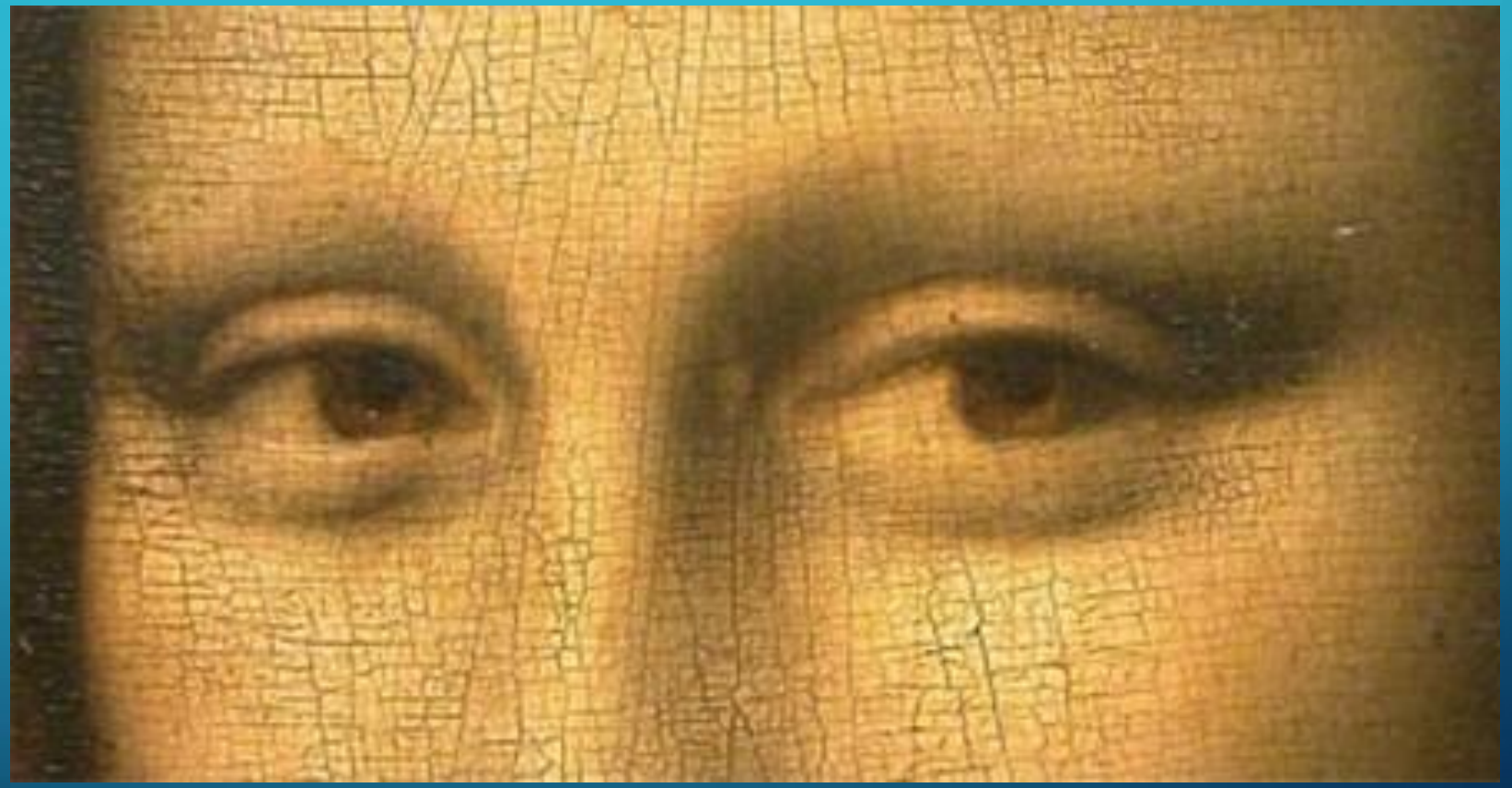

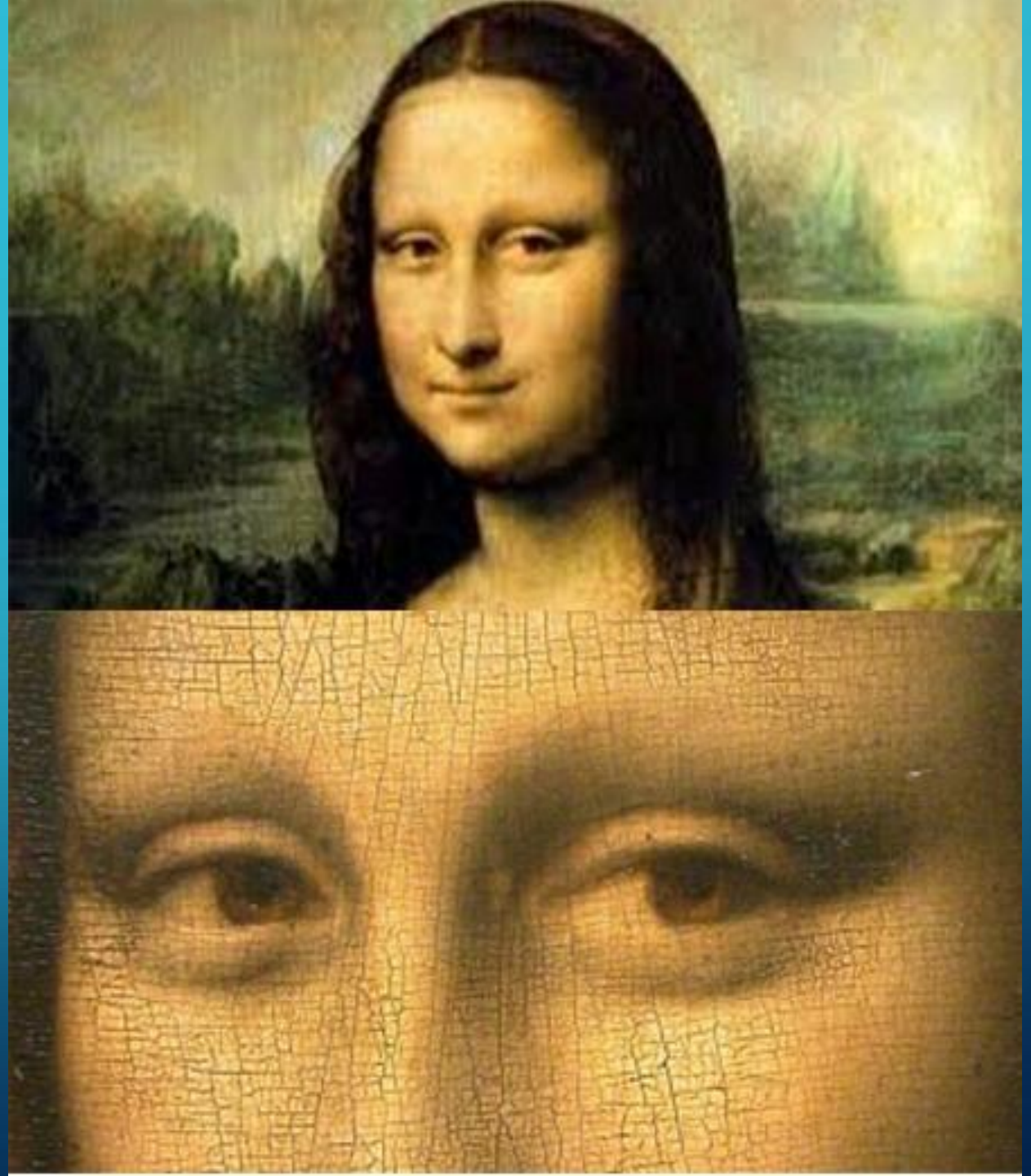

FDUSCOPY FOR INTERNISTS

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OBJECTIVE

- It allows Direct visualization of blood vessels and its adverse changes
- Describe abnormal findings, and recognise systemic disease
- To exclude sign of raised ICP like papilloedema

DIRECT OPHTHALMOSCOPY BY CLINICIAN

- Fundoscopy is the examination of the visible retina
- Perform on both eyes, then make a diagnosis
- May need eye drops (Not if driving or history of closed angle glaucoma)

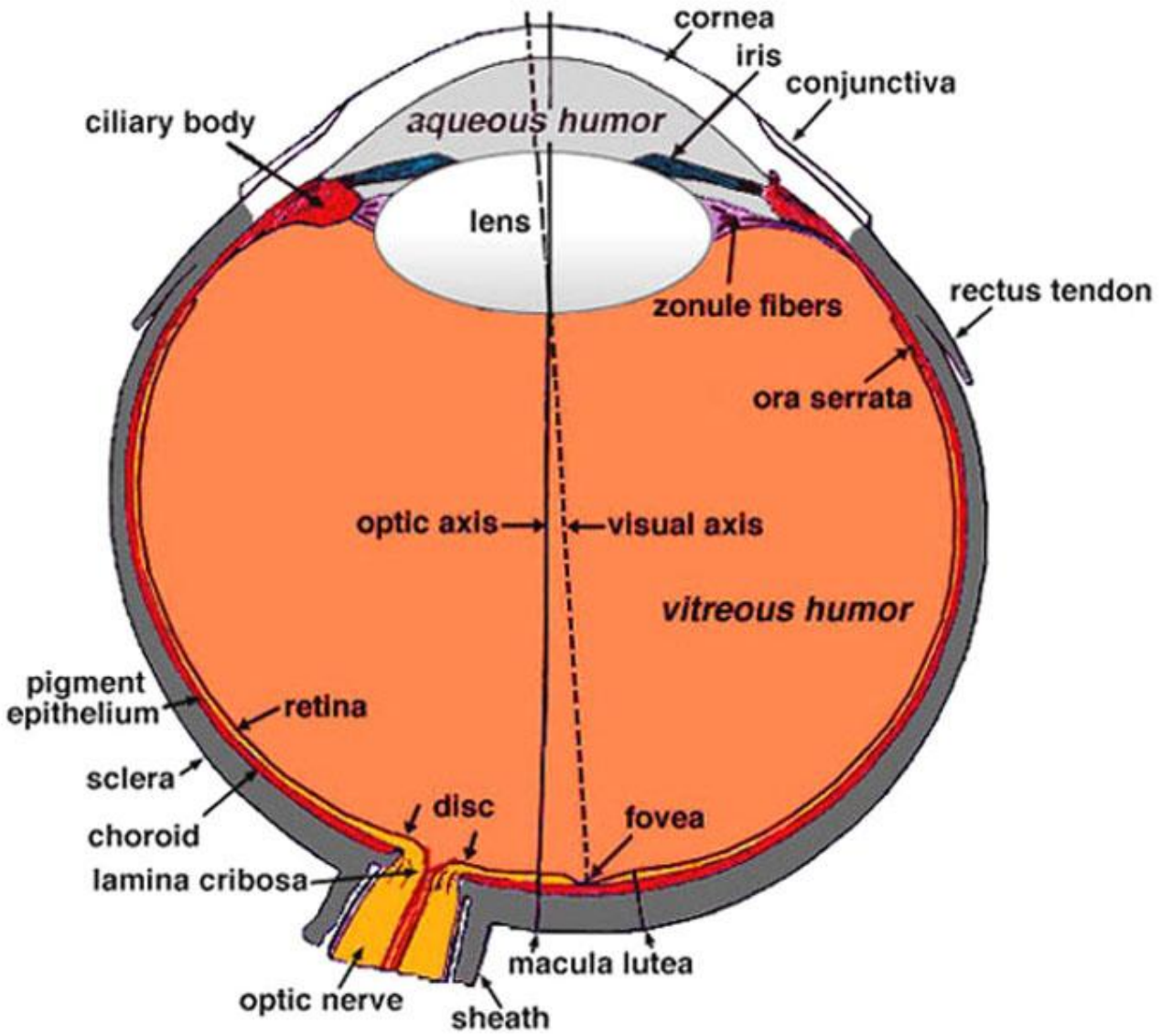


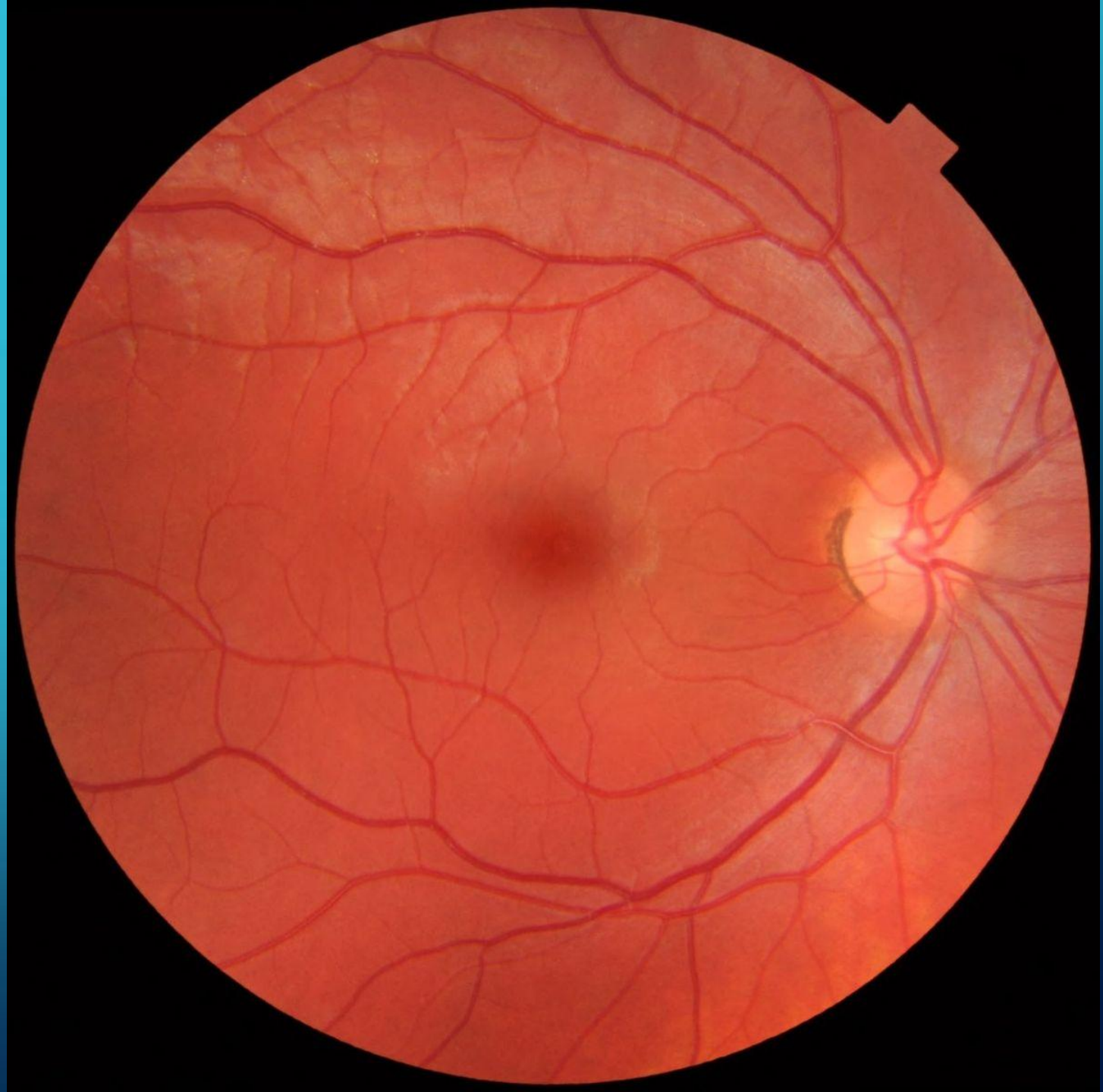
Fig. 2. Sagittal horizontal section of the adult human eye.

What is fundus ?

It is the area

of the retina seen by

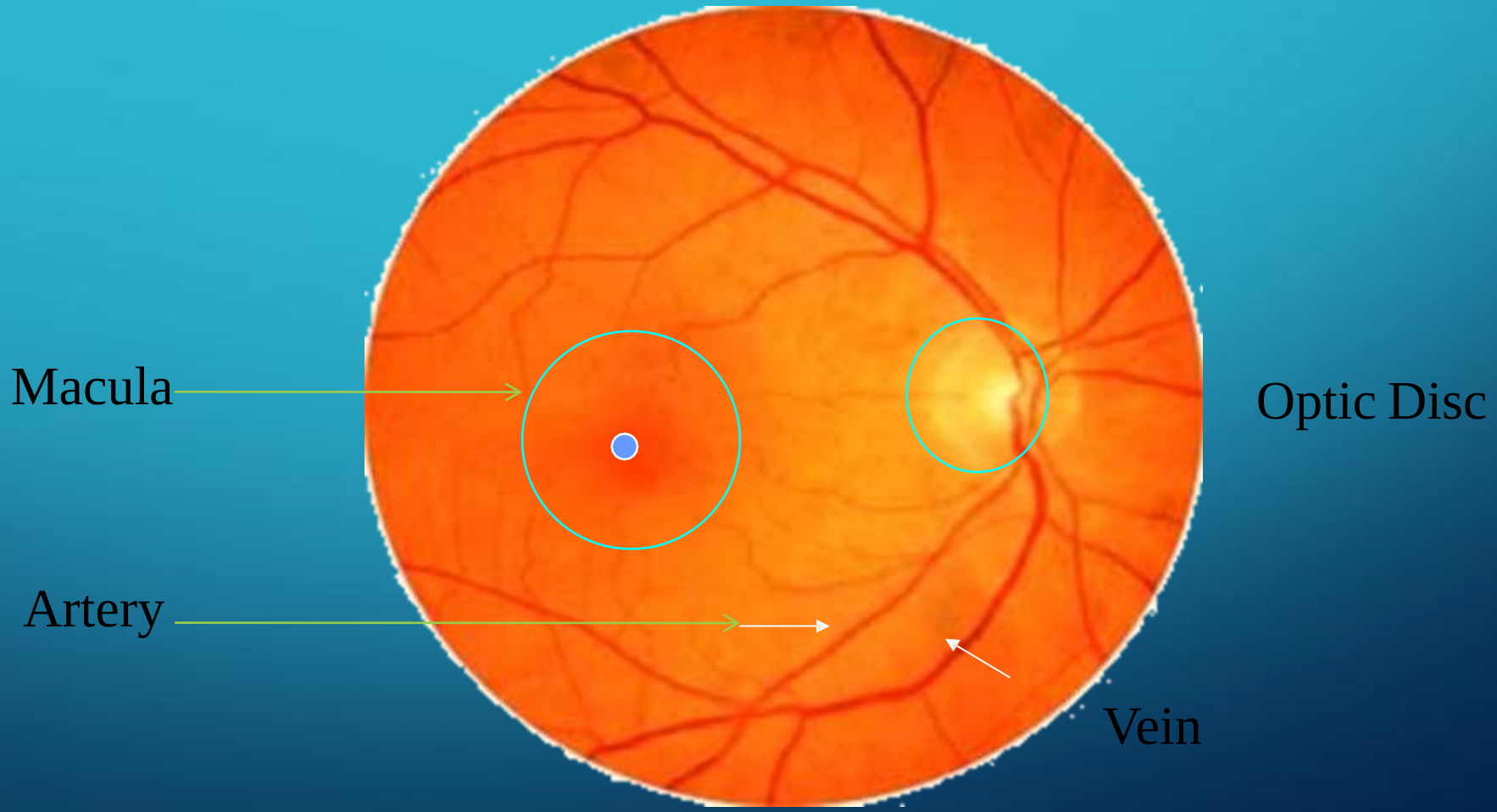
ophthalmoscope.

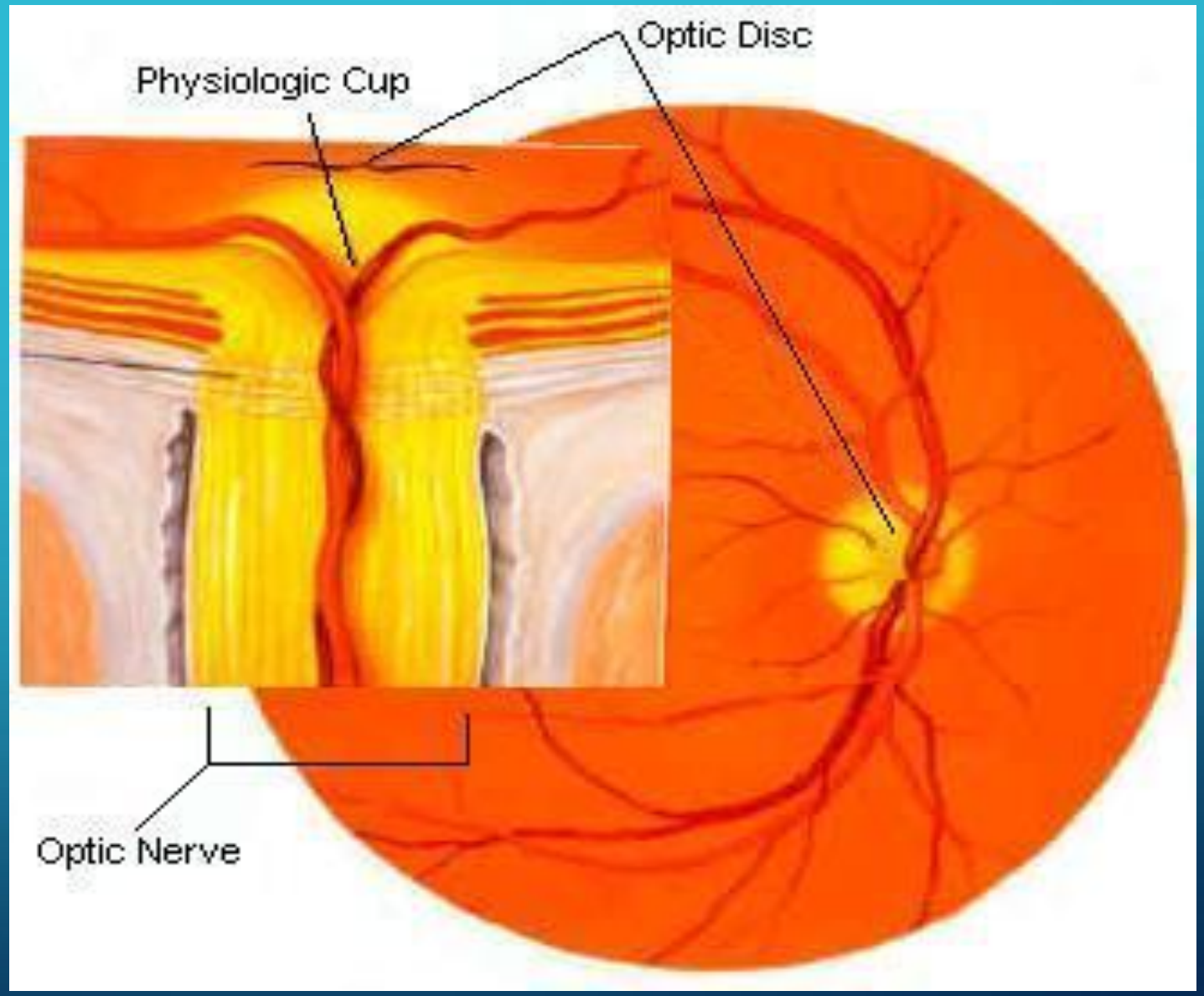


WHAT TO SEE IN A FUNDUS

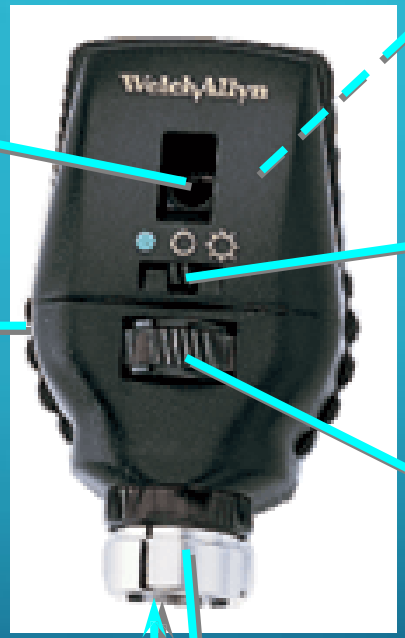
- Media / Vitrious
- Optic Disc :
  - Size
  - Shape
  - Margin
  - NRR
  - C:D
  - Blood vessels
  - Hgs
  - Peripapillary region (alpha and bita zone)
- Peripheral retina
  - Blood vessels
  - Pathological findings eg.: Hgs, exudate, hole, tear, RD etc.
  - Nerve fiber layer
- Macula
  - Foveal reflex
  - Pathological findings eg. Oedema, hole, SRNVM etc.

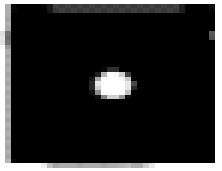
NORMAL FUNDUS



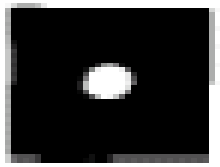

Optic Disc
Physiologic Cup
Optic Nerve

OPHTHALMOSCOPE HEAD (ONE TYPE)

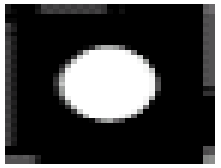




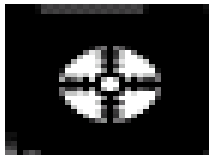
Micro Spot Aperture: Allows quick visual entry in very small, undilated pupils.



Small Aperture: Provides easier view of fundus through undilated pupil.

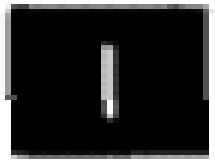


Large Aperture: Standard aperture for dilated pupil and general examination of the eye.



Fixation Aperture: Features graduated cross-hairs for measuring eccentric fixation or for locating lesions and other abnormalities.

Cobalt Filter: Blue filter used with fluorescein dye permits easy viewing of small lesions, abrasions and foreign objects on the corneal surface.



Slit: Used to determine various levels of lesions and tumors.

BEFORE PROCEEDING

- GRIP
  - Greet, rapport, introduce and identify, explain procedure
- Inform patient
  - Lights down and close curtains for a good view
  - Need to get close for a “good look”
  - Bright light may dazzle but not damaging
  - Patient to focus on a distant point (identify one for them)
  - May need eye drops (Not if driving or history of closed angle glaucoma)

GET READY!

- Check the ophthalmoscope works
  - Only use full power if necessary
    - Miosis and discomfort
- Set the lens to 0 power
- Remove patient's and own spectacles
  - Unless you have a significant astigmatism
- Position the patient on a seat
  - You need access to both sides of the patient
  - Ensure patient is at a good working height
  - Can also be done with patient laying down
- Darken the room

PATIENT GAZE A DISTANT FIXED OBJECT

EXAMINE THE PATIENT' RIGHT EYE

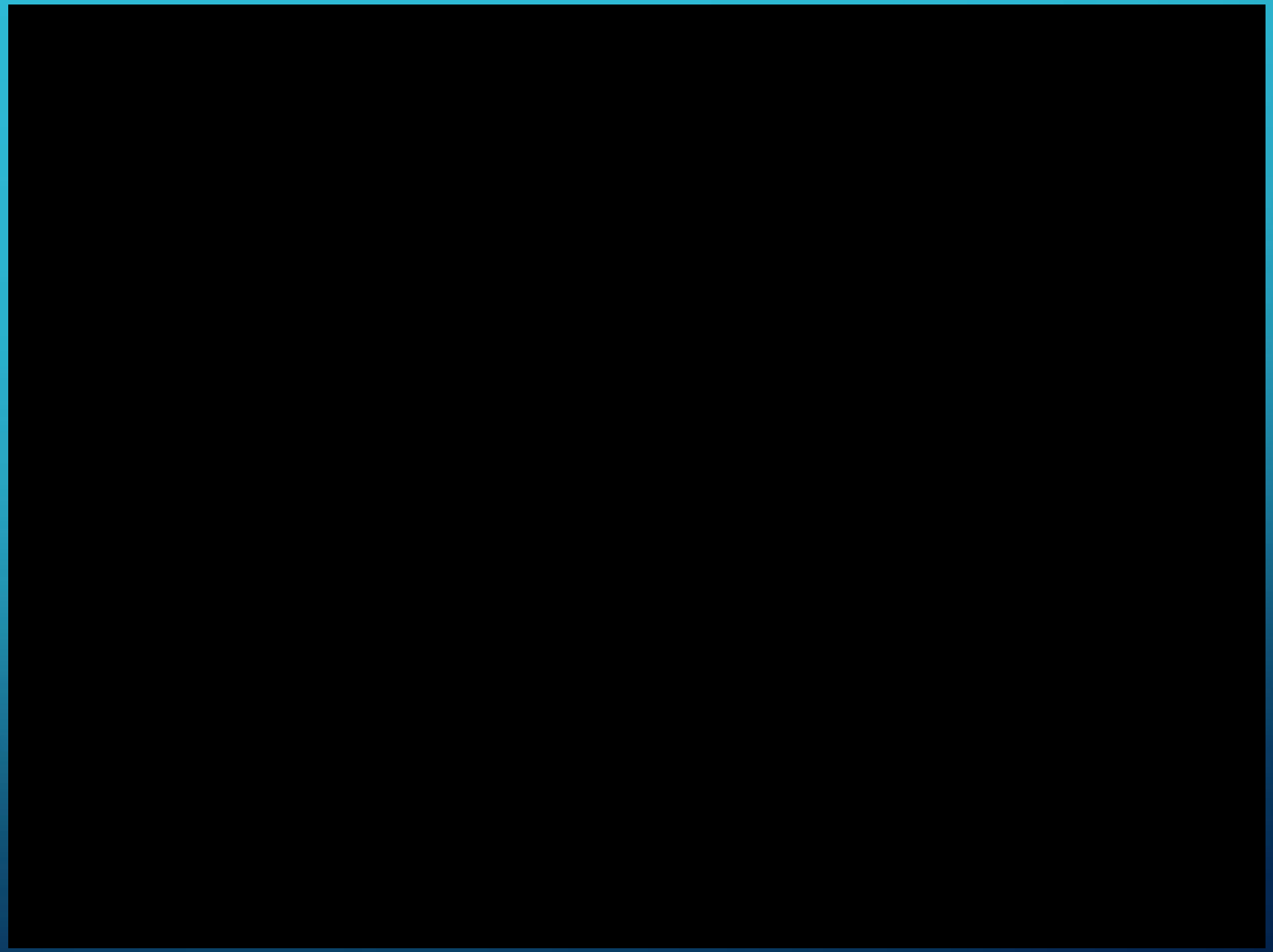
- Rest left hand on patient's forehead with thumb extended
- Hold ophthalmoscope in right hand and look through your right eye at patient's right eye
- Start from 6 inches away at an angle of 25^{o}
- Fundus can be seen at 2 inches away

EXAMINE THE PATIENT' RIGHT EYE CONT.

- Examine for red reflex at arm's length
  - Normal - red glow from choroid
  - Look for opacities or loss of reflex
  - Determine depth of obstruction by moving side to side
    - In front of pupil moves away from you
    - Behind pupil moves with you
    - In line of pupil - doesn't move

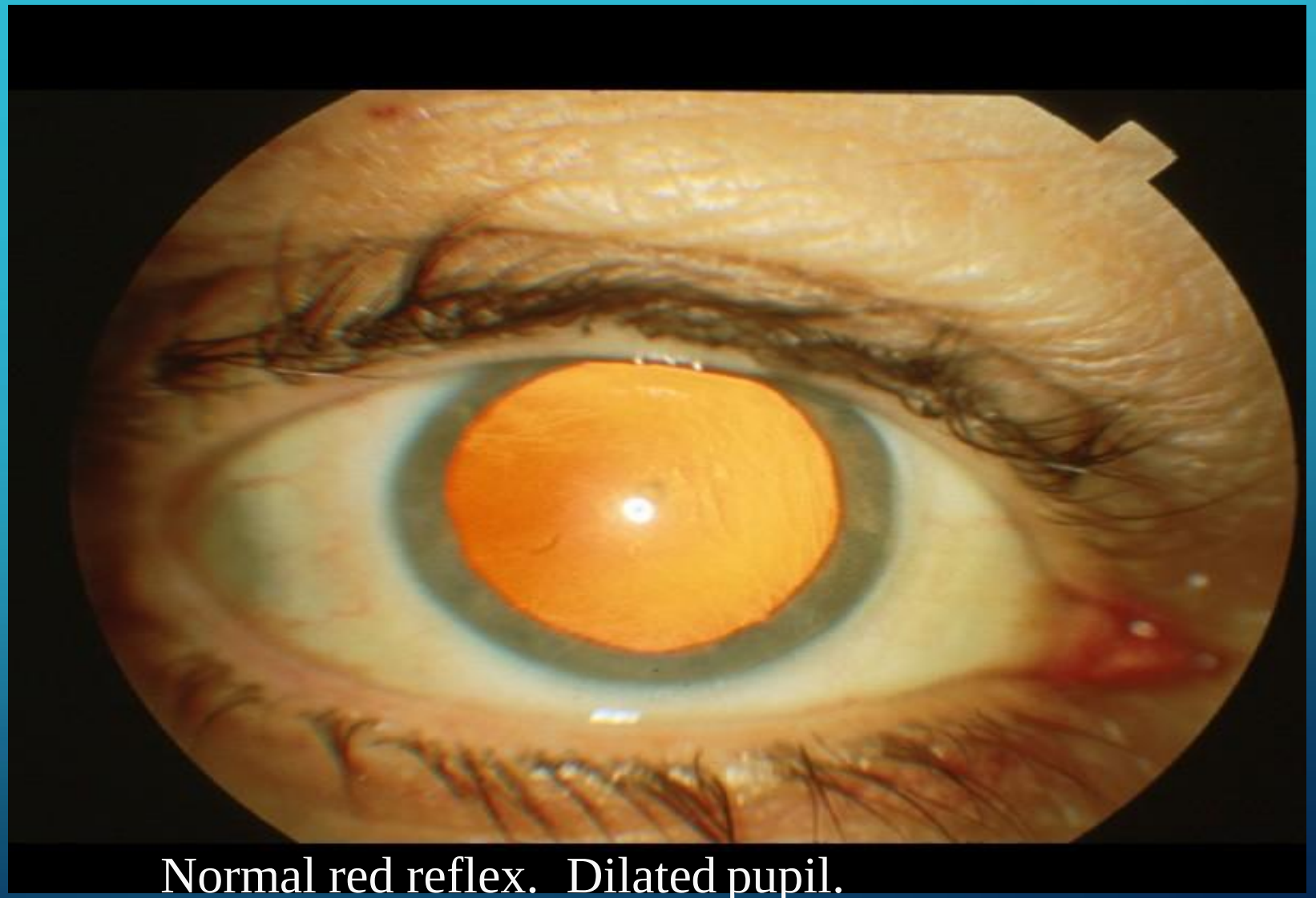
FUNDOSCOPY – OPTIC DISC

- Move as close to the patient as possible
  - Rest the thumb of your left hand on your forehead Focus on the fundus
- Find the optic disc
  - Follow a retinal vessel back (arrow sign)
- Examine the optic disc
  - Normal
  - Swollen/ blurred margins
  - Pale
  - Optic disc/ cup ratio
    - Can measure with grid

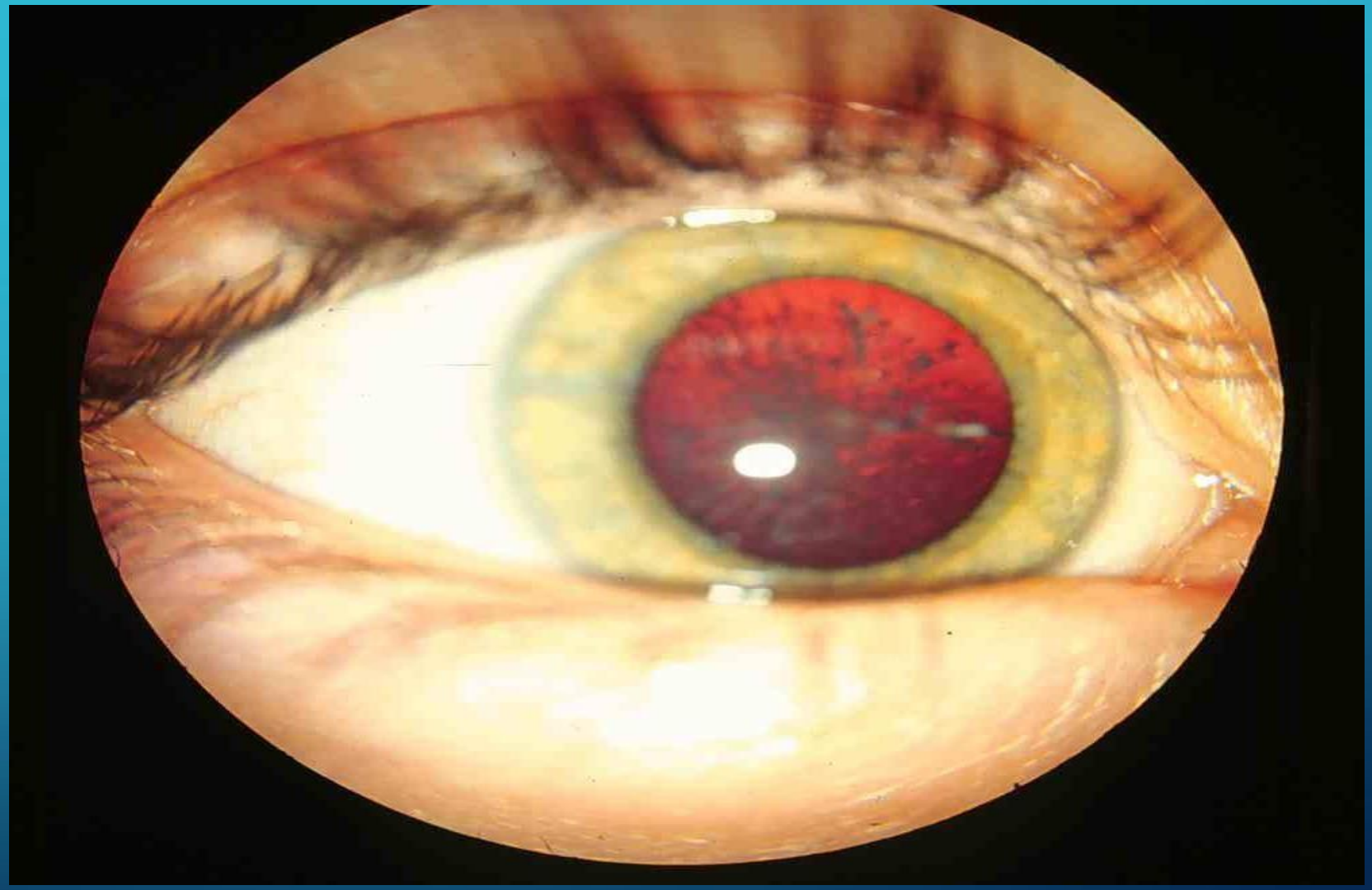


FINISHING YOUR EXAMINATION

- Switch the lights off
- Summarise your findings
- Try not to comment during examination itself
- You may be asked to make a diagnosis
- Remember, this is part of a full ocular examination
  - Fields, acuity, extraocular movements, pupillary reaction, external examination, colour vision

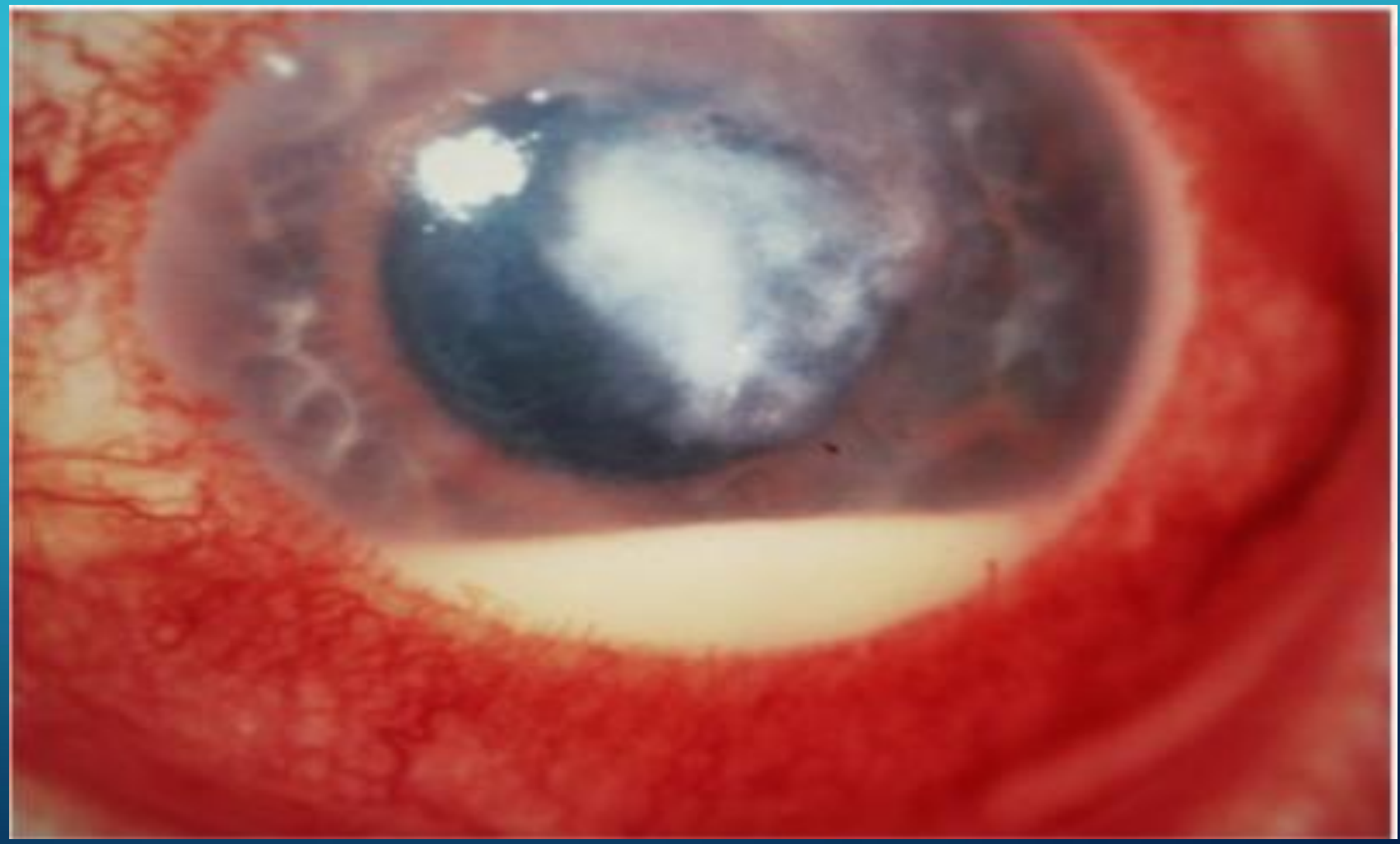


Normal red reflex. Dilated pupil.



Cataract (black, spidery thing) obscuring red reflex

CORNEAL ULCER LEADING TO IRITIS
CORNEAL INJECTION (RED EYE) HYPOPYON (PUS IN THE ANTERIOR CHAMBER)



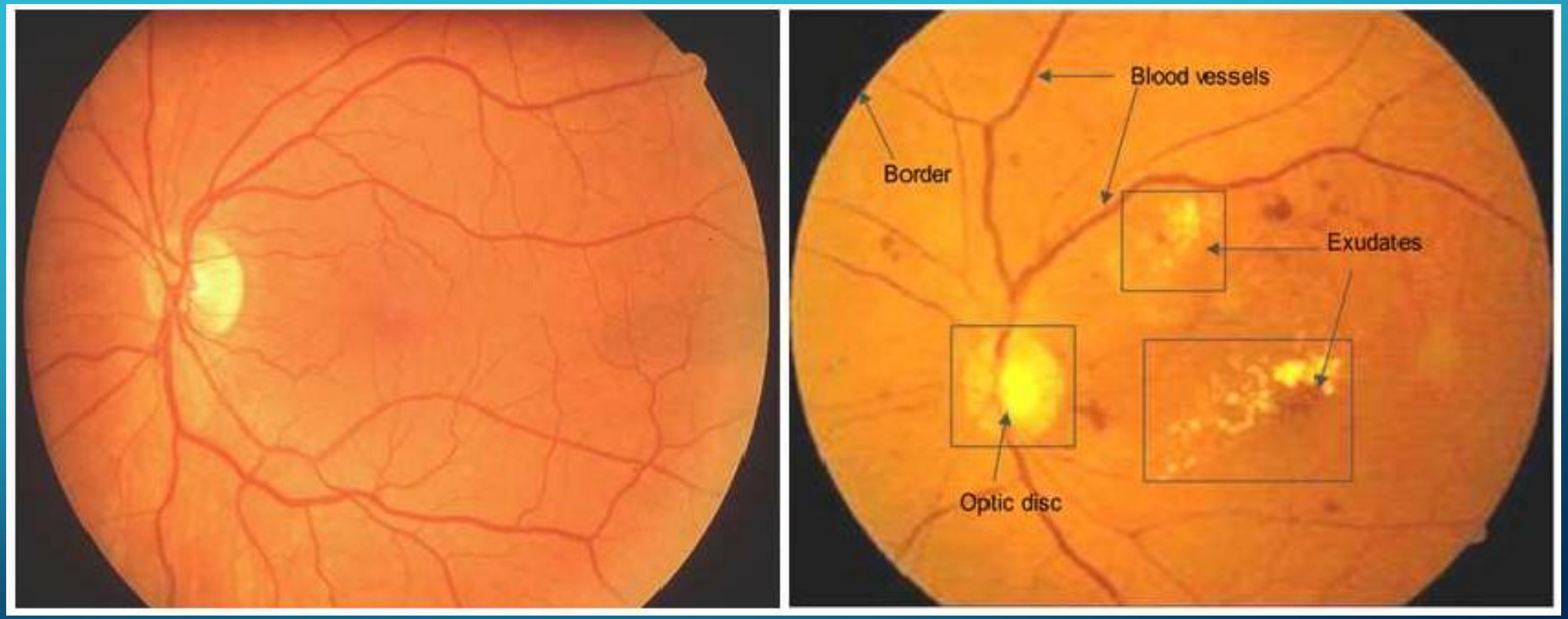
FUNDOSCOPY - FUNDUS

- Colour
  - Darker with pigmented skin or retinitis pigmentosa
  - Pale with arterial occlusion
- Vessels in 4 quadrants – arteries narrower and usually cross veins
  - Number
  - Straight or tortuous?
  - Colour and width
  - Light reflex
  - Points of crossing
- Macula
  - “look at light”

FUNDOSCOPY - PATHOLOGY

- Hypertension
  - A-V nipping, hard exudates, retinal oedema, arteriolar vasoconstriction, haemorrhages (rarely papilloedema)
- Diabetes
  - Cotton wool spots, blot haemorrhages, new vessel formation (laser burns if treated)
- Glaucoma
  - Optic disc cupping
- Added features
  - Haemorrhages or exudates
    - Green "red-free" filter makes haemorrhages easier to see

DIABETIC RETINOPATHY


Blood vessels
Border
Exudates
Optic disc

INTERNATIONAL GRADING SYSTEM FOR DIABETIC RETINOPATHY

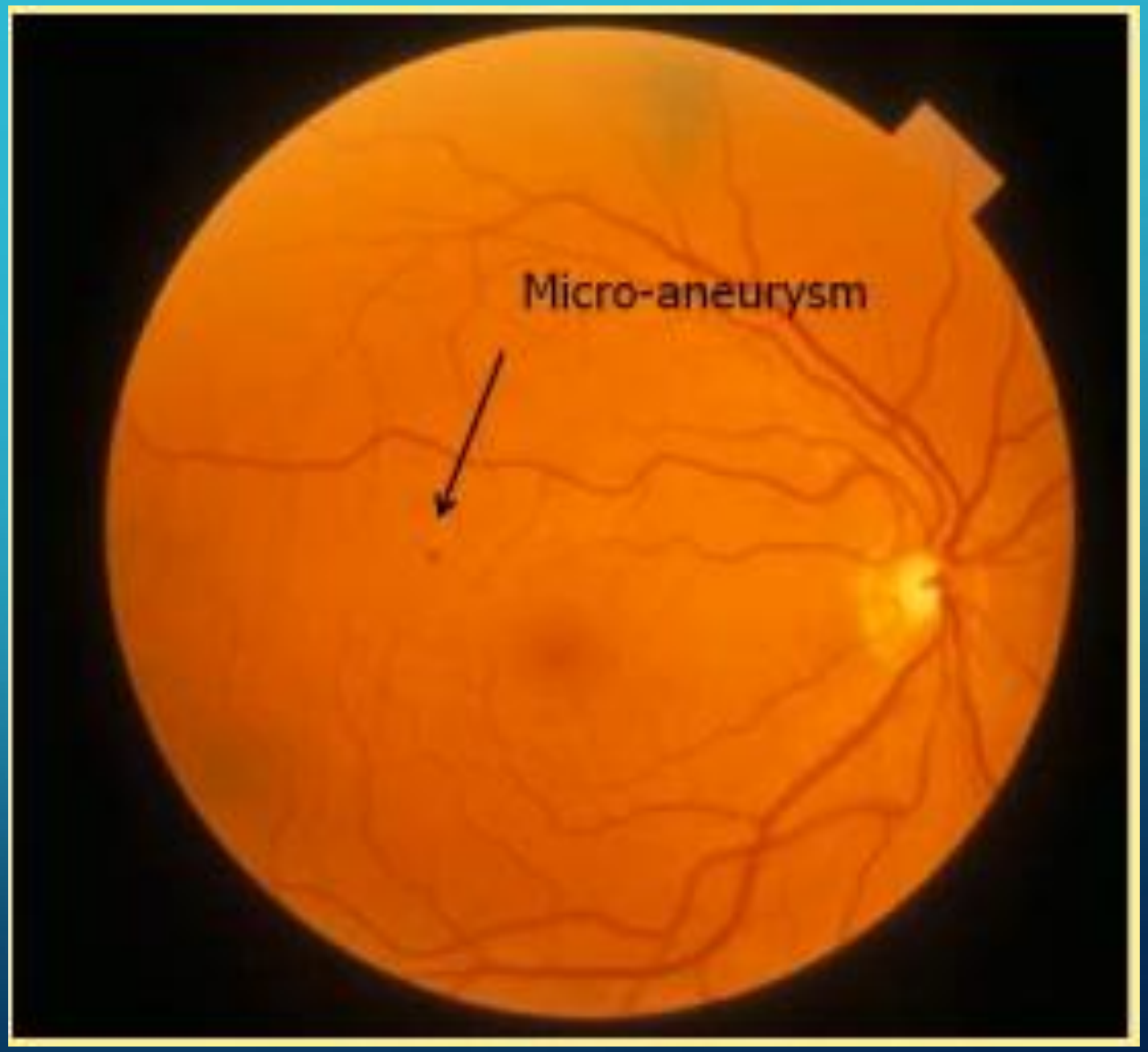
Name	Explanation
No diabetic retinopathy	
Mild non-proliferative diabetic retinopathy	Microaneurysms only
Moderate non-proliferative diabetic retinopathy	More than microaneurysms but less than severe NPDR
Severe non-proliferative diabetic retinopathy	Any of the following: >20 microaneurysms in each 4 quadrants definite venous beading in >2 quadrant prominent intra-retinal microvascular abnormalities in >1 quadrant no signs of proliferation
Proliferative	Definite neovascularization Preretinal or vitreous haemorrhage
Clinically significant macular (o)edema	

A CLASSIFICATION OF DIABETIC RETINOPATHY

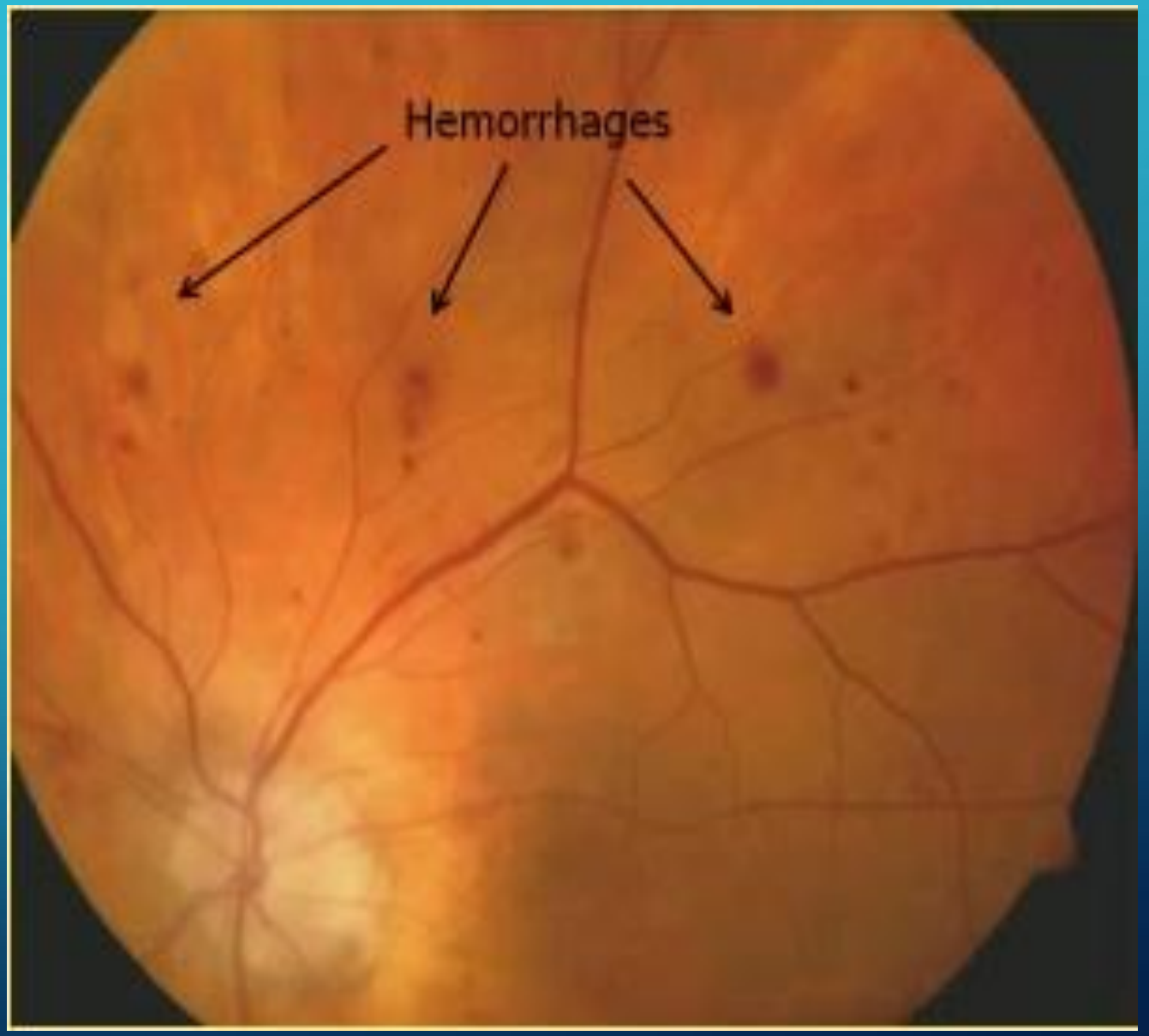
- Non-proliferative diabetic retinopathy (NPDR)
- Mild non-proliferative diabetic retinopathy
  - Microaneurysms
  - Dot and blot haemorrhages
  - Hard (intra-retinal) exudates
- Moderate-to-severe non-proliferative diabetic retinopathy
  - The above lesions, usually with exacerbation, plus:
  - Cotton-wool spots
  - Venous beading and loops
  - Intra-retinal microvascular abnormalities (IRMA)

- Proliferative diabetic retinopathy
  - Neovascularization of the retina, optic disc or iris
  - Fibrous tissue adherent to vitreous face of retina
  - Retinal detachment
  - Vitreous haemorrhage
  - Pre retinal haemorrhage
- Maculopathy
  - Clinically significant macular oedema (CSME)
  - Ischaemic Maculopathy

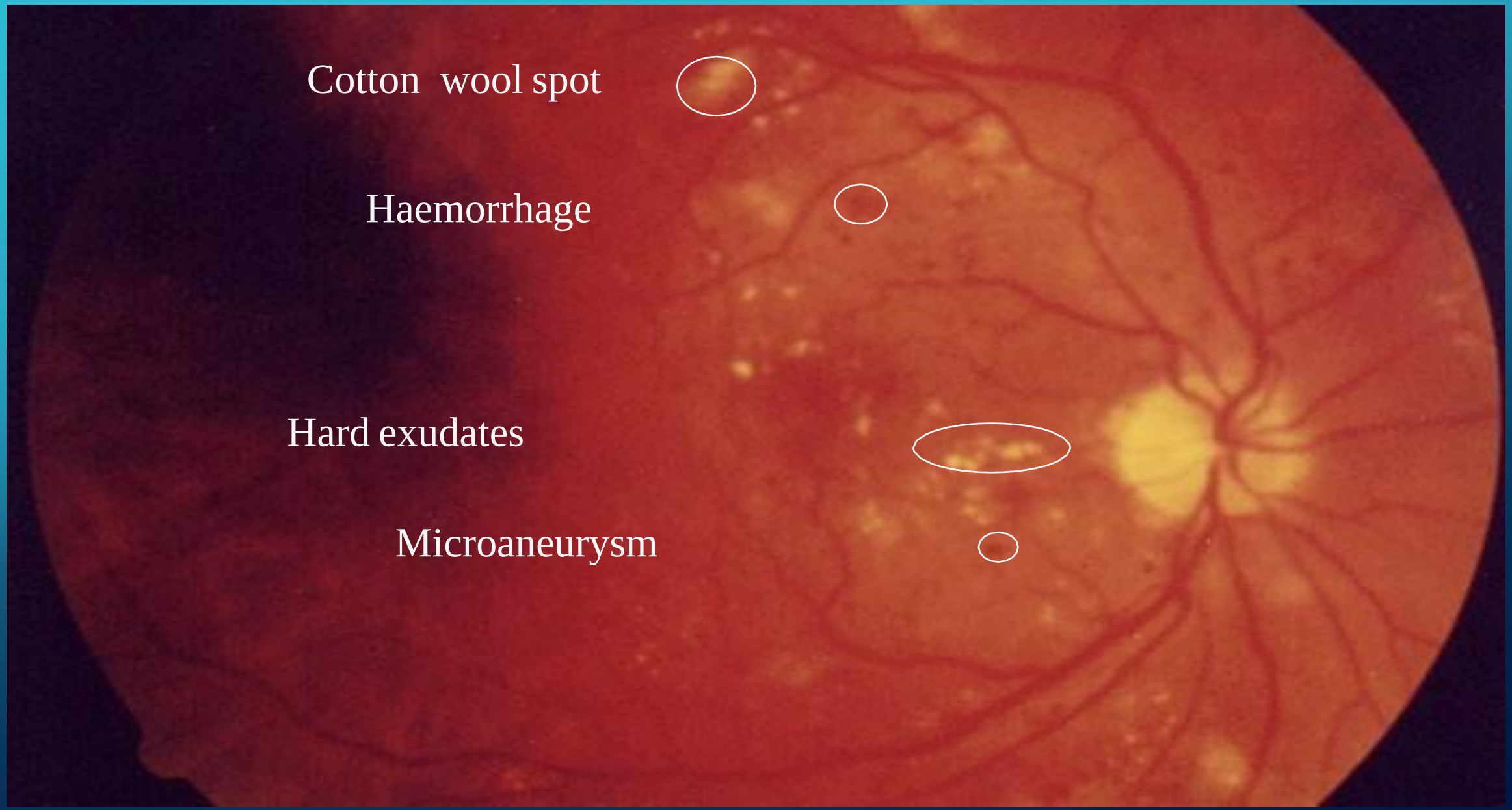
CATEGORY 2: MILD NON-PROLIFERATIVE DIABETIC RETINOPATHY



CATEGORY-3, NPDR

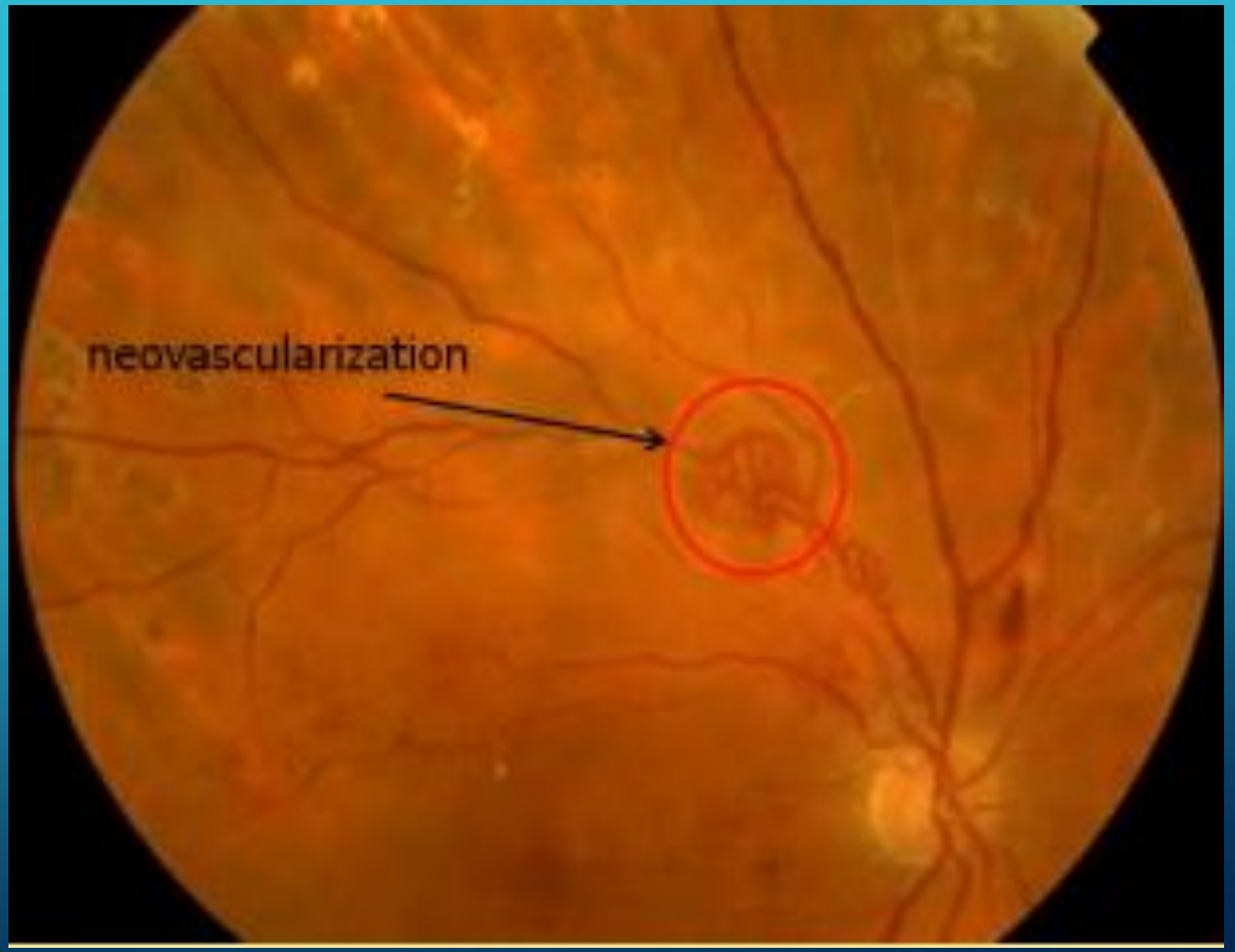


Severe non-proliferative diabetic retinopathy



CATEGORY4 DM PDR

CATEGORY 4 PDR DM



RETINOPATHY HAS FEATURES OF:

a. **Microvascular occlusion - IRMA, new vessel**

b. **Microvascular leakage**

    1. **Diffuse retrial oedema**

    2. **Localized retinal oedema - hard exudates**

Background diabetic retinopathy

Characterized by:

(a) Microaneurysms

(b) Dot and blot hges, flame shaped hges

(c) Hard exudates

(d) Retinal oedema - pale retina

(e) Diabetic maculopathy

PRE PROLIFERATIVE DIABETIC RETINOPATHY

Characterized by:

a. Cotton-wool spots
b. Dark blot hges
c. IRMA
d. Venous beading

MICROANEURYISMS AND HAEMORRHAGES

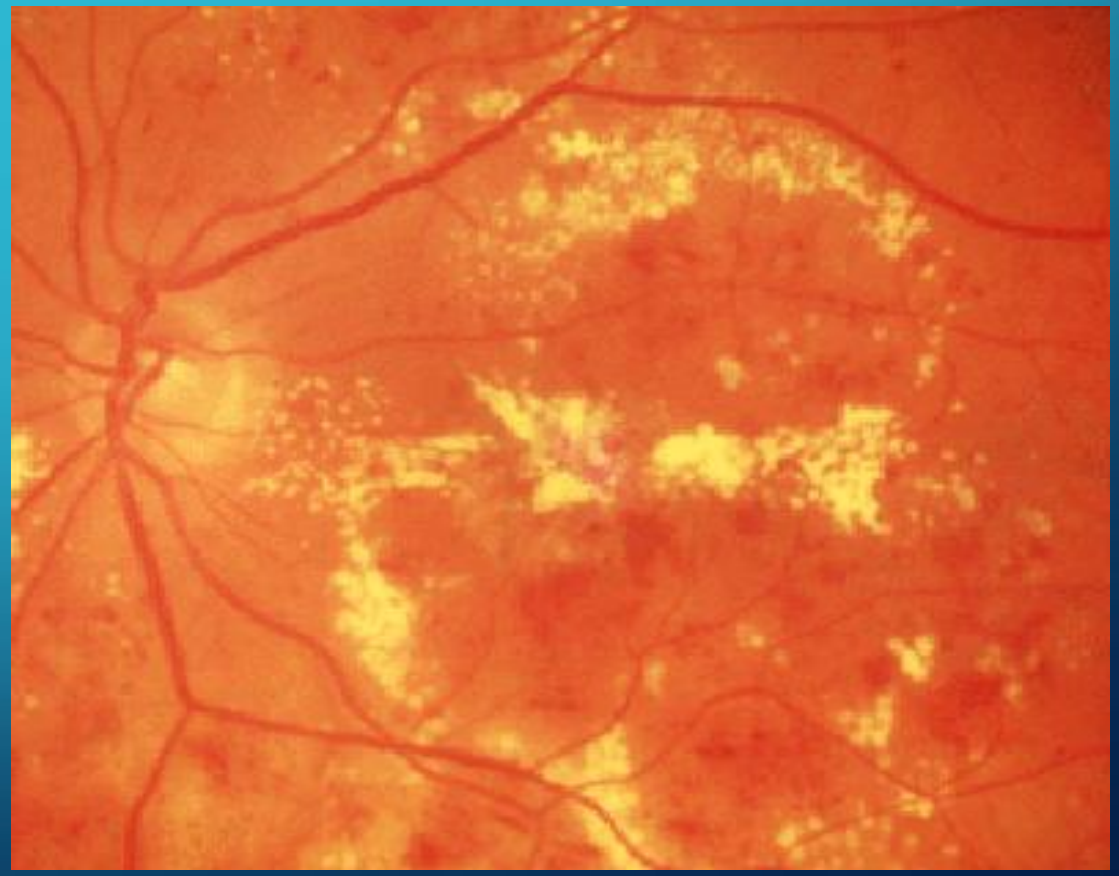
Retinal microaneurysms are focal dilatations of retinal capillaries, 10 to 100 microns in diameter, and appear as red dots. They are usually seen at the posterior pole, especially temporal to the fovea. They may apparently disappear whilst new lesions appear at the edge of areas of widening capillary non-perfusion.

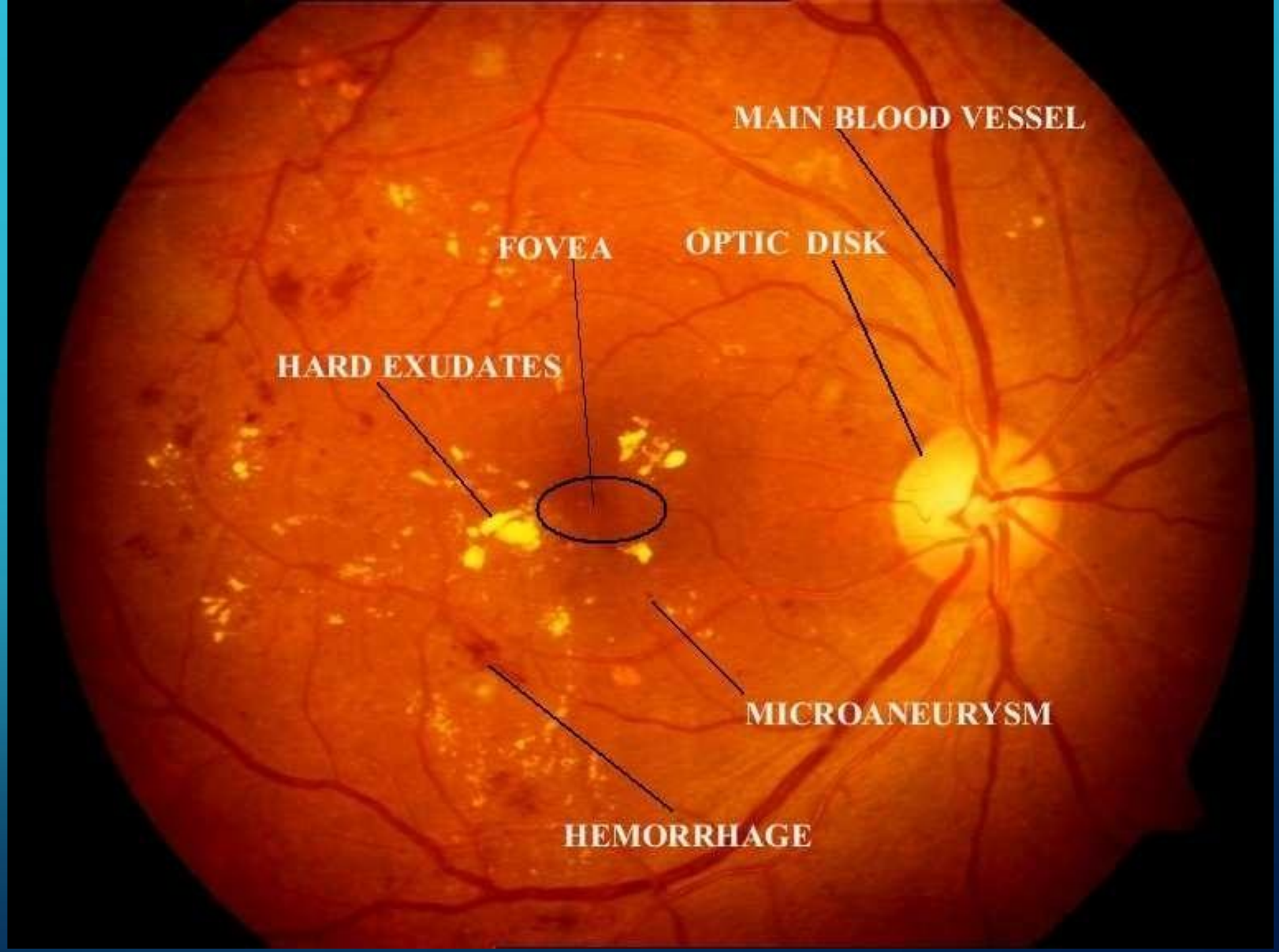
COTTON WOOL SPOTS

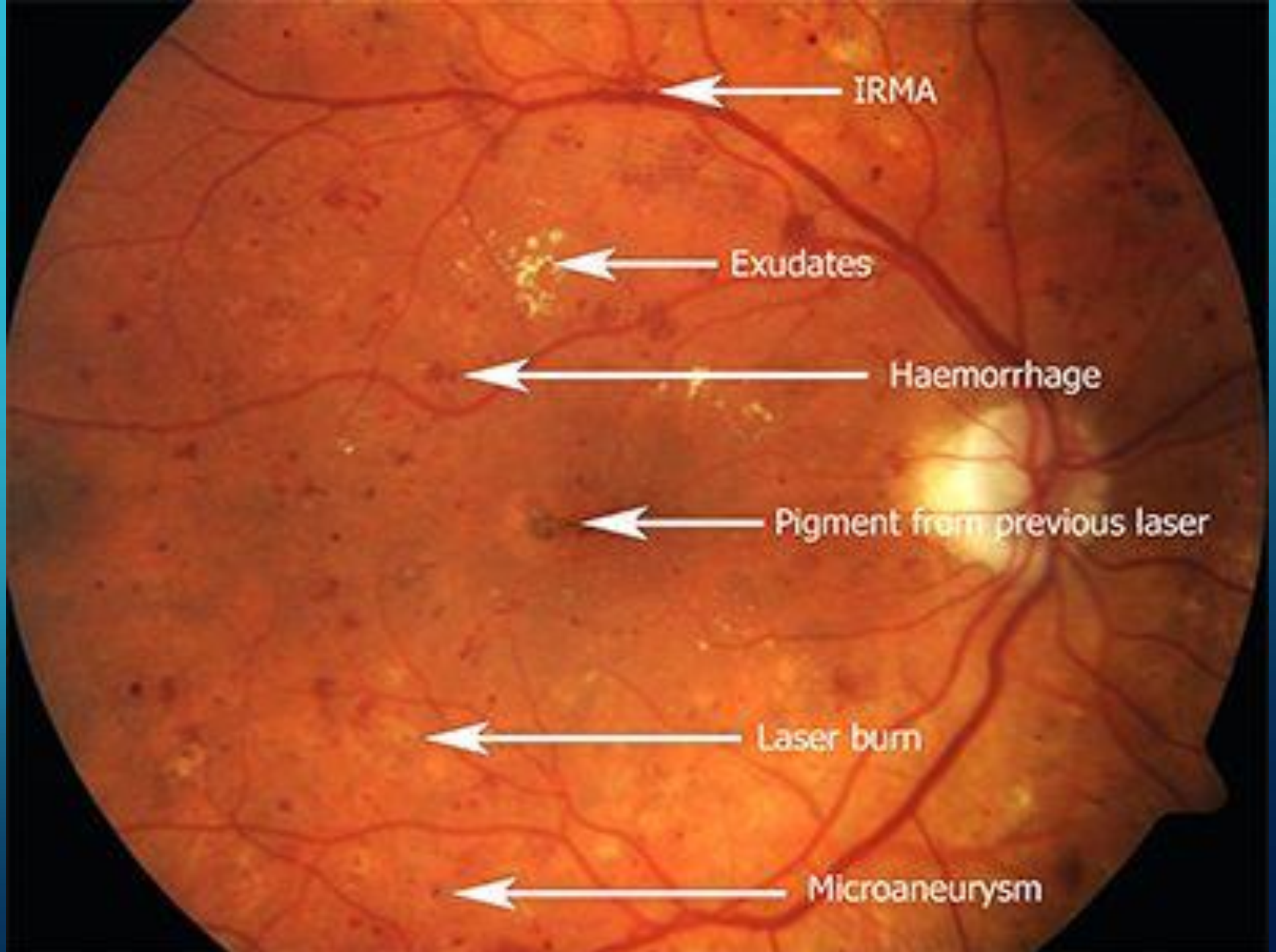
- Cotton wool spots result from occlusion of retinal pre-capillary arterioles supplying the nerve fibre layer with concomitant swelling of local nerve fibre axons. Also called "soft exudates" or "nerve fibre layer infarctions" they are white, fluffy lesions in the nerve fibre layer.

HARD EXUDATES (INTRA-RETINAL LIPID EXUDATES)

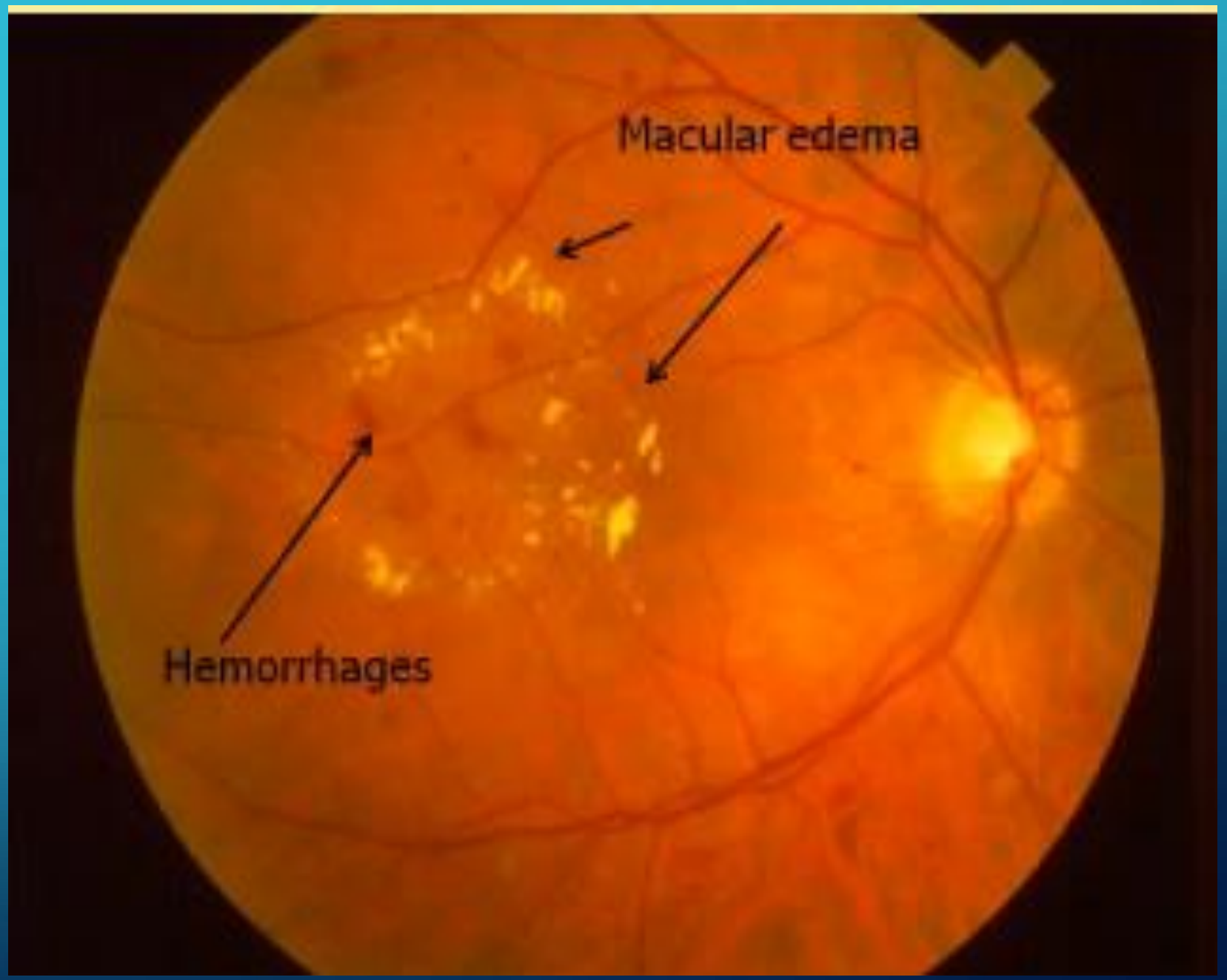
- Hard exudates (Intra-retinal lipid exudates) are yellow deposits of lipid and protein within the sensory retina. Accumulations of lipids leak from surrounding capillaries and microaneuryisms, they may form a circinate pattern. Hyperlipidaemia may correlate with the development of hard exudates.



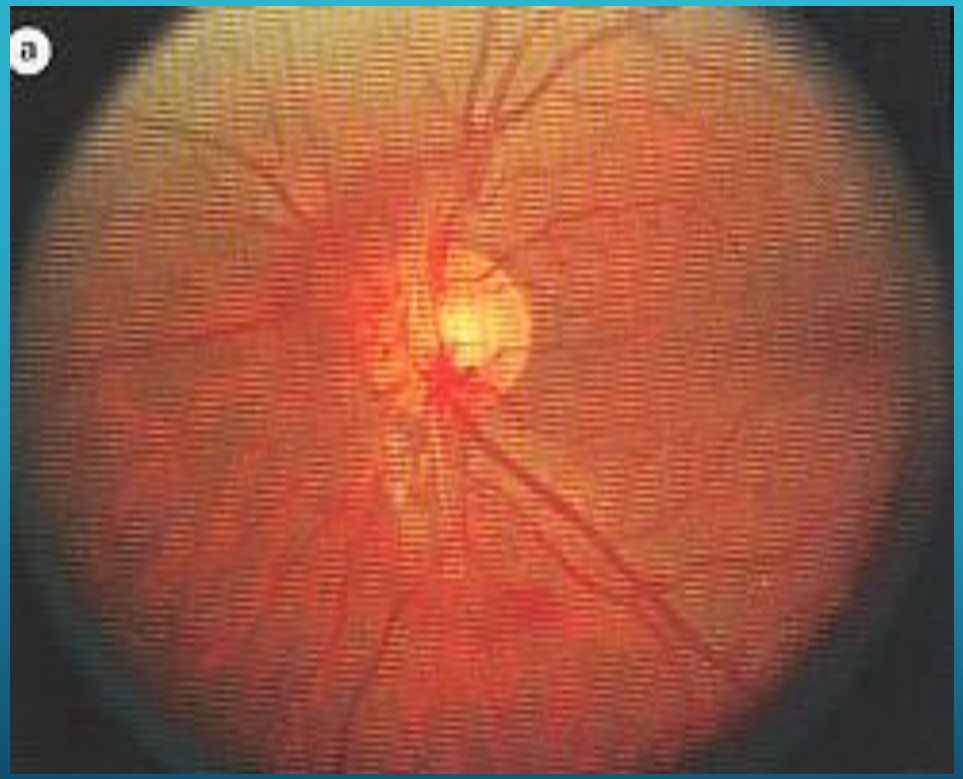

MAIN BLOOD VESSEL
FOVEA
OPTIC DISK
HARD EXUDATES
MICROANEURYSM
HEMORRHAGE

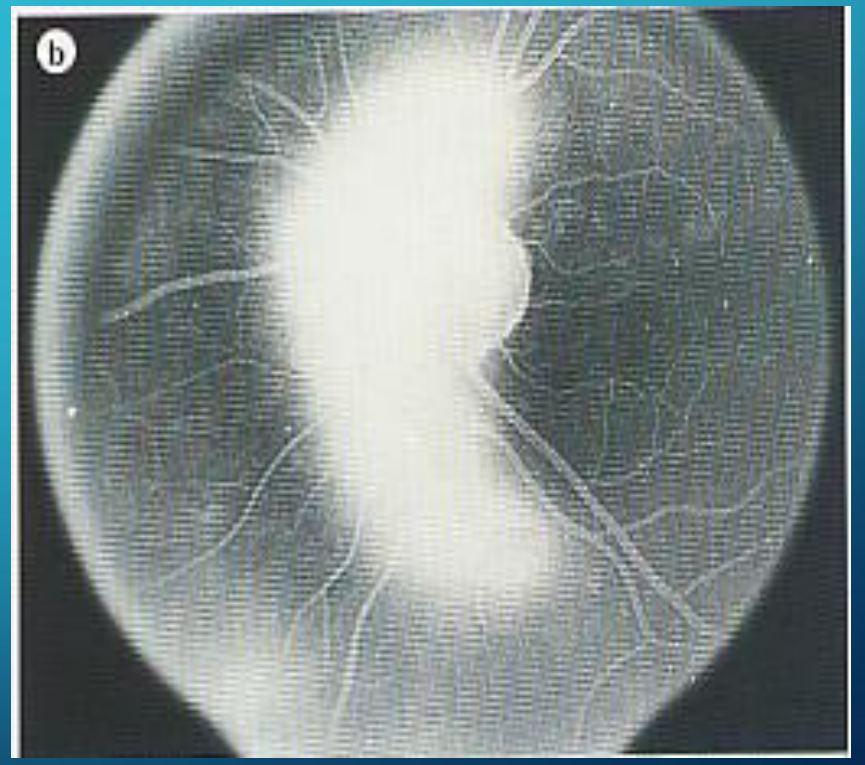

IRMA
Exudates
Haemorrhage
Pigment from previous laser
Laser burn
Microaneurysm

MACULAR EDEMA



Proliferative DR





Haemorrhages

Retrohyaloid hemorrhage (preretinal)

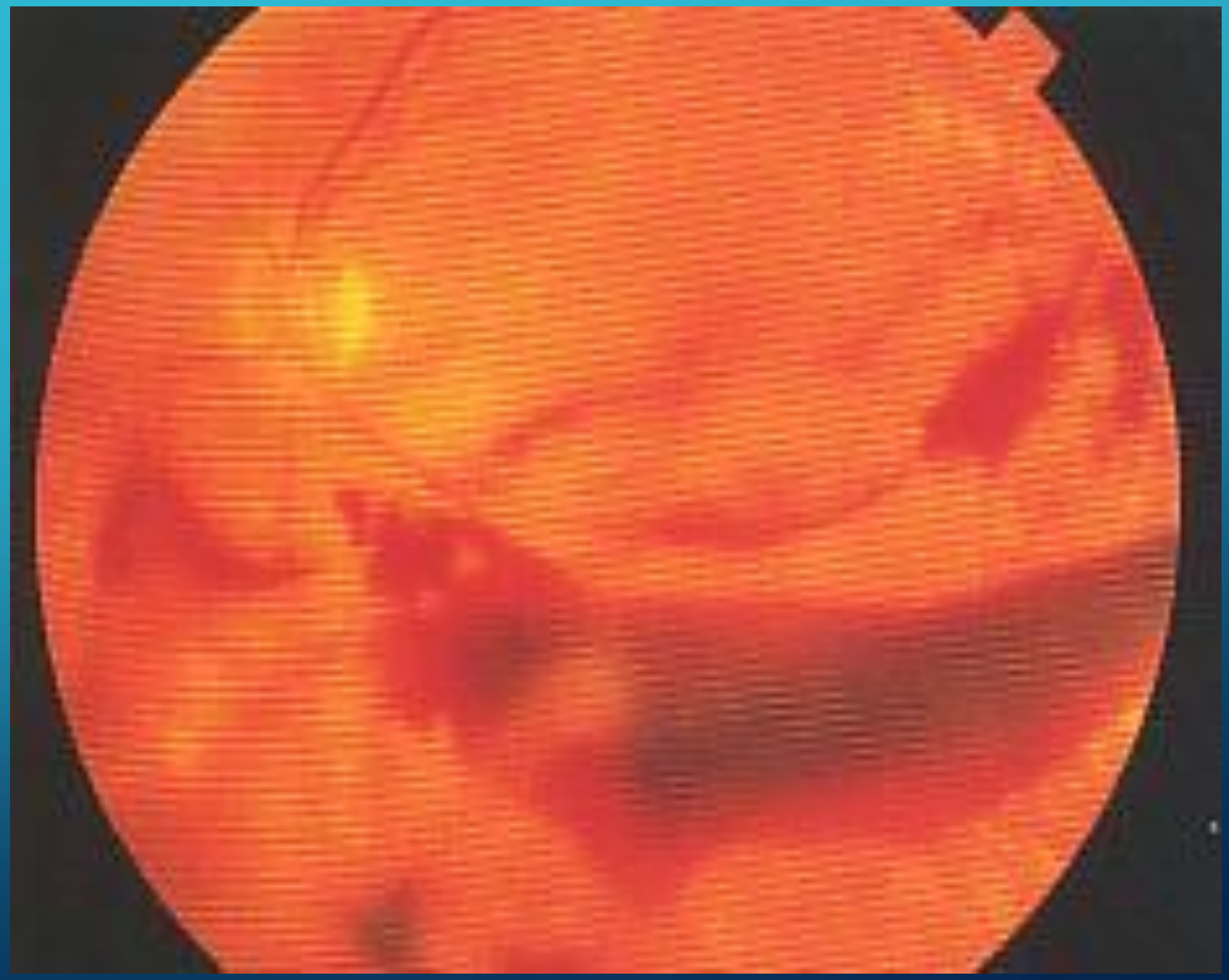
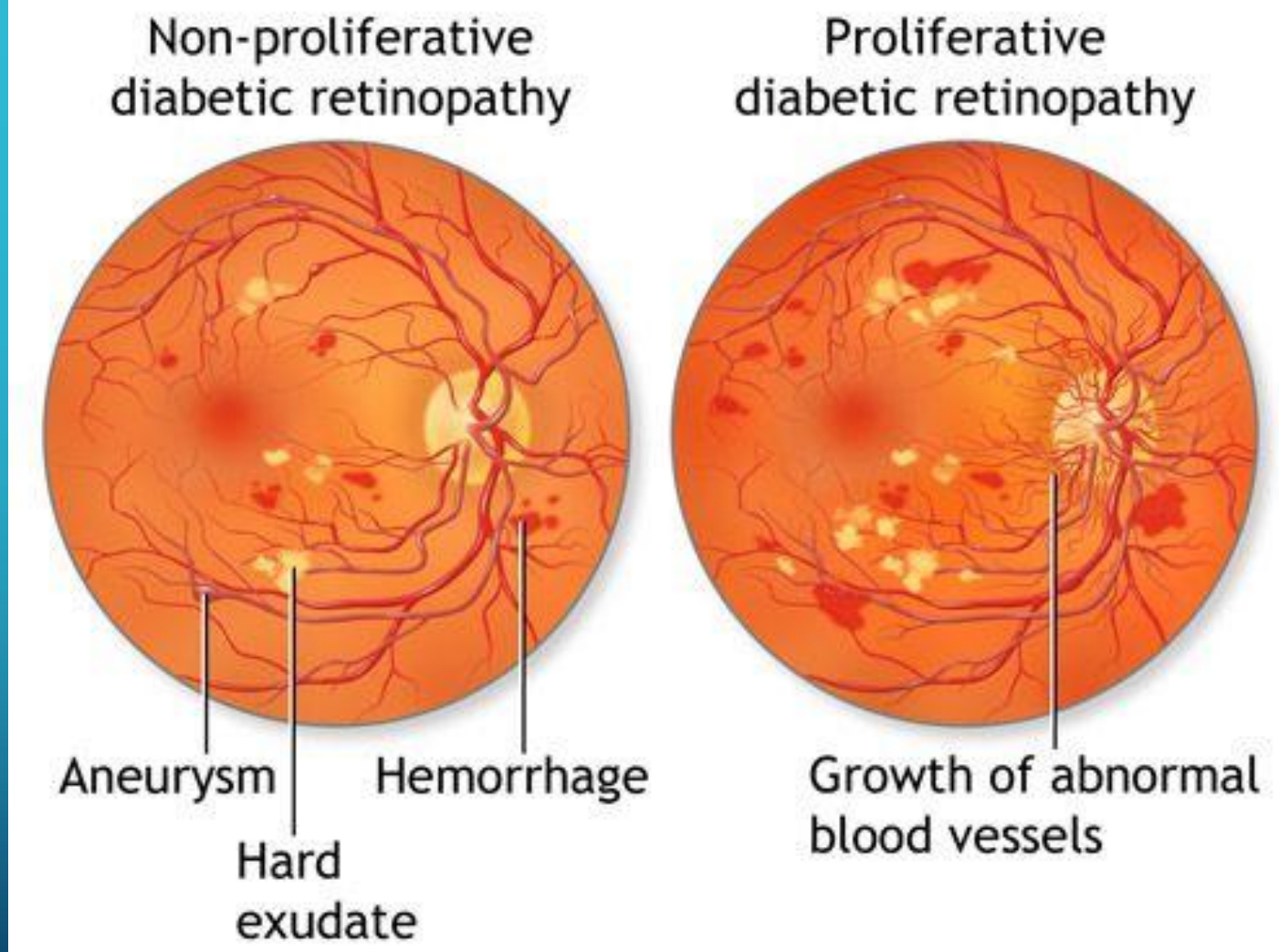


Fig. 14.22
Preproliferative diabetic retinopathy. Venous dilatation, looping and intraretinal microvascular abnormalities along the inferotemporal arcade, blot haemorrhages inside the superotemporal arcade and hard exudates at the macula

LASER TREATED DIABETIC RETINOPATHY


Non-proliferative diabetic retinopathy
Proliferative diabetic retinopathy
Aneurysm
Hard exudate
Hemorrhage
Growth of abnormal blood vessels
A.D.A.M.

HYPERTENSIVE RETINOPATHY

GRADING OF HYPERTENSIVE RETINOPATHY

Grade -o- No change

Grade -1- Barely detectable arteriolar narrowing, broadening of arteriolar light reflex.

Grade -2- Focal narrowing, deflection of veins at A-V crossings (Salus' sign).

Grade-3-(a) Copper wiring of arterioles.

(b) Banking of veins distal to crossing (Bonnet sign).

(c) Tapering of veins on either side of crossing (Gunn sign).

(d) Right angled deflection of veins.

(e) Flame shaped hemorrhages, cotton-wool spots, hard exudates

Cont...

Grade 4 - (a) Silver wiring of arterioles.

(b) Disc swelling.

(c) Other changes associated with grade 3

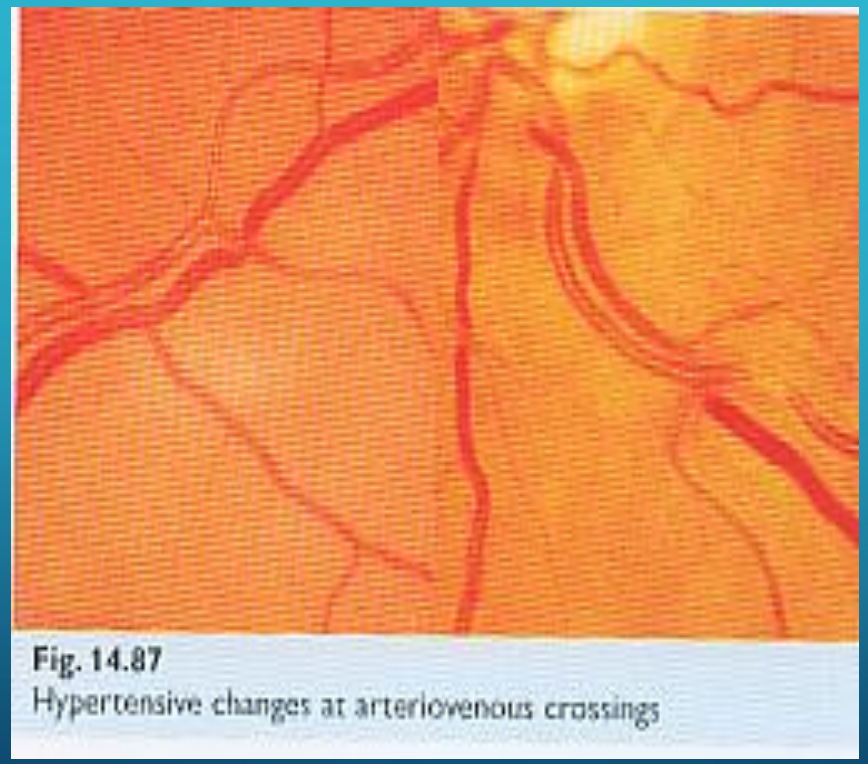


Fig. 14.87
Hypertensive changes at arteriovenous crossings

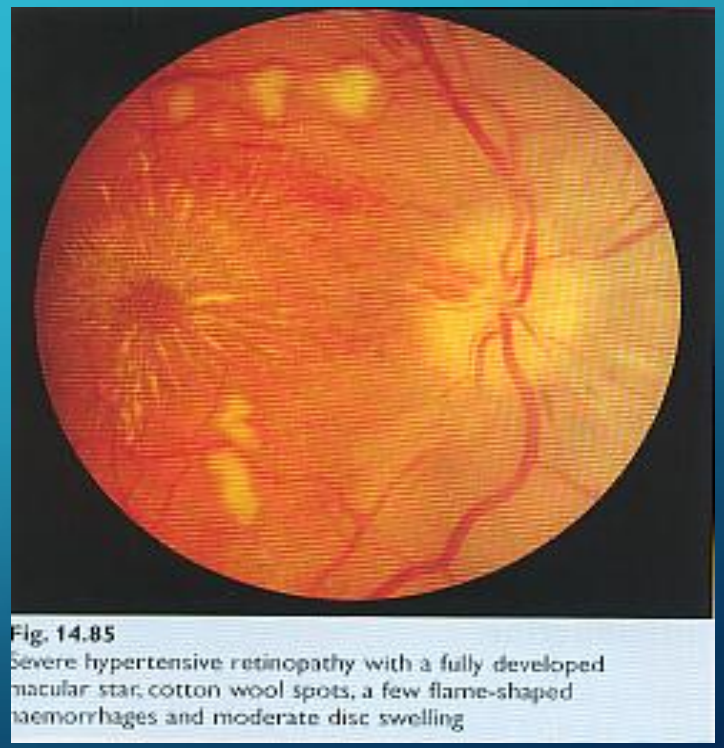


Fig. 14.85
Severe hypertensive retinopathy with a fully developed macular star, cotton wool spots, a few flame-shaped haemorrhages and moderate disc swelling

HYPERTENSIVE RETINOPATHY IN A NUTSHELL

Classification

- Grade 0: No changes
- Grade 1: Minimal arteriolar narrowing
- Grade 2: Obvious arteriolar narrowing with focal irregularities
- Grade 3: Grade 2 + retinal hemorrhages and/or exudate
- Grade 4: Grade 3 + swollen optic nerve (Malignant hypertension)

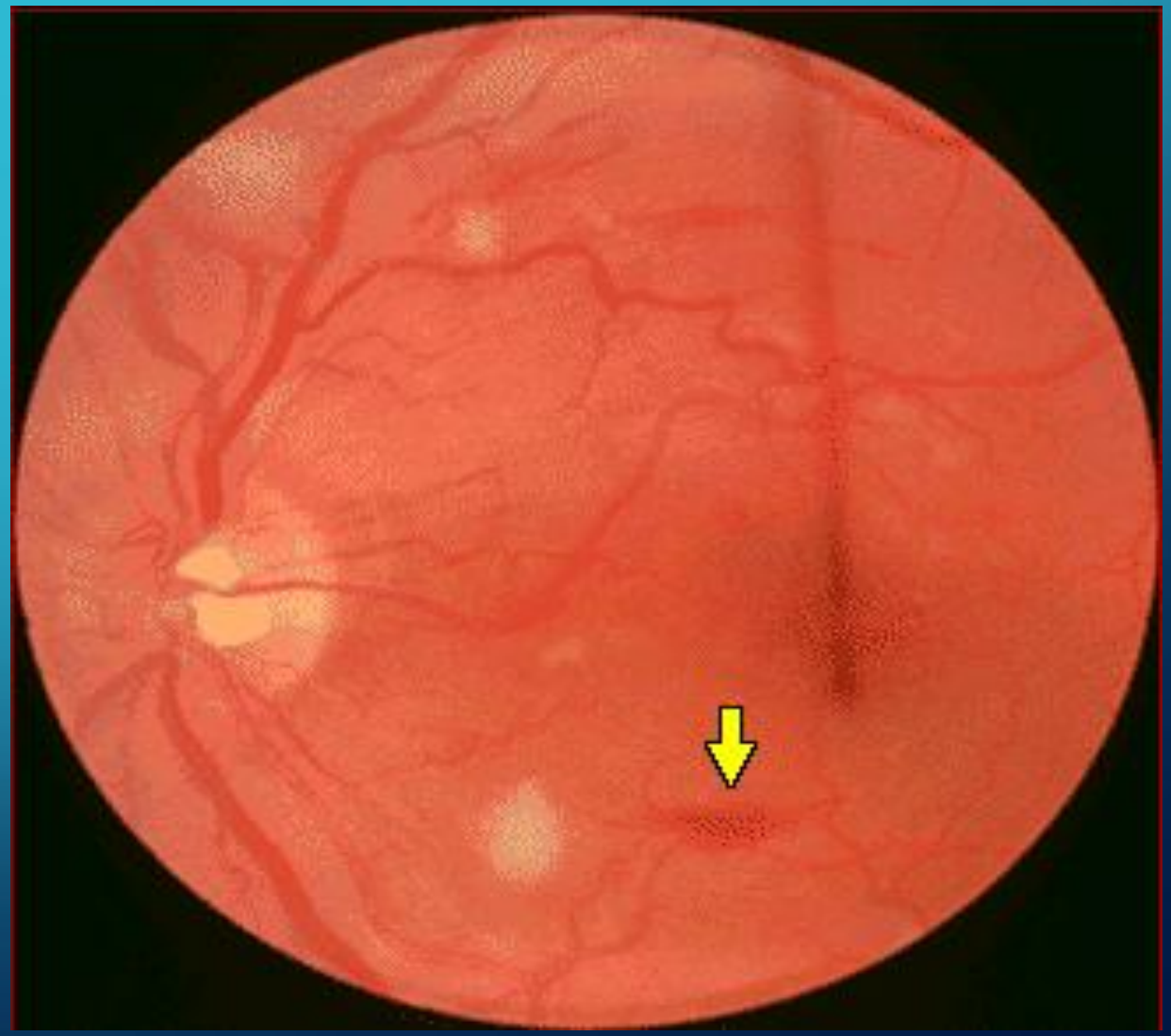
HYPERTENSIVE RETINOPATHY GRADE 2

Arteriovenous nicking in association with hypertension Grade 2

(yellow arrow)

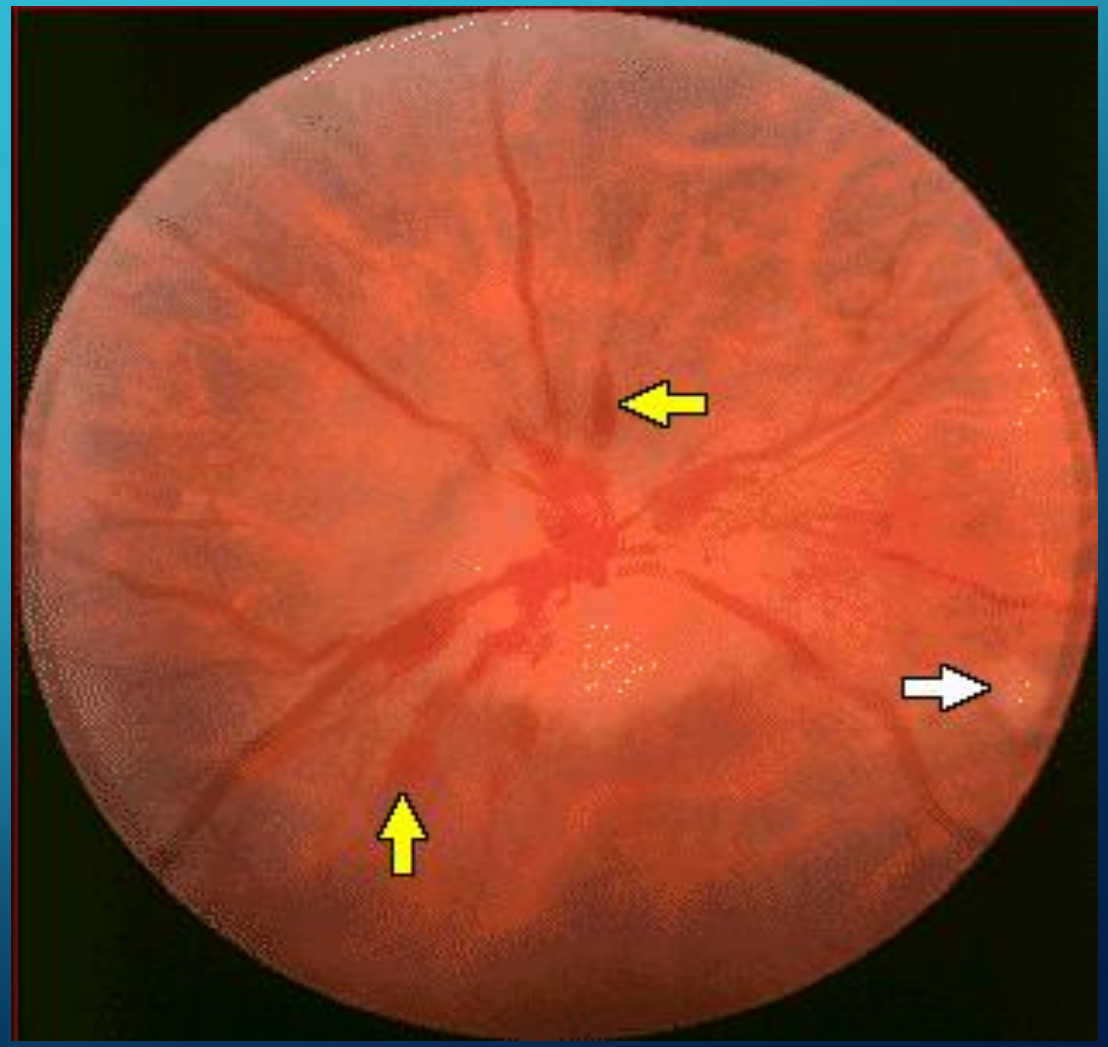
HYPERTENSIVE RETINOPATHY GRADE 3

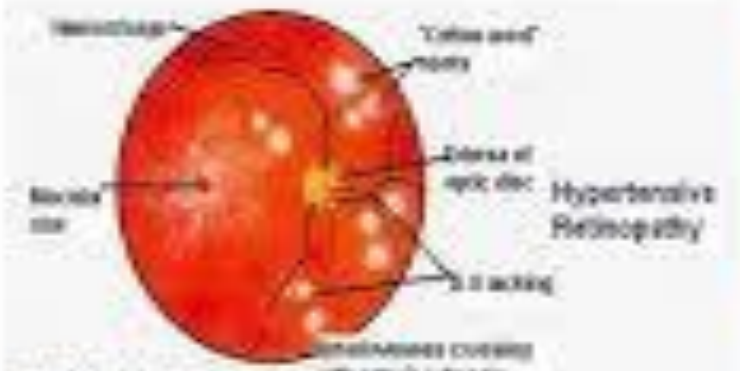
- Flame-shaped hemorhage in association with severe hypertension Grade 3 (yellow arrow)

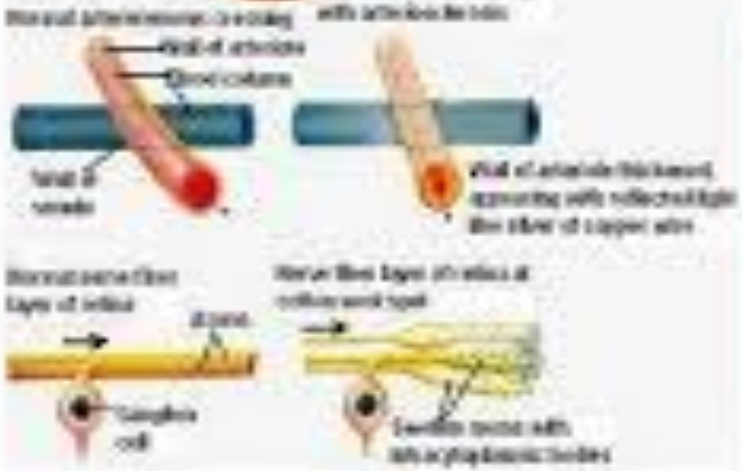


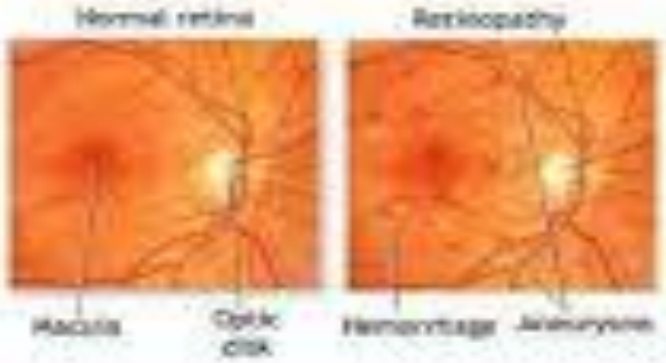
HYPERTENSIVE RETINOPATHY GRADE 4

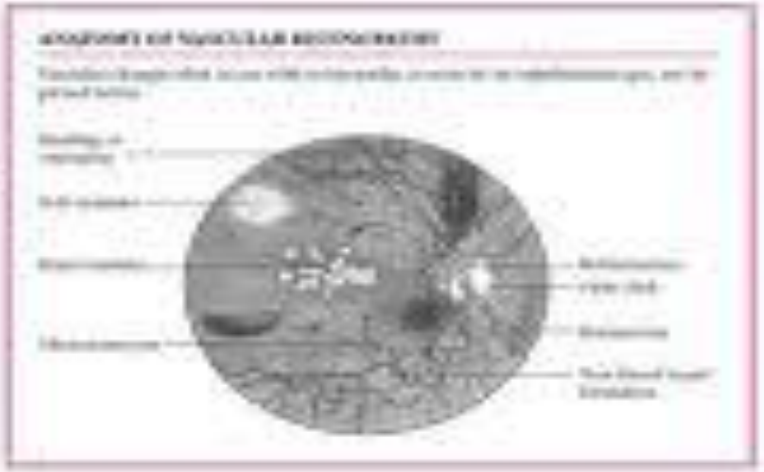
- Papilledema from malignant hypertension. There is blurring of the borders of the optic disk with hemorrhages (yellow arrows) and exudates (white arrow)

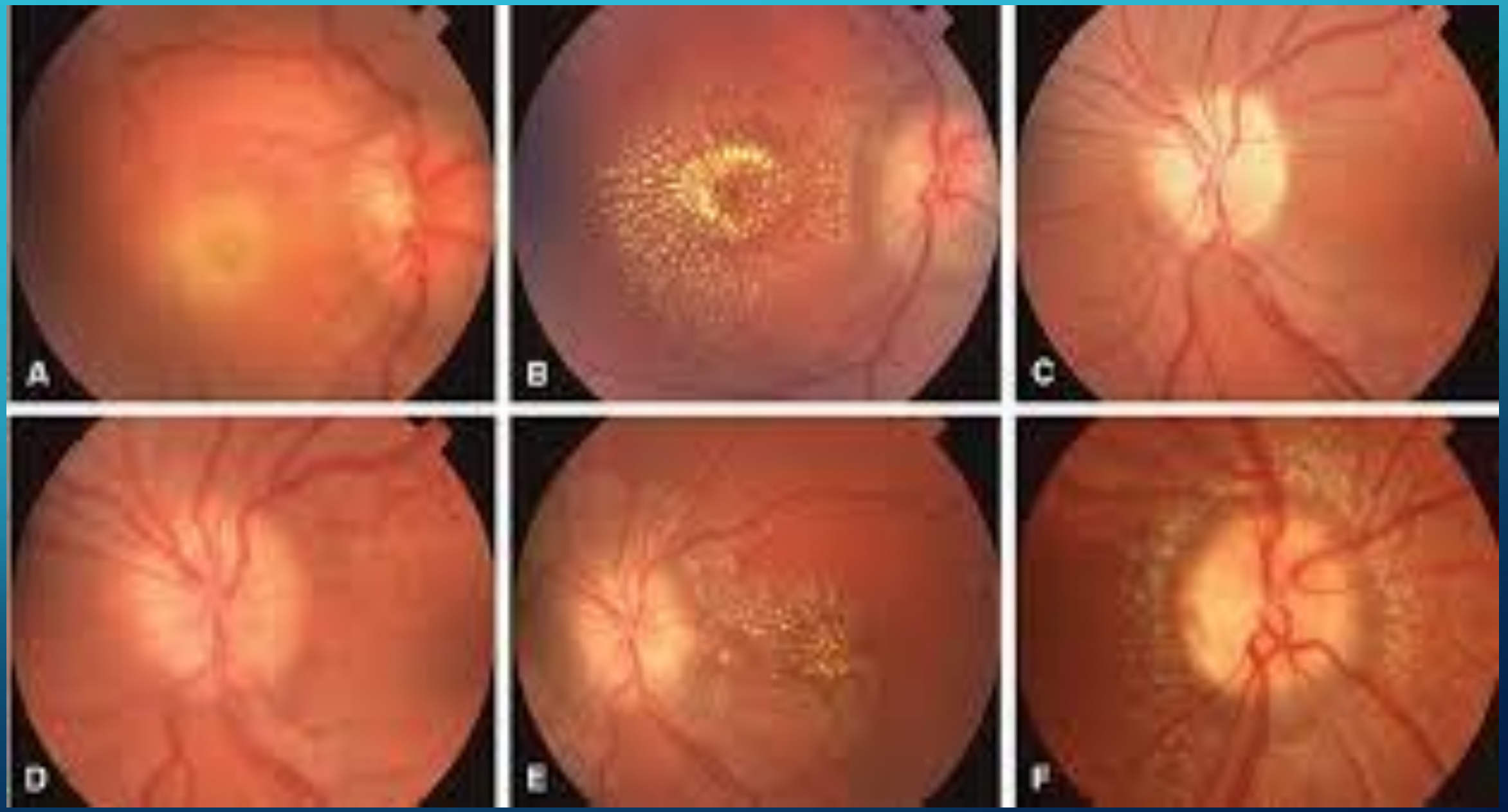



Hypertensive
Retinopathy




Normal retina
Retinopathy
Macula
Optic
disk
Hemorrhage

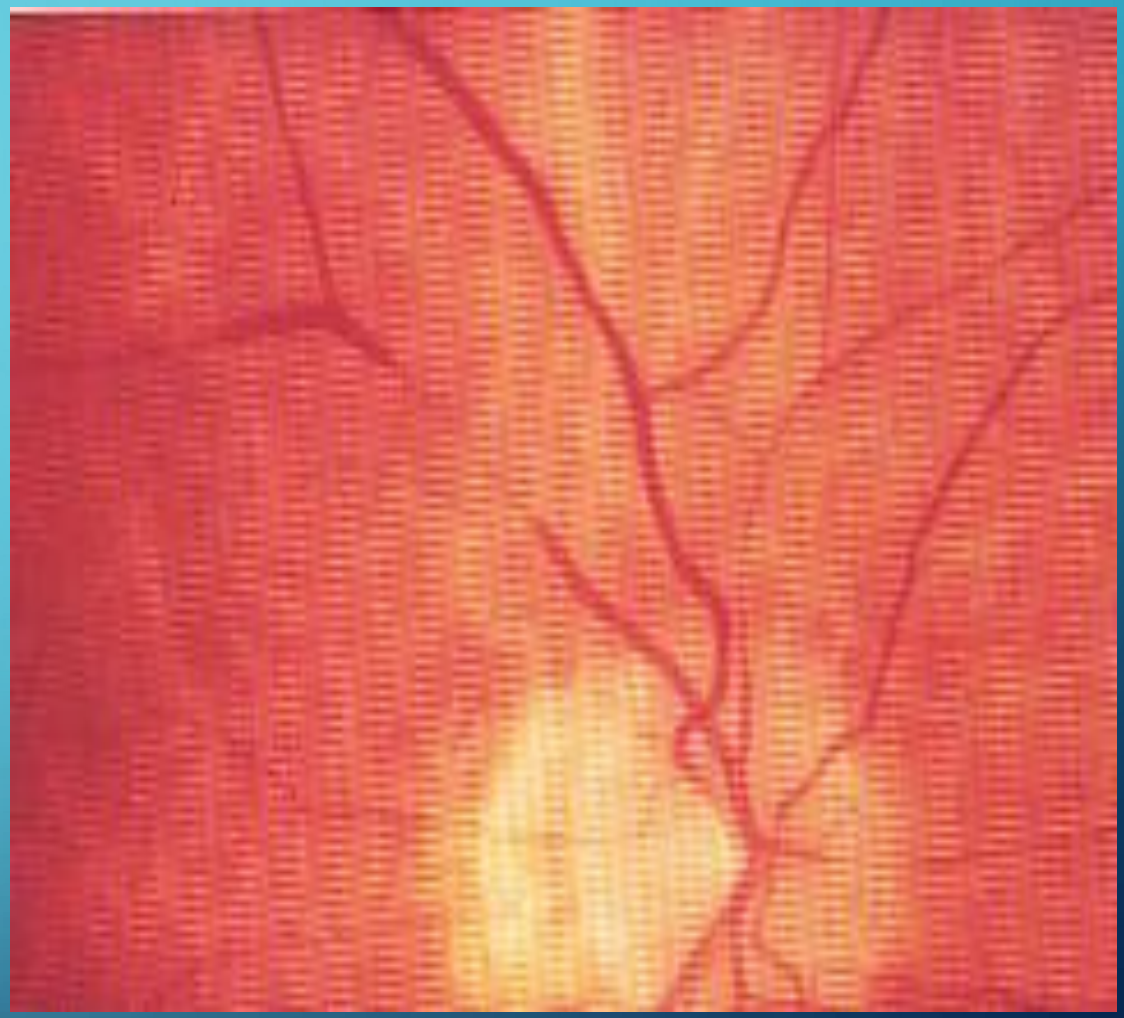



A
B
C
D
E
F

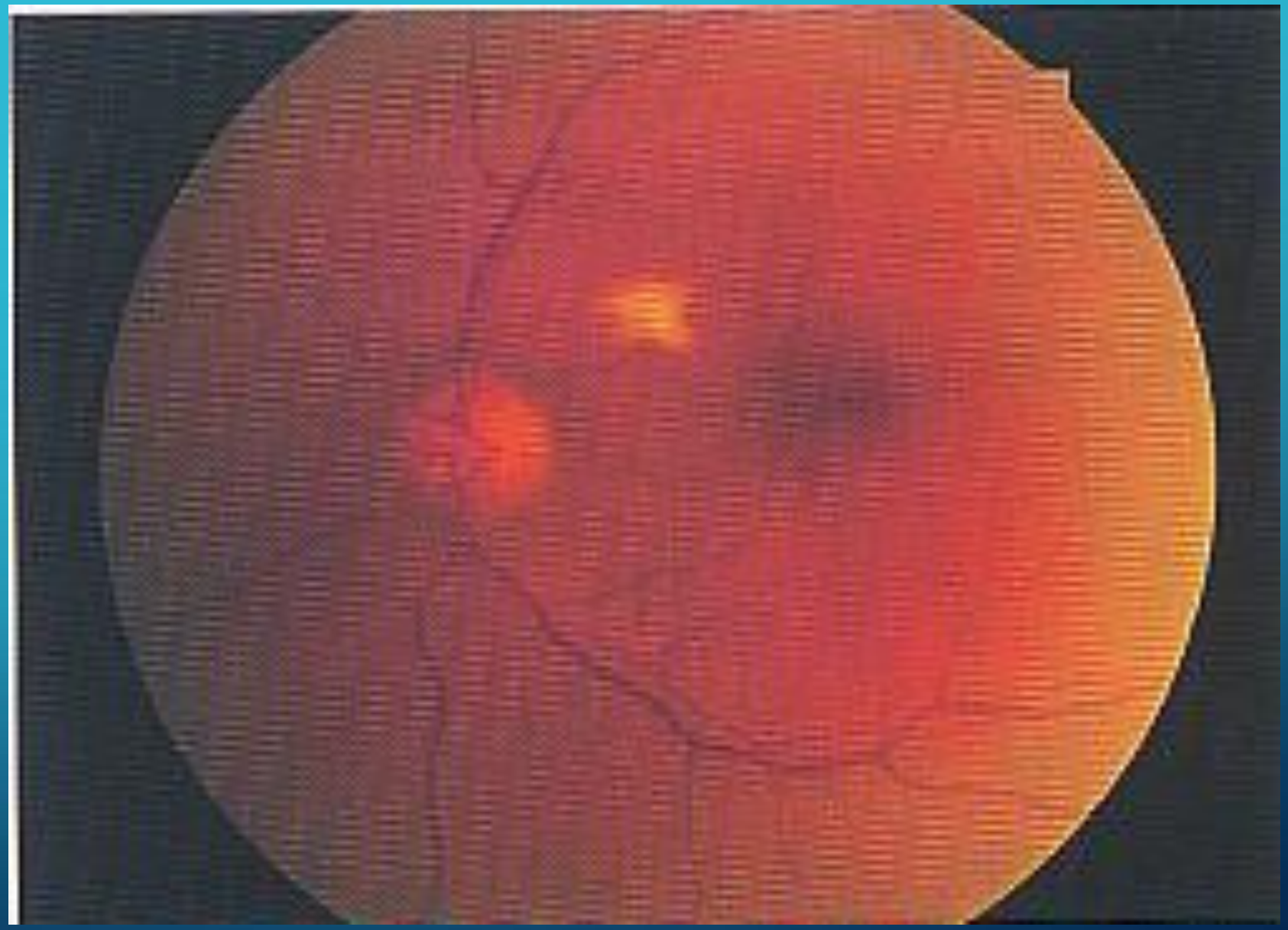
The fundus picture of hypertensive retinopathy in short :

- **Vasoconstriction**
- **Leakage – Flame shaped hemorrhage**
- **Arteriosclerosis**

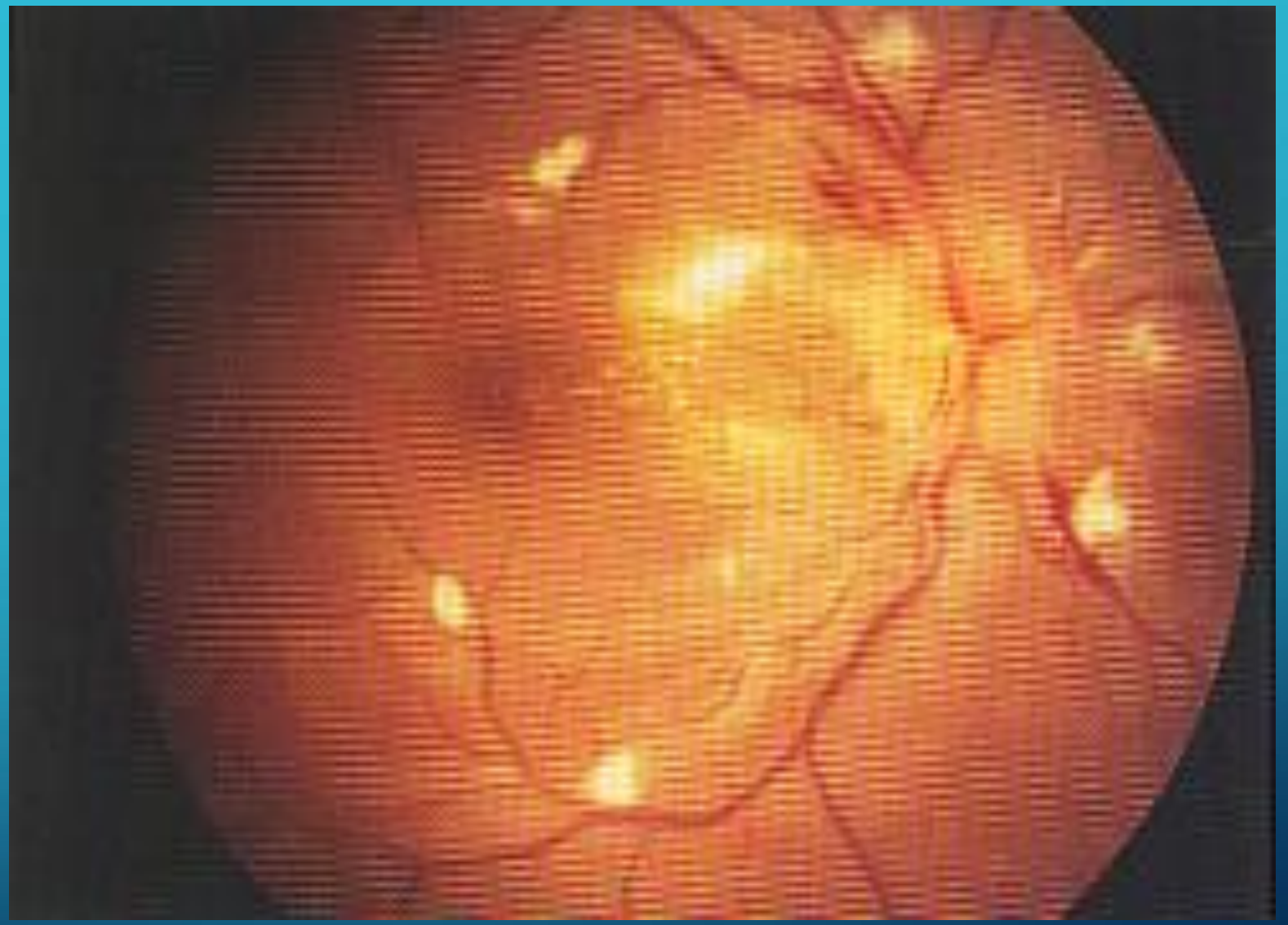
Generalized Vasoconstriction



Focal Vasoconstriction



Arteriolar narrowing and a cotton-wool spot

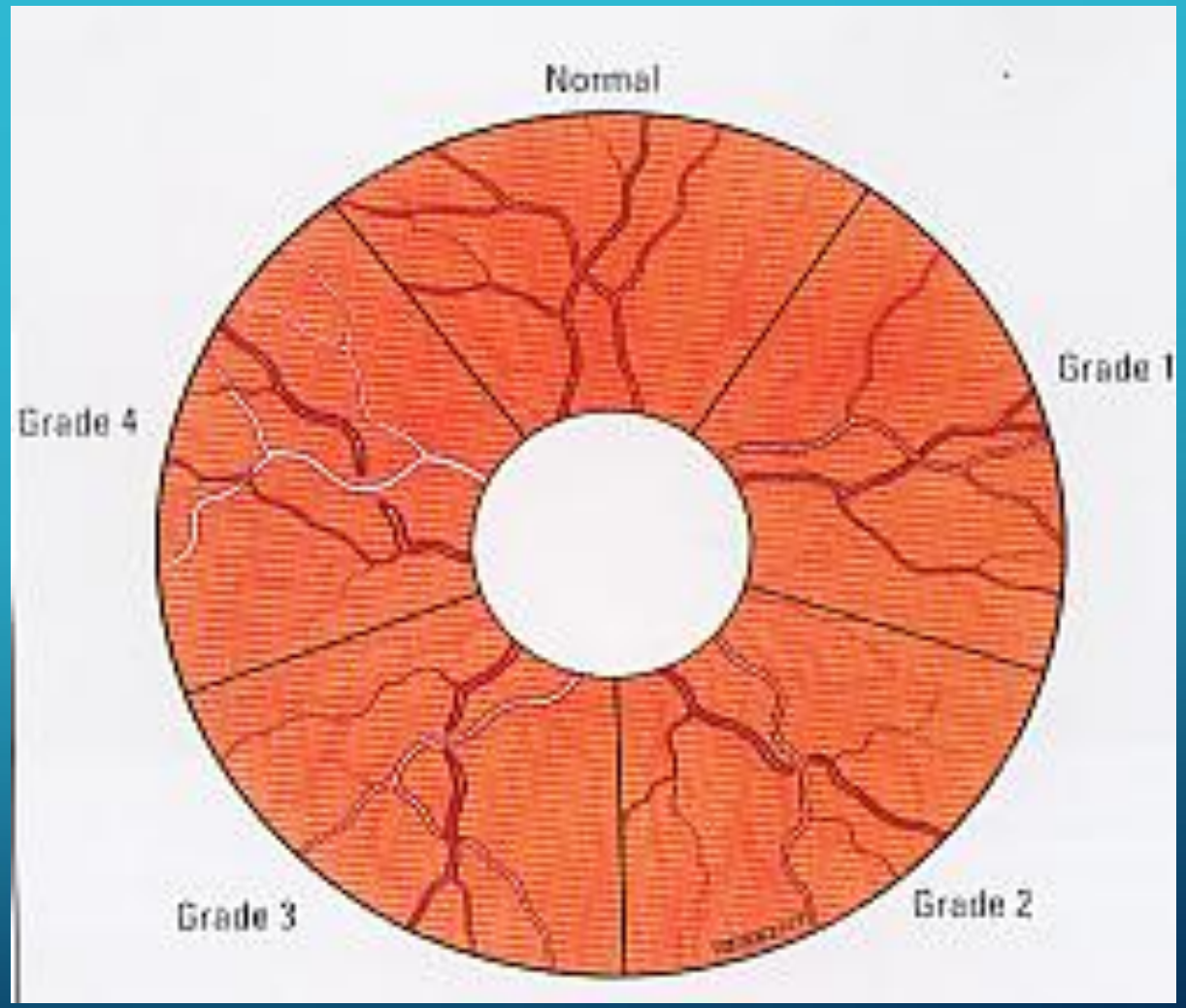


COTTON-WOOL SPOTS AND FLAME SHAPED HGES, DISC SWELLING AND MACULAR EDEMA

Arteriosclerosis: causes the thickening of vessel wall, arterio-venous crossing changes (A-V nipping). Its presence indicates hypertension is present for may years

Disc swelling is the hallmark of malignant hypertension.

GRADING OF RETINAL ARTERIOSCLEROSIS



Hypertensive Retinopathy	Diabetic Retinopathy
Dry retina:	Wet retina:
few haemorrhages	multiple haemorrhages
rare oedema	extensive oedema
rare exudate	multiple exudates
multiple cotton wool spots	few cotton wool spots
flame-shaped	rare flame-shaped
haemorrhages	haemorrhages
visibly abnormal retinal	visibly abnormal retinal
arteries	veins and capillaries

OTHER CHANGES ASSOCIATED WITH HYPERTENSION

1. **Ischemic choroidal infarcts (Eclampsia), serous RD**
2. **CRAO**
3. **BRVO / CRVO**
4. **Macro aneurysm**
5. **AION**

Central Retinal Artery Occlusion:

I. Sparing cilioretinal artery

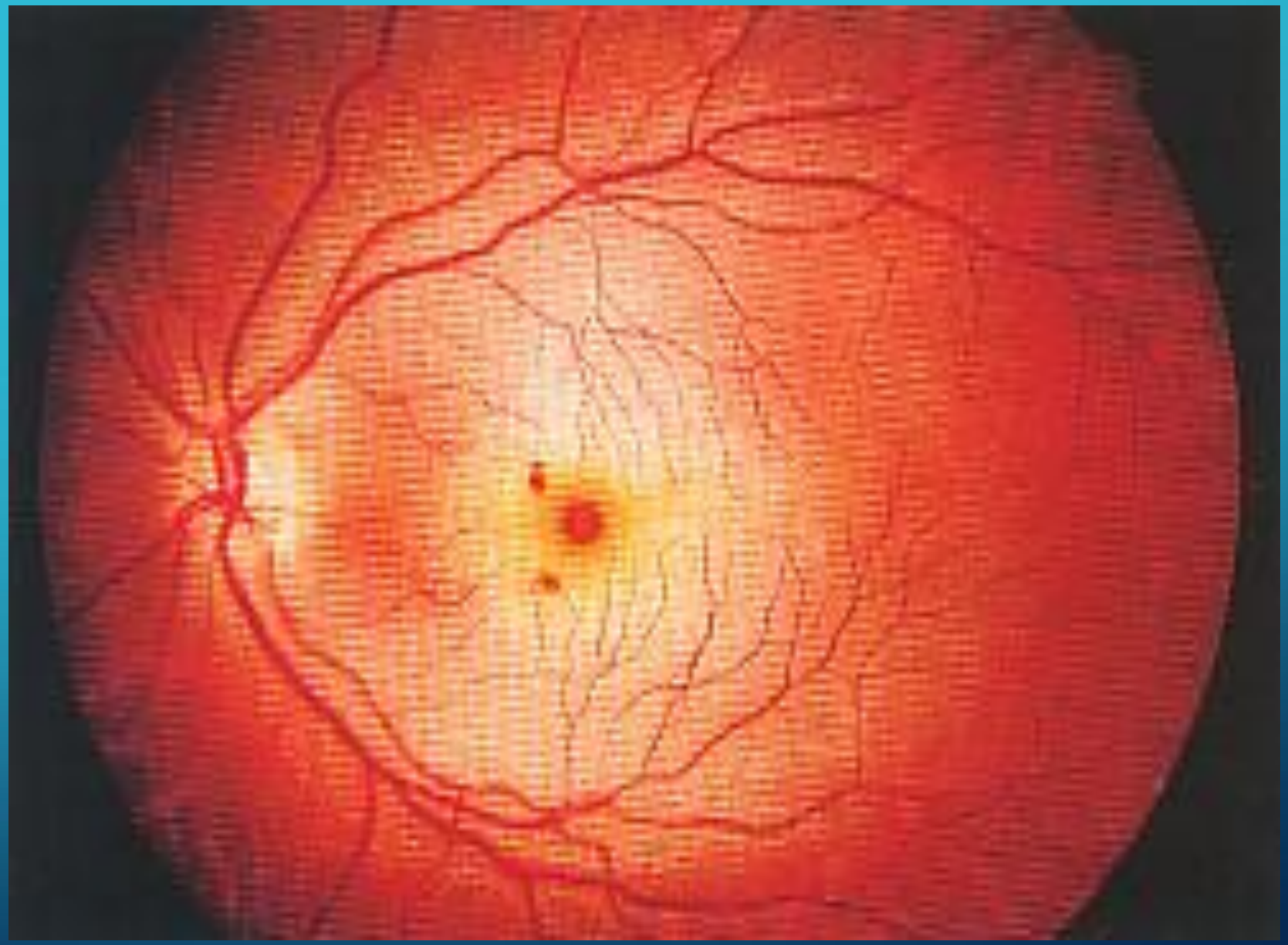
(a) Narrowing of arterioles and venules and segmentation of blood column (Acute CRAO)

(b) Cherry red spot in macula

(c) Hollenhorst plaques in retinal arteriole

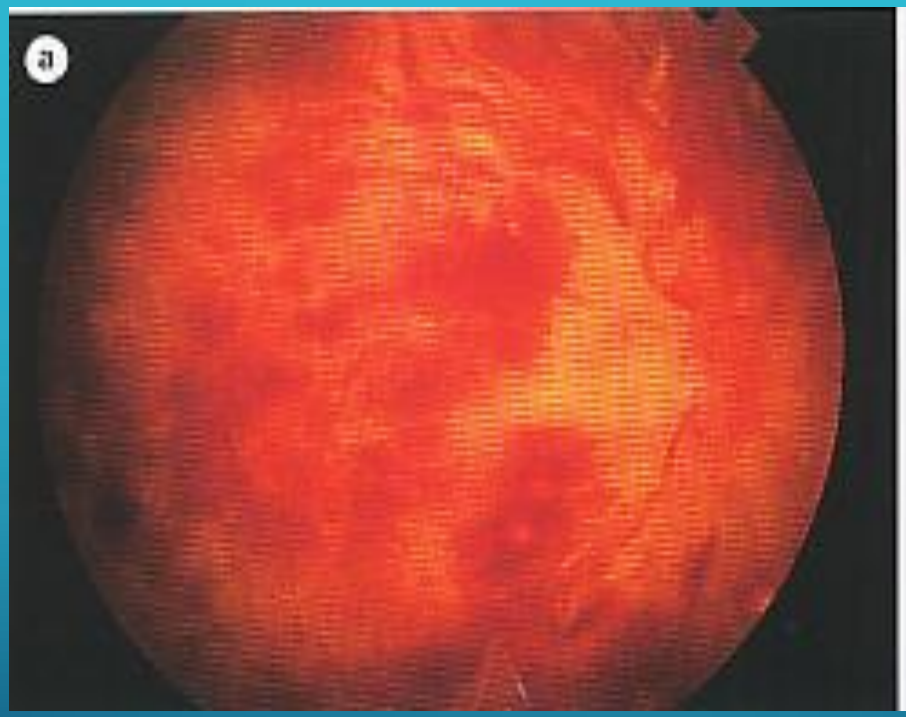
RETINAL ARTERY OCCLUSION

- Atherosclerosis-related thrombosis
- Carotid embolism
  - Cholesterol
  - Calcific
  - Fibrin platelet



Cherry-red spot in CRAO

Central Retinal Vein Occlusion



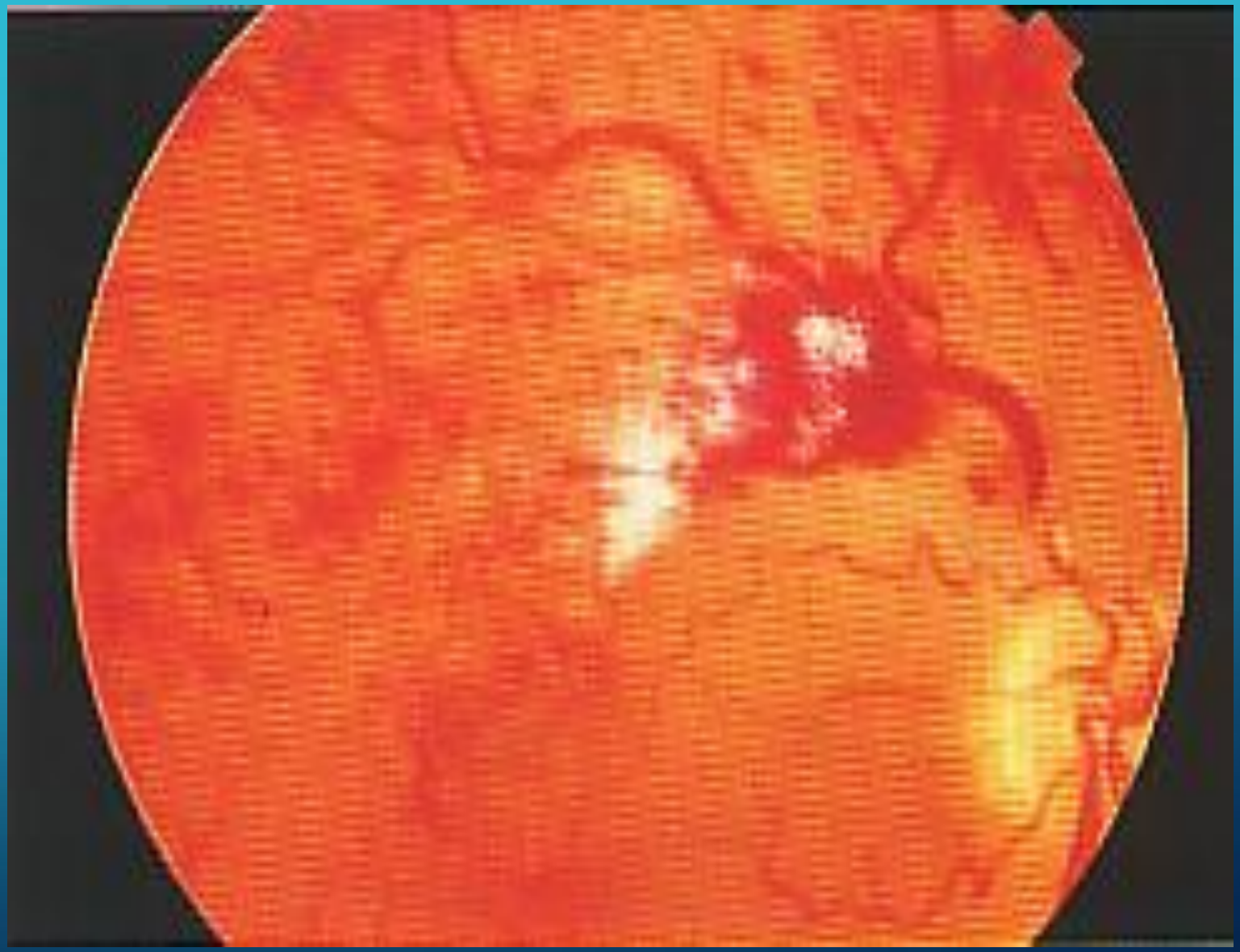
Ischaemic CRVO

FFA in CRVO

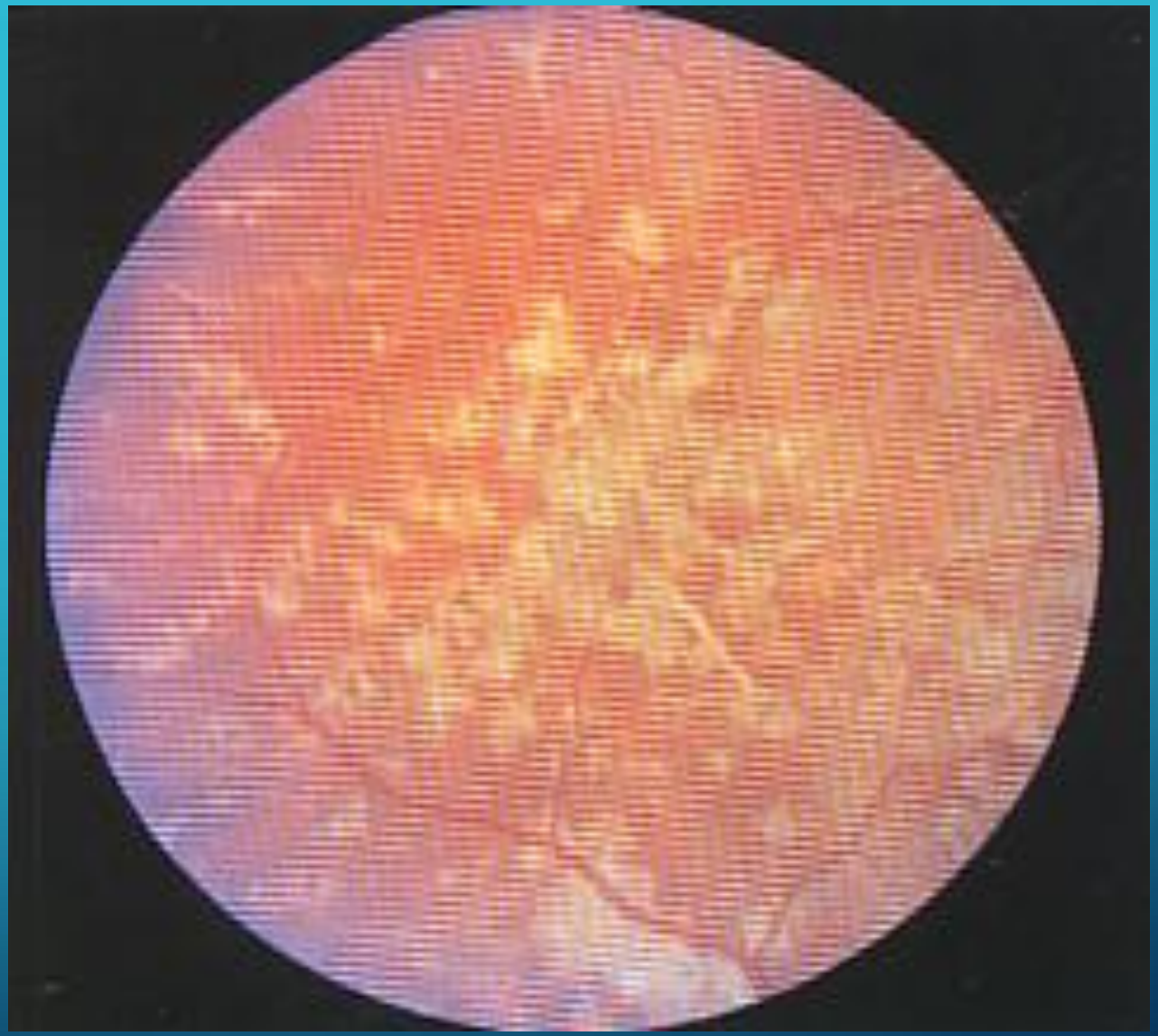
BRANCH RETINAL VEIN OCCLUSION

- Dilatation and tortuosity of the venous segment
- Hemorrhages
- Cotton-wool spots (sometimes)

BRVO:



Branch retinal vein occlusion

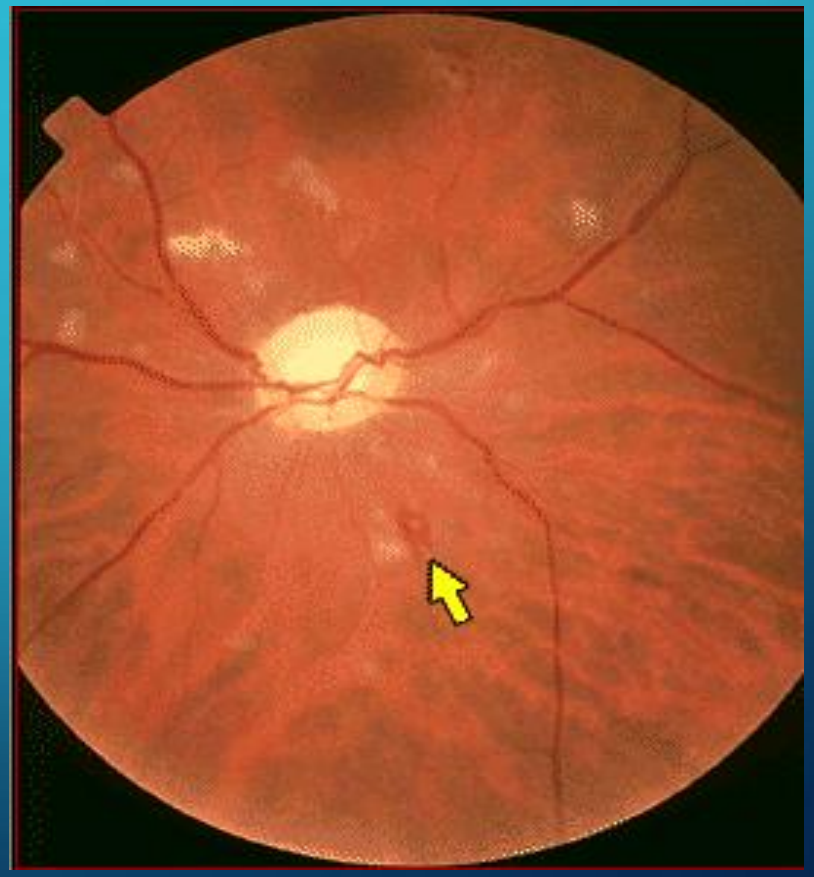


Elschnig spots in hypertension

Other diseases

BACTERIAL ENDOCARDITIS:
ROTH SPOTS

Roth spot. The yellow arrow indicates a hemorrhage with a white central spot typical of sub-acute bacterial endocarditis



Toxaemia of pregnancy:

Retinal oedema,

Arteriolar narrowing,

Hemorrhages,

Exudates, exudative RD,

Macular oedema,

Papilloedema

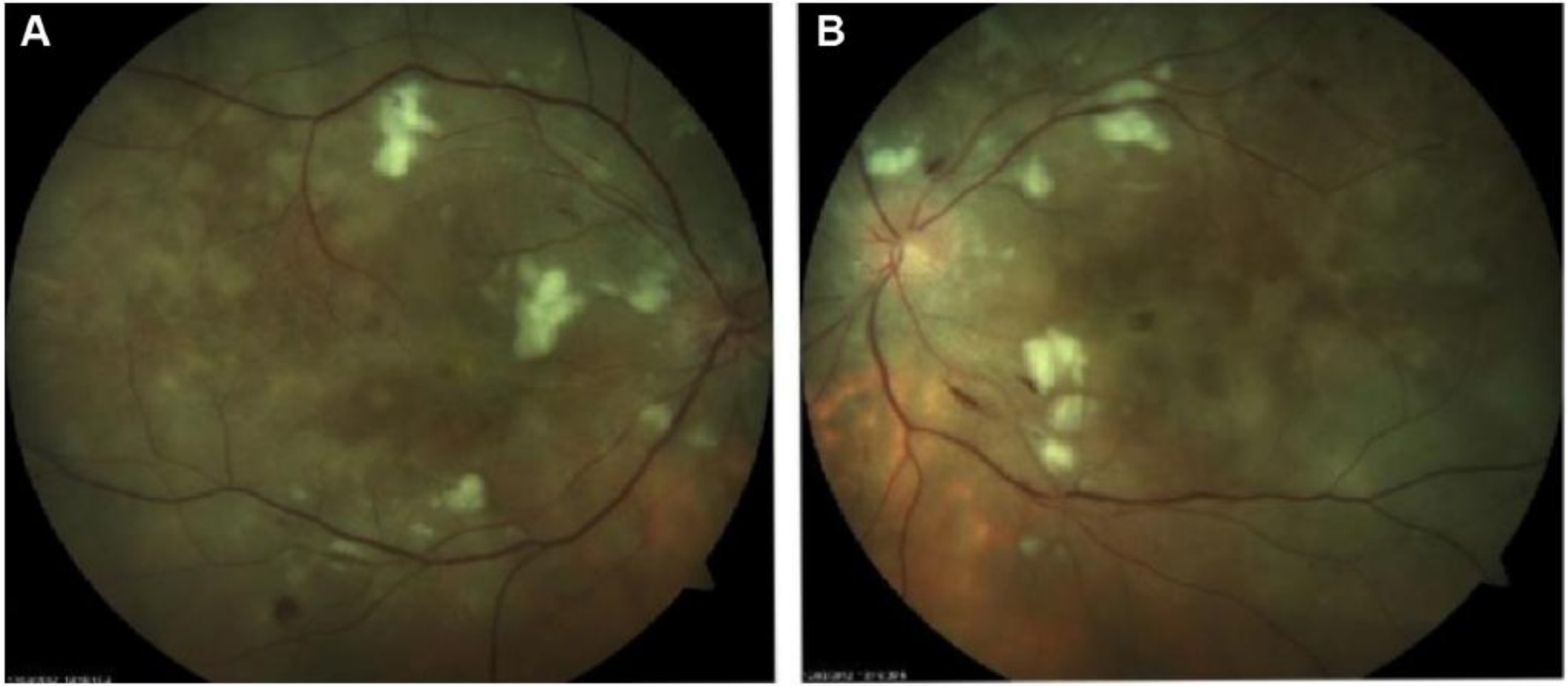
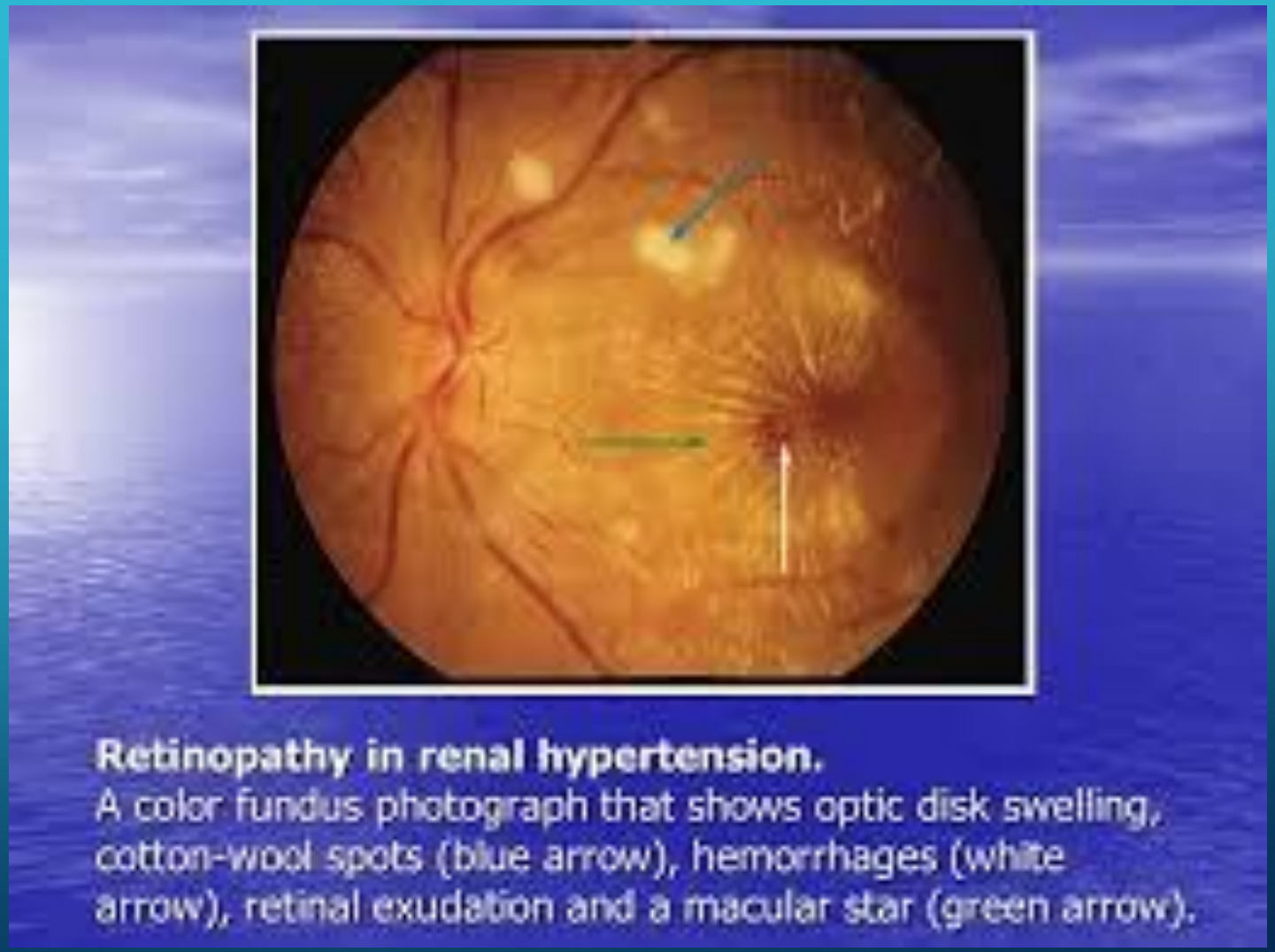


Figure 1 Retinography 12 hours post partum.

Notes: Bilateral optic disc edema, narrowing, and irregularity of retinal arteries with arteriovenous nicking, diffuse cotton wool spots, intraretinal and subretinal transudates, and multiple superficial and deep retinal hemorrhages. (**A**) right eye; (**B**) left eye.

RENAL RETINOPATHY



Retinopathy in renal hypertension.
A color fundus photograph that shows optic disk swelling, cotton-wool spots (blue arrow), hemorrhages (white arrow), retinal exudation and a macular star (green arrow).

HAEMATOLOGICAL DISEASES

a. Anaemias – oedema, exudates, dilated vessels

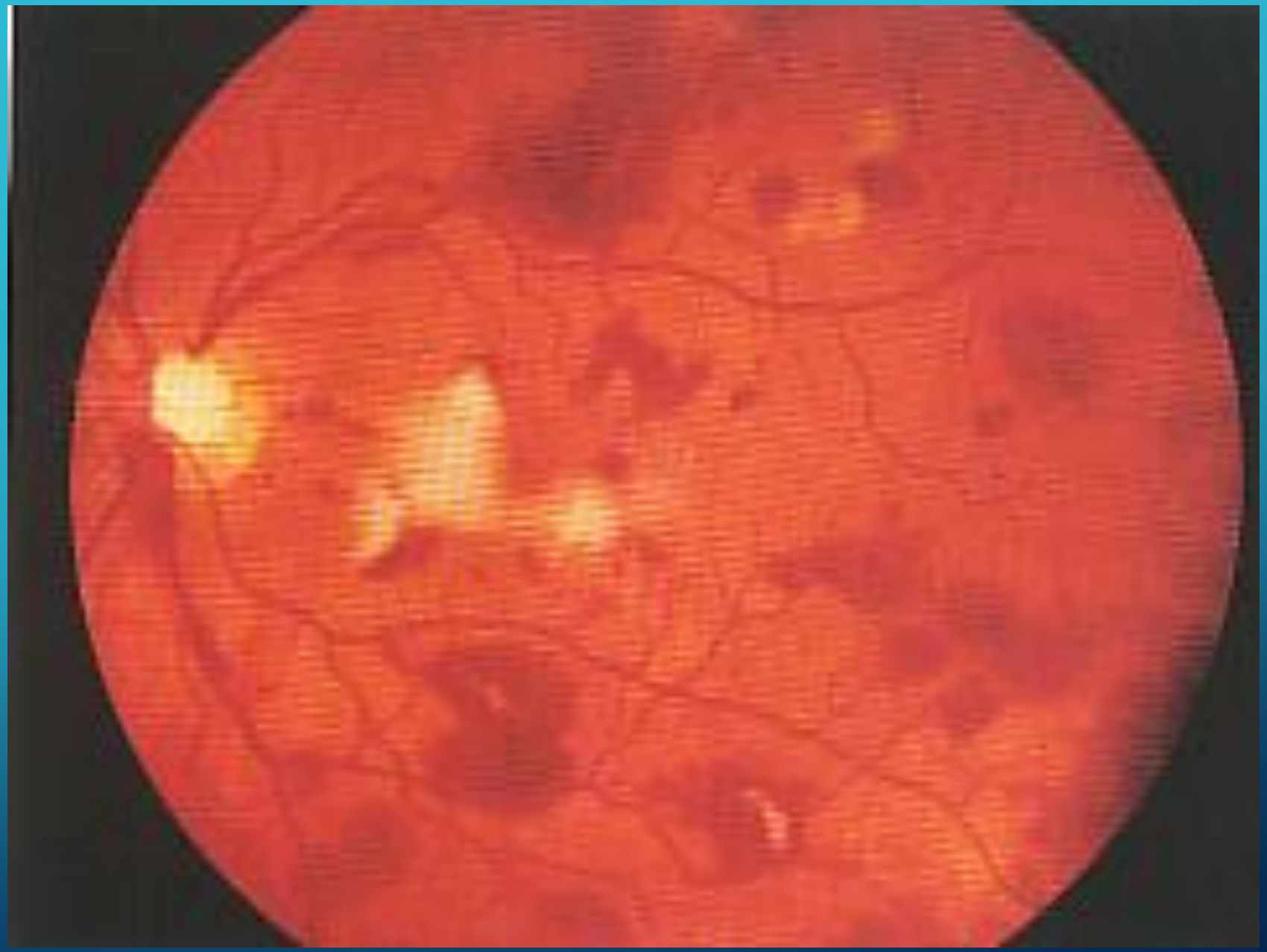
a. Leukaemia – oedema, exudates, tortuous vessels, papillitis, Roth spots

b. Polycythaemia vera – retinal vessel tortuosity, hges, disc hyperaemia, papilloedema

ANAEMIAS

Characterized by:

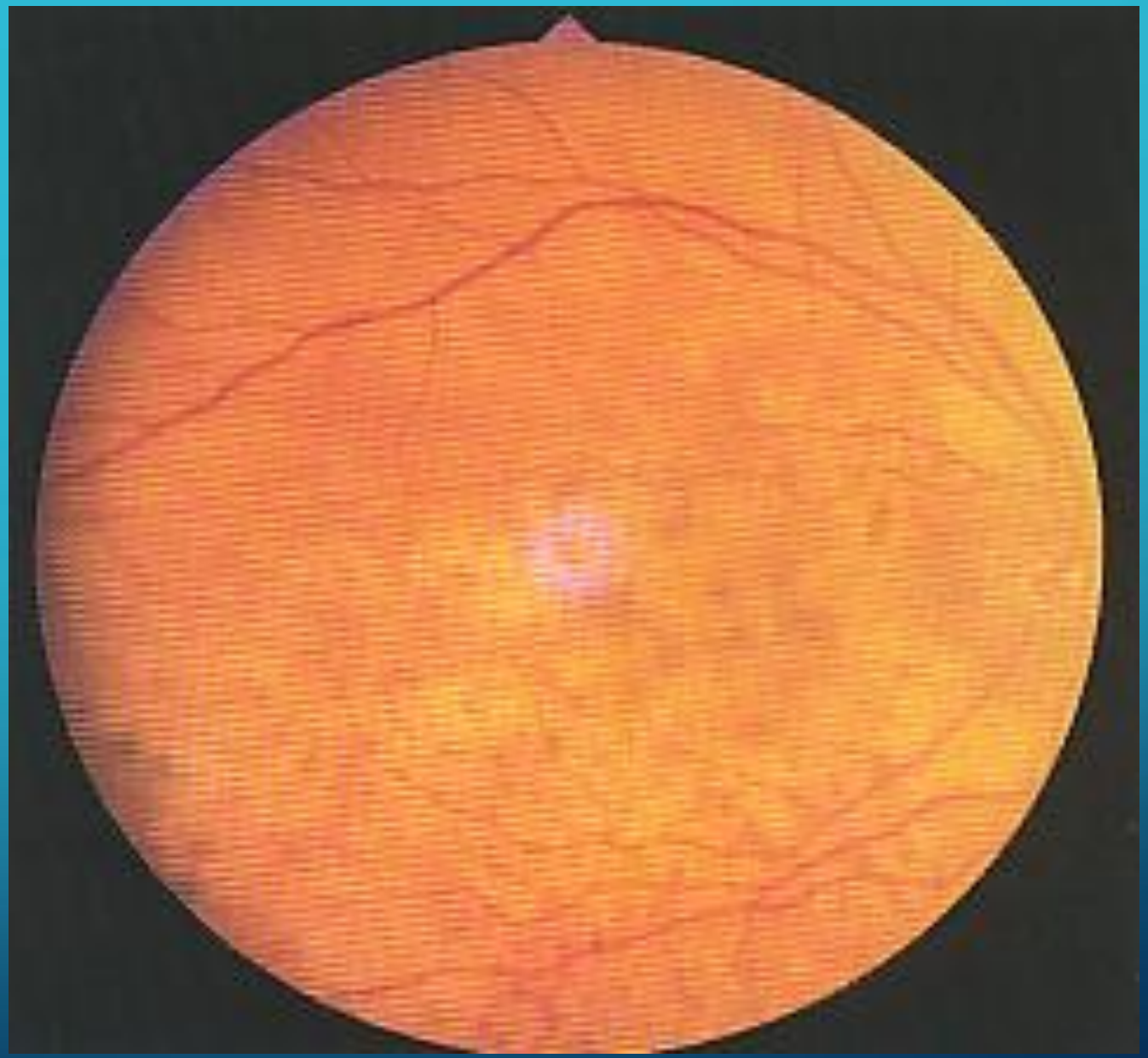
1. **Hemorrhages**
2. **Cotton-wool spots**
3. **Venous tortuosity**
4. **Roth spots**
5. **Optic atrophy with centrocaecal scotoma in pernicious anaemia**



Roth spots in severe anaemia

LEUKAEMIA

- Flame shaped hges
- Roth spots
- Cotton-wool spots
- Peripheral retinal neovascularization
- Leopard spot ratina – choroidal infarction
- Optic neuropathy due to optic nerve infiltration



Leopard spot ratina in chronic leukaemia

HYPERVISCOSITY STATES

(a) Increased no of red cells in polycythaemia vera and secondary polycythaemia.

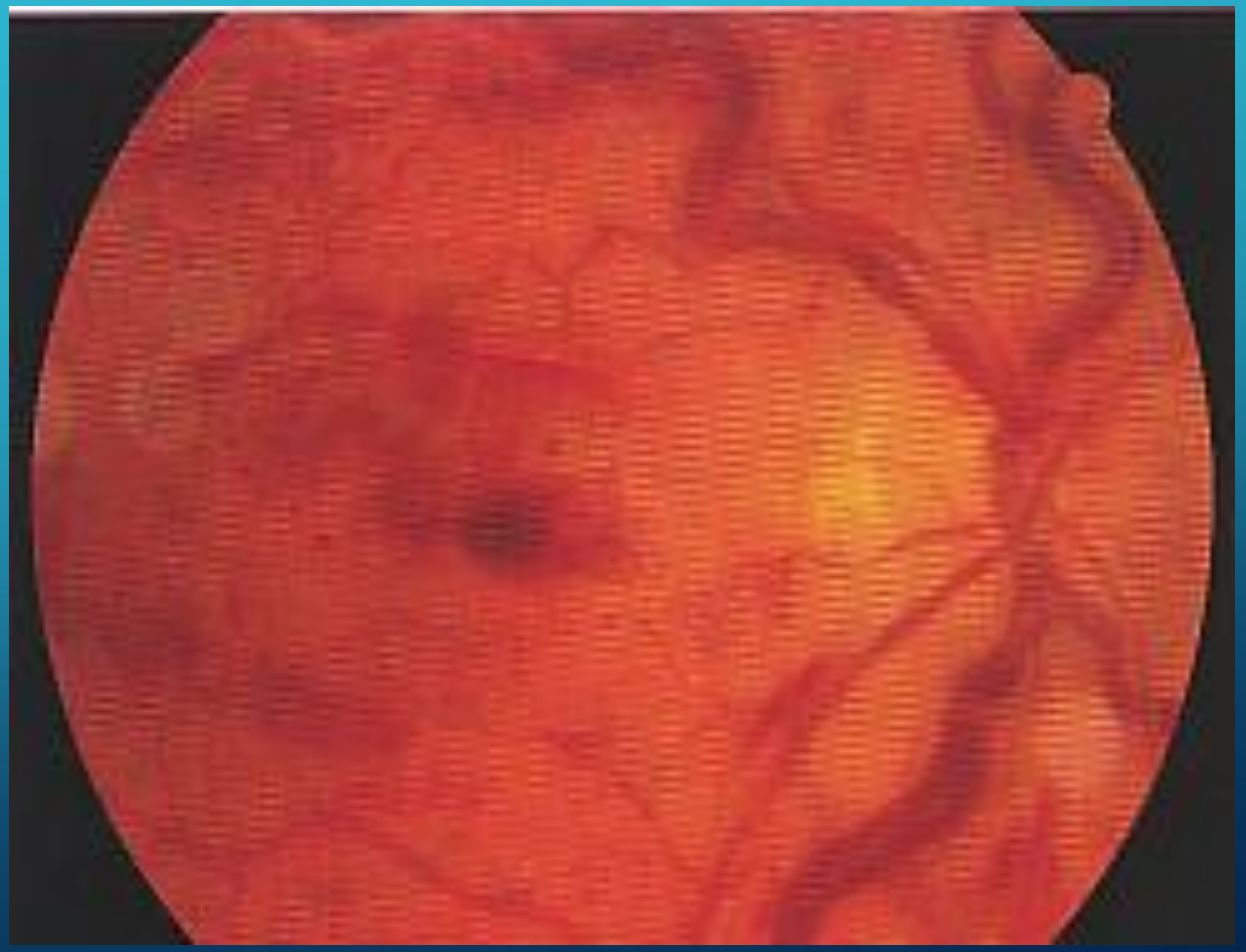
(b) Increased no of white cells in leukaemias

(c) Abnormal plasma cells in Waldenstroms macroglobulinaemia

Retinopathy in hyperviscosity is characterized by:

(a) Venous dilatation, segmentation, tortuosity

(b) Superficial and deep retinal hges



ITP

ITP

Figure 1. Fundus photographs of the right eye (A) and left eye (B) at initial examination showing subretinal and intraretinal hemorrhage.

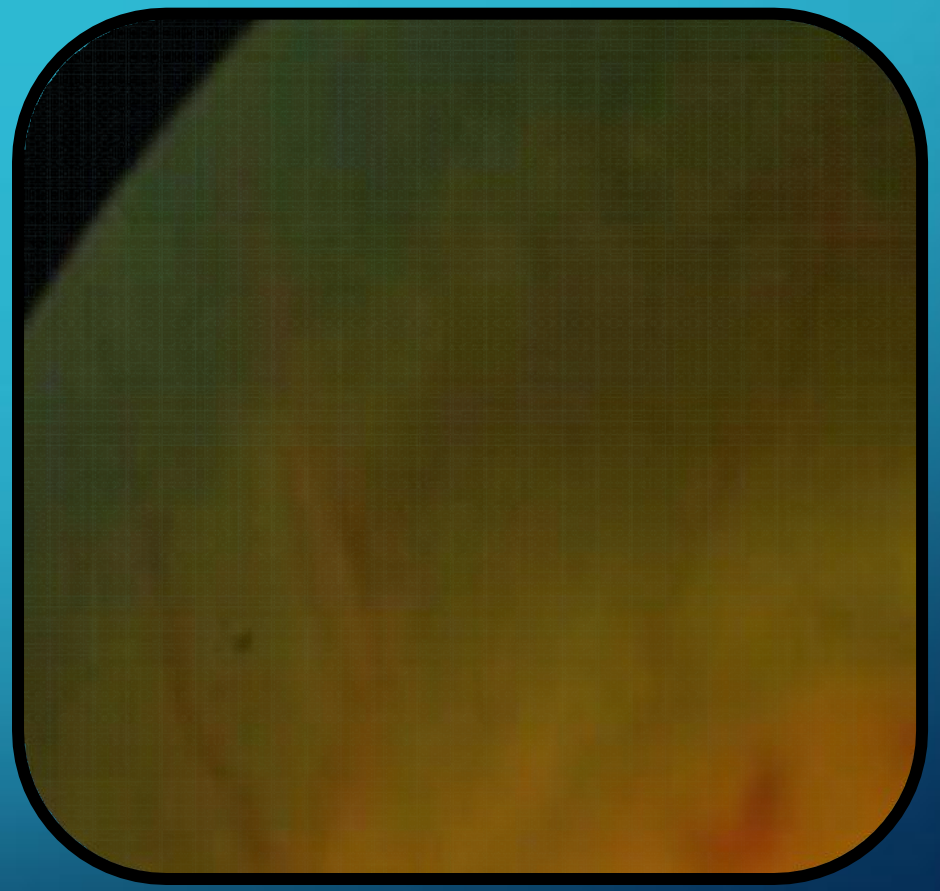
INFECTIOUS DISEASES

a. Candidiasis : Retinitis
b. Histoplasmosis : Histo-spots
c. Parasites : Chorioretinitis
d. Septicaemia : Haemorrhagic retina
e. Viral infections : Retinitis
f. Tuberculosis : Choroiditis
g. AIDS : Opportunistic infection
h. Herpes Simplex/Zoster : Necrotizing retinitis
i. Cytomegalovirus : Retinitis
j. Dengue haemorrhagic fever: Haemorrhagic fundus

TUBERCULOSIS OF RETINA

- Always secondary

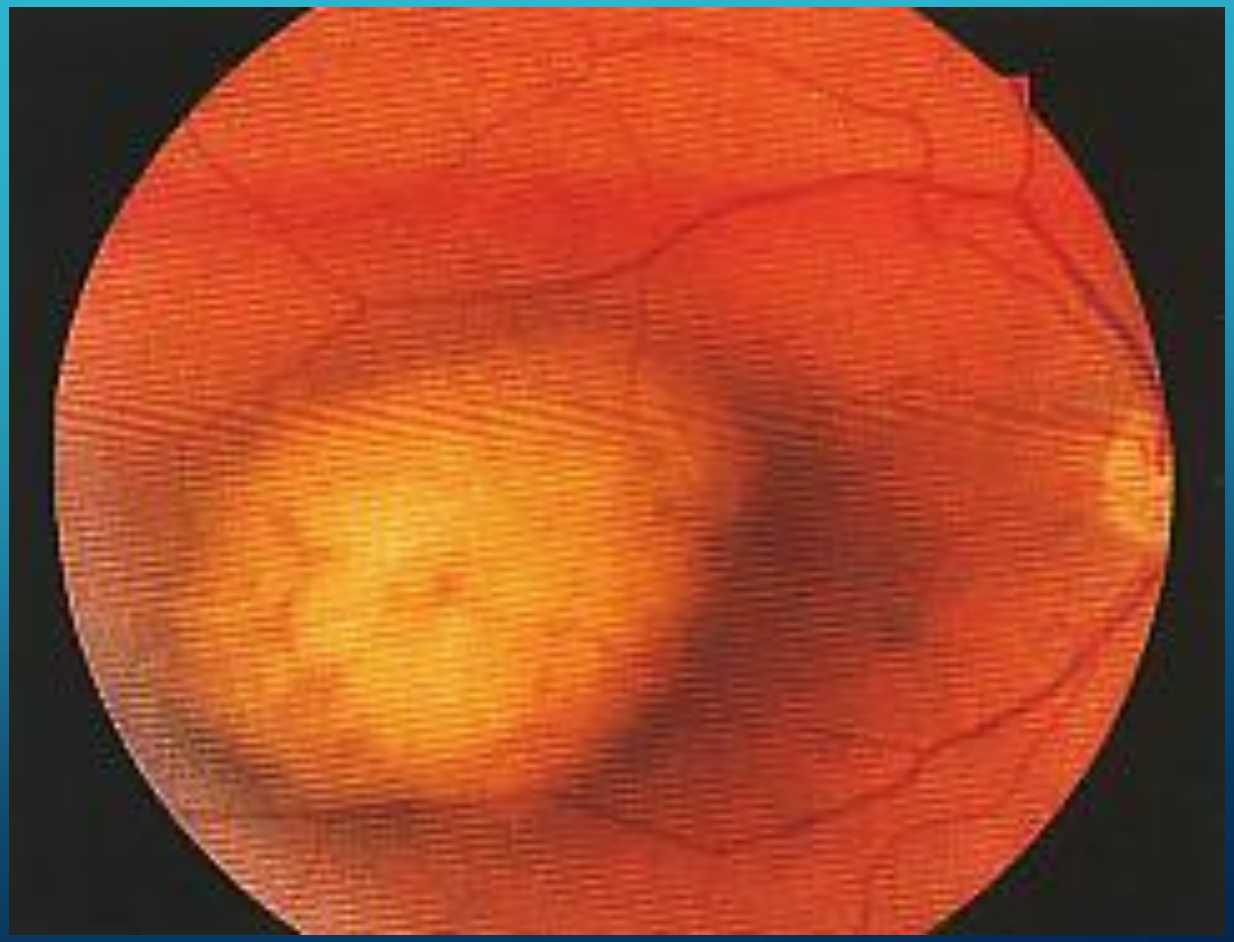
1. Exudative retinitis
2. Miliary retinitis
3. Tuberculous periphlebitis (Eales disease

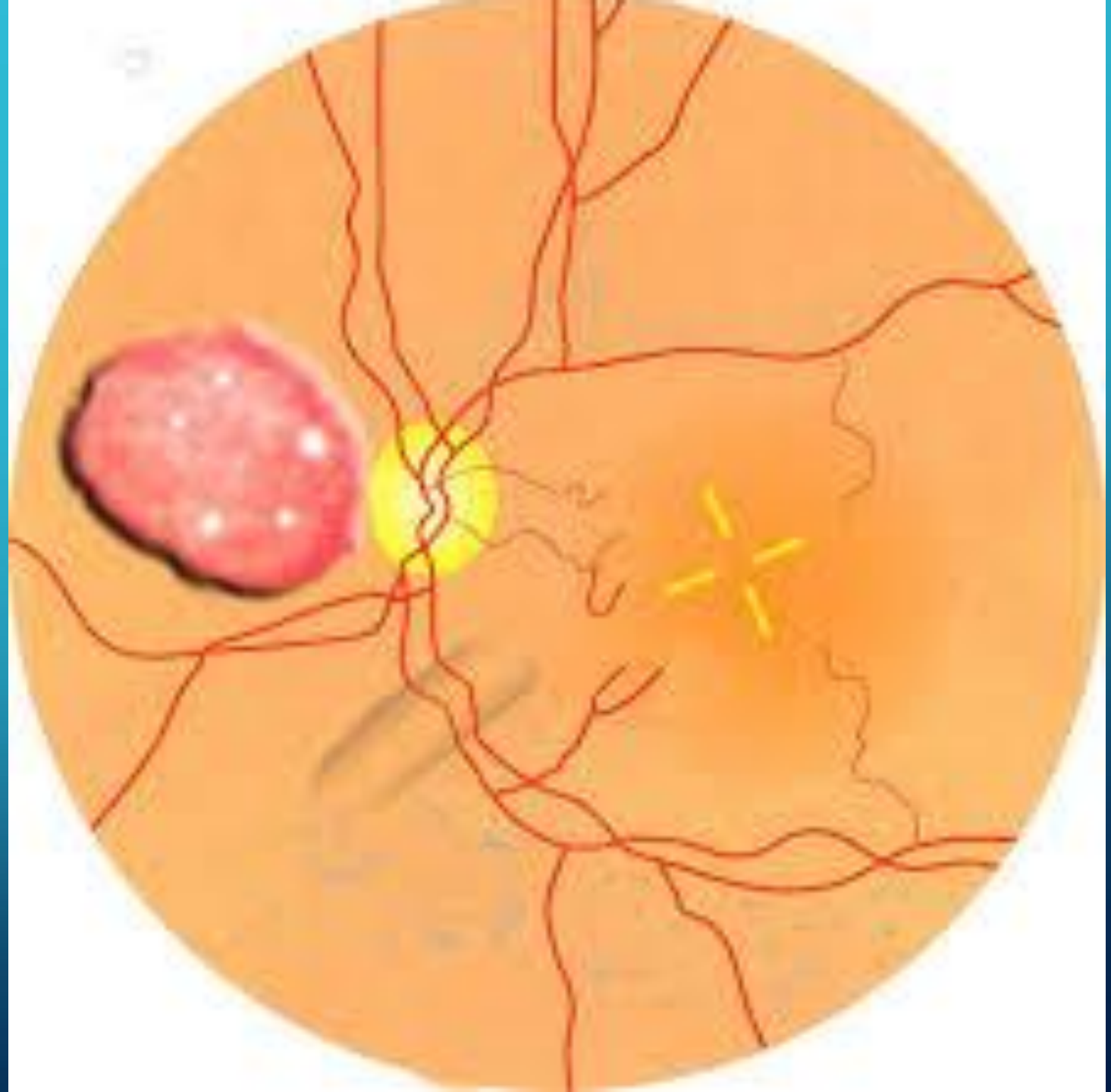


TUBERCULOSIS

(1) Chorioditis: Focal and multifocal

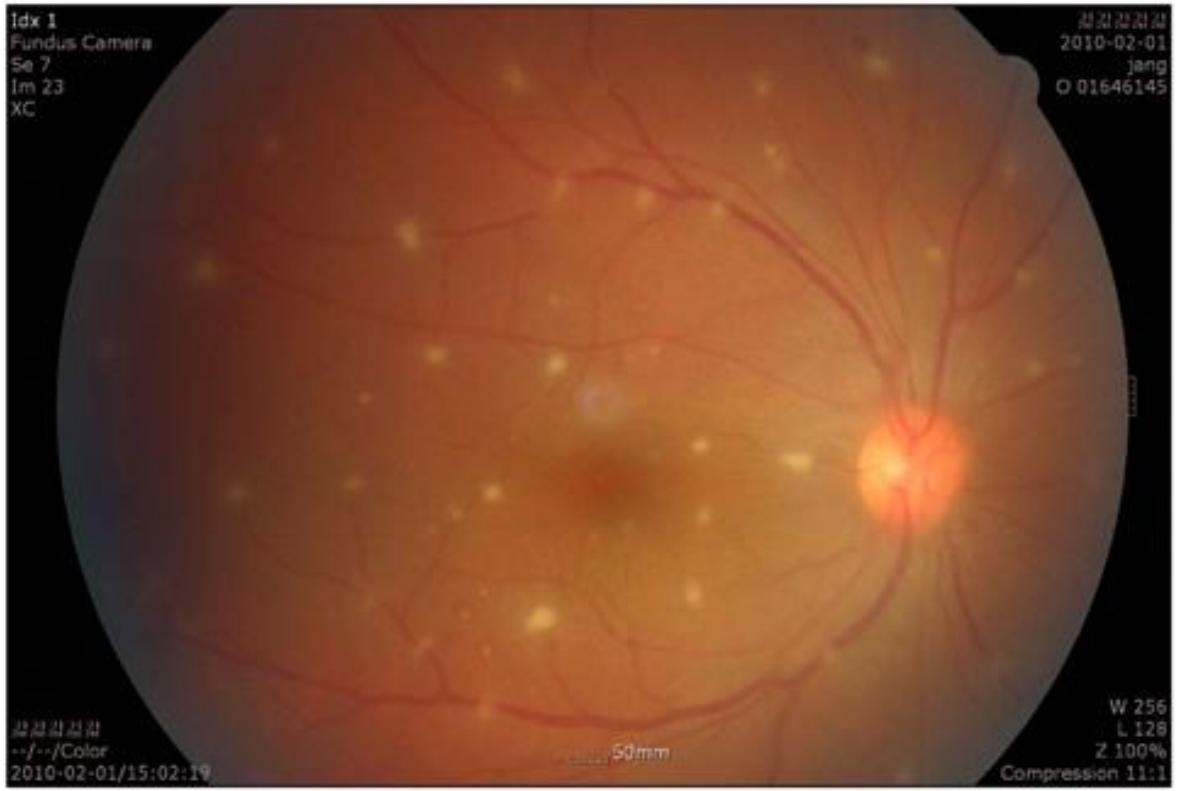
(2) Large solitary choroidal granuloma





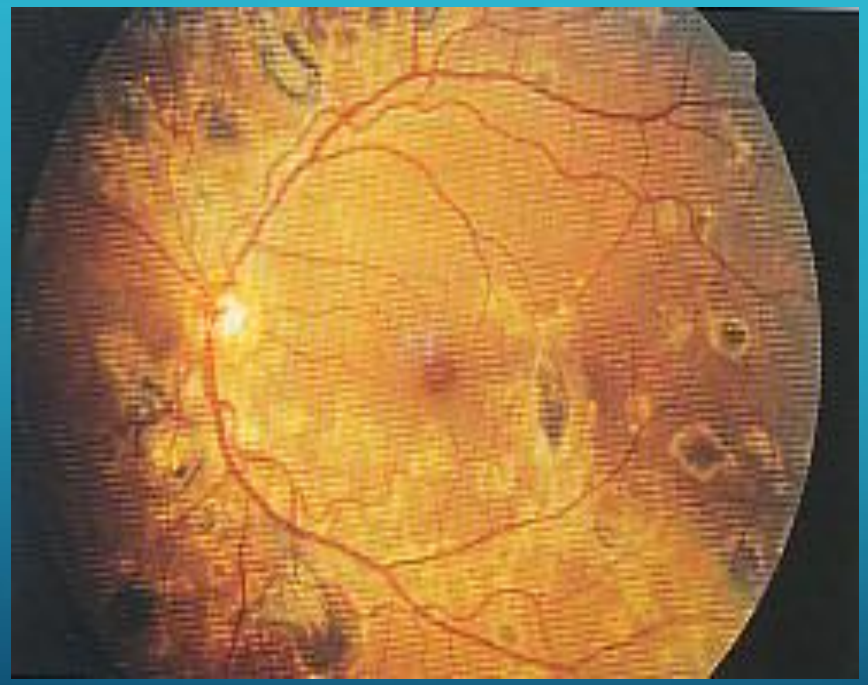
TB

MILIARY TUBERCULOMA

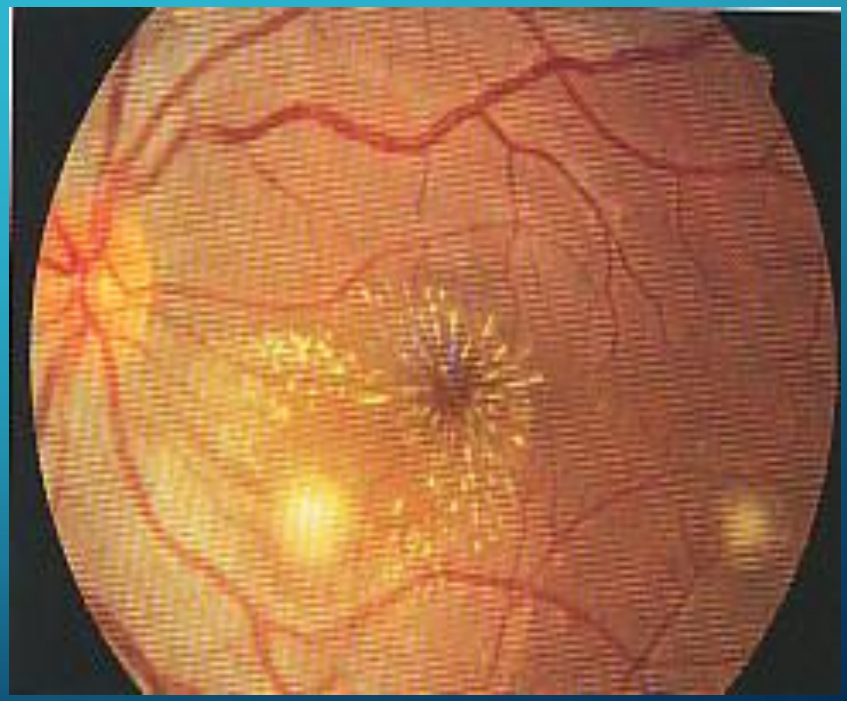


SYPHILIS

1. Maltifocal choroiditis
2. Unifocal choroiditis
3. Neuroretinitis



Old multifocal choroiditis



Active syphilitic neuroretinitis

RETINITIS PIGMENTOSA

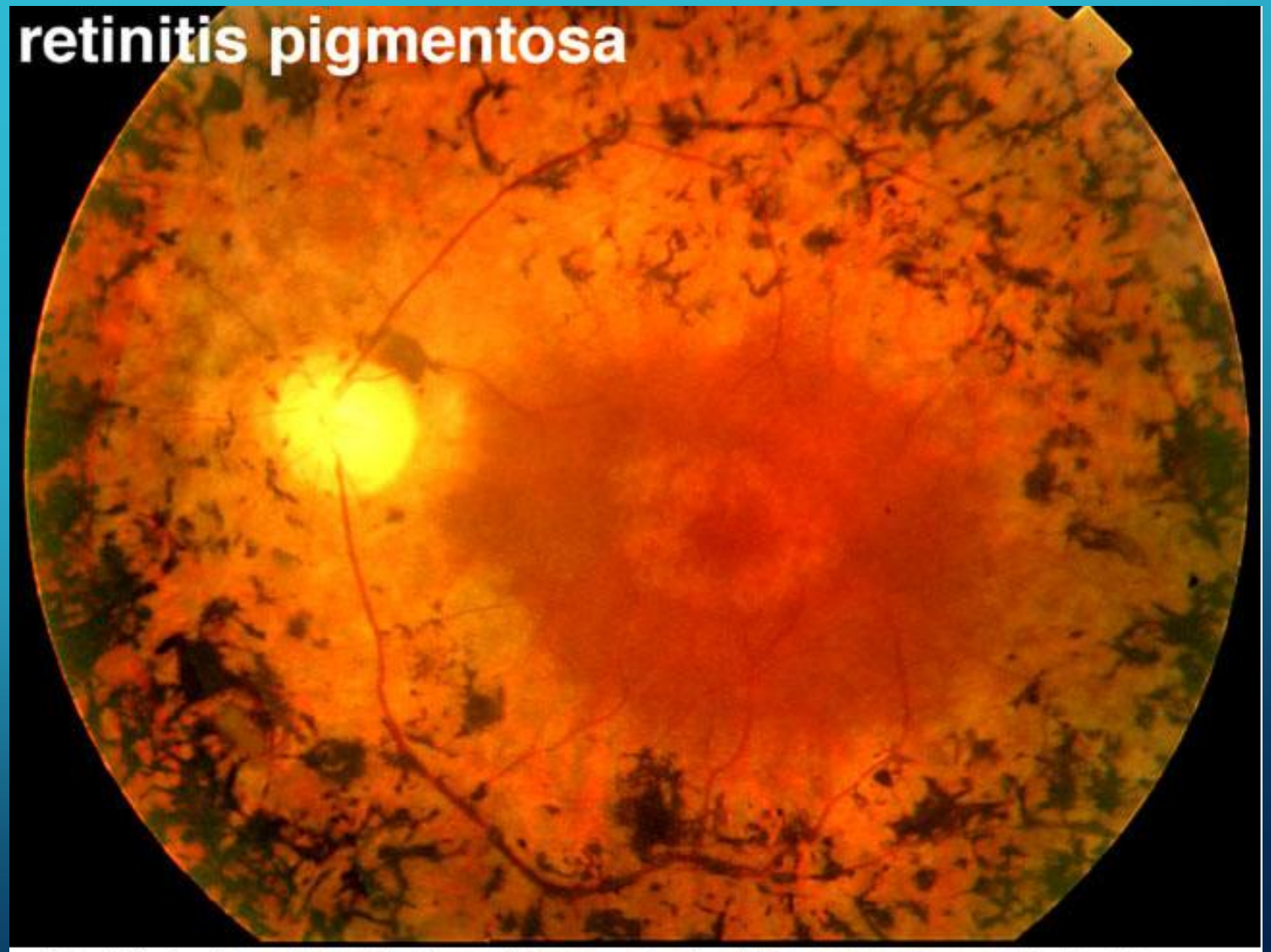
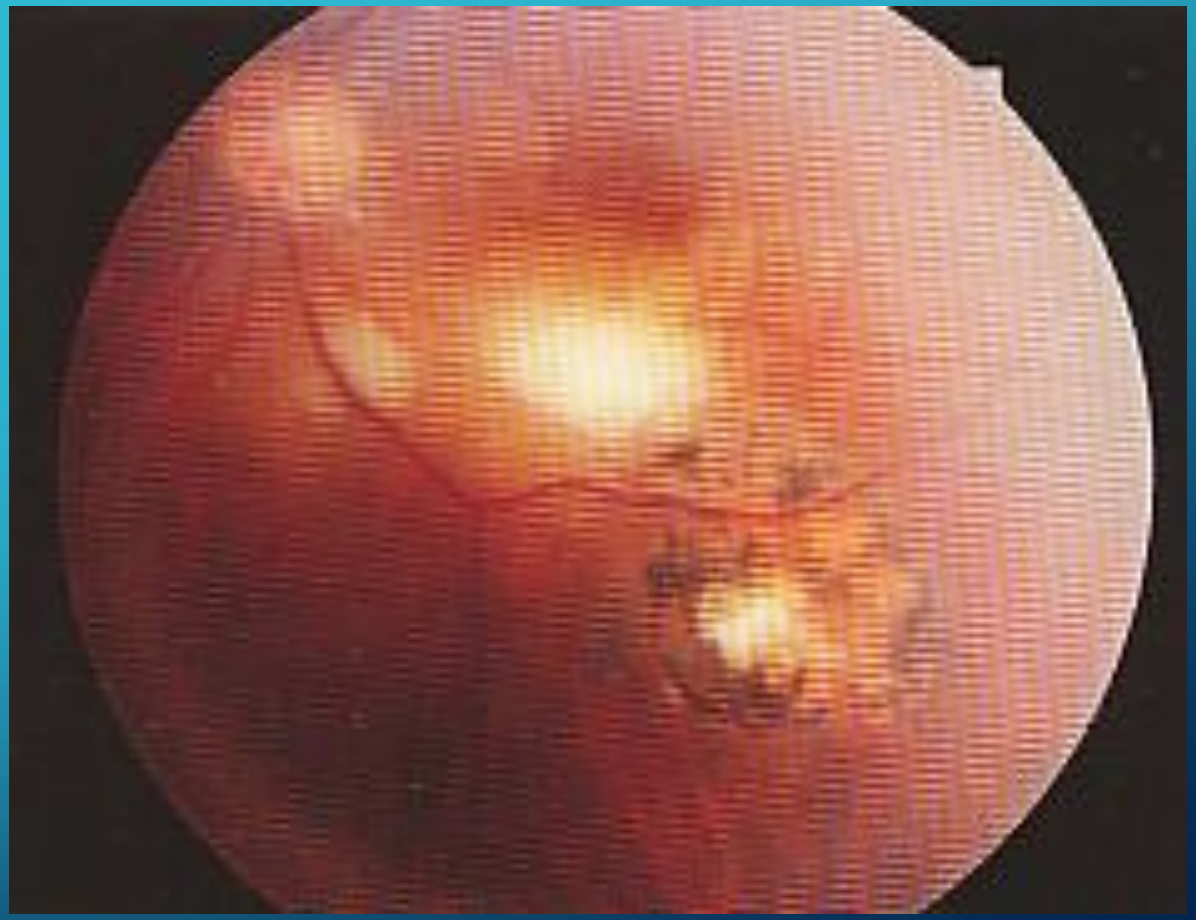


Fig. 24. A view of the fundus of the eye and of the retina in a patient who has retinitis pigmentosa.

TOXOPLASMOSIS

Acquired toxoplasmosis:

Unifocal necrotizing retinitis adjacent to an old inactive pigmented scar (satellite lesion)



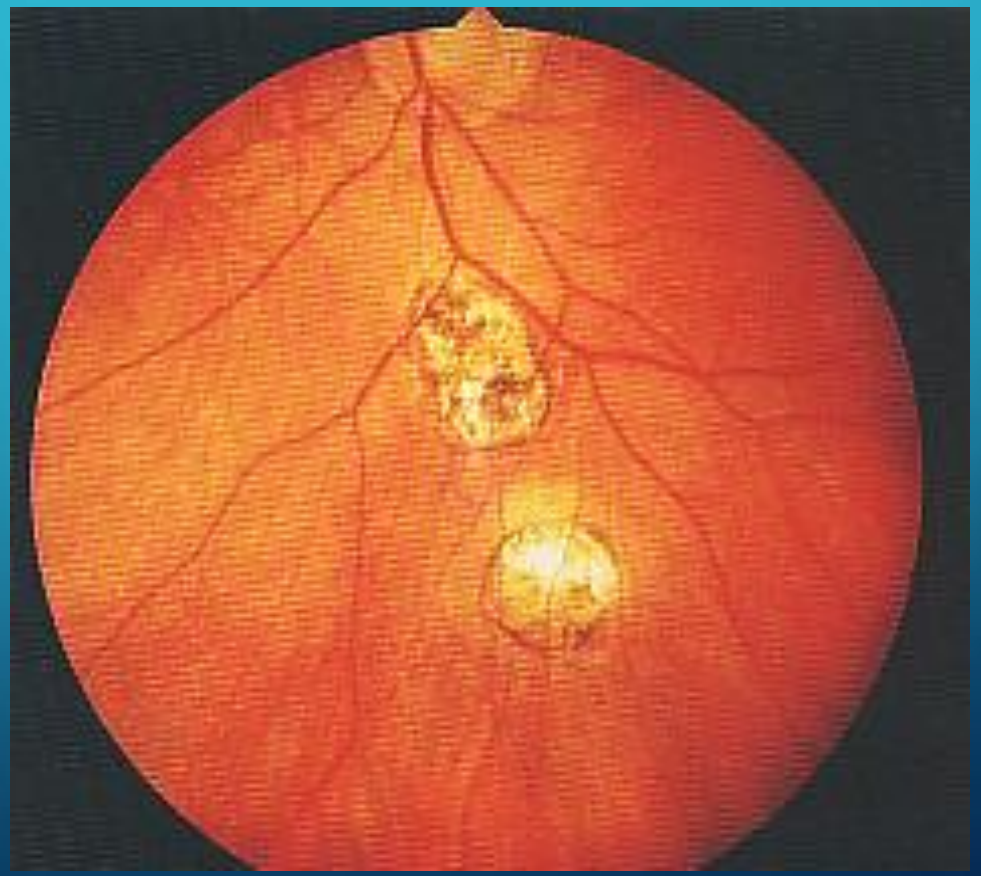
Typical toxoplasma retinitis

TOXOPLASMA RETINITIS

- Satellite lesion

Congenital toxoplasmosis:

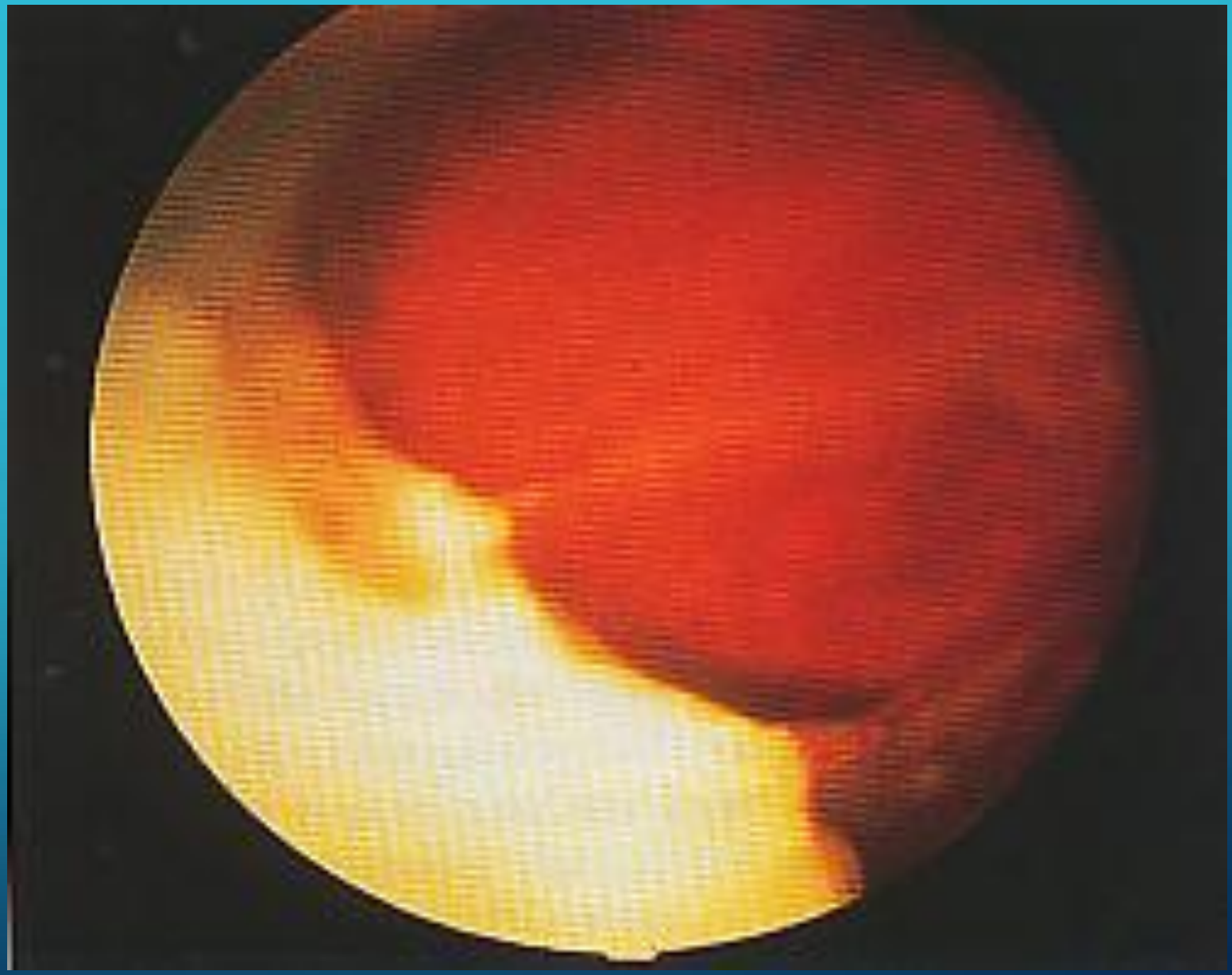
Healed chorioretinal scar



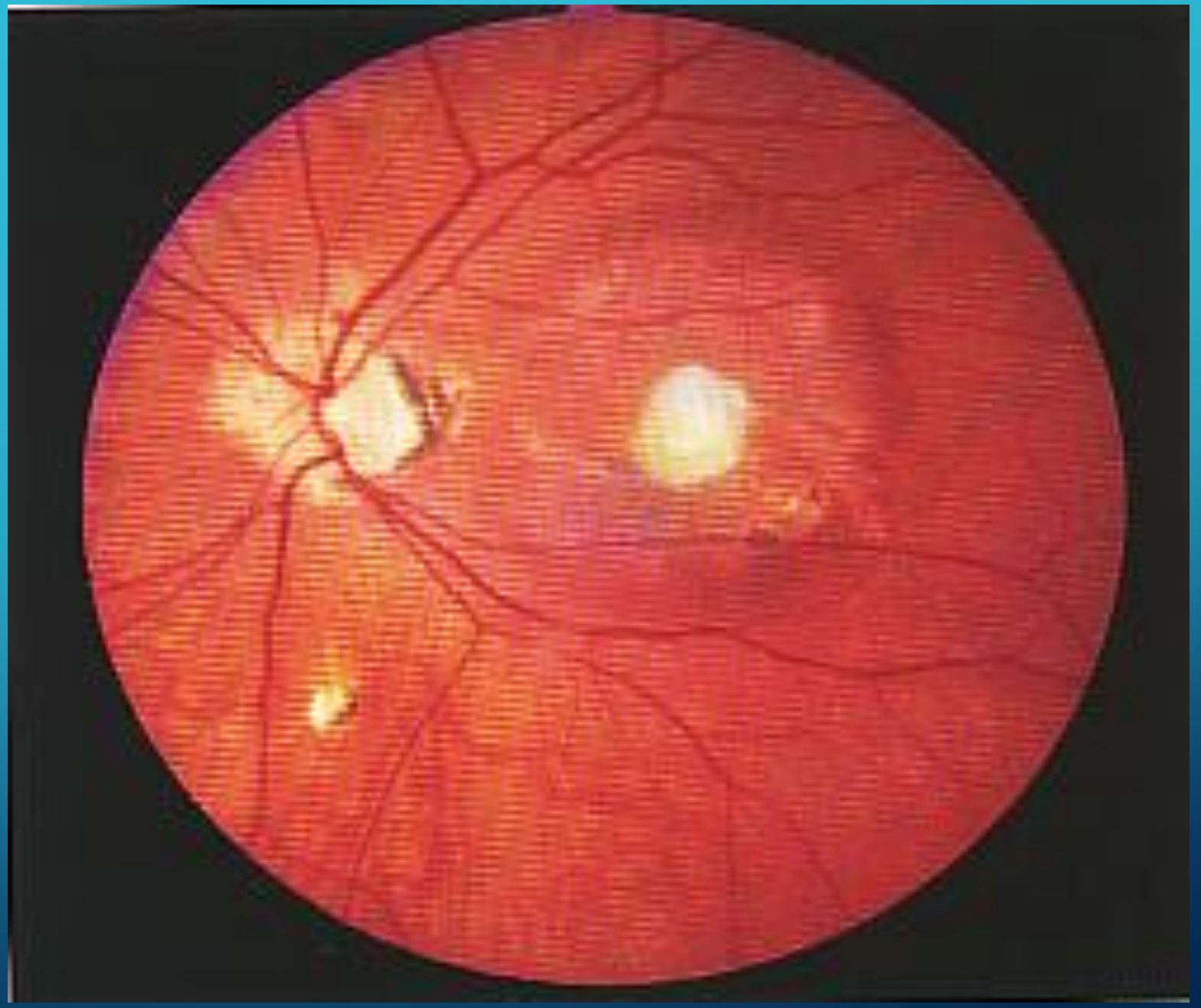
TOXOCARIASIS

There forms of ocular lesion

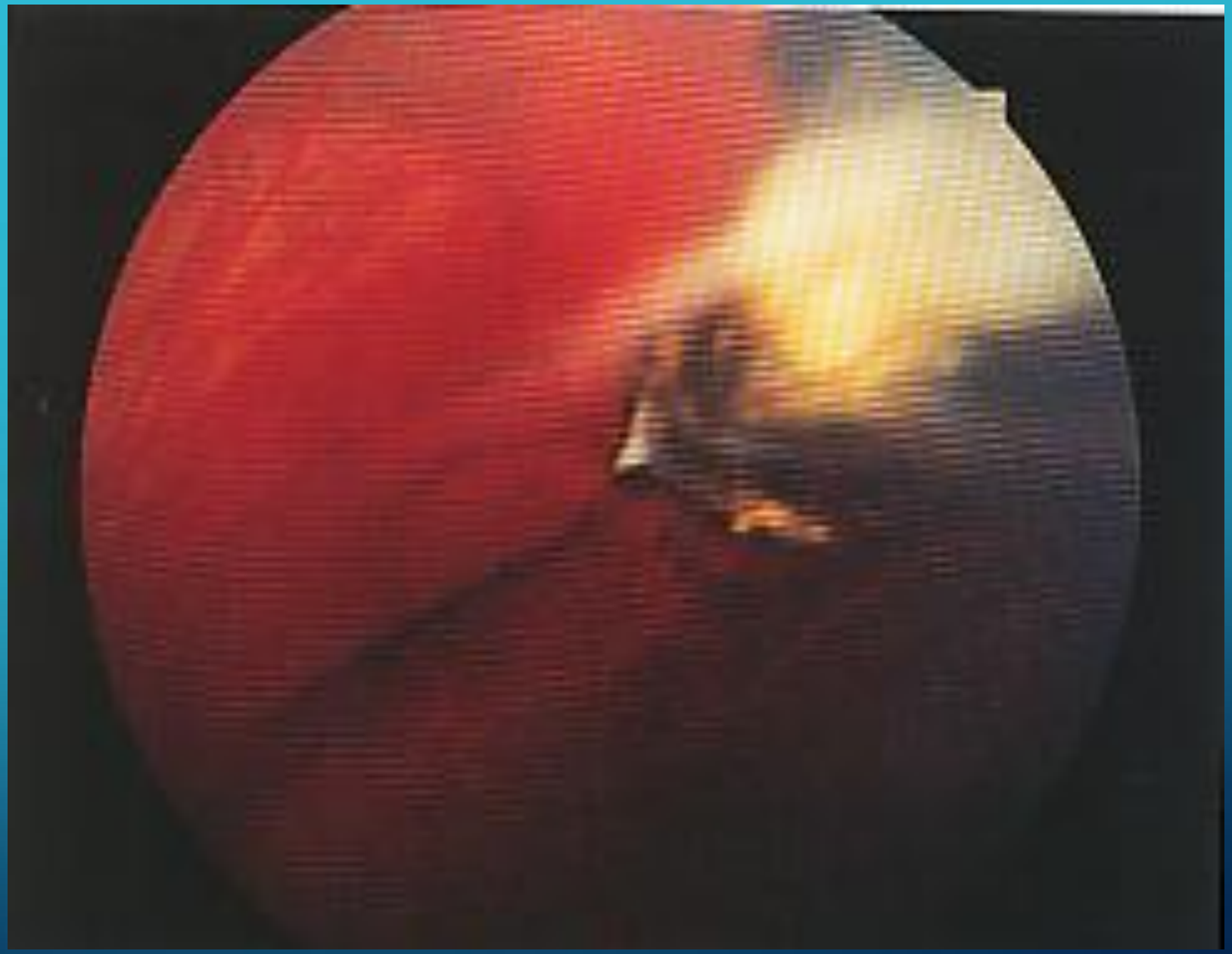
1. Chronic endophthalmitis like picture
2. Posterior pole granuloma
3. Peripheral granuloma



Chronic endophthalmitis like picture



Posterior pole granuloma



Peripheral granuloma

FUDUS PICTURE OF SYSTEMIC INFECTIONS

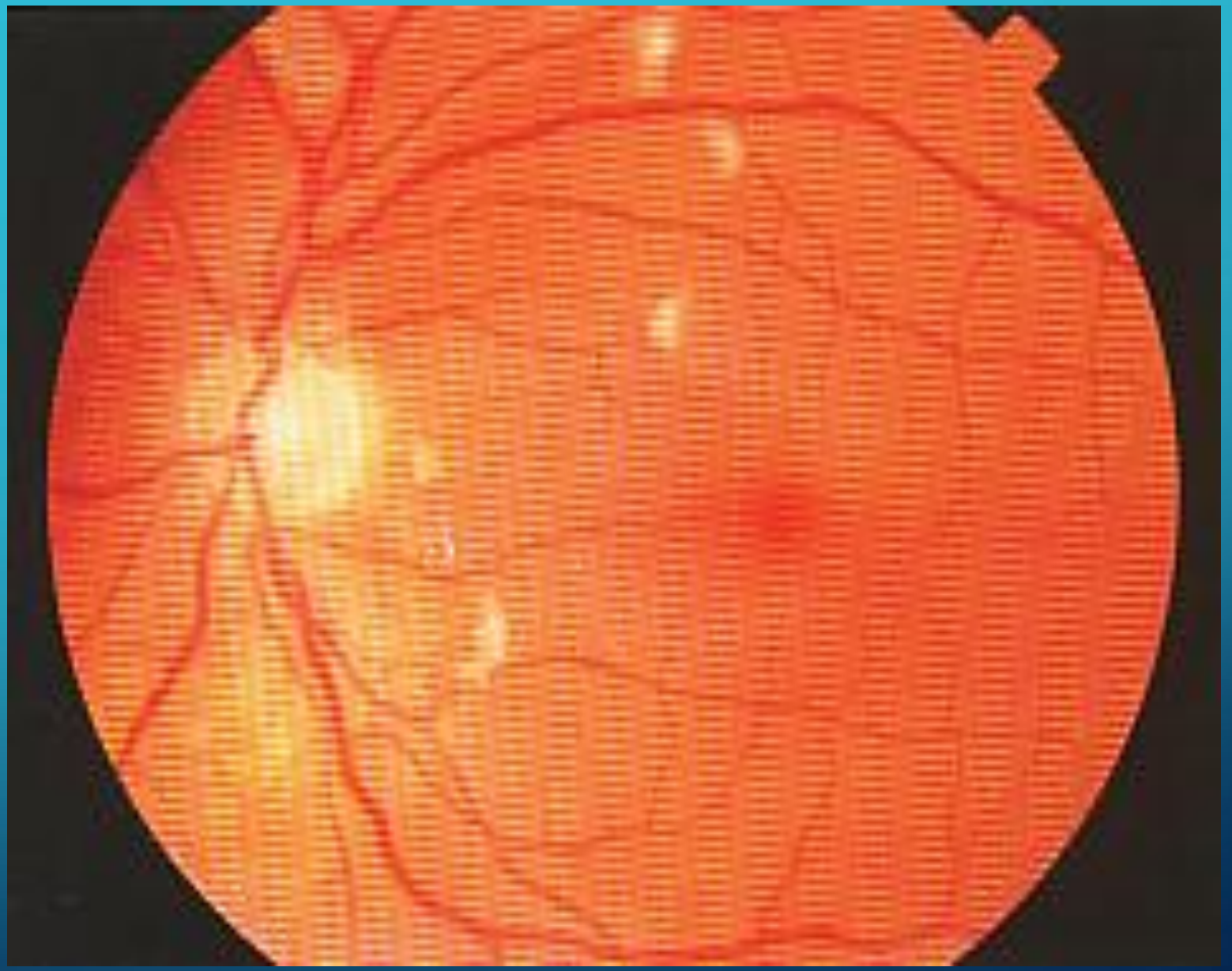
A. AIDS

(1) Retinal microangiopathy – characterized by

(a) Cotton-wool spots

(b) Retinal hemorrhages

(c) Microaneurysm



Cotton-wool spots in HIV retinopathy


OPHTHALMIC
PHOTOGRAPHERS
SOCIETY


1

HIV

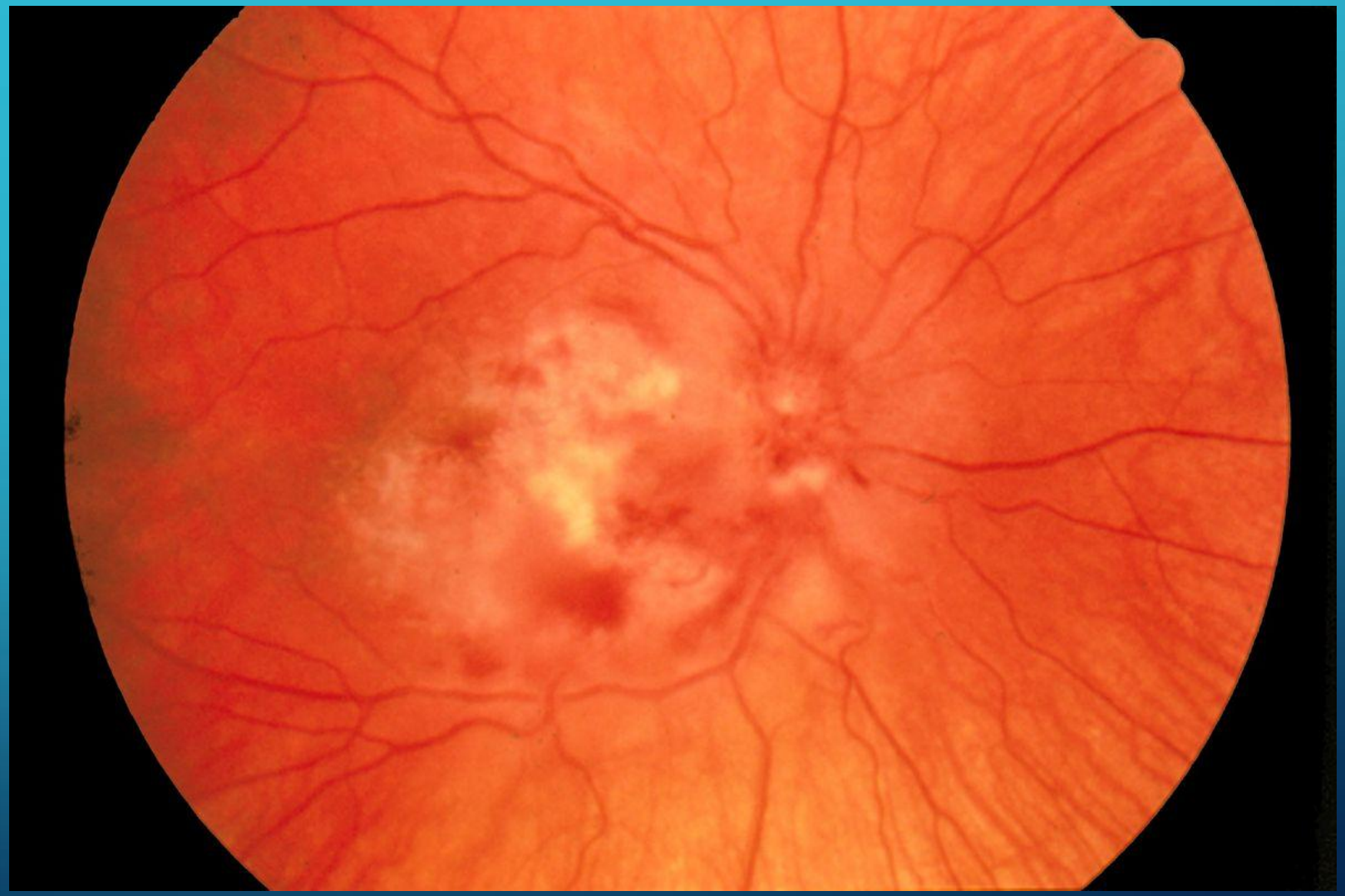
(2) Cytomegalovirus Retinitis – 40% of AIDS

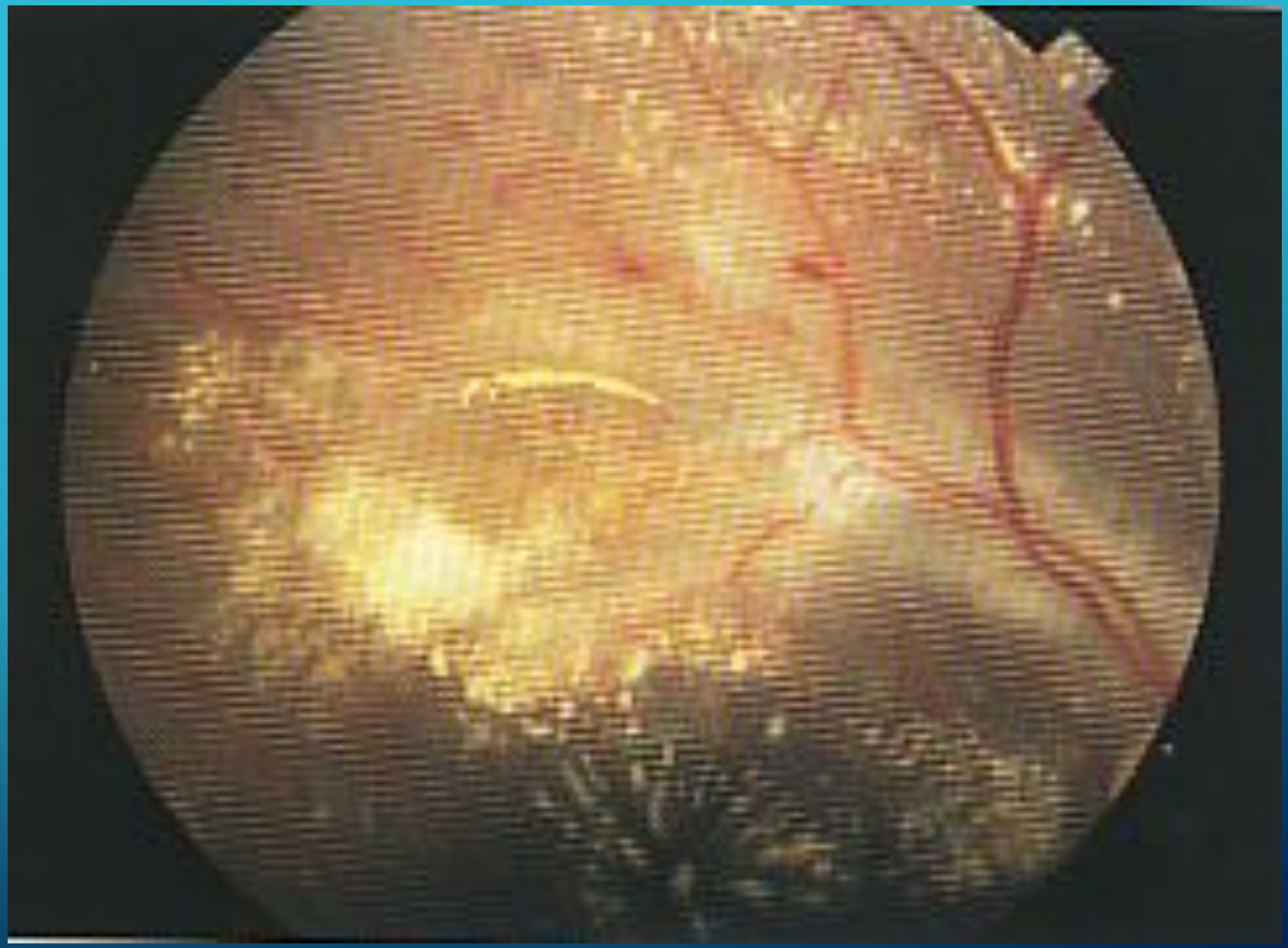
Fulminant retinitis – Geographical or confluent retinitis, venous sheathing like frosted branch angitis which progress relentlessly as a brushfire like extension

CMV RETINITIS

- Vasculitis
- Perivascular sheathing
- Retinal opacification

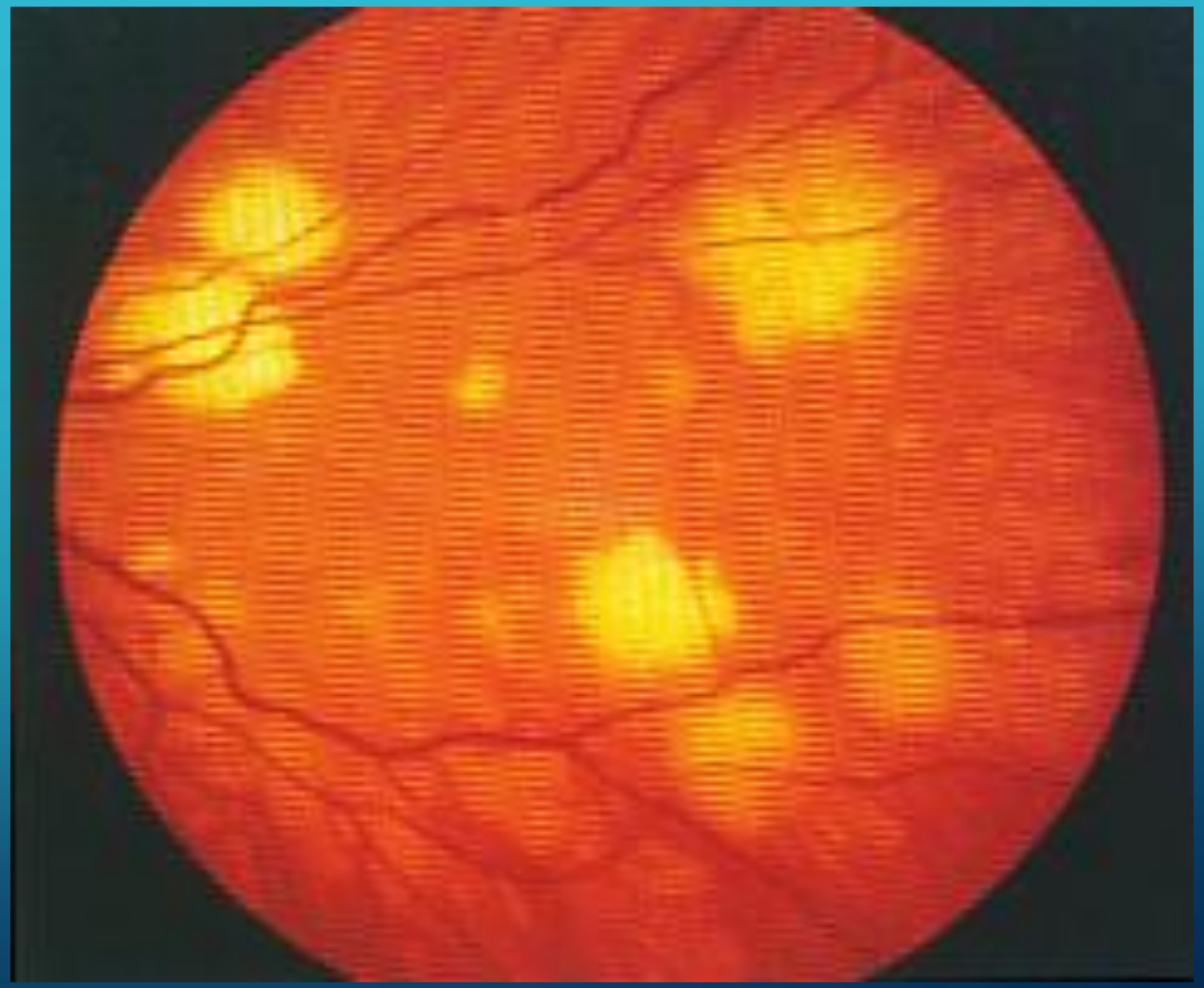
CMV RETINITIS





Fulminating CMV retinitis

(3) Pneumocystis carinii choroiditis- flat yellow round choroidal lesions



Choroidal pneumocystosis

VIRAL DISEASES

HERPES ZOSTER

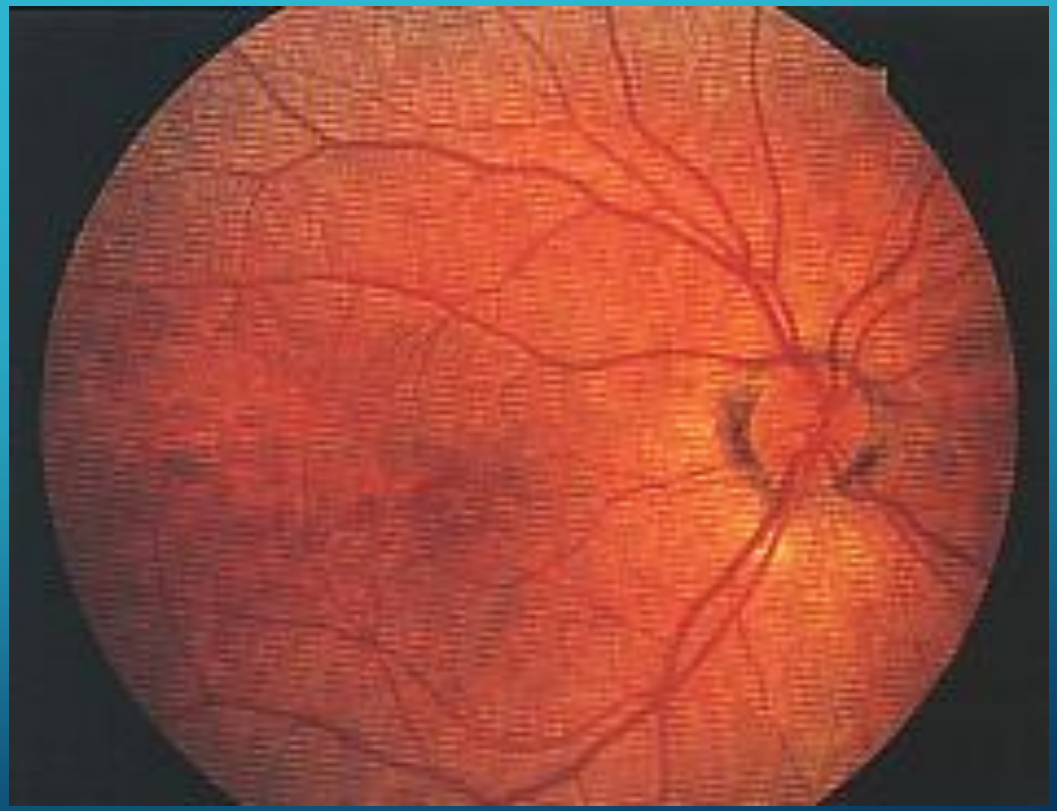
Fundus lesions characterized by

Acute retinal necrosis

CONGENITAL RUBELLA

Retinopathy characterized by

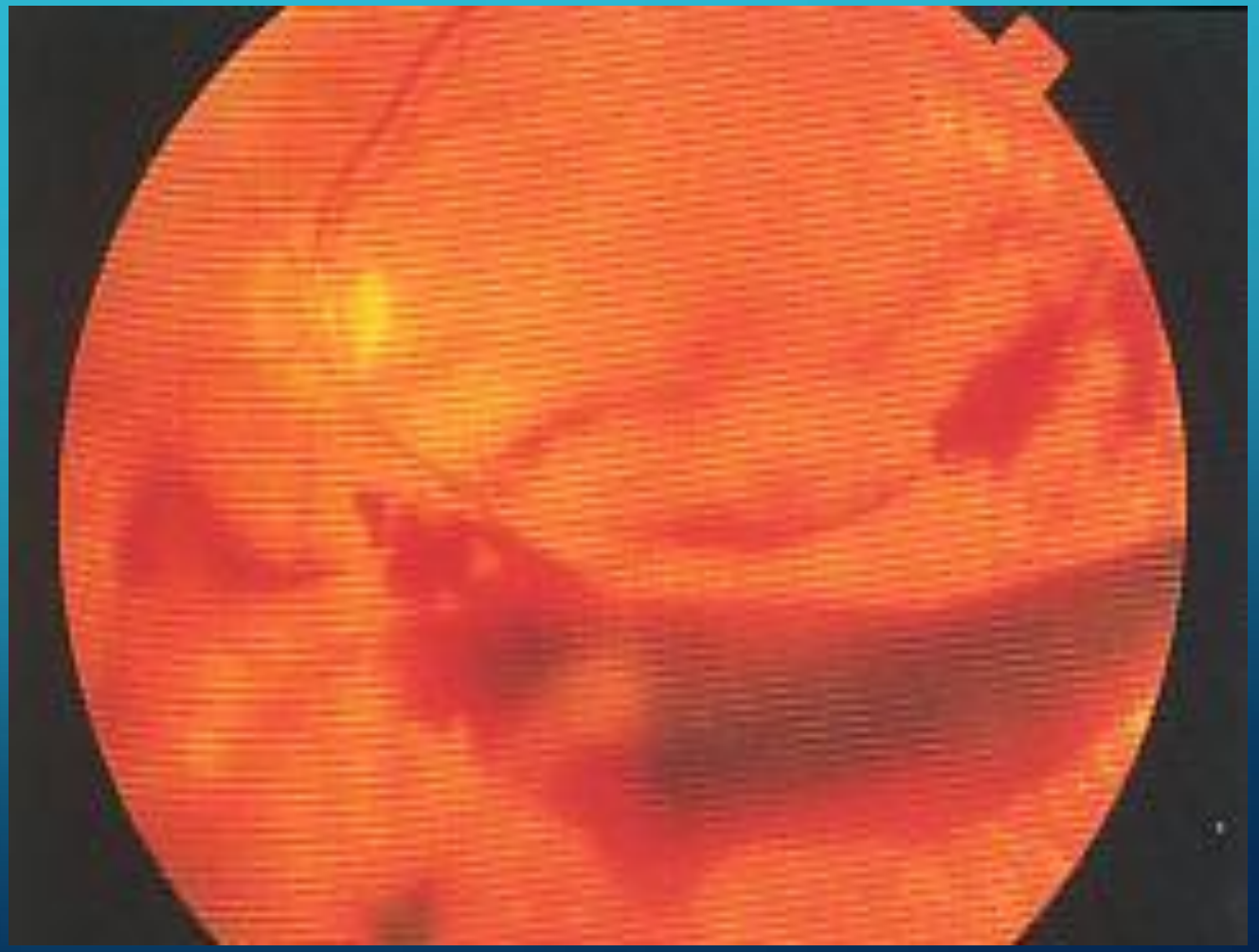
(1) Salt and pepper pigmentary disturbances



Rubella retinopathy

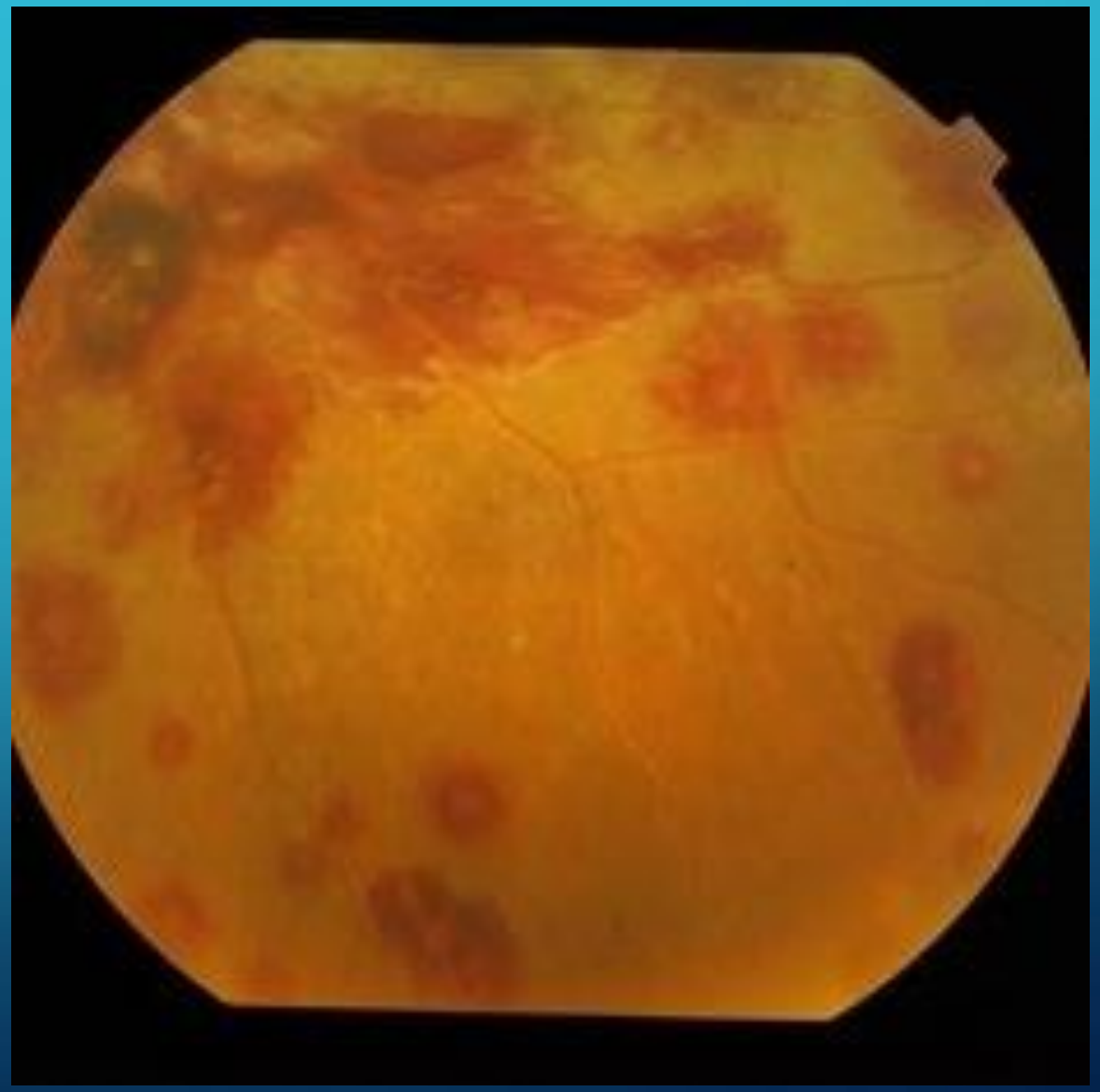
DENGUE HAEMORRHAGIC FEVER

Preretinal hge / retinal hge

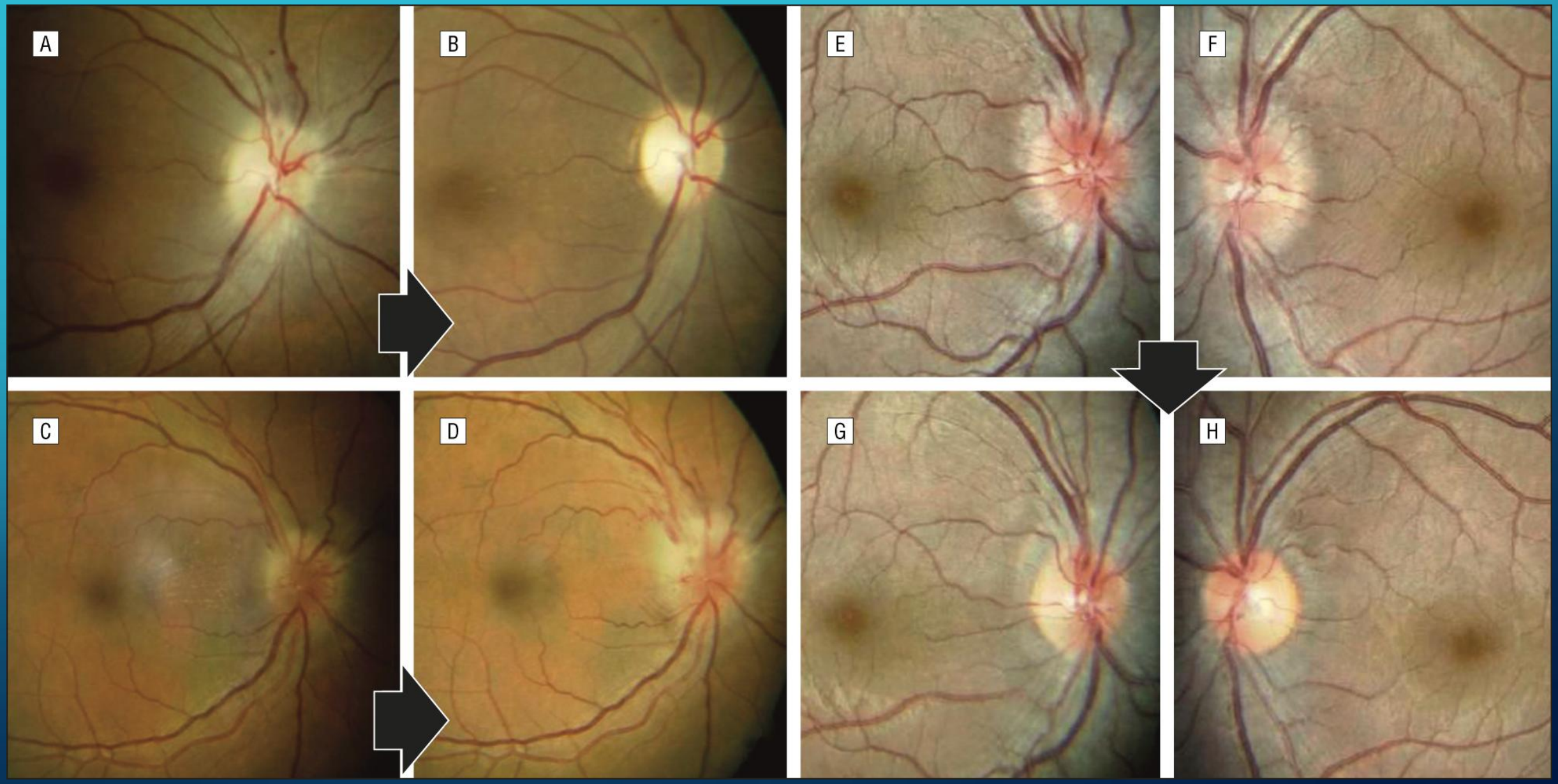


DENGUE

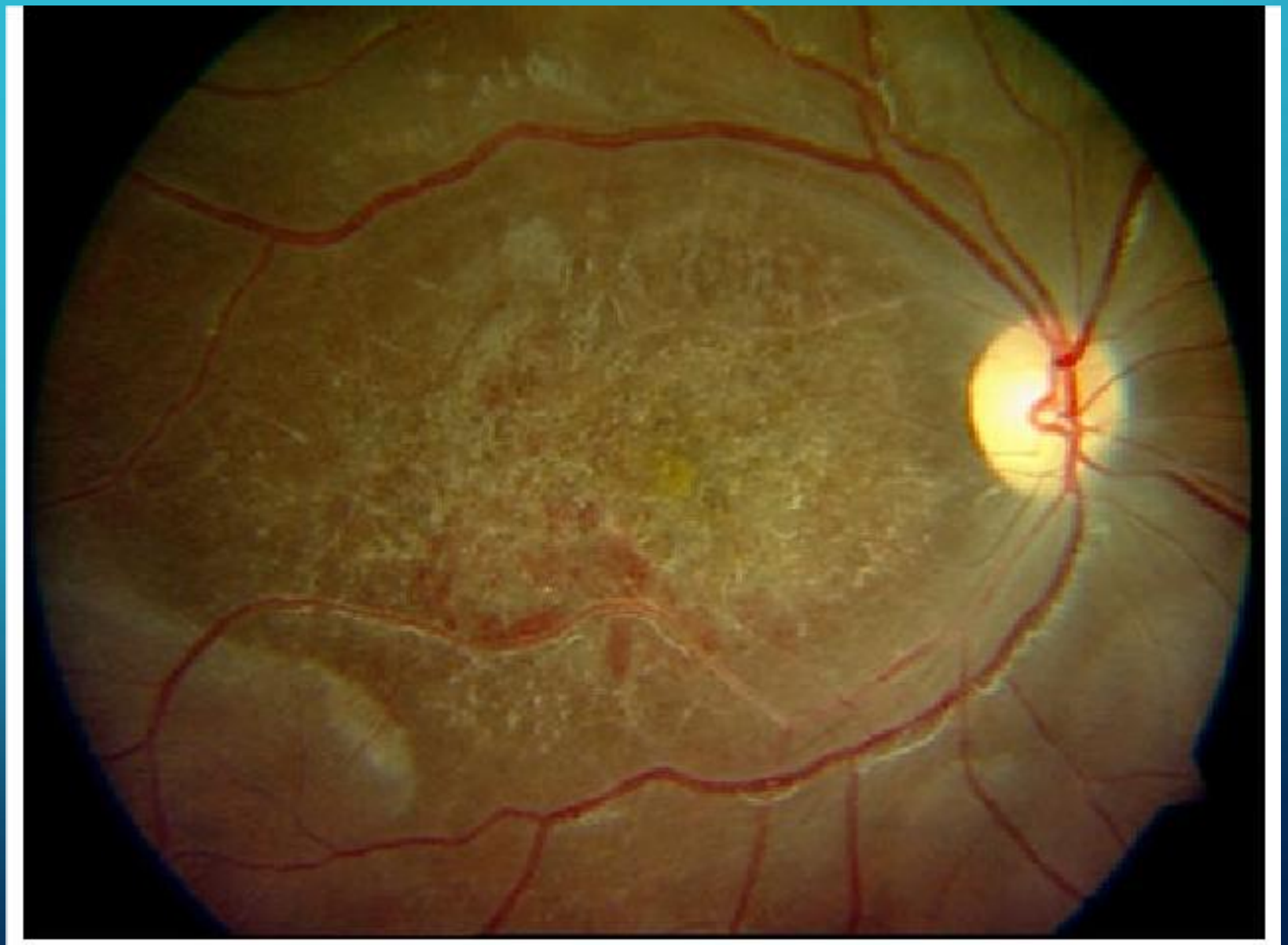
DENGUE



CHIKUNGUNIA OPTIC NEURITIS

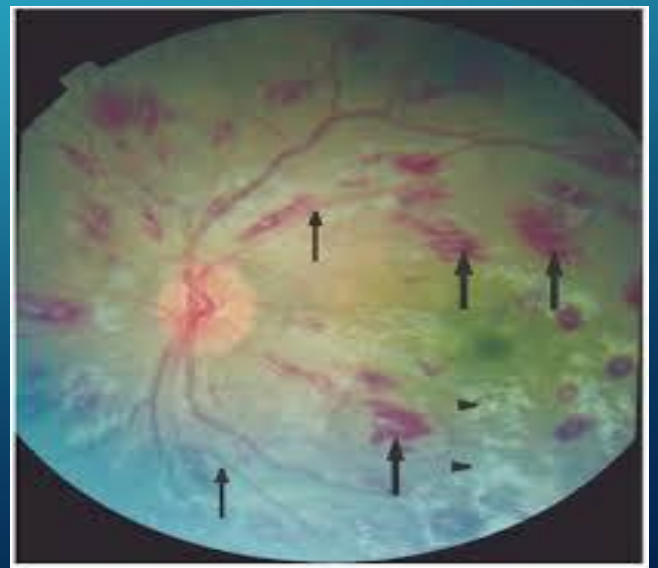


CHIKUNGUNIA



CHIKUNGUNIA RETINITIS

MALARIAL RETINOPATHY



Components of malarial retinopathy

Retinal whitening

- Macular
- Peripheral

Vessel changes

- Whitening (including orange vessels and tramlining)
- Capillary whitening

Retinal hemorrhages

Papilloedema

Cotton wool spots

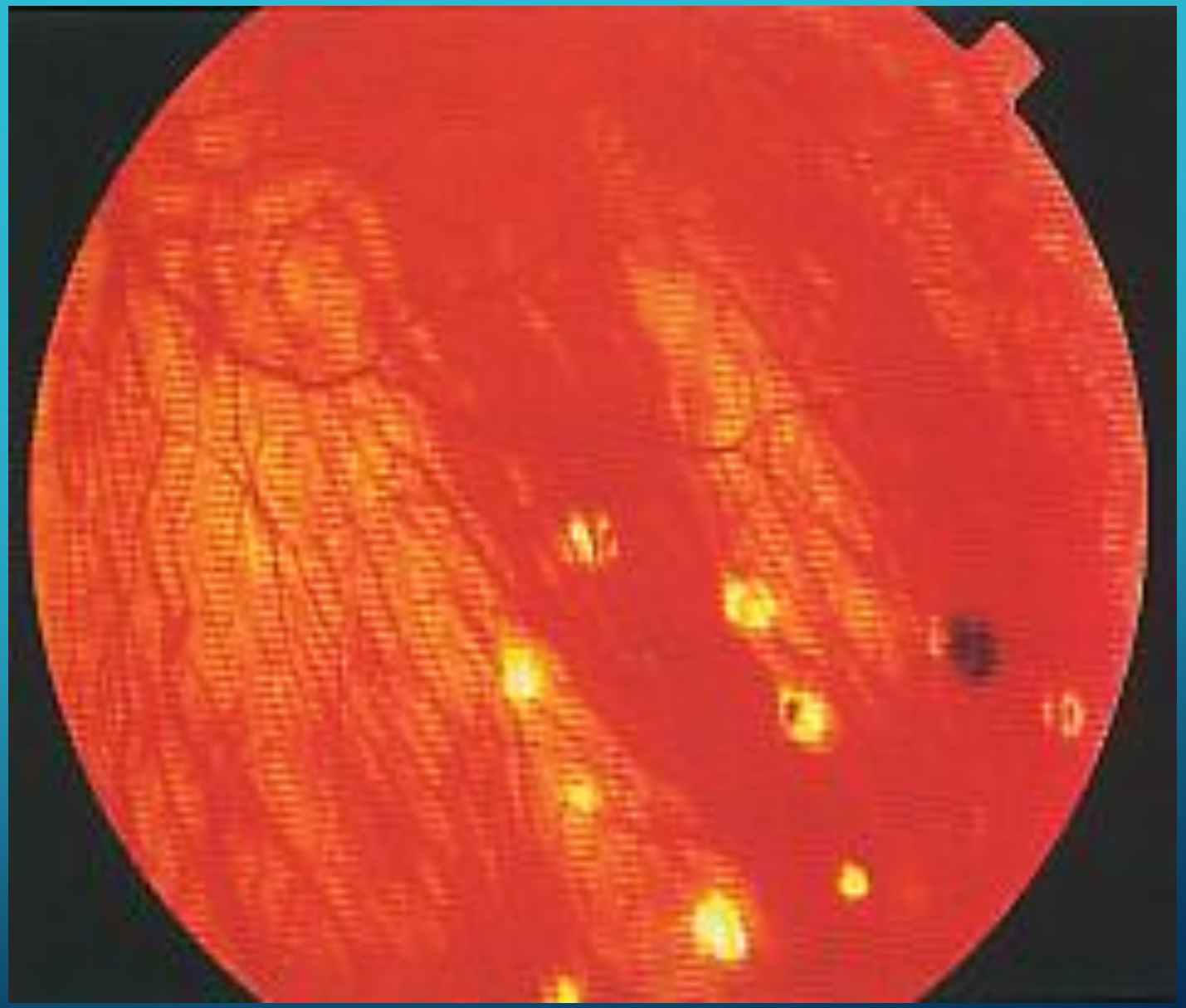
FUNGAL DISEASES

(1) *Histoplasmosis (POHS) characterized by:*

(a) Atrophic histo spots

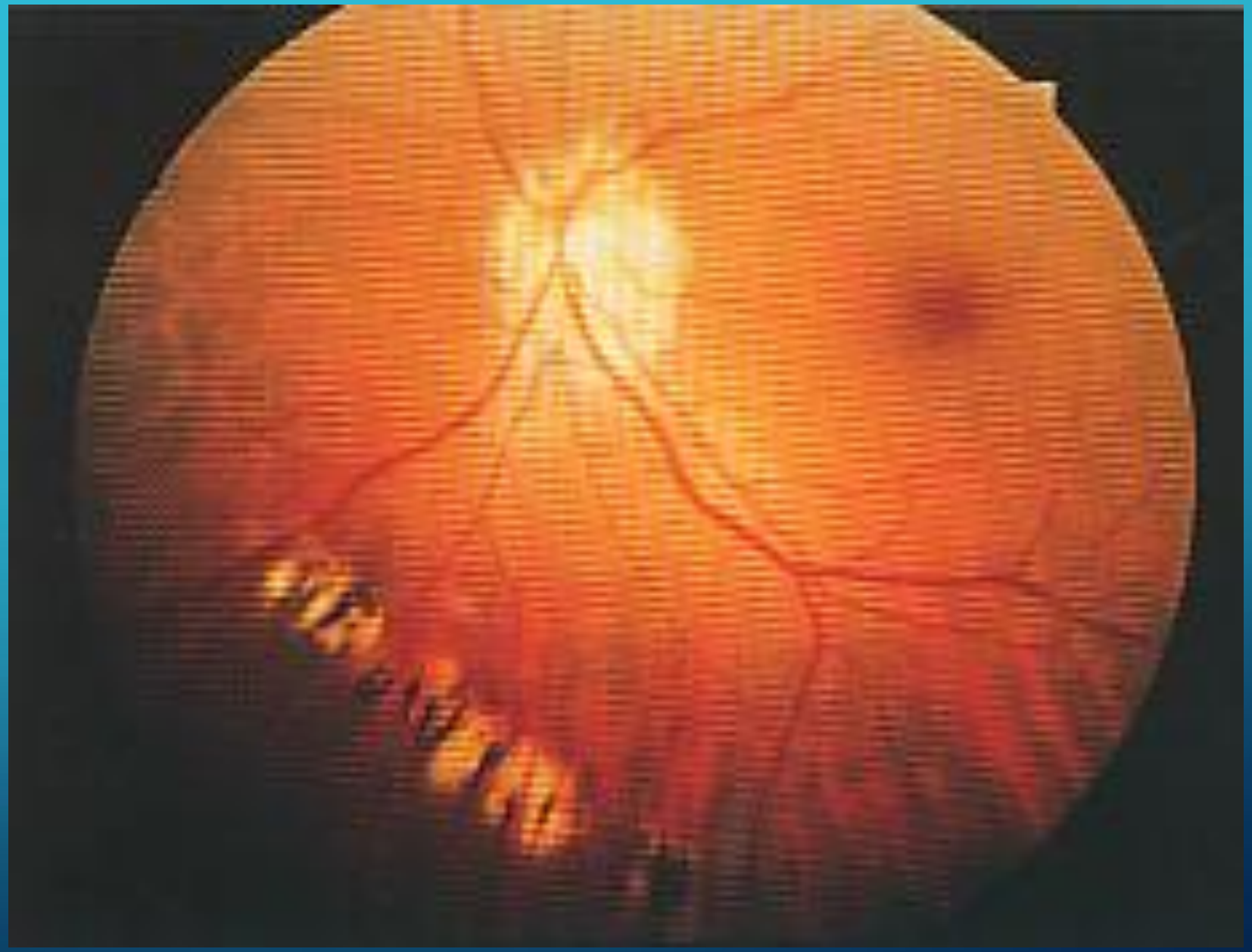
(b) Peripapillary choroidal atrophy

(c) Linear streaks



Atrophic histo spots

Peripapillary choroidal atrophy

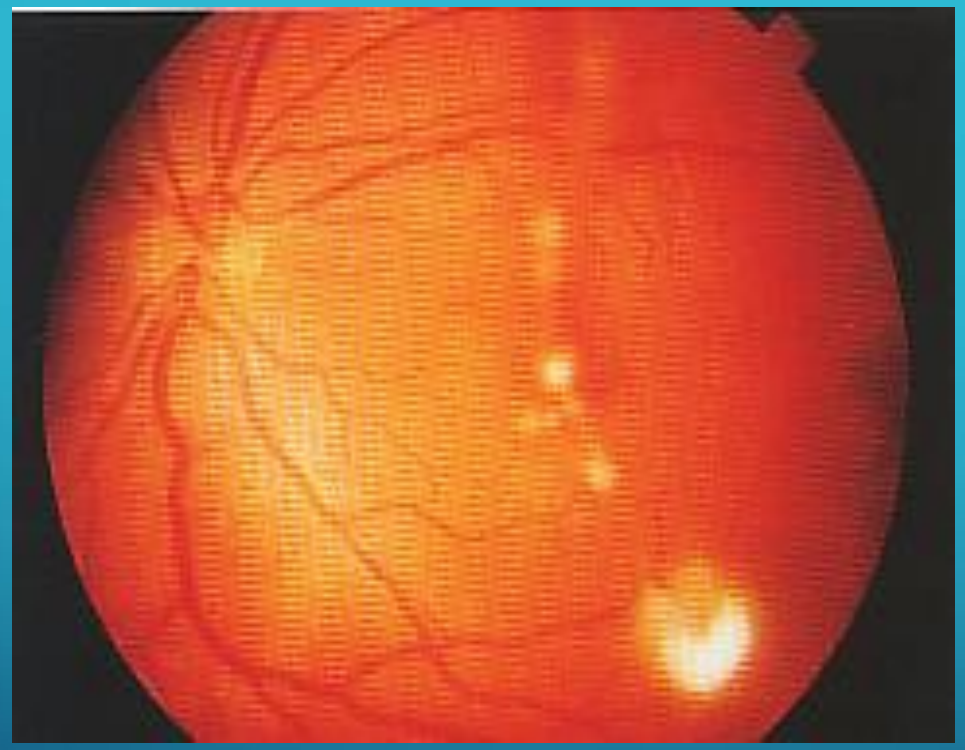


Linear streaks

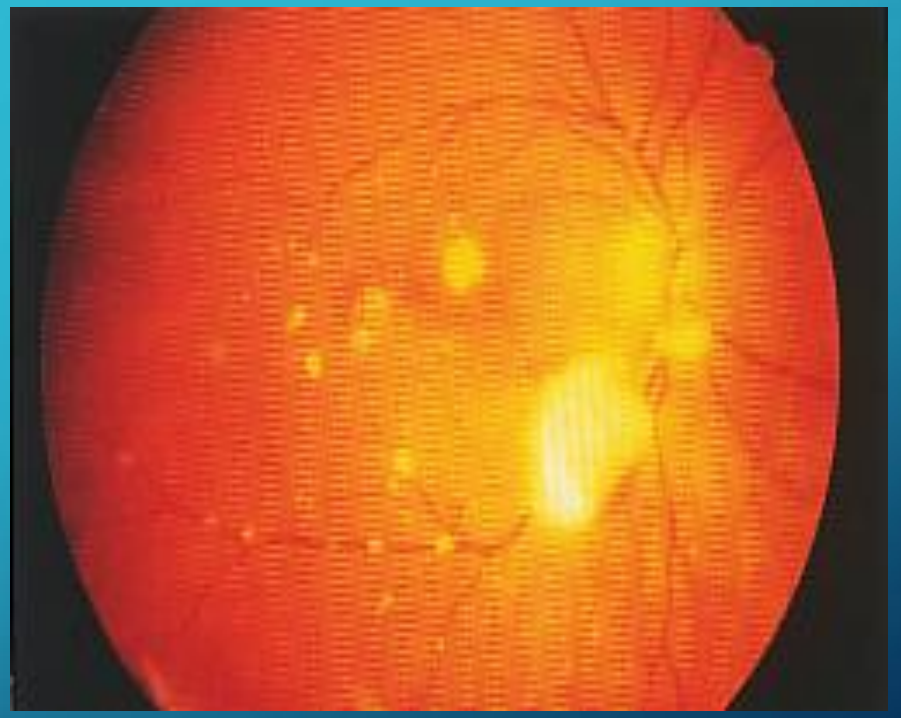
CANDIDIASIS (SYSTEMIC)

Characterized by

a. **Multifocal retinitis**
b. **Floating white cotton ball colonies**
c. **Colonies join like string of pearls**
d. **Candida endophthalmitis**



Multifocal retinitis



White cotton ball colonies

GRANULOMATOUS DISEASES

SARCOIDOSIS

Fundus picture:

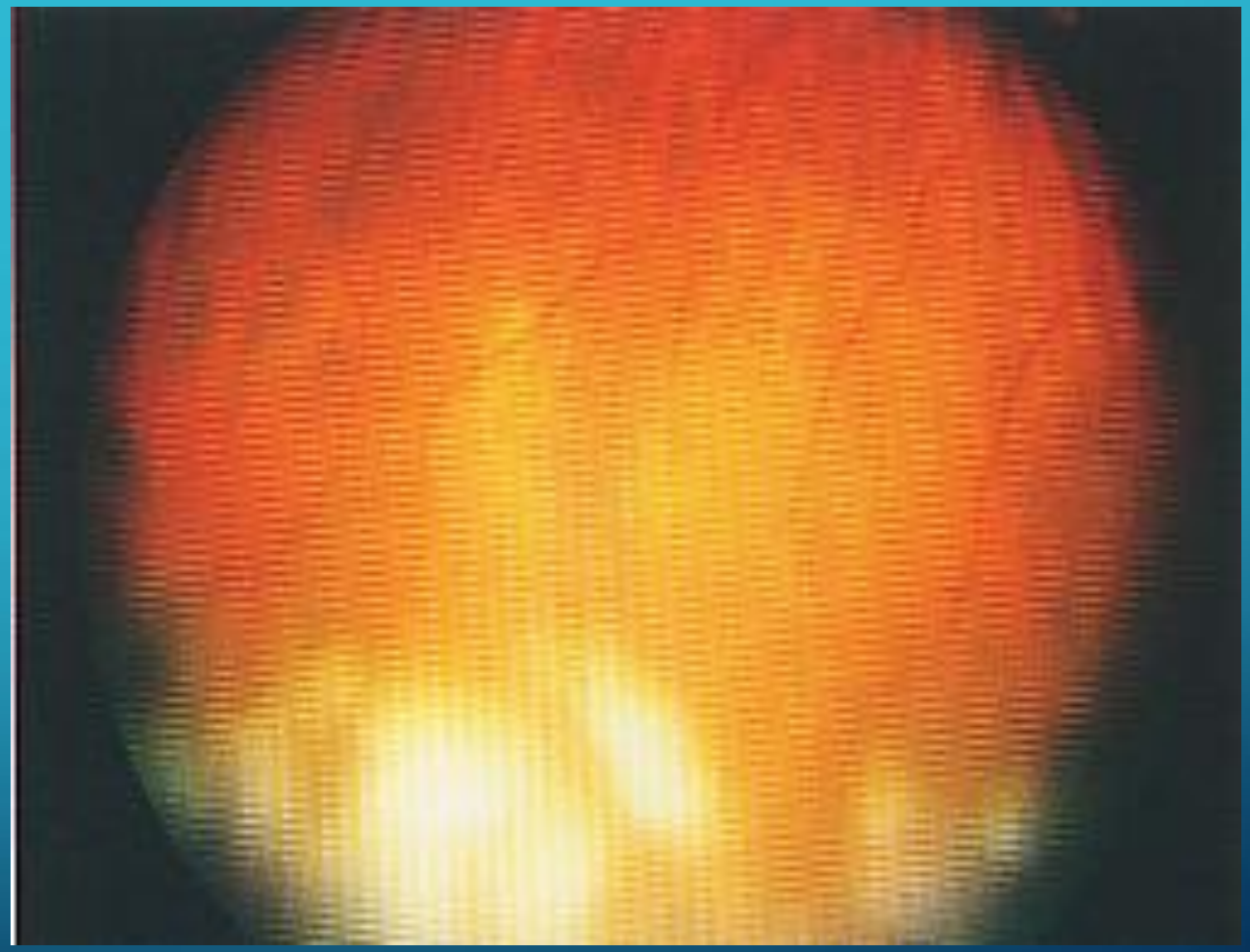
1. **Diffuse vitritis or cotton ball opacities**
2. **Periphlebitis - Candlewax drippings**

   - Vascular sheathings
3. **Retinal and preretinal granuloma (Lander's sign)**

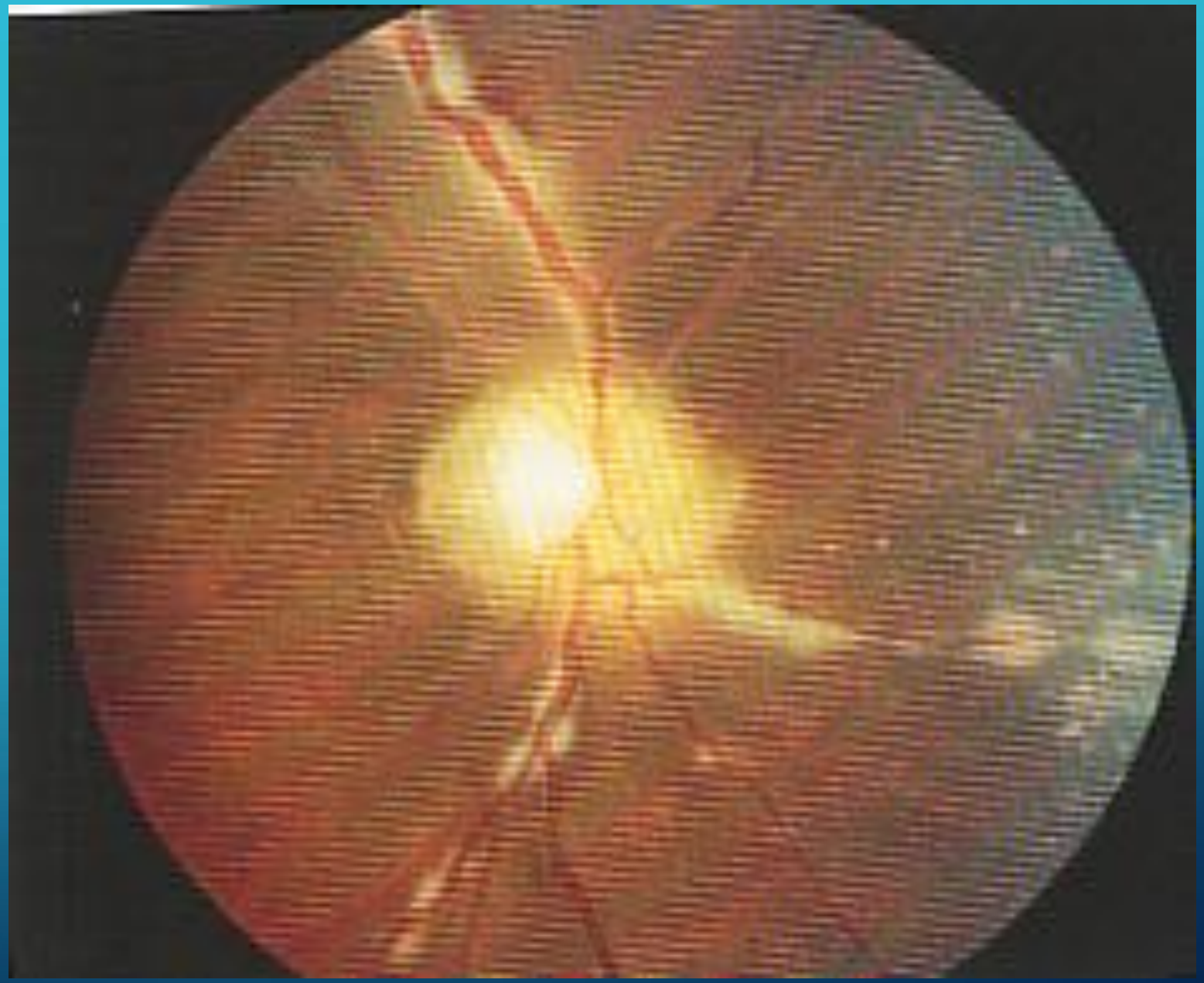
SARCOIDOSIS CONT.

4. Acute sarcoid retinopathy
    1. Vitreous hge
    2. Candlewax dripping
    3. Retinal and preretinal granuloma
    4. Retinal hges

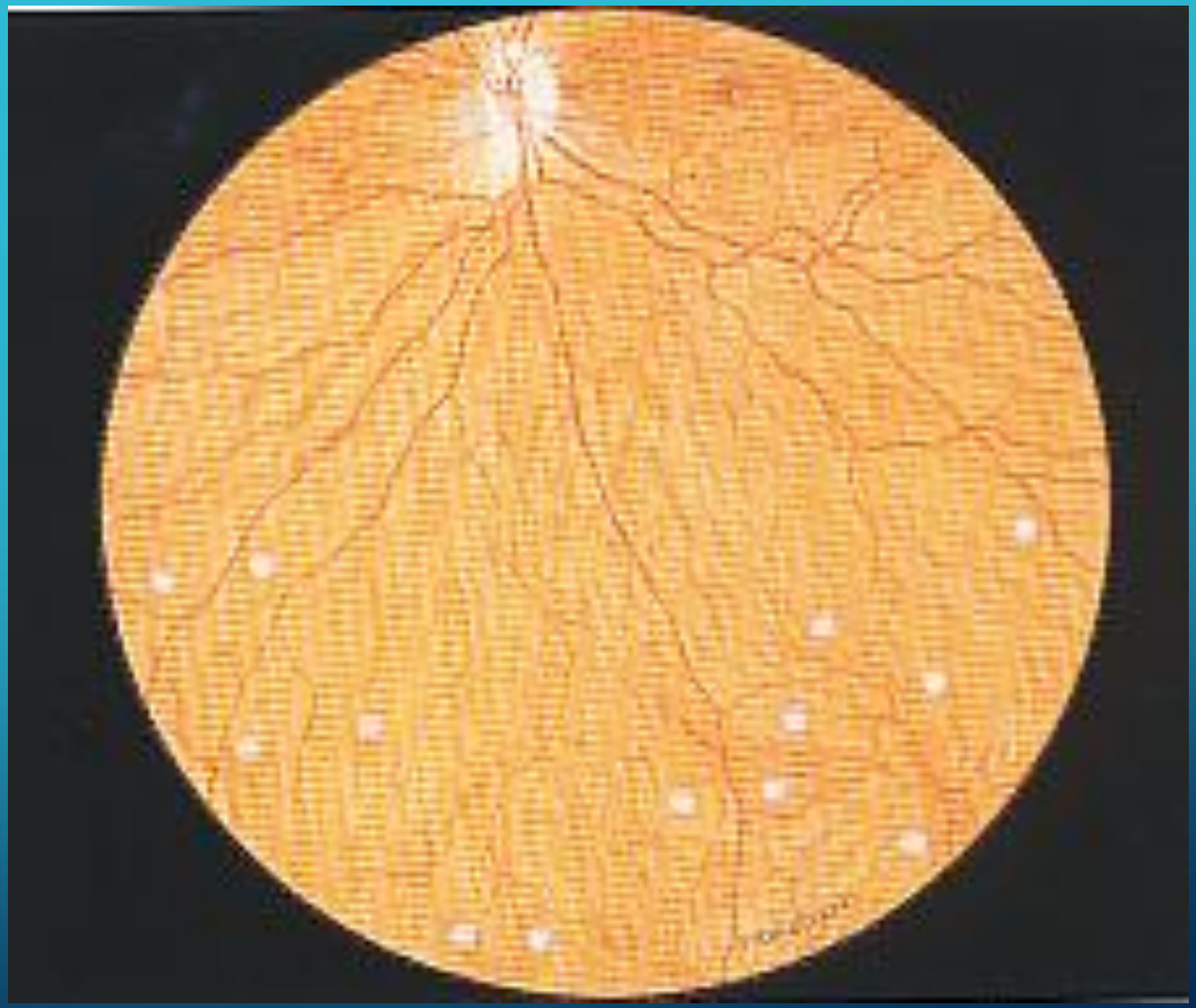
5. Optic nerve lesions
    i. Focal granuloma
    ii. Popilloedema secondary to CNS involvement



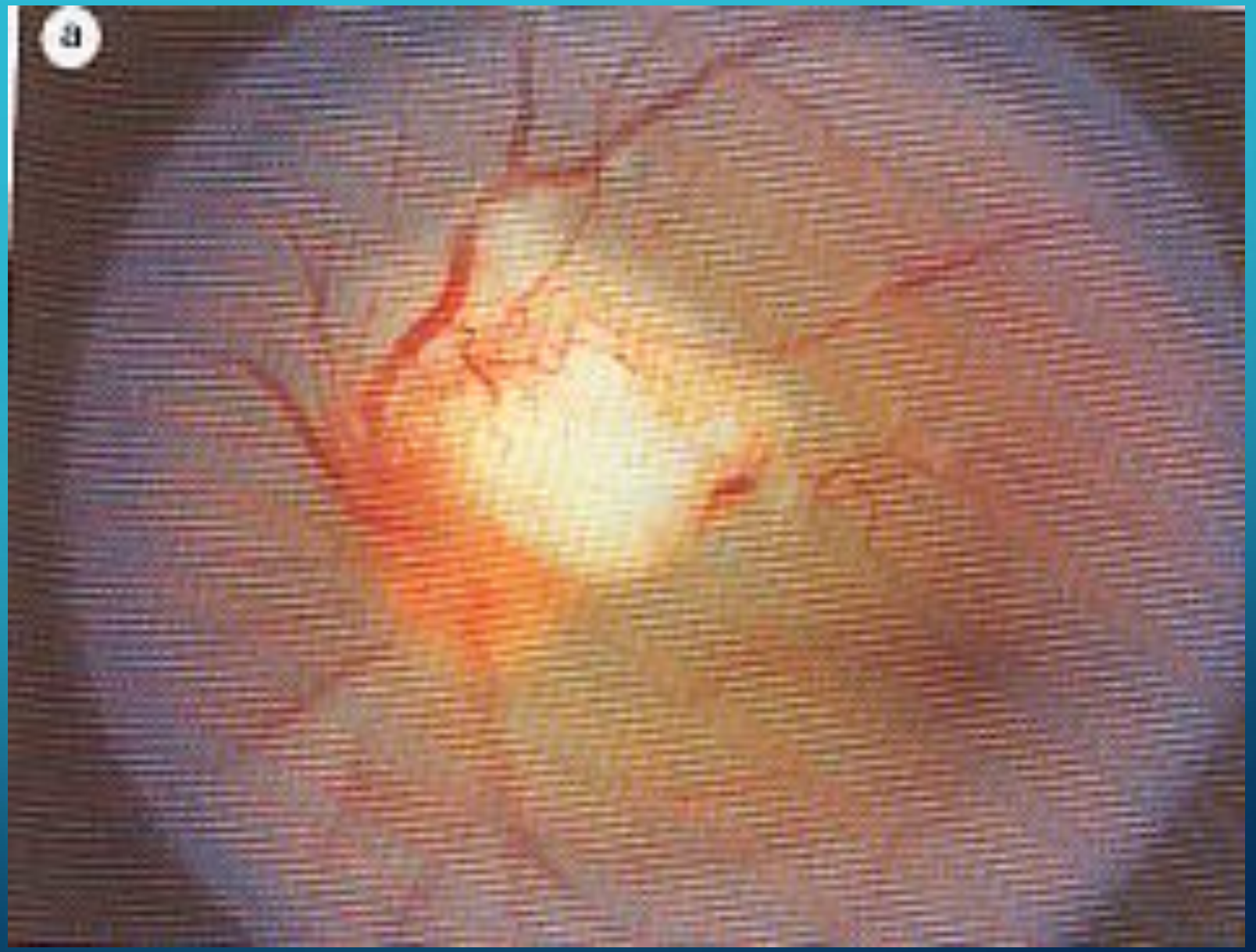
Vitreous cotton balls in intermediate uveitis



Candlewax drippings sarcoid periphlebitis



Multiple preretinal granulomas: Lander's sign



Optic disc sarcoid granulomas

OPTIC NERVE DISEASES

Optic atrophy

- **Primary optic atrophy –**

  This occurs without antecedent swelling of the optic nerve head.

  - **Sign:**
    - Pale flat disc with clearly delineated margin
    - Kestenbaum sign positive
    - Attenuation of parapapillary blood vessels
    - Atrophy may be diffuse or sectoral depending on the cause.

- **Secondary optic atrophy-**

  Preceded by swelling of the optic nerve head.

  - Sign:
    - White or dirty gray slightly raised disc with poorly delineated margin.
    - Kestenbaum sign

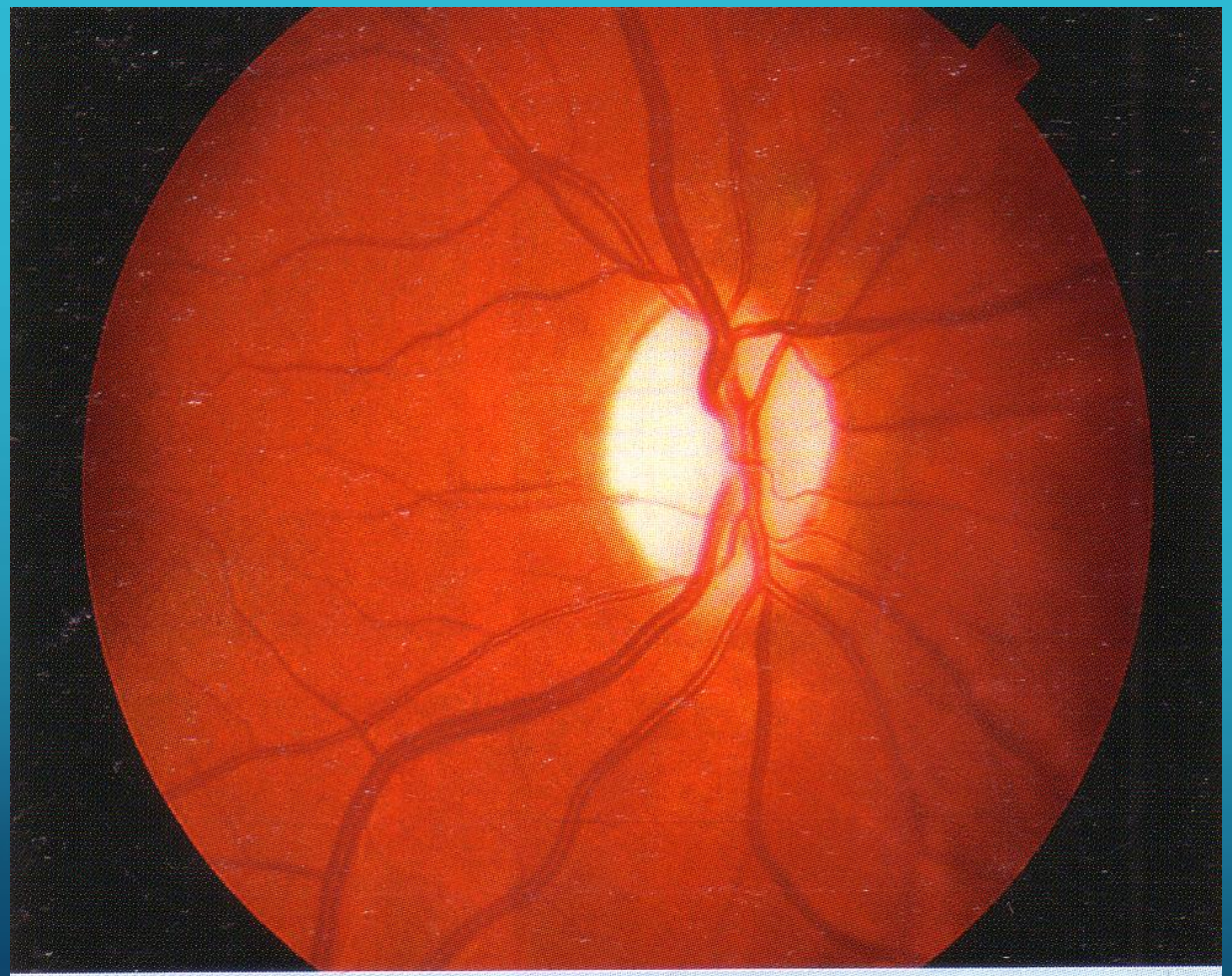


Fig. 18.20
Primary optic atrophy

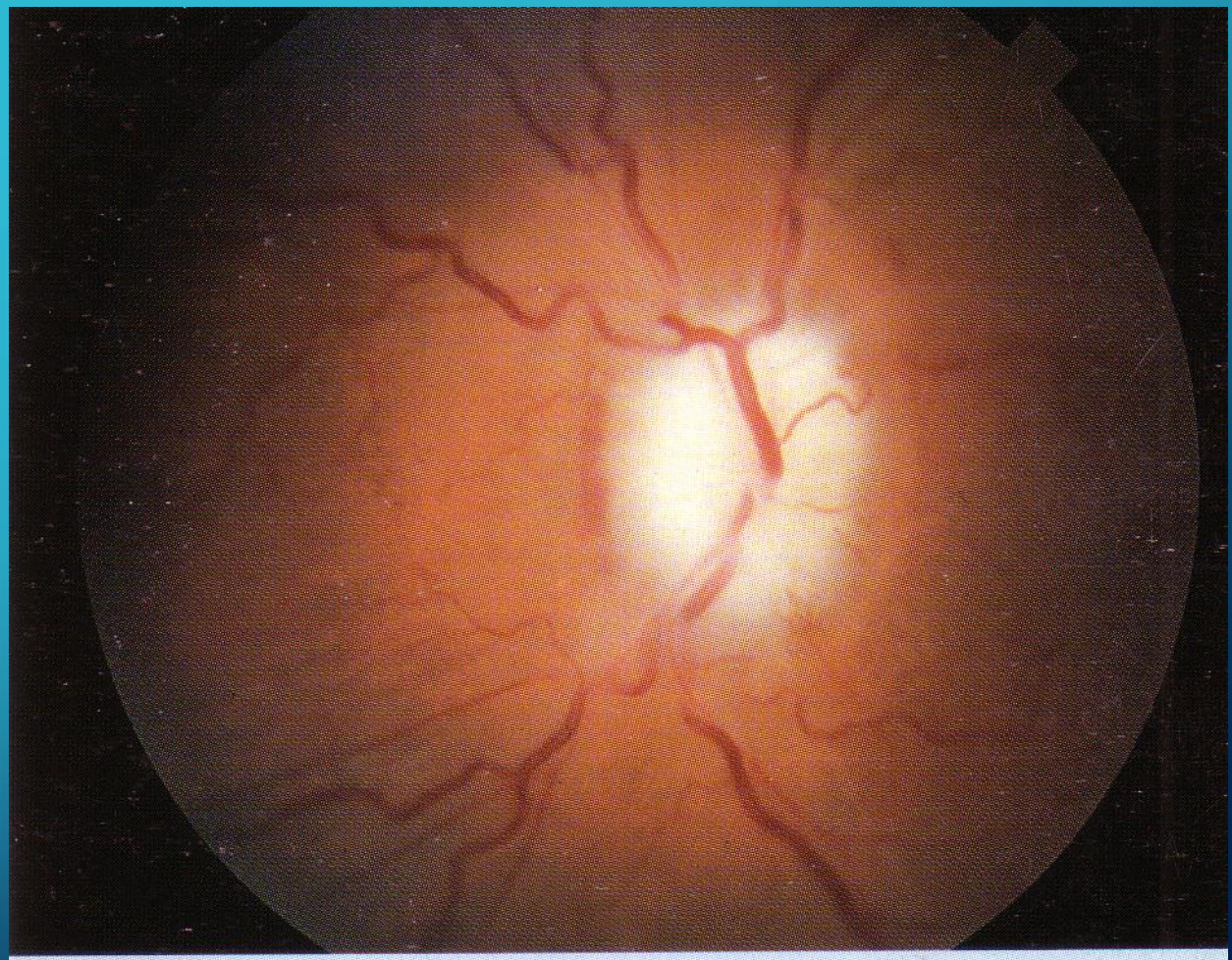


Fig. 18.21
Secondary optic atrophy

OPTIC NEURITIS

- Ophthalmoscopic classification
  - Retrobulbar neuritis – optic disc appears normal
  - Papillitis – variable hyperaemia and oedema of the optic disc with/without parapapillary flame shaped haemorrhage.
  - Neuroretinitis – characterized by papillitis in association with inflammation of the retinal nerve fiber layer. Macular star may be present.

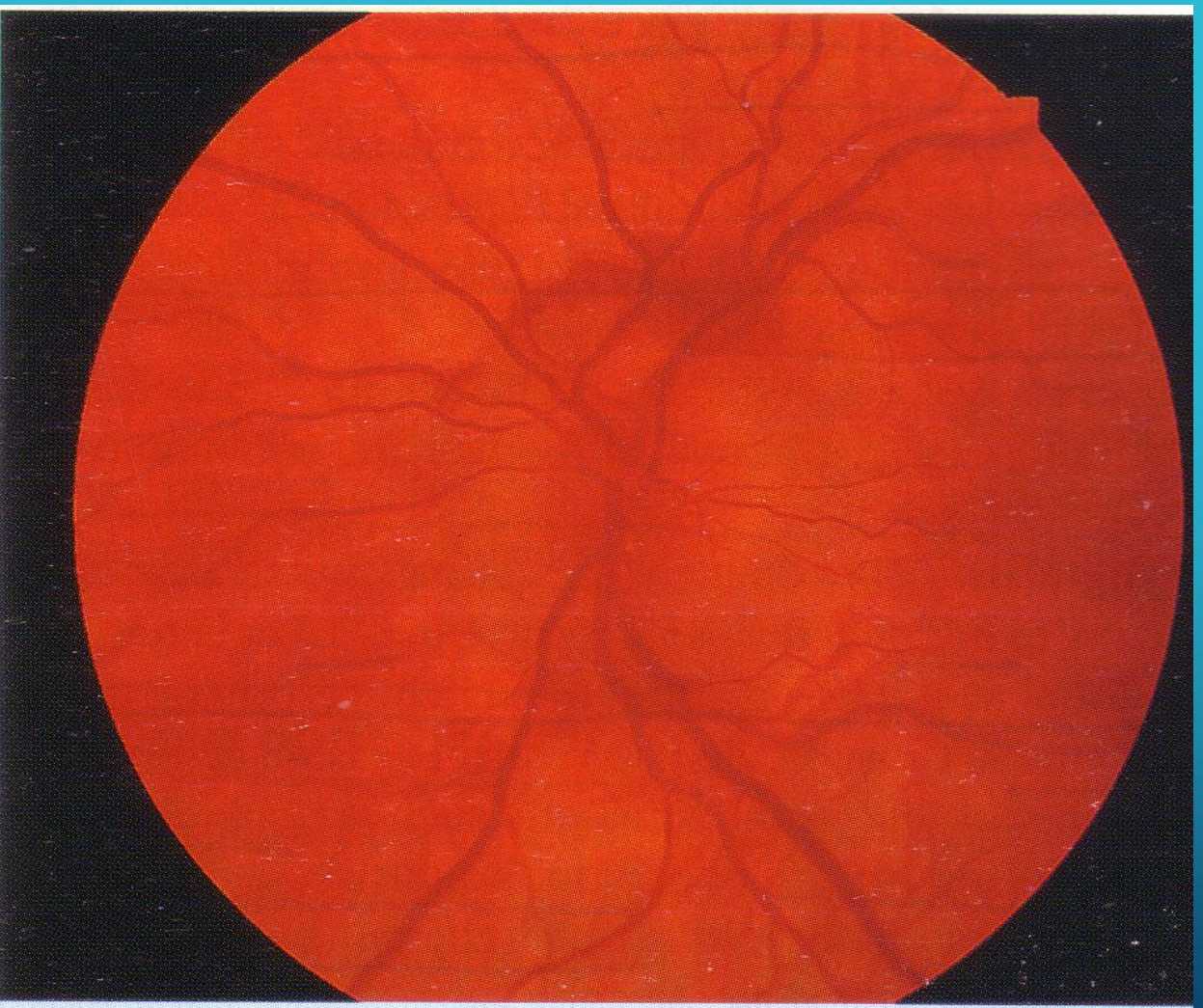


Fig. 18.22
Papillitis

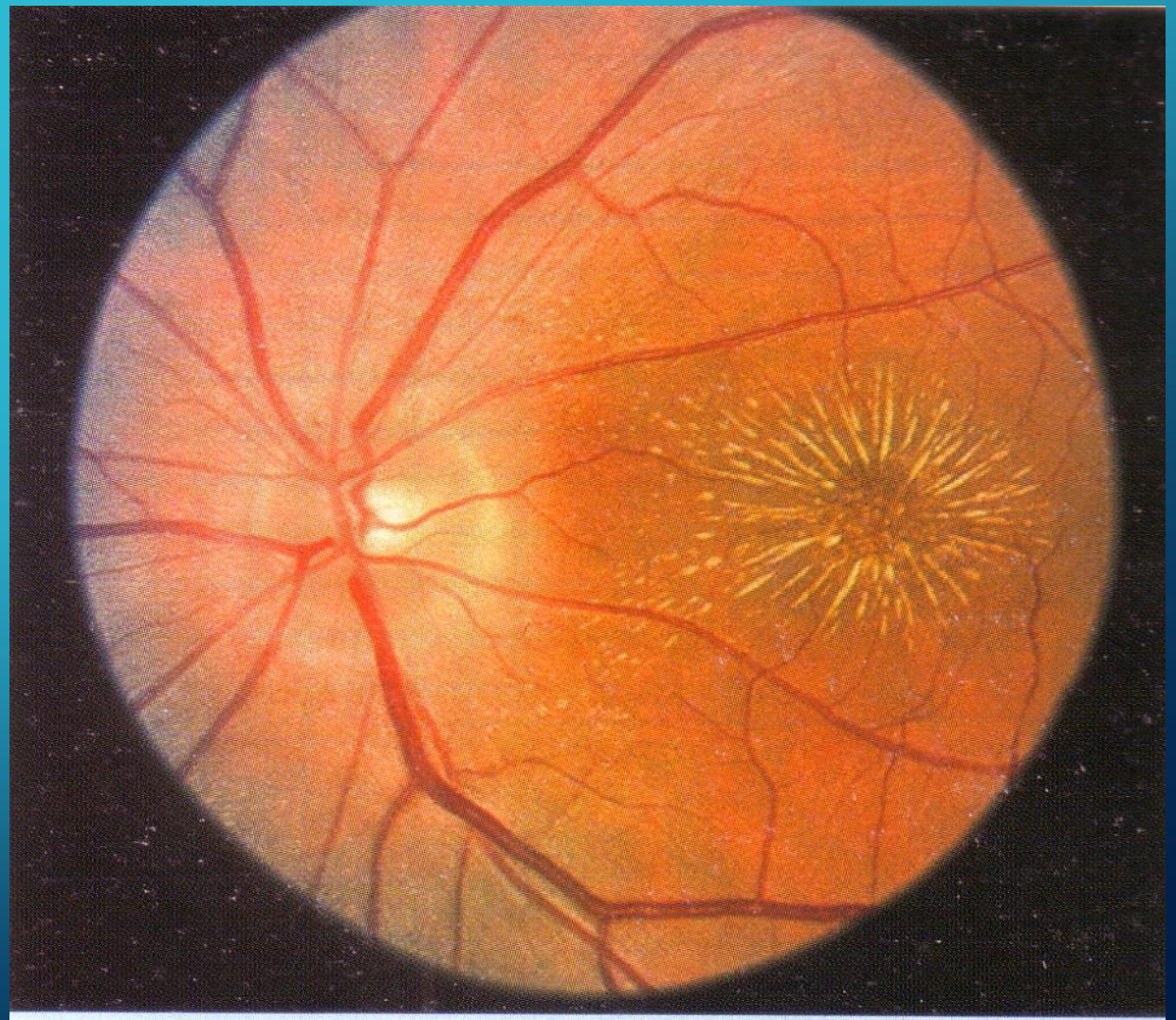


Fig. 18.23
Neuroretinitis

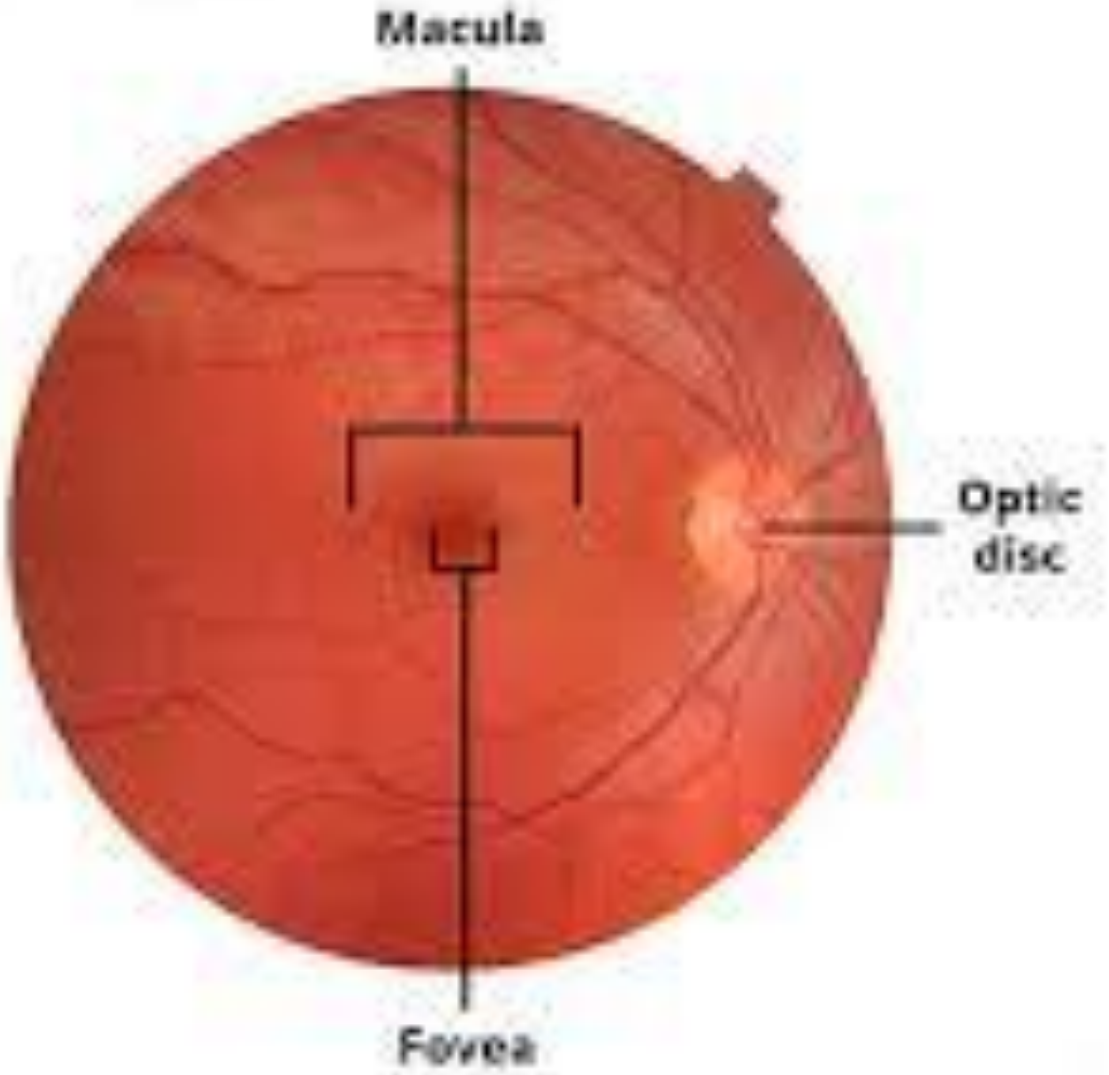
PAPILLOEDEMA

- It is the swelling of the optic nerve head secondary to raised intracranial pressure.

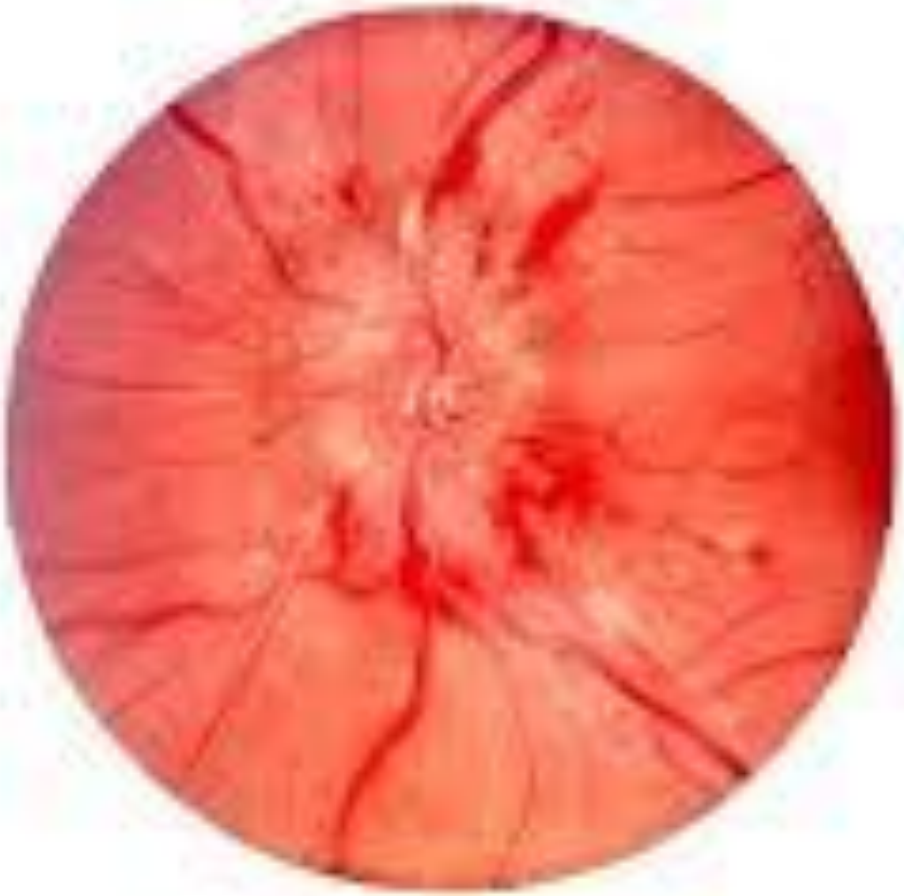
  (N.B.: Swelling of the optic disc due to other cause is known as disc oedema/swelling)

- Sign:
  - Early papilloedema
    - Optic disc shows hyperaemia and mild elevation
    - Disc margins appear indistinct and swelling of the parapapillary nerve fiber layer.
    - Loss of previous spontaneous venous pulsation

Normal:



Papilloedema:



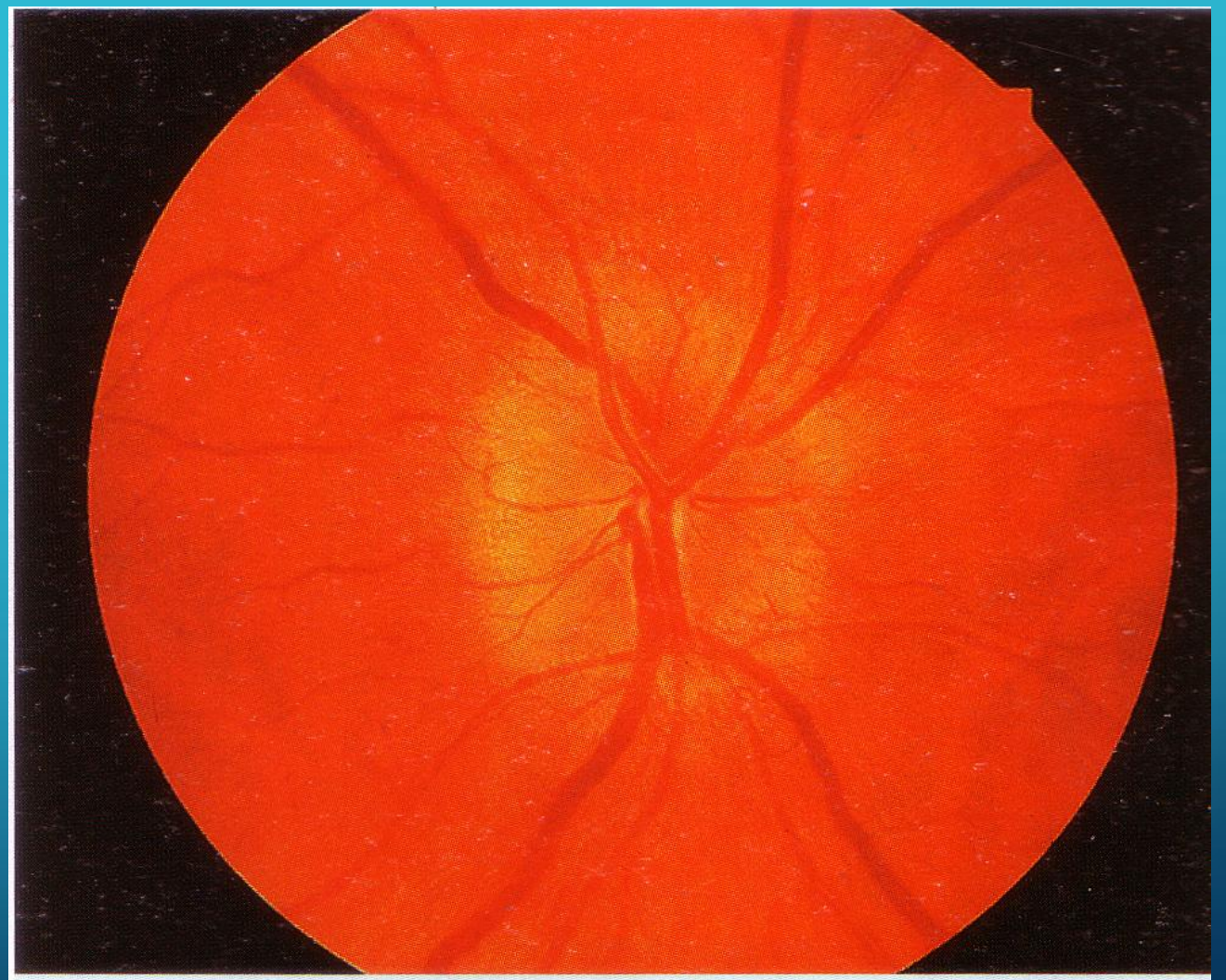


Fig. 18.37
Early papilloedema

- Established papilloedema-
  - Optic disc shows severe hyperaemia and moderate elevation with indistinct margin.
  - Optic cup and small vessels on the disc are obscured.
  - Venous engorgement, parapapillary flame shaped haemorrhage present.
  - Macular star may be present.

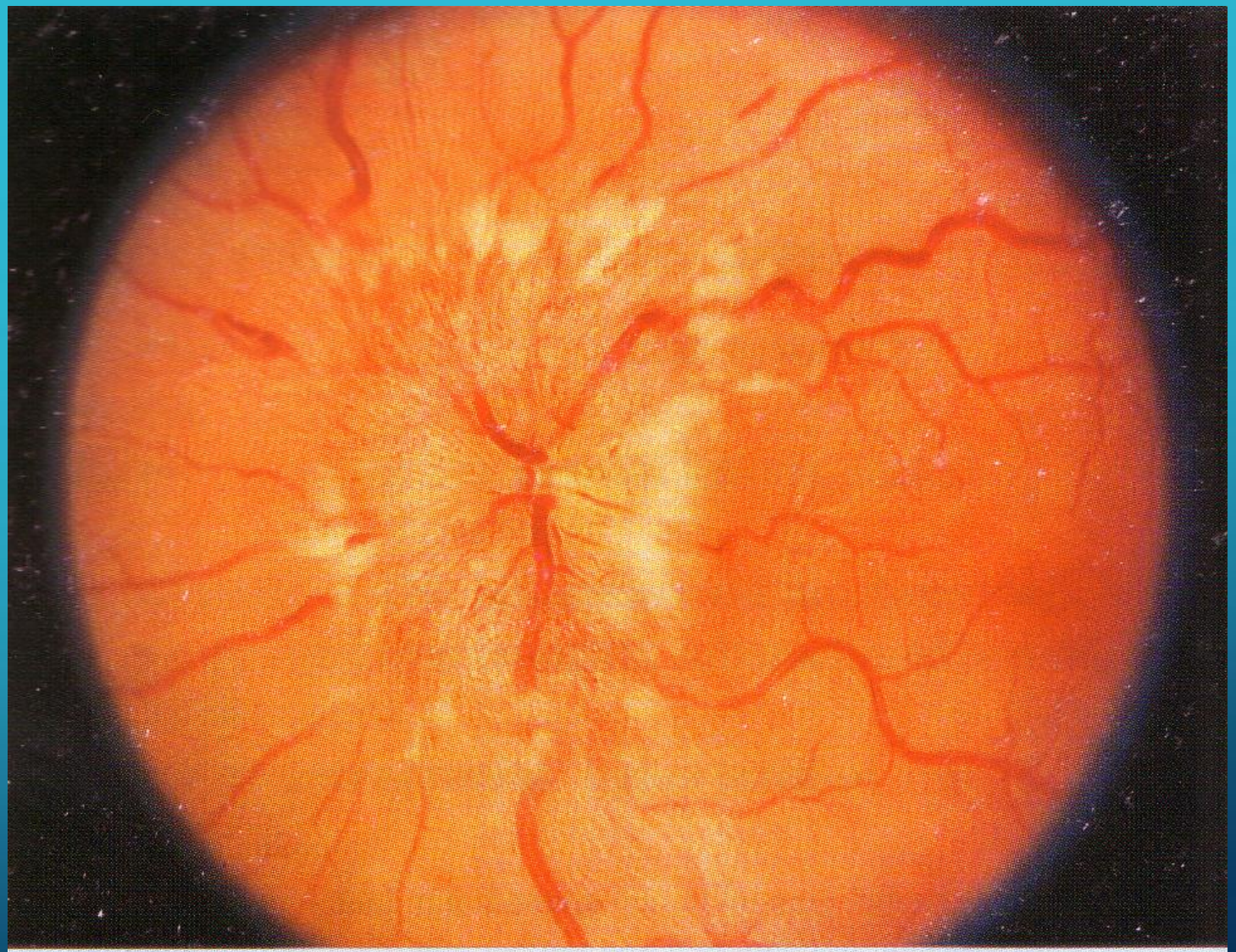
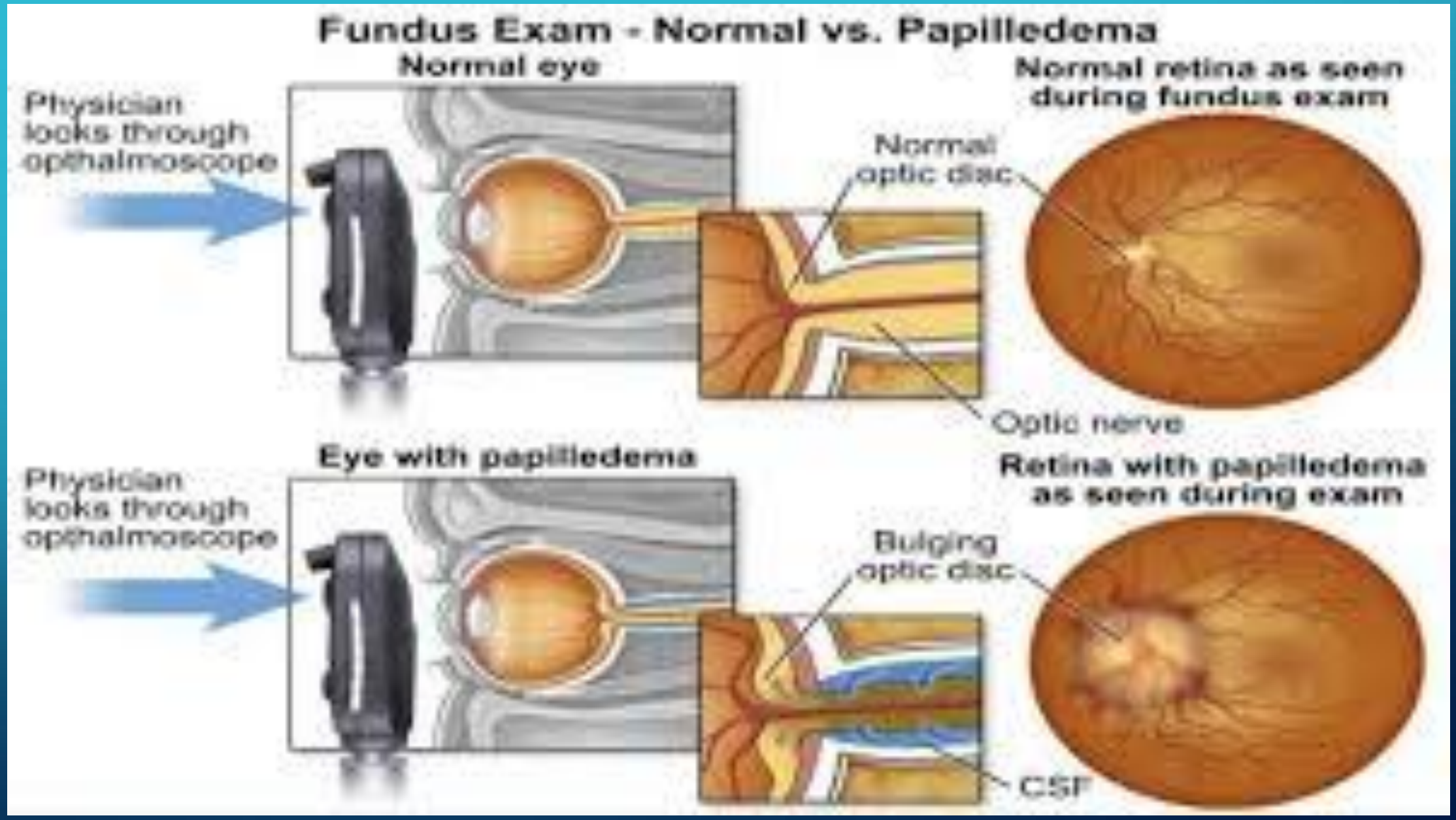


Fig. 18.38
Established papilloedema

PAPILLOEDEMA

- Secondary to raised intra cranial pressure
- Swelled disc
- Disc margin disappears


Fundus Exam - Normal vs. Papilledema
Normal eye
Physician looks through opthalmoscope
Normal optic disc
Optic nerve
Normal retina as seen during fundus exam
Eye with papilledema
Physician looks through opthalmoscope
Bulging optic disc
CSF
Retina with papilledema as seen during exam

Long standing papilloedema :

- Optic discs are markedly elevated
- Cotton wool spot and haemorrhage are absent.
- Opticociliary shunts and drusen like crystal deposits may be present on the disc surface.

- Atrophic papilloedema:
  - Optic discs are dirty gray color, slightly elevated with indistinct margin.

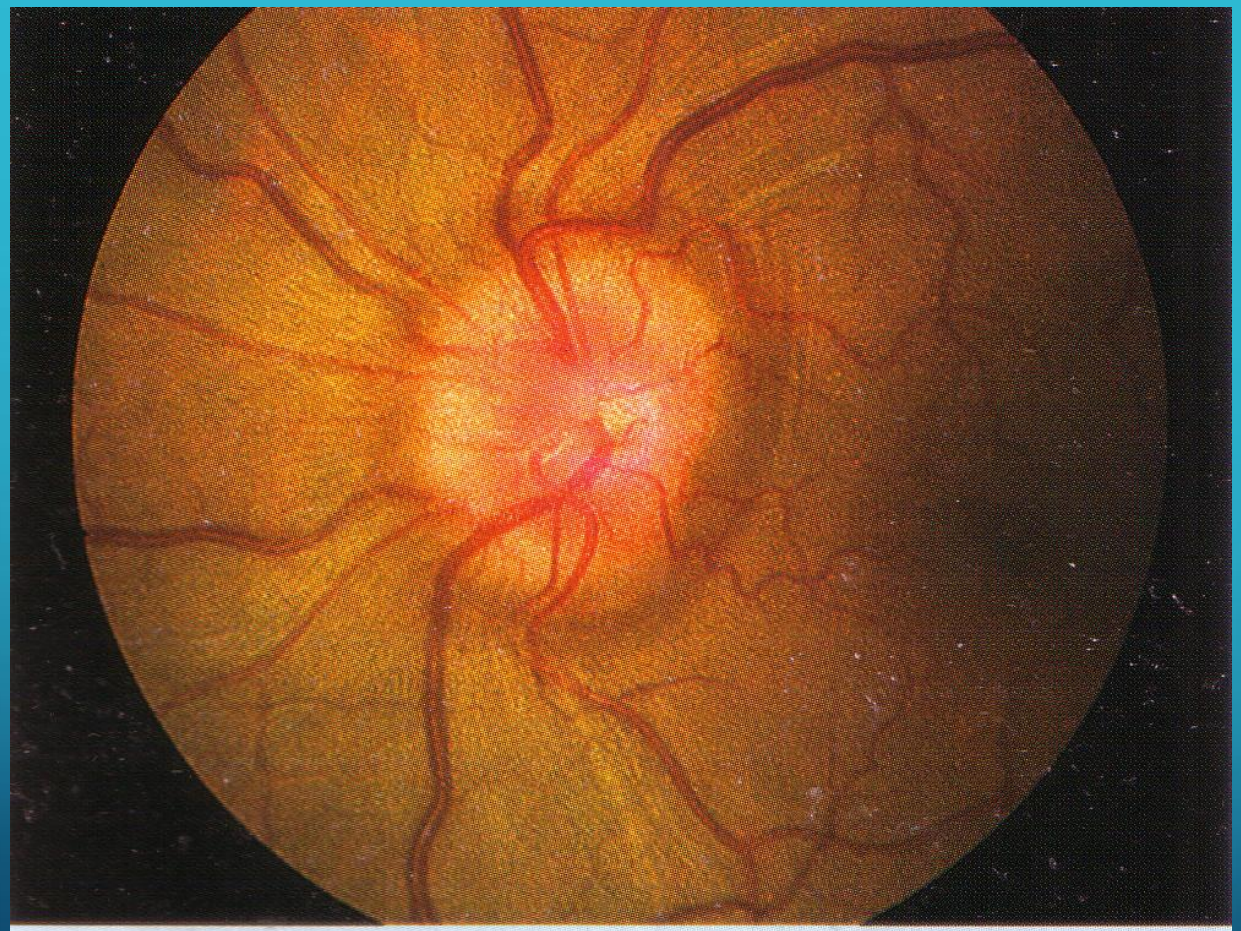


Fig. 18.39
Long-standing papilloedema

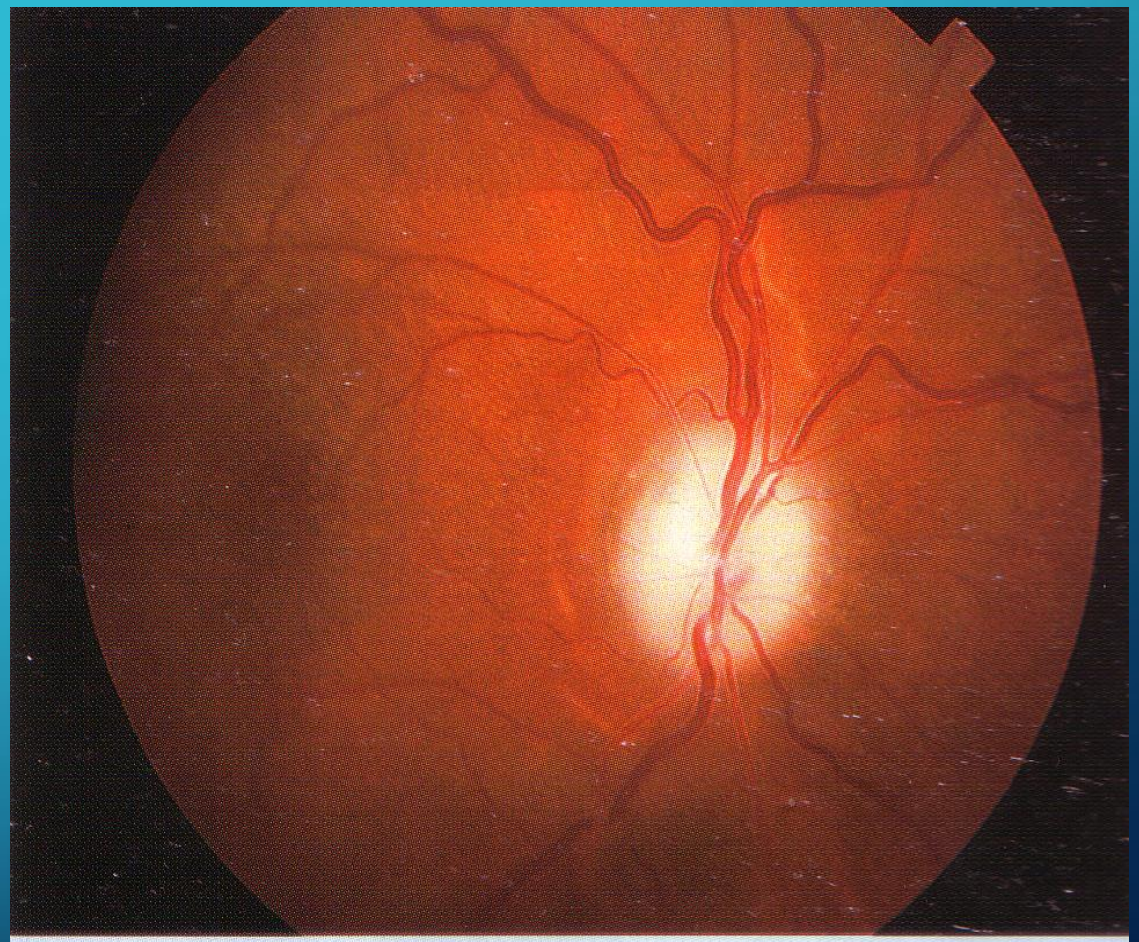


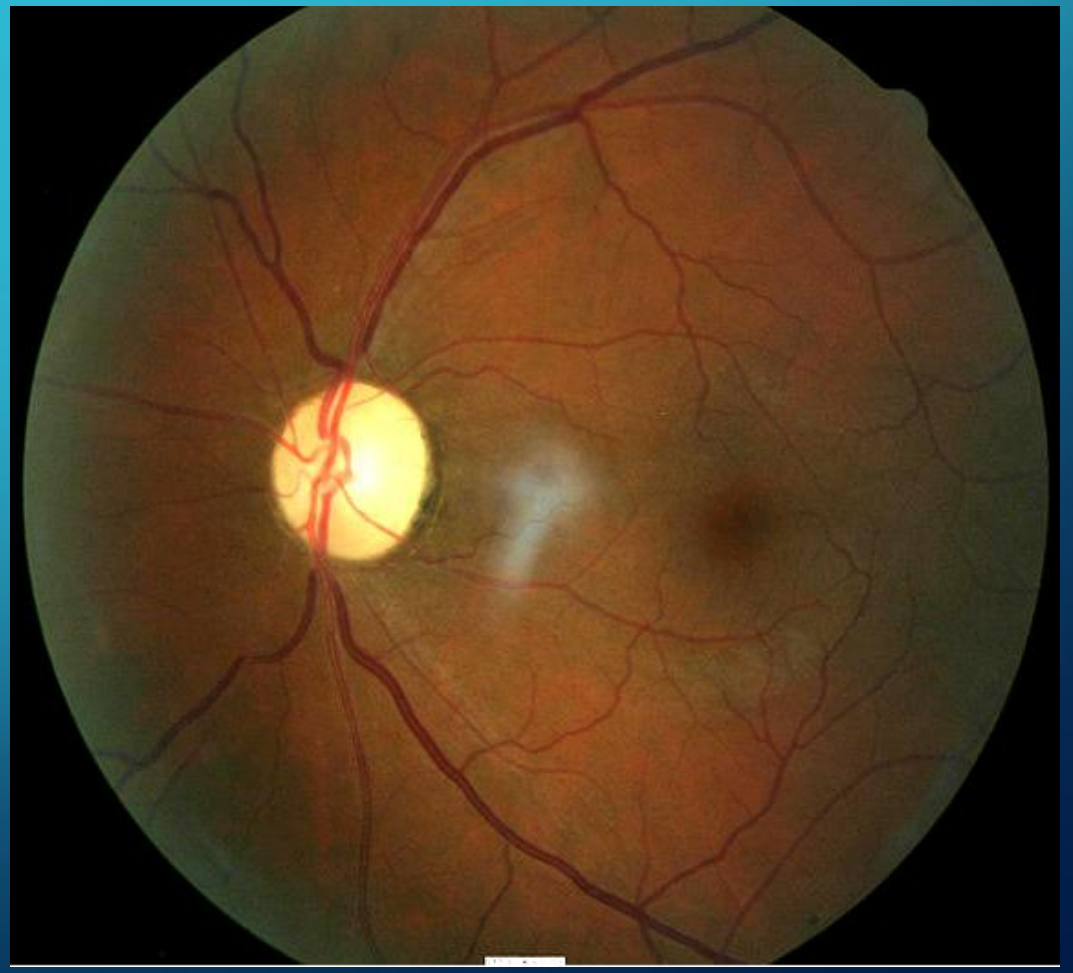
Fig. 18.40
Atrophic papilloedema

IDIOPATHIC INTRACRANIAL HYPERTENSION (IIH)

- Previously known as benign intracranial hypertension (BIH).
- Although not life threatening but IIH may result in permanent visual damage due to papilloedema. So it is not as benign as we thought.
- IIH is defined as raised intracranial pressure in the absence of an intracranial mass lesion or enlargement of ventricle due to hydrocephalus.
- Signs are same as papilloedema.

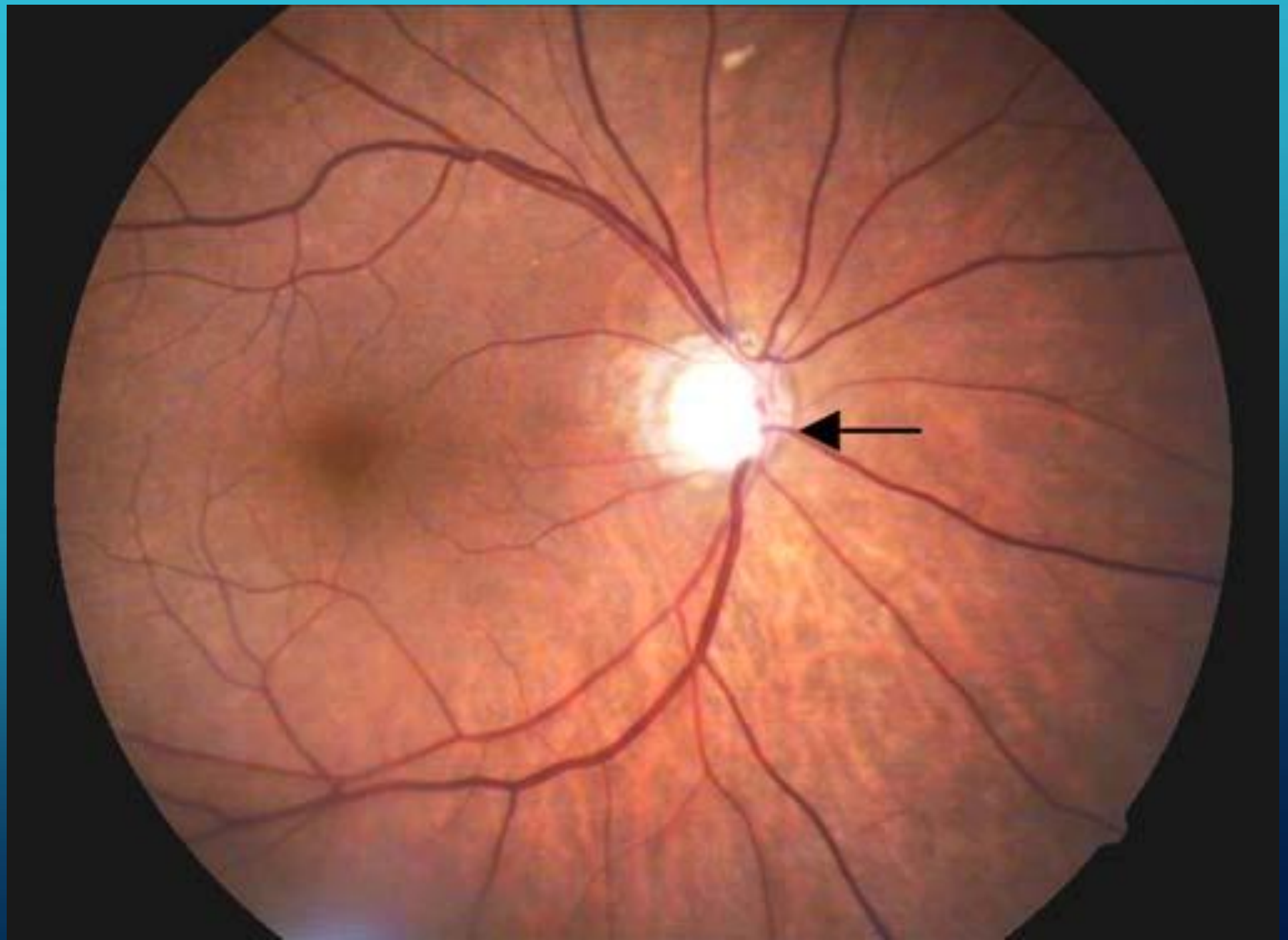
PRIMARY OPTIC ATROPHY

- Well defined disc margin
- Chalk white color
- Normal vessels



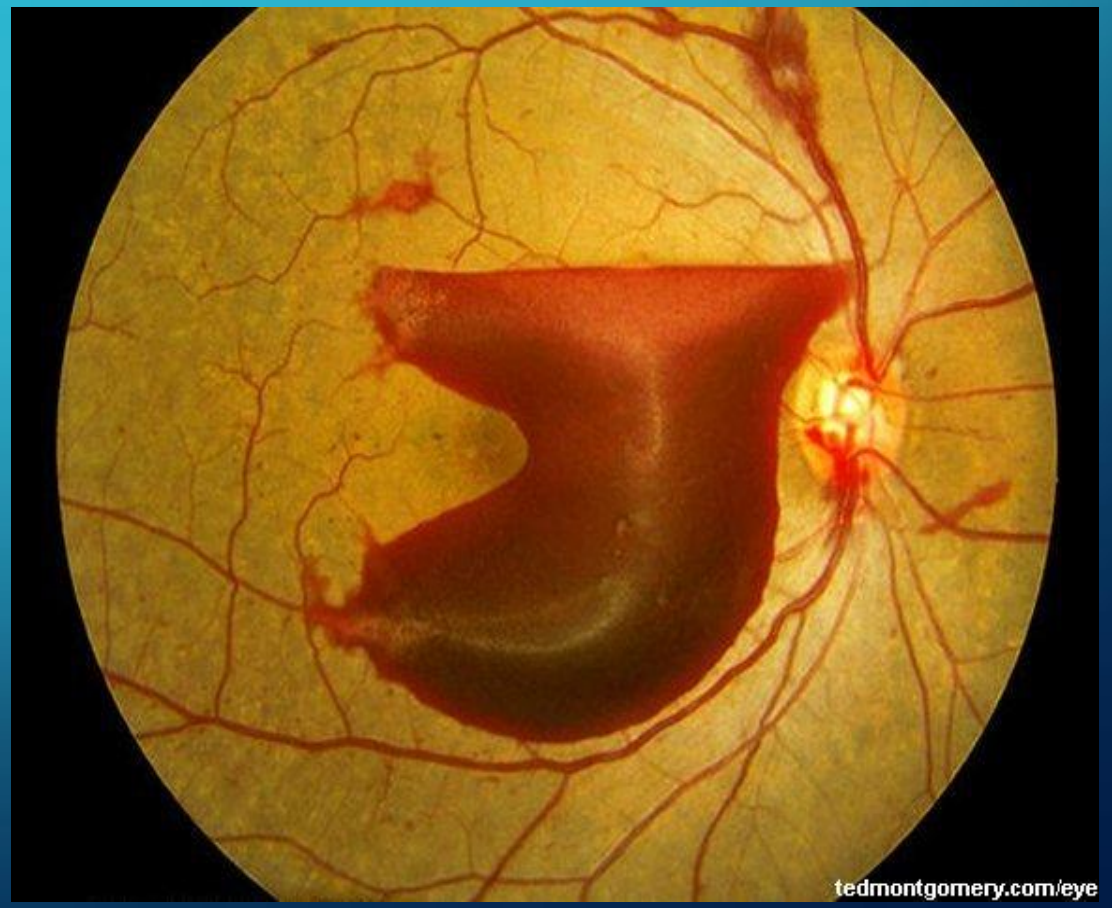
SECONDARY OPTIC ATROPHY

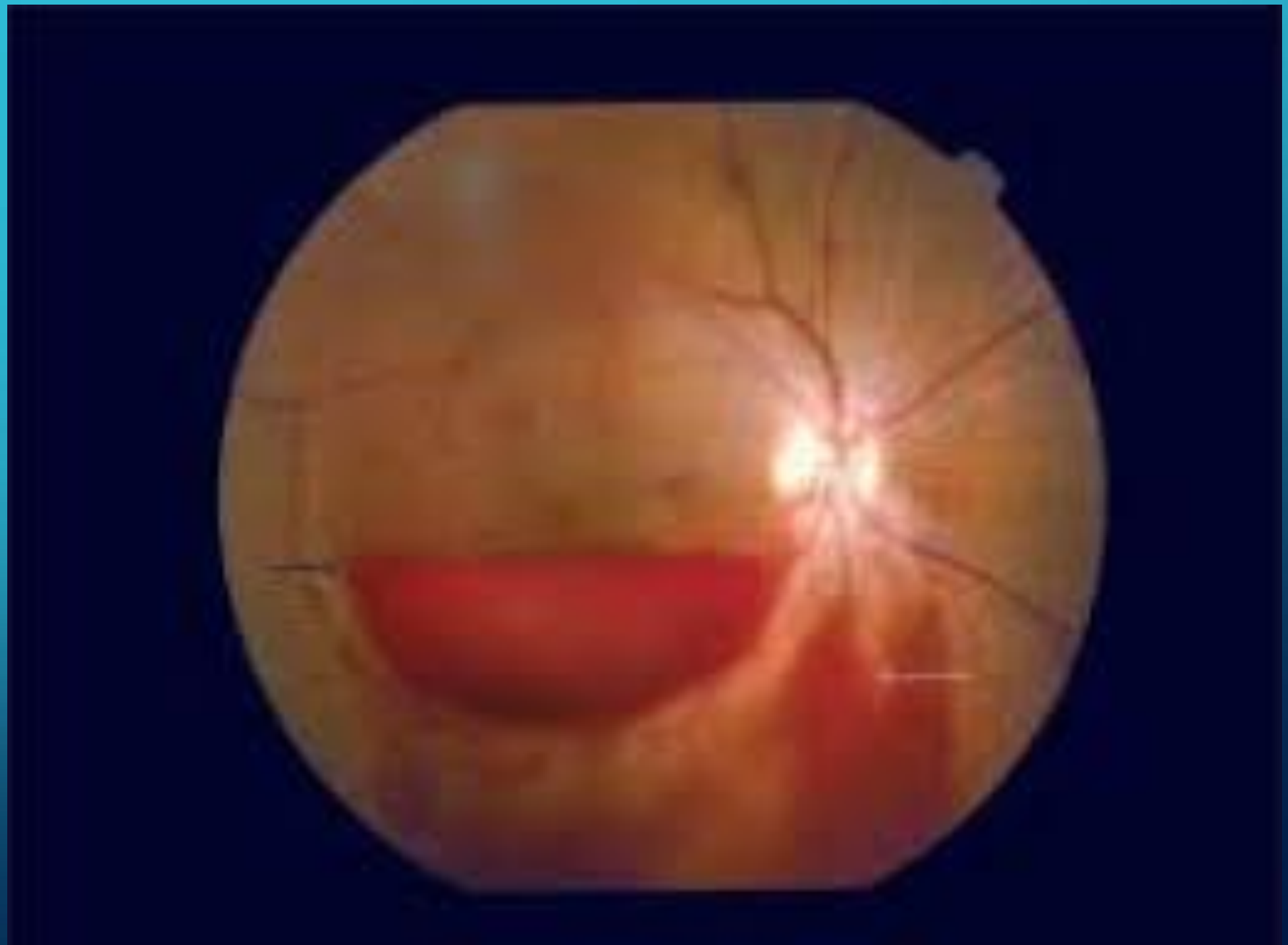
- Blurred disc margin
- Gray (dirty white) margin
- Normal or Attenuated vessels



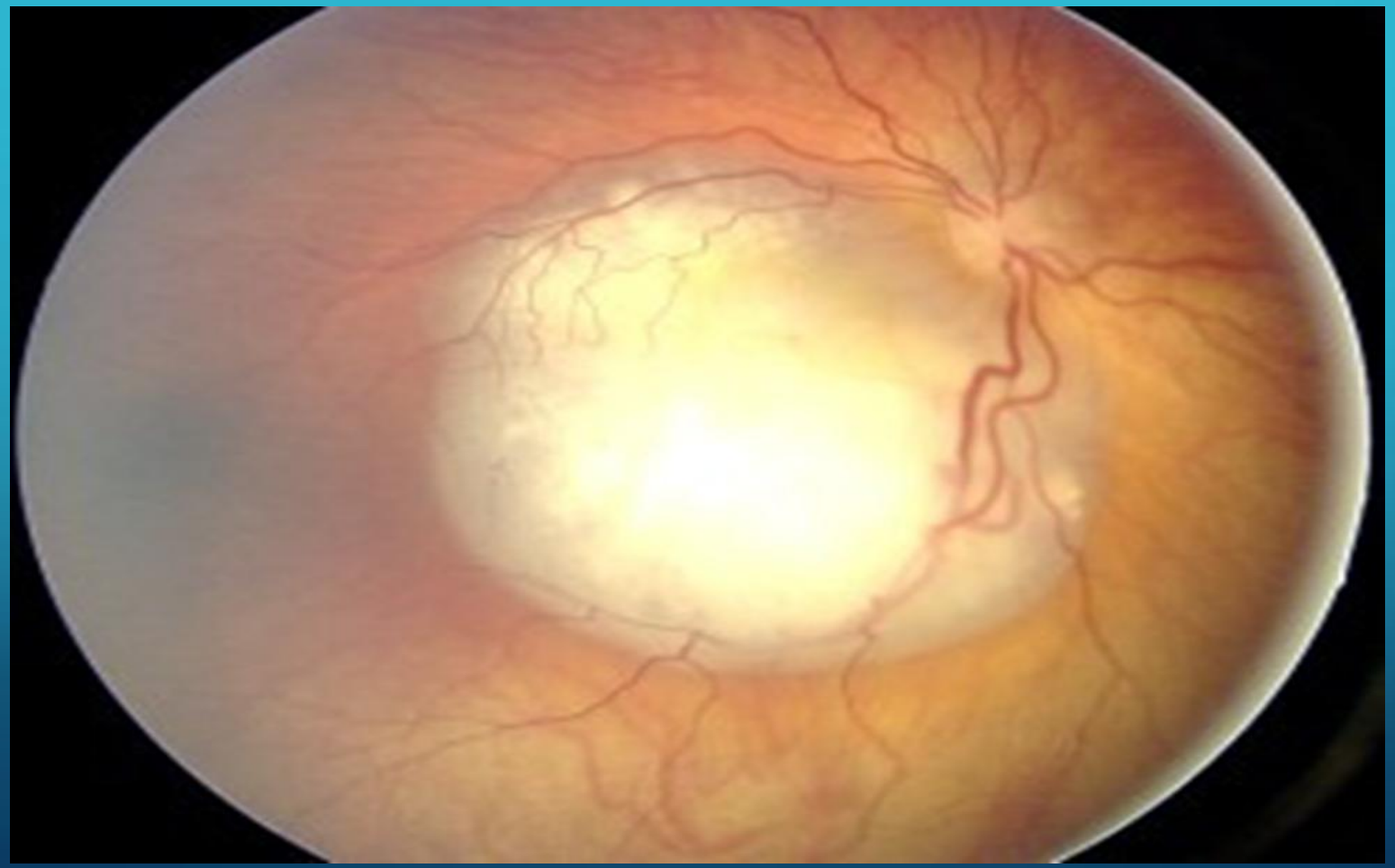
SUBARACHNOID HEMORRHAGE

- Retinal and sub-hyaloid hemorrhage





RETINOBLASTOMA



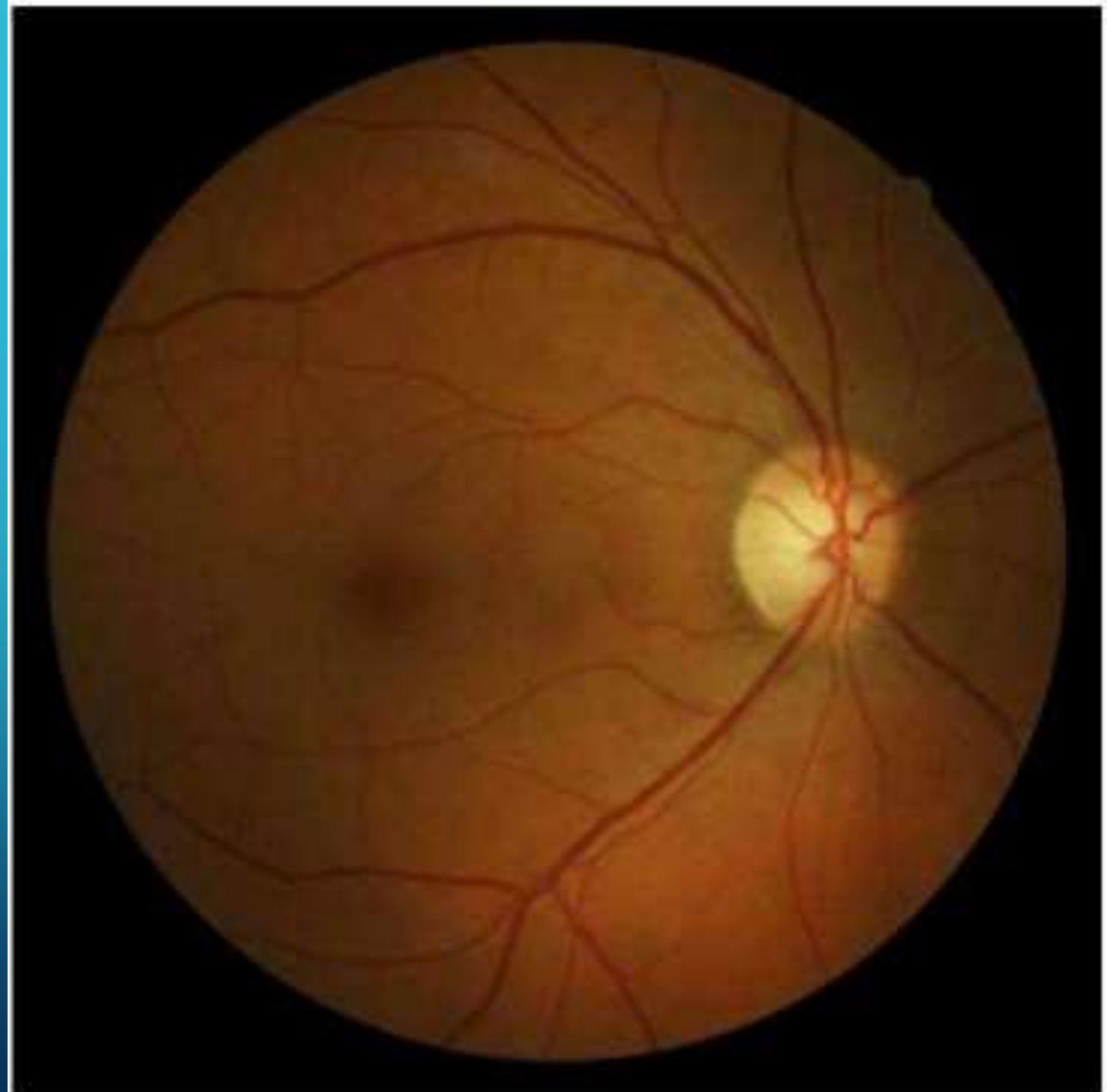
Leukocoria

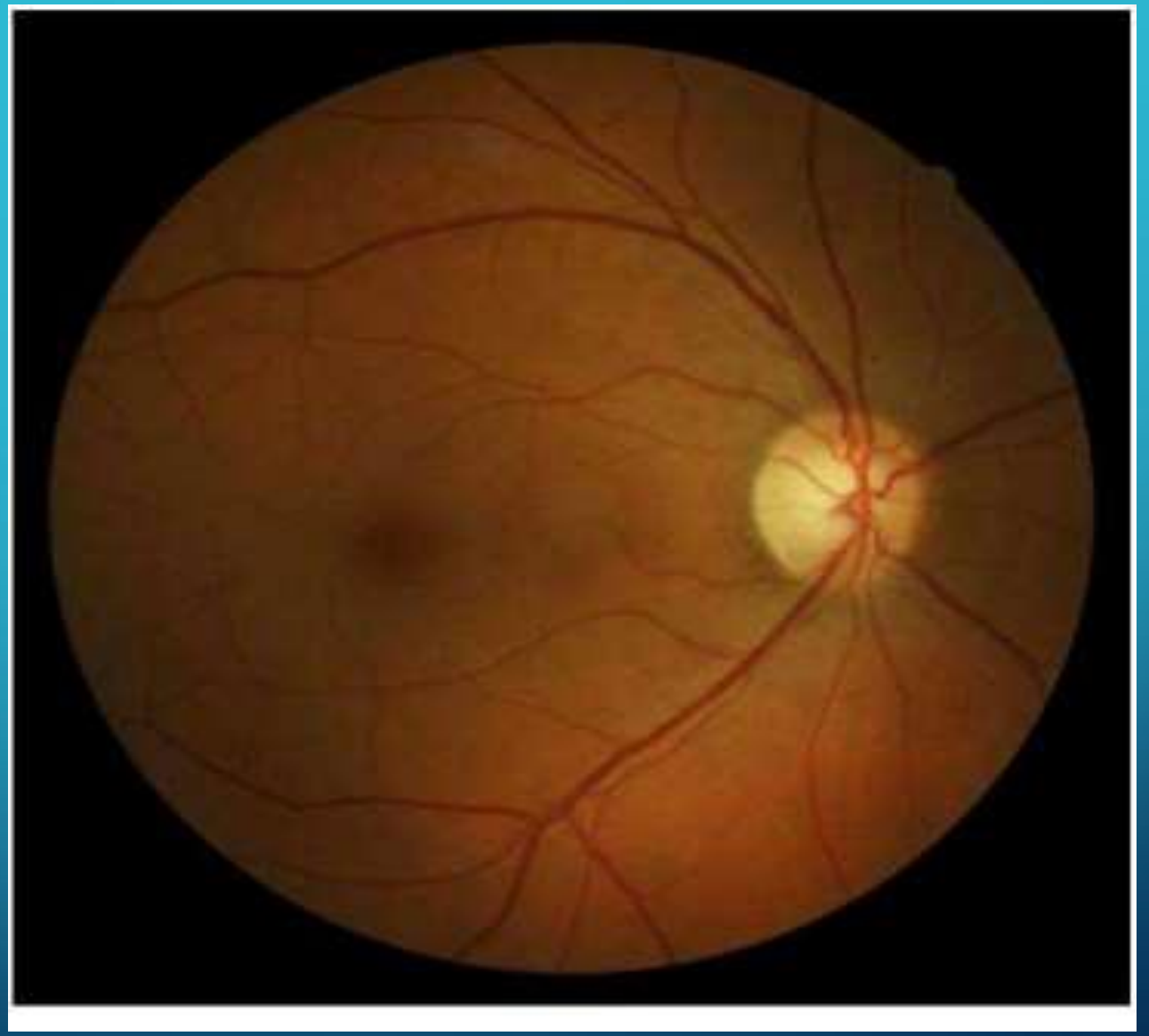
Direct visualization of tumor

(Multi globulat-

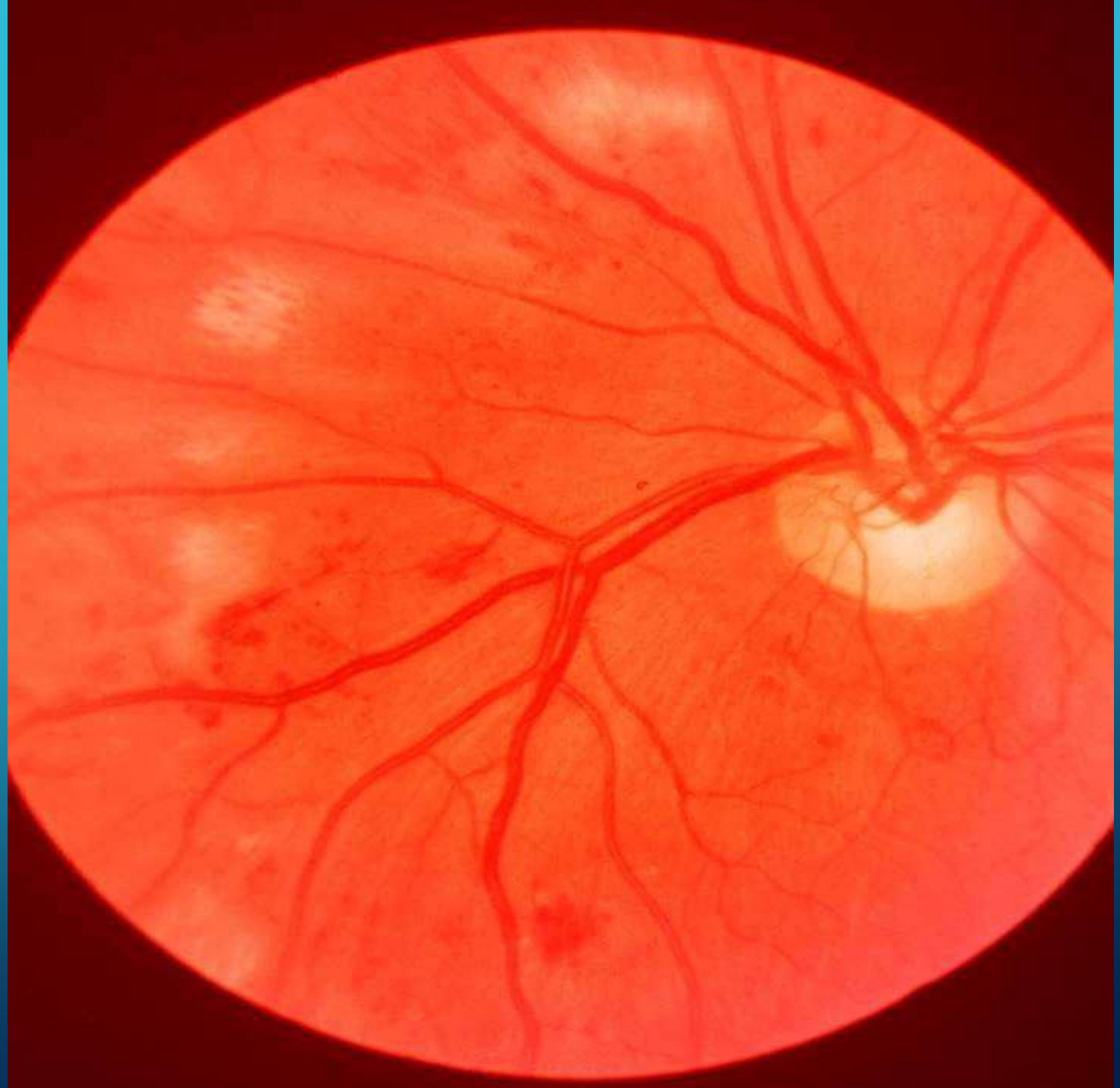
-ed white mass with overlying retinal detachment)

RAPID QUIZ

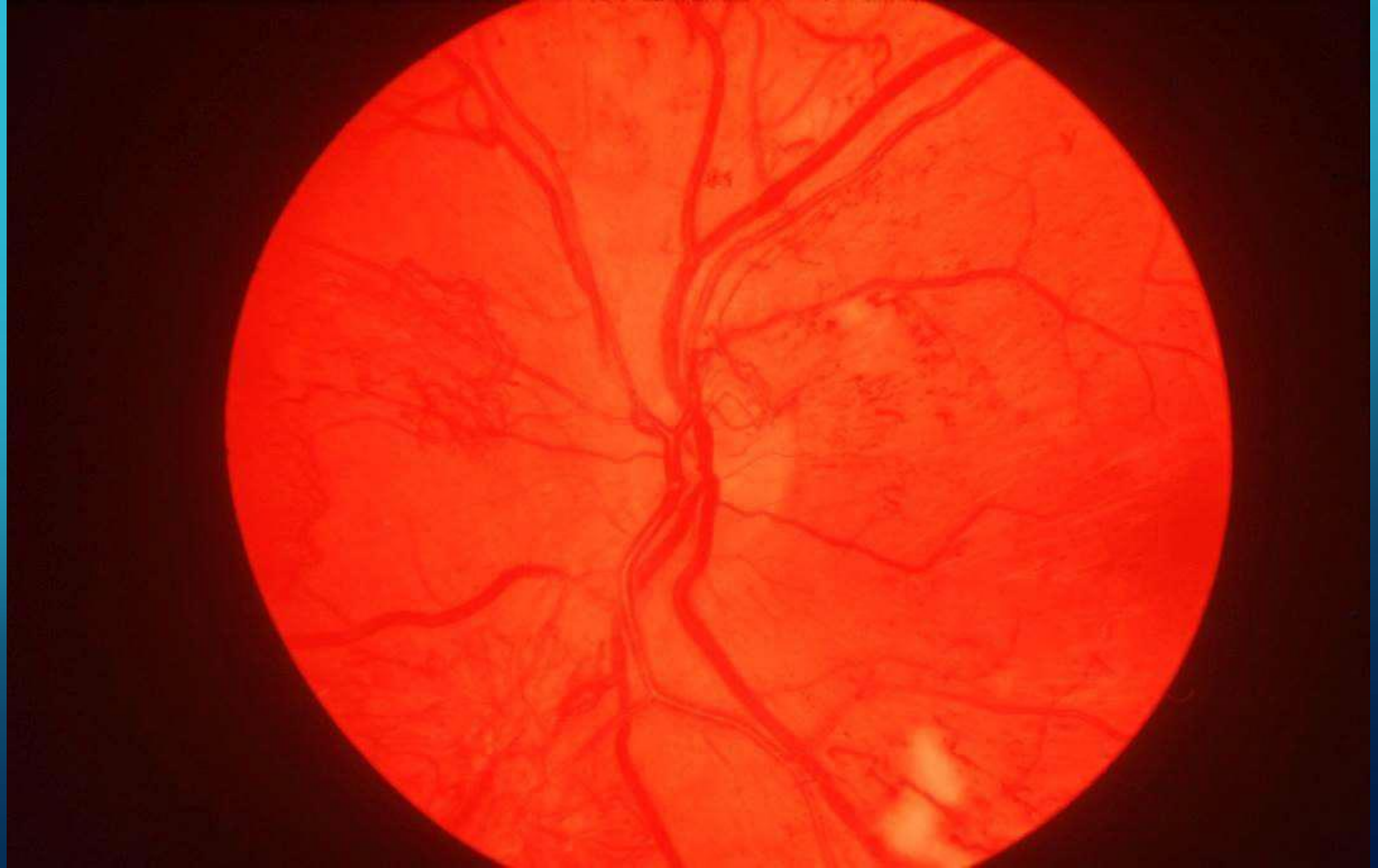




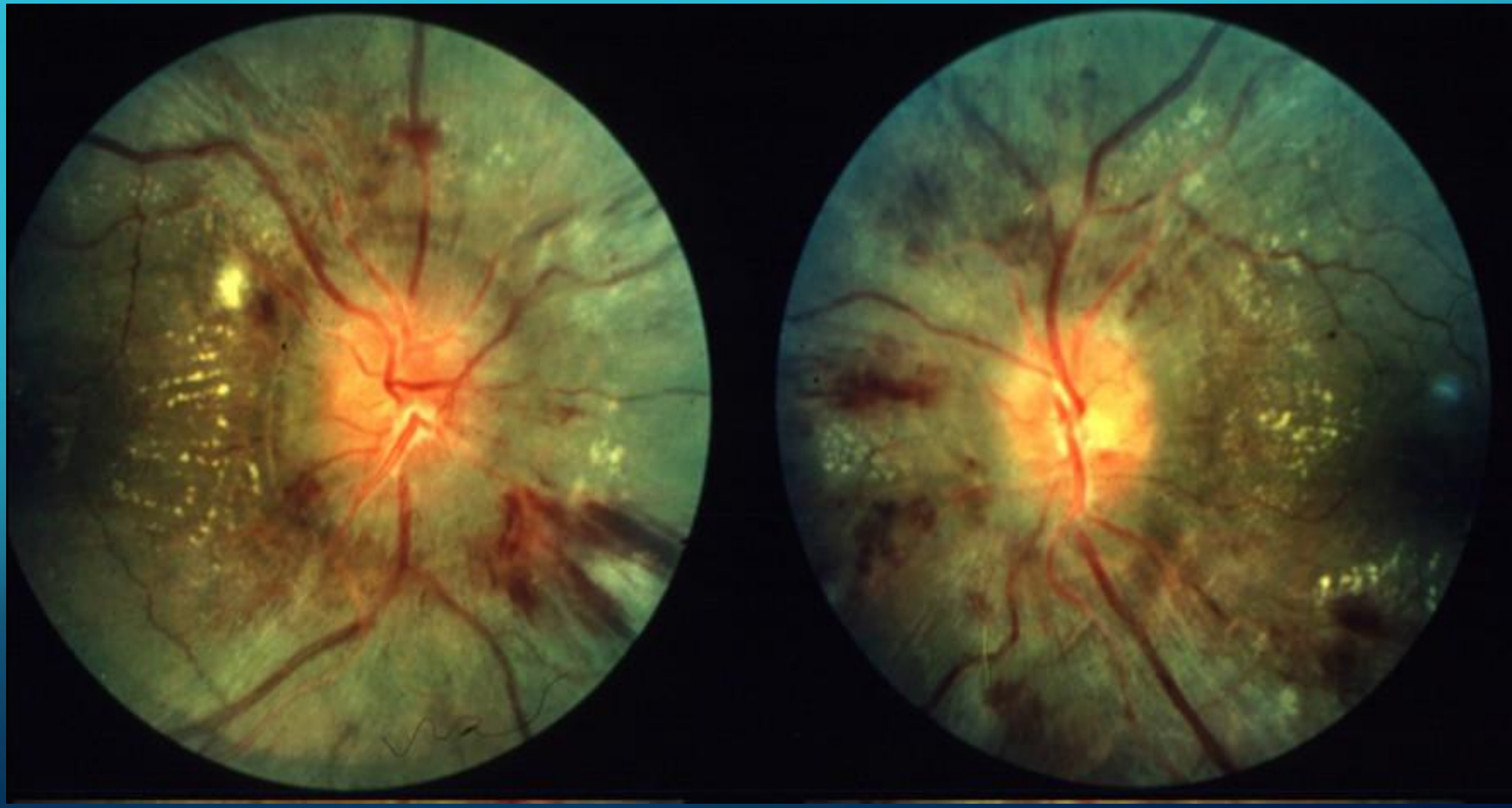
NORMAL FUNDUS



- Opthlamoscopic findings of the right eye of this pleasant middle aged man revealed multiple microaneurysms, retinal dot and blot hemorrhages, exudates, cotton wool spots .The disc is normal.
- Diagnosis is Diabetic background retinopathy.

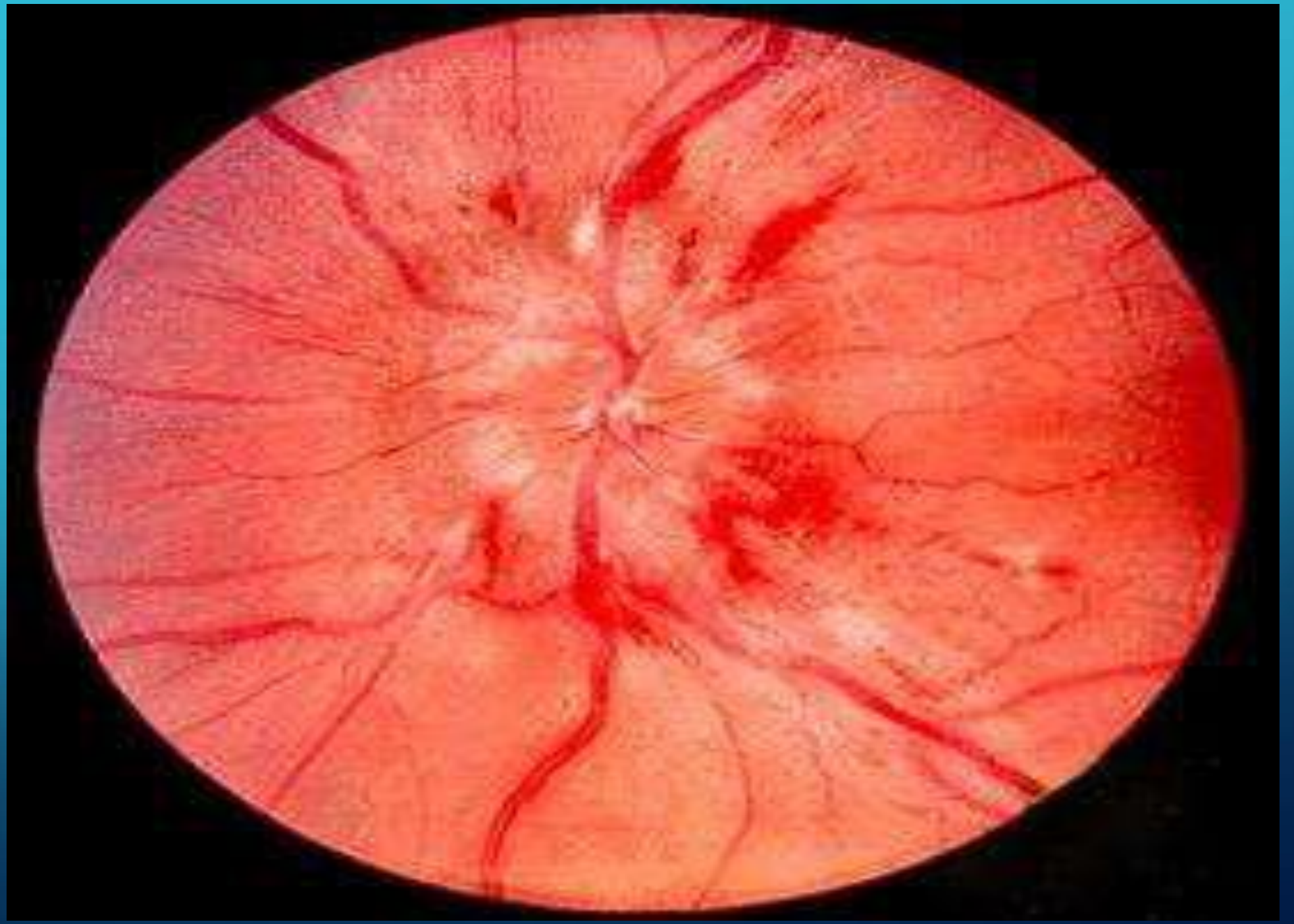


- Opthlamoscopic findings of the right eye of this pleasant middle aged man revealed multiple microaneurysms, retinal dot and blot haemorrhages, exudates, cotton wool spots and Small tufts of irregular vasculature around the disc.
- The disc is normal.
- My diagnosis is Proliferative Diabetec Retinopathy.

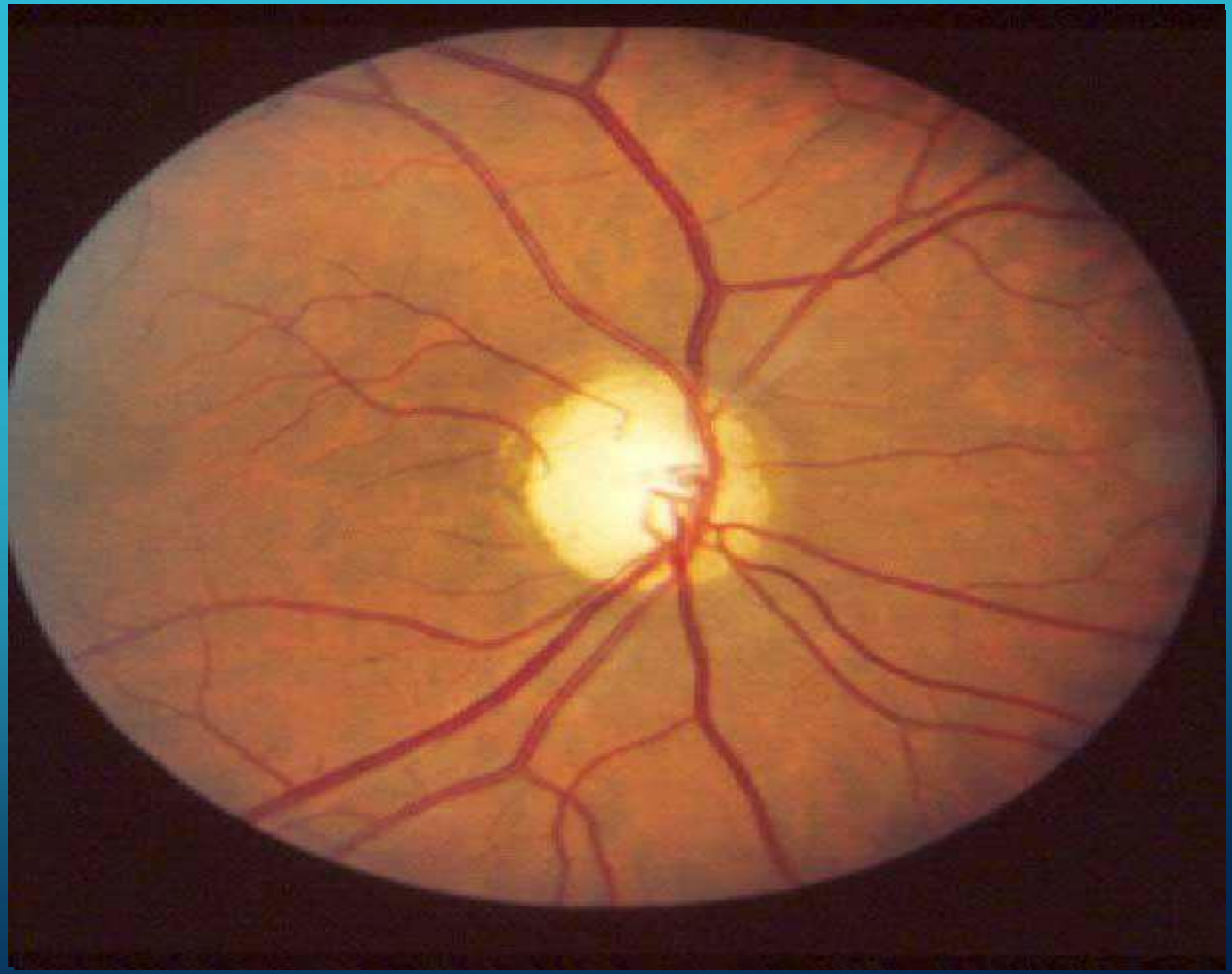


The discs are swollen with blurred margin. The retinal arterioles are irregular, tortuous with silver wiring and AV nipping, numerous hard exudates all over retina and few cotton wool exudates.

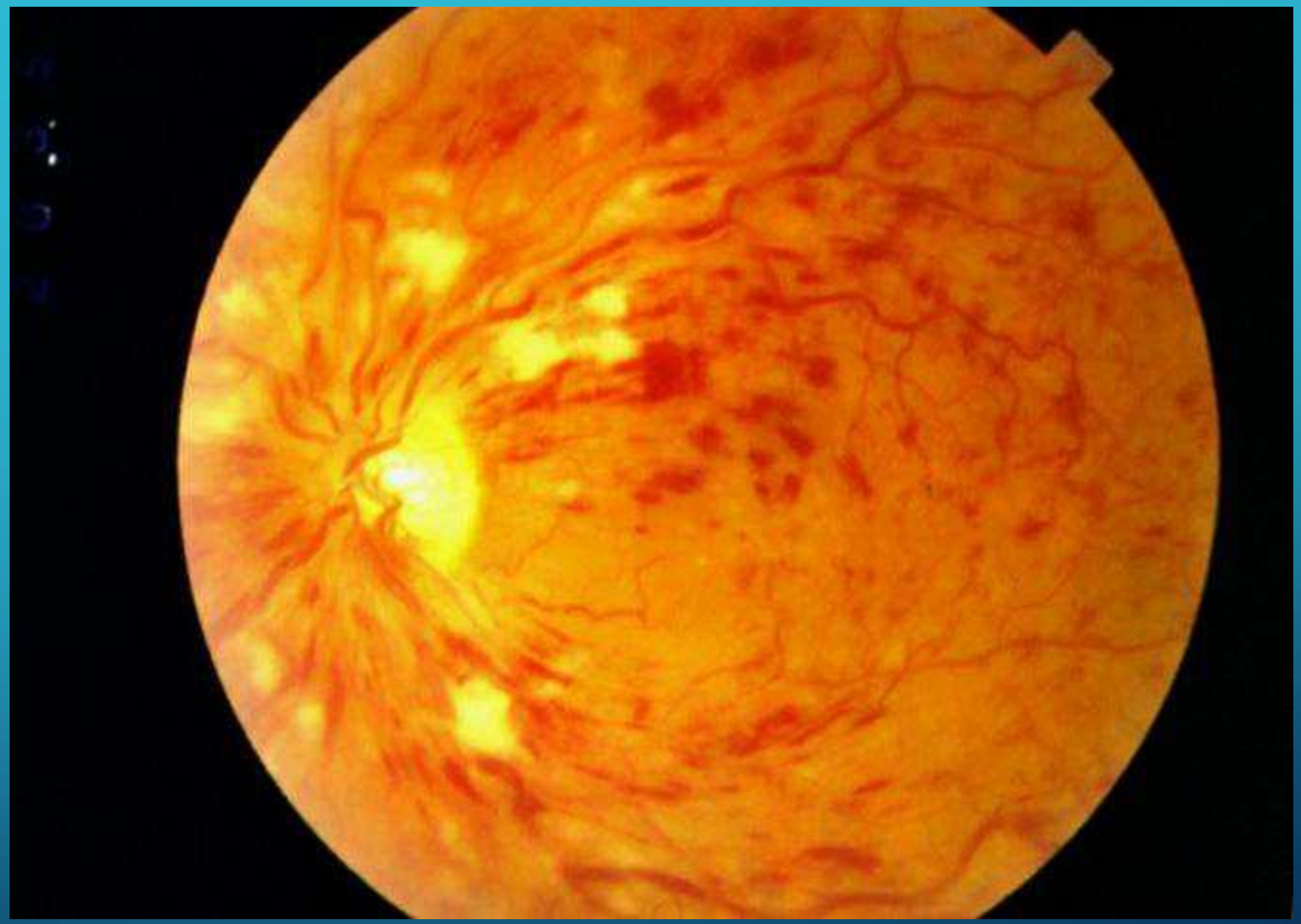
Diagnosis is Hypertensive retinopathy grade four



- There are Bilateral swelling of the optic disc, Blurring of the optic disc margins, there are hemorrhages and cotton wool exudates around the disks,
- The diagnosis is bilateral papiloedema.

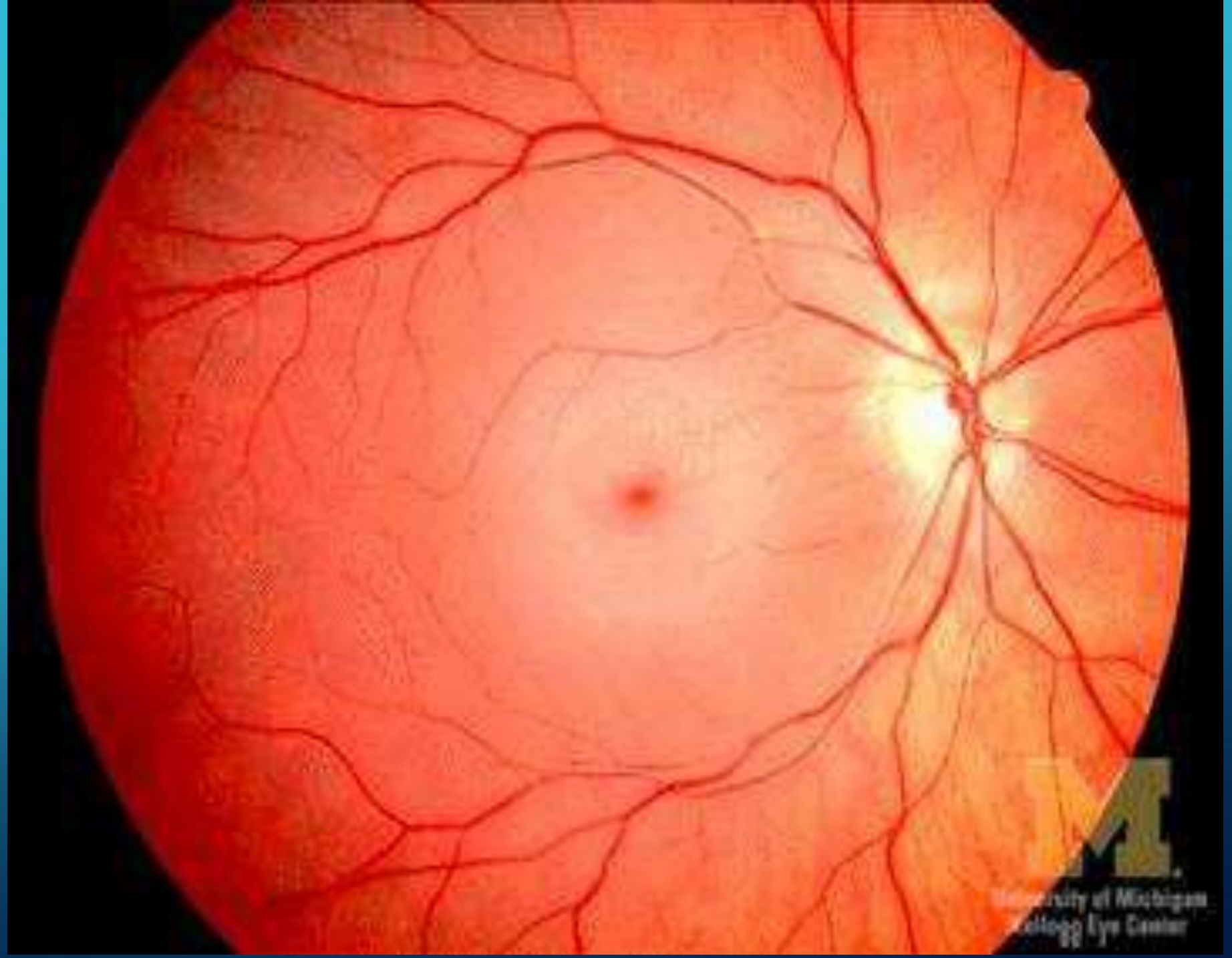


- The optic disc is pale and has distinct margin. The pupil is dilated on the same eye.
- Diagnosis is primary optic atrophy.



- There are multiple scattered flame hemorrhage all over retina. The veins are tortuous. In addition there are soft exudates. The disc is swollen.
- Diagnosis is Central Retinal Vein occlusion.

- There are multiple scattered flame hemorrhage in upper and right quadrant of retina. The veins are tortuous. The disc is swollen.
- Diagnosis is Branch Retinal Vein occlusion.


University of Michigan
Kellogg Eye Center

- Typical Cherry red spot in the centre of retina and papiloedema
- Diagnosis is Central retinal Artery occlusion.

TAKE HOME MESSAGE

- Important bedside examination
- Don’t complete cranial nerve examination without examining fundus
- Don’t miss to detect signs of raised ICP like papilloedema in suspected cases of headache and other CNS diseases
- Do not perform lumber puncture before examining fundus
- Assessment of progression of systemic diseases like Diabetes, Hypertension
- Systemic diseases often diagnosed first through fundoscopy by ophthalmologist

রায়েরবাজার বধ্যভূমিতে শহীদ বুদ্ধিজীবীদের স্মৃতিসৌধ

ফাঁসির মঞ্চে গেয়ে গেল যারা জীবনের জয়গান, আসি' অলক্ষ্যে দাঁড়ায়েছে তারা, দিবে কোন্ বলিদান?

এই সে বধ্যভূমি।১৯৭১ সনে মুক্তিযুদ্ধ বিজয়ের উষালগ্নে পাকিস্তানি হানাদার ও তাদের এ দেশীয় দোসর রাজাকার,আলবদর বাহিনীর বাঙালি-বুদ্ধিজীবী নিধনের এ সেই স্থান। এখানেই নৃশংসভাবে হত্যা করা হয়েছে বাঙালি জাতির বিবেক, চেতনা,মননশীলতা,ঐতিহ্য ও সংস্কৃতির ধারক ও বাহক-এ মাটির শ্রেষ্ঠ সন্তান-বুদ্ধিজীবীদের। পরিত্যক্ত ইটের ভাটার এ বধ্যভূমি থেকে আজো ভেসে আসে ক্ষতবিক্ষত হাত পা,উপড়ানো চোখ,বেয়নেটবিদ্ধ শহীদের আর্তনাদ: শোনা যায় স্বাধিকার প্রত্যাশী প্রতিবাদী কণ্ঠের গোঙানি আর মানুষরূপী বরুলোনুপ হায়েনার মারণ-উল্লাস। এখানে আকাশ ধমকে আছে, বাতাস ভারী, পত্রপল্লব অনড়, শোক ভাষাহীন।এ নির্বাক শোক, আর বেদনারই বিমূর্ত প্রতীক এ স্মৃতিসৌধ। "সোনার বাংলা আমরা গড়বই" —এই হোক নাম জানা, অজানা অসংখ্য শহীদের অতৃপ্ত আত্মার প্রতি আমাদের শেষ অঙ্গীকার।

তোমাদের যা বলার ছিল
বলছে কি তা, বাংলাদেশ?

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