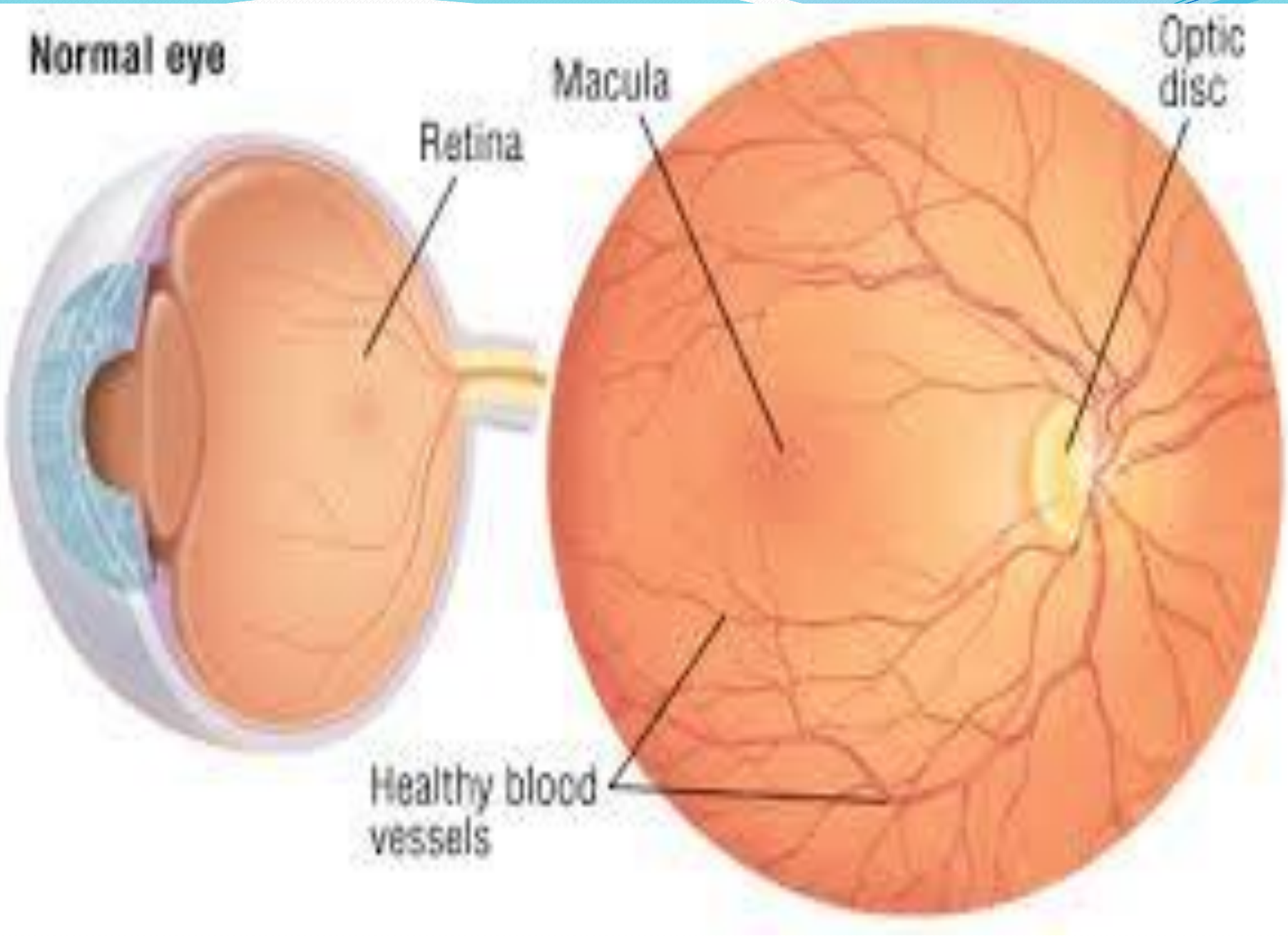
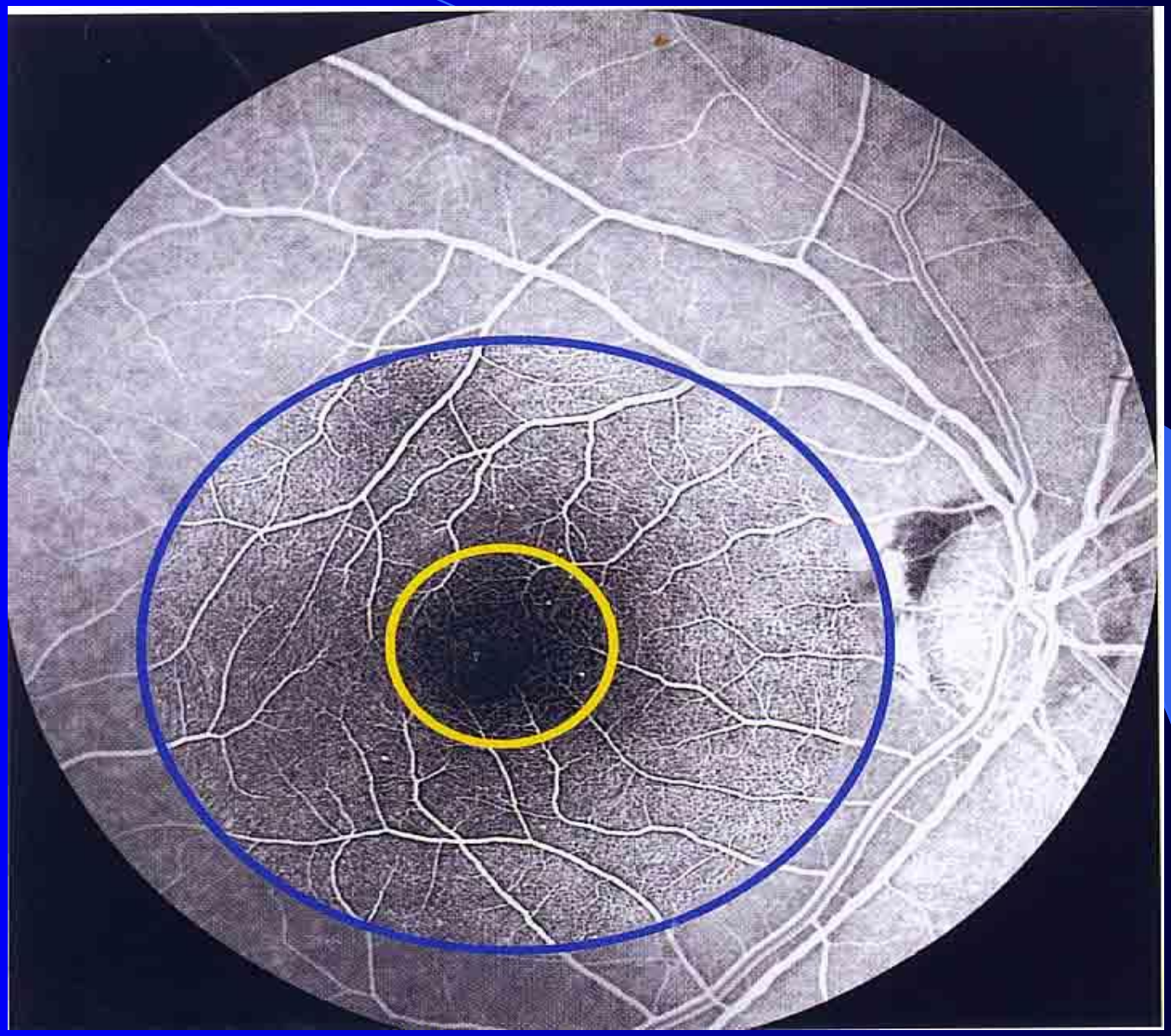
Retina

- highly organized structure
- Processing power
- Macula 1 : 1 relationship – central and color vision (photopic)
- Scotopic vision
- Rhodopsin : opsin + 11 cis retinal
- Rod : 500 n m
- Cone : 430 / 540 / 575 nm (400 – 700 nm)


Normal eye
Retina
Macula
Optic disc
Healthy blood vessels



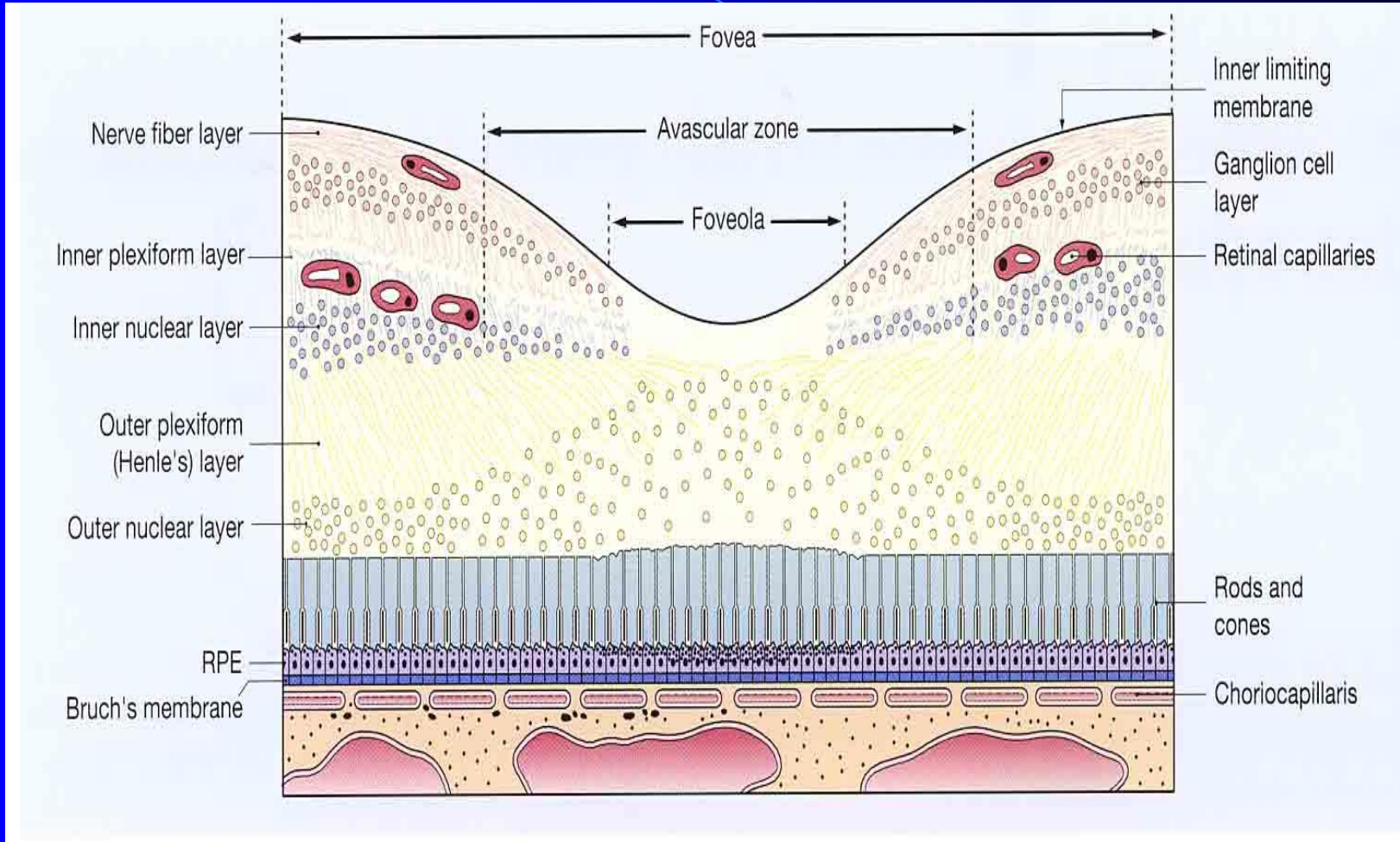


Figure 1.3 Cross-section of the fovea

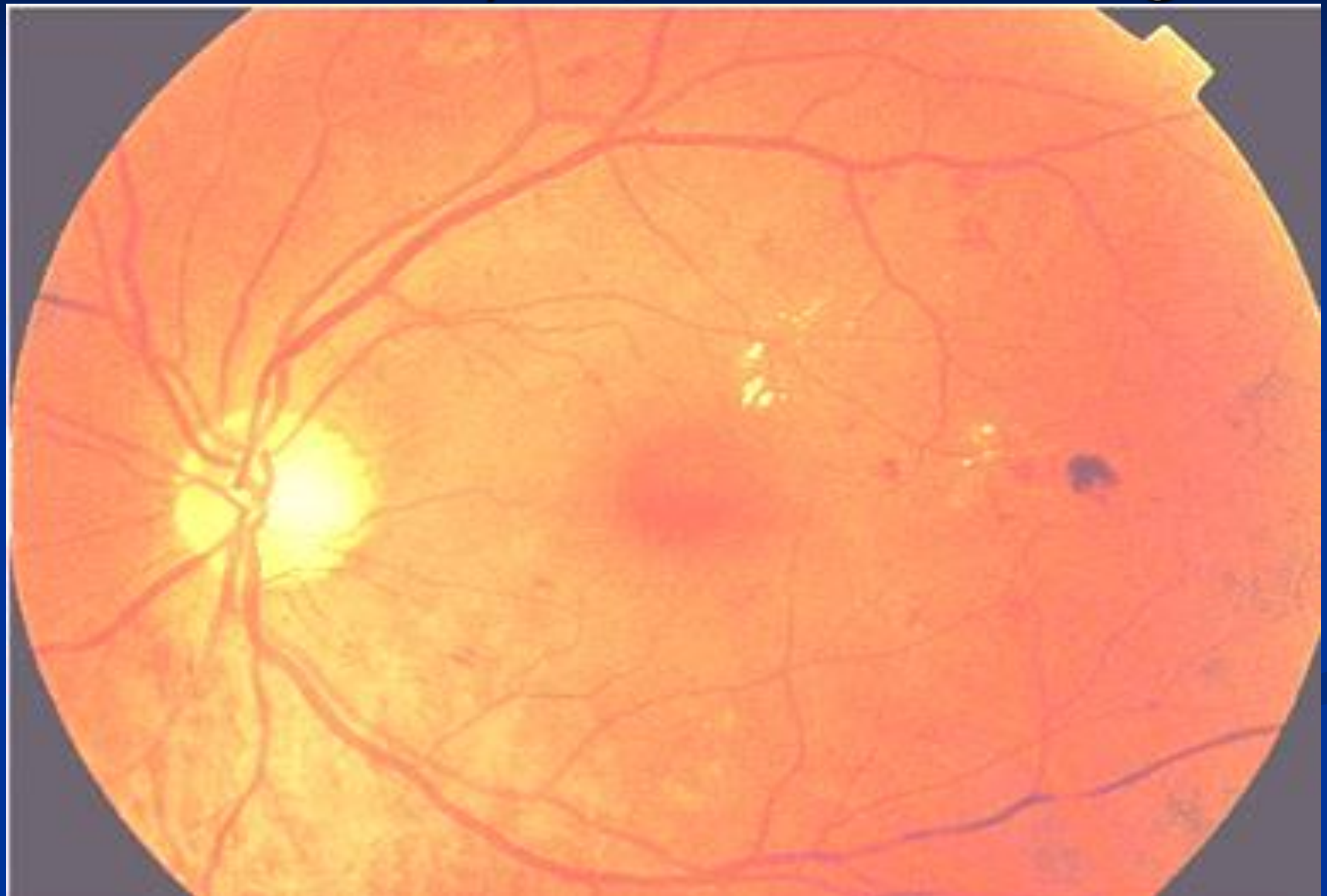
Diabetic retinopathy (DR)

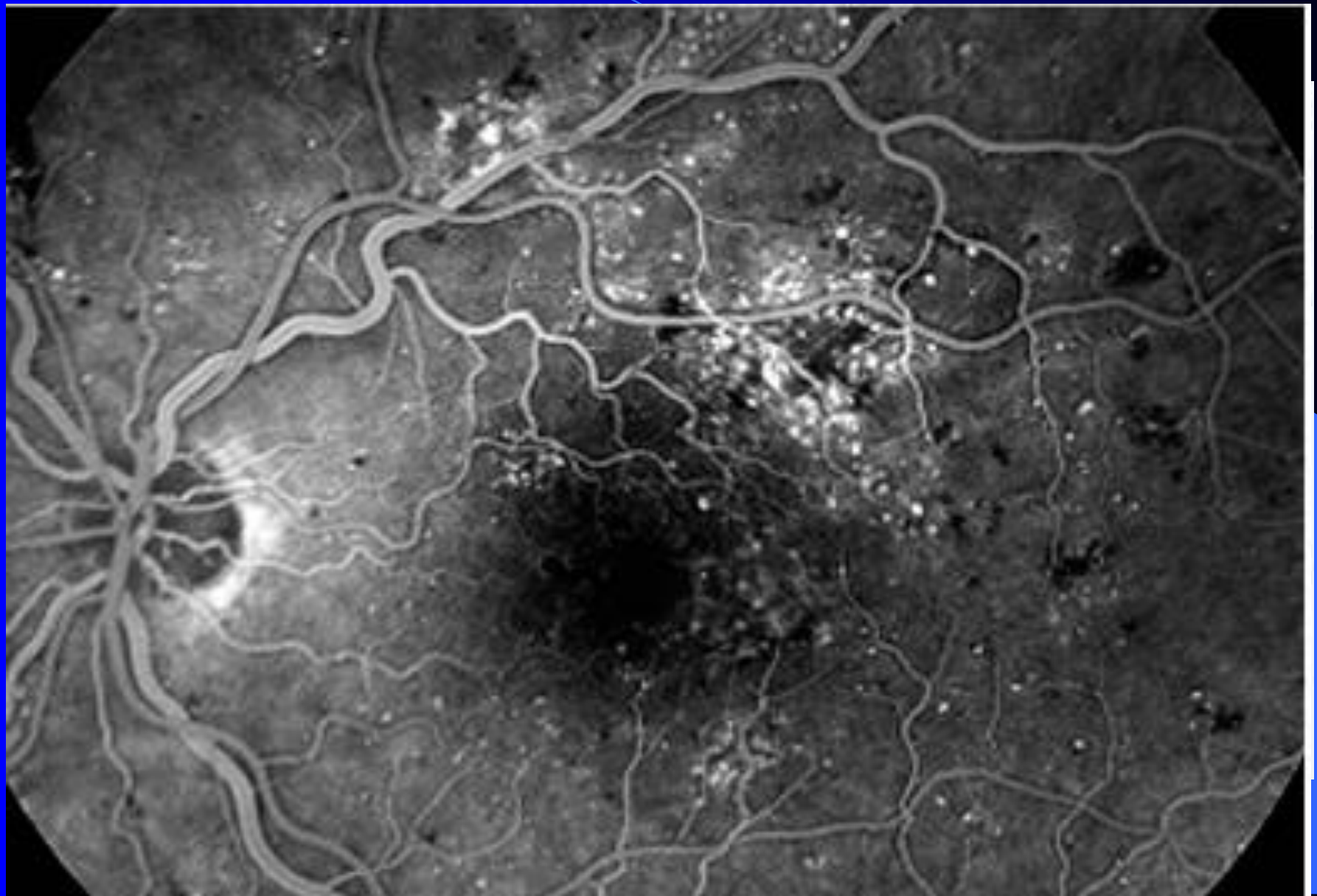
- chronic hyperglycemia
- In type 1 : occular examination at least 3 – 5 years after onset but in type 2 at the time of diagnosis
- pregnancy : in first trimester and then at least every 3 months

Non proliferative diabetic retinopathy

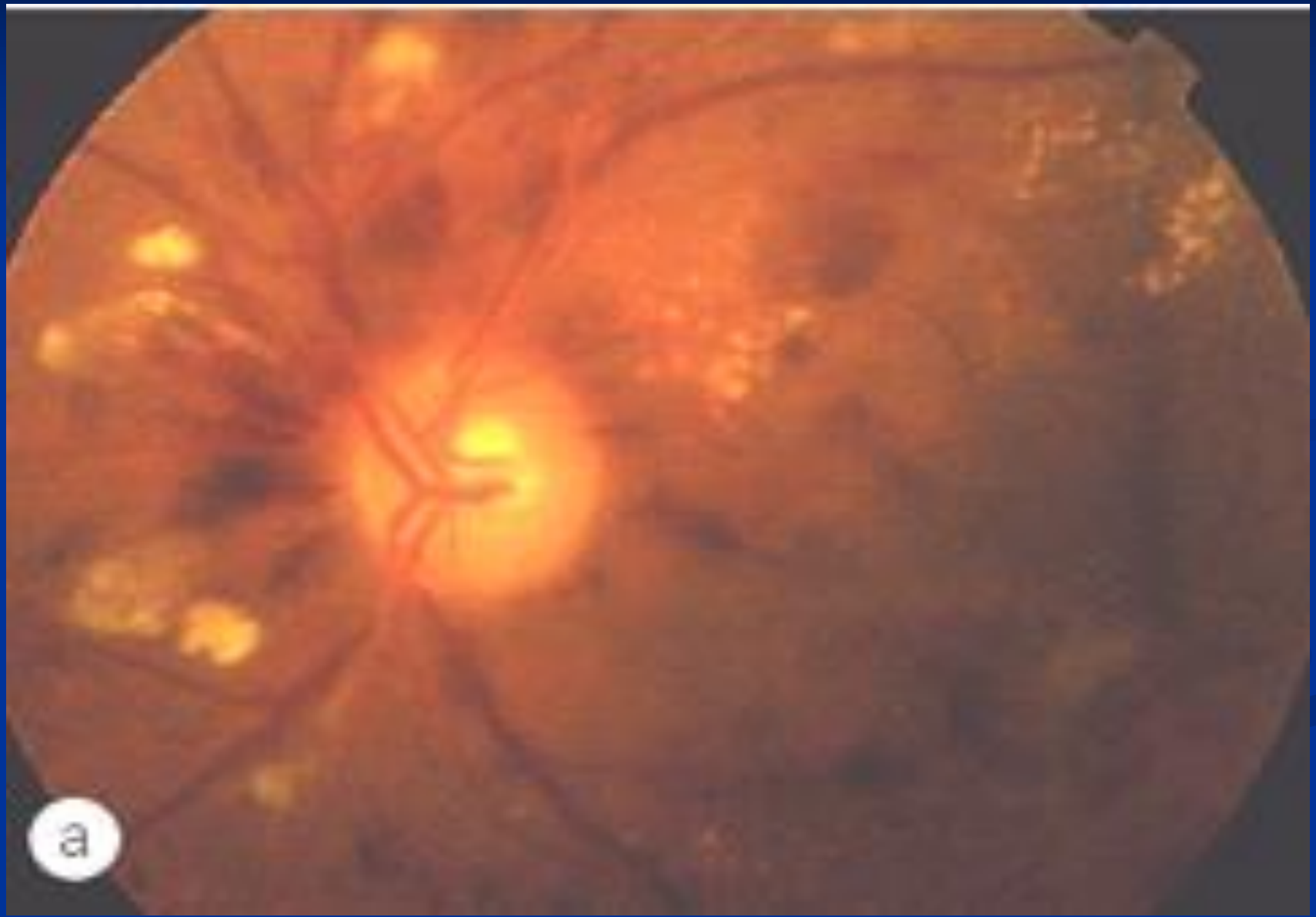
- thickening of capillary endothelial BM
- Pericyte reduction
- Hyperpermeability
- Microaneurysms
- Dilated & tortuous veins
- Hemorrhage
- Macular edema : in 10%
- Inner BRB
- exudate

Diabetic Retinopathy microaneurysm, dot hemorrhage





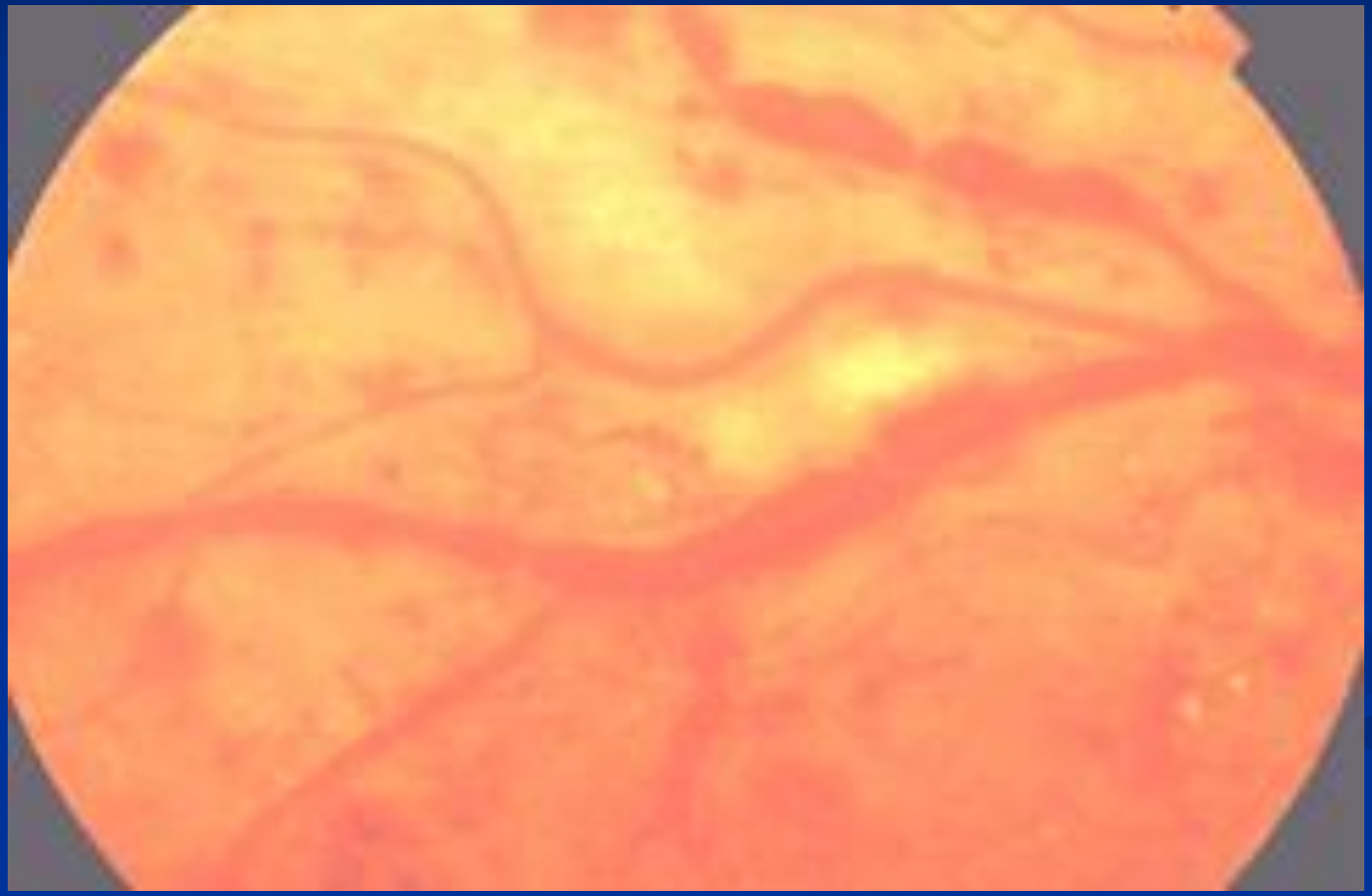
Diabetic Retinopathy advanced NPDR, cotton-wool spots



Preproliferative DR

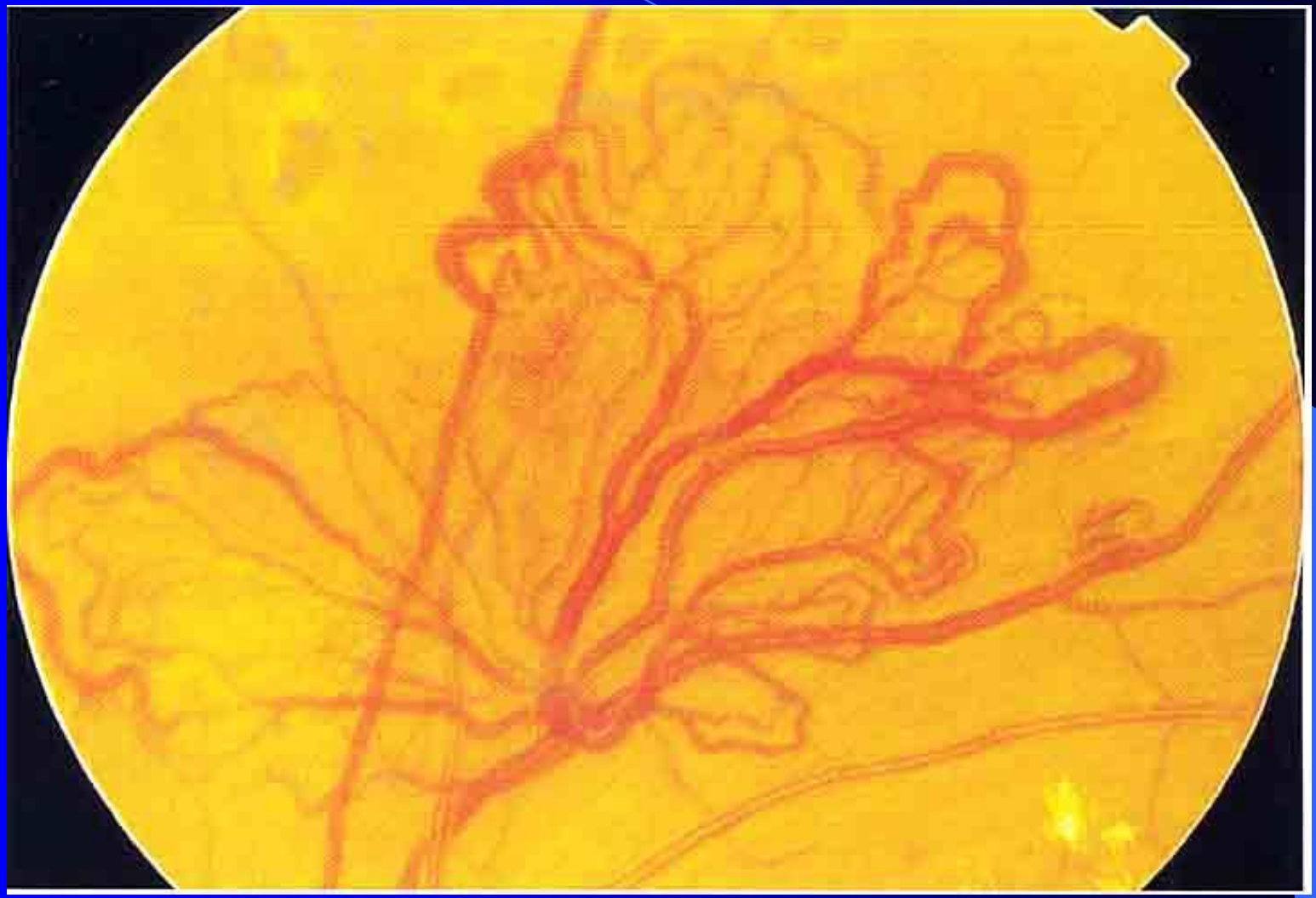
- from increased ischemia
- C.W.S
- Venous beading
- Segmental dilation of capillary (IRMA)
- FA : CNP most prominent in midperiphery

Diabetic Retinopathy venous beading and tortuosity

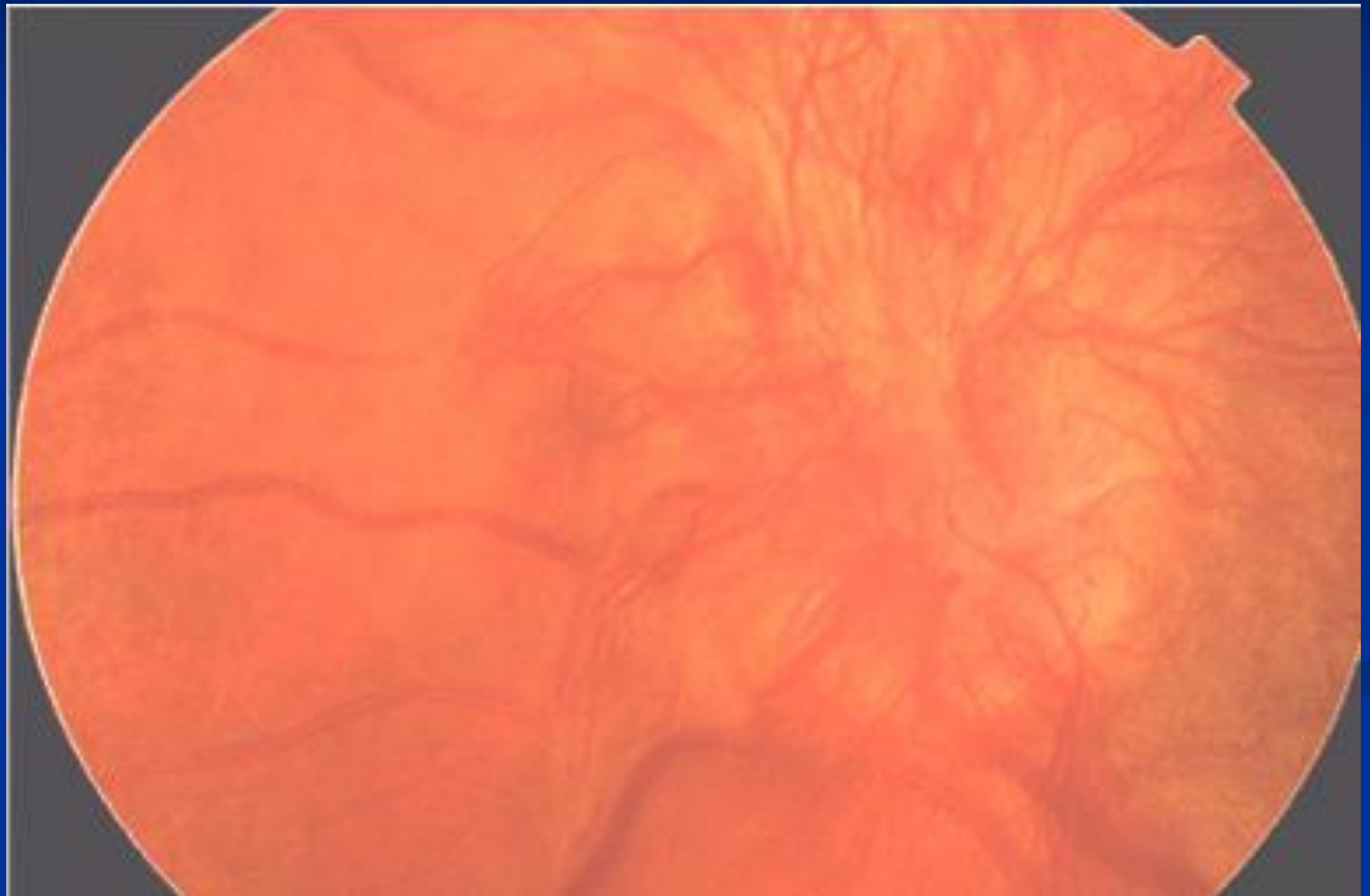


Proliferative DR

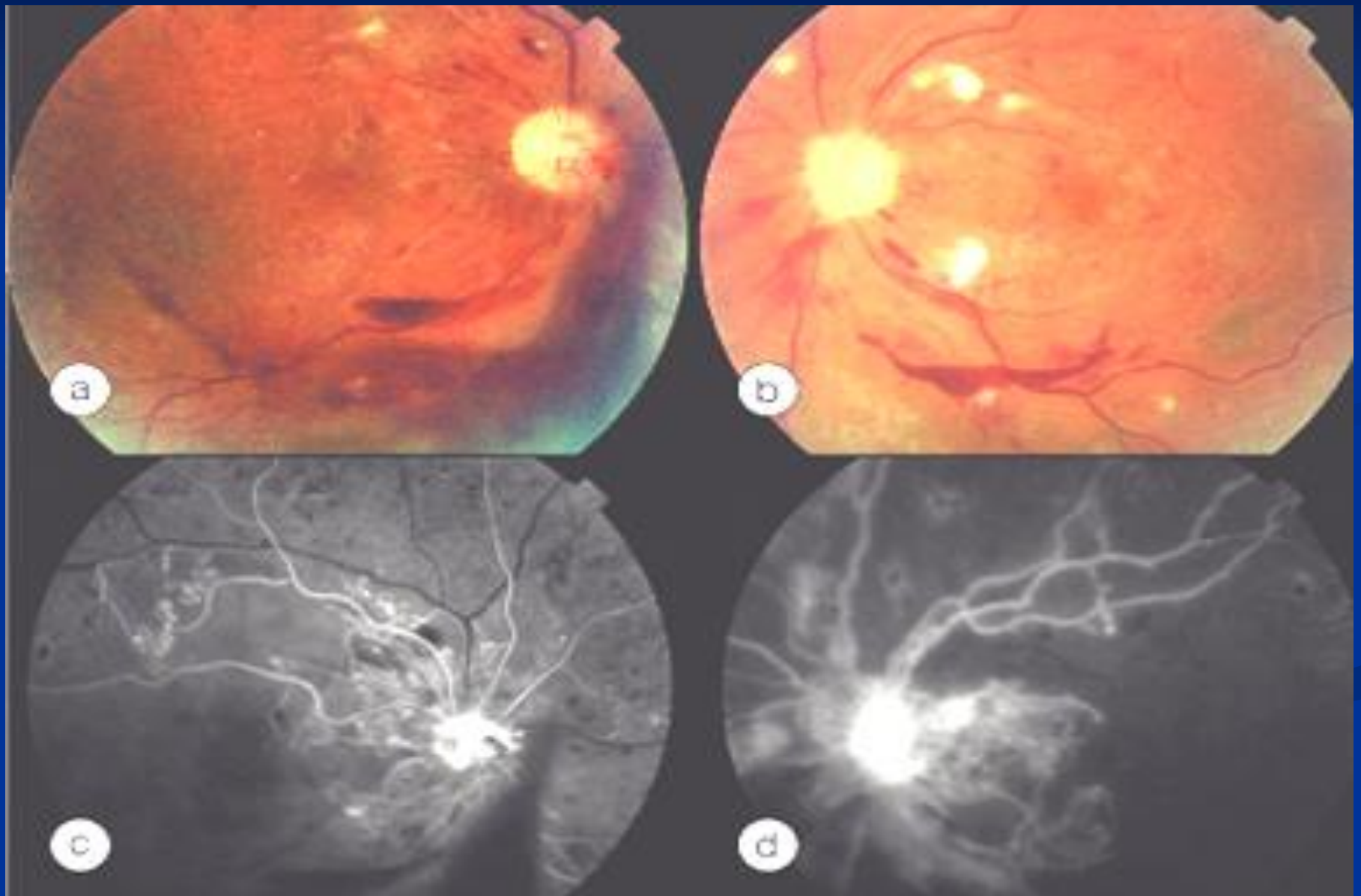
- N.V ____ NVD / post edge of peripheral zones of non perfusion / NVI
- Vitreous hemorrhage
- RRD
- Panretinal photocoagulation (PRP)
- vitrectomy



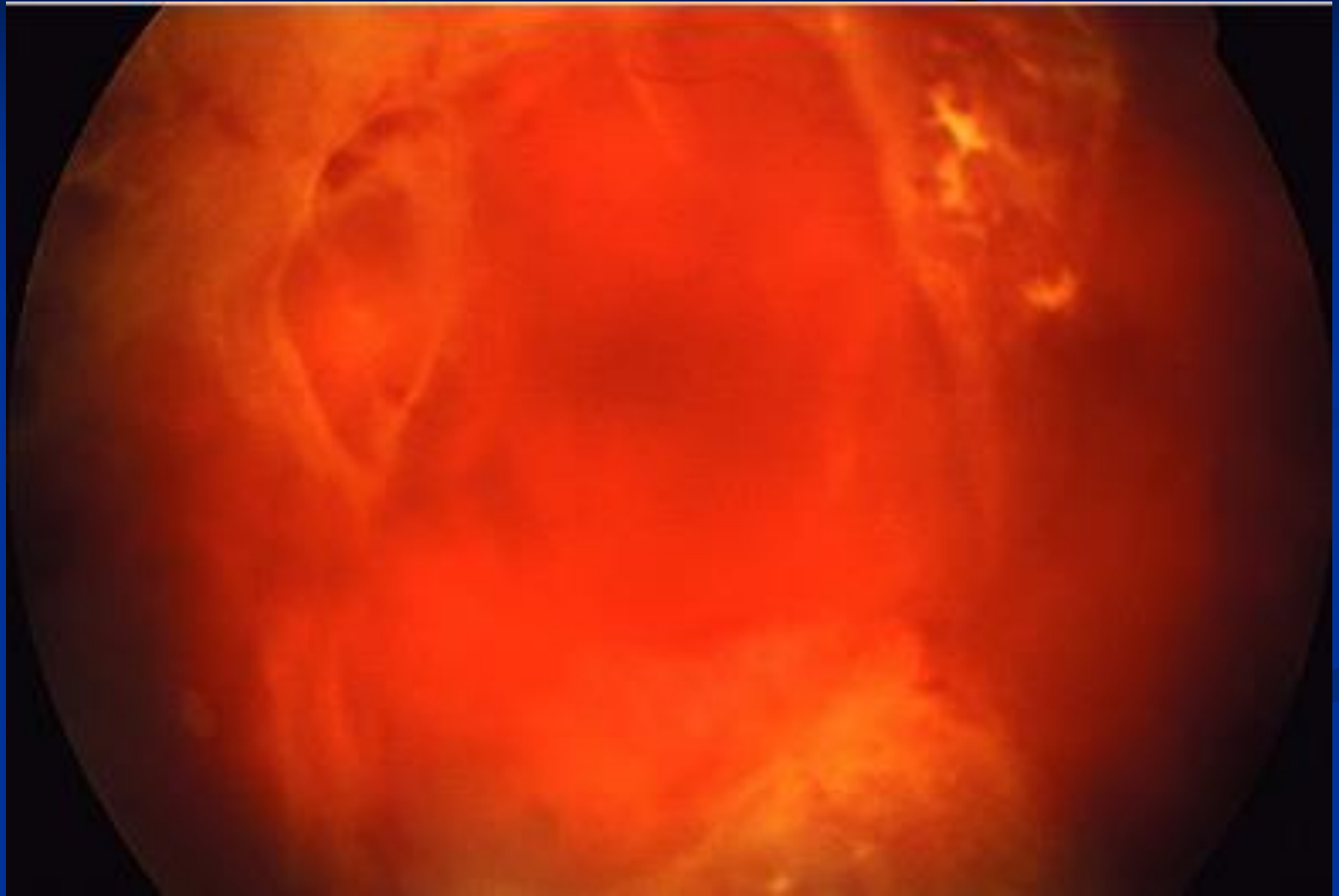
Diabetic Retinopathy
NVD



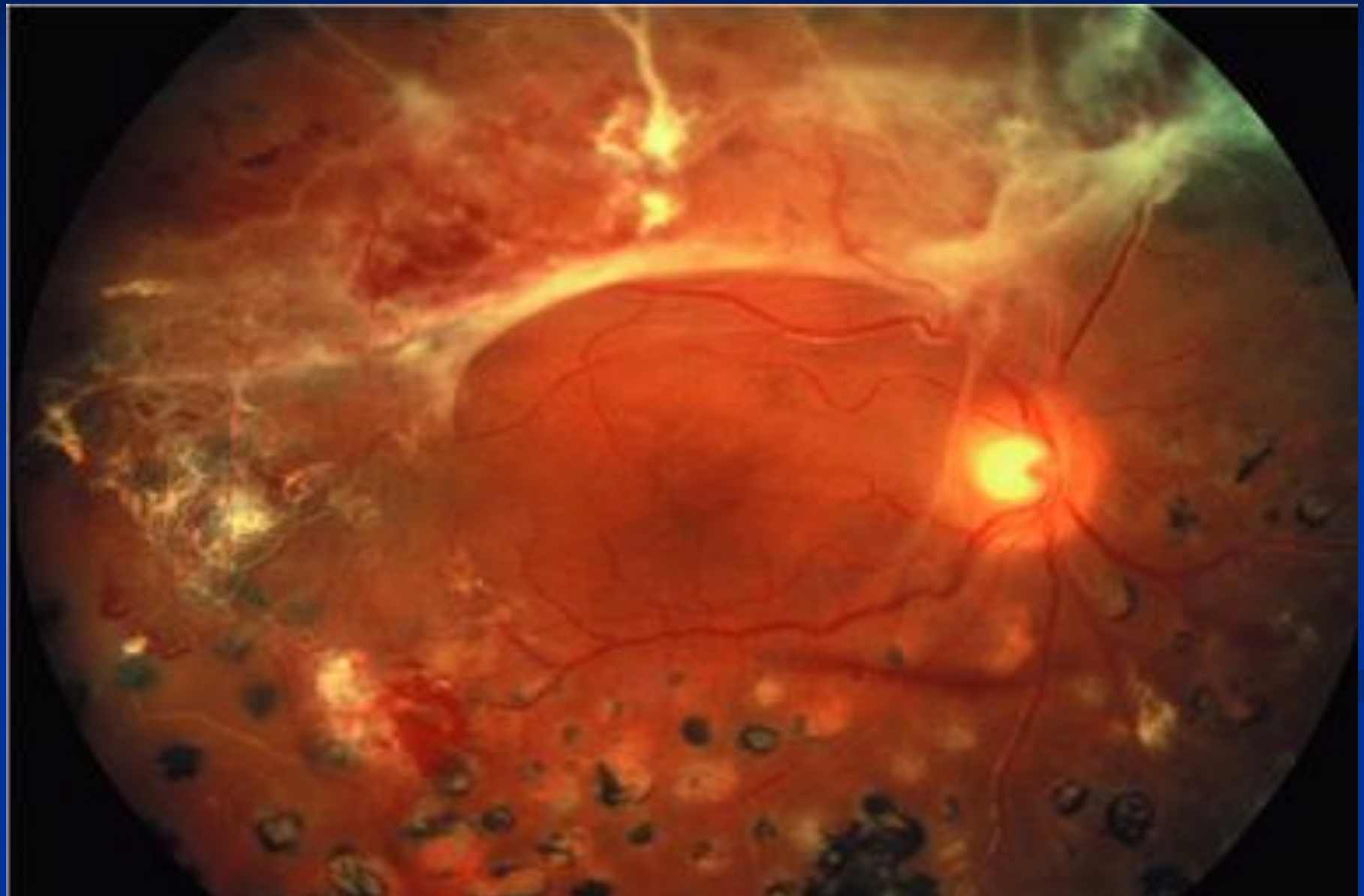
Diabetic Retinopathy
PPDR, preretinal hem, cap nonperfusion

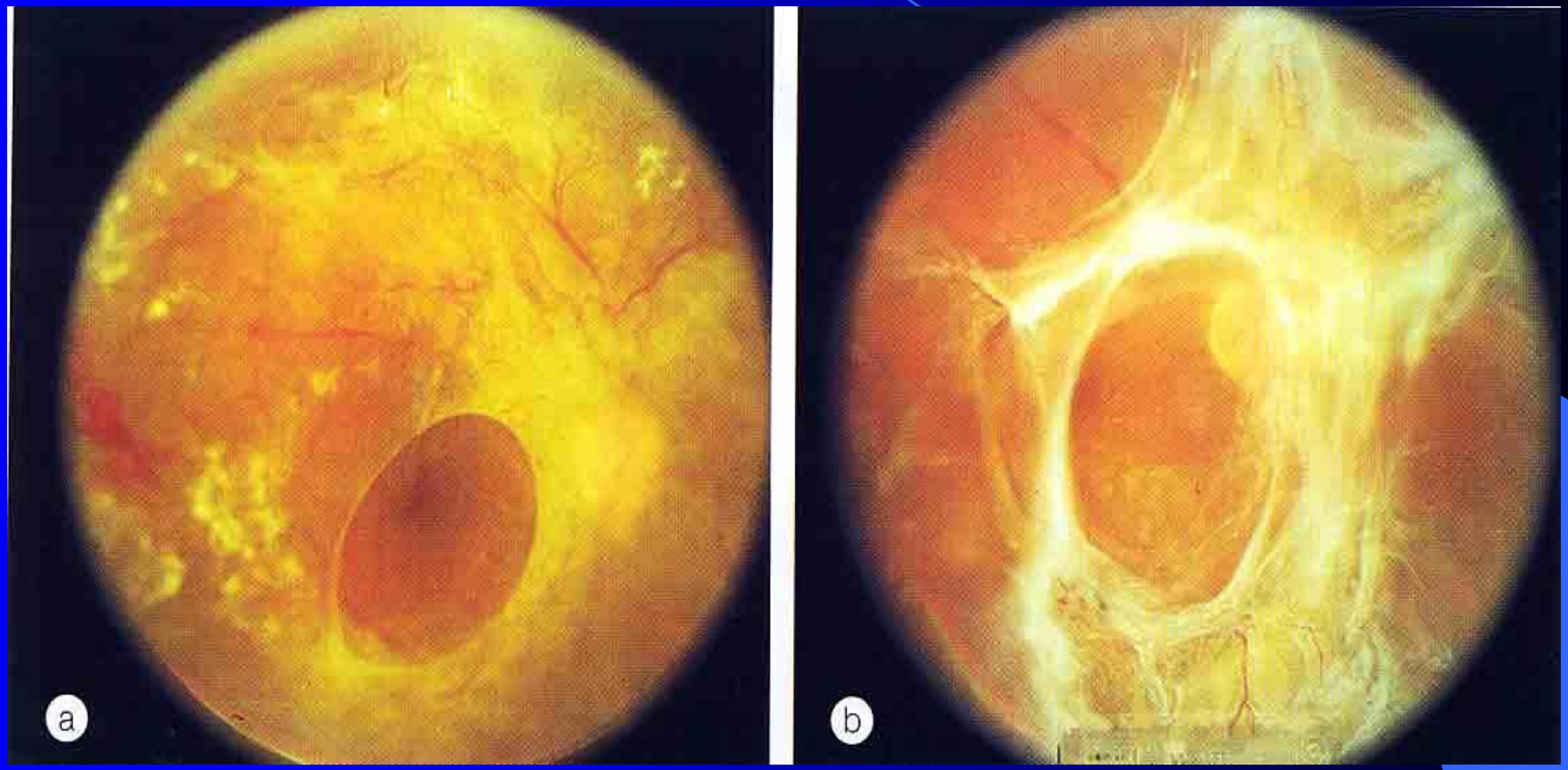


Diabetic Retinopathy
Vitreous hemorrhage

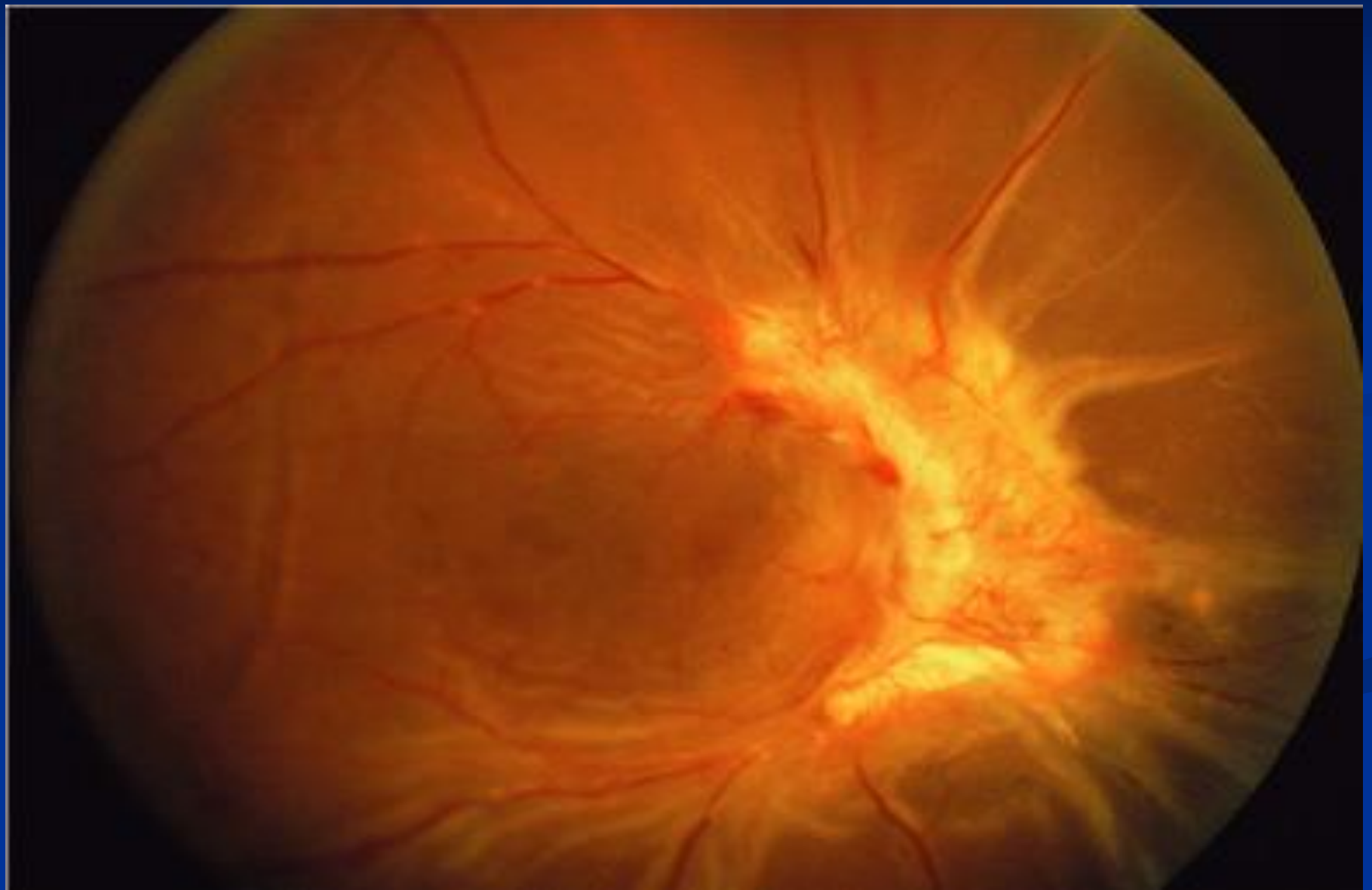


Diabetic Retinopathy
Tractional RD, laser spots

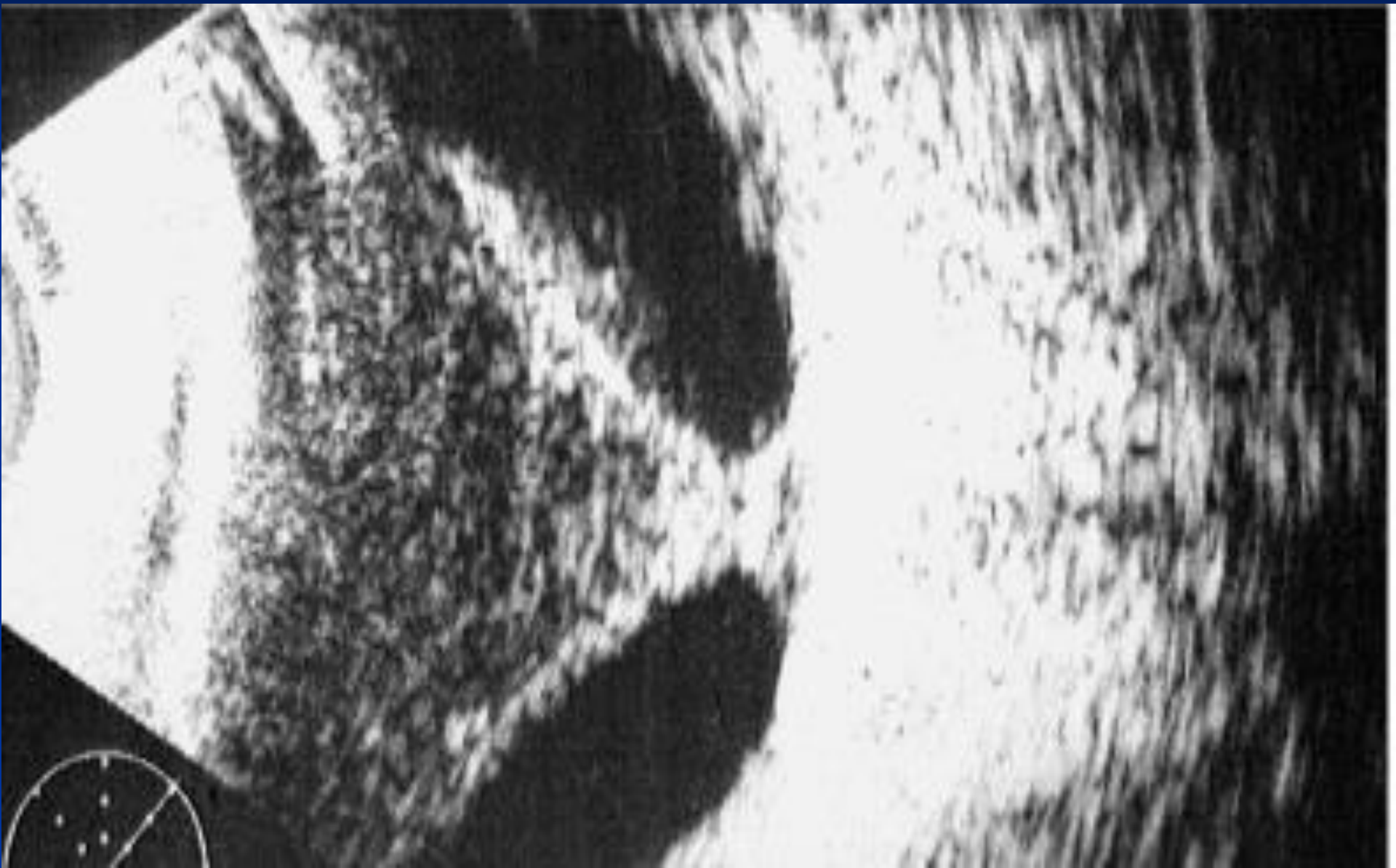



a
b

Diabetic Retinopathy
Tractional RD



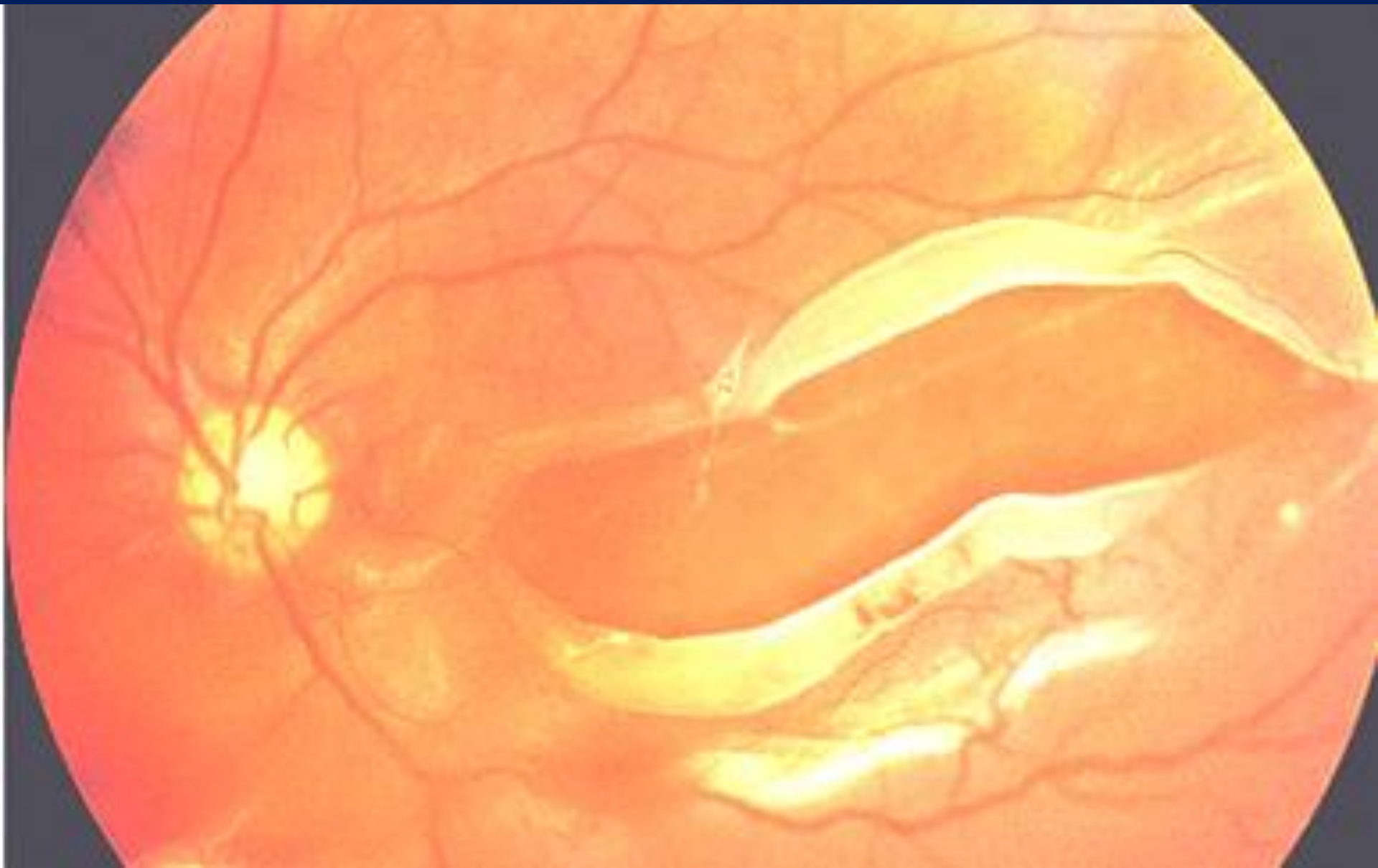
Diabetic Retinopathy
Funnel shaped RD, vit hemorrhage



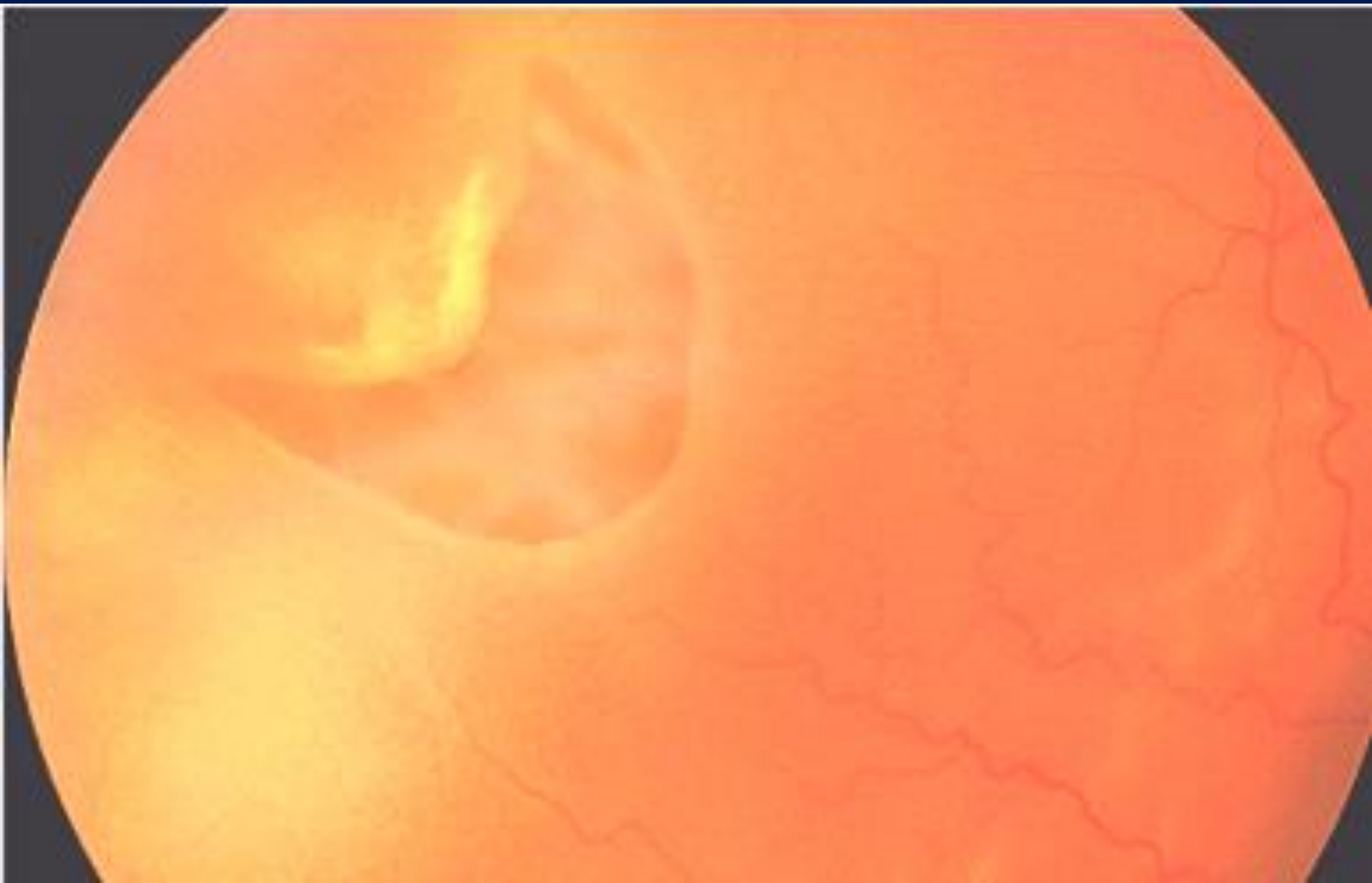
Retinal detachment

1) RHEGMATOGENOUS
- the most common
- Full thickness break
- Horse shoe tear ____ supero temporal
- Dialysis ___ infero temporal
- treatment SB/retinopexy / vitrectomy

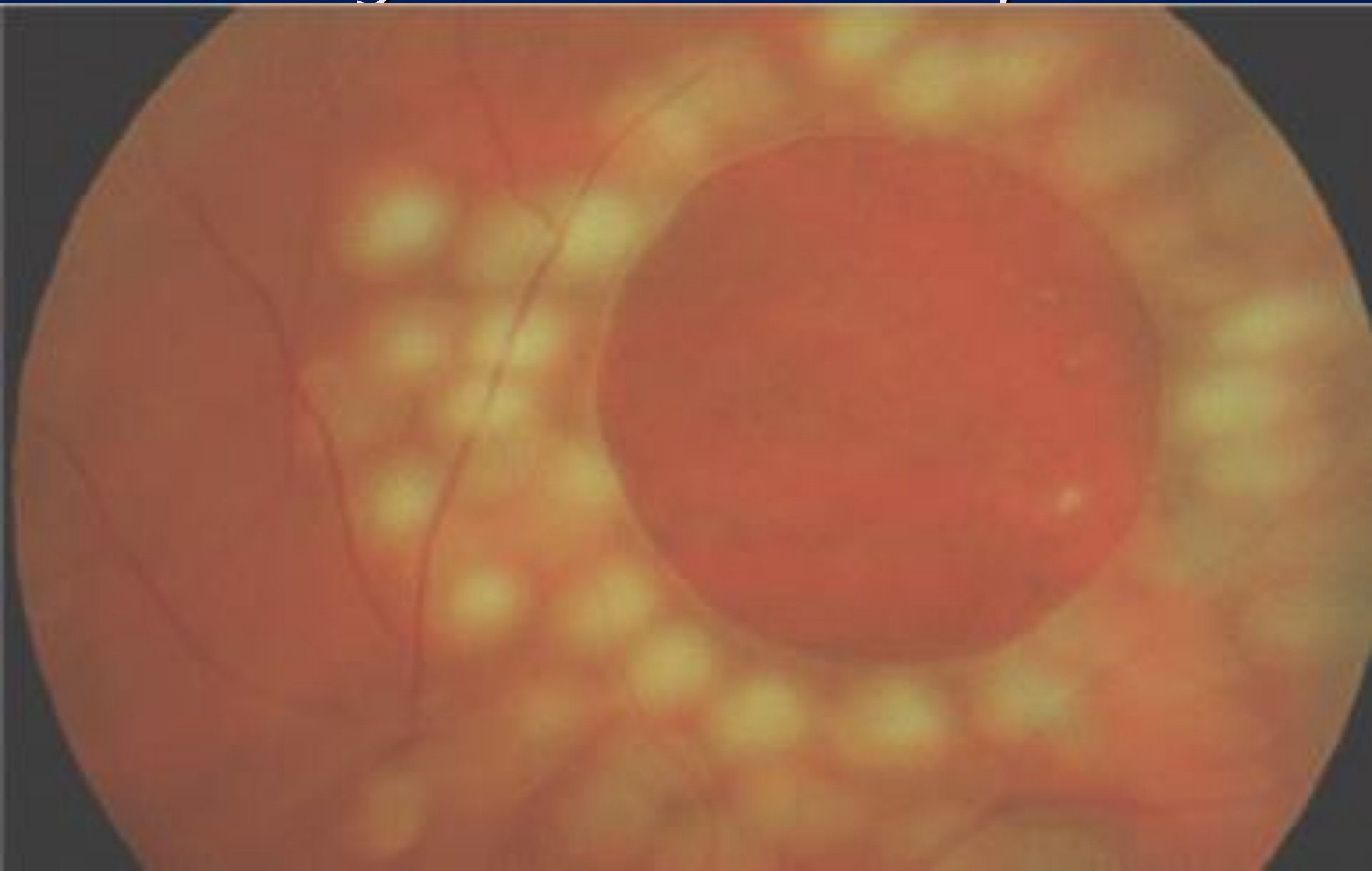
Retinal Detachment
Giant Tear



Retinal Detachment
Horseshoe tear

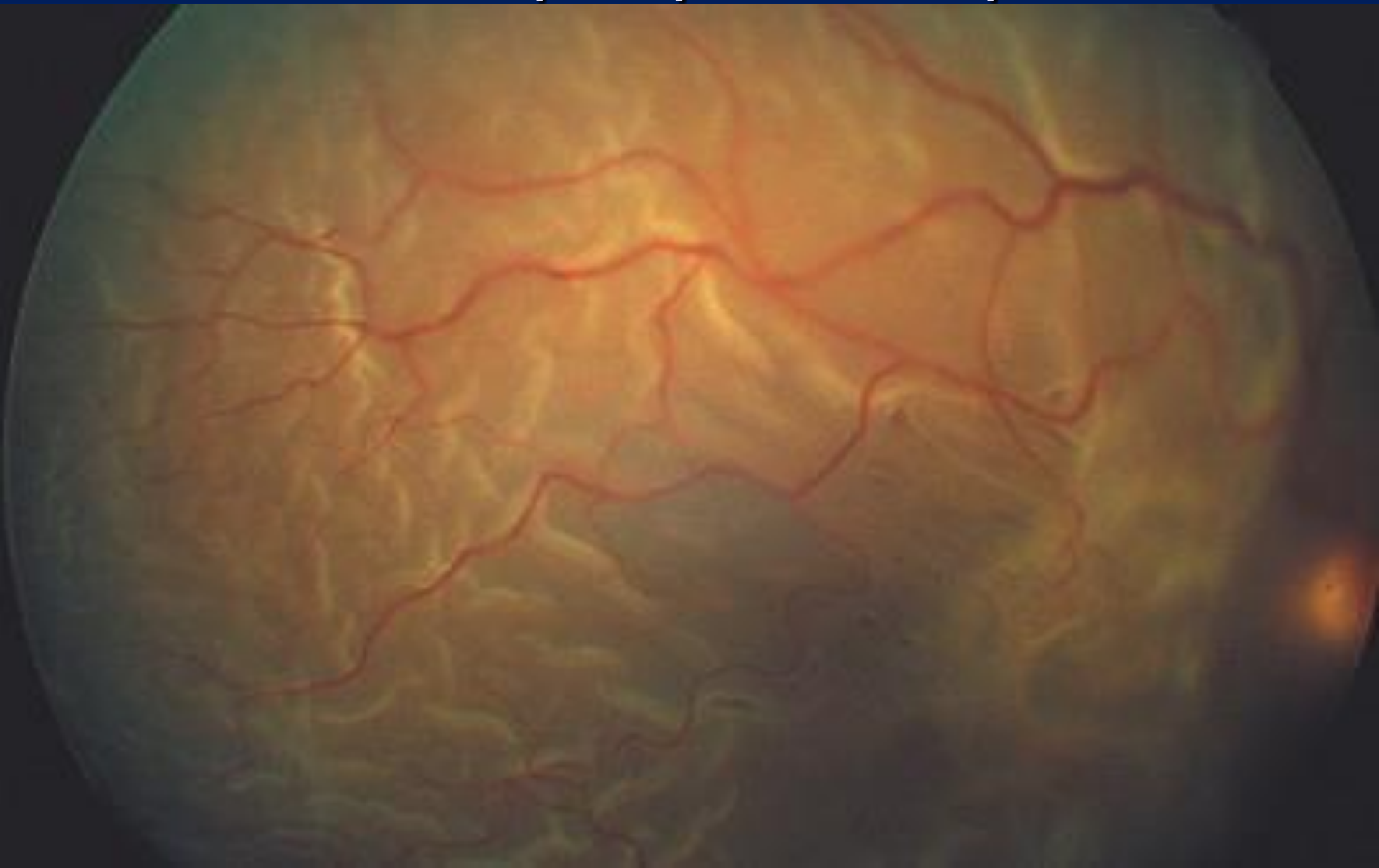


Retinal Detachment
Large hole with laser spots



Retinal Detachment
Superior detachment

Retinal Detachment
Folds and opacification of retina



2) TRACTIONAL

- fibroblast / glial / RPE
- PVR

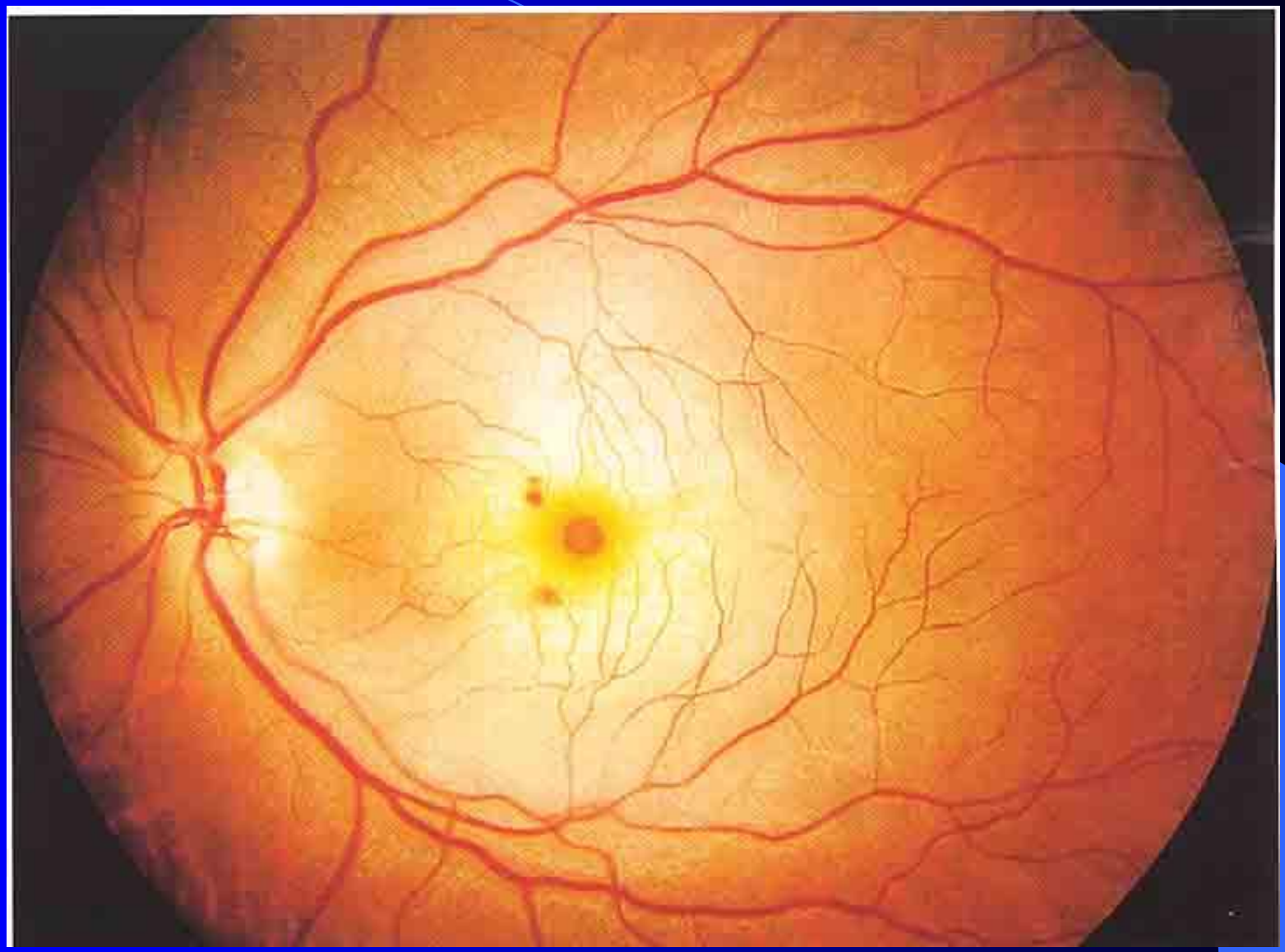
3) SEROUS & HEMORRHAGIC

- diseases of RPE & choroid
- Degenerative / inflammatory / infectious

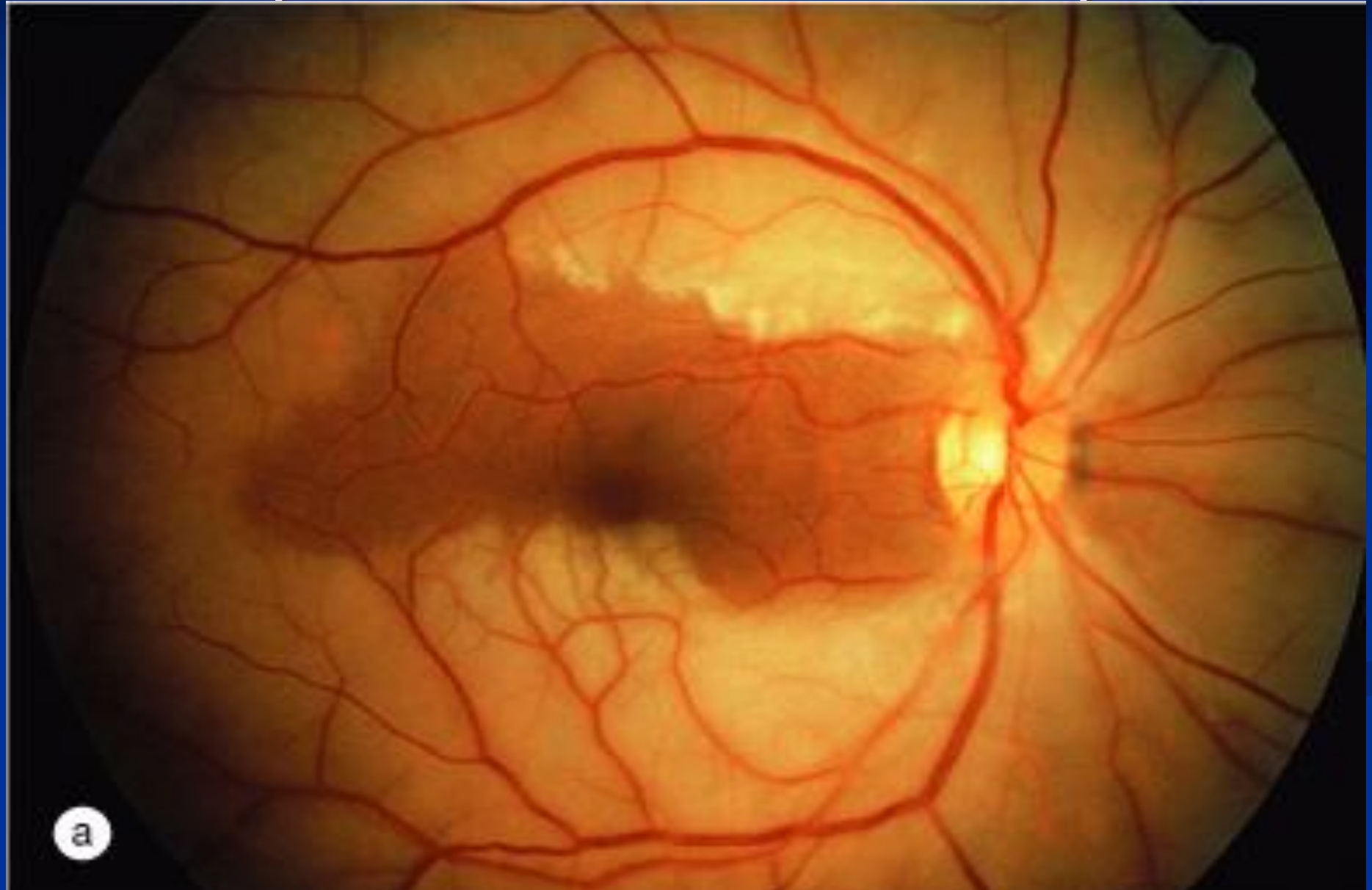
Central retinal artery occlusion

- painless visual loss over seconds
- Amaurosis fugas
- VA in 90% : CF _____ LP
- RAPD
- Superficial retina opacification
- Cherry red spot
- Cilioretinal artery in 25%
- Leaving pale optic disc

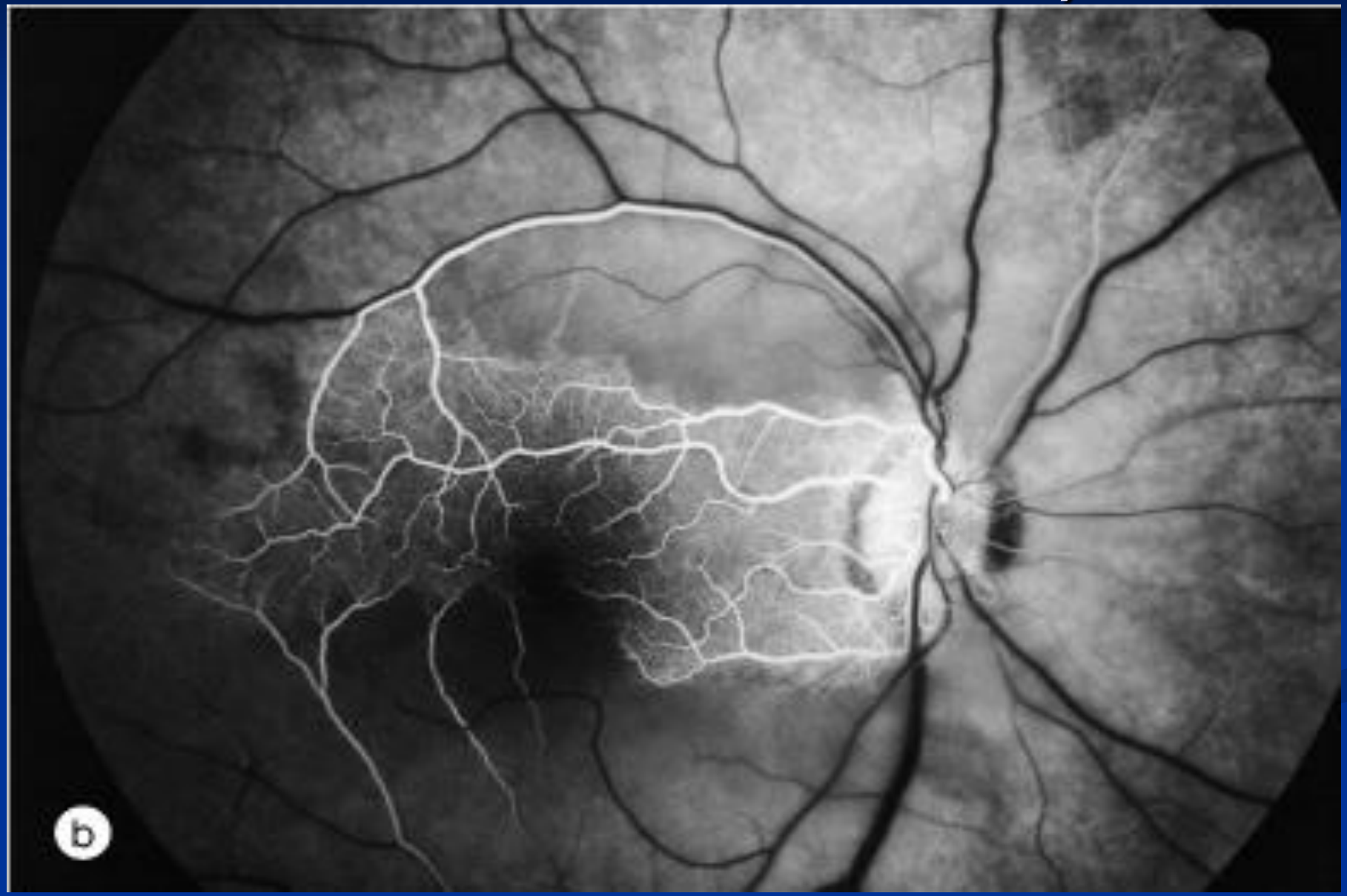
CRAO
cherry red spot



CRAO
patent cilioretinal artery



CRAO
Patent cilioretinal artery

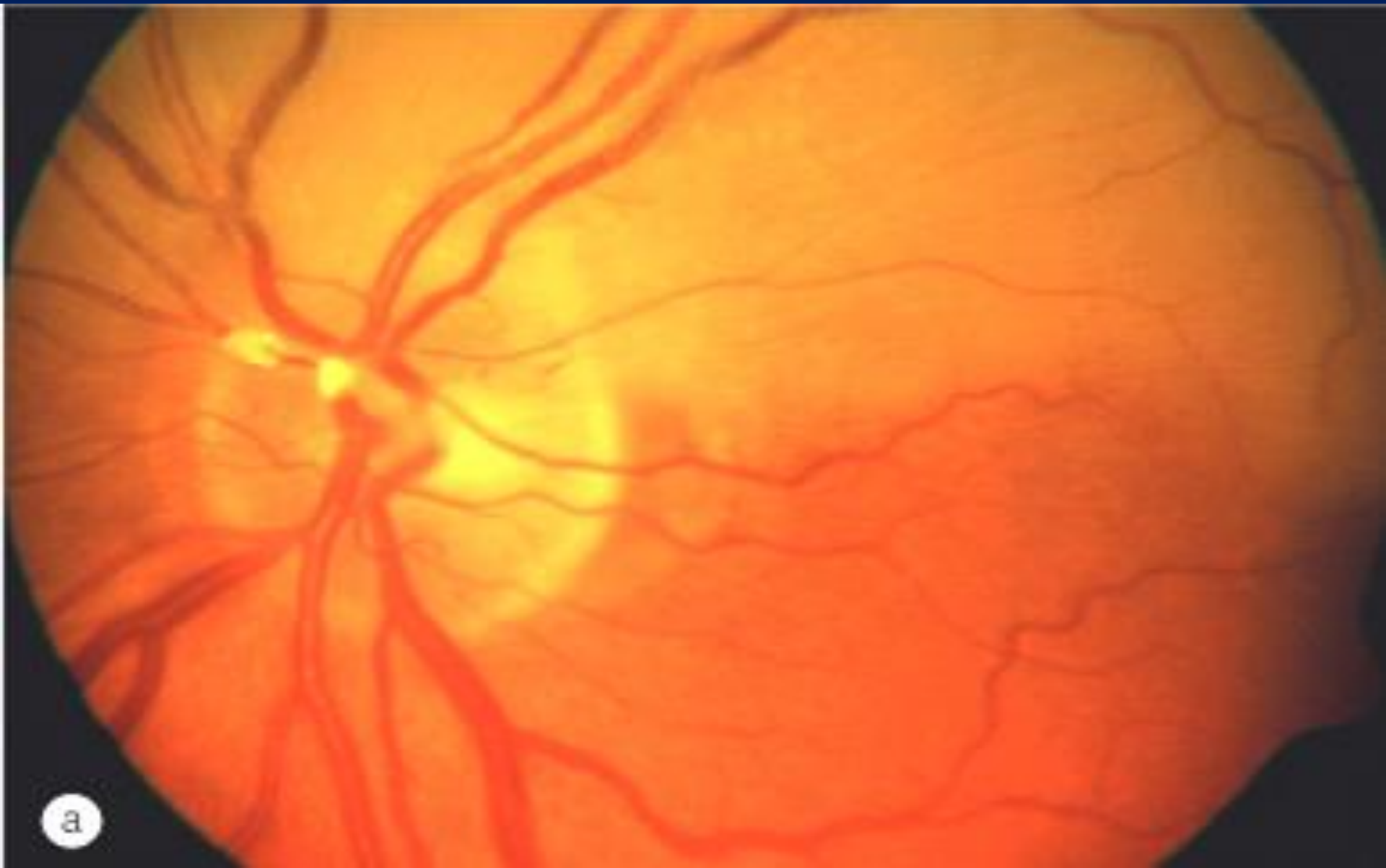


- Gaint cell arteritis / arterio sclerosis / emboli (carotid or cardiac)
- 90 minutes
- AC paracentesis
- Inhaled oxygen – carbon dioxide
- IV acetazolamide
- Direct infusion of thrombolytic agent : within 8 H

Branch retinal artery occlusion

- sudden loss of VF and VA (macular involvement)
- Emboli : more common
- Migraine / OCP / vasculitis

BRAO
superior branch occlusion

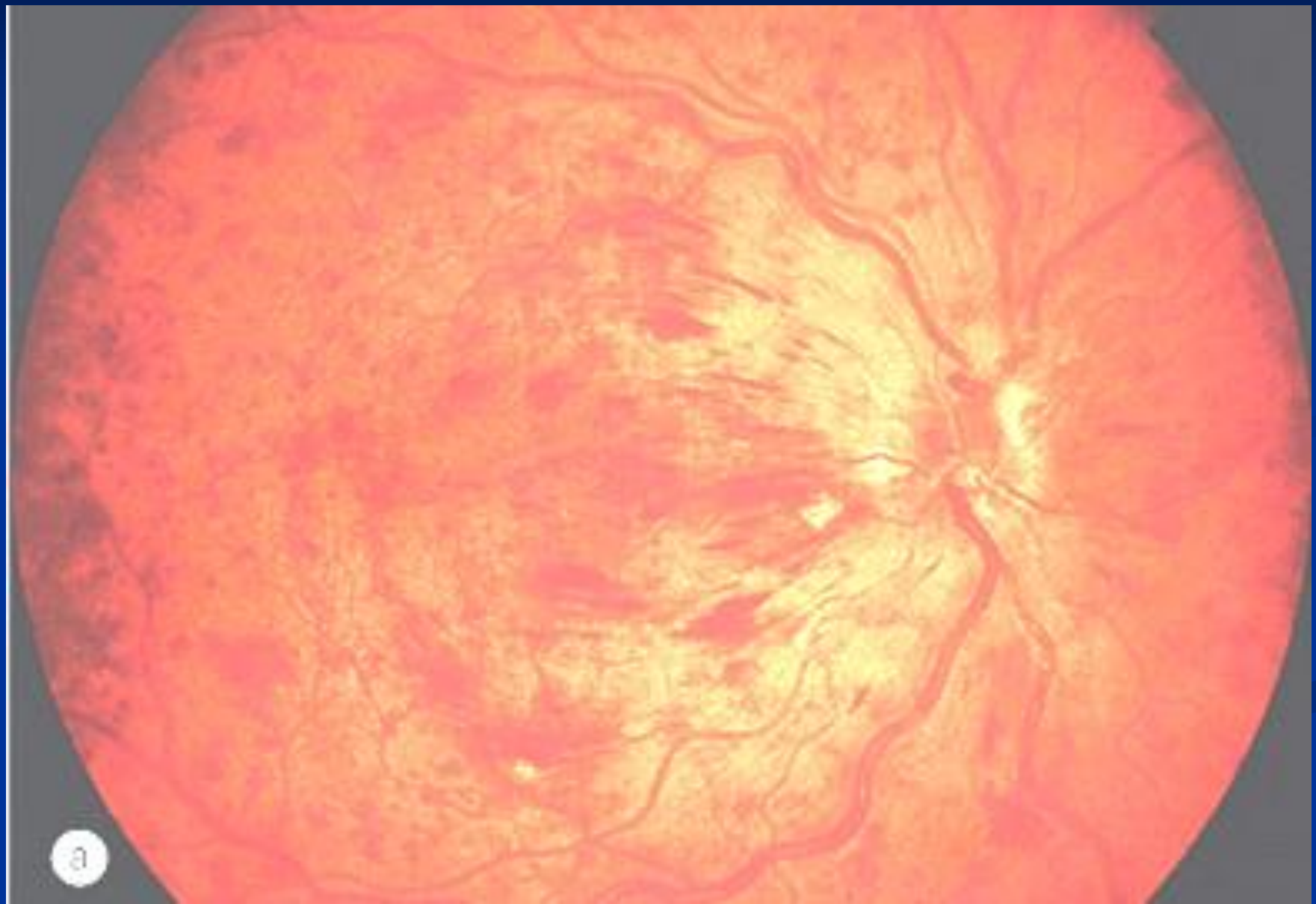


BRAO
inferior branch occlusion

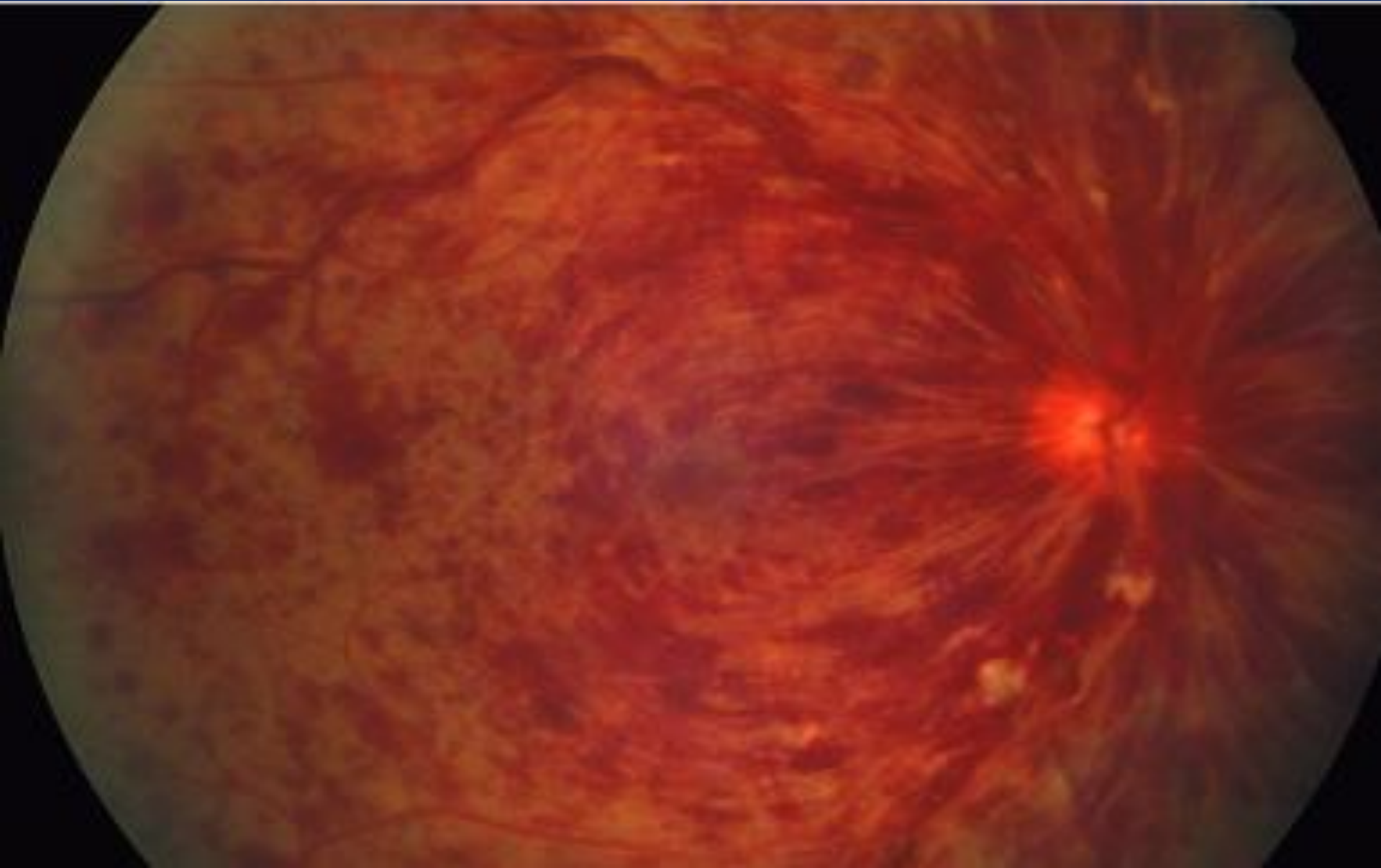
Central retinal vein occlusion

- sudden painless loss of vision
- Over 50 years
- COAG
- Complications (macular edema / NVG)
- CNP in one third
- NVG in one half

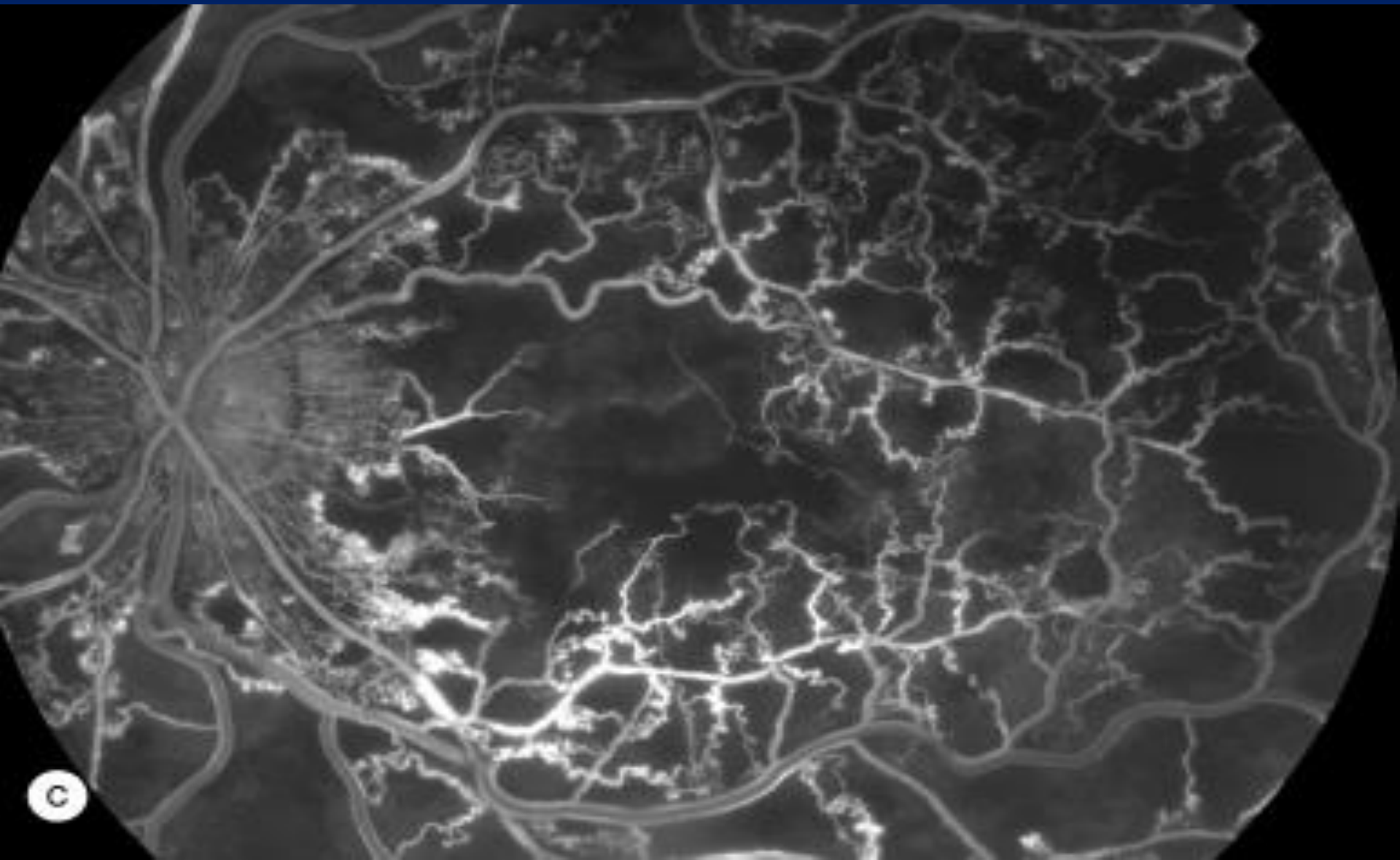
CRVO
nonischemic



CRVO
ischemic



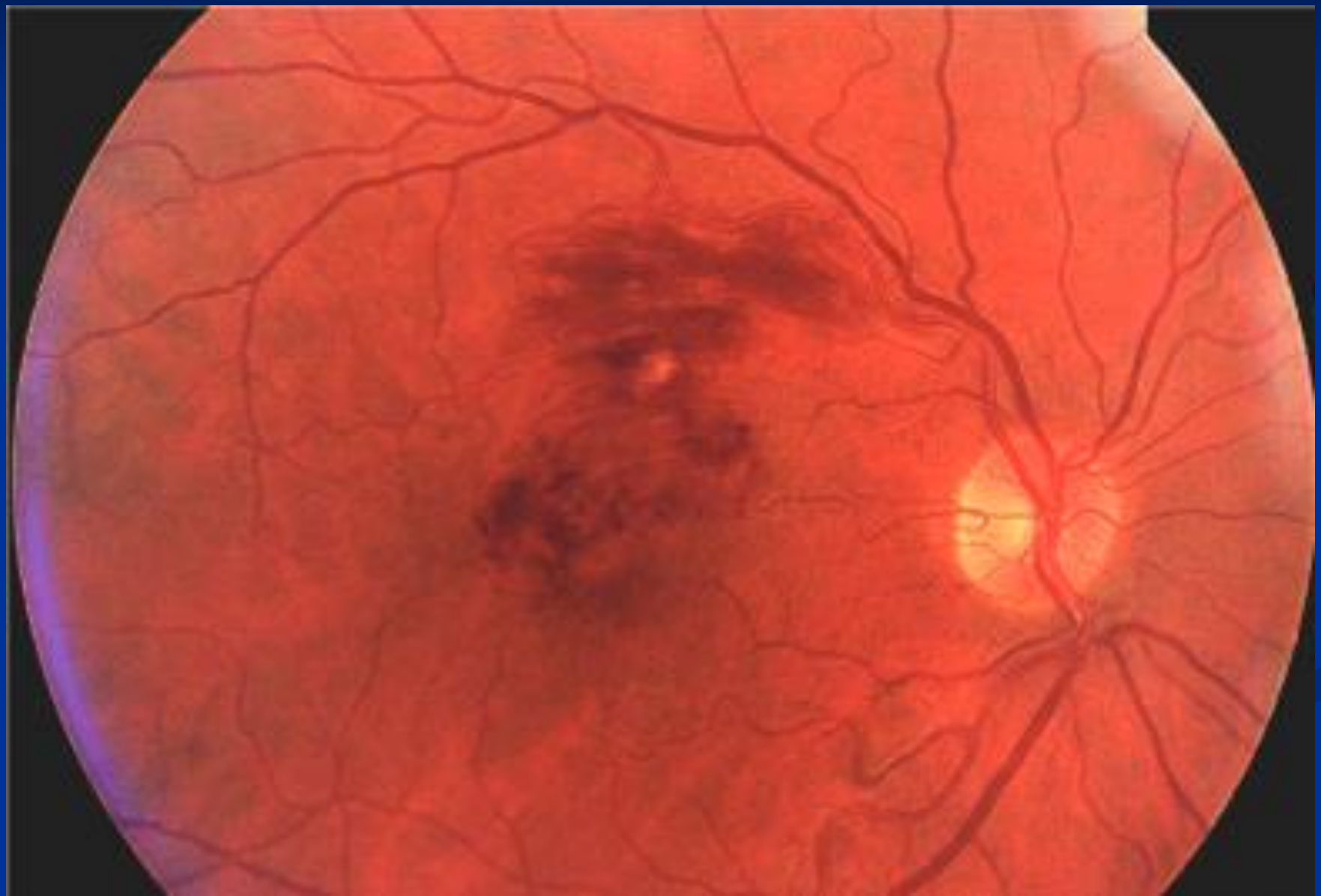
CRVO
ischemic, cap dropout,



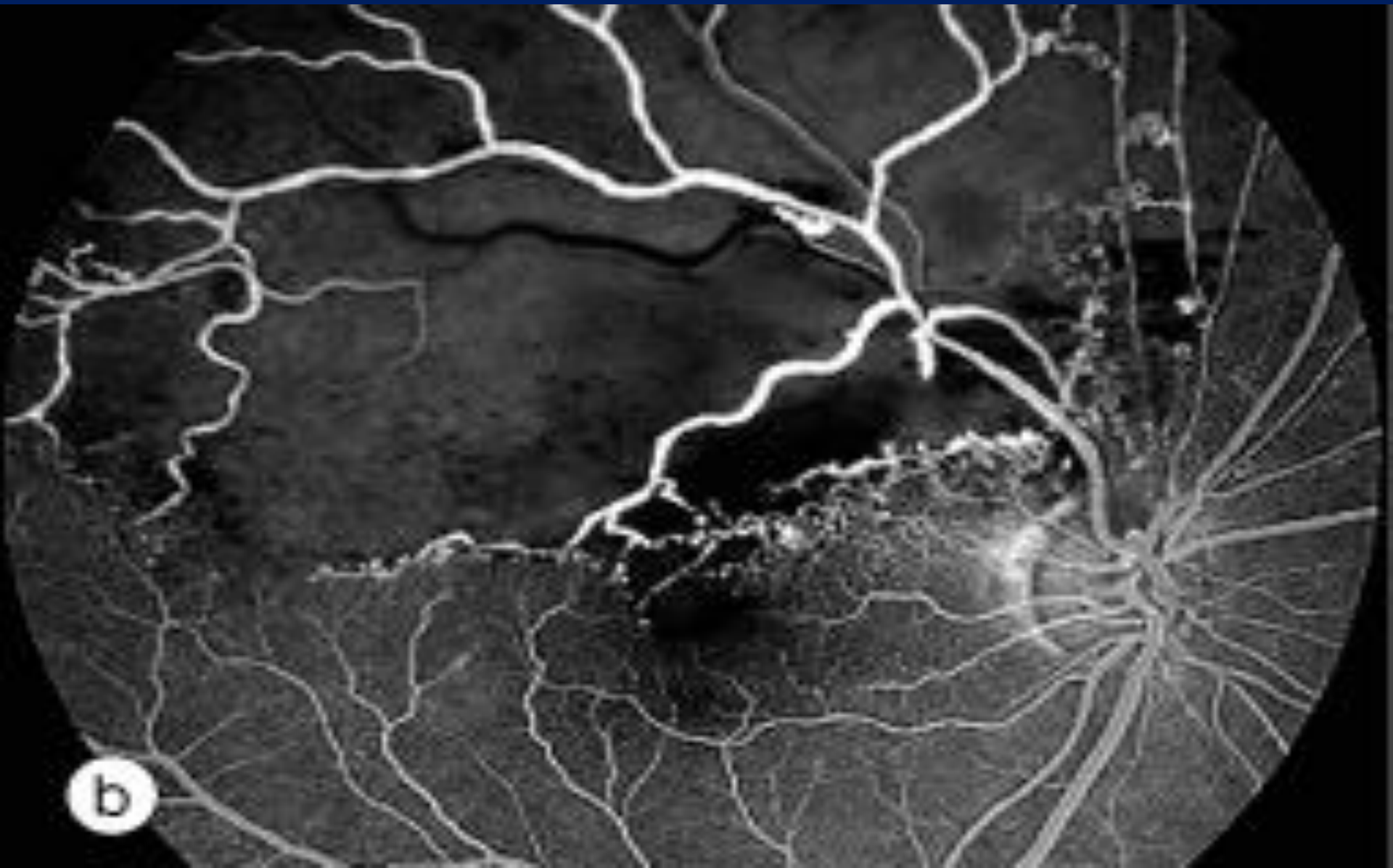
Branch retinal vein occlusion

- AV crossing
- If CNP more than 5 DD _____ N.V
- Sectoral laser
- Grid laser

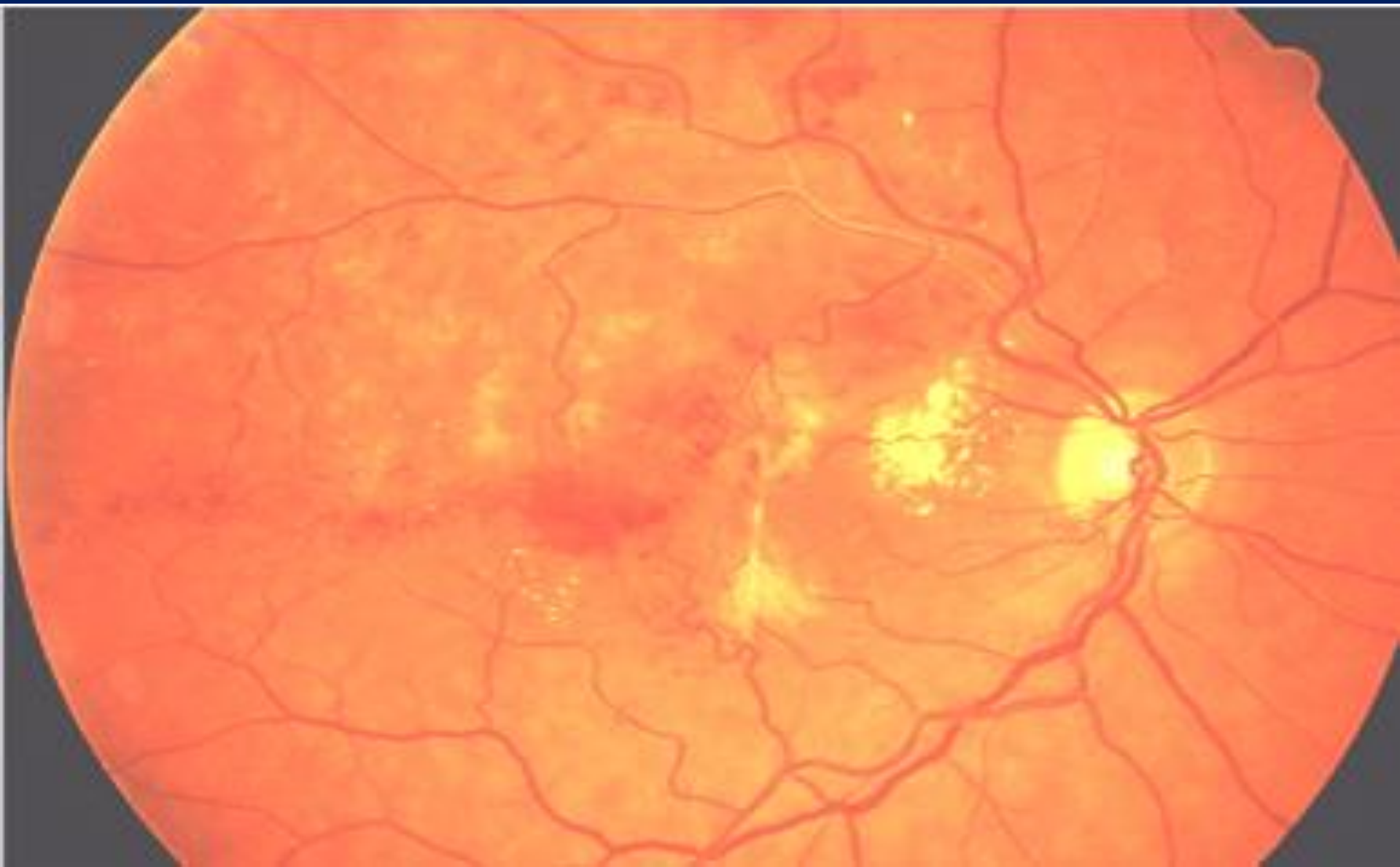
BRVO
macular branch involvement



BRVO
delayed filling, capillary dropout

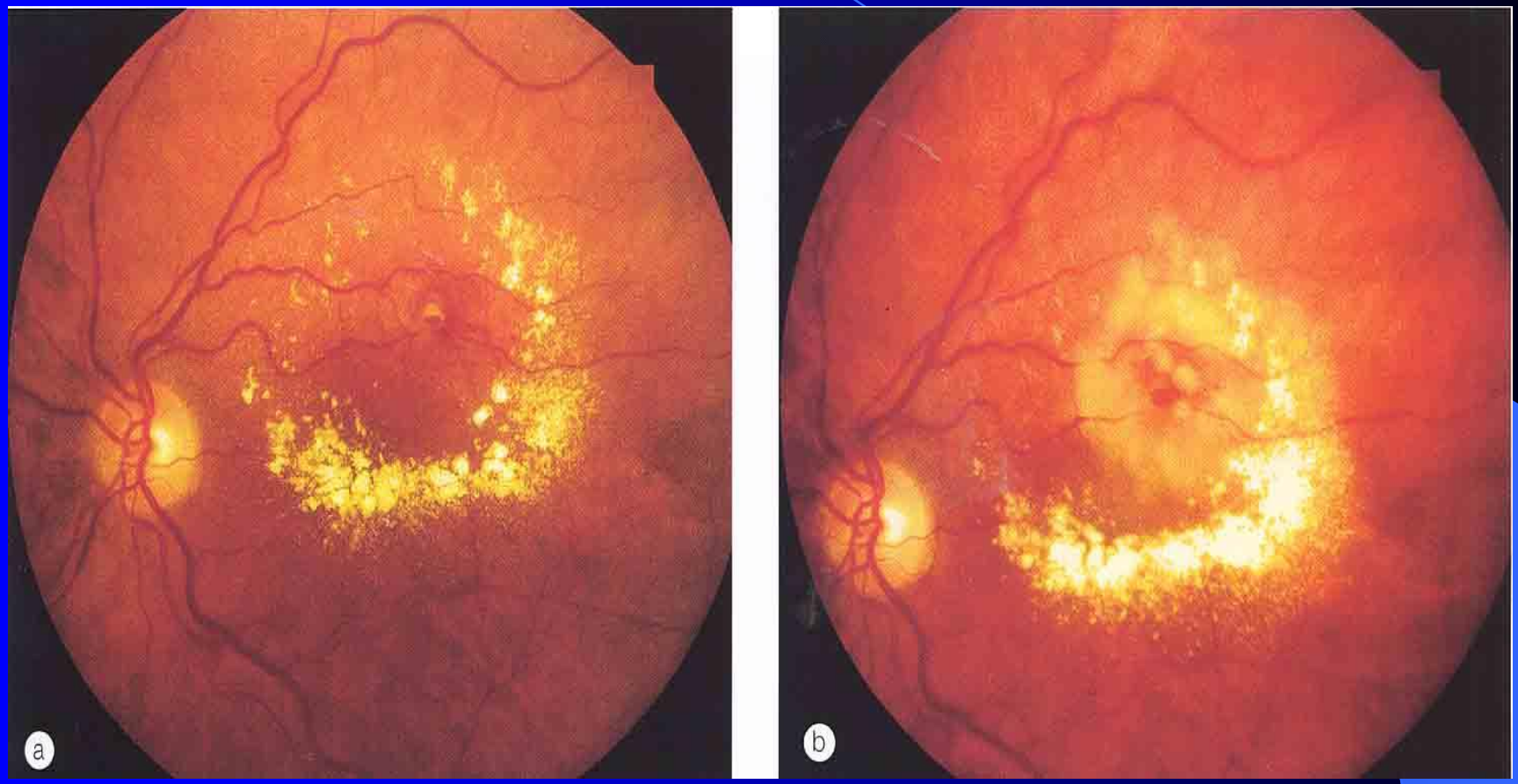


Old BRVO
residual hem, sheathing, hard exudate



Retinal arterial macroaneurysm

- fusiform or round dilations of arterioles
- Within the first three orders
- Supero temporal artery
- Hypertension in two – thirds
- Loss of VA form retinal edema / exudate / hemorrhage (hour – glass)
- laser


a
b

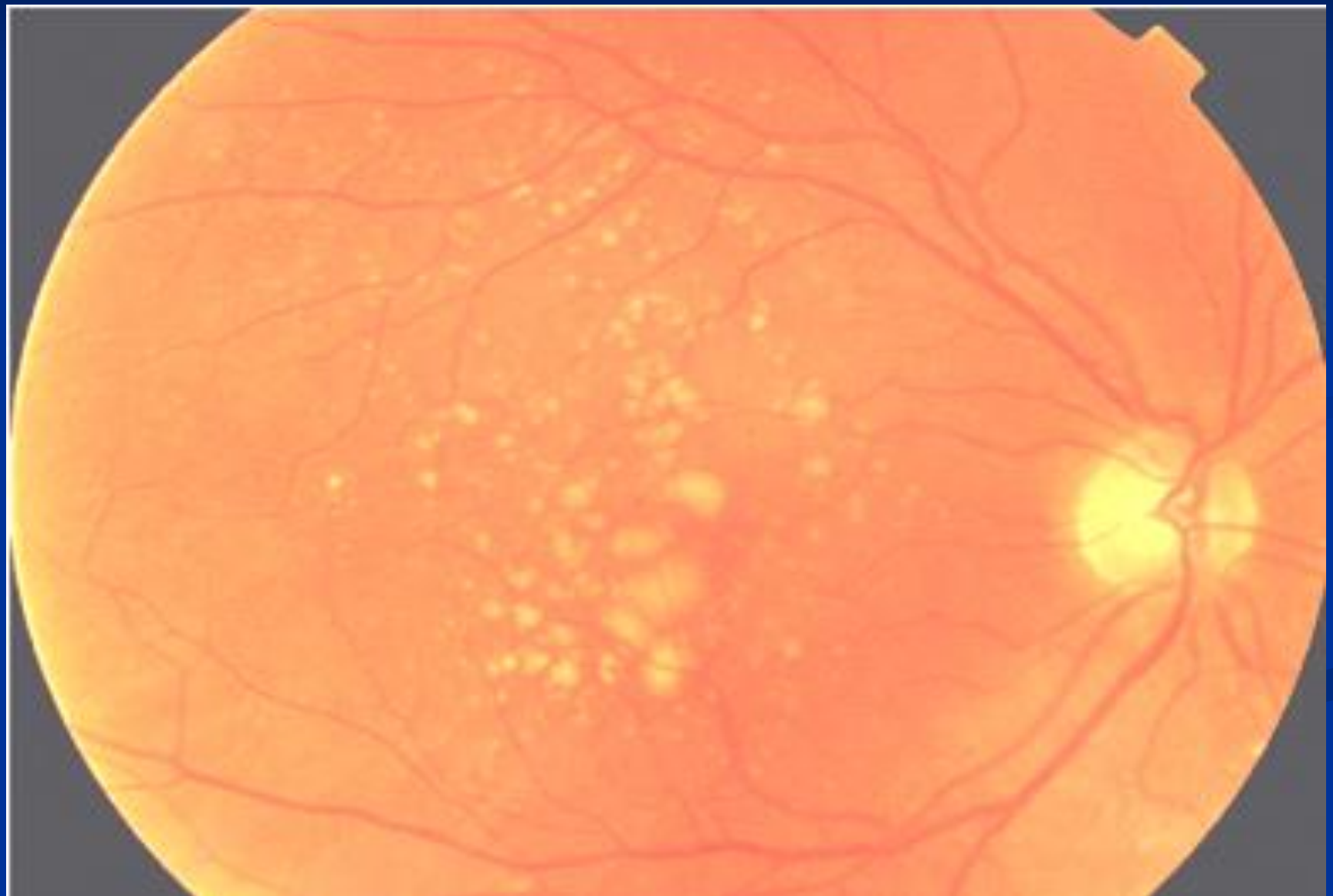
Age – related macular degeneration (AMD)

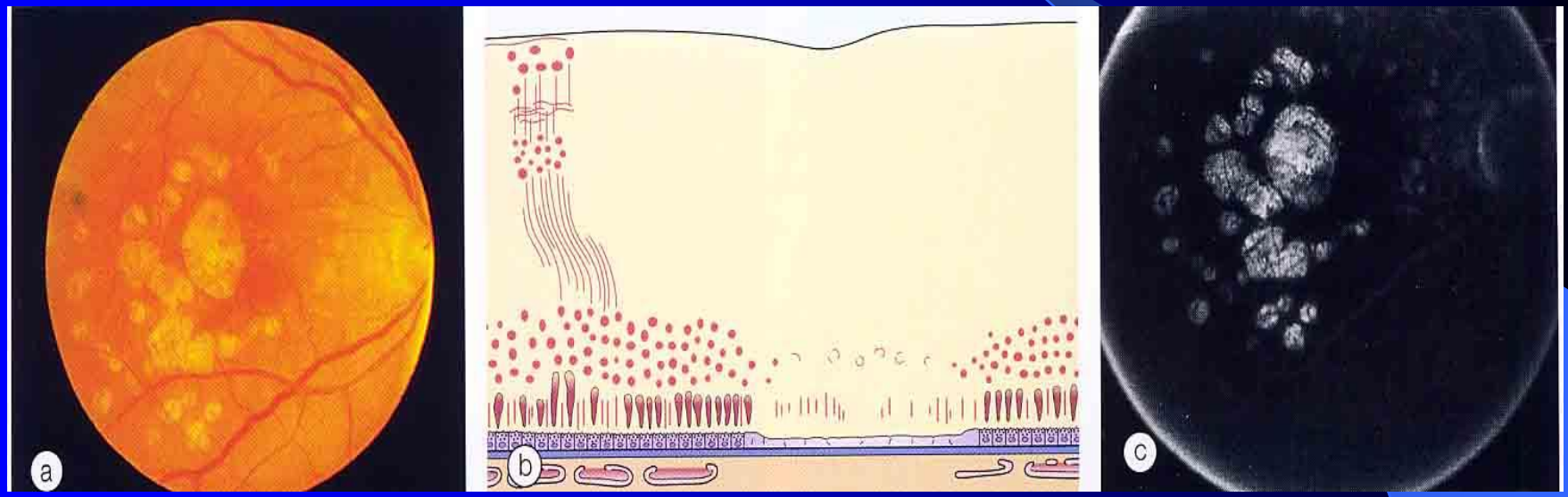
- > 50 years
- Caucasian / female / family history / smoking

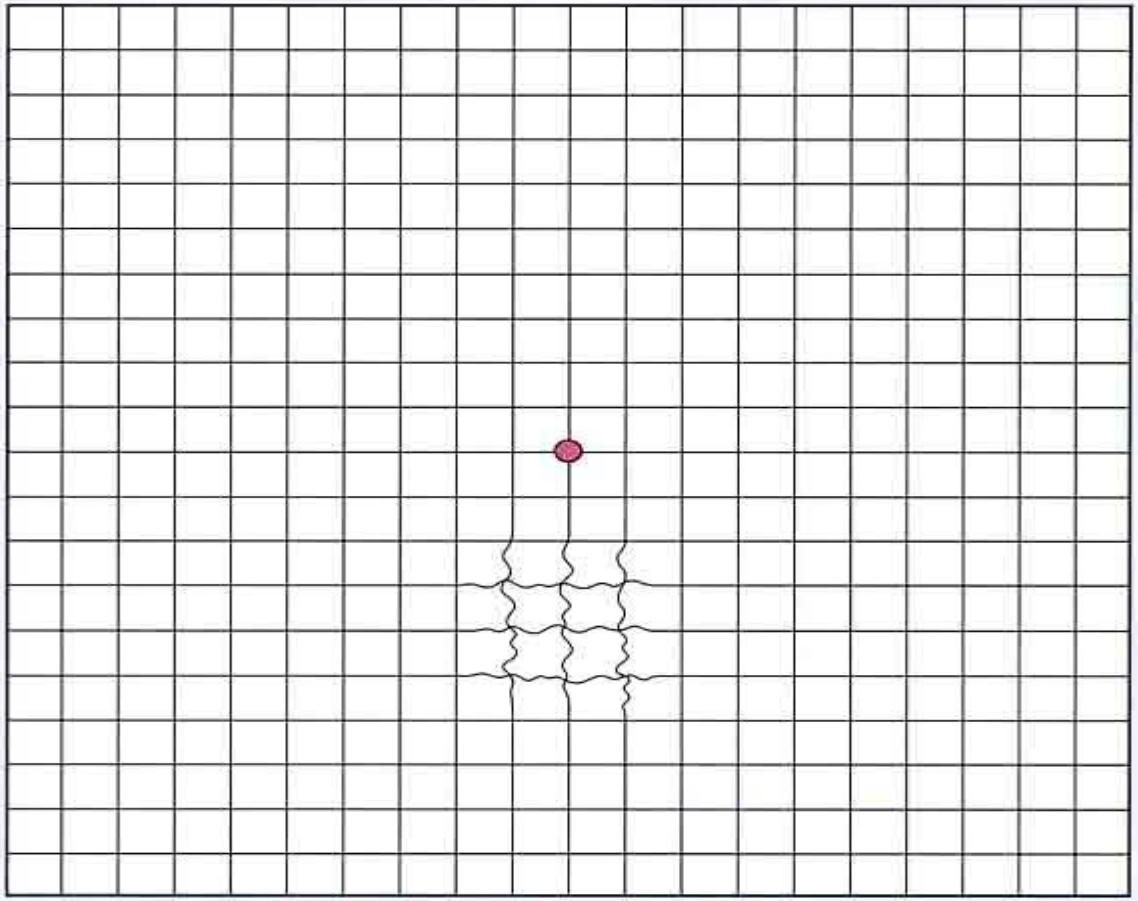
Non exudative macular degeneration

- atrophy and degeneration of outer retina
- RPE / Bruch's / choriocapillaris
- Drusen : beneath the PRE / eosinophilic material
- Amsler grid

Age related macular degeneration Drusen

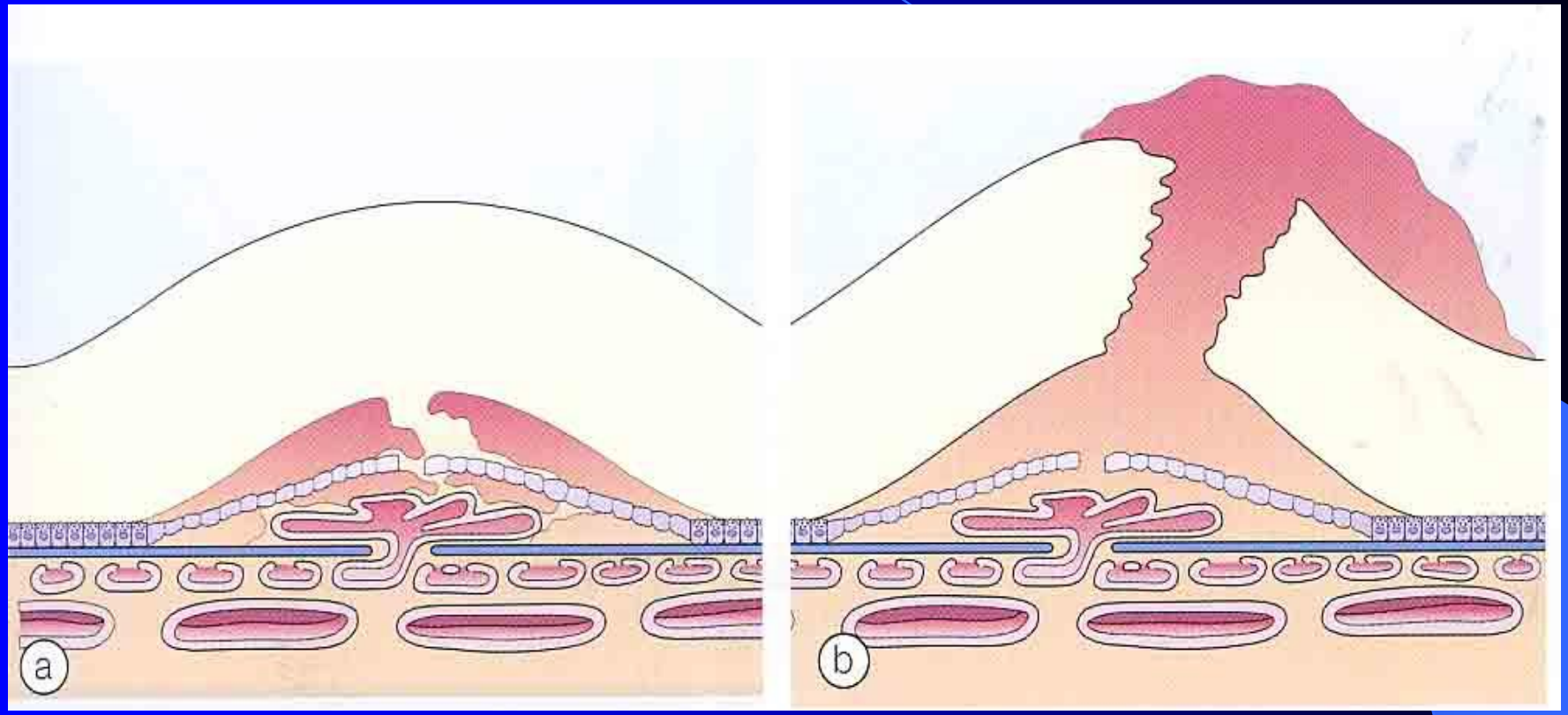



a
b
c

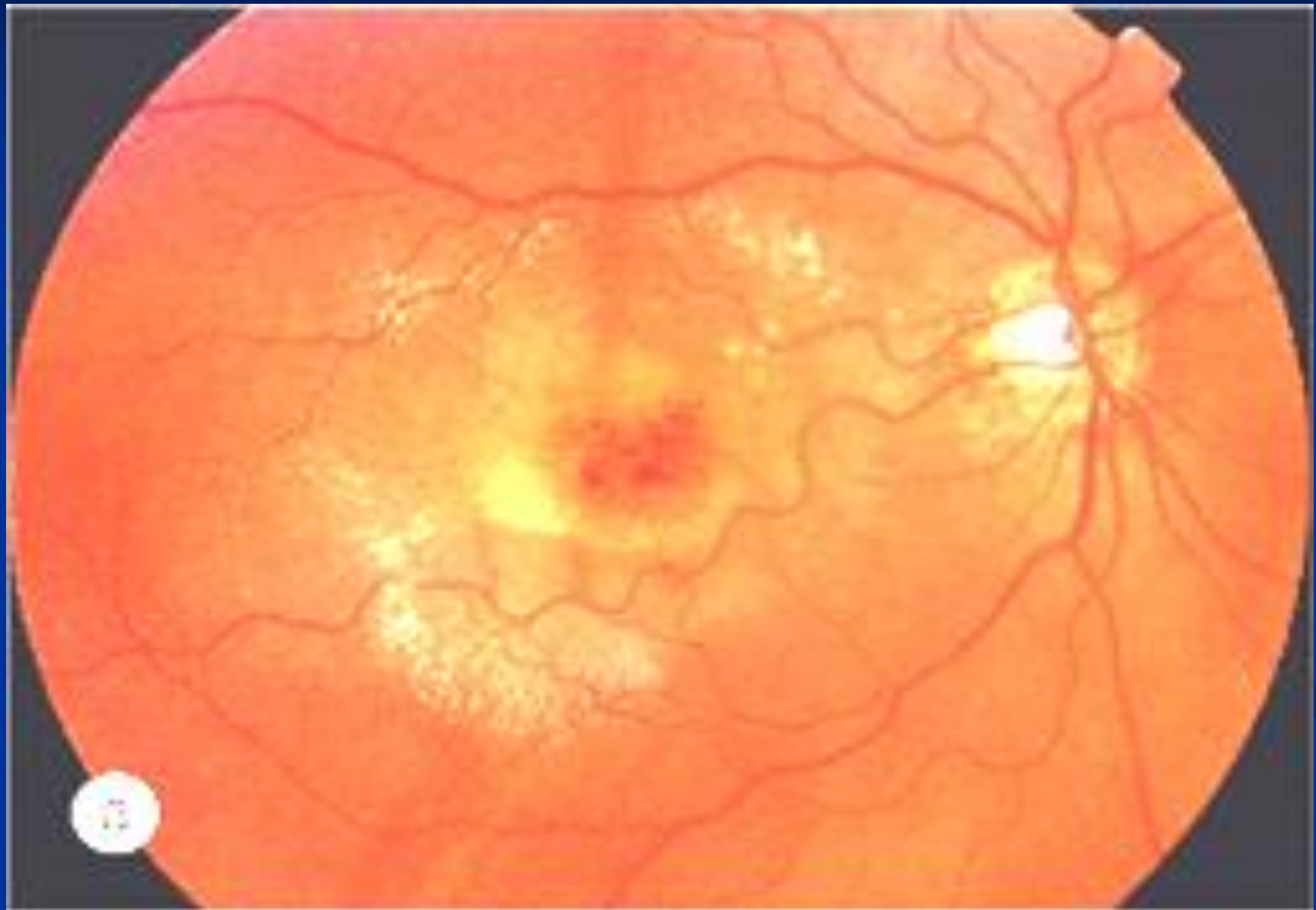


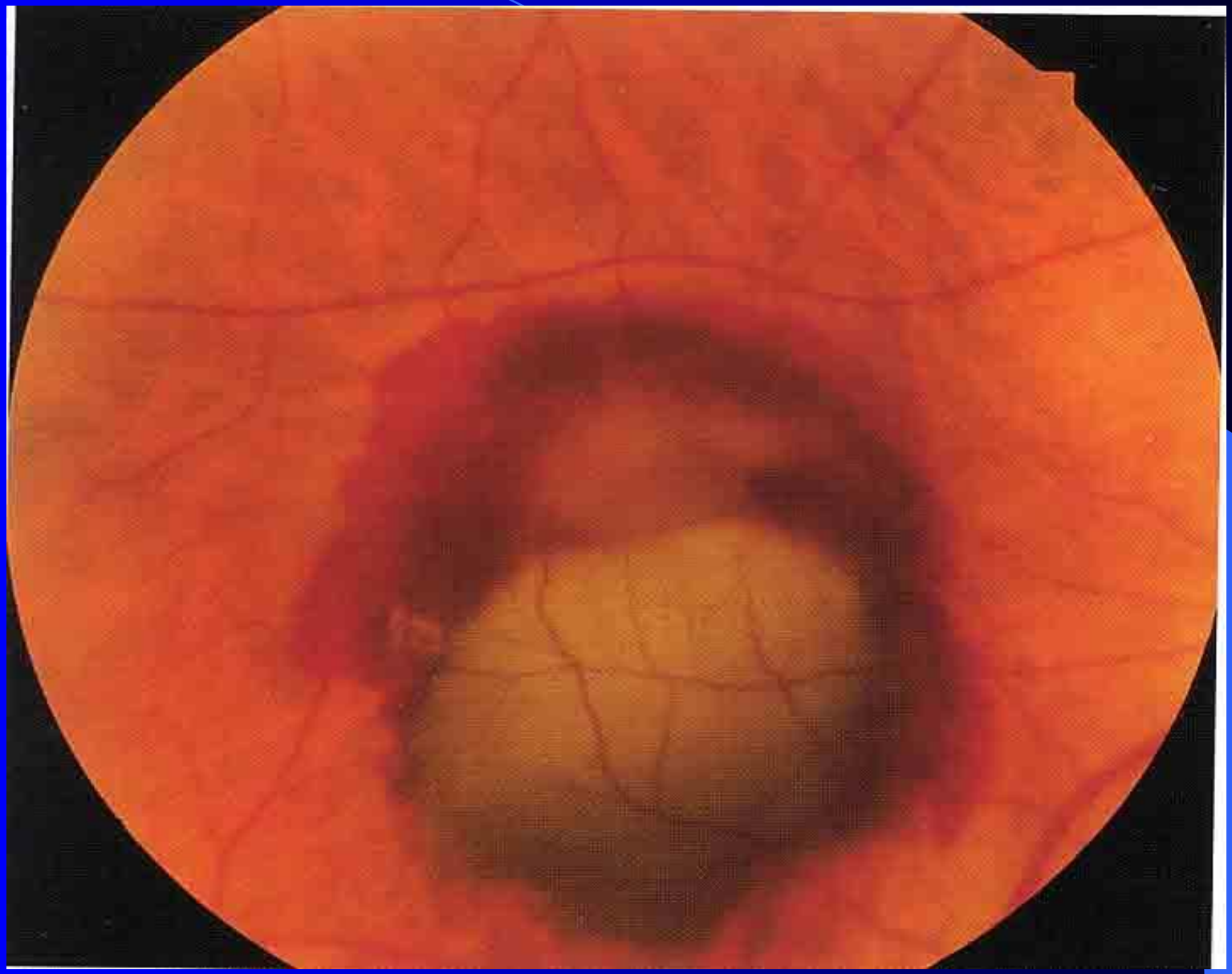
Exudative macular degeneration

- severe vision loss from subretinal N.V
- Ingrowth of N.V from choroid
- Treatment
  - laser
  - Recurrence in one- half by 2 years
  - Rt
  - LVA


a
b

Age related macular degeneration Choroidal neovascularization

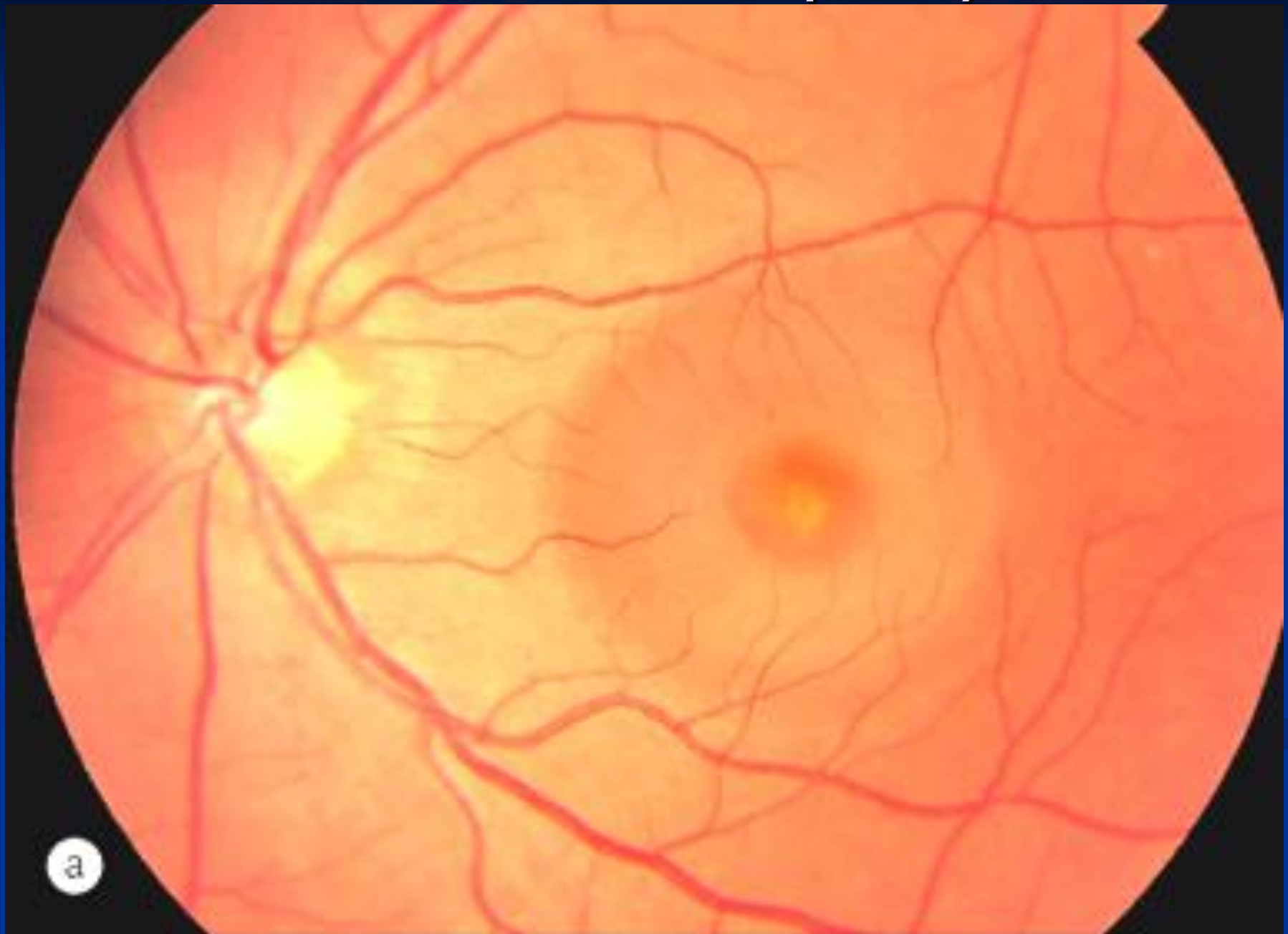


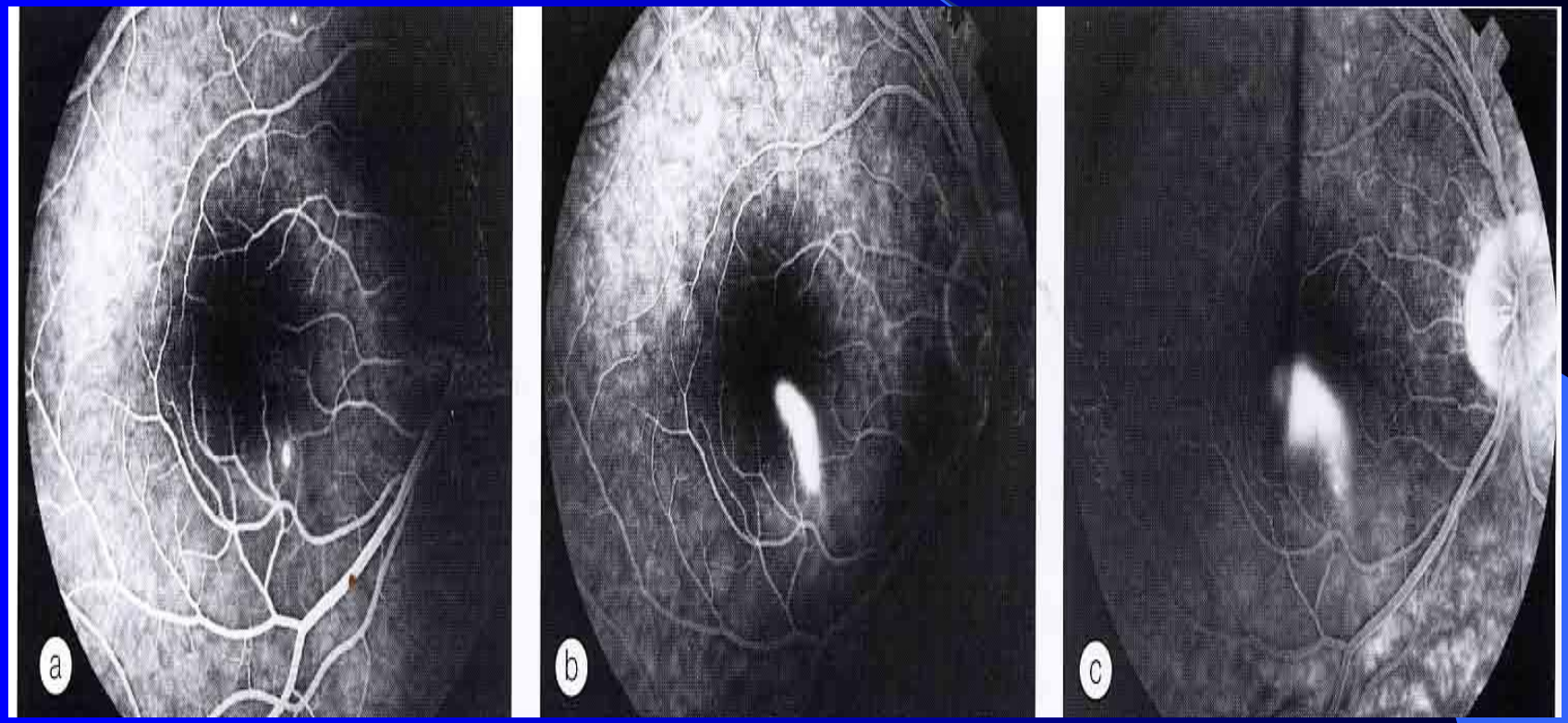


Central serous chorioretinopathy (CSR)

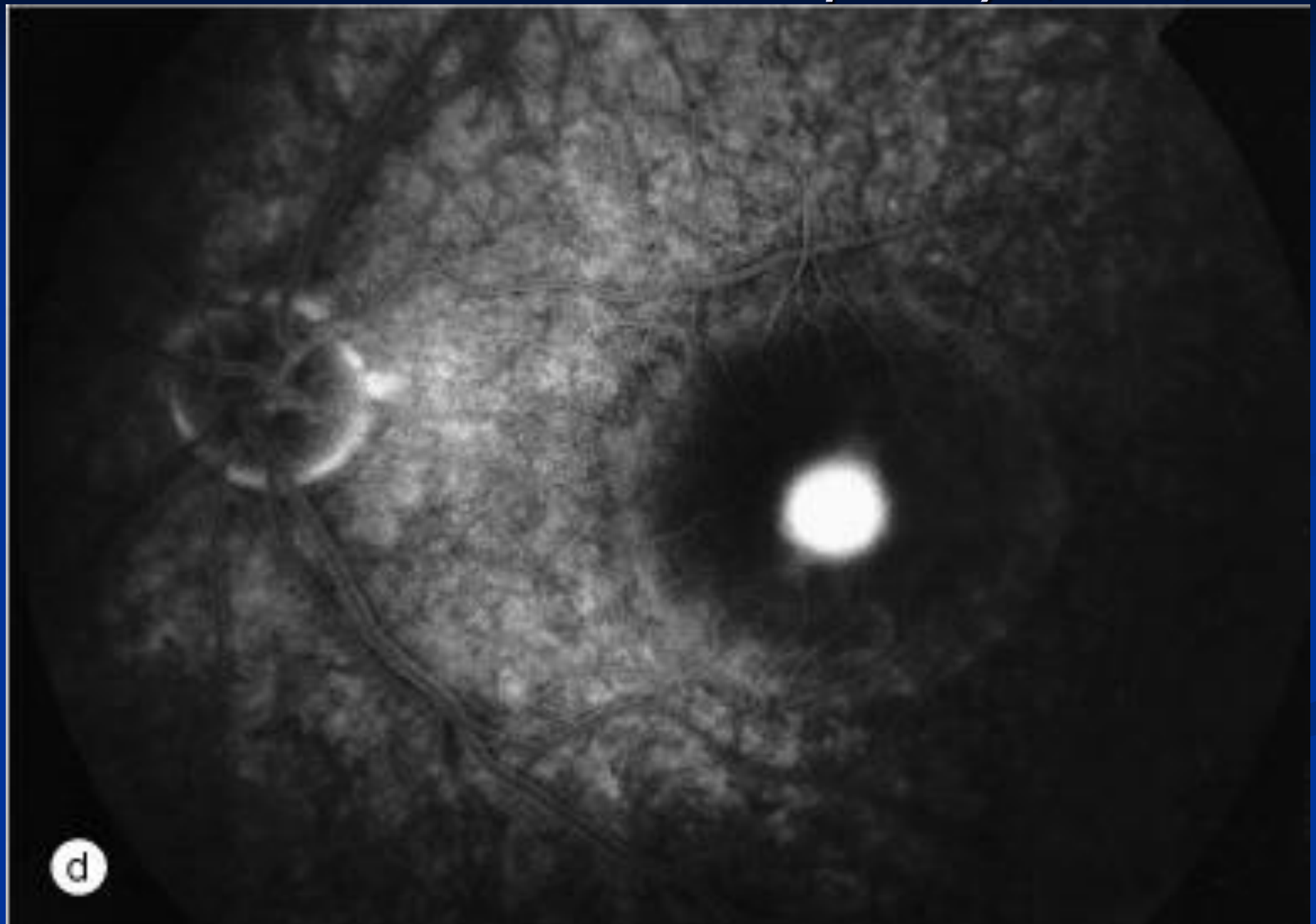
- serous detachment of sensory retina
- Young to middle aged – men
- Life stress
- FA ___ smoke stack
- Spontaneous resorption in 80% within 6 months
- Recurrence and complication in 20 – 30%
- Unknown cause
- Argon laser

Central Serous Retinopathy (CSR)

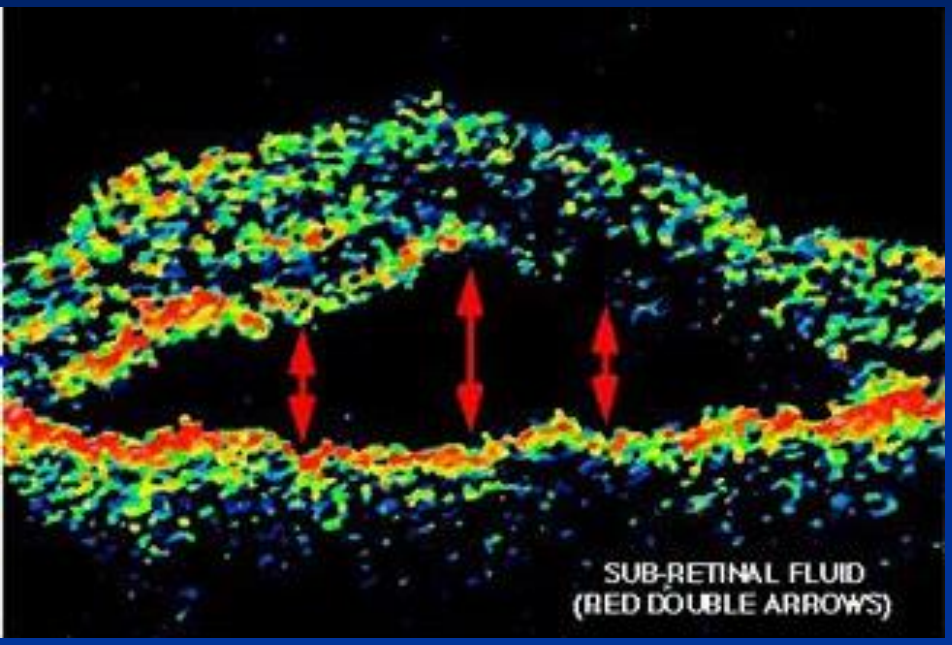


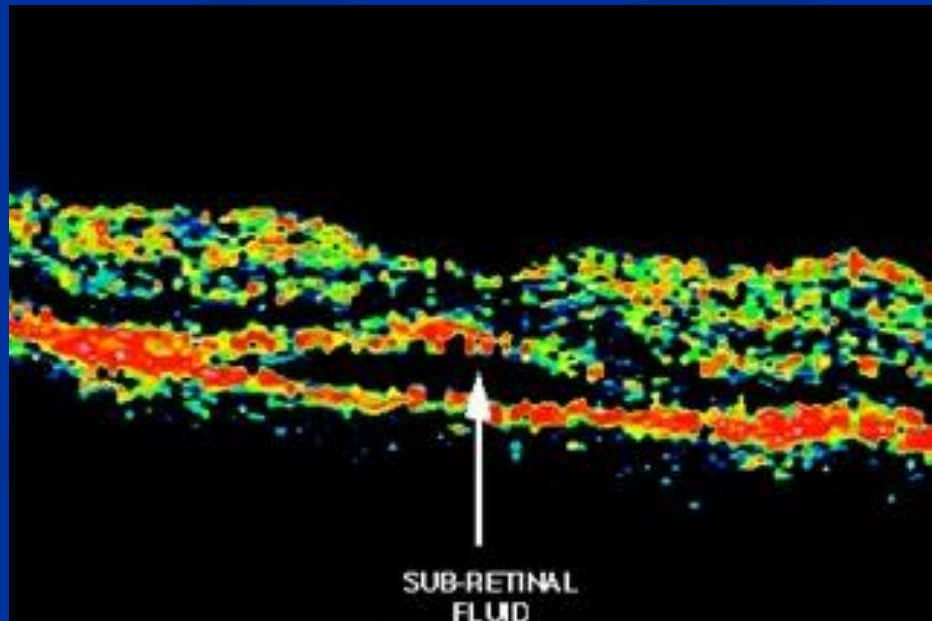

a
b
c

Central Serous Retinopathy (CSR)



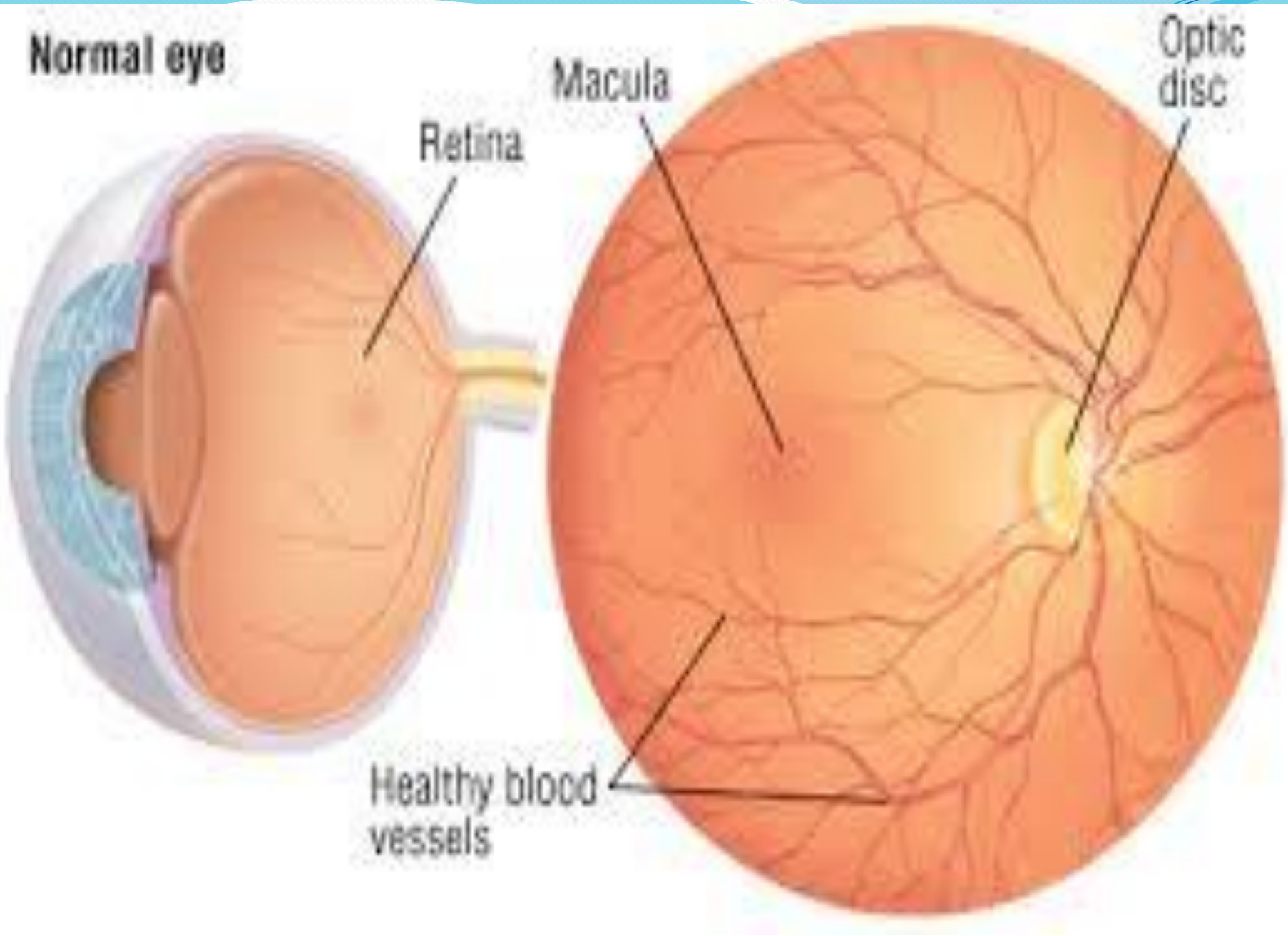
Central Serous Retinopathy (CSR) OCT

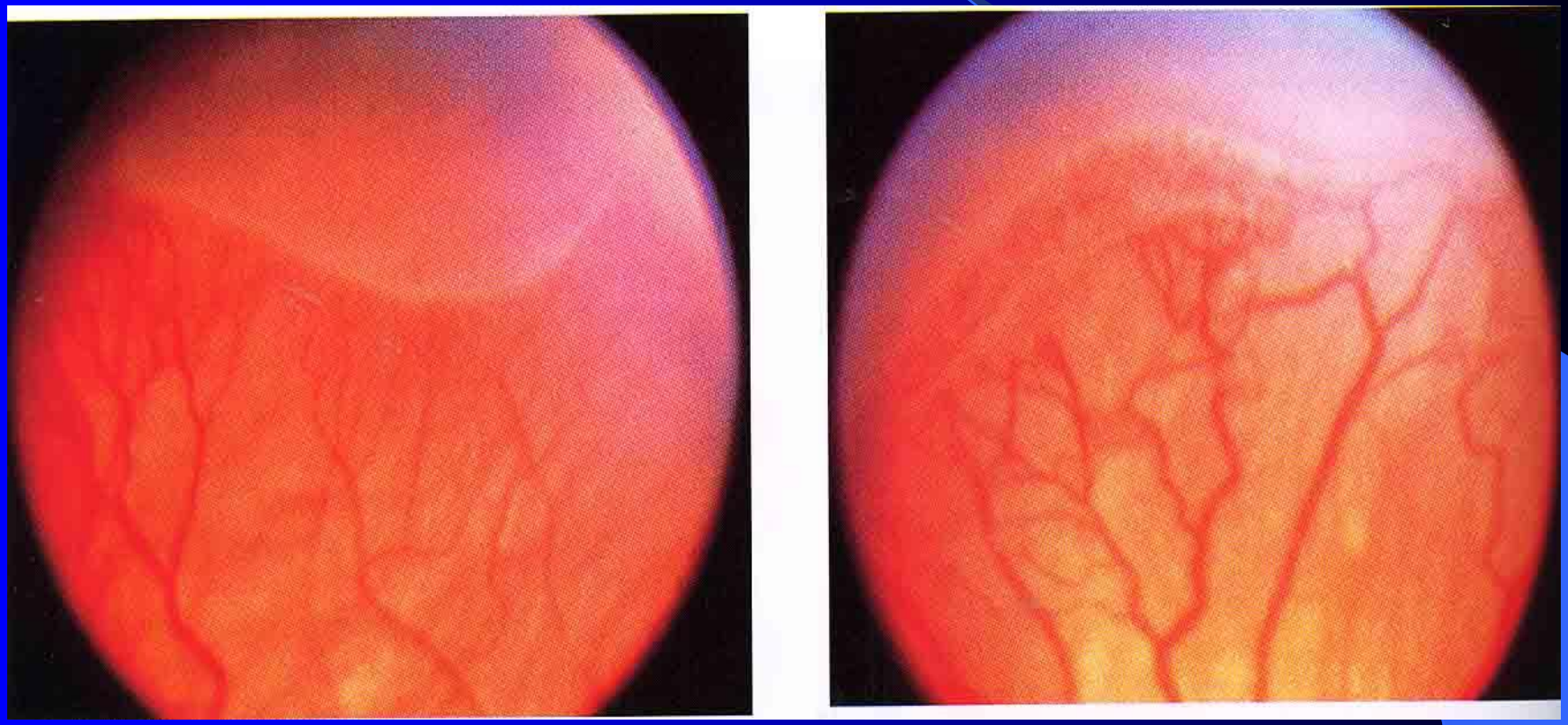


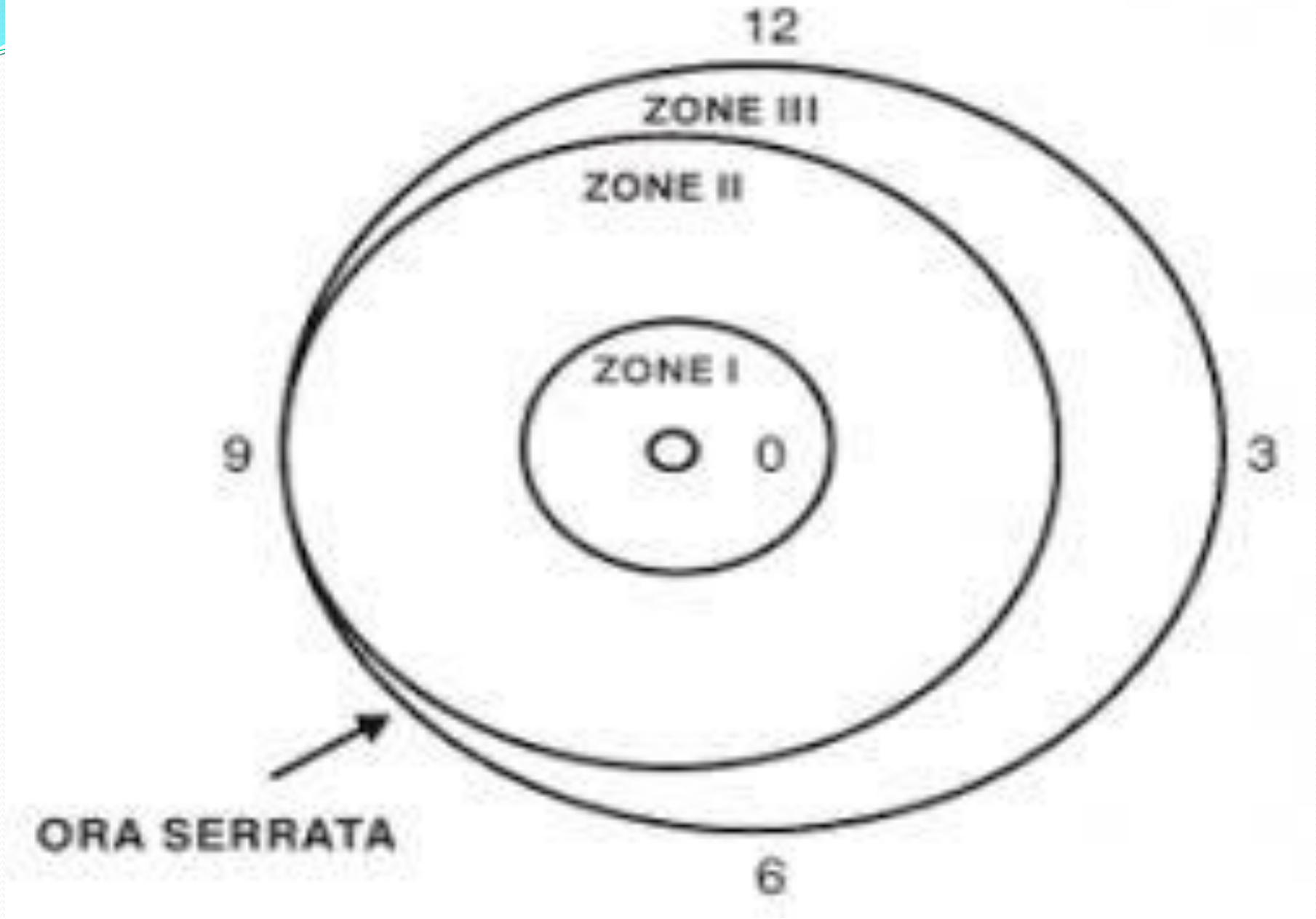


Retinopathy of prematurity

- vaso proliferative retinopathy
- Childhood blindness
- 3 zones / 5 stages
- Laser / vitrectomy

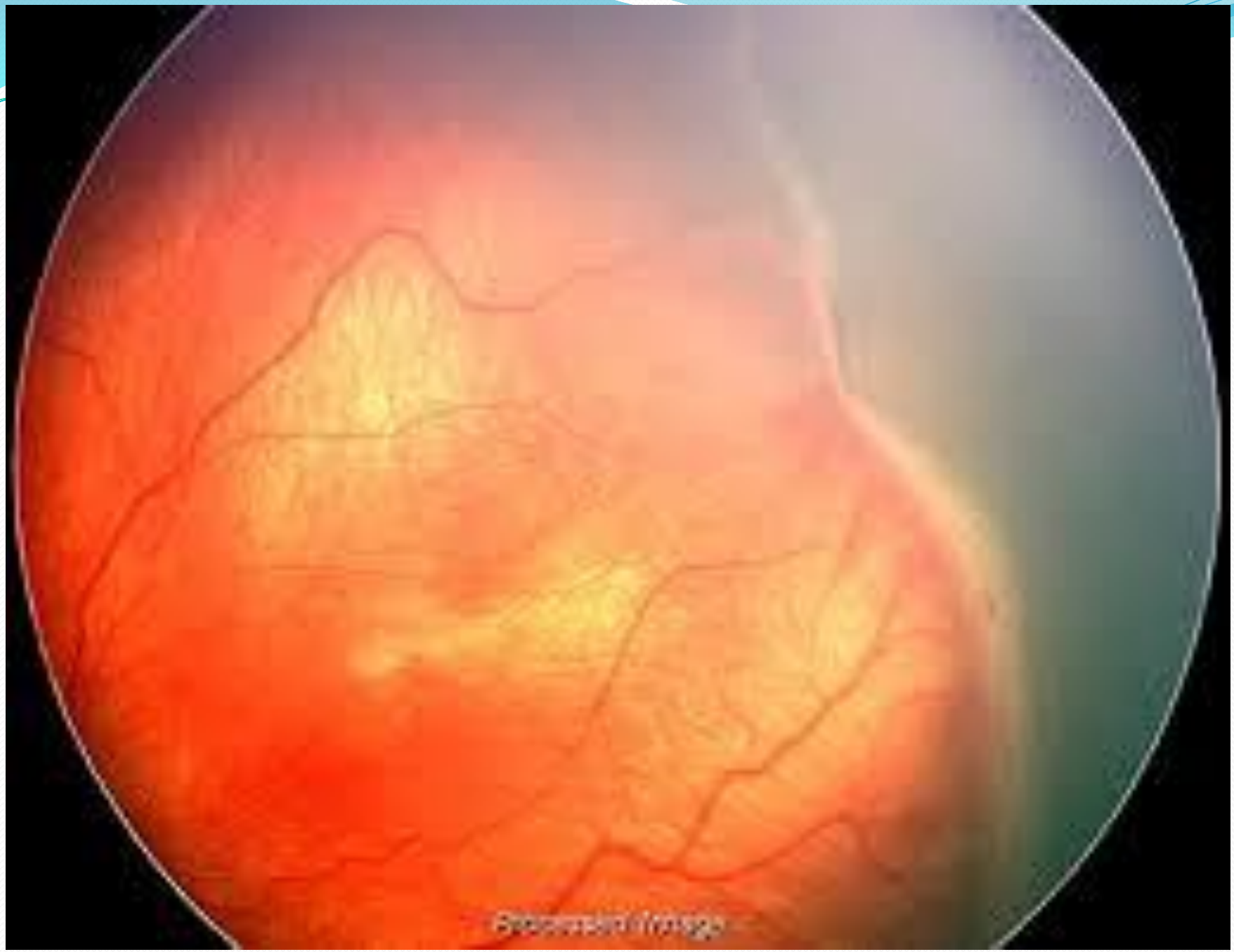

Normal eye
Retina
Macula
Optic disc
Healthy blood vessels

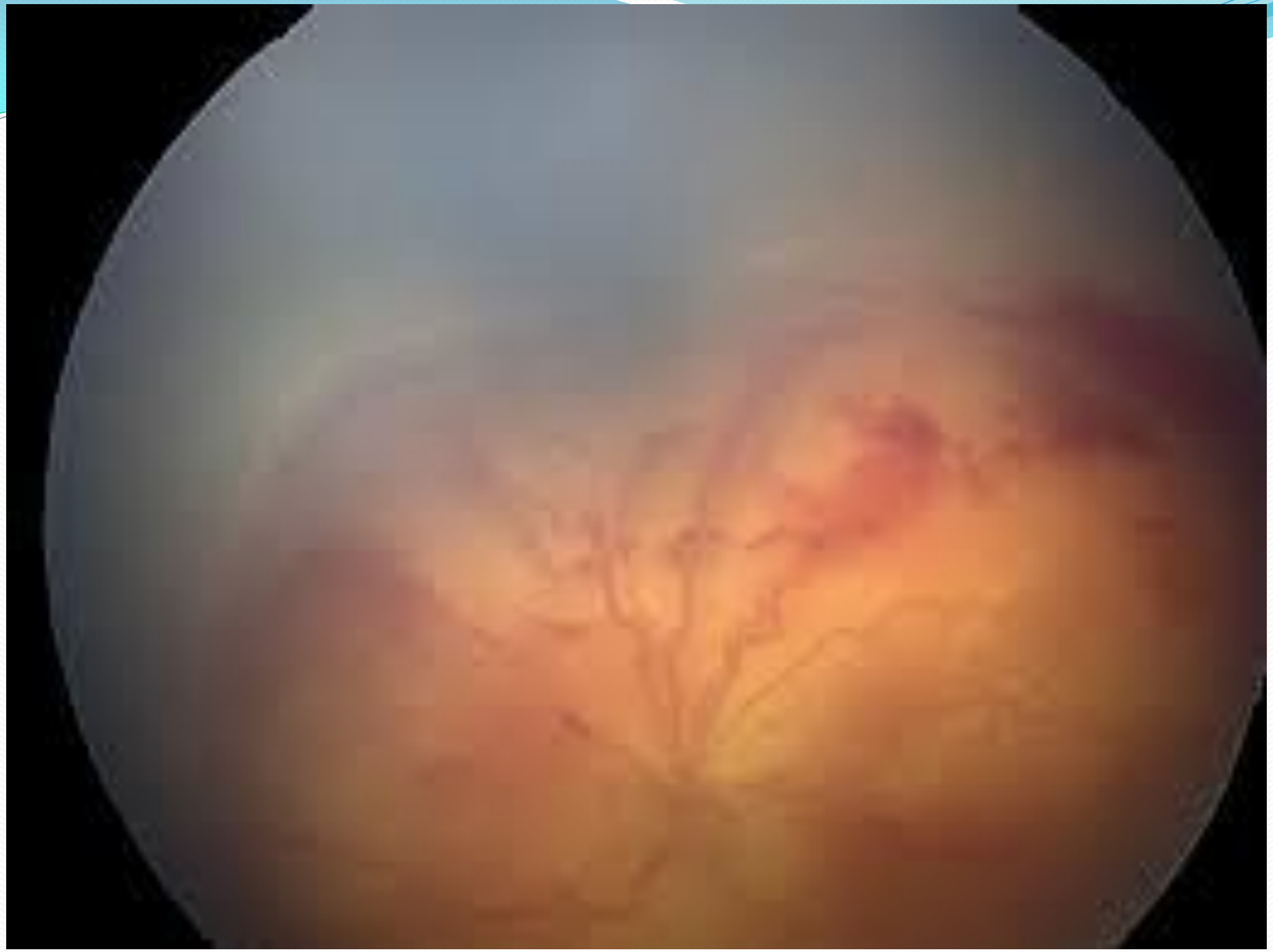


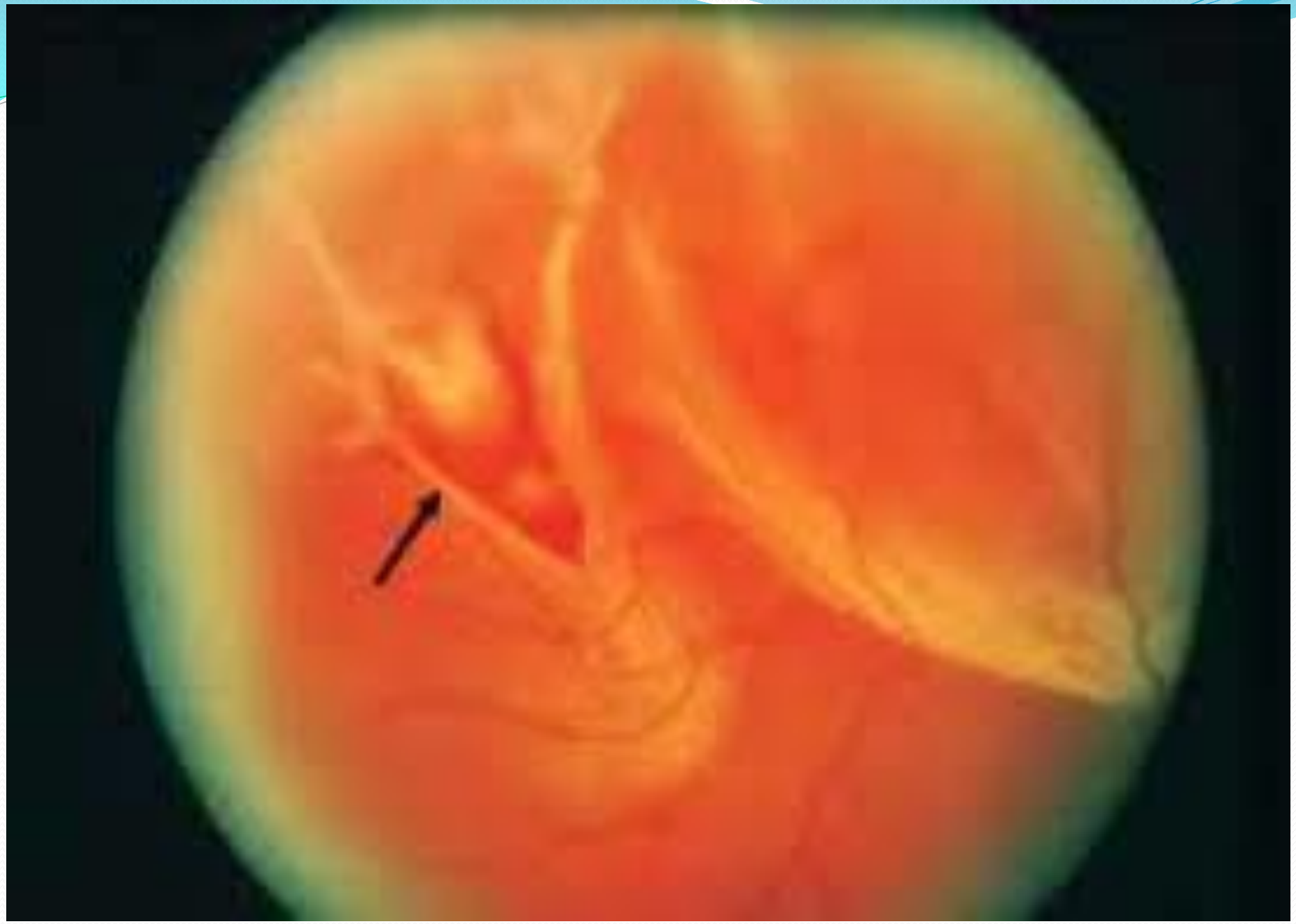

12
ZONE III
ZONE II
ZONE I
9
0
3
6
ORA SERRATA

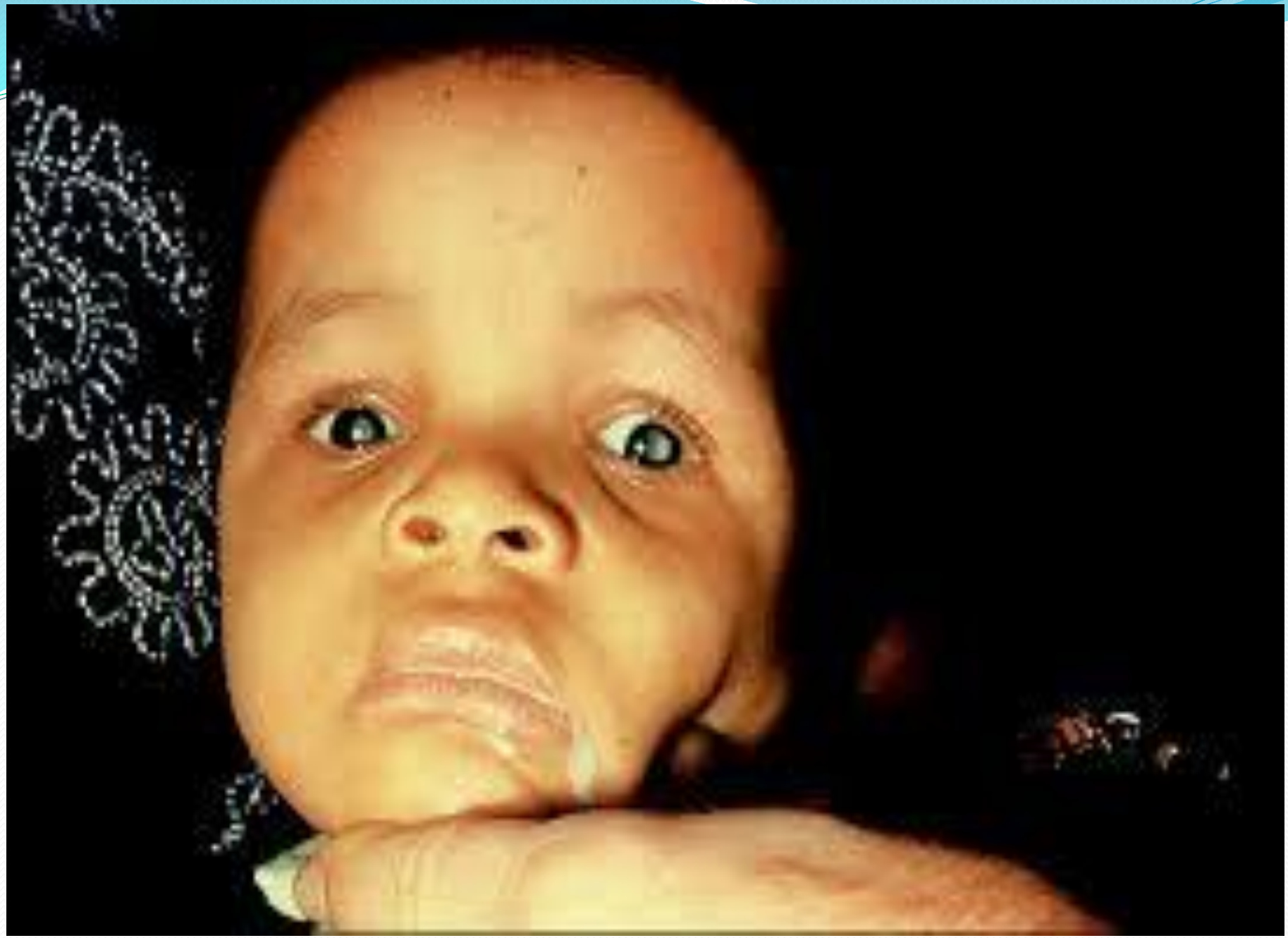
Rop: Stages	Description
Stage 1	Demarcation Line
Stage 2	Ridge
Stage 3	Ridge with Extra Retinal
Mild / Moderate / Severe	Fibrovascular Proliferation
Stage 4	Subtotal Retinal Detachment
A	A. Not Involving Macula
B	B. Involving Macula
Stage 5	Total Retinal Detachment


IMAGEBANK









- all infants with a birth weight ≤1500 g or a gestational age (GA) of 30 weeks or less

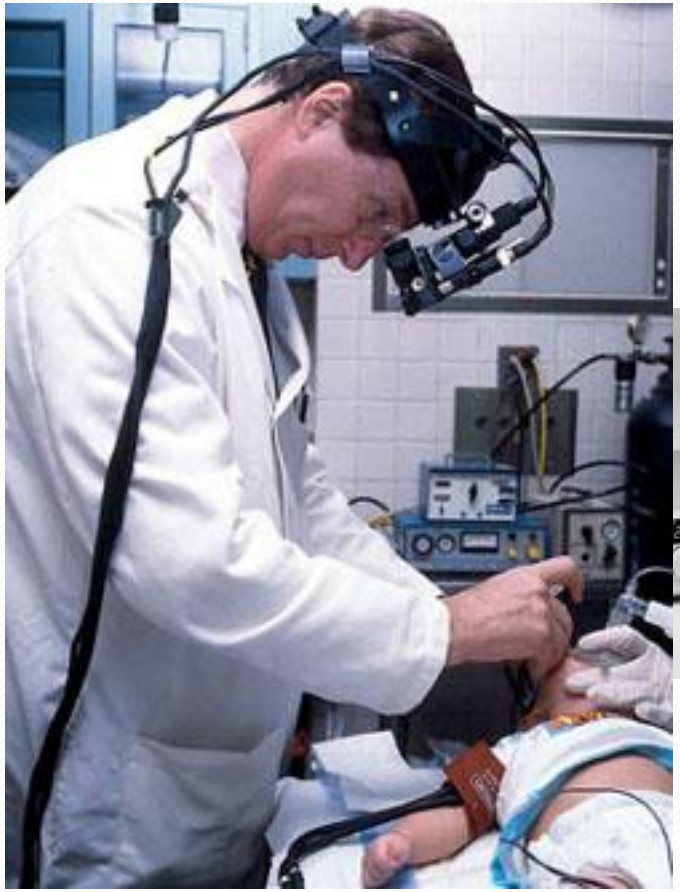
- infants with a birth weight between 1500–2000 g or a GA of more than 30 weeks whose clinical course places them at increased risk for ROP as well as those believed by their neonatologist to be at high risk for ROP. Such conditions could include the need for prolonged supplemental oxygenation or ventilation, poor postnatal growth or intrauterine growth restriction, or comorbidities such as necrotizing enterocolitis, intraventricular hemorrhage, sepsis, and bronchopulmonary dysplasia

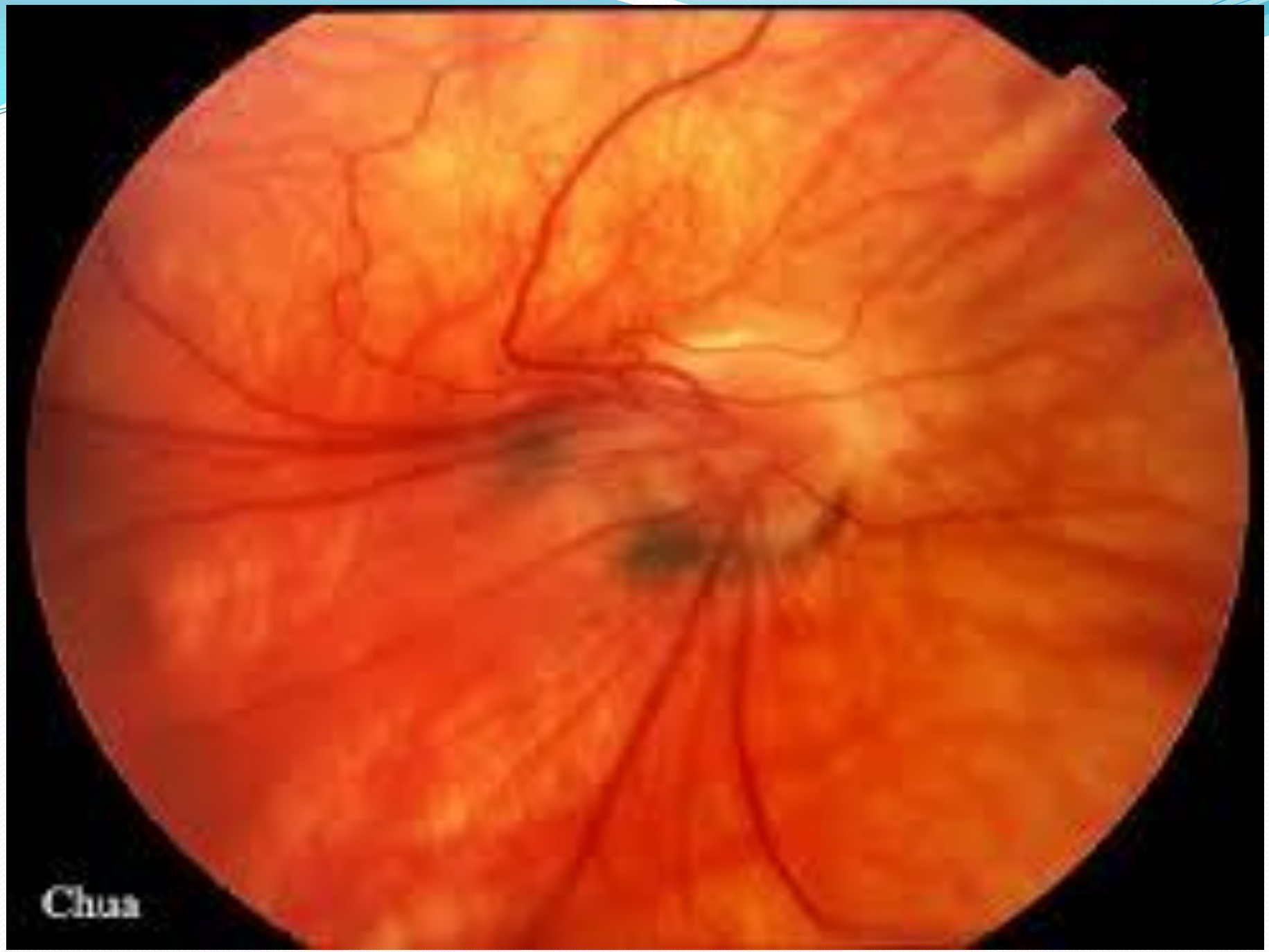
- The first examination should be performed prior to hospital discharge at 4–6 weeks after birth, or at 31 weeks postmenstrual age, whichever is later

Treatment of ROP

- Cryotherapy has been used to treat ROP since 1972.

LASER THERAPY FOR ROP

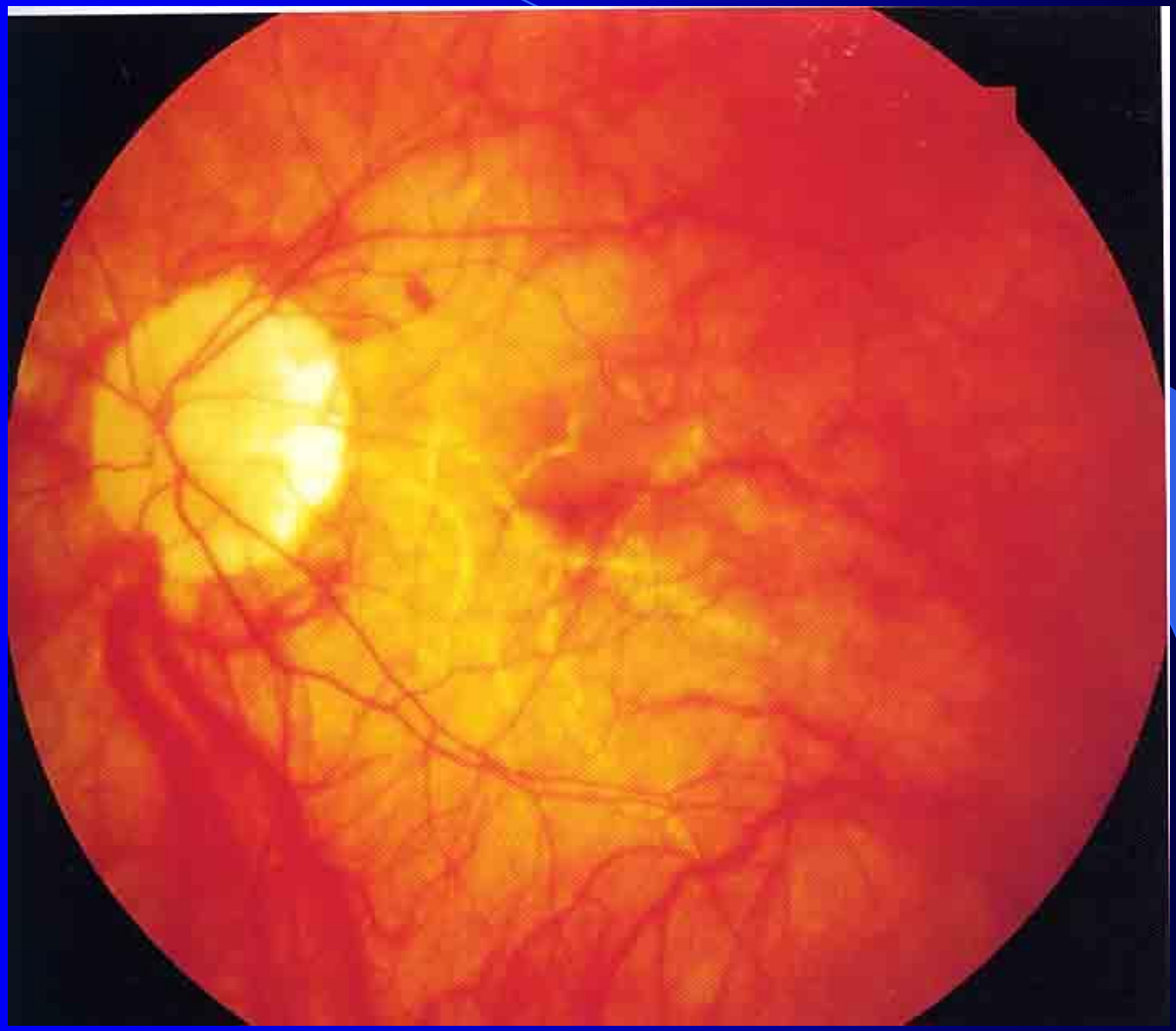


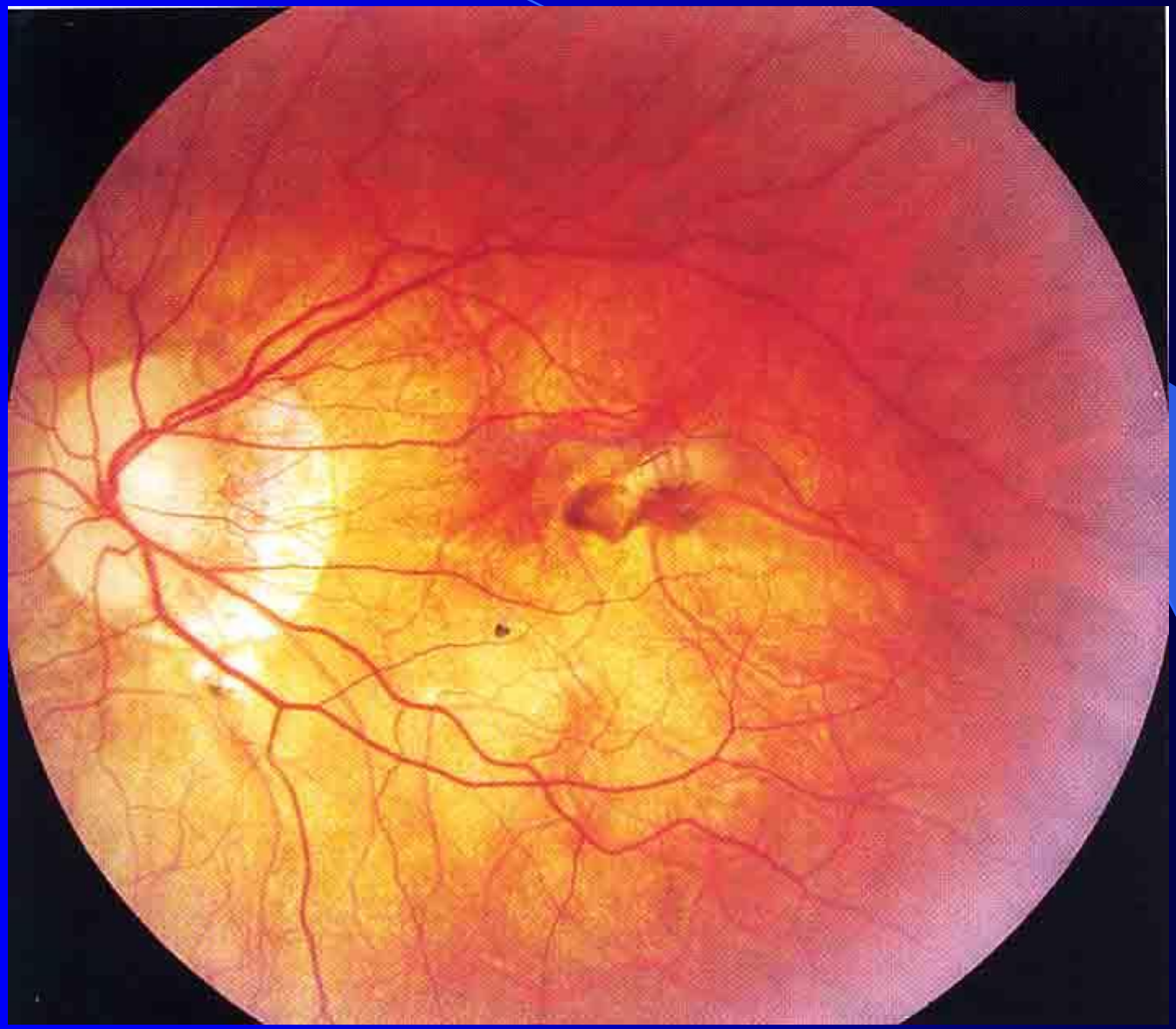

Chua

- Recently, the Bevacizumab Eliminates the Angiogenic Threat of Retinopathy of Prematurity (BEAT-ROP) study tested the anti-VEGF antibody, bevacizumab, given intravitreally at 0.625 mg in 0.025 mL in 150 infants. A benefit was reported for infants with zone .

Myopic macular degeneration

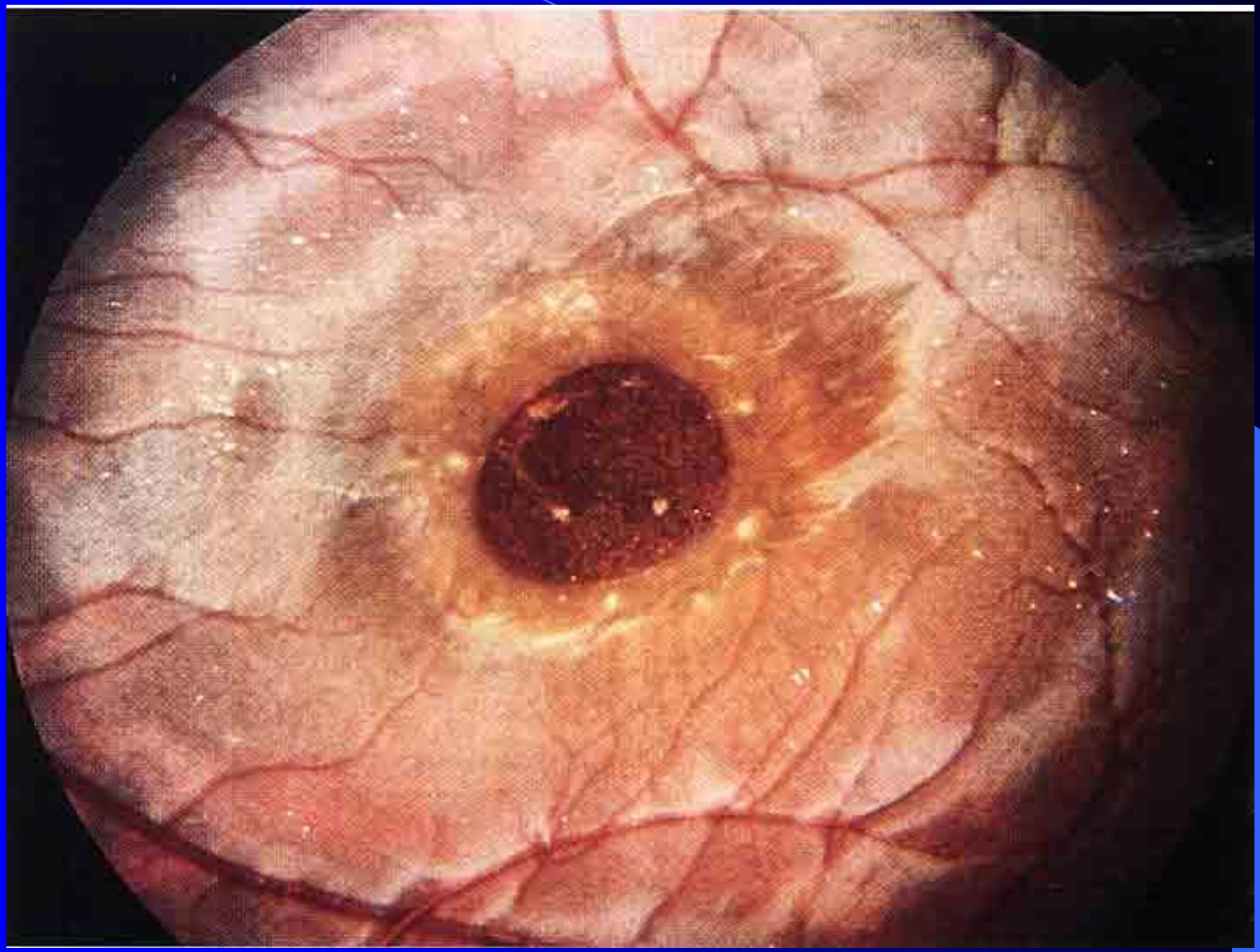
- lacquer cracks : linear breaks in Bruch's
- Fuchs spot
- Fifth decade ____ sub retinal NV
- Laser is not as beneficial





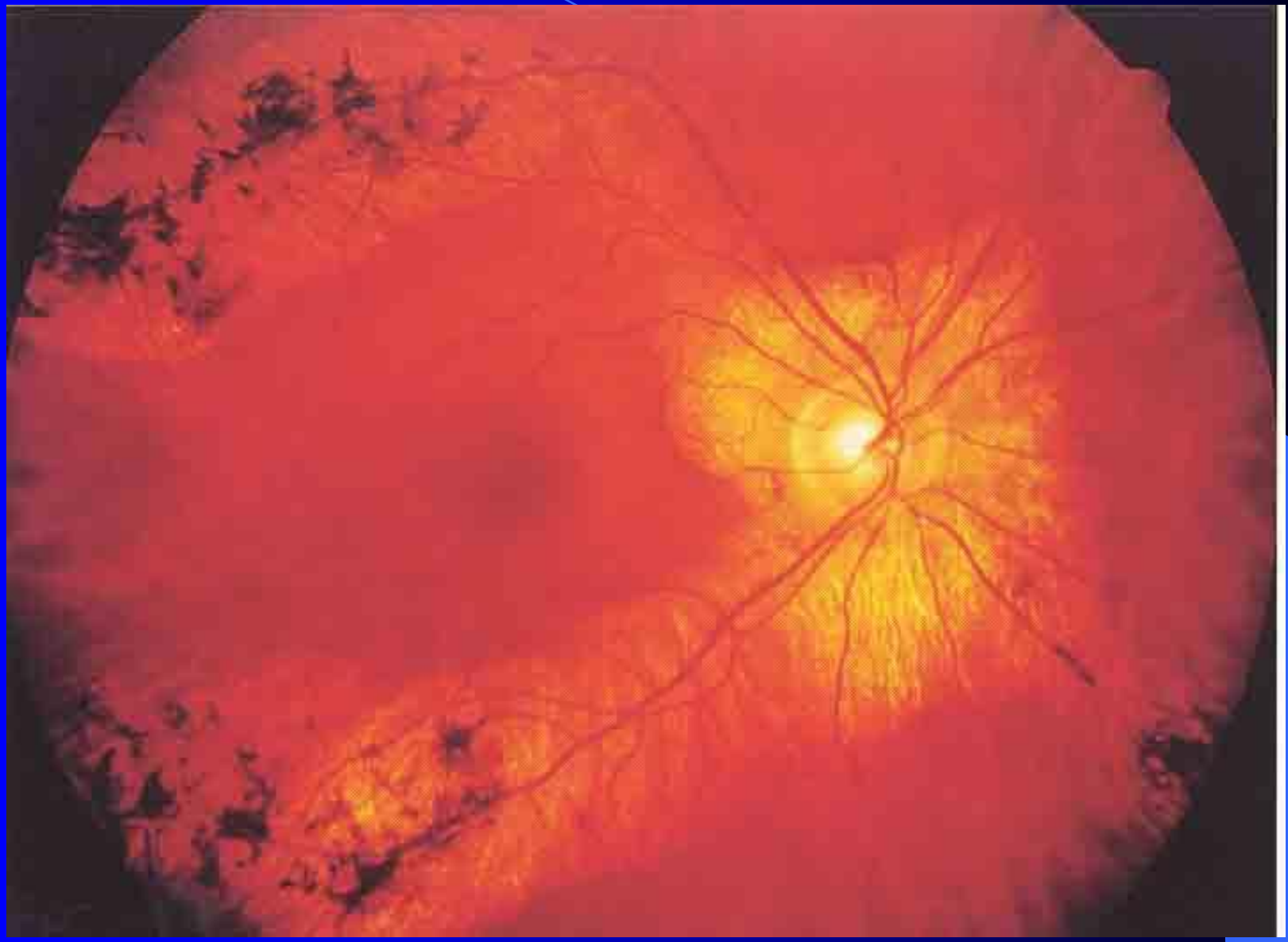
Macular hole

- elderly women
- Elevated plasma fibrinogen
- One – third DD
- Tangential traction
- Decreased VA / metamorphopsia / central scotoma



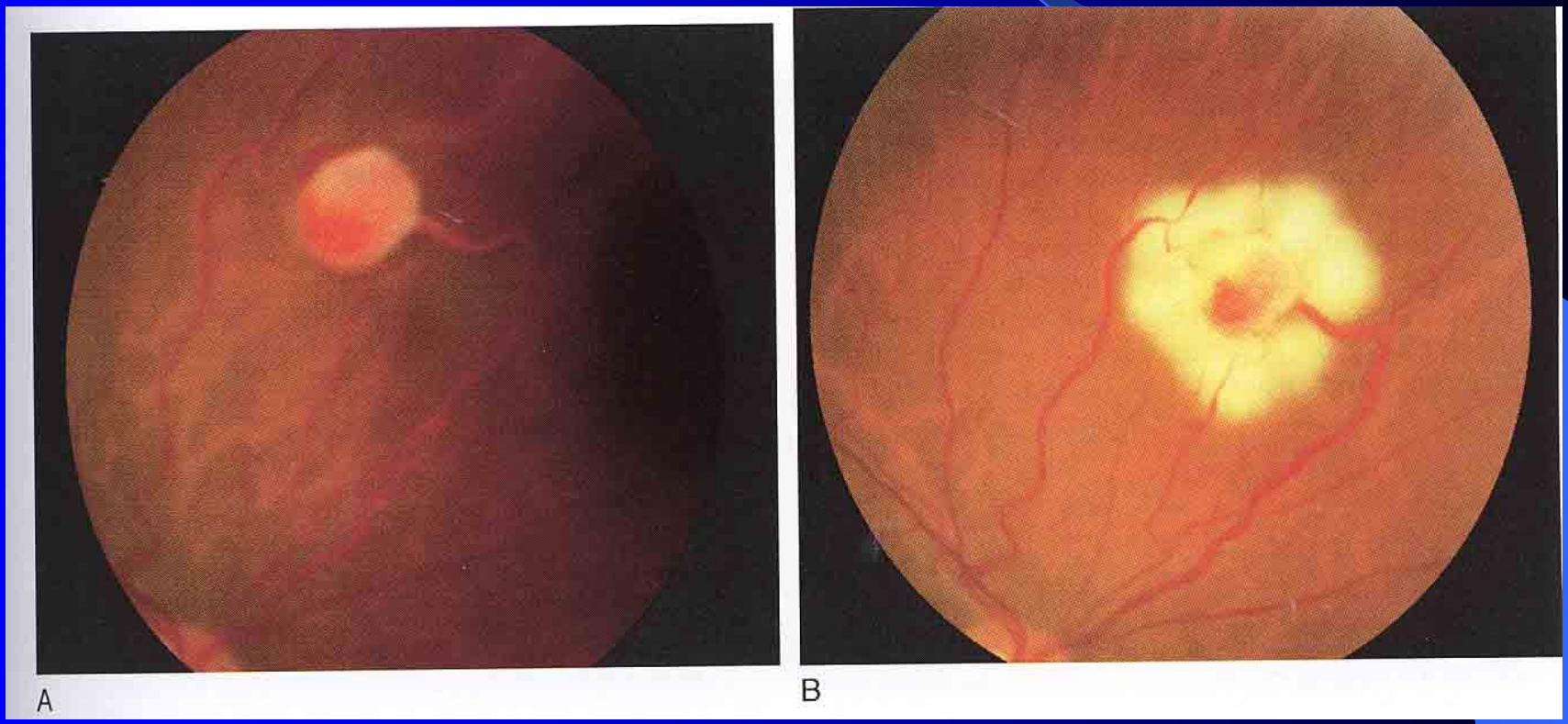
Retina degenerations

- Retinitis pigmentosa
  - Hereditary
  - Photoreceptor degeneration
  - Night blindness/ peripheral VF loss
  - Arteriol narrowing / RPE mottling
  - Bone - spicule



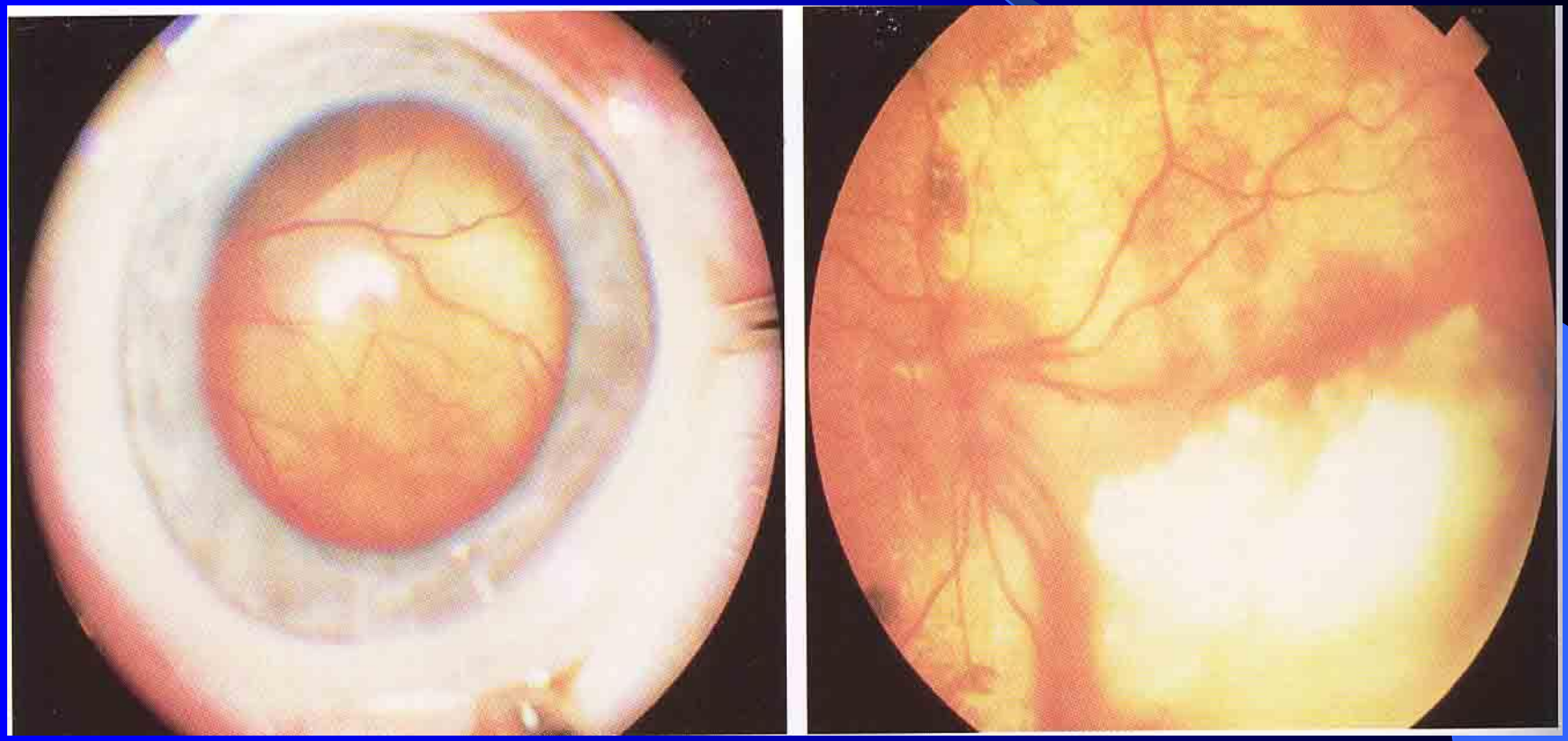
Retinal angioma

- Isolated
- Von hippel – lindau : cerebellar hemangioblastoma , pancreatic cysts and carcinomas / renal cystes and carcinomas / pheochromocytoma
- Vision loss due to bleeding or exudate
- Laser / diathermy / cryotherapy


A
B

Retinoblastoma

- two – thirds before the end of third year
- Bilat : 30%
- Unilat in up to one - third of heritable
- Allele within chromosomal band 13q14 controls the tumor
- Suppressor gene or anti oncogene



- Survivors of heritable form ___ producing affected child in 50%
- Exophytic or endophytic
- Extension through optic . Nerve and emissary vessels
- Pseudo inflammation mimicking retinitis , vitritis , uveitis , or endophthalmitis
- Flexner wintersteiner rosettes indicative of photoreceptor differentiation
- Necrosis and calcification

- in few : spontaneous resolution
- leukocoria / strabismus / inflammation
- Treatment : enucleation / plaque or external beam RT / CT
- Second primary malignant tumor (especially osteosarcoma) in 20% - 90% of heritable form

Lymphoma

- rarely in assosiation with systemic lymphomas
- Involving retina & vitreous
- Mimic retinitis / vitritis / uveitis
- CNS involvement : usual cause of death
- Rt & Ct

Color vision defects

- cortical response
- 400 – 700 nm
- Cone photoreceptor
- Congenital : red green / 8% of males & 0.5% of females / both eyes equally / X-linked recessive
- Acquired : blue – yellow / M = F
- Dichromates

- Protanopia : red – sensitive pigment loss
- Deuteranopia : green – sensitive pigment loss
- Tritanopia : blue – yellow color blindness
- Anomalous trichromates
- Rod monochromatism = without functioning cones / decreased VA / absent color vision / photophobial nystagmus
- Cone monochromatism = all cones contain the same pigment