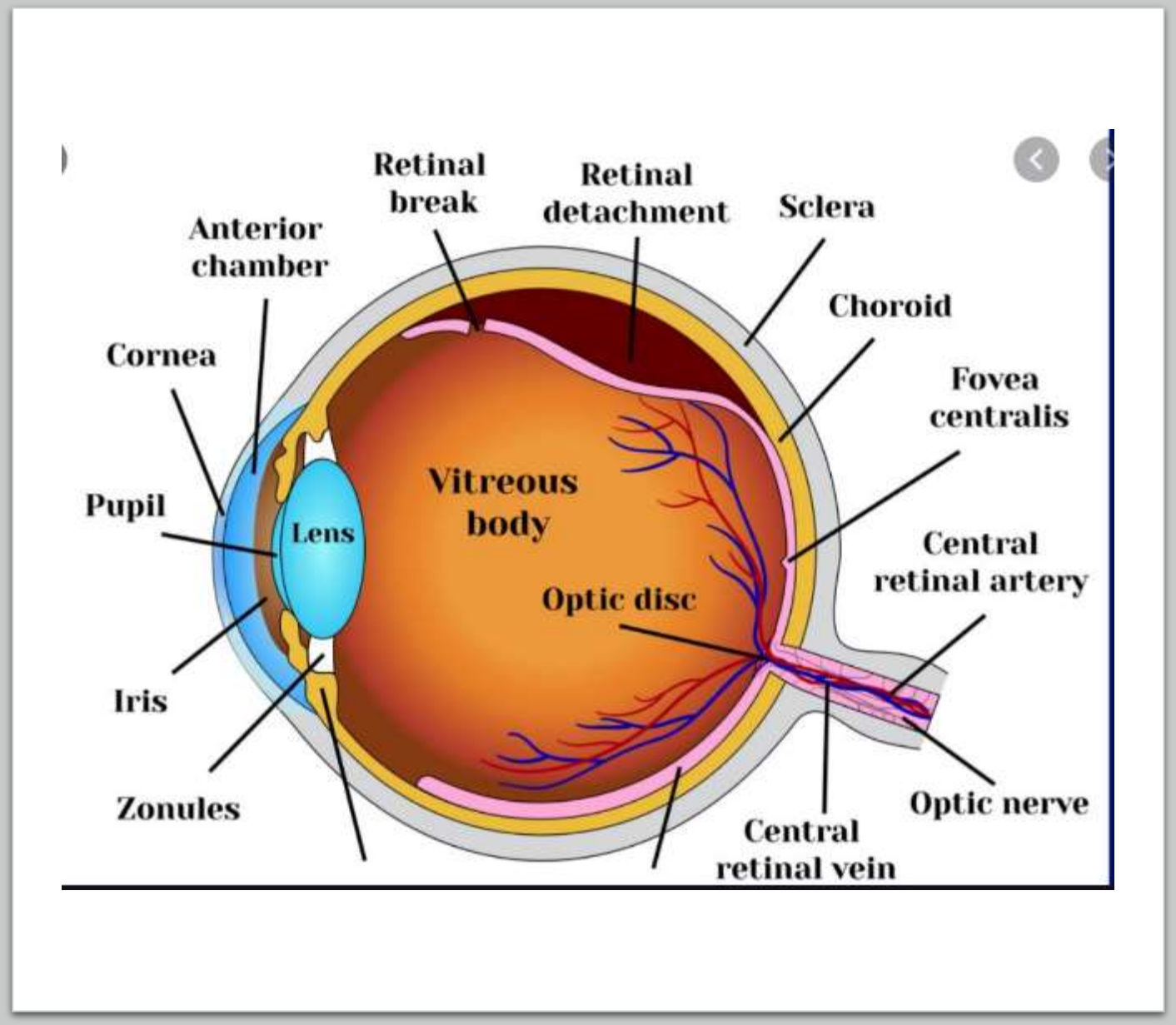
Retinal Detachment

- Separation of the retina from the back of the eye

CAUSES:

- Trauma
- Thin retina (high myopia)
- Prior surgery
- Diabetic retinopathy



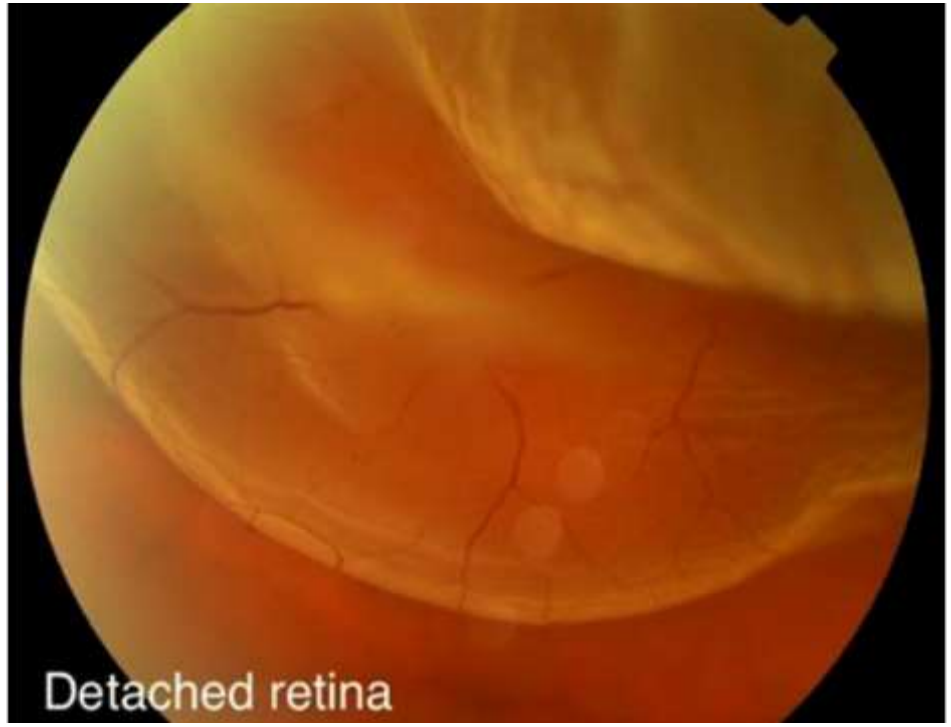
CLINICAL FEATURES:

- Sudden onset of floaters or flashes
- Blurred vision in one eye
- ‘A curtain came down over the eye’
- Fundoscopy: large shadow in vitreous cavity

MANAGEMENT:

Tell the patient to **tilt their head** in an attempt to prevent progression of the detachment, and to promote the chance of the detached retina to fall back into the place.

- IMMEDIATE referral
- Laser surgery (to prevent further detachment)
- Pneumatic dilatation



MCQ

A 66-year-old woman presents with sudden decrease of vision in her right eye 45 minutes ago. She has a 15-year history of type II diabetes mellitus and hypertension for the past five years, for which she is on enalapril. On examination, the visual acuity of the left eye is 12/18, and that of the right eye is limited to only finger counting. Fundoscopic examination of the right eye is shown in the following photograph (next slide). Which one of the following is the most likely diagnosis?

- A. Central retinal artery occlusion (CRAO).
- B Central retinal vein occlusion (CRVO).
- C Age-related macular degeneration.
- D Diabetic retinopathy.
- E Hypertensive retinopathy.

- Option A is correct
- The findings in the photograph are a pale retina and a cherry-red macula (cherry-red spot) associated with central retinal artery occlusion (CRAO).
- (Option B) Central retinal vein occlusion (CRVO) has a more insidious onset, unless the vein has acutely undergone complete obstruction. The funduscopic findings in CRVO **are tortuous retinal vessels, oedema of the optic nerve and diffuse haemorrhages in all the four quadrants of the retina.**
- (Options C, D and E) Age-related macular degeneration, diabetic retinopathy and hypertensive retinopathy are not usually associated with sudden onset of visual loss. Moreover, fundoscopy will show different patterns

CENTRAL RETINAL ARTERY OCCLUSION (CRAO)

- Arterial obstruction by Atherosclerotic emboli/thrombi.
- Look for signs of atherosclerosis, Heart disease, diabetes, smoking or lipids.

CLINICAL FEATURES:

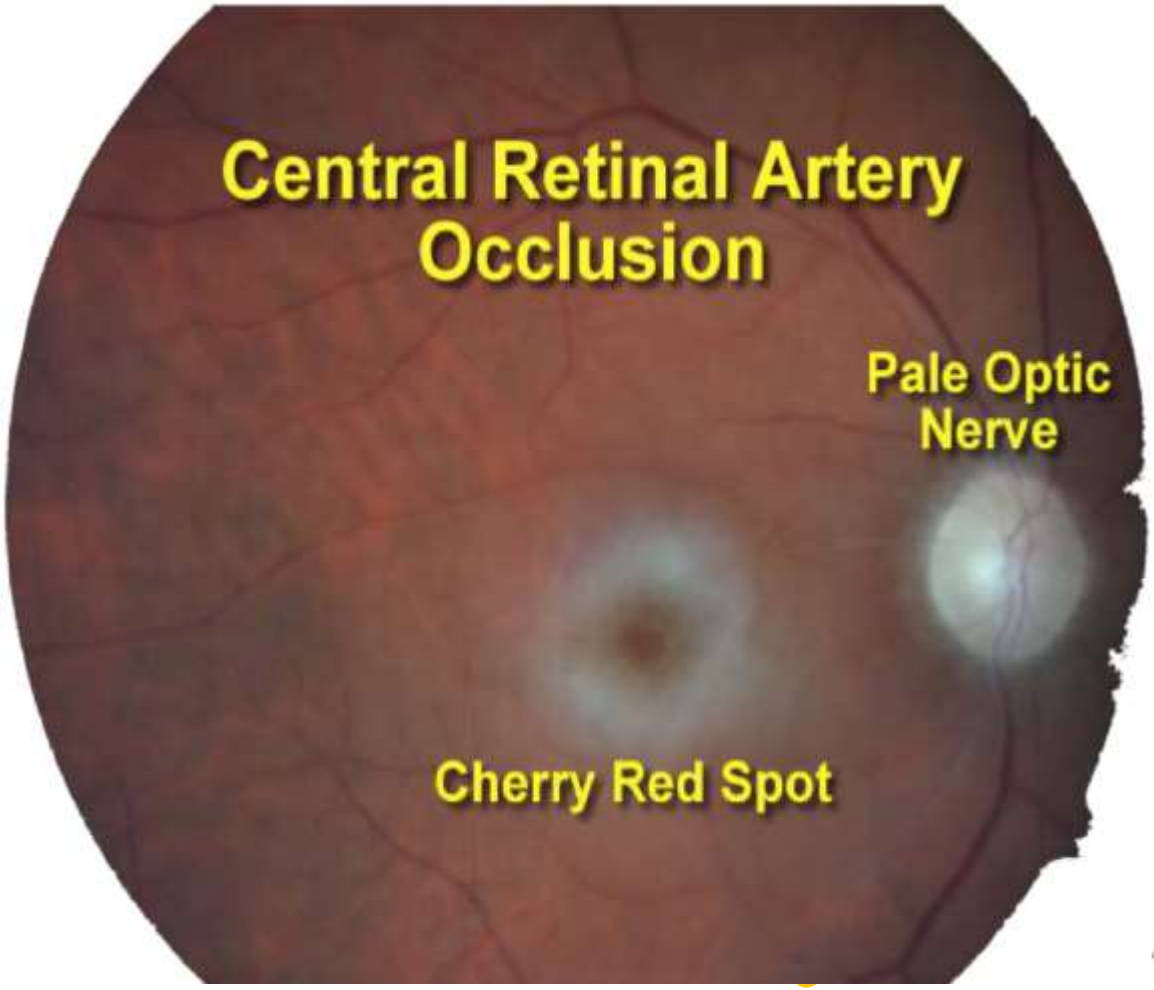
- Sudden severe painless loss of vision in one eye
- Not improved by pinhole
- No light perception

Fundoscopy:

Retina- oedematous and pale

Blood vessels- markedly narrow

classic cherry red spot



A patient presented to the ED, three hours, after a sudden loss of vision. He is known hypertensive, well-controlled on oral anti-hypertensive therapy. The retinal image shows a typical cherry red spot.

Which of the following would be an appropriate management?

1. Hyperbaric O2
2. IV acetazolamide
3. Ocular massage
4. Pilocarpine
5. Review after few days

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CENTRAL RETINAL ARTERY OCCLUSION (CRAO)

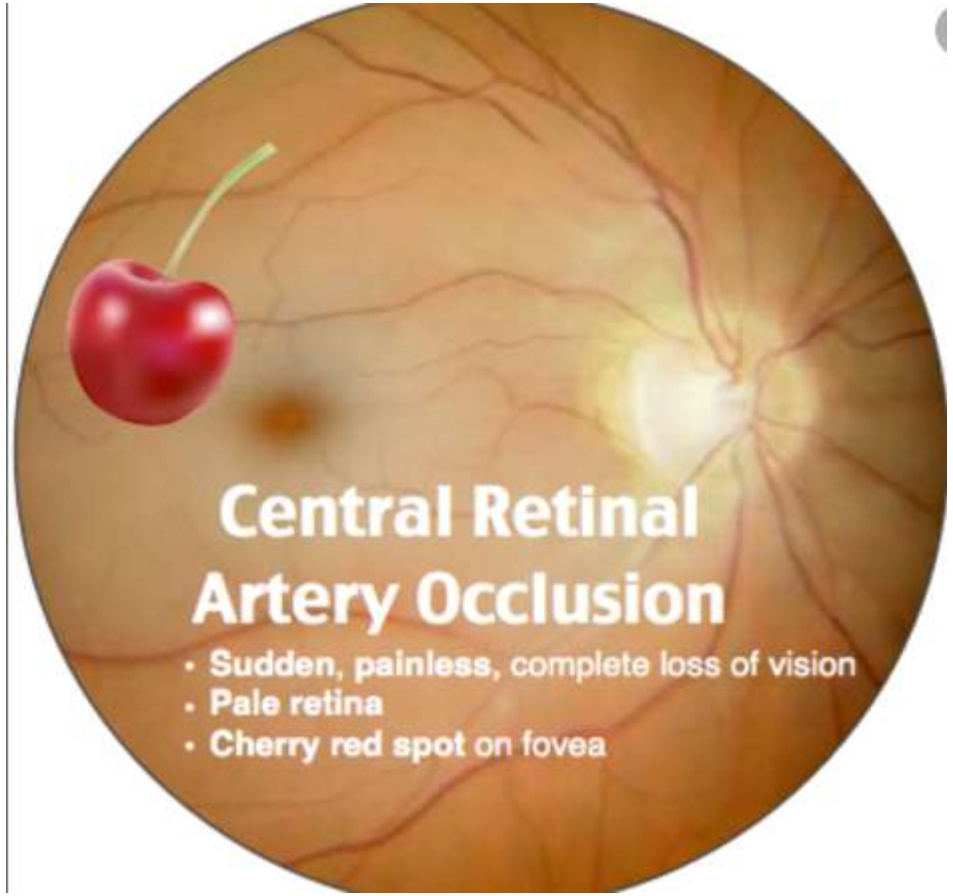
MANAGEMENT:

1. Within 30 mins of presentation:

- Massage eye-globe directly (direct digital pressure)
- Re-breathe CO_2(paper bag)

2. IV acetazolamide

3. Refer urgently



Guess this…!!

CENTRAL RETINAL VEIN OCCLUSION (CRVO)

- Usually seen in elderly patients

CLINICAL FEATURES:

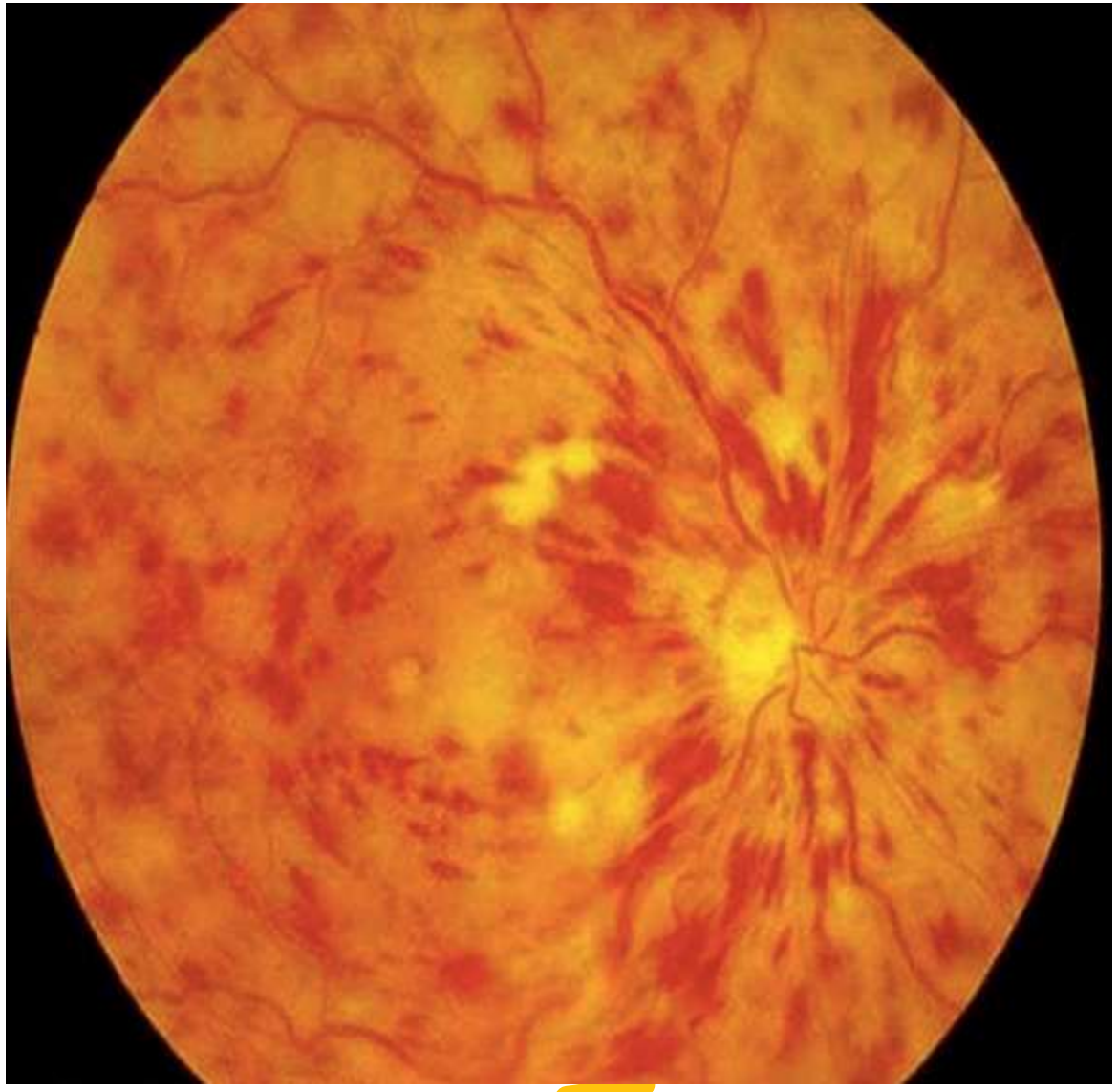
- Sudden loss of **central vision** in one eye (can be gradual too)
- Not improved by pinhole
- Improves with distorted image

Fundoscopy: stormy sunset appearance (angry looking red clouds are hemorrhages, besides engorged veins).

Fluid collects in the area of the retina responsible for central vision called the macula. This fluid causes oedema of macula, causing loss of central vision

MANAGEMENT:

- No specific treatment
- Injectable medication and steroids can be used to treat macular edema
- Laser photocoagulation to prevent neovascular galucoma



Vision in CRVO

GUESS THIS ???

Macular Degeneration

- Seen in elderly
- TWO TYPES:
- 1 WET –exudative
- 2 DRY –pigmented
- WET MD:
- Neovascular membranes develop under retina and leak fluid
- Serious condition
- DRY MD:
- Accumulation of debris between retina and choroid
- More common

Macular degeneration

CLINICAL FEATURES:

- Sudden fading of central vision
- Distortion of vision
- Straight lines may seem wavy and objects distorted
- Peripheral vision is normal

FUNDUSCOPY: white exudate, haemorrhage

AMSLER GRID: distorted lines

A 60- year- old women presents to your practice, complaining of visual problems. She describes it as gradually losing her ability to see clearly and the center of her vision is blurry. Furthermore, she sees horizontal lines wavy. Which one of the following would be the next best step in the management?

1. Referral to ophthalmologist
2. Pilocarpine drops
3. Laser emulsification
4. Duplex Doppler sonography of the carotid artery
5. Iridectomy

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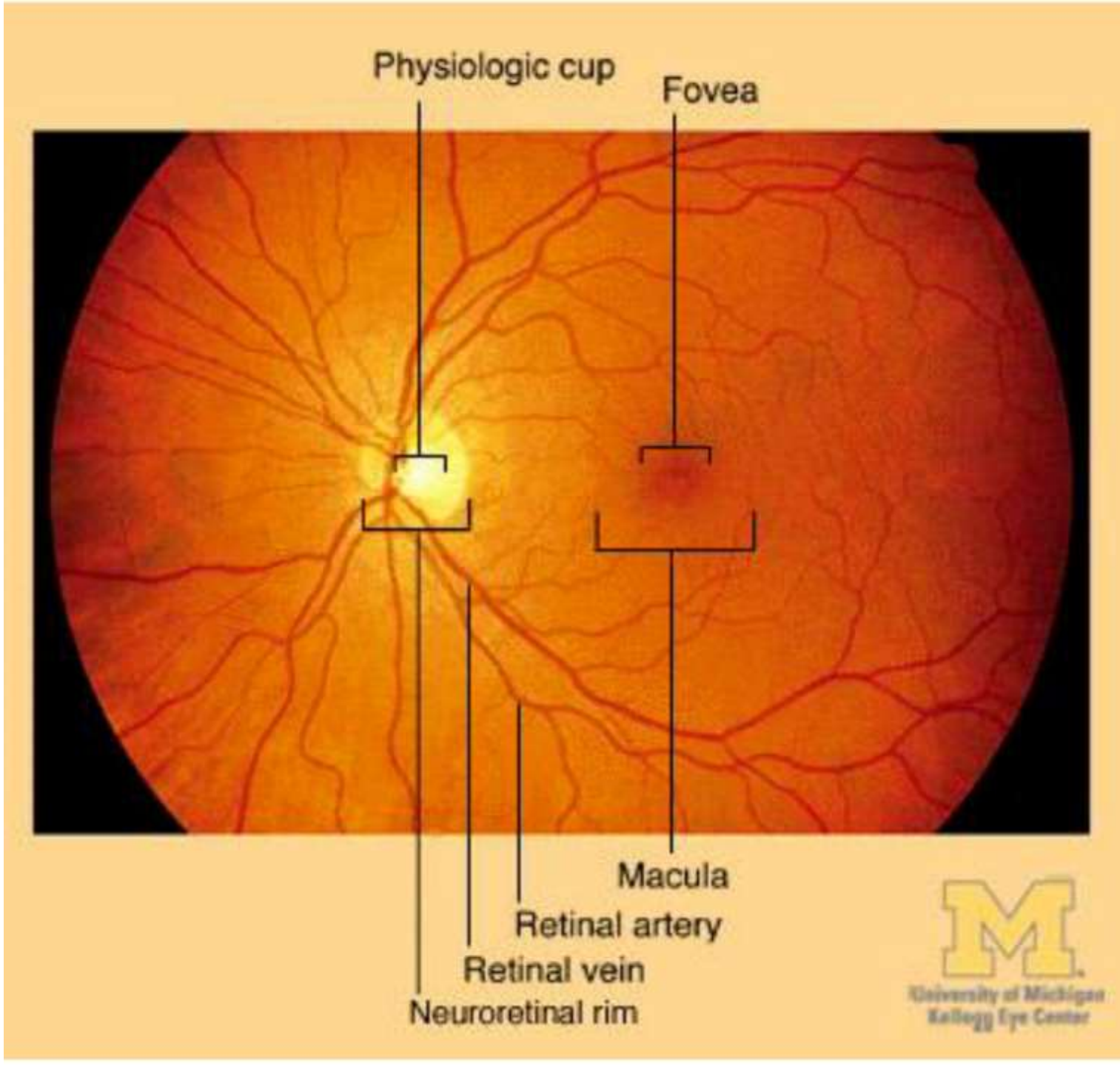
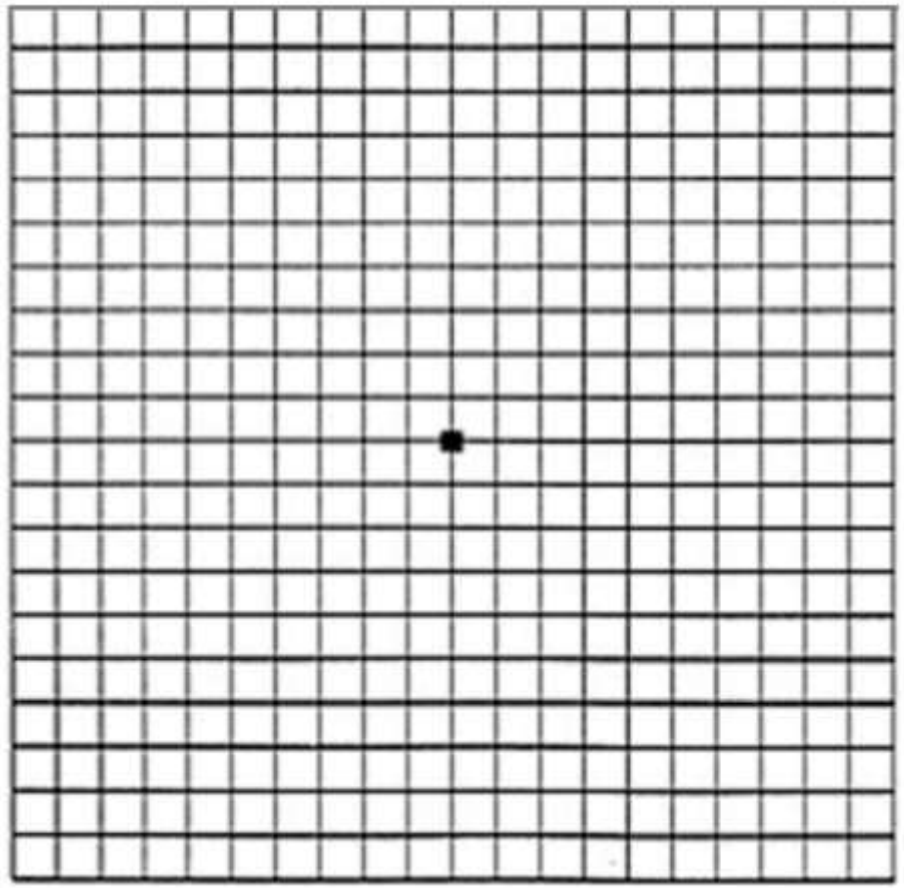
Normal fundus



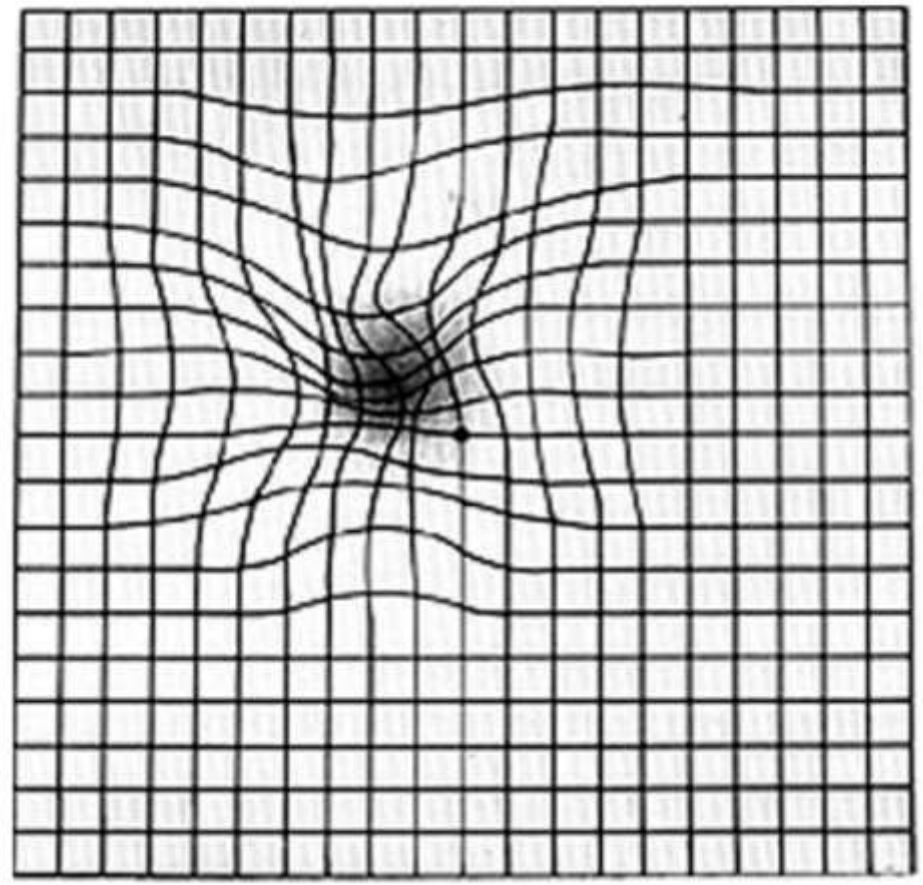
Age-related MACUALR DEGENERATION (AMD)

AMSLER GRID

The Amsler Grid might appear like this to somebody without AMD.



The Amsler Grid might appear like this to somebody with AMD.



Macular degeneration

MANAGEMENT:

- No specific treatment

In WET MD:

The treatment doesn't cure the disease but aim to stabilise and maintain the best vision for as long as possible. In few cases, treatment can improve vision.

A protein called VEGF (vascular endothelial growth factor) is predominantly responsible for leaking and growth of new blood vessels that result in rapid and severe vision loss.

Therefore, to slow the progression, anti-VEGFs may be injected to the eye. For example- Ranibizumab, Aflibercept, Bevacizumab

- Fluorescein angiography
- Laser photocoagulation

Guess this??

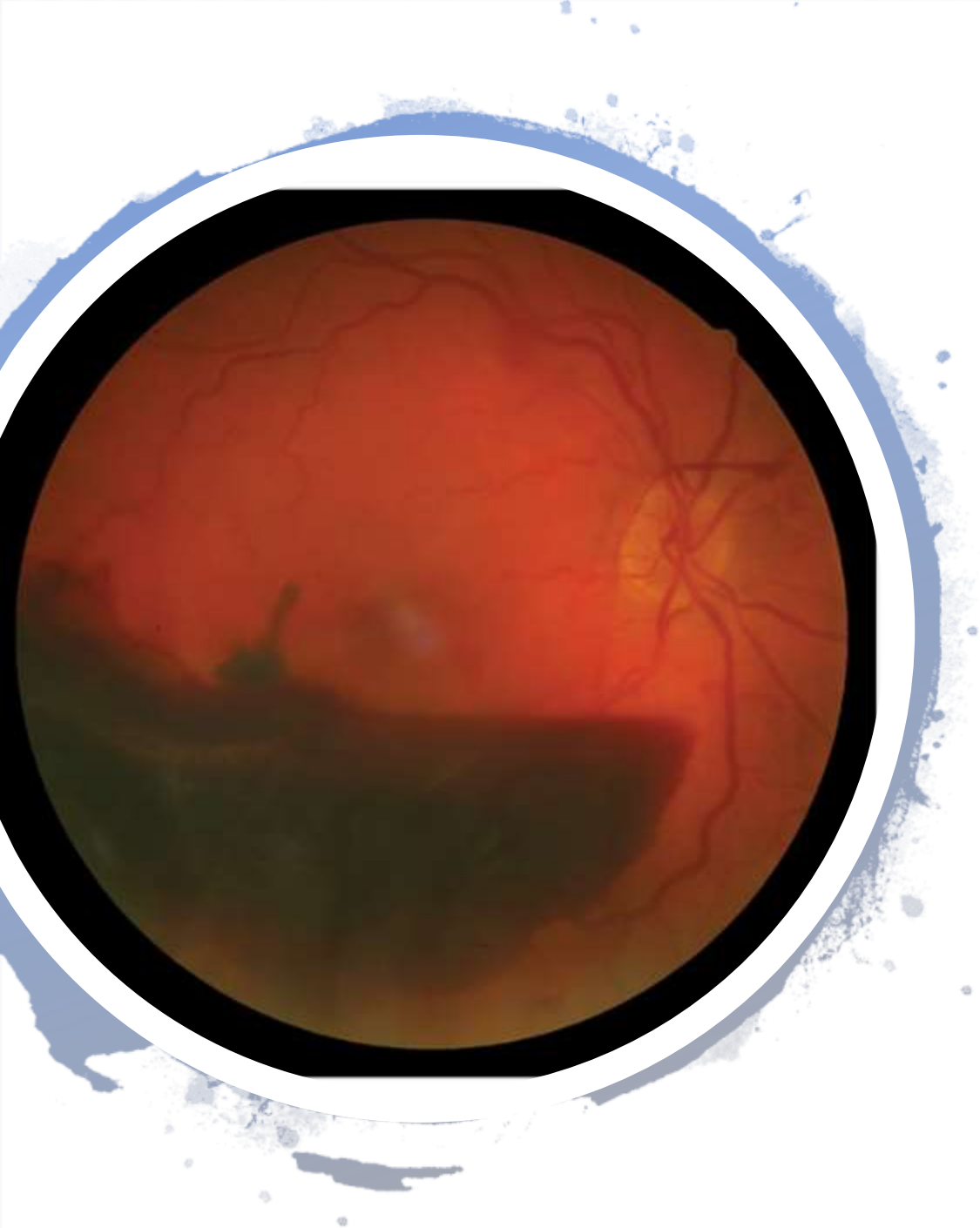
Vitreous Hemorrhage

- Haemorrhage may occur from spontaneous rupture of vessels, avulsion of vessels during retinal traction or bleeding from abnormal new vessels.

Causes- ocular trauma, diabetic retinopathy, tumour and **retinal detachment**.

Clinical features-

- Sudden onset of floaters or ‘blobs’ in vision
- May be sudden loss of vision
- Visual acuity depends on the extent of the haemorrhage; if small, visual acuity may be normal



Ophthalmoscopy

- may show reduced light reflex
- there may be clots of blood that move with the vitreous (a black swirling cloud).

Management

- **Urgent referral** to exclude retinal detachment
- Exclude underlying causes such as diabetes
- Ultrasound helps diagnosis (B-scan)
- May resolve spontaneously
- Bed rest encourages resolution
- Surgical vitrectomy for persistent haemorrhage

Optic Neuritis

Inflammation in Optic Nerve

Optic neuritis

It is an acute inflammation of the optic nerve that results in painful loss of vision

CAUSES:

- Multiple sclerosis
- Toxins
- Infections- herpes zoster, Lyme disease, syphilis, TB, CMV, etc

CLINICAL FEATURES:

- Usually 20–40 years female
- Loss of vision over a few days and discomfort around the eye that is aggravated by eye movement

Signs include-

- decreased visual acuity
- Decreased colour vision
- Decreased subjective brightness
- Visual field abnormality

Mrs Smith, is a 32-year-old, who comes to see you with a unilateral mild painful loss of vision for the past 12 hours. There is no associated headache or redness. Examination revealed normal fundus findings, visual acuity on left 6/60 and right 6/6.

Which of the following is the best investigation to detect her diagnosis?

1. CT head
2. Lumbar puncture
3. Temporal artery biopsy
4. Serum ESR
5. Visual evoked potential

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5. Visual evoked potential

Optic neuritis

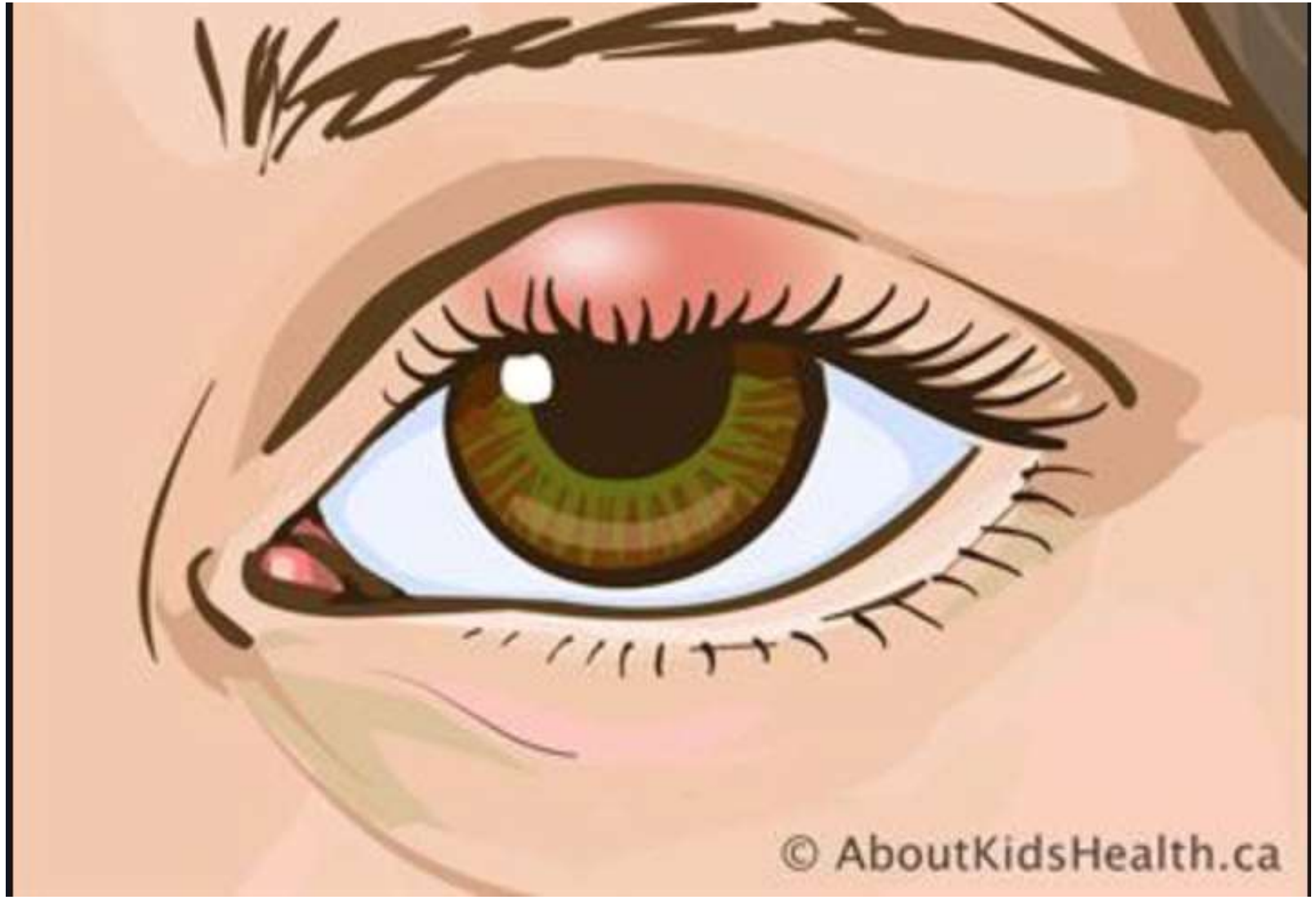
Fundoscopy: optic atrophy (late)

TESTS:

- MRI: baseline and first
- Visual evoked potential for uncertain cases
- LP: much less commonly used

MANAGEMENT:

- Urgent referral to ophthalmologist
- IV methyl prednisolone followed by oral prednisolone



EYE LIDS

Chalazion

- Blocked meibomian glands Inflammation of the ‘meibomian gland’
- May rupture through conjunctiva and cause granuloma
- Benign
- **ORGANISM:** Staph. aureus

Chalazion

CLINICAL FEATURES:

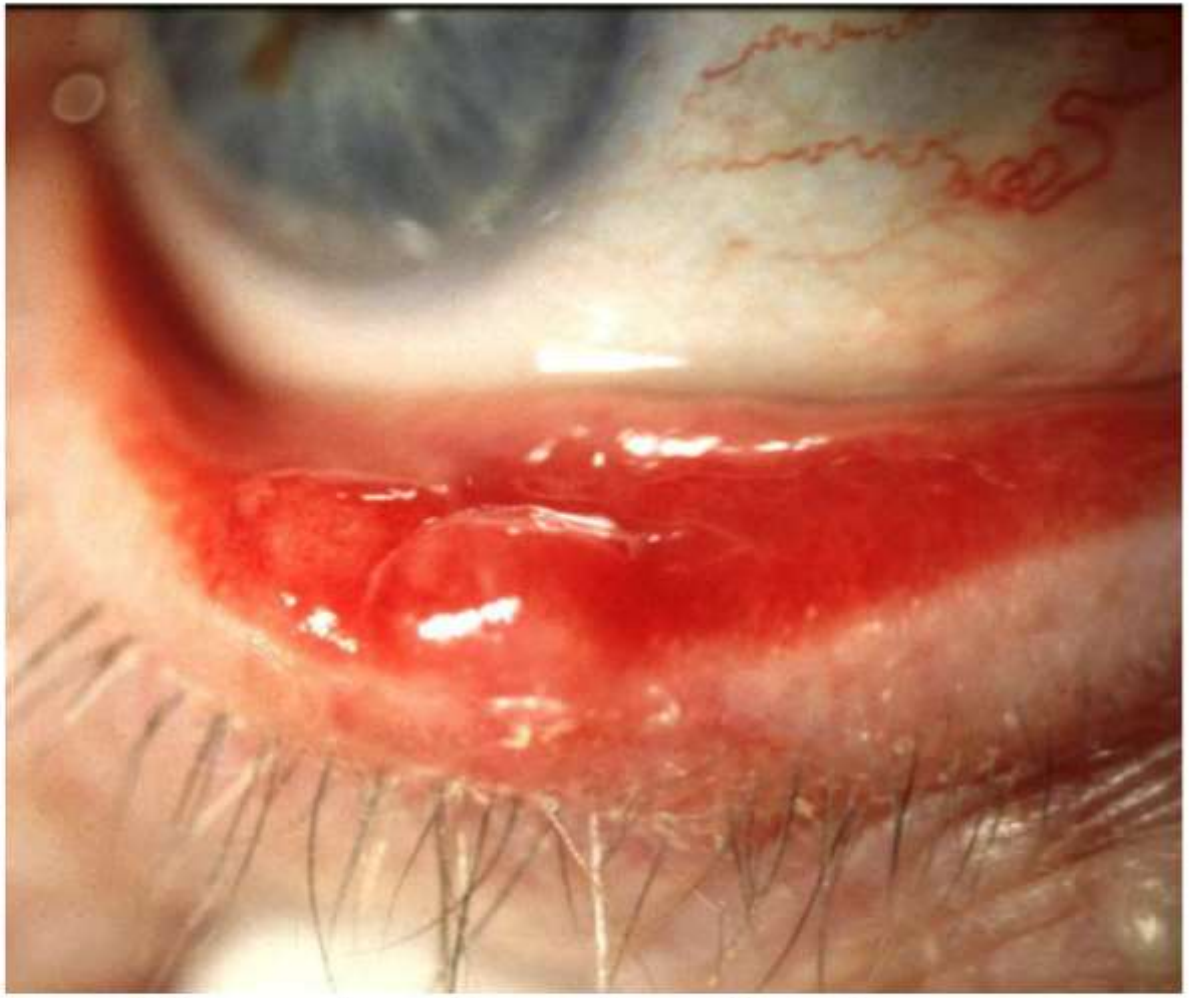
- Tender irritating lump in the lid
- Painless, round, firm lesion within tarsal plate
- Inflamed eyelid
- Resembles sebaceous carcinoma

MANAGEMENT:

- Steam/heat compression warm compress, massage
- Chloramphenicol ointment if inflamed
- LARGE: incision and curettage + Antibiotics (oral)

Chalazion

Painless, roundish, firm lesion within tarsal plate



May rupture through conjunctiva and cause granuloma

Internal hordeolum

- Abscess of meibomian gland
- Usually Staphylococcus
- Tender swelling with inflammation/Infection
- May discharge through skin or conjunctiva
- Rx: warm compresses, may require systemic antibiotics; incision and drainage if recurrent

External hordeolum (stye)

- Abscess of lash follicle

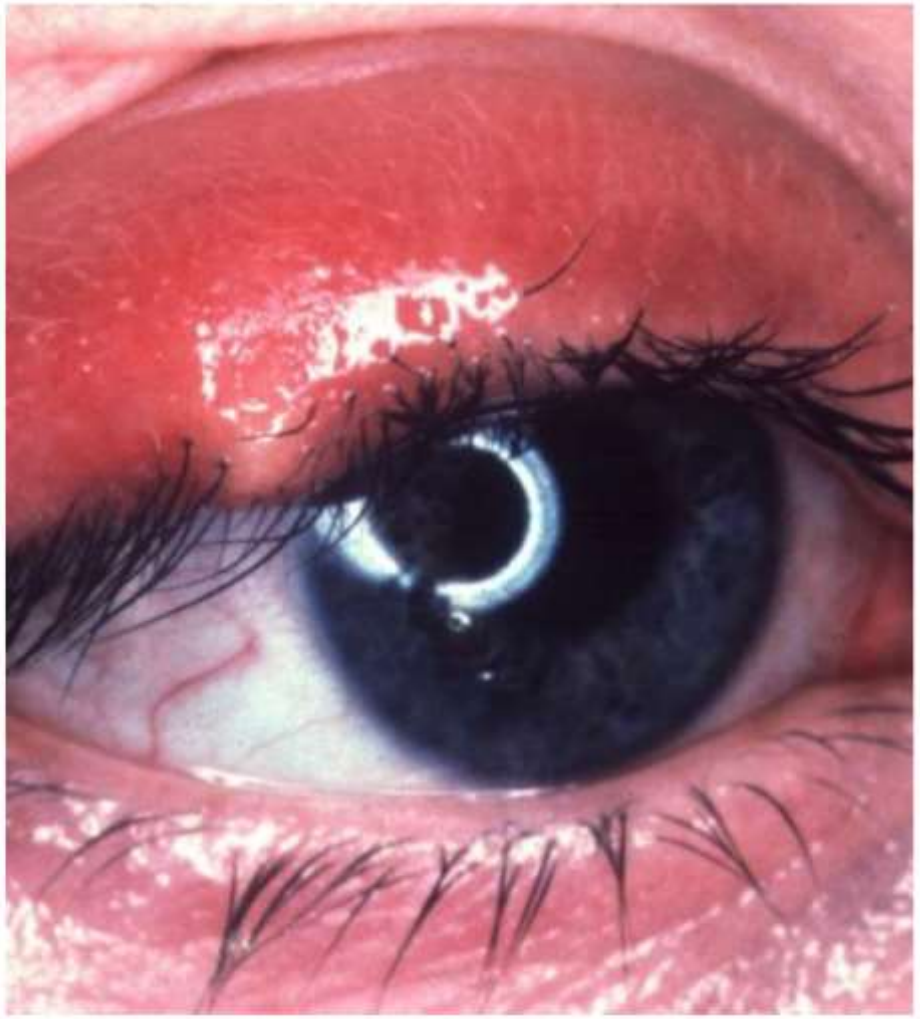
ORGANISM: Staph. Aureus

CLINICAL FEATURES:

- Red tender swelling of lid margin
- Usually medial side
- Tender swelling on lid margin
- May discharge through skin

MANAGEMENT:

- Steam/heat to help it discharge
- Lash epilation
- Chloramphenicol (if infection is spreading)



Internal hordeolum

Stye

Chalazion

Let’s make it clear….!!

GUESS THIS ???

Herpes simplex

Signs

- Crops of small vesicles
- Rupture and crust
- Heal without scarring after 7 days

Complications

- Follicular conjunctivitis
- Keratitis

Treatment –topical antivirals

Herpes zoster Ophthalmicus

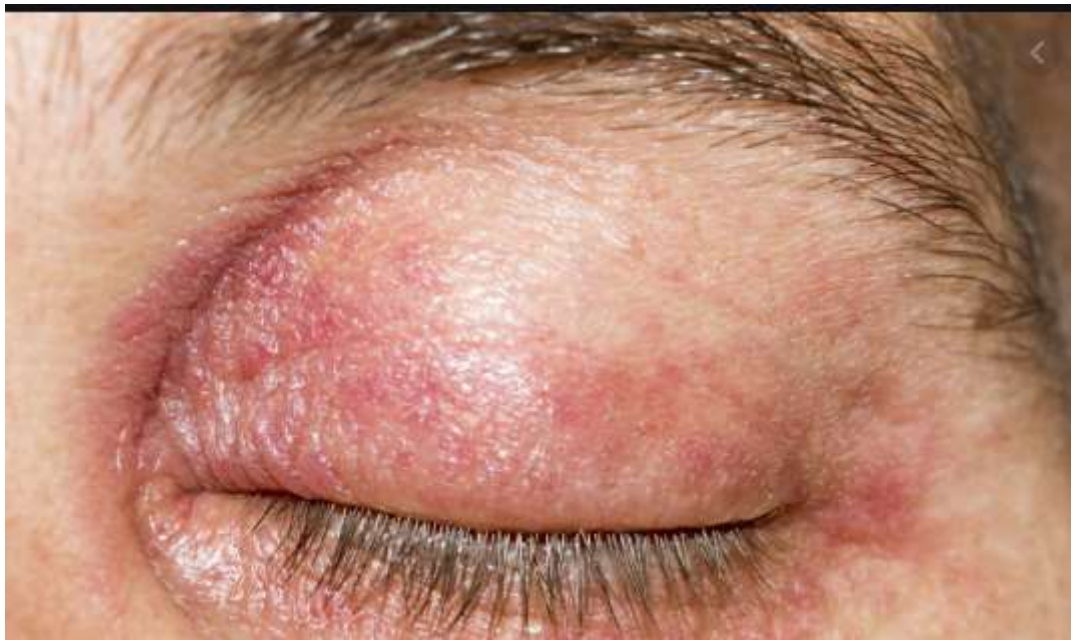
- Painful vesicles and pustules
- Periorbital oedema

Treatment -oral antivirals

Any guesses??

Acute Allergic Oedema

- **Causes** -insect bites, urticaria and angioedema
- Unilateral or bilateral
- Painless, red, pitting oedema
- Chemosis may be present
- Self-limiting
- Anti-histamine if itchy



Contact Dermatitis

Contact Dermatitis

- Sensitivity to topical medication
- Unilateral or bilateral
- Painless oedema and erythema
- Vesiculation and crusting
- Thickening if chronic

Rx- Steroid cream if severe
Anti-histamine if itchy

INFECTIONS OF LACRIMAL PASSAGES

- Congenital nasolacrimal duct obstruction
- Congenital dacryocele
- Chronic canaliculitis
- Dacryocystitis: Acute / Chronic

Congenital nasolacrimal duct obstruction

- Caused by delayed canalization near valve of Hasner
- About 20% of infants develop watery eyes, most resolve by 12 months.
- **Excessive eye watering in infants is the key sign that there is inherited narrowing of the nasolacrimal ducts**
- On pressure reflux of purulent material from punctum

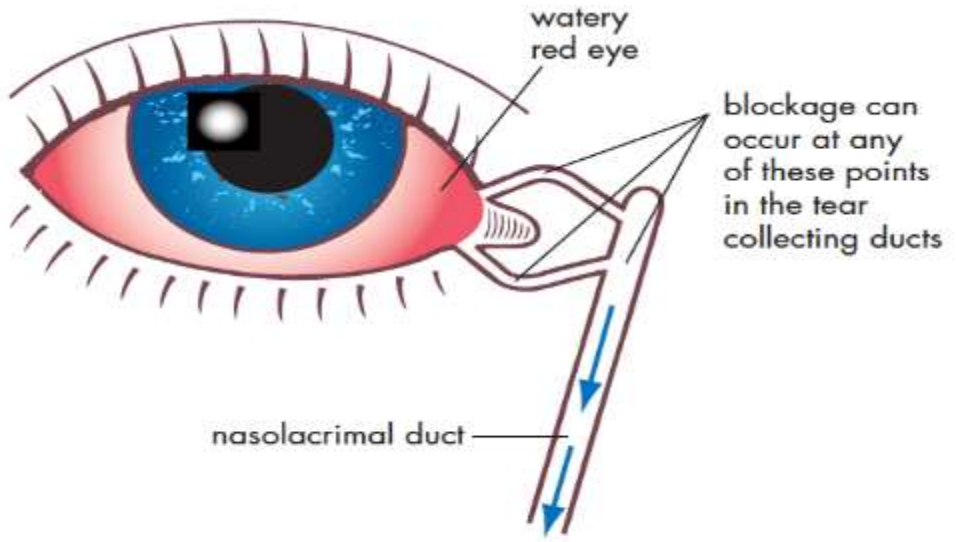


FIGURE 91.2 Blocked nasolactimal duct

Congenital dacryocele

- Distension of lacrimal sac by trapped amniotic fluid.
- Caused by imperforate valve of Hasner
- Bluish cystic swelling at or below medial canthus
- May become secondarily infected
- Pulsatile swelling above medial canthal tendon

MOA- The mucocele forms within the lacrimal sac or within the nasal cavity as a result of a congenital nasolacrimal duct obstruction (NLDO). The mucous secreted by the lacrimal sac goblet cells or amniotic fluid is then trapped in the nasolacrimal sac.

MX

- Initially massage
- Probing if massage fails

Congenital Dacryocele

Acute Dacryocystitis

- Usually secondary to nasolacrimal duct obstruction
- Tender canthal swelling
- Mild preseptal cellulitis
- May develop into abscess
- Inflammation over medial canthus
- History of watery eye for months

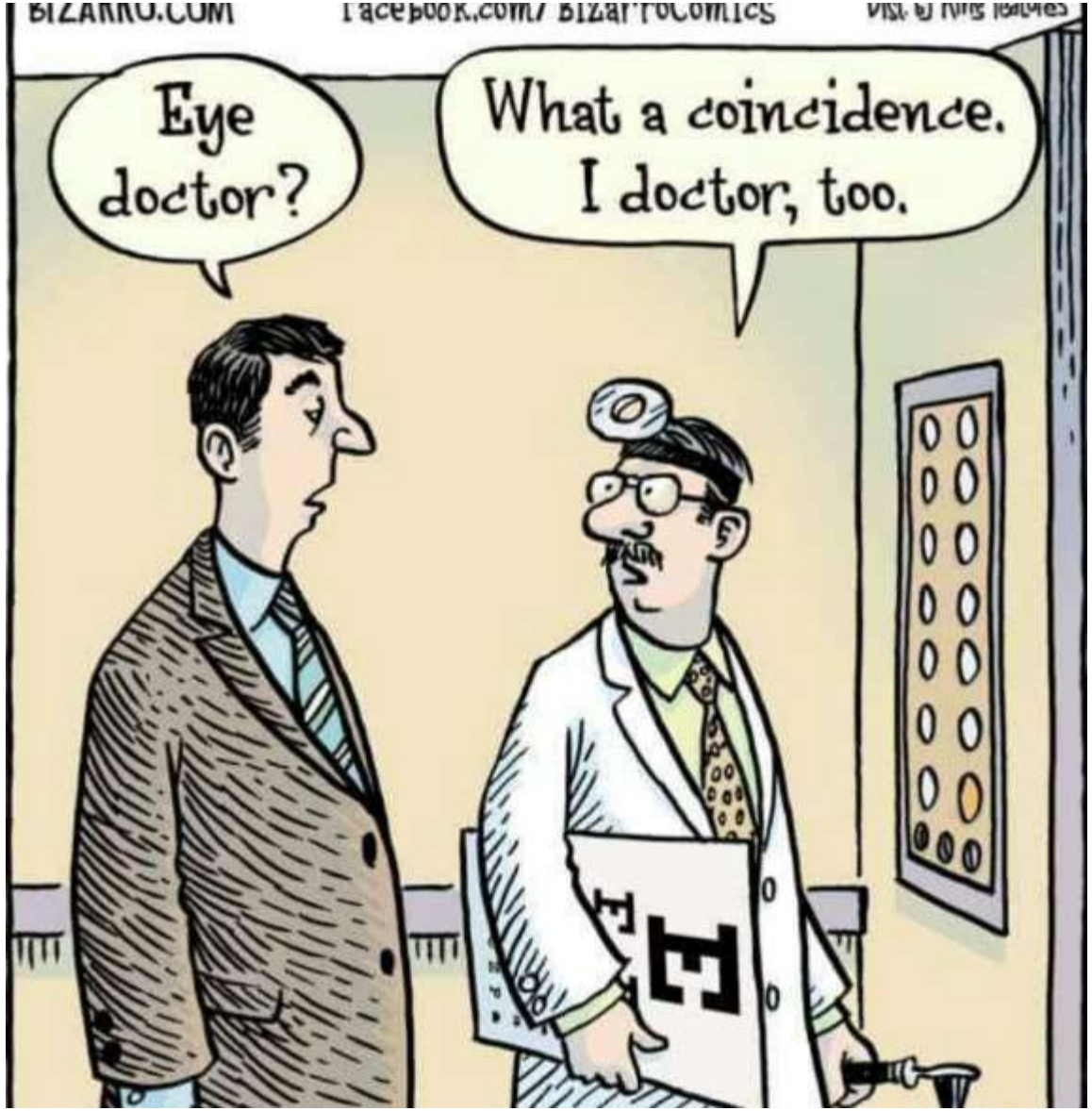
MANAGEMENT:

- Local heat
- Analgesics
- In mild cases, massage the sac and duct, and instil astringent drops

(e.g. zinc sulfate + phenylephrine)

- Acute- Flucloxacillin (change after result of Gram stain)
- Recurrent: dacryocystorhinostomy

ORBIT



Preseptal cellulitis

Preseptal cellulitis

Causes

- Skin trauma or insect bites of lids or eyebrows
- Spread from local infection
- Or an Upper respiratory or ear infection
- Trauma to the eye

Signs

- Usually unilateral
- Tender and red Periorbital oedema
- Eye movements normal
- Vision normal

Treatment - systemic antibiotics

Orbital cellulitis

Orbital cellulitis

- Potentially life-threatening and blinding
- More common in children
- Systemically unwell (toxic) patient
- Infection behind orbital septum
- Usually secondary to ethmoiditis
- Presentation -severe malaise, fever and orbital signs
- Severe eyelid Oedema and redness
- Proptosis -most frequently lateral and down
- Sinus tenderness
- Ocular nerve compromise (vision and pupil affected)
- PAINFUL eye movements specially in extreme direction, ophthalmoplegia ⟶differs it from ‘peri-orbital cellulitis’

Complications of orbital cellulitis

- Raised intraocular pressure
- Retinal vasculature occlusion
- Optic neuropathy

Orbital:

- Orbital or subperiosteal abscess

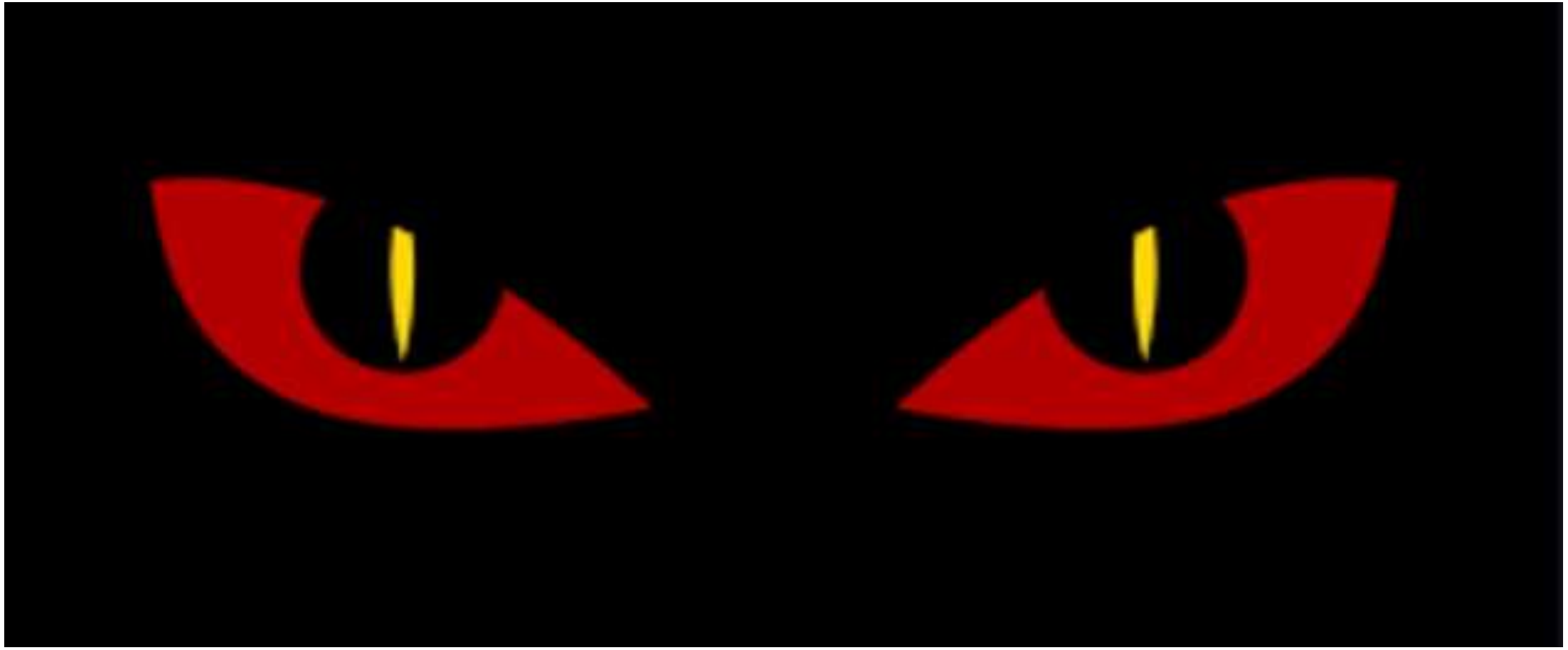
Intracranial:

- Meningitis, brain abscess
- Cavernous sinus thrombosis

Management

- Immediate referral to hospital for specialist treatment
- IV Cefotaxime + Flucloxacillin till afebrile
- Followed by Amoxicillin/Clavulanate oral for 10 days

ACUTE RED EYE



A 21-year-old women presents to your office with itchy and watery eyes, Her symptoms started 2 days ago with redness of both eyes, lacrimation and itching. She wears contact lenses. On examination, her upper and lower lids are erythematous bilaterally. Which one of the following, if in history, is most consistent with the diagnosis?

1. Mucopurulent discharge
2. A lump in the upper eyelid
3. Reduced visual acuity
4. Using a new preserving solution for her contact lenses
5. Bilateral conjunctivitis 3 months ago

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1. Mucopurulent discharge
2. A lump in the upper eyelid
3. Reduced visual acuity
4. Using a new preserving solution for her contact lenses
5. Bilateral conjunctivitis 3 months ago

- A mucopurulent discharge will be consistent with bacterial conjunctivitis which is unlikely in this scenario. A previous history of bacterial conjunctivitis is unrelated to the current presentation

- A lump in the upper eyelid is a finding in stye or chalazion, which have a quite different presentations.

- Conjunctivitis doesn't affect vision. If vision is impaired, consider some other diagnosis

Red Eye with Normal vision

Painful/discomfort

- Diffuse superf. redness (conjunctivitis)
- Diff. deep redness (anterior scleritis)
- Circumlimbal redness (keratitis, anterior uveitis, corneal foreign body)
- Sectoral redness (episcleritis, marginal keratitis)

Painless

- Subconjunctival haemorrhage

Red eye with Reduced vision

Normal IOP

- Corneal abrasion, keratitis, anterior uveitis, endophthalmitis

Increased IOP

- Acute glaucoma

CONJUNCTIVAL INFECTIONS

Conjunctival inflammation lasting <3 weeks

Bacterial

- Simple bacterial conjunctivitis
- Gonococcal keratoconjunctivitis

Viral

- Adenoviral keratoconjunctivitis
- Molluscum contagiosum conjunctivitis
- Herpes simplex conjunctivitis

Chlamydia

- Adult chlamydial keratoconjunctivitis
- Neonatal chlamydial conjunctivitis
- Trachoma

Acute viral Conjunctivitis

Signs of conjunctivitis

- Most common organism –adenovirus
- Associated with URTIs

CLINICAL FEATURES:

- Usually bilateral
- Itching present
- Follicular growth on lids
- Watery discharge
- Pre-auricular lymph node palpable

MANAGEMENT: symptomatic

- Educate about hygiene
- Topical lubricants
- Avoid corticosteroids

What is this?

BACTERIAL CONJUNCTIVITIS

- History of contact usually presents
- Spreads easily by contaminated objects (e.g. clothes, utensils)

CAUSATIVE ORGANISMS:

- Streptococcus pneumonia
- Haemophilus influenza
- Staphylococcus aureus

CLINICAL FEATURES:

- Gritty eyes
- Purulent discharge –eyes stuck in the morning
- Clear cornea
- May have photophobia

Bacterial Conjuctivitis

DIAGNOSIS: Clinical

Swab if: severe / neonates

MANAGEMENT:

MILD: saline irrigation

SEVERE: chloramphenicol (antibiotic) drops

Gonococcal keratoconjunctivitis

Signs
- Acute, profuse, purulent discharge,
- hyperemia and chemosis

Complications
- Corneal ulceration, perforation
- and endophthalmitis if severe

MX
- Topical ciprofloxacin
- Ceftriaxone IM

CHLAMYDIAL CONJUNCTIVITIS

- Similar to bacterial conjunctivitis
- Increased redness and development of follicles –brick red eye
- Usually unilateral
- Foreign body sensation

SEEN IN:

- Neonates
- Young people with venereal infection
- Isolated aboriginals with trachoma

MANAGEMENT:

- Swabs for PCR
- Azithromycin single dose
- Treat partner/family

Primary Herpes simplex infection

- Produces a follicular conjunctivitis
- Diagnostic ‘dendritic ulcer’ on cornea seen on fluorescein stain

MANAGEMENT:

- Acyclovir ointment for 2 weeks
- Atropine to prevent reflex vasospasm of pupil


BREAK
TIME !!

Let’s guess this

SUBCONJUNCTIVAL HAEMORRHAGE

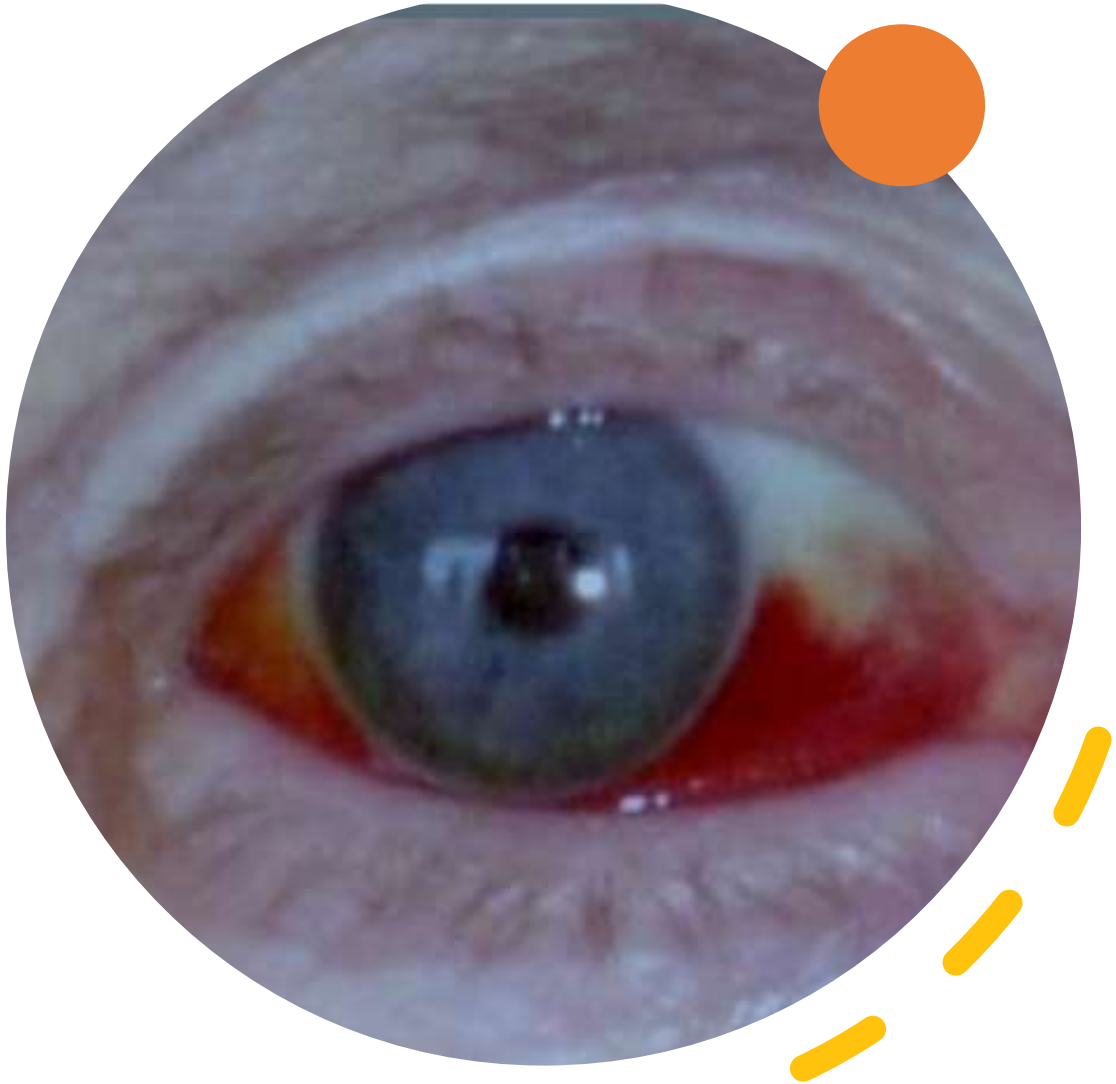
- It is caused due to small, delicate blood vessels behind the conjunctiva due to sudden pressure or straining
- NOT an inflammation/infection
- Beefy red localised haemorrhage
- Has a definite posterior margin
- If no posterior margin, then it indicates orbital fracture
- It usually doesn't cause pain or affect your vision.

SEEN IN:

- Trauma
- Bleeding disorder

MANAGEMENT:

- Self resolving
- Education and reassurance
- Artificial tears to relieve irritation can be used



A 38-year-old women presents to the emergency department after getting hit in her right eye with a squash ball in a match. On examination, the visual acuity of the affected eye is decreased. The eye is shown in next slide. Which of the following is the next step in management?

1. Application of an eye patch
2. Evacuation of the blood under local anesthesia
3. Reassurance as it resolves within 5-7 days
4. Topical antibiotics
5. Urgent referral to an ophthalmologist

A 38-year-old women presents to the emergency department after getting hit in her right eye with a squash ball in a match. On examination, the visual acuity of the affected eye is decreased. The eye is shown in next slide. Which of the following is the next step in management?

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4. Topical antibiotics
5. Urgent referral to an ophthalmologist

A 32-year-old man presents to your clinic following a trauma to his left eye. On slit lamp examination, hyphema in the anterior chamber is noted. Which one of the following is the most appropriate next step in management?

1. Immediate referral to ophthalmologist
2. Give antibiotics and arrange follow-up in a week
3. Advise icepacks and review in the emergency department tomorrow
4. Prescribe NSAIDs and follow-up in 3 days
5. Drain the hyphema in the ED

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3. Advise icepacks and review in the emergency department tomorrow
4. Prescribe NSAIDs and follow-up in 3 days
5. Drain the hyphema in the ED

Hyphema:

- A hyphema is when blood collects inside the front of the eye. This happens between the cornea and the Iris (anterior chamber)
- Is usually painful and can cause vision problem

Main Cause-

- Trauma is the most common cause.

In case of trauma the impact forces the globe inwards and instantaneously increases the pressure of the anterior chamber. This pressure pushes the lens, iris and ciliary bodies backwards and disrupts the vasculature, with tearing of the bleeding from the blood vessels.

Other causes-

- Blood clotting disorders
- Medications- anticoagulants
- Neovascularization- in diabetic retinopathy, previous eye surgery etc.

Treatment-

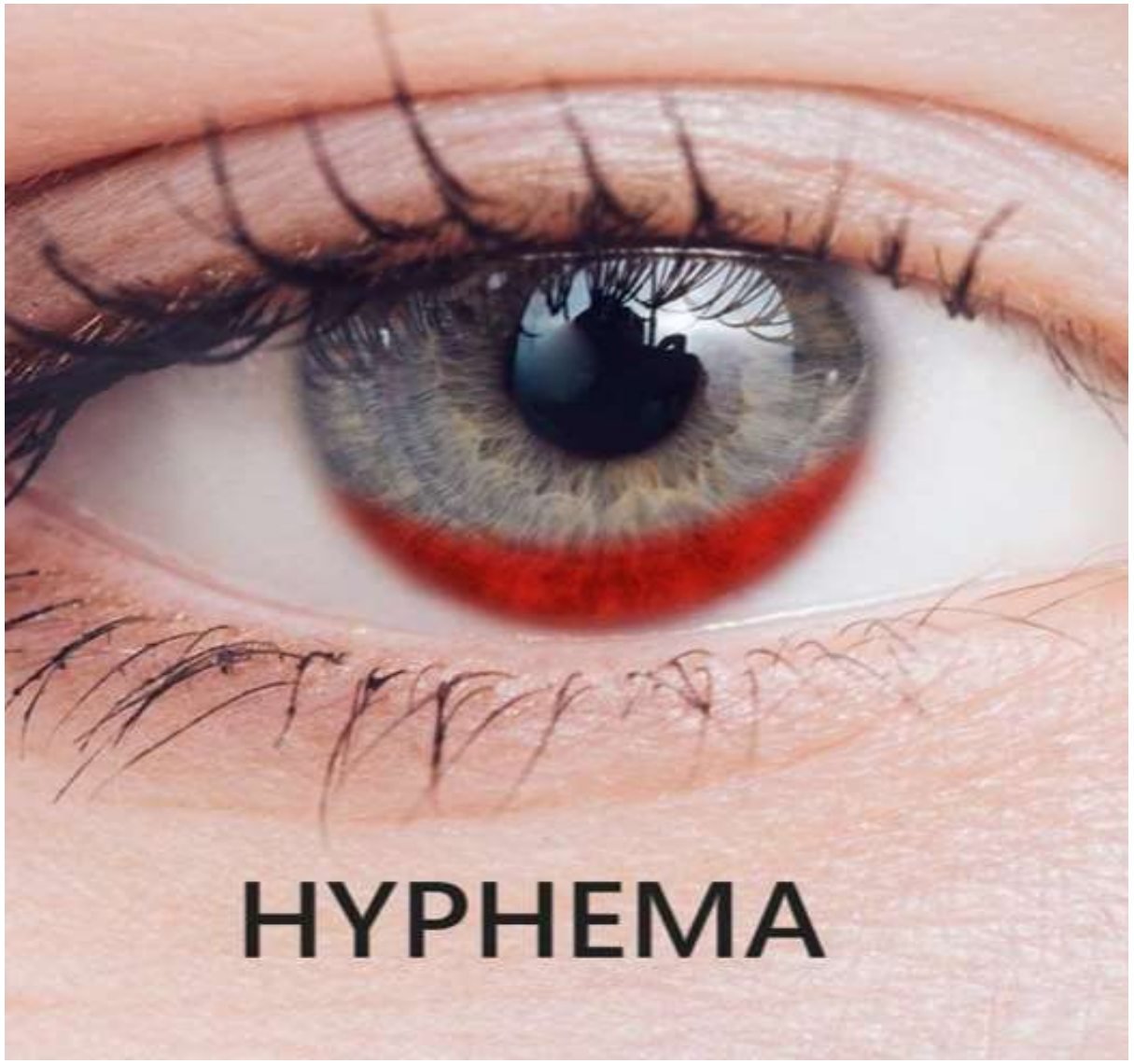
- Urgent referral to the ophthalmologist

Preventive measures-

- In the meanwhile the eye should be protected from more damage (by application of eye patches or shields), the head elevated (30-45 degree) and the patient is advised about restriction of physical activity
- Intraocular pressure must be monitored regularly
- Hyphema is associated with recurrent bleeding, glaucoma, and blood staining of the cornea. Any of these three may result in permanent loss of vision.

Don’t get confused !!!

SCH



A child presents to the ED with eye lid oedema, proptosis and restricted painful eye movement. What is his most likely diagnosis?

A. Peri-orbital cellulitis

B. Migraine

C. Conjunctivitis

D. Orbital cellulitis

E. Optic nerve glioma

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C. Conjunctivitis

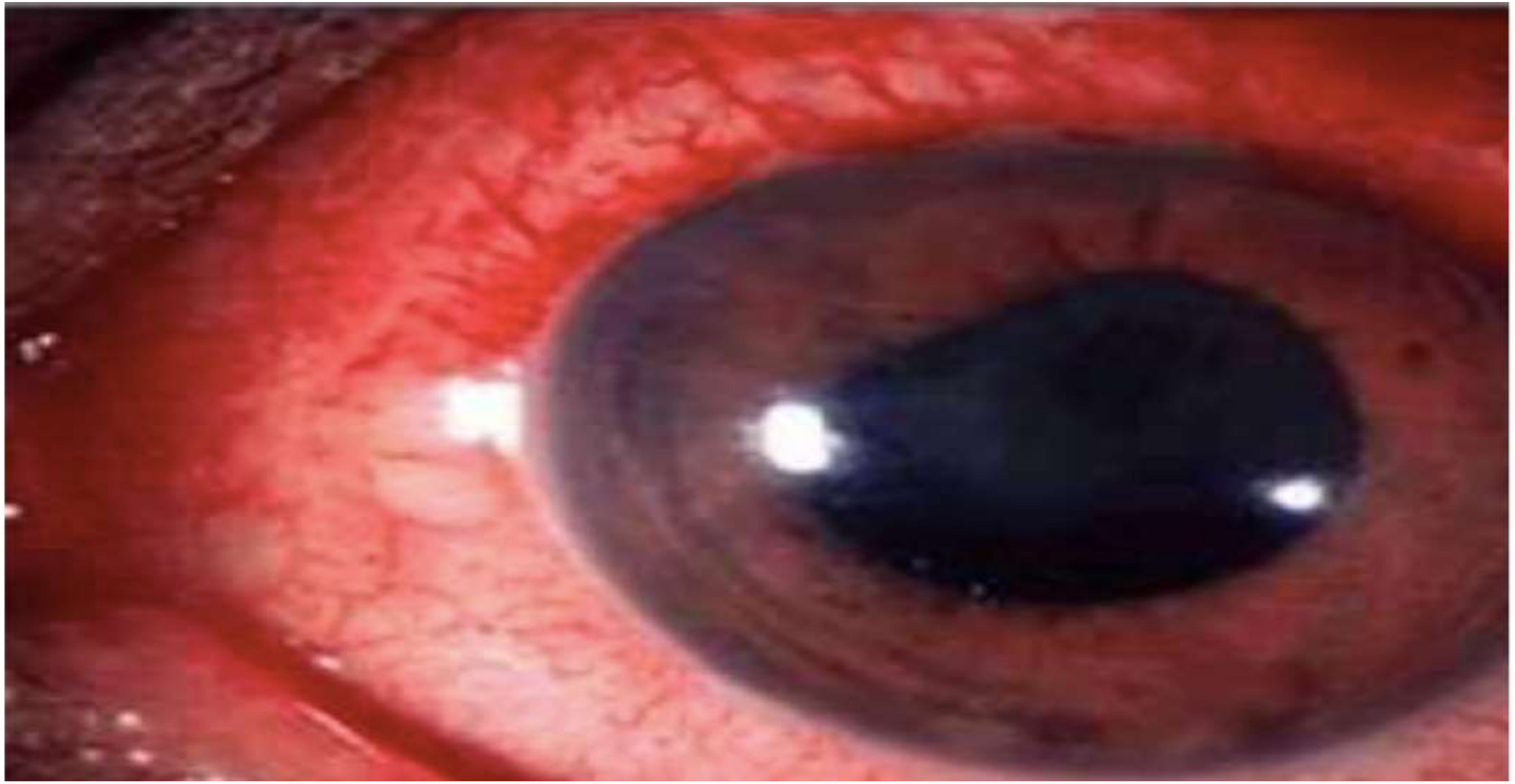
D. Orbital cellulitis

E. Optic nerve glioma

MCQ

A 27-year-old woman presents to your practice with sudden onset of pain, redness and tearing of her right eye that is illustrated in the following photograph. Further inquiry reveals that she also has had pain and stiffness of her lower back for the past 1 year that she attributes to bad sitting at work. Her brother has similar back pain. On examination, she is found to be photophobic. Limited ability to bend forward is the other significant finding. Which one of the following would be the next best step in management ?

- A Anti-double stranded DNA antibody.
- B. HLA – B27
- C X-ray of the lumbosacral spine.
- D Anti-nuclear antibody (ANA).
- E Check ESR and CRP



- Option C is correct
- (Options A and D) As the name implies, serologic tests such as ANA, anti-double stranded DNA antibody, rheumatoid factor (RF), etc are negative in seronegative arthropathies.
- (Option B) Although HLA-B27 is positive in 90% of patients with AS, it is not used as a diagnostic tool because it is also positive in 10% of people without AS.
- (Option E) Seronegative arthropathies are inflammatory; therefore, ESR and CRP are expected to be elevated. However, normal values do not exclude AS. On the other hand, positive levels can be found in several other conditions and are not diagnostic for AS or other seronegative arthropathies

Uveitis (Iritis)

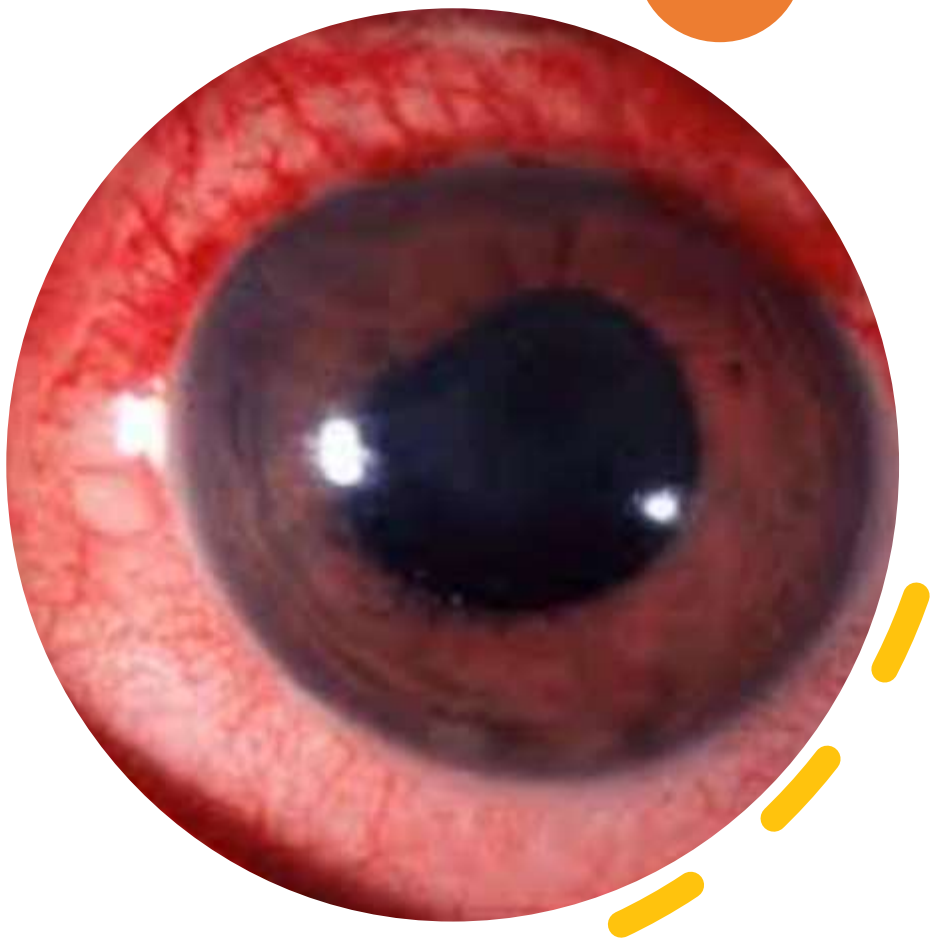
- Inflammation of the iris and ciliary body –anterior uveitis
- Inflamed iris ⟶sticks to lens ⟶pupil distortion ⟶blurring vision

CLINICAL FEATURES:

- Can be associated with Hypopyon (leucocytic exudate in the ant. chamber)
- Eye redness
- Blurred vision
- Pain
- Small pupil (initially from iris spasm, later it may be irregular or dilate irregularly due to adhesion)

MANAGEMENT:

- Refer
- Atropine –pupil dilatation which prevents adhesion between lens and iris
- Topical steroids –reduce inflammation



IMPORTANT SYSTEMIC ASSOCIATIONS OF UVEITIS

- Spondyloarthropathies
- Juvenile arthritis
- Sarcoidosis
- Reactive arthritis
- IBD
- Tubulo-interstitial nephritis

RETINOPATHY

Diabetic retinopathy

Risk factors for diabetic retinopathy:

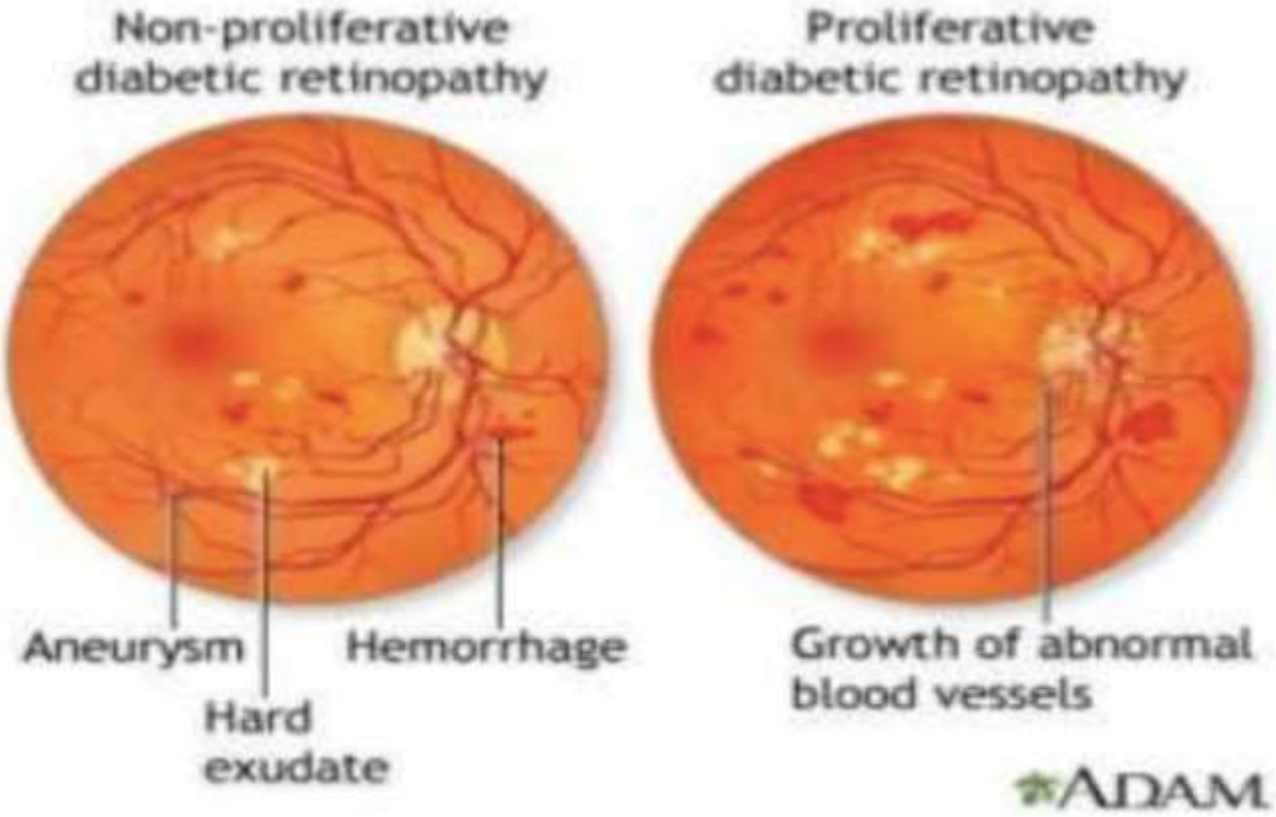
- Duration of DM, poor DM control, HT, increased lipids, proteinuria, anaemia, pregnancy, smoking.
- 5-10% of diabetic patients develop diabetic retinopathy each year very common problem

Systemic management:

- strict blood sugar control, blood lipid control, HbA1c, exercise, cease smoking, weight control

Diabetic Retinopathy

- Features are :
  - Retinal haemorrhages
  - white patches (cotton wool spots)
  - swelling (oedema)
  - growth of new vessels(neo-vascularisation)
  - deposition of scar tissue, and
  - decrease in capillary perfusion of tissue

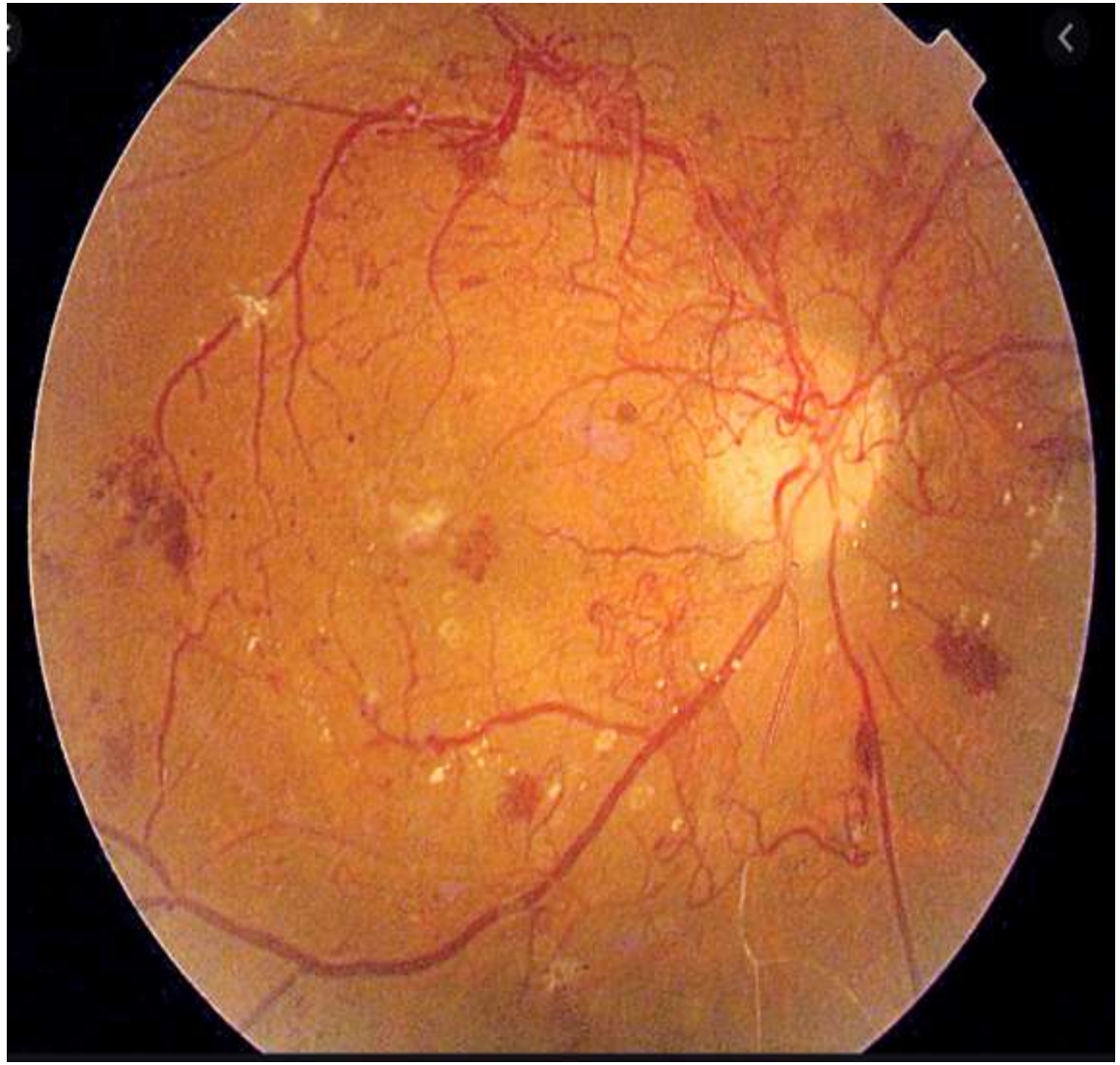


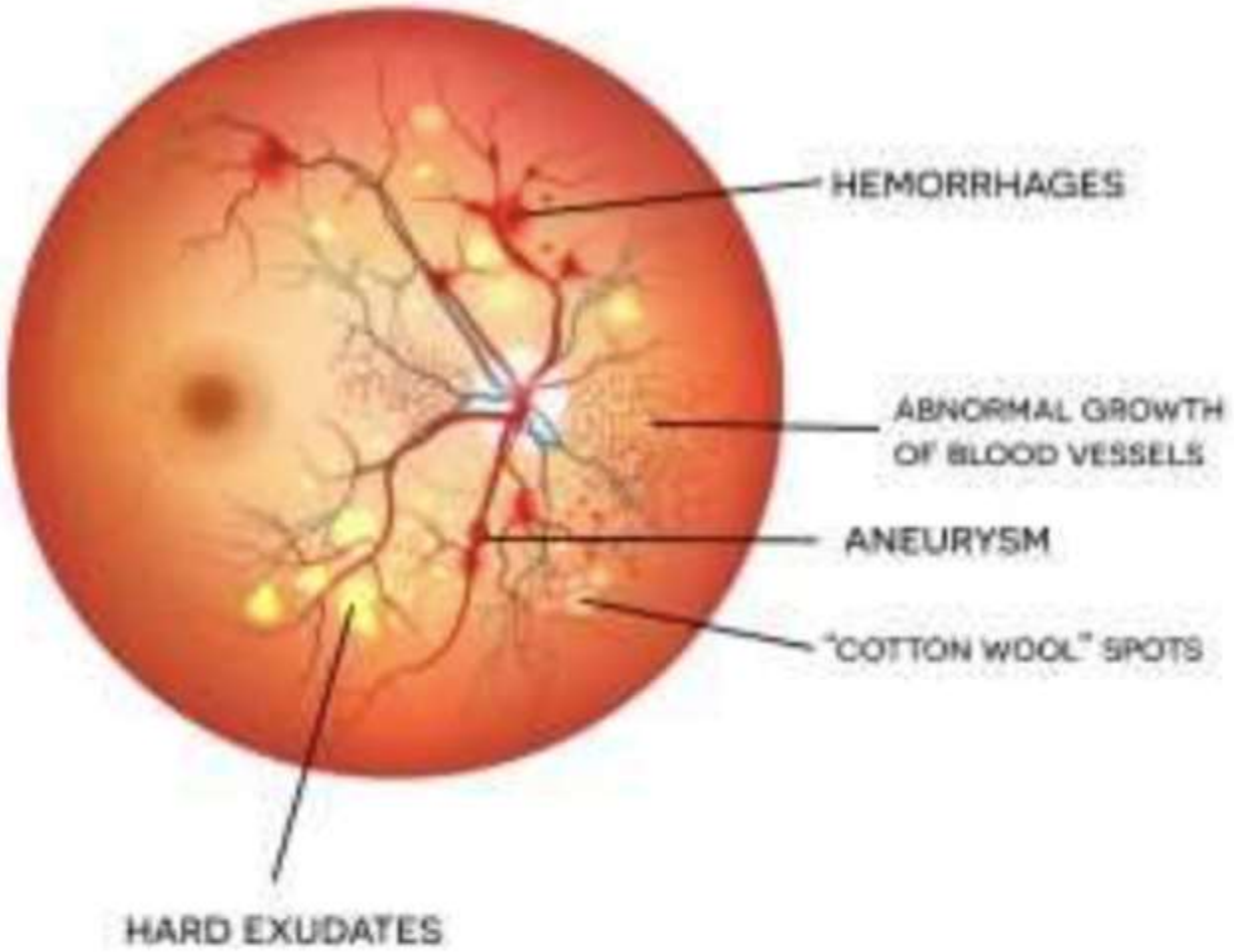
Diabetic retinopathy

Classification:

- Non-Proliferative DR: microaneurysms, intraretinal haemorrhages, venous beading, intraretinal microvascular abnormalities
- Proliferative DR: characterised by neovascularisations (risk of bleeding and retinal traction)

DIABETIC RETINOPATHY

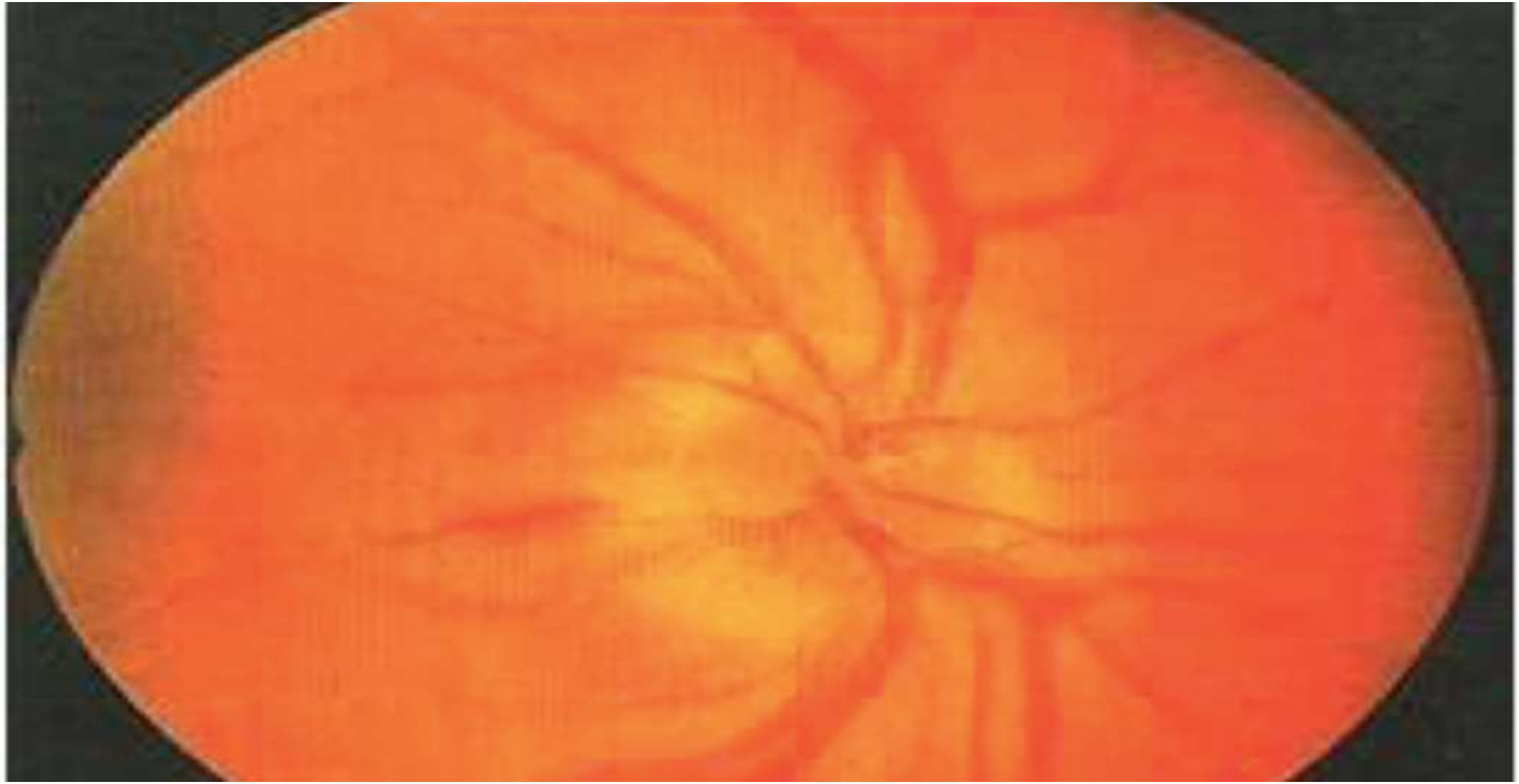




MCQ

A patient presents to your practice with gradual loss of vision. The accompanying photograph is the fundus of one of his eyes on funduscopic exam. Which one of the following is the most likely diagnosis?

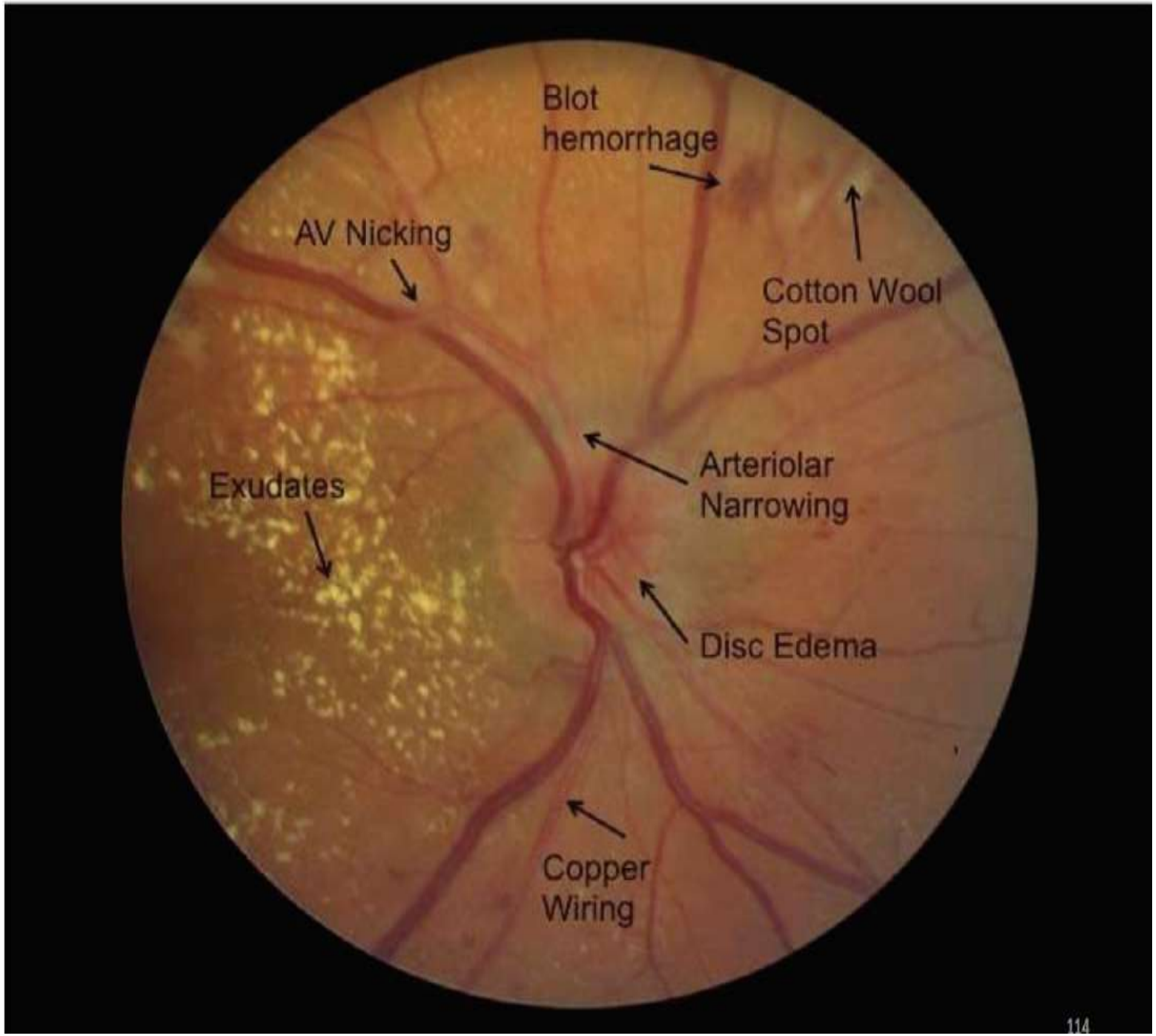
- A Diabetic retinopathy.
- B Hypertensive retinopathy.
- C Age-related macular degeneration.
- D Central retinal artery occlusion.
- E Central retinal vein occlusion



- Option B is correct
- Hypertensive retinopathy - Findings on funduscopic examination
  - papilledema (C-shaped head of the optic nerve)
  - straightening of the vessels, thickened opacites vessel walls (copper-wiring) and arteriovenous nicking.
- Further progression of hypertensive retinopathy will lead to:
  - Retinal haemorrhages (either flame or dot-blot)
  - Cotton-wool spots
  - Optic nerve oedema
  - Star-shaped macula and hard exudates

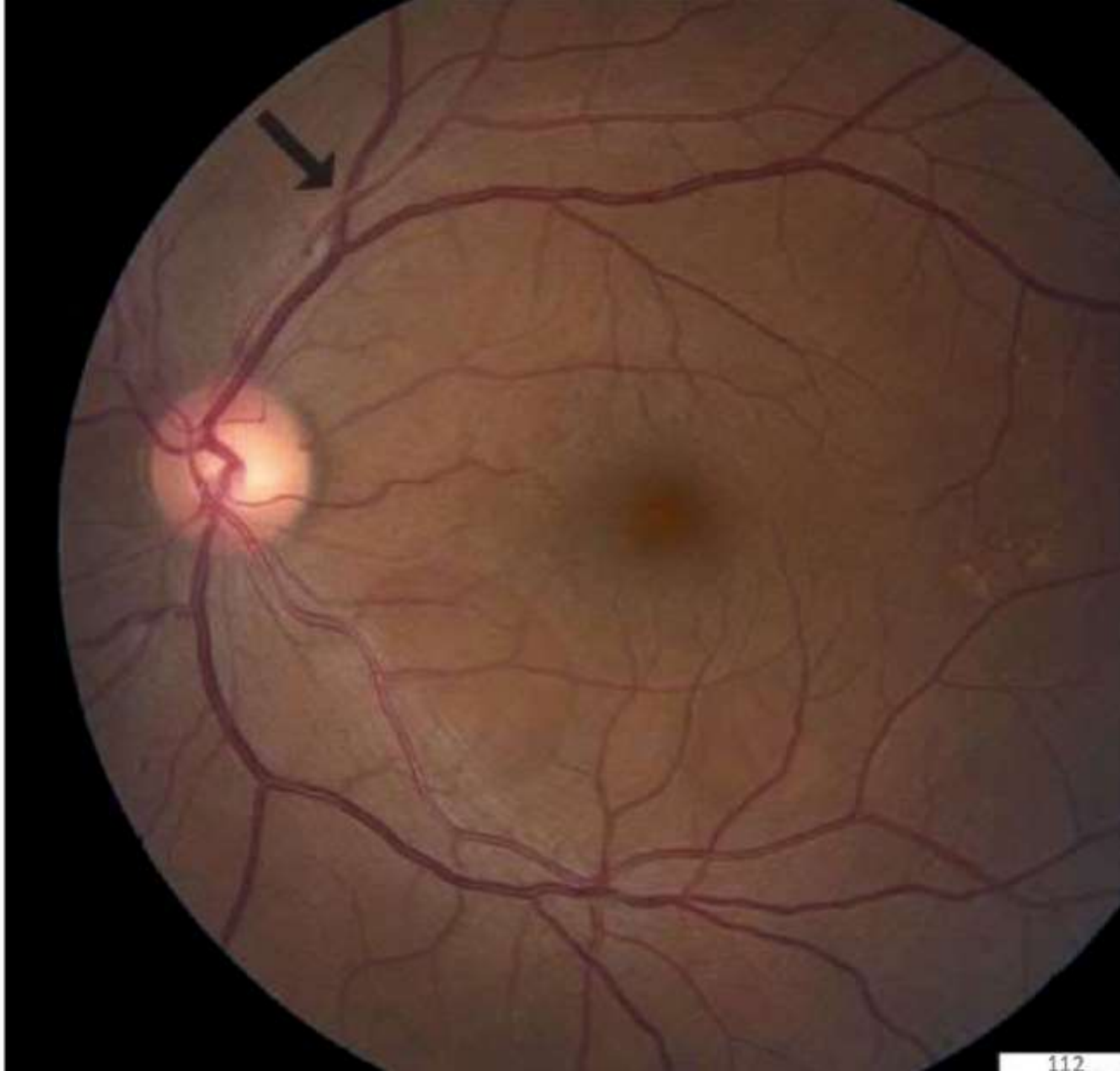
Hypertensive Retinopathy

- Features of hypertensive retinopathy
  - AV nicking
  - Copper wiring
  - Retinal haemorrhages (either flame or dot-blot)
  - Cotton-wool spots
  - Optic nerve oedema
  - Star-shaped macula and hard exudates

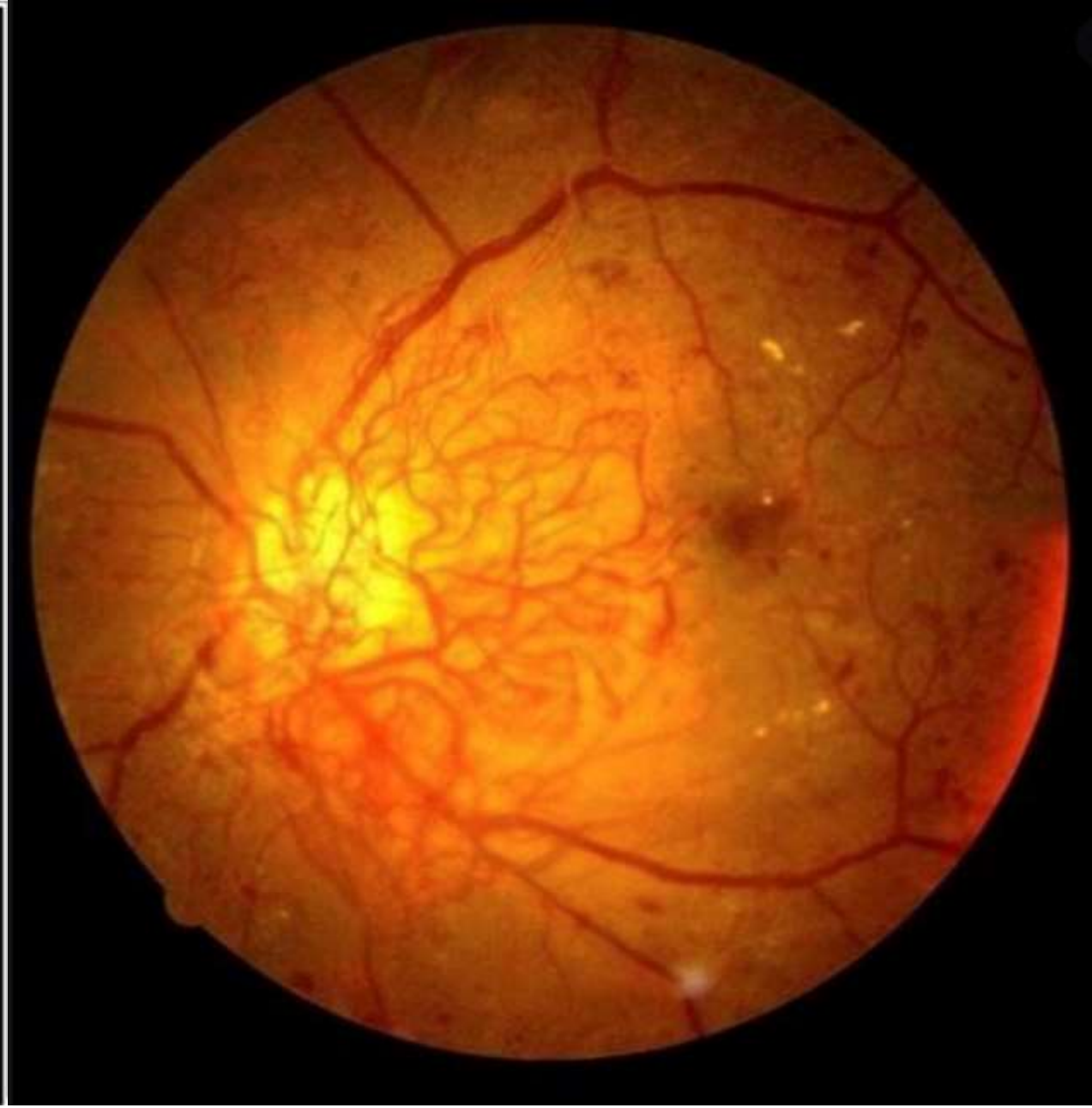


AV- Nicking

Chronic hypertension stiffens and thickens arteries. At AV crossing points arteries indent and displace veins



Hypertensive Retinopathy



Diabetic Retinopathy

A 67-year-old man presents to your practice complaining of difficulty seeing in day light. He explains that when he is out in the daylight, the light is dazzling. However, he does not have any problem in reading or watching TV. He has a history of type II DM and HTN for which he is on metformin and enalapril, respectively. Which one of the following is the most likely diagnosis?

1. Cataract
2. Chronic simple glaucoma
3. Hypertensive retinopathy
4. Presbyopia
5. Retinal detachment

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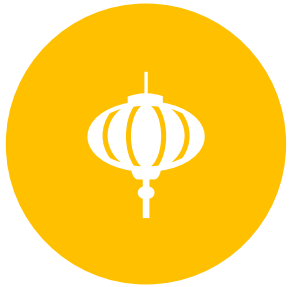
1. Cataract
2. Chronic simple glaucoma
3. Hypertensive retinopathy
4. Presbyopia
5. Retinal detachment

Chronic glaucoma- Blurring in periphery of visual field. Dazzling is not a problem

Hypertensive retinopathy- vision loss and retinal hemorrhage, but dazzling is an unusual feature



Presbyopia- associated with ageing, and have problems In dim light not day light

Retinal detachment is associated with curtain falling not dazzling

Cataract

Cataract

- Opacity in the lens
- Causes **progressive visual loss**

CAUSES:

➛Age
➛DM
➛Steroids
➛Radiation
➛TORCH –congenital cataracts
➛Trauma

CLINICAL FEATURES

- Difficulty in reading
- Difficulty in recognising faces
- Difficulty in driving at night
- Halos around lights (dazzling seen in sunlight)

EXAMINATION

- ↓↓ visual acuity
- ↓↓red reflex on ophthalmoscopy

MCQ

Which one of the following is the most appropriate definite management of cataract?

- A Intraocular lens(IOL)
- B Phacoemulsification
- C Use of protective measures such as sunglasses.
- D Topical corticosteroids.
- E Pilocarpine drop.

- Option A is correct
- Nothing can be done for an opacified lens; hence it should be removed and a synthetic intraocular lens replaced. The best method for lens replacement is phaco-emulsification.
- (Option B) Phaco-emulsification is a modern cataract surgery, in which the lens is emulsified with an ultrasonic handpiece and aspirated from the eye. Aspirated fluids are replaced with irrigation of balanced salt solution, maintaining the anterior chamber, as well as cooling the handpiece. Phaco-emulsification and extracapsular cataract extraction (ECCE) is the best method of for intraocular lens replacement.
- (Option C) Protective measures such as wearing sunglasses are advised to prevent further damage to the lens, but not for treatment.
- (Option D) Short-term topical corticosteroid may be used for management of post-operative inflammation. Corticosteroids are not useful for treatment of cataract.
- (Option E) Pilocarpine drop causes pupil constriction, and is used for initial management of angle closure glaucoma or long-term medical management of chronic simple glaucoma.

CATARACT – MANAGEMENT

- Extraction when patient can not cope
- No medical treatment
- After removal of cataractous lens, an intraocular lens is implanted

Preventive strategies-

Protection from UV exposure that is wearing hats and sunglasses may prevent the development of cortical cataract.

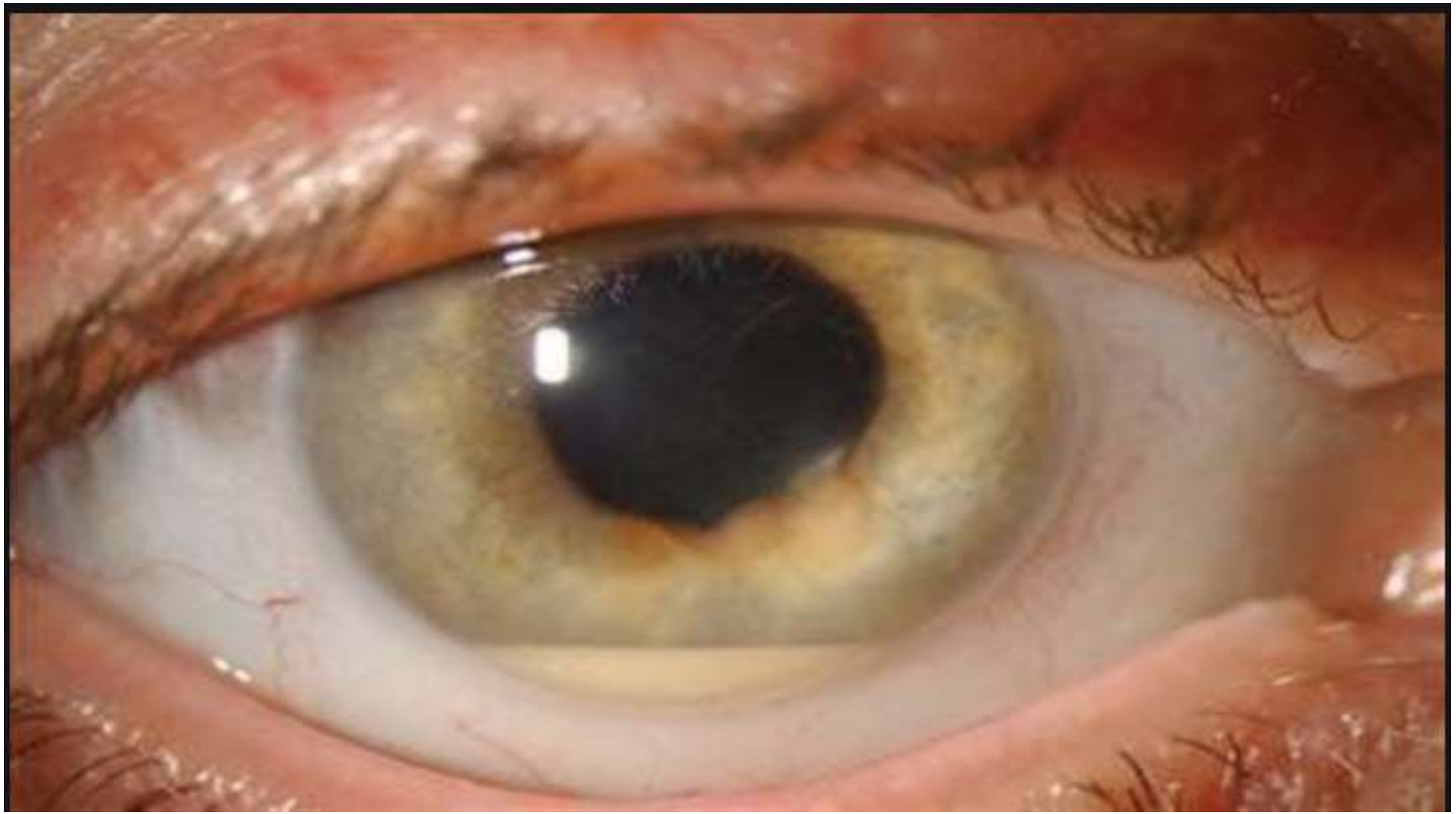
Post-op complication-

- posterior capsule thickening
- Anterior uveitis (after phacoemulsification)

CONTRAINDICATIONS:

- Intraocular inflammation
- Severe diabetic retinopathy

- Five days after phaecoemulsification surgery and intraocular lens replacement due to cataract, a 68-year-old man presents with redness and blurred vision of the treated eye. The eye is illustrated in the accompanying photograph. Which one of the following is the condition shown in the photograph (next slide)?
- A Hyphaema.
- B Hypopyon
- C Retinal detachment
- D Central retinal artery occlusion
- E Keratitis.



- Option B is correct
- Phaeco-emulsification, the current standard procedure for lens replacement in cataract, has a number of potential post-operative complications, with anterior uveitis being one of them.
- Anterior uveitis:
  - C/F
    - eye pain and redness (conjunctiva and episclera in a circumcorneal fashion)
    - blurred vision, photophobia, and reflex lacrimation.
    - The pupil is often constricted but regular.

Hypopyon

- is accumulation of leukocytic exudate in the anterior chamber.
- The exudate settles at the dependent aspect of the eye due to gravity.
- Photograph has collection of exudate material at the bottom of the anterio chamber due to gravity, characteristics of hypopyon, a feature seen in ante uveitis.
- The most common post-operative complication associated with phaeco-emulsification is thickening of the posterior capsule.

Central retinal artery occlusion is not a complication of phaecoemulsification

A 45-year-old man comes to the ED with C/C of severe pain in the left eye. The pain started 3 hours ago and is associated with blurred vision and nausea. On examination, the patient has stable vitals. The left eye is reddened and hard on palpation. The visual acuity of the left is 6/18 and right is 6/12. There is no history of trauma to the eye. What is the most likely diagnosis?

1. Acute retinal artery occlusion
2. Acute retinal vein thrombosis
3. Open angle glaucoma
4. Acute angle closure glaucoma
5. Cataract

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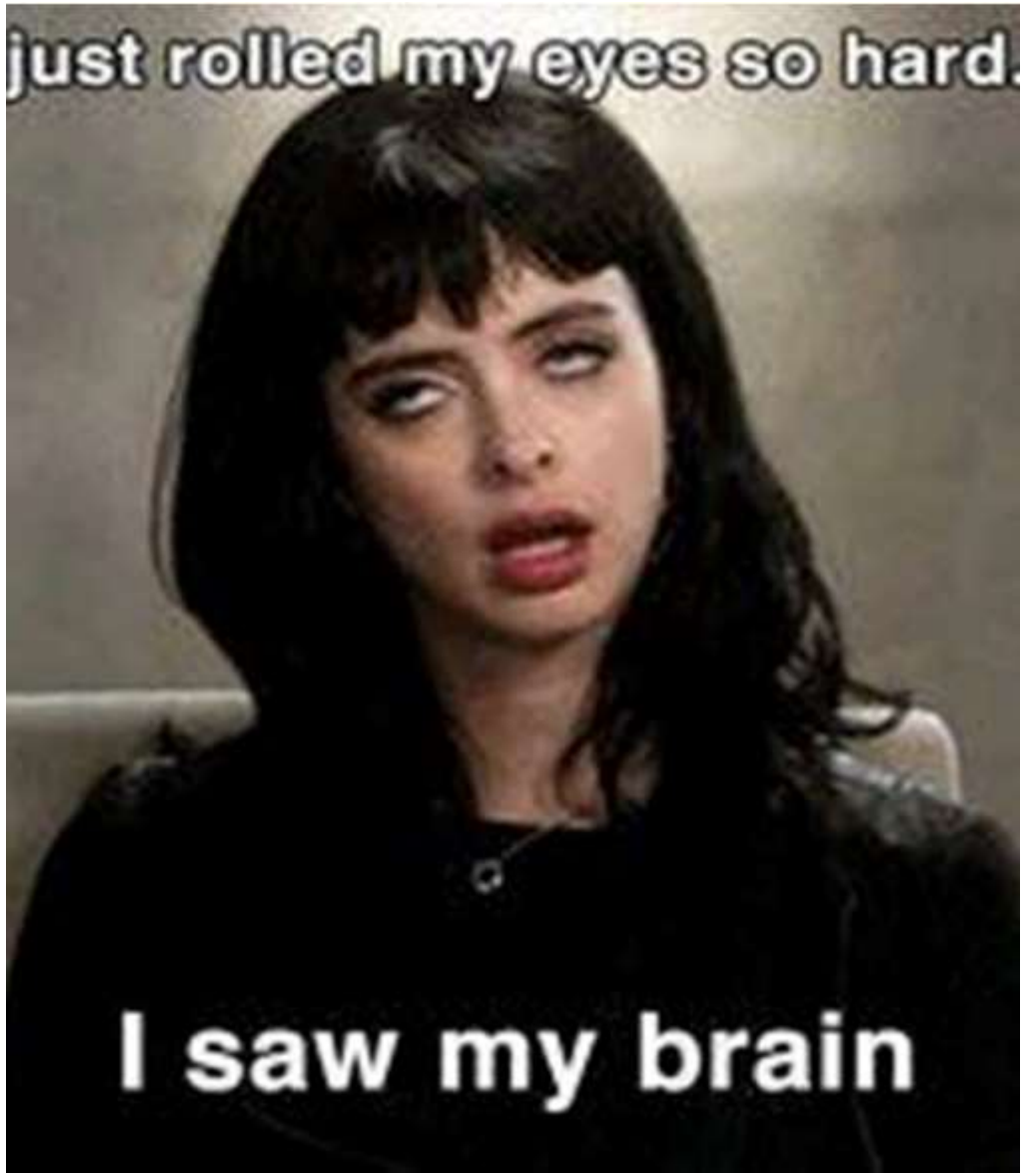
1. Acute retinal artery occlusion
2. Acute retinal vein thrombosis
3. Open angle glaucoma
4. Acute angle closure glaucoma
5. Cataract

Acute retinal artery and vein occlusion can cause sudden loss of vision, but they are painless.

Open angle glaucoma presents with gradual painless vision loss. It does not develop acutely.

Cataract is opacification of lens. Not painful. Not acute.

GLAUCOMA



GLAUCOMA

- Problem in drainage of aqueous humor
- Increasing pressure of the outflow on the eye
- Progressive damage of the optic nerve
- Leads to progressive blindness

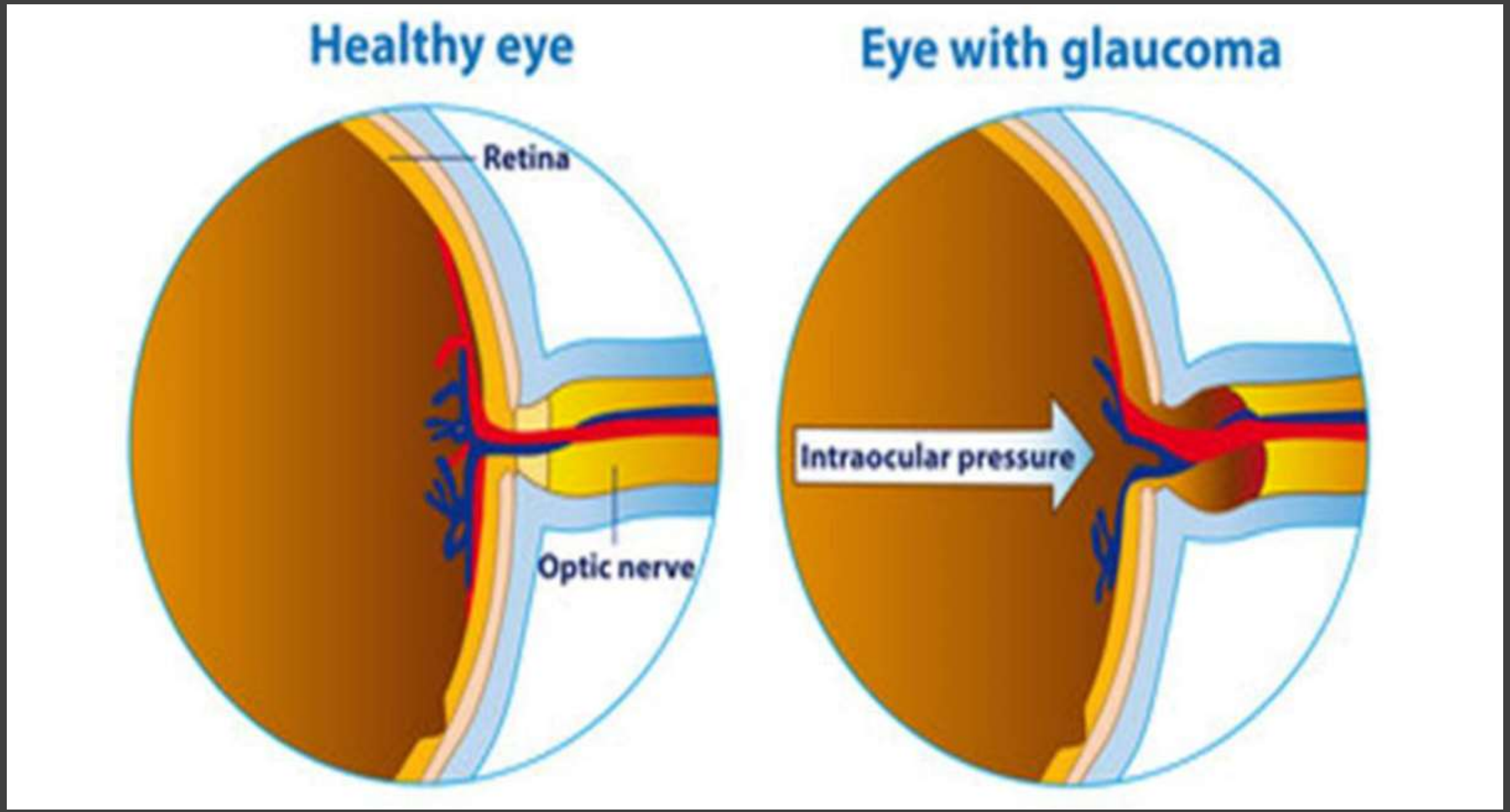
TYPES:

1. Primary
- Chronic –open angle
- Acute –closed angle
- Congenital
- Normal tension or low-tension glaucoma

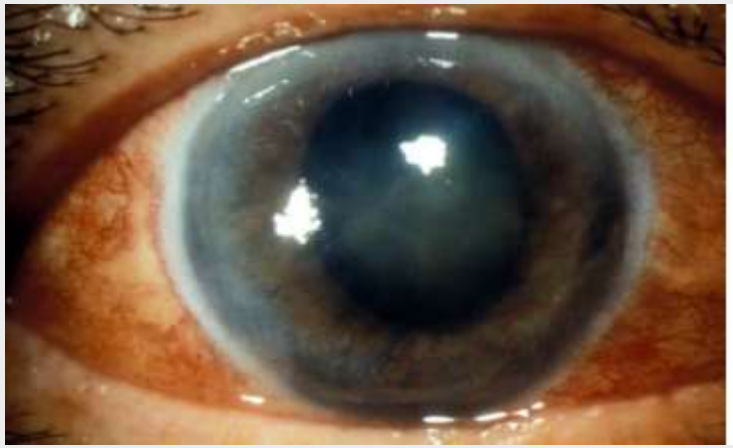
2. Secondary (traumatic or steroids)

Primary Open Angle Glaucoma (POAG)

- It is the most common form of glaucoma in Australia
- **It is a condition in which optic nerve is damaged, in most cases by high eye pressure, leading to loss of peripheral vision.**
- The rise in pressure and subsequent optic nerve damage is usually due to impaired drainage of fluid out of the eye due to the degeneration and obstruction of the trabecular meshwork, whose original function is to absorb the aqueous humor.
- Most patients have no symptoms of the condition as there is no pain and in the early stages the vision seems normal
- There is no cure, however, further loss can be prevented.
- POAG is usually treated with eye drops that reduce the IOP.


Healthy eye
Retina
Optic nerve
Eye with glaucoma
Intraocular pressure

Acute Closed Angle glaucoma



Clinical features-

Unilateral painful red eye, ipsilateral headache, nausea and vomiting.

The affected eye feels hard to touch, as the IOP has risen to over 60 mmHg (normal 15-20 mmHg).

The attack is often preceded by blurred vision and decreased visual acuity.

Examination-

Red eye, irregular semi-dilated fixed pupil

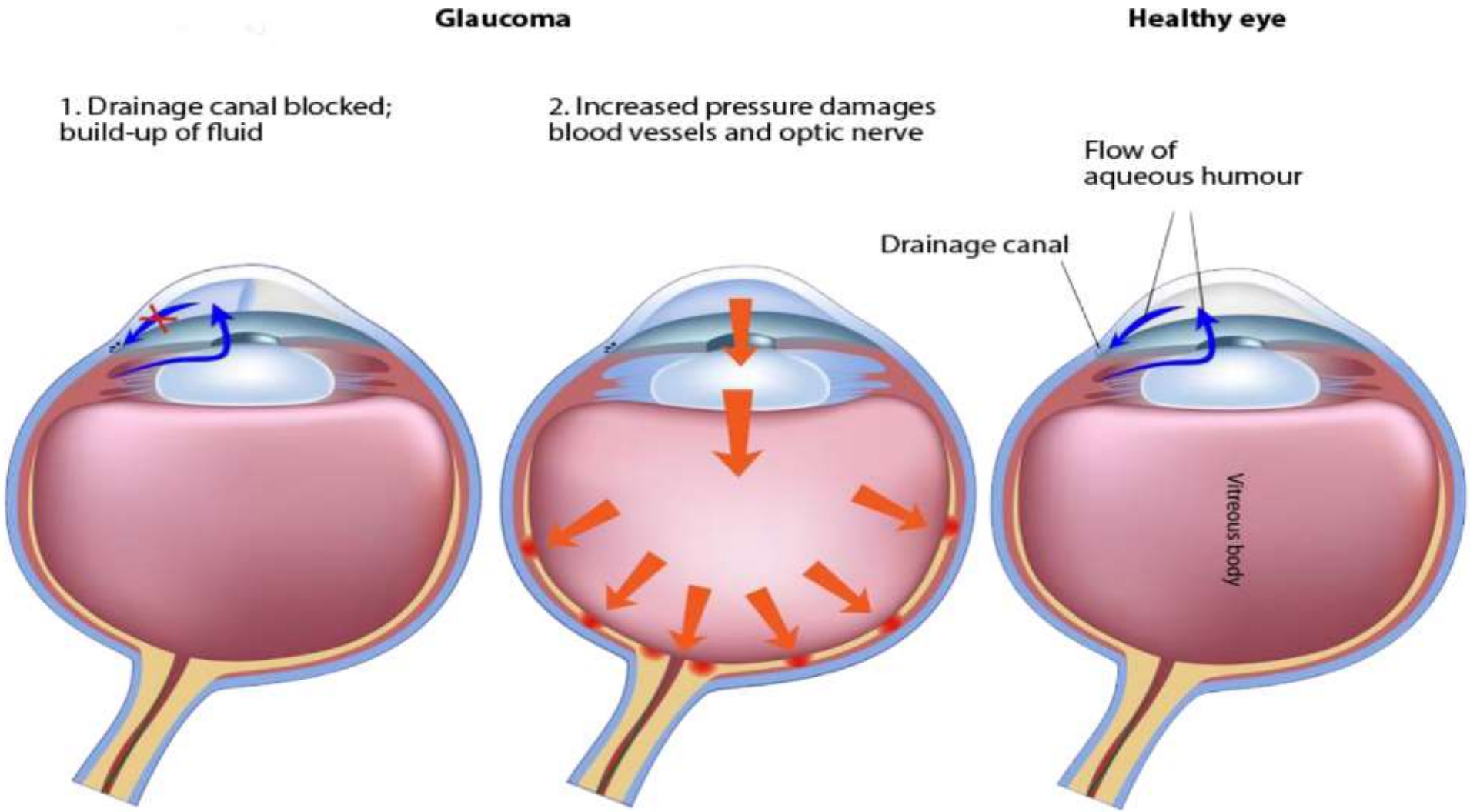
The pupil may look vertically ovoid and hazy cornea.

Cause-

Acute angle closure glaucoma results from an obstruction preventing the aqueous humor from being circulated normally, this leads to increased pressure within the orbit.

It is a **genuine emergency** and hesitation in prompt treatment can result in permanent loss of vision.

Development of Glaucoma



Chronic angle- closure glaucoma

It is the result of an **inherited narrowness of the drainage angle** of the eye.

- Familial tendency
- No early signs or symptoms
- Central vision usually normal
- Progressive restriction of visual field

Investigations

- Tonometry- Upper limit of normal is 22 mmHg
- Ophthalmoscopy- Optic disc cupping >30% of total disc area

Screening

- Adults 40 years and over: 2–5 yearly (at least 2 yearly over 60)
- Start about 30 years, then 2 yearly if family history

Normal tension Or low-tension glaucoma

About 1/3rd of cases of glaucoma the characteristic optic nerve changes and visual field loss can develop in an eye with normal pressure.

EXTREME GLAUCOMA

ADVANCED GLAUCOMA

EARLY GLAUCOMA

NORMAL VISION

Mr Gru is a 30 year-old patient came to see you complaining of sudden onset decreased vision with haloes. You have examined him to find his eyes feel hard on palpation. What is the most appropriate next step in his management?

A. Topical pilocarpine

B. Oral acetazolamide

C. Topical danazol

D. Intraocular needle aspiration

E. IV steroids

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Treatment of Glaucoma

- Acetazolamide 500 mg i.v.
- Intravenous mannitol 2g/kg of 20% solution

Topical therapy (1st line)

- Pilocarpine 2% to both eyes (cholinergic agonist- reduce fluid)
- Topical Beta-blockers- Timolol, Cartelol drops
- Alpha adrenergic agonists- apraclonidine (used in chronic glaucoma)
- Steroids

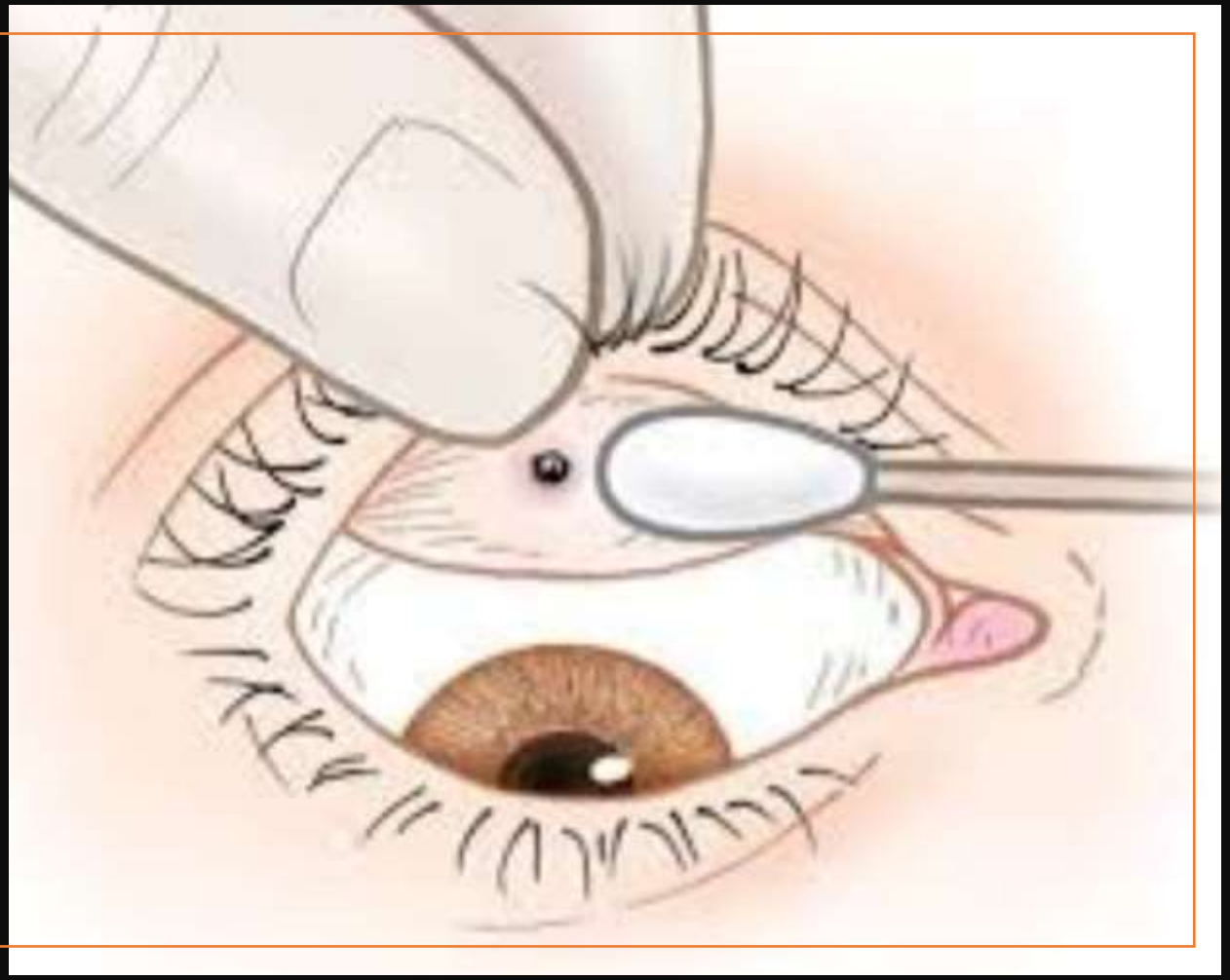
Other management depends on setting-

- If the patient can be seen within 1 hour of presentation, urgent referral to an ophthalmologist will be the next best step.
- If the referral is delayed, the patient should be given topical pilocarpine/timolol followed by acetazolamide PO (250mg x2)

Surgery-

- YAG laser iridotomy -To both eyes when cornea is clear
- Incisional surgery (trabeculectomy)

Foreign body in eye



A 42-year-old machinist engineer comes to the emergency department with foreign body in his left eye. On examination, a metallic speck is found to be stuck in the cornea. Which one of the following is most appropriate management?

1. Removal of foreign body under local anesthesia
2. Obtain an orbital X-ray
3. Refer the patient to an ophthalmologist
4. Cover the eye with a pad
5. Remove the foreign body under general anesthesia

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- ✓Any embedded foreign body should be removed by an ophthalmologist, and the next best step in the management would be referral to an ophthalmologist

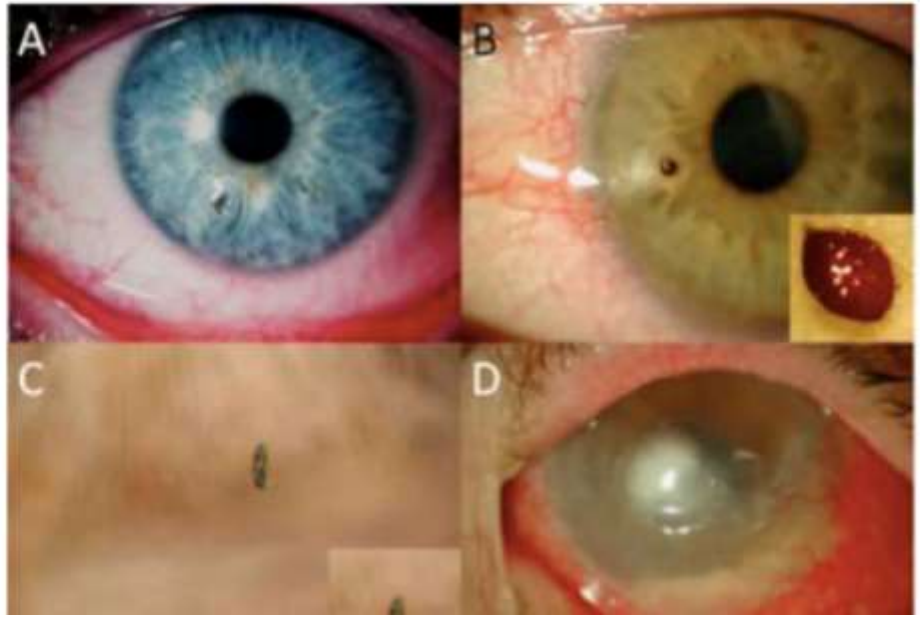
- ✓An X-Ray of the orbital area is required if the foreign body is suspected, but not visible on examination

- ✓No evidence supports the usefulness of eye patch when foreign body is still in the eye. However, after removing padding can be done if needed

- ✓Removal of embedded foreign body usually does not require application of anesthesia.

Removing foreign body

A superficial foreign body embedded earlier that day is particularly amenable to remove in GP office as there will be no encroaching corneal epithelium and no rust ring. If the GP does not feel safe to proceed, referral to the ophthalmologist is warranted. Removal of corneal FB without the aid of slit-lamp can be challenging procedure.



TRAUMA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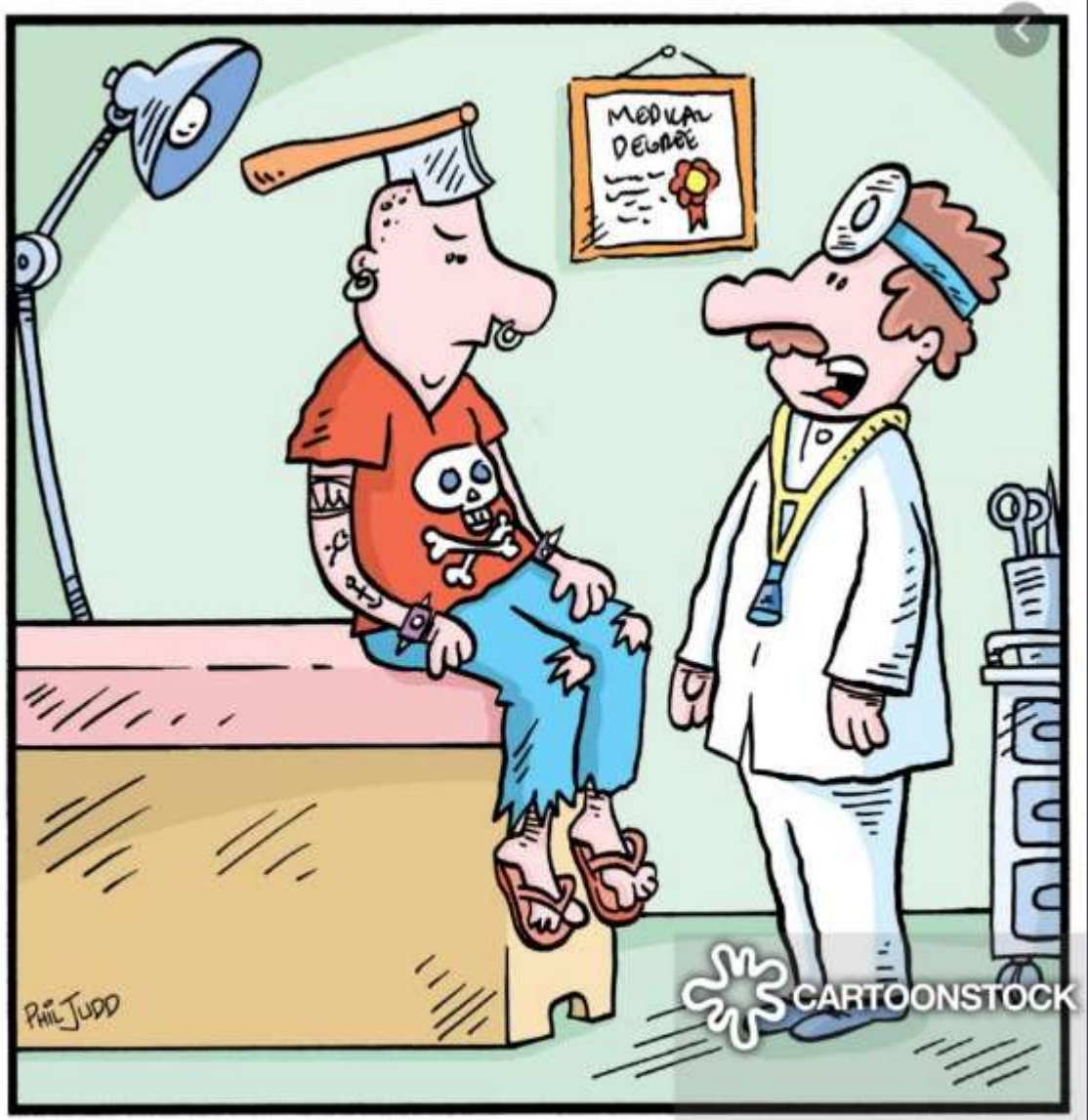

MEDICAL DEGREE
PHIL JUDD
CARTOONSTOCK
Search ID: pjun1277
"In my opinion your blurred vision is caused by the axe in your head. But you may want a second opinion."

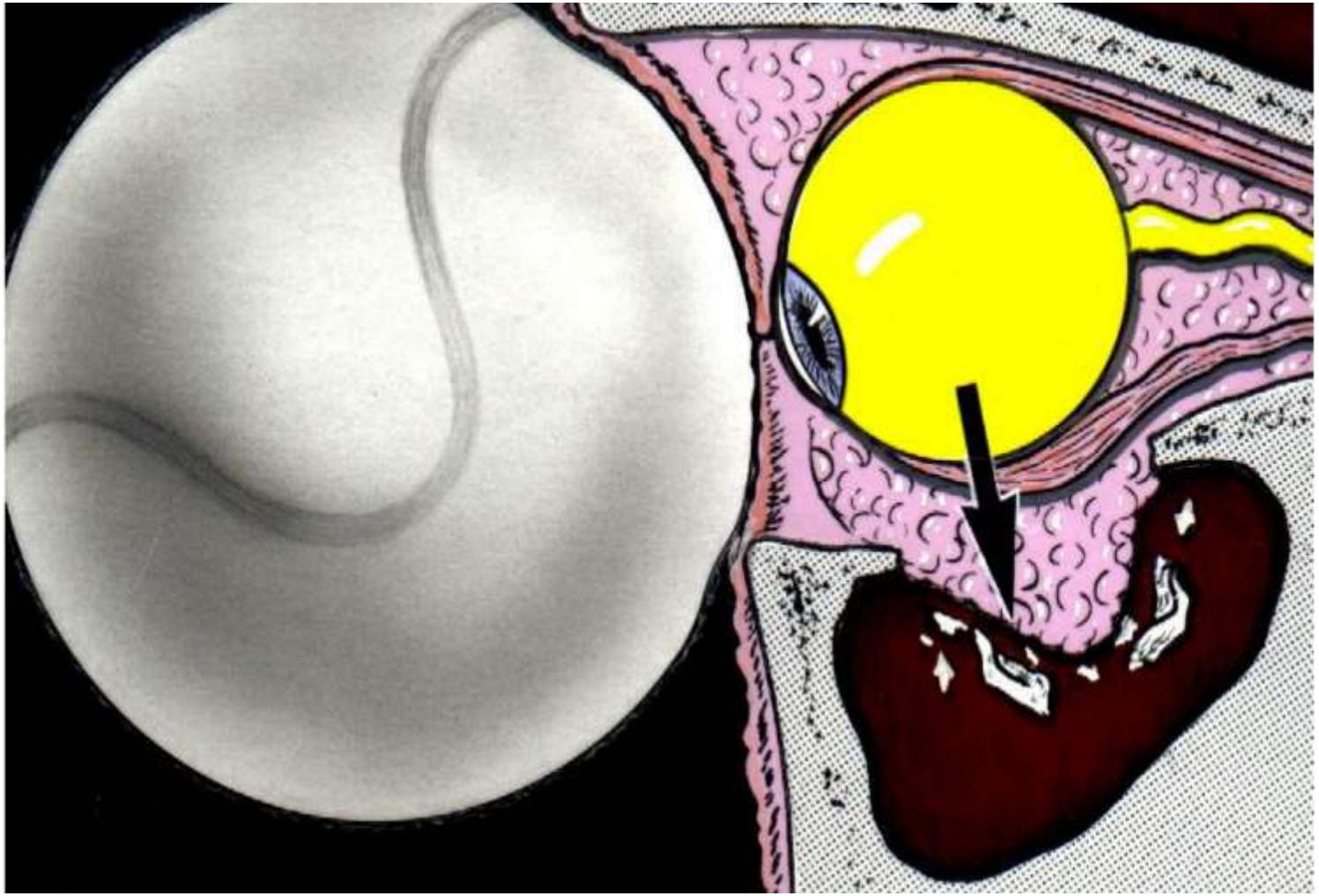
Eyelid haematoma

Usually not harmful but exclude associated trauma to globe or orbit

Orbital roof fracture if associated with subconjunctival haemorrhage without visible posterior limit

Basal skull fracture -bilateral ring haematoma (‘panda eyes’)

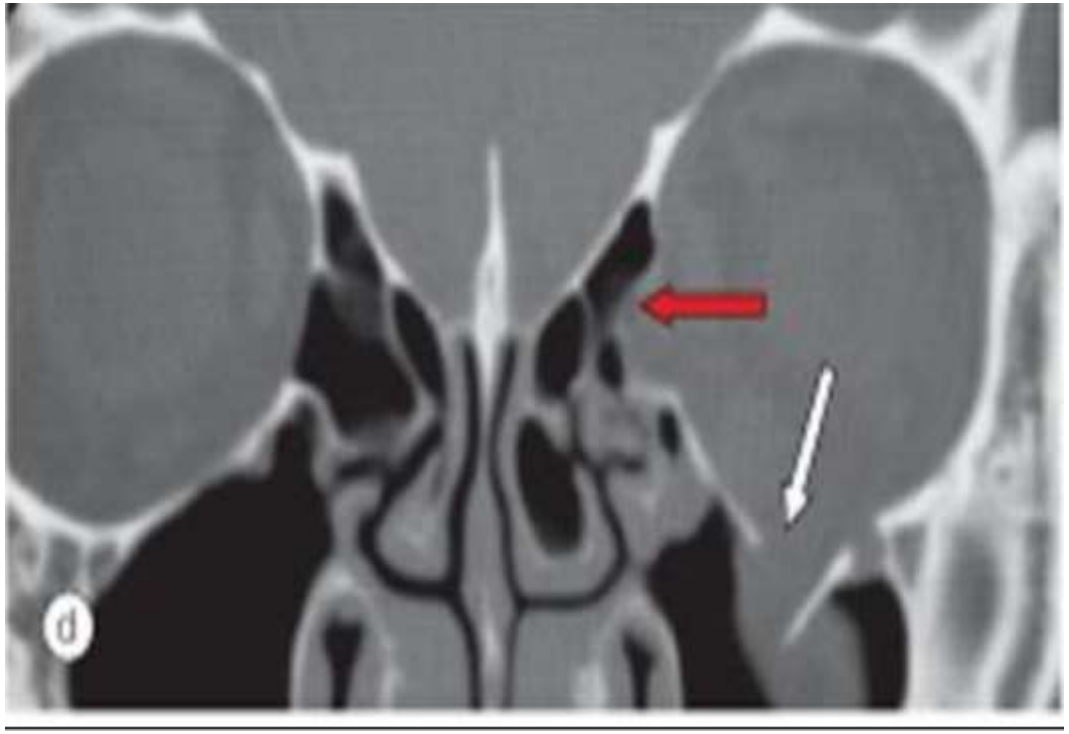
Fig. (A) Periocular haematoma and oedema; **(B)** periocular haematoma and subconjunctival haemorrhage; **(C)** 'panda eyes'



How does it occur?

Signs of orbital floor blow-out fracture

- Periocular ecchymosis and oedema
- Infraorbital nerve anaesthesia
- Ophthalmoplegia -typically in up- and down-gaze (double diplopia)
- Enophthalmos -if severe



Which of the following is the most appropriate initial step in management of chemical burn injuries to the eyes?

1. Instillation of local anesthetic and padding the eye
2. Irrigation with water
3. Irrigation with a neutralizing agent
4. Topical antibiotics
5. Urgent referral to the ophthalmologist

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- In case to chemical injury to the eye, the most important initial step is irrigation with plenty amount of water to wash out the offending agent
- Urgent referral to an ophthalmologist for further management
- While the eye might have been seriously damaged, application of local anesthetics and padding are inappropriate action
- Neutralizing agents should never be used in this situation, as they can result in heat production and more damage caused by thermal injury.
- Topical antibiotics may be considered by the ophthalmologist for further management, but its not an initial management
- Urgent referral to ophthalmologist is the most appropriate next step after vigorous irrigation

Where you need an urgent referral to Ophthalmologist?

- ✓ Significant trauma to the eye
- ✓ Penetrating injury
- ✓ Chemical burns
- ✓ Embedded foreign body in the cornea or intraocular FB
- ✓ Hyphema >3mm
- ✓ Hypopyon corneal ulcer
- ✓ Acute iritis
- ✓ Acute glaucoma
- ✓ Giant cell arteritis
- ✓ Acute Dacrocystitis
- ✓ Endophthalmitis
- ✓ Herpes zoster ophthalmicus

MCQ

A 42-year-old man presents to the emergency department with floaters and ashes in his right eye. Ophthalmologic examination reveals a detached retina as the cause. Which one of the following is the most important initial management?

- A Atropine drop.
- B Pilocarpine drop.
- C Acetazolamide.
- D Intravenous prednisolone.
- E Nursing the eye with head-up position.

- Option E is correct (Head-up position is the initial management)
- Retinal Detachment

MCQ

A 52-year-old man presents to the emergency department with sudden-onset right-sided loss of vision. His medical history is remarkable for right-sided headache of 2 weeks duration, which is exacerbated by chewing. Fundoscopic exam is performed with the findings shown in the following photograph (next slide). Which one of the following is the most likely cause of the visual loss?

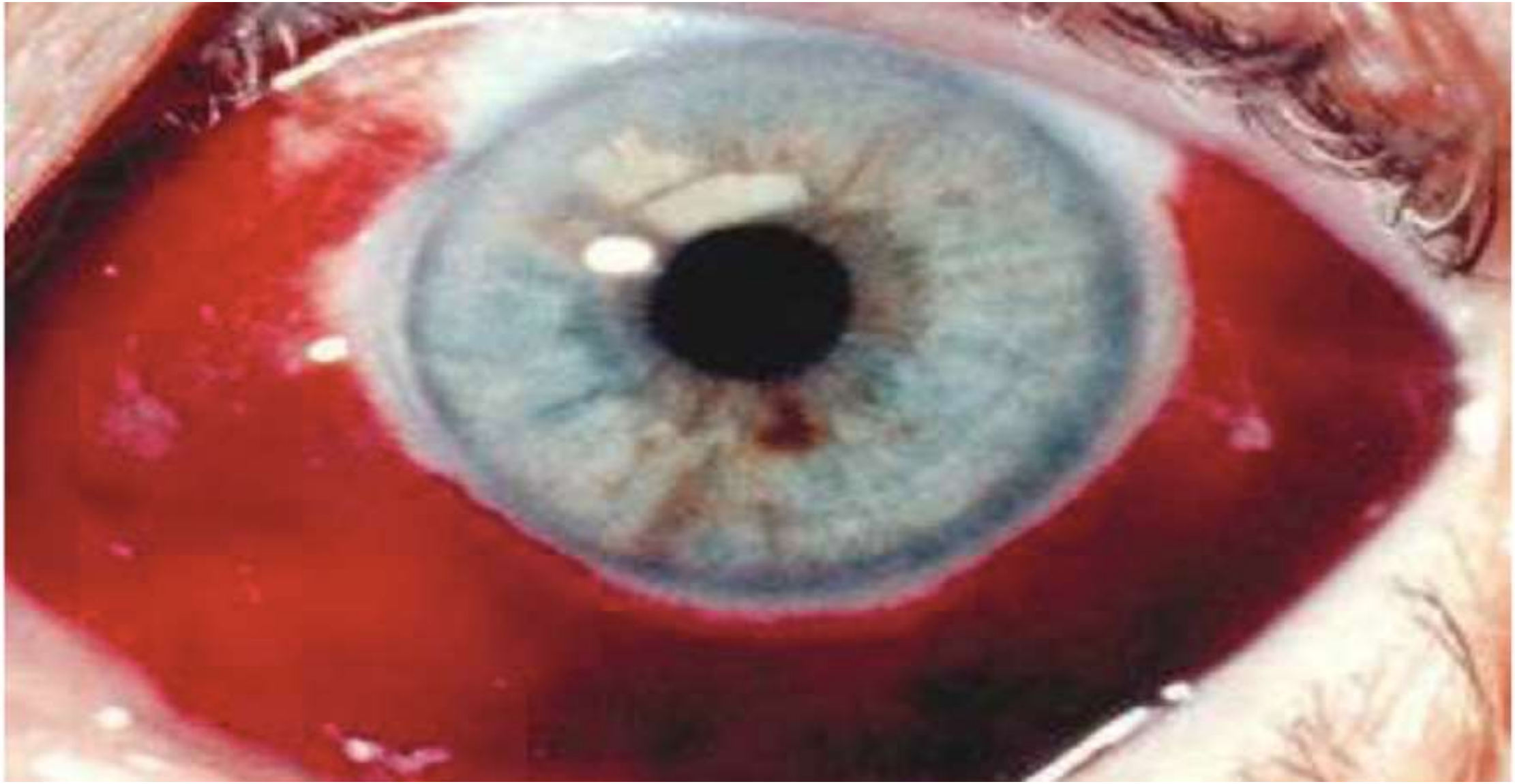
- A Central retinal artery occlusion (CRAO).
- B Branch retinal artery occlusion (BRAO).
- C Central retinal vein occlusion (CRVO).
- D Branch retinal vein occlusion (BRCO).
- E Circum-ciliary vein occlusion.

- Option A is correct
- (Option B) BRAO presents differently on fundoscopic exam with whitening and paleness of the retina only and in segments that are supplied by the occluded branch of the retinal artery.
- (Options C and D) Fundus examination in CRVO and BRVO reveals retinal haemorrhage, oedema and dilated retinal veins. This pattern is generalized in CRVO and focal in BRVO.
- (Option E) Circumcellular vein occlusion is seen in glaucoma. Glaucoma has a different fundoscopic exam appearance.

MCQ

Which one of the following is the most appropriate managem ent option for the eye abnormality shown in the accompanying photograph?

- A CT scan of the head and the orbit.
- B Warm compress.
- C Anaesthetic eye drops
- D Antibiotic eye drops.
- E Corticosteroid eye drops.



- Option B is correct
- Subconjunctival haemorrhage:
  - NOTE
    - **Subconjunctival haemorrhage is not related to hypertension b ut measuring the blood pressure to reassure the patient is worthwhile.**
  - Treatment:
    - In cases of subconjunctival haemorrhage with no history of trau ma, no active treatment is required.
    - Artificial tears can be applied if irritation is a complaint.

- Note:
  - Use of aspirin and NSAIDs should be avoided due to increased risk of rebleeding.
  - Like a bruise, the haemorrhage may become green or yellow with time. The discoloration usually disappears within 2 weeks.
  - Application of warm compress , after cold compress for the first 24 to 48 hours, several times a day,
  - Patients should be advised to return the bruise like appearance does not resolve completely, if pain ensues, or if there is rebleeding.
- CT scan of the orbit:
  - Subconjunctival haemorrhage following injury to exclude orbit fractures or other possible associated injuries.

Three days after a successful lens replacement in a 67-year-old man due to cataract of his right eye, he wakes up in the morning with a painful eye and photophobia. On examination, the affected eye has decreased and blurry vision. Fundoscopy examination is normal on both eyes. The picture of his eye is given. Which of the following is the most likely diagnosis?

1. Hypopyon
2. Conjunctivitis
3. Acute glaucoma
4. Uveitis
5. Suture infection and abscess

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Option D is correct

(Option A) Hypopyon is accumulation of leukocytic exudate in the anterior chamber. The ex udate settles
at the dependent aspect of the eye due to gravity. Although this patient has Hypopyon i n the affected eye, this is a sign seen in anterior uveitis not a diagnosis

(Option C) Acute closed -
angle glaucoma presents with acute eye pain and ipsilateral headache, nauseas and vomiting, hazy cornea and an irregular dilated pupil. The orbit is hard to palpation. This patient does not have a clinical presentation suggestive of acute glaucoma.

(Option E) Suture infection, if occurs, is most likely to cause endophthalmitis (the infection of the entire
orbit including both the anterior and posterior chambers) with a different presentation especially on funduscopic exam.

Complication of procedure Phacoemulsification is anterior uveitis and several others.

The eyeillustrated in the photograph has collection of exudate material at the bottom of th e anterior chamber due
to gravity, characteristics of hypopyon that is a feature seen in anterior uveitis.

Mr Adams is a 56-year-old admitted patient, day 3 post cataract extraction. Today he woke up with eye pain, lid swelling with little hypopyon and red conjunctiva. The pupil seemed small. His visual acuity is also decreased.

What is his most likely diagnosis?

A. Hypopyon

B. Acute iritis

C. Acute conjunctivitis

D. Glaucoma

E. Cataract re-emergence

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A 35-year-old female presents with recurrent Chalazion of the upper eyelid. A curettage is scheduled and subjected to histopathological examination.

Which of the following must be ruled out?

A. Squamous cell carcinoma

B. Basal cell carcinoma

C. Marjolin’s ulcer

D. Sebaceous carcinoma

E. Malignant melanoma

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A lady diagnosed with high myopia has come to you now with complains of suddenly seeing floaters. On fundoscopy a large shadow in vitreous cavity with some vitreous debris are seen. What is the most likely diagnosis?

1. Vitreous haemorrhage
2. Retinal detachment
3. Open angle glaucoma
4. Amaurosis fugax
5. cataract

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A patient came with acute right eye pain, redness and blurr vision. O/E- you see hazy cornea, pupil is irregular, semi-dilated. What is the most appropriate immediate management?

1. Oral acetazolamide
2. Topical Pilocarpin
3. Corticosteroid
4. Iridotomy
5. Topical Timolol

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Topical pilocarpine is no longer commonly used now in Australia. So, 1st line of management for acute cases is betablockers (timolol)


ALL THE
BEST