

Dougherty Laser Vision CE Event, March 29, 2015

Common Posterior Segment Disease

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Outline

- ❖ **Vitreous**

- ❖ Posterior vitreous detachment
- ❖ Vitreous hemorrhage

- ❖ **Vitreoretinal interface**

- ❖ Rhegmatogenous retinal detachment
- ❖ Vitreomacular traction
- ❖ Epiretinal membrane
- ❖ Macular hole

- ❖ **Retinal Vessels**

- ❖ NPDR
- ❖ PDR
- ❖ Retinal artery occlusion
- ❖ Retinal vein occlusion

- ❖ **RPE/Bruch's membrane**

- ❖ Nonexudative (dry) ARMD
- ❖ Exudative (wet) ARMD
- ❖ Central serous retinopathy



Format

- ❖ Presentation
- ❖ Differential Diagnosis
- ❖ Management



Vitreous

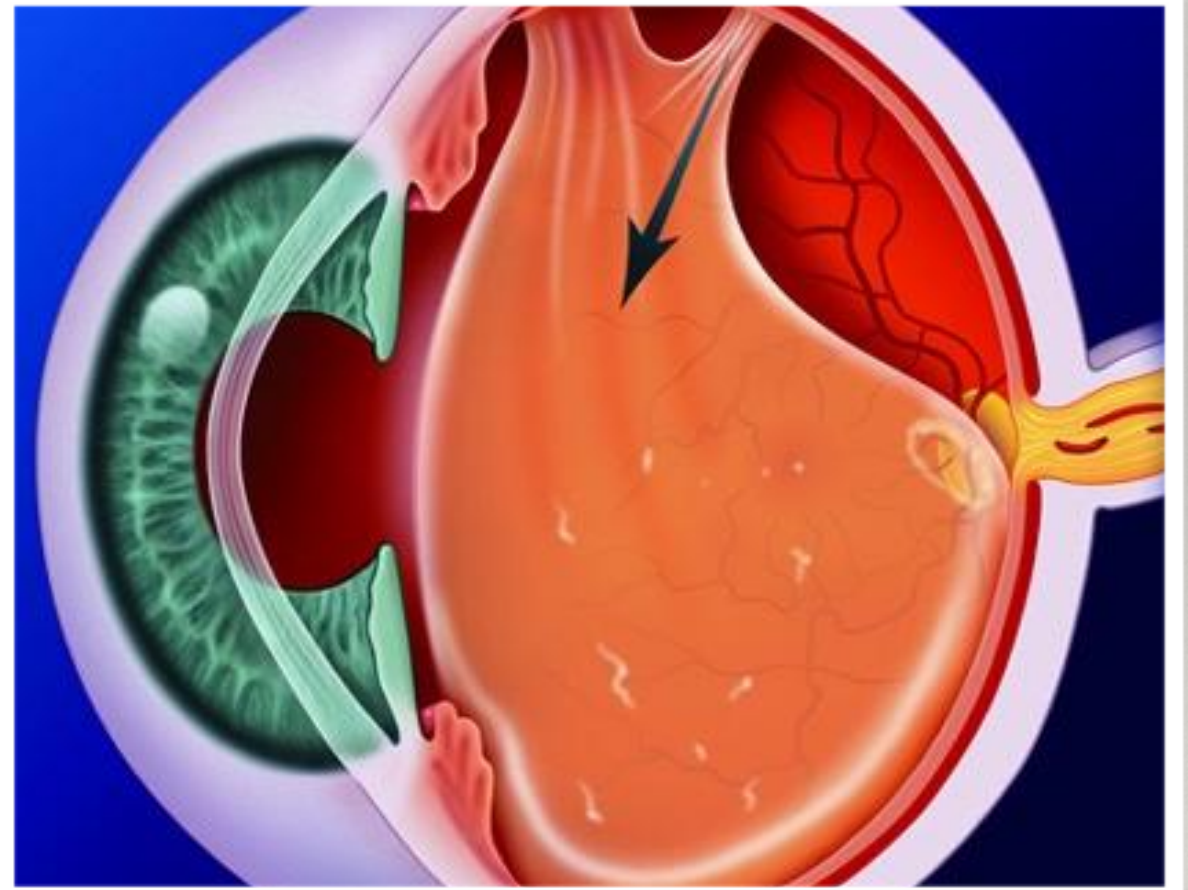
“I cook with wine, sometimes I even add it to food.”

—W. C. Fields

Posterior Vitreous Detachment

❖ Presentation:

- ❖ “cobwebs”, “bugs”, “tadpole”, “a ring”
- ❖ flashes (temporally located) – “especially when it’s dim”
- ❖ blurred vision
- ❖ opacities float within the vitreous as eye moves side to side
- ❖ associated with age, high myopia, after CE/IOL (esp. with vit. loss), uveitis, and trauma



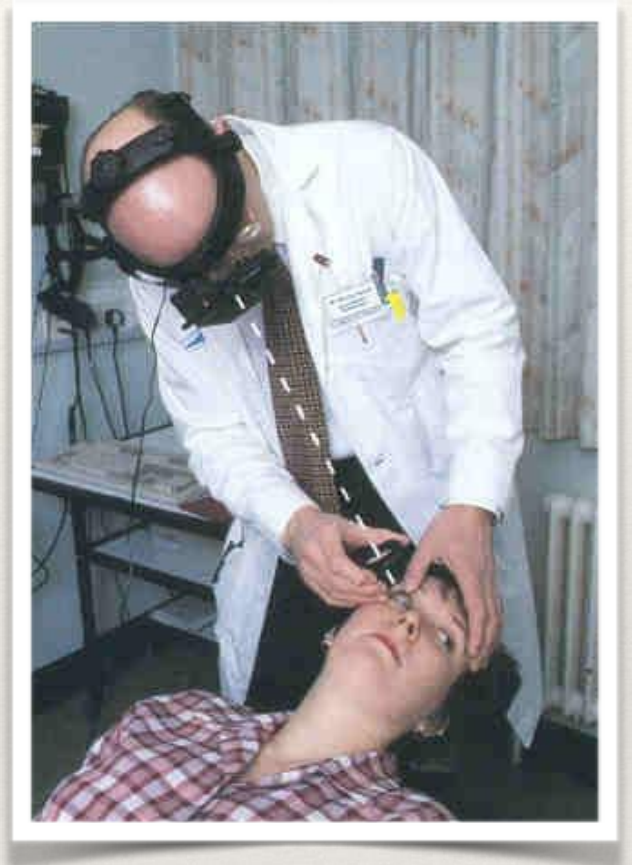
❖ Differential diagnosis:

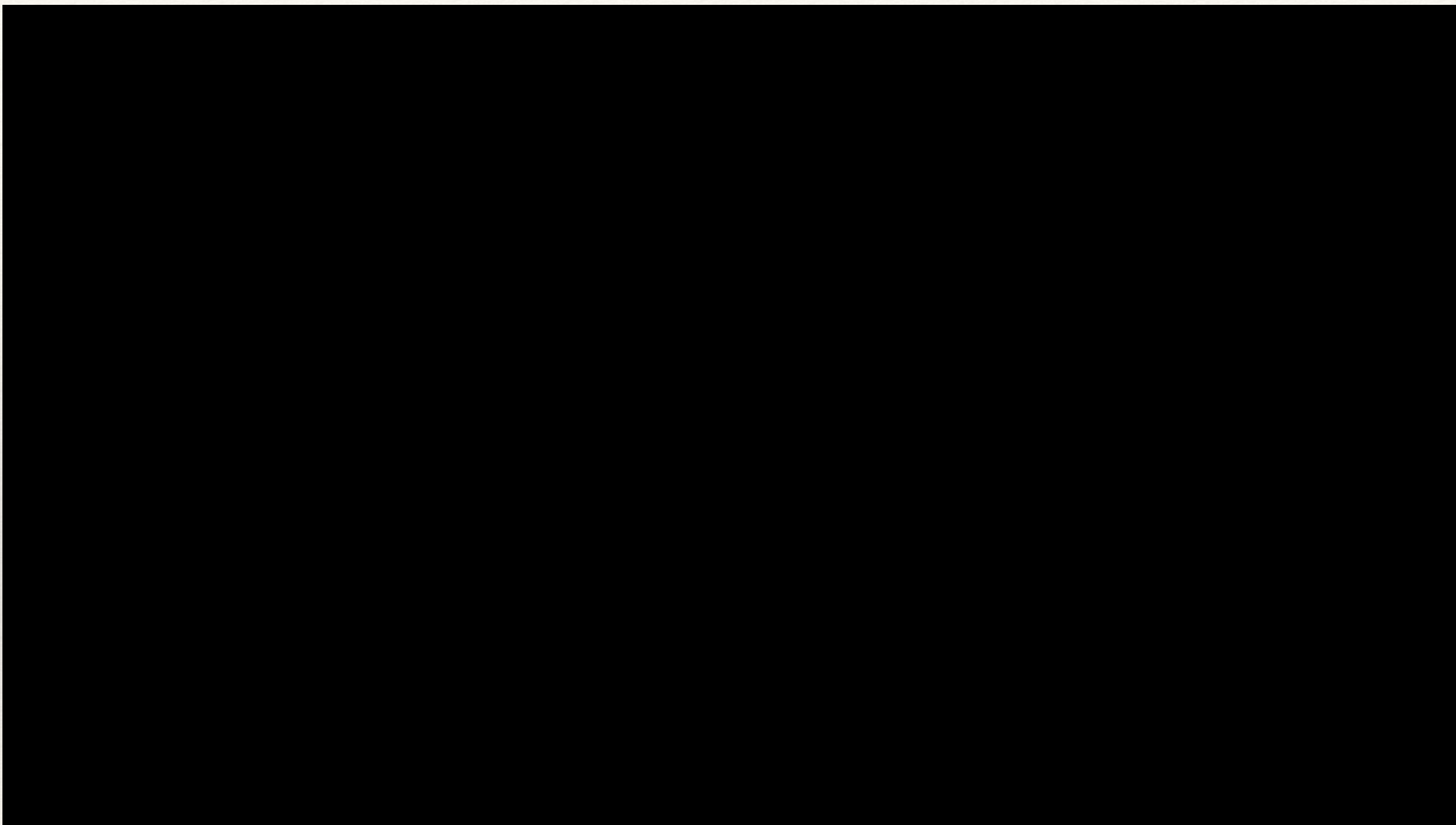
- ❖ vitritis
- ❖ migraine (flashing lights in a zig-zag pattern, lasts 20 minutes, +/- headache)
- ❖ asteroid hyalosis
- ❖ certain types of cancer



❖ Management:

- ❖ dilated exam with scleral depression
- ❖ RD precautions
- ❖ referral to retina specialist
- ❖ B-scan to r/o RD if hemorrhagic PVD
- ❖ repeat exam at 2 wks., 3 mos.,
and 6 mos.



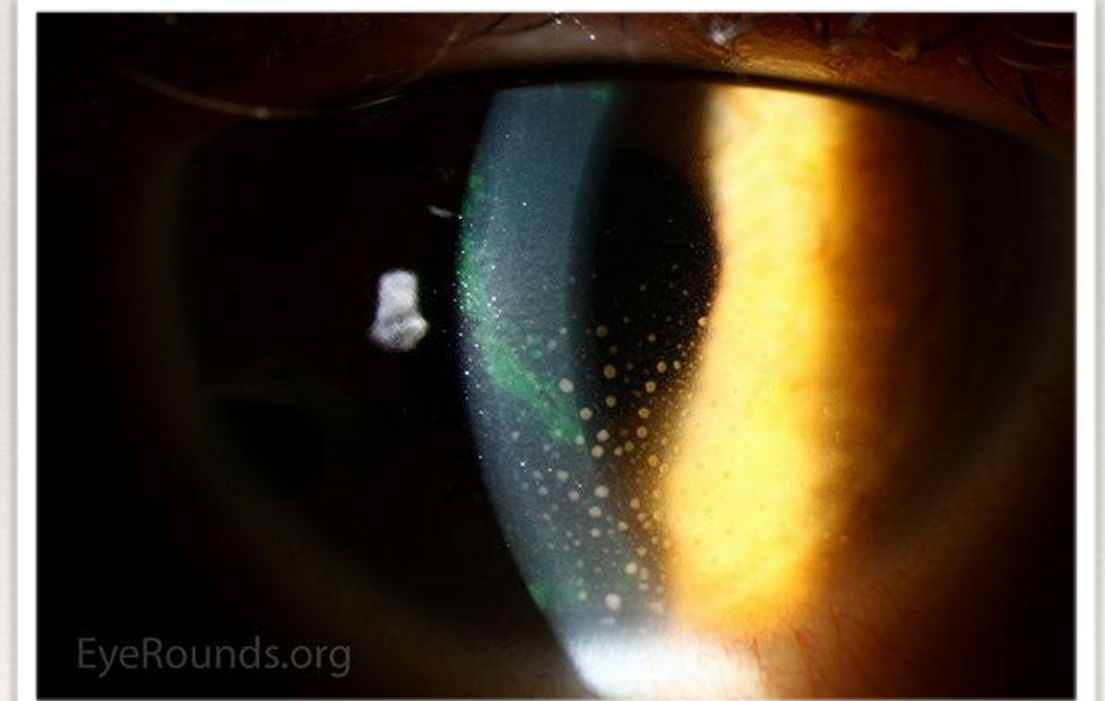


Vitreous Hemorrhage

❖ Presentation:

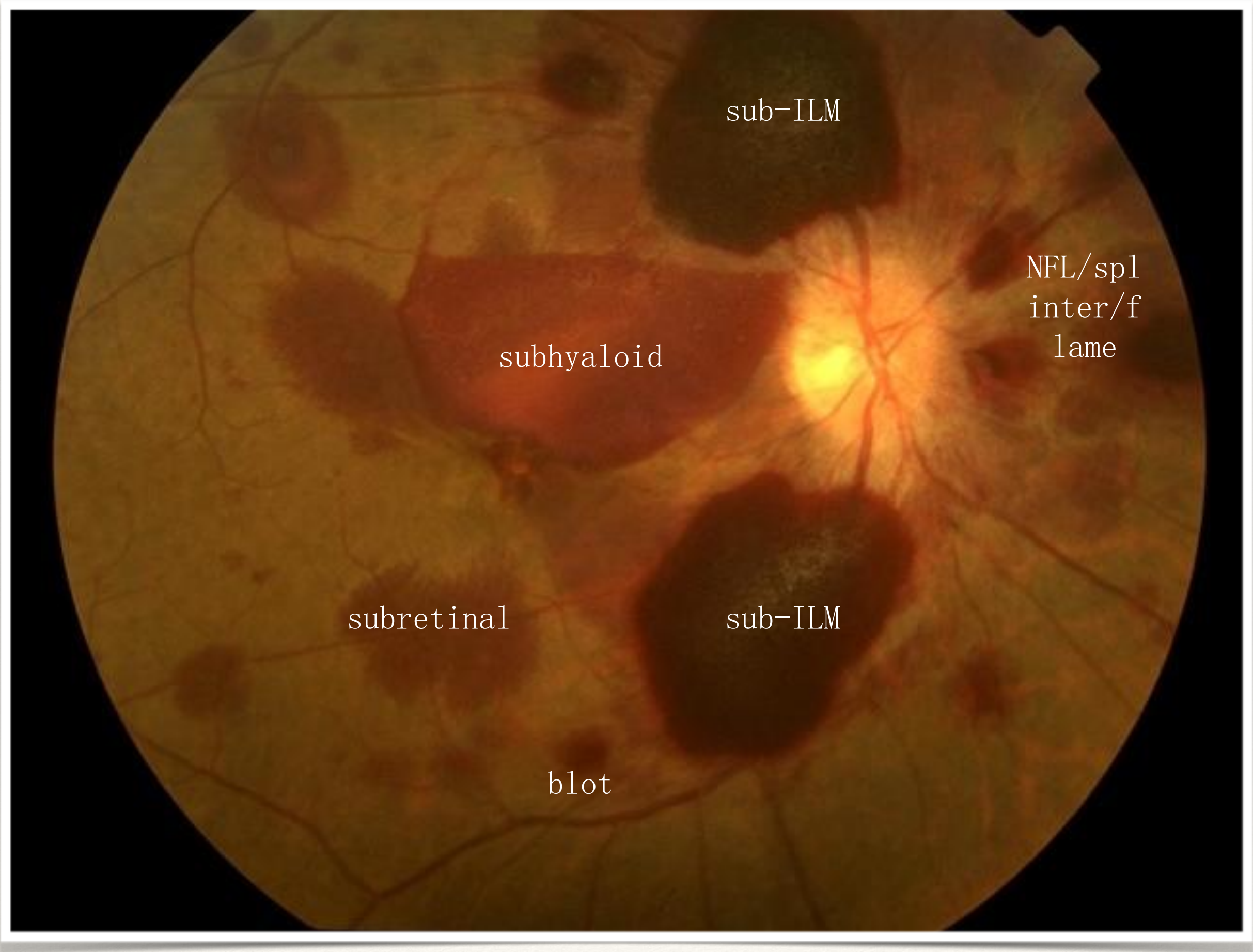
- ❖ sudden, painless loss of vision
- ❖ black spots with flashing lights
- ❖ h/o DM, HTN, trauma, wet ARMD, sickle cell disease, others
- ❖ RBCs or frank blood visible behind lens
- ❖ chronic VH may have yellow ochre appearance

- ❖ Differential diagnosis:
 - ❖ vitritis
 - ❖ onset typically much less sudden
 - ❖ look for cells in AC or keratic precipitates
 - ❖ RD



❖ **Management:**

- ❖ depends upon etiology
 - ❖ history and examination of contralateral eye
 - ❖ no scleral depression if h/o trauma
- ❖ B-scan
- ❖ FA (if possible)
- ❖ elevate HOB
- ❖ bilateral patching (very effective)
- ❖ no ASA, NSAIDs, etc.
- ❖ treat underlying cause once identified
- ❖ PPV for nonclearing VH (immediate – 6 mos.)
- ❖ PPV if necessary treatment cannot be accomplished through VH



sub-ILM

NFL/spl
inter/f
lame

subhyaloid

subretinal

sub-ILM

blot

Vitreoretinal Interface

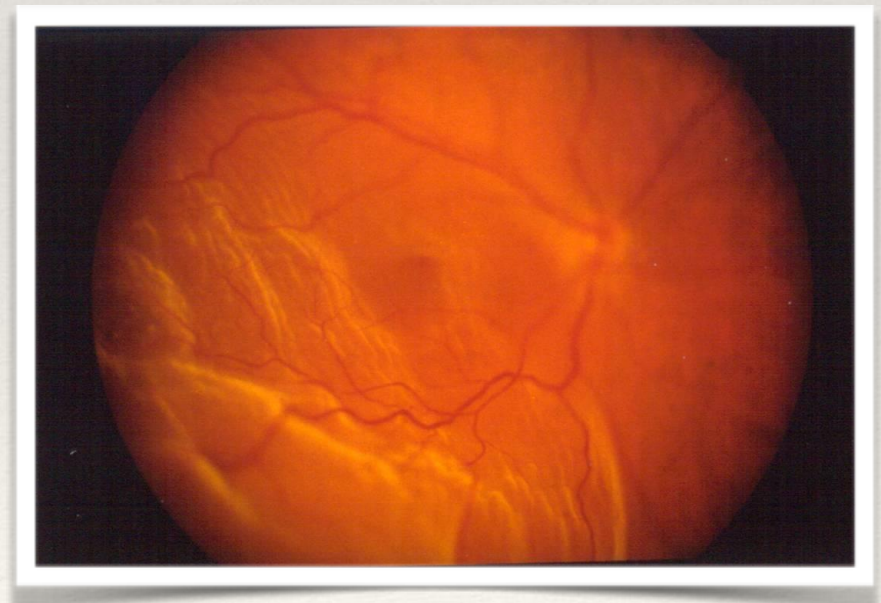
“Wine is constant proof that God loves us and
wants to see us happy.”

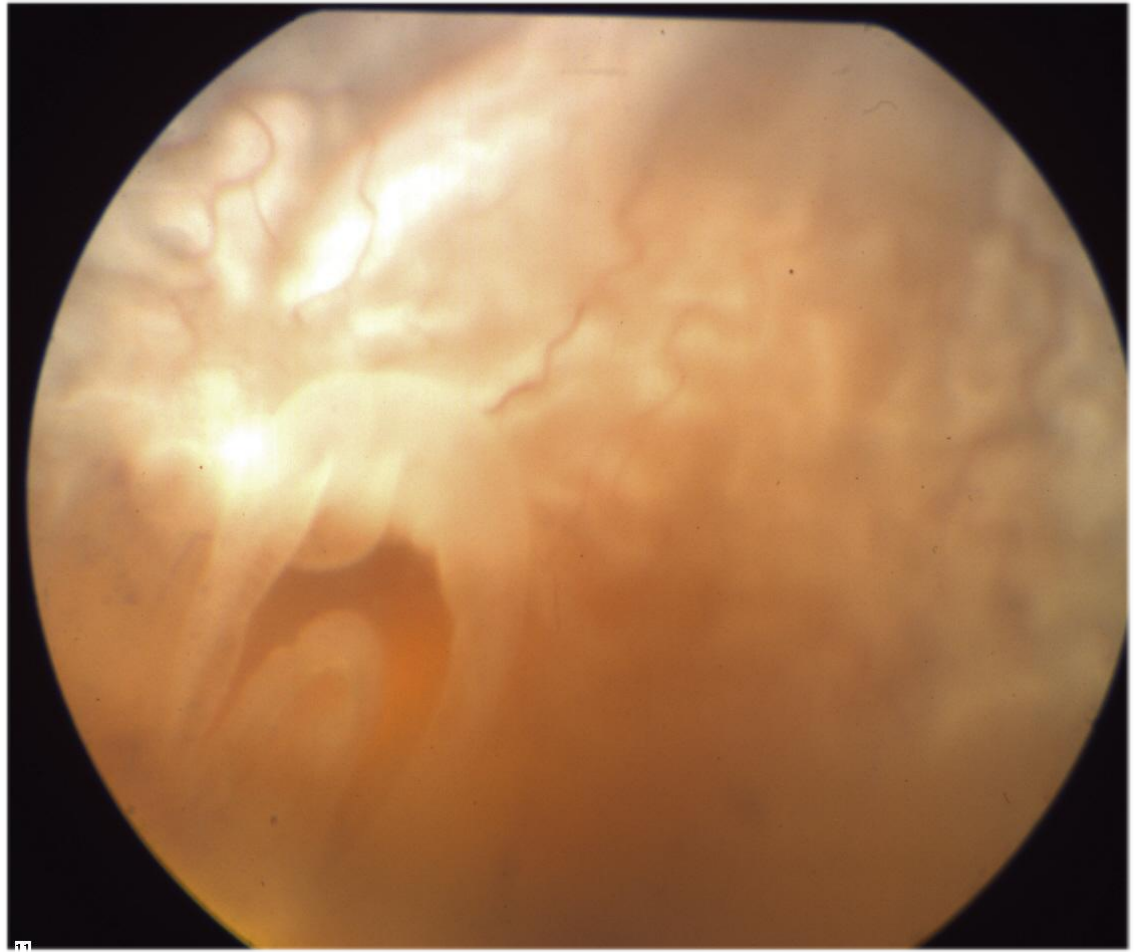
-Benjamin Franklin

Rhegmatogenous Retinal Detachment

❖ Presentation:

- ❖ PVD-like symptoms + curtain/veil/shadow
- ❖ h/o high myopia, trauma, lattice degeneration, recent (complicated) cataract surgery
- ❖ Fhx of RD and/or h/o fellow eye RD
- ❖ pigmented cells in the anterior vitreous, VH, PVD
- ❖ retinal break (may not be readily visible in pseudophakes):
 - ❖ HST, atrophic hole, decompensated schisis cavity, dialysis, MH
- ❖ lower IOP in affected vs. contralateral eye
- ❖ **retinal elevation**
 - ❖ corrugated, opaque appearance
 - ❖ fixed folds
 - ❖ non-shifting SRF
- ❖ pigmented demarcation line in chronic RD



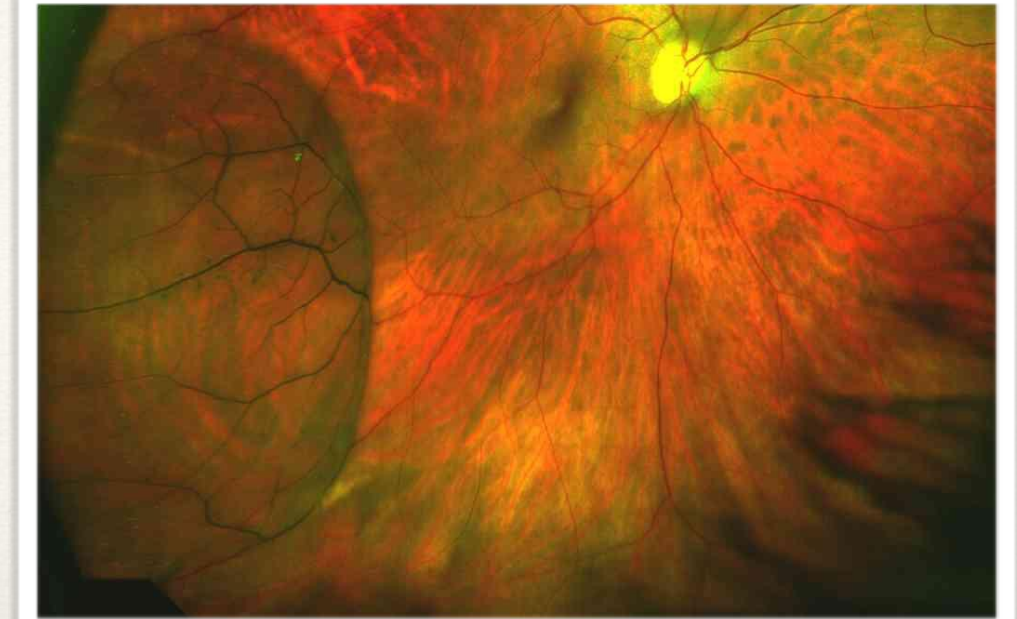


Complicated forms of RD

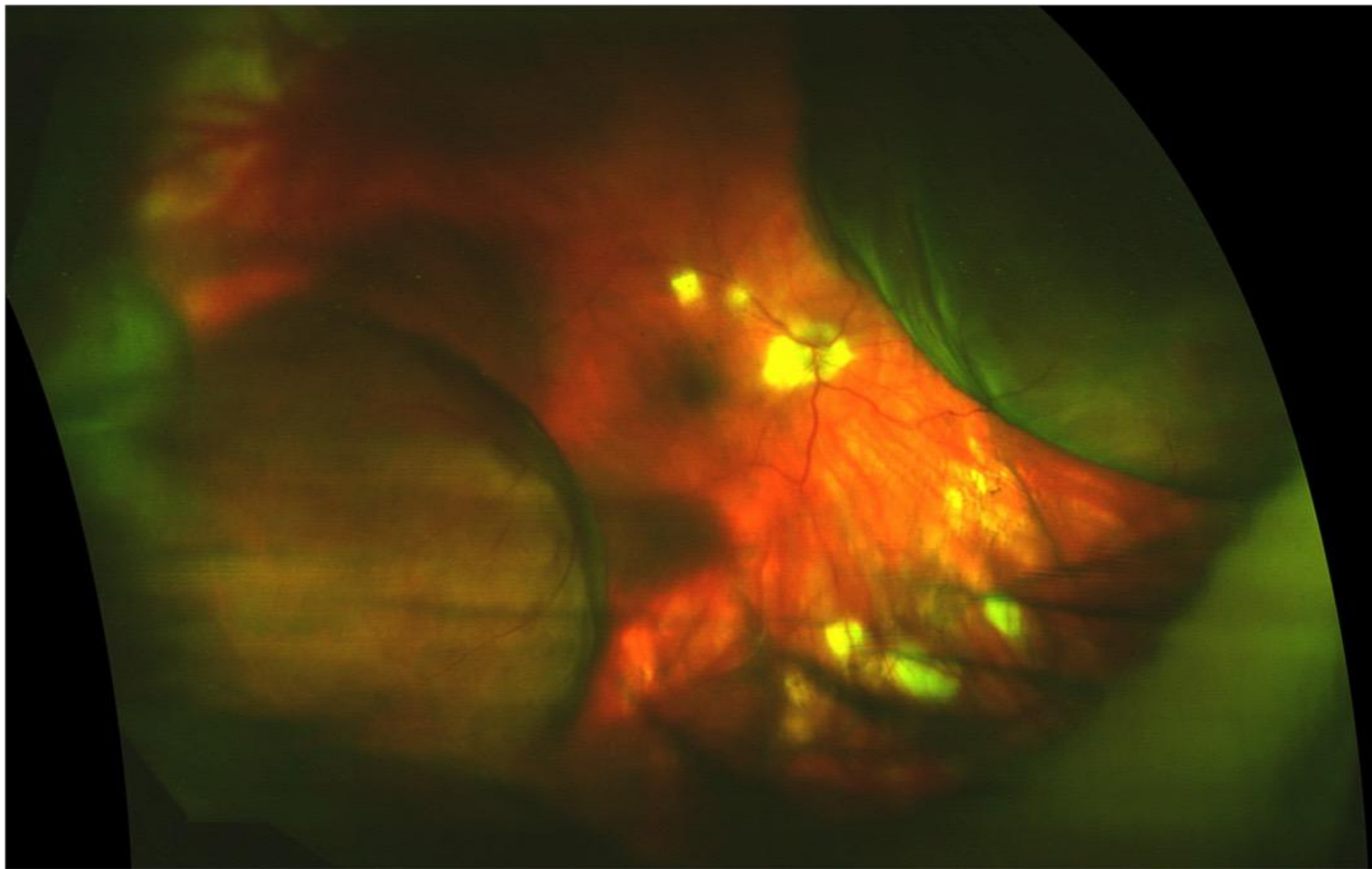


❖ Differential diagnosis:

- ❖ retinoschisis
- ❖ chronic VH
- ❖ exudative/traction detachment
- ❖ choroidal detachment
- ❖ scleral folds (hypotony)
- ❖ tumor
- ❖ ARN (or other retinitis)
- ❖ PVD







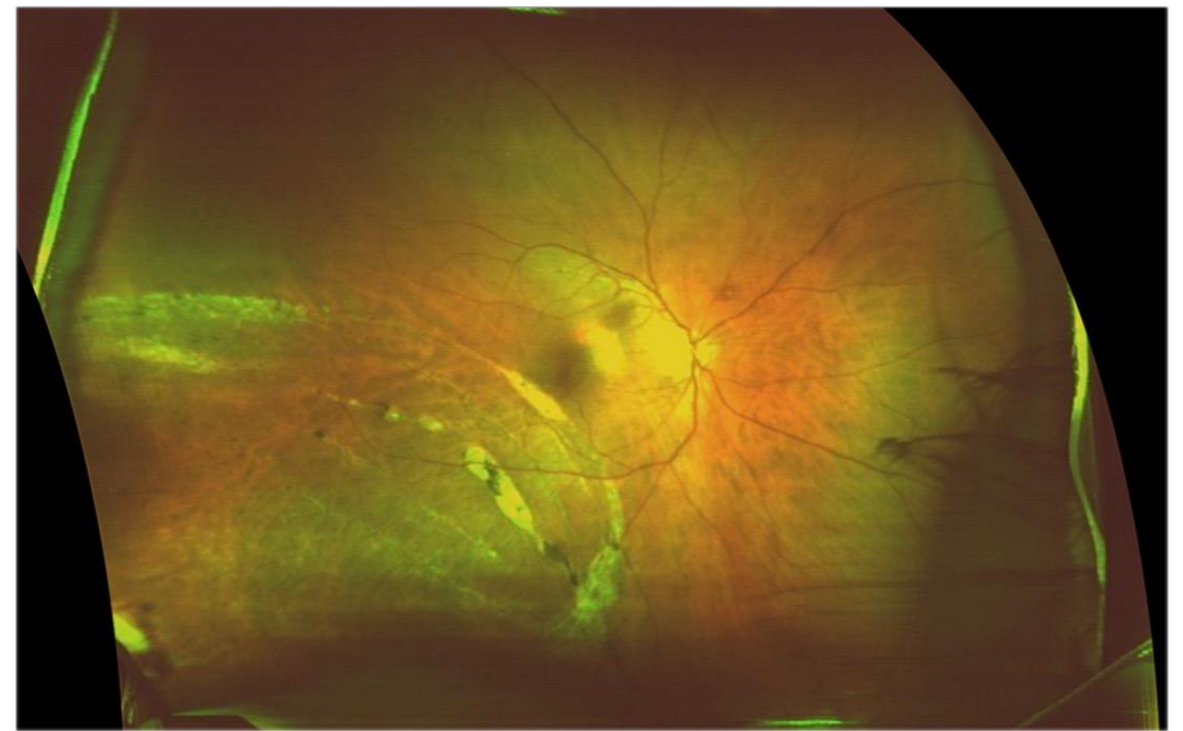
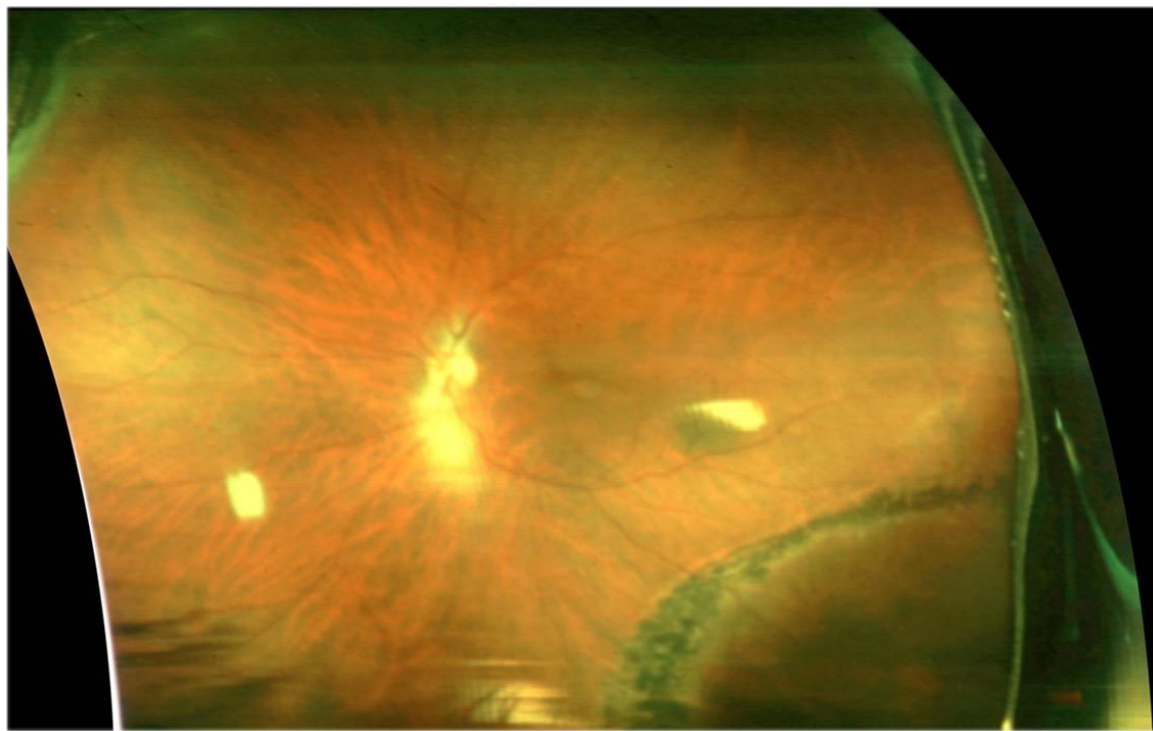


- ❖ Management:

- ❖ Stabilize: barrier laser retinopexy/cryotherapy

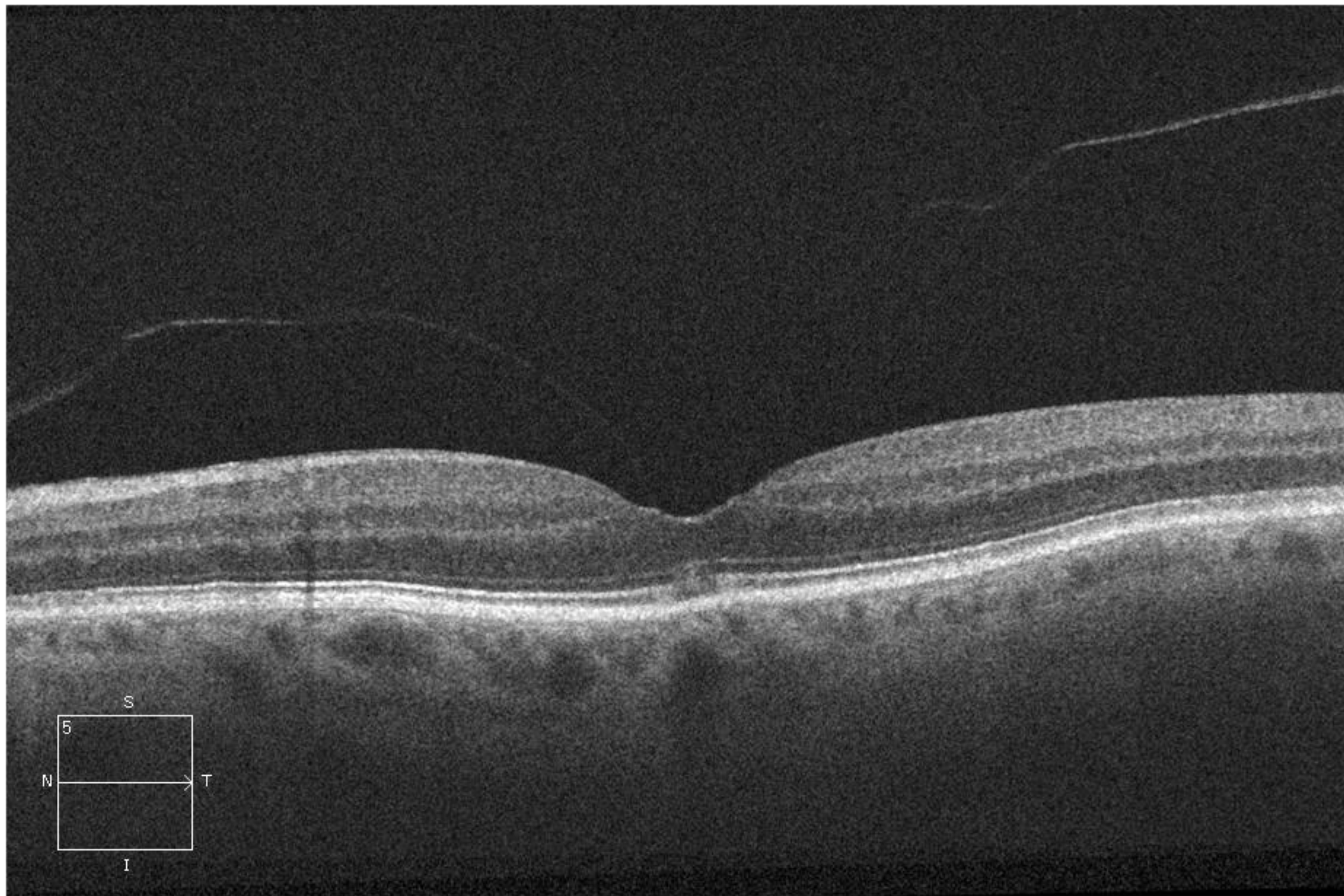
- ❖ Repair: surgery- PPV / SB / pneumatic retinopexy

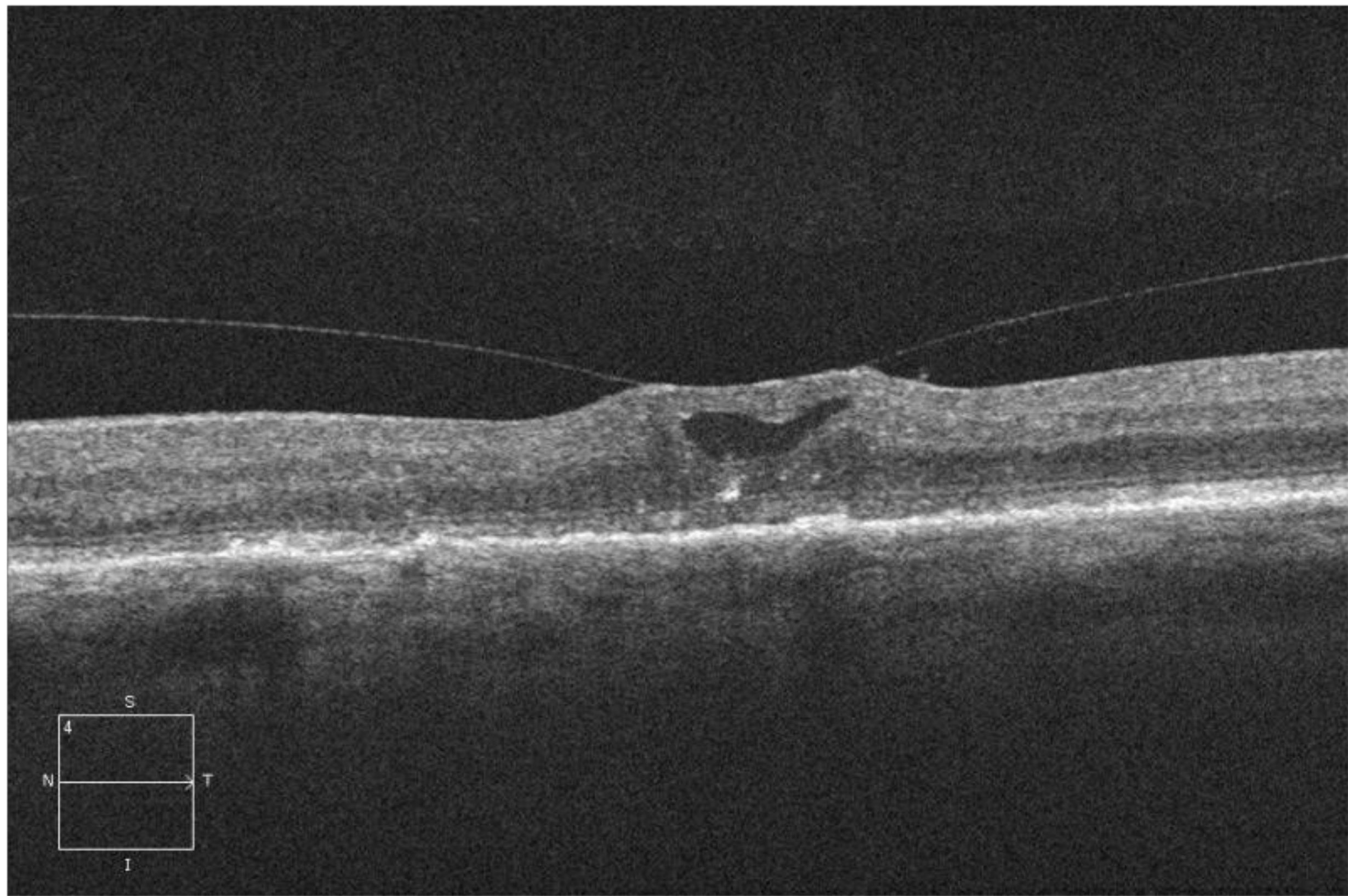
- ❖ Observe

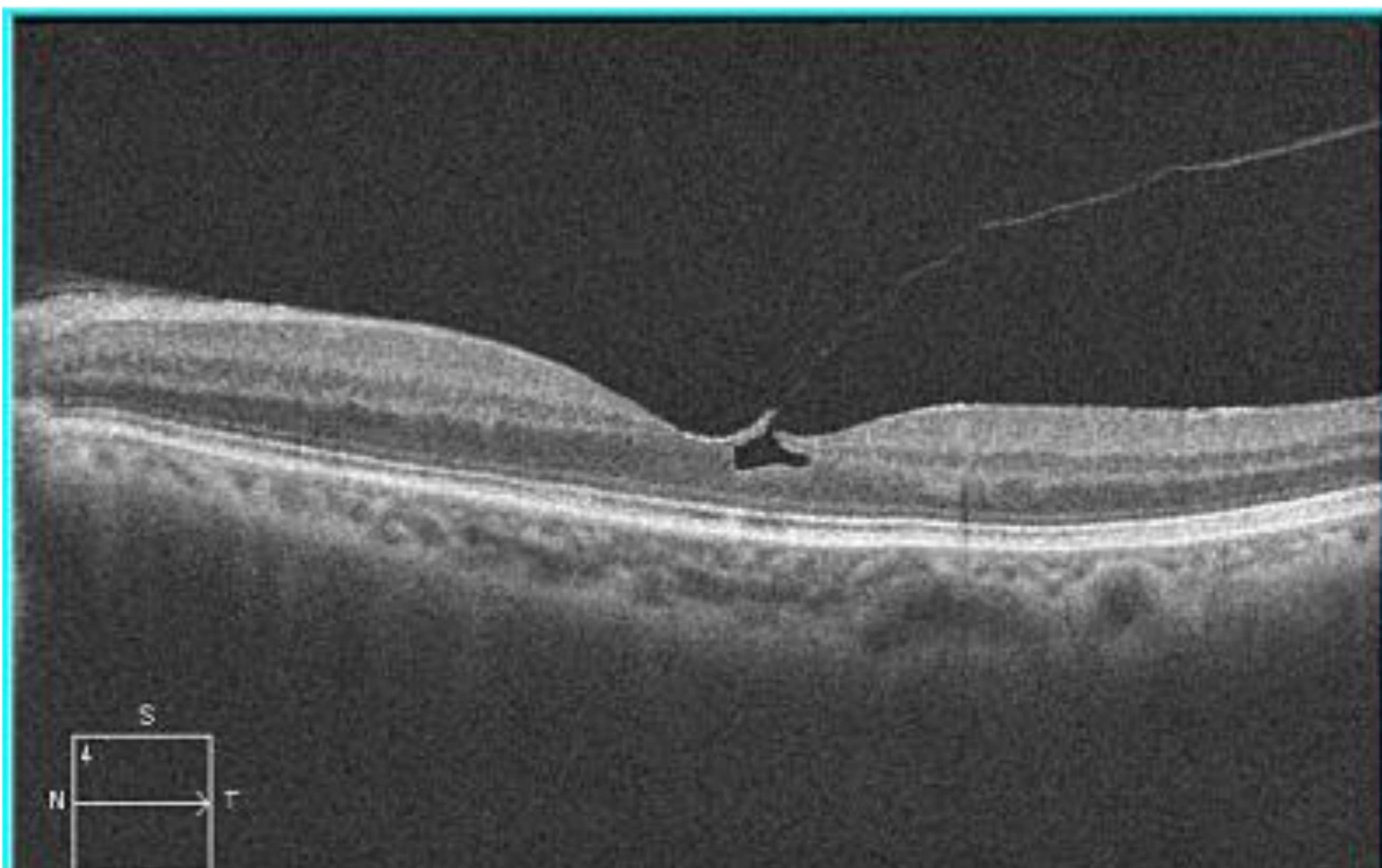


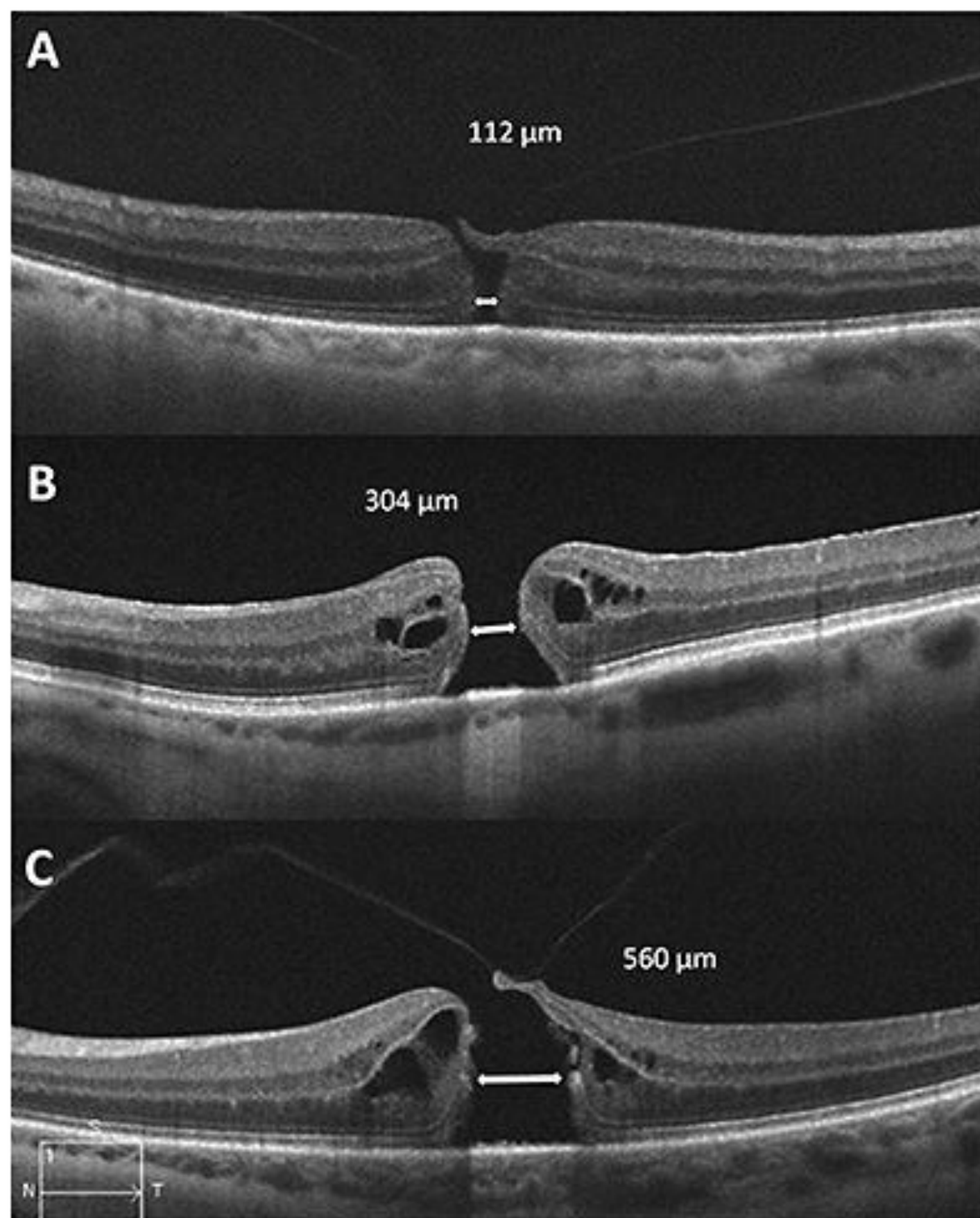
Vitreomacular Traction

- ❖ Presentation:
 - ❖ blurred central vision
 - ❖ distortion
 - ❖ aneisokonia
 - ❖ asymptomatic (VMA)







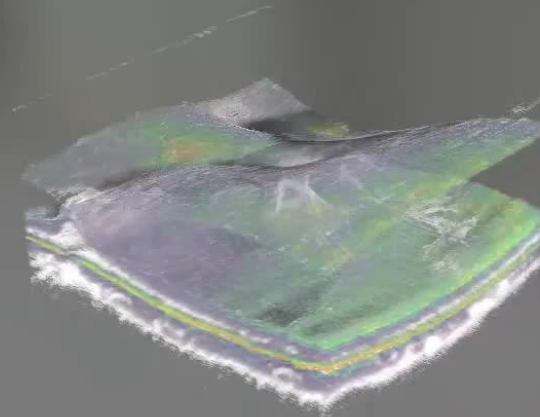
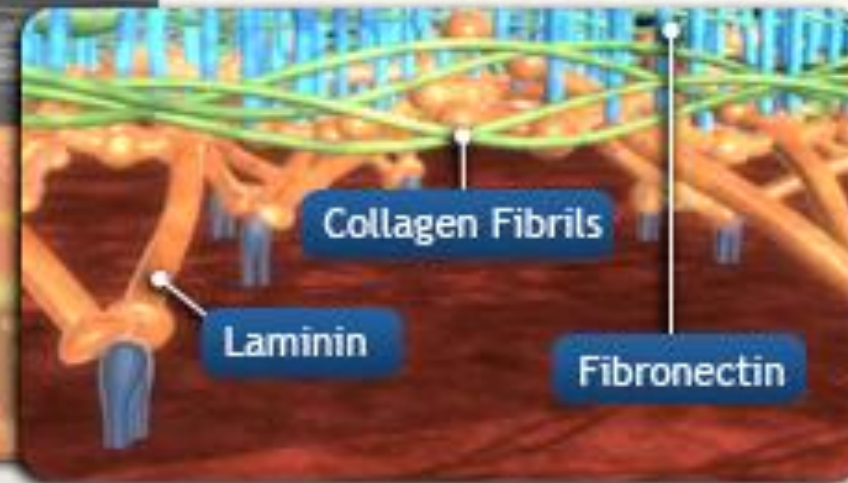


Vitreoretinal Interface

Vitreous Cortex

ILM

Retina



❖ Differential diagnosis:

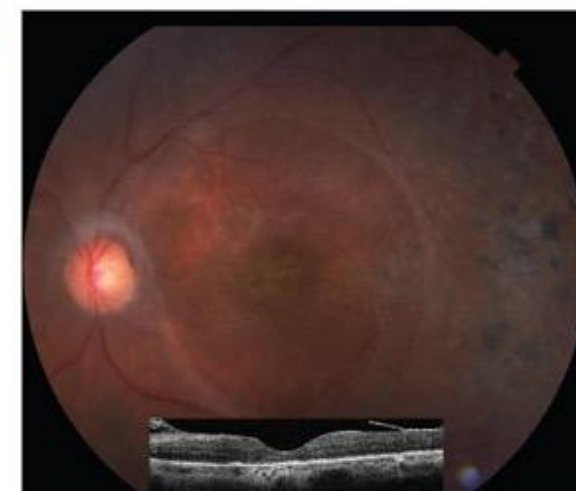
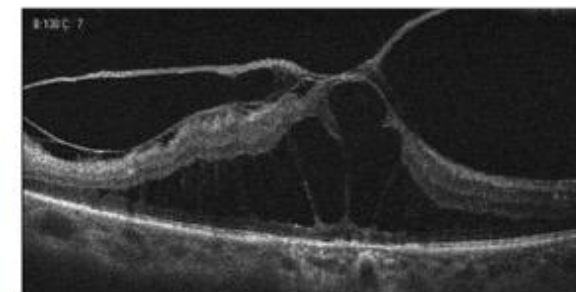
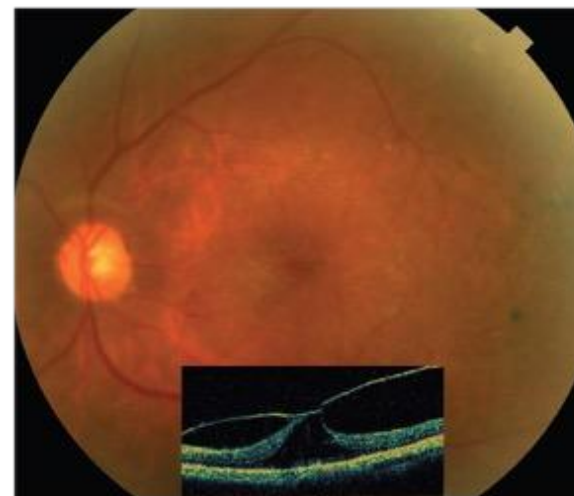
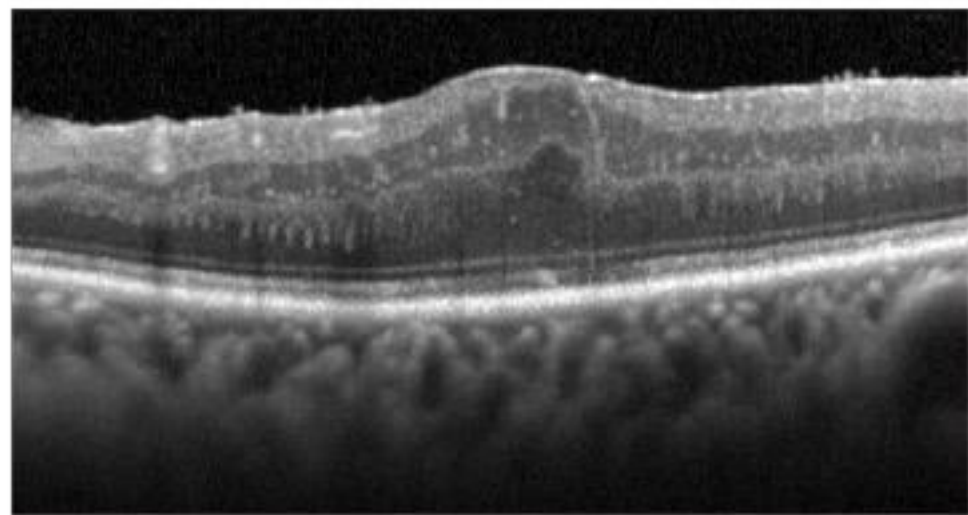
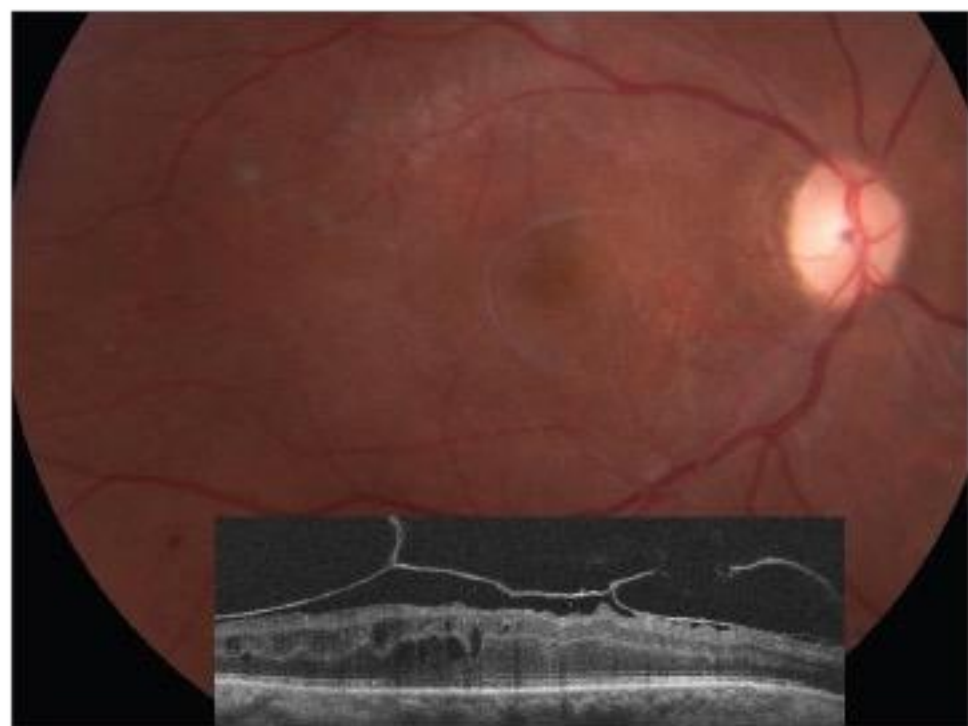
❖ CME

❖ DME

❖ ERM

❖ stage 1 MH

❖ subretinal disease (CNV/CSR)



❖ Management:

- ❖ vitrectomy
- ❖ Jetrea
- ❖ observation

- ❖ Depends on severity of symptoms (not OCT)!

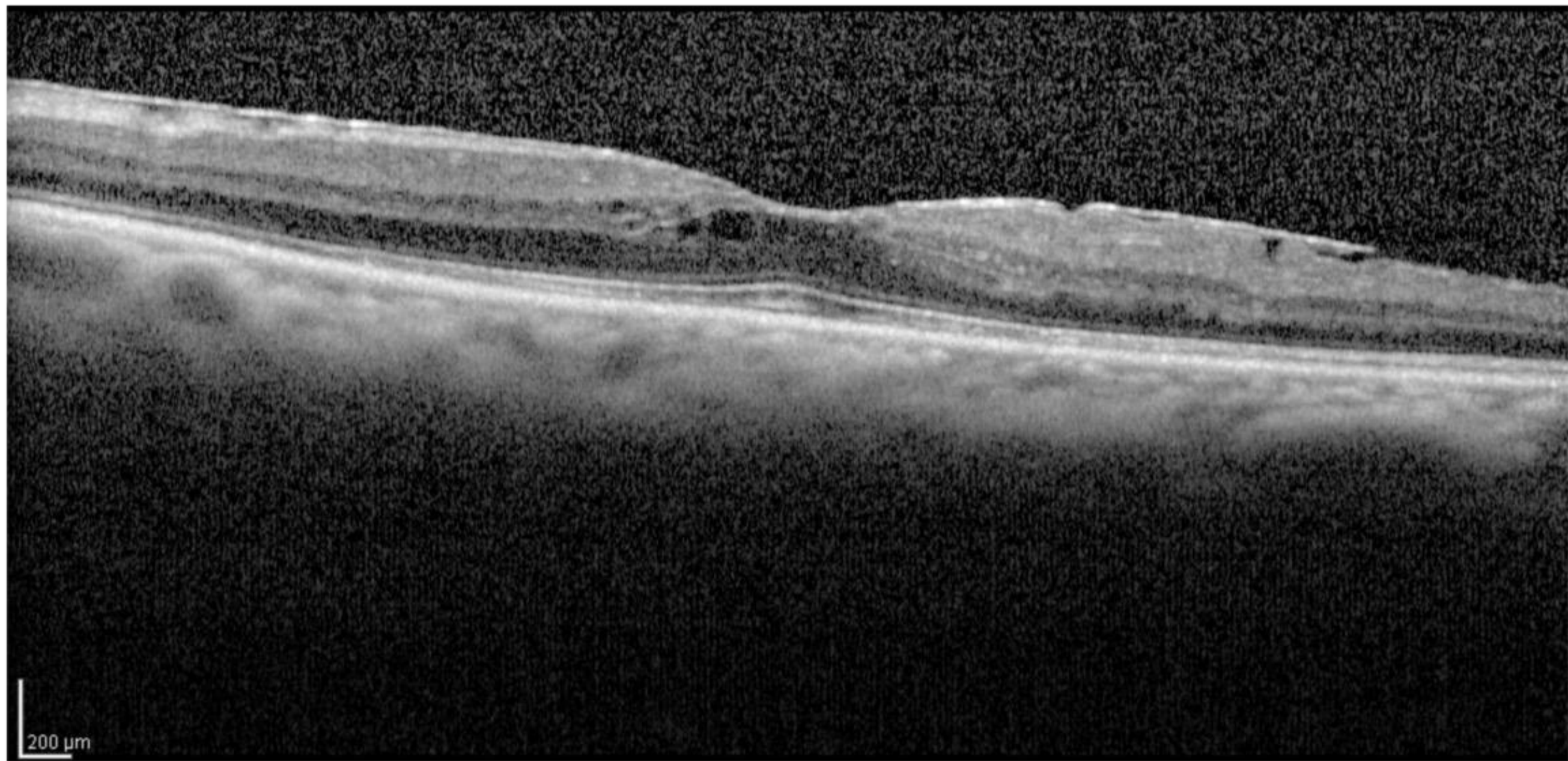


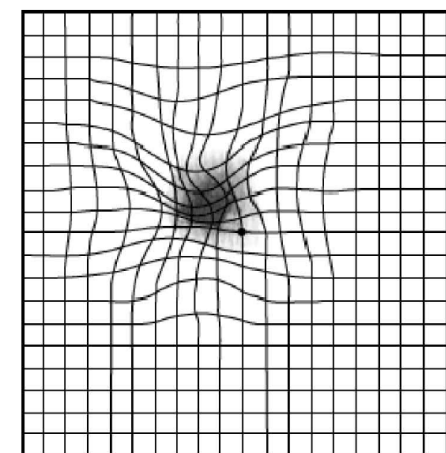
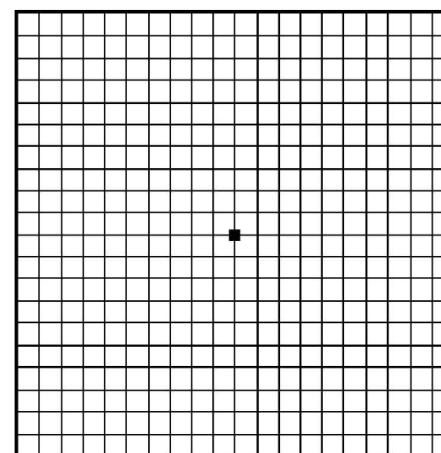
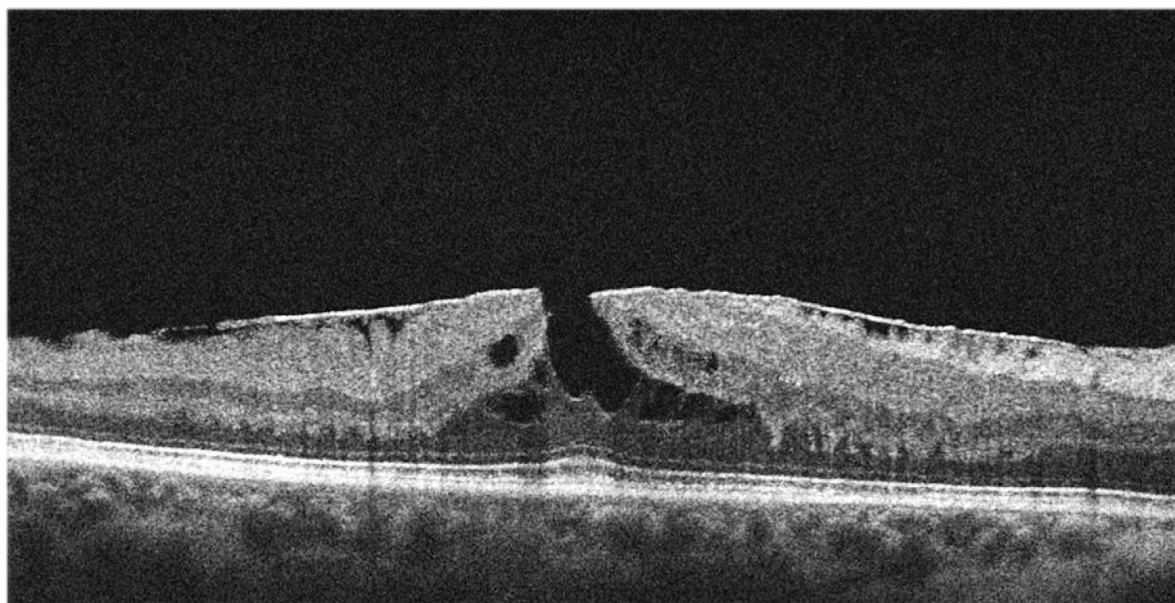
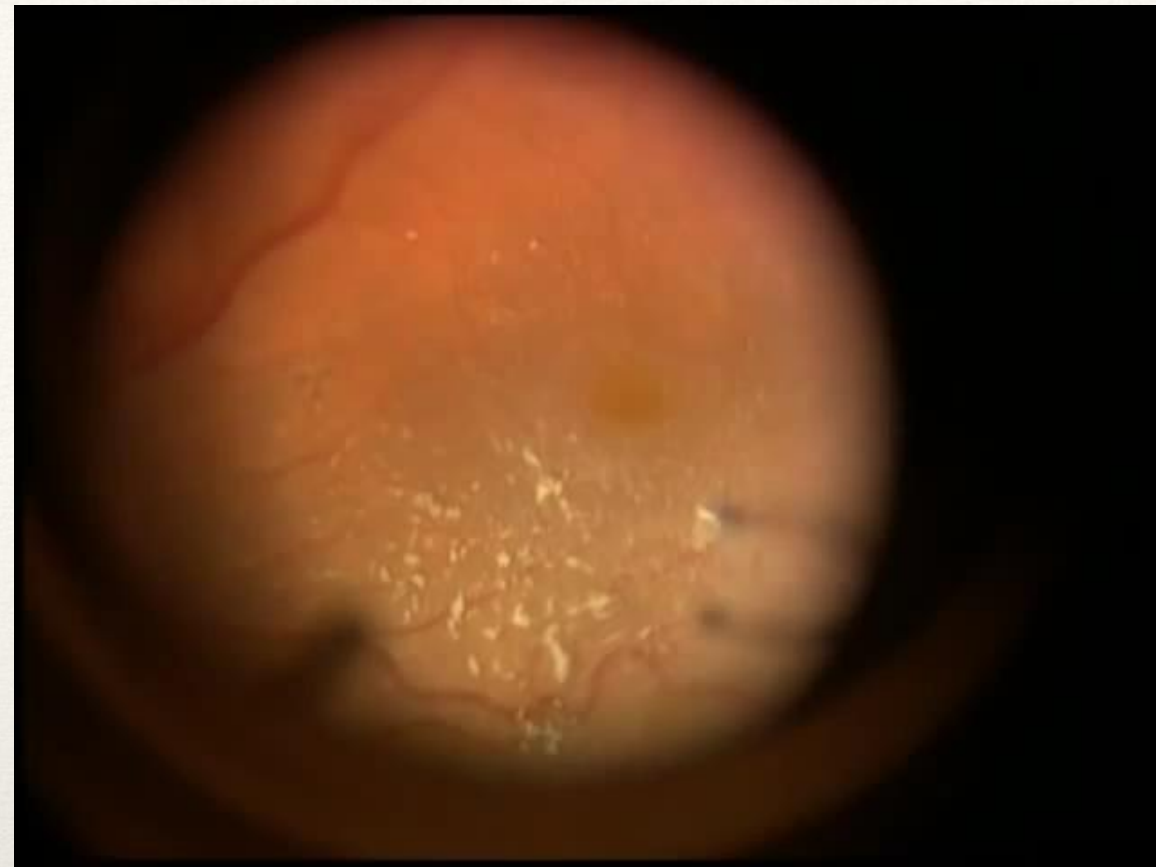
Epiretinal Membrane

❖ Presentation:

- ❖ blurred central vision
- ❖ distortion
- ❖ aneisokonia
- ❖ most are asymptomatic
- ❖ typically in middle-aged or elderly
- ❖ 20% bilateral







❖ Differential diagnosis:

❖ diabetic retinopathy (taut posterior hyaloid)

❖ DME

❖ CME

❖ Associated disease?

❖ uveitis

❖ retinal break/RD

❖ PVD

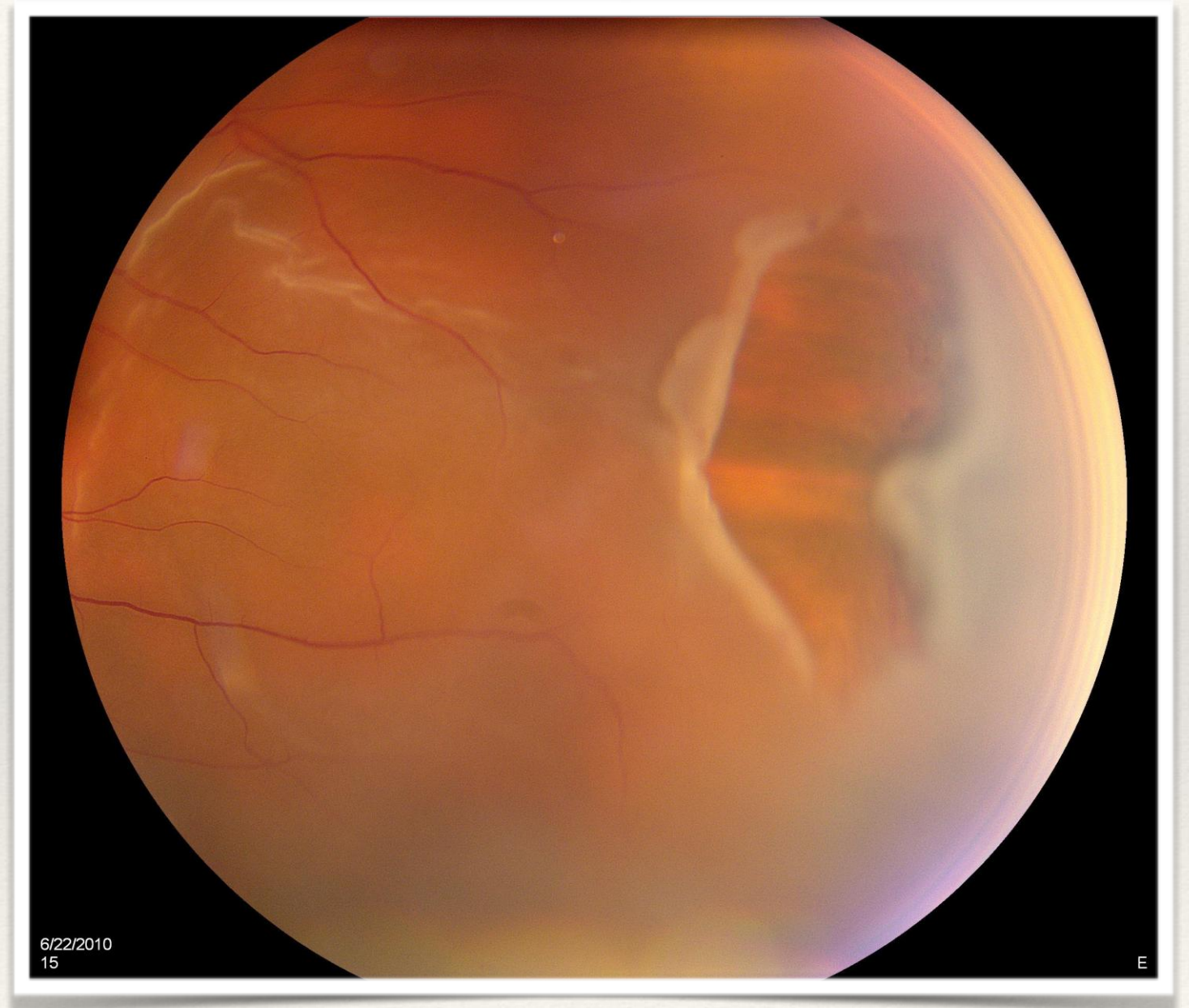
❖ after laser retinopexy/cryopexy

❖ after surgery/trauma

❖ retinal vascular disease

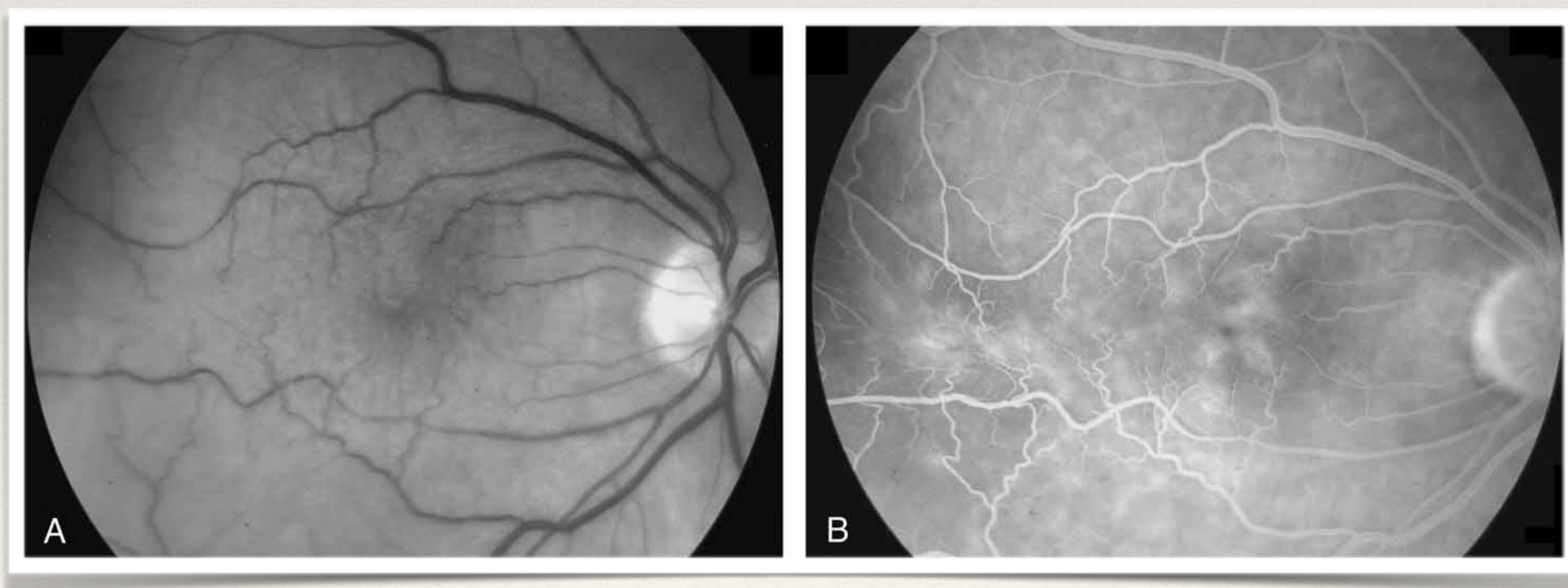
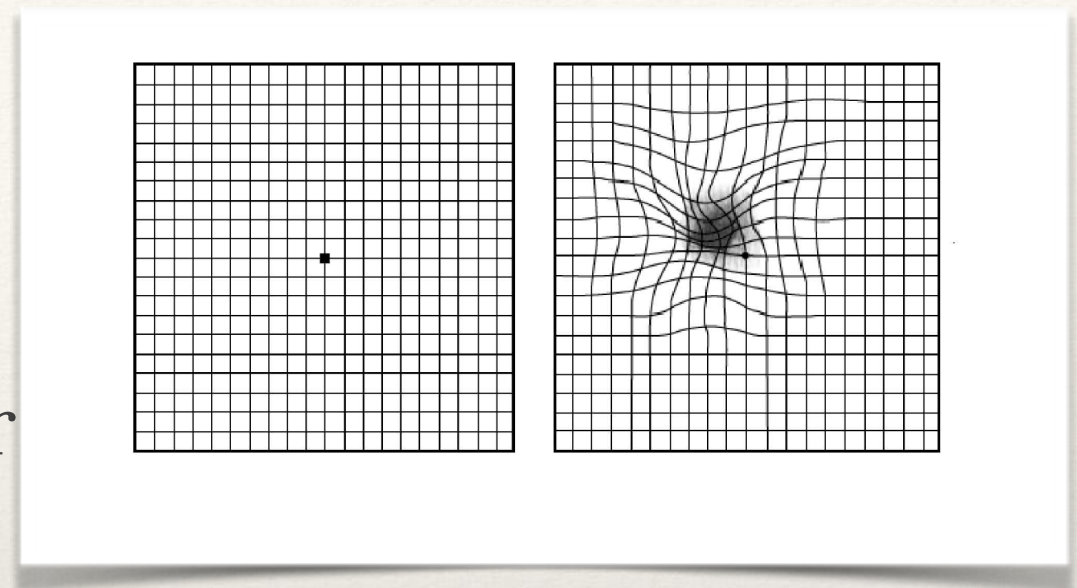
❖ DM, HTN, RVO, etc.

❖ idiopathic



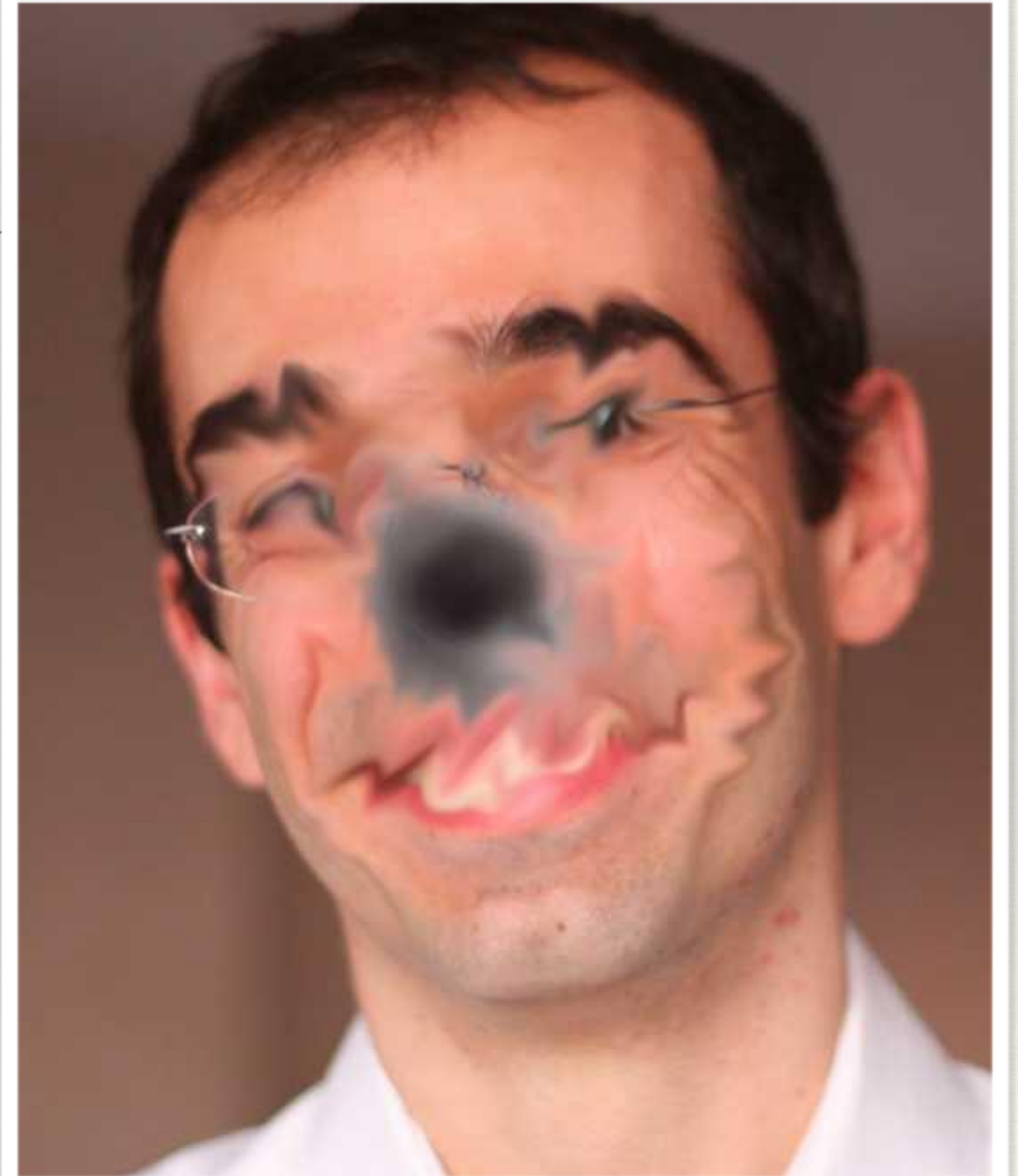
❖ Management:

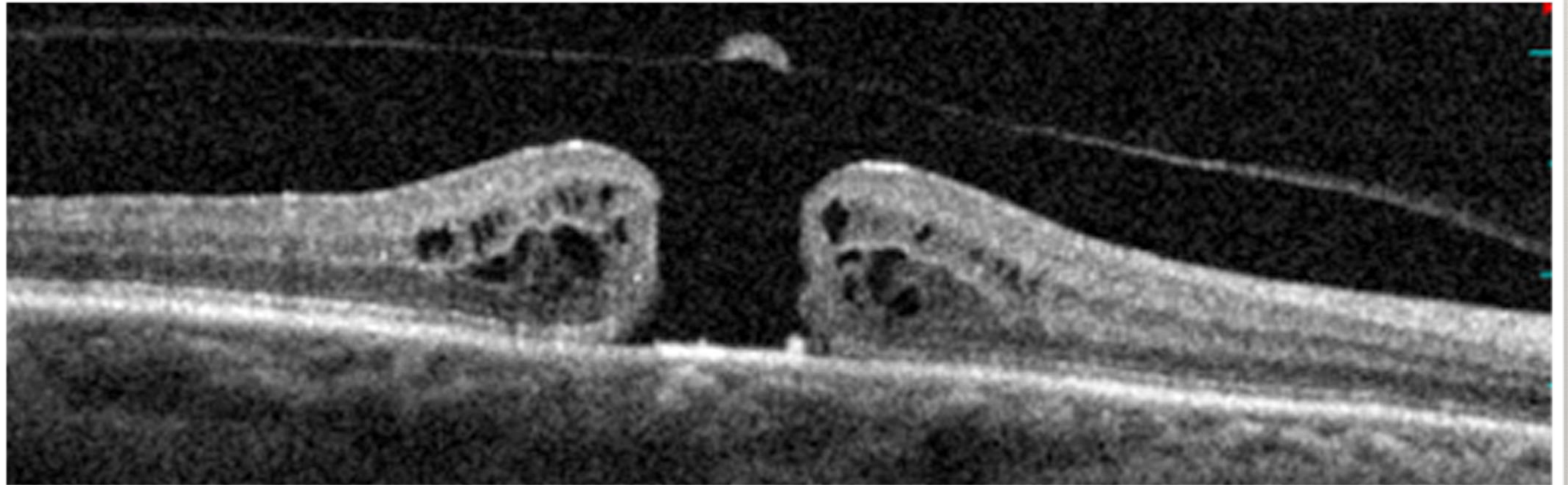
- ❖ vitrectomy
- ❖ observation
- ❖ treat underlying disorder



Macular Hole

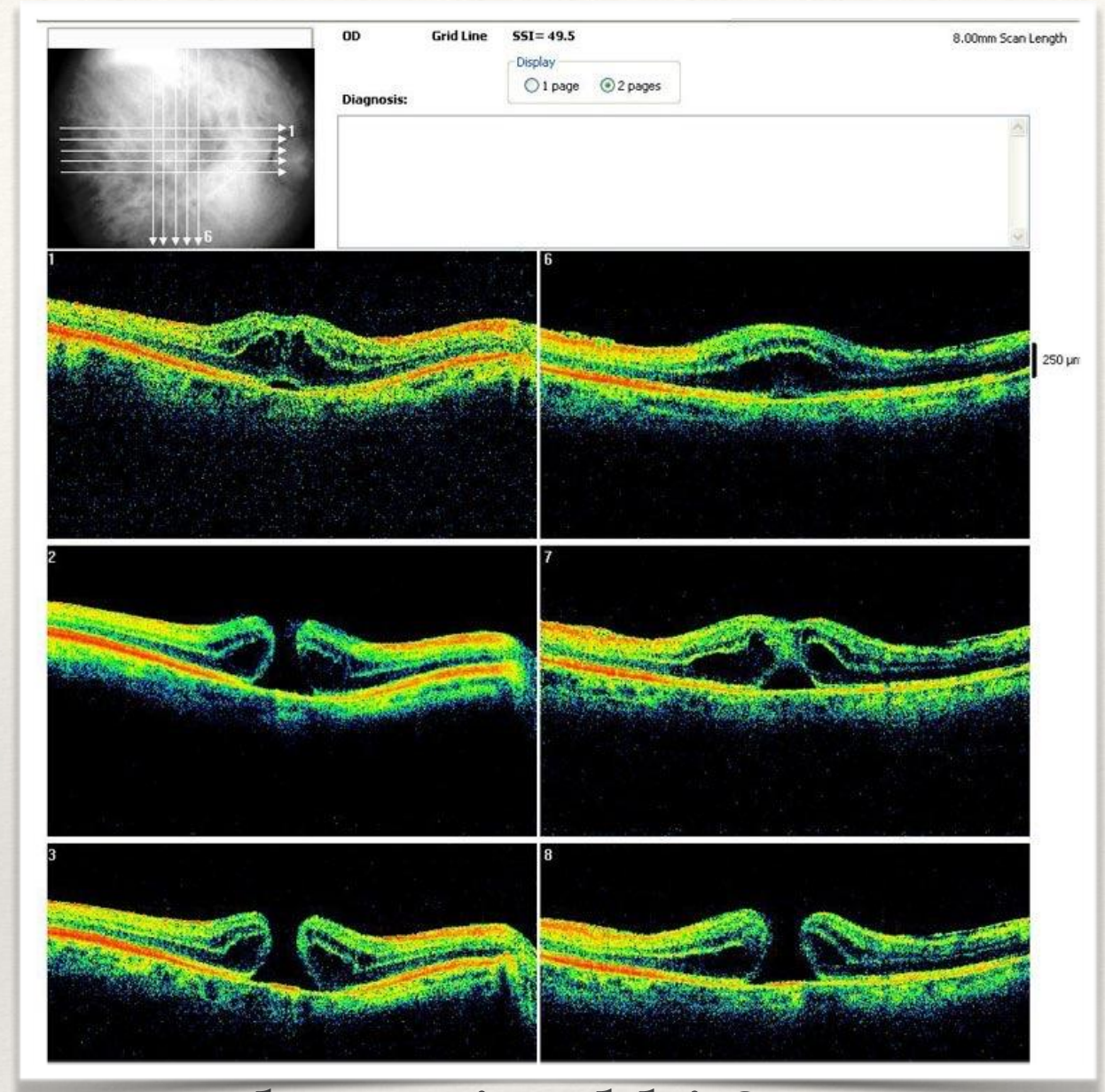
- ❖ Presentation:
 - ❖ decreased central vision
 - ❖ distortion
 - ❖ central scotoma
 - ❖ more common in women
 - ❖ 6th–8th decade
 - ❖ 10% bilateral

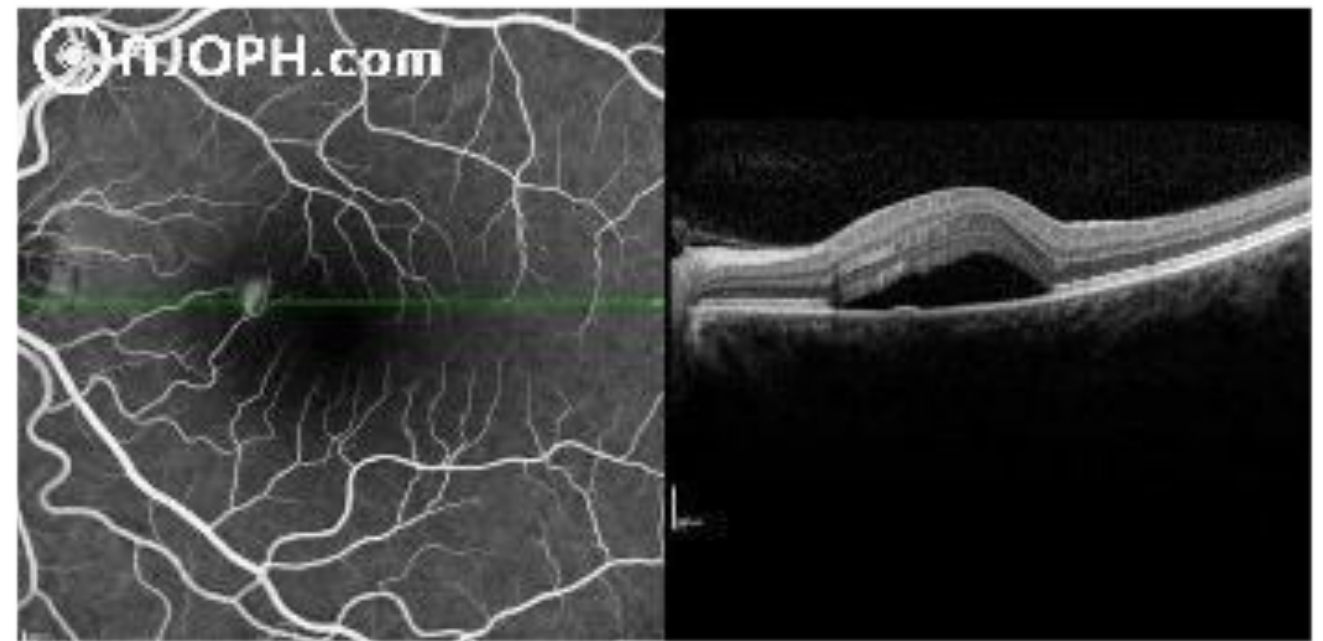
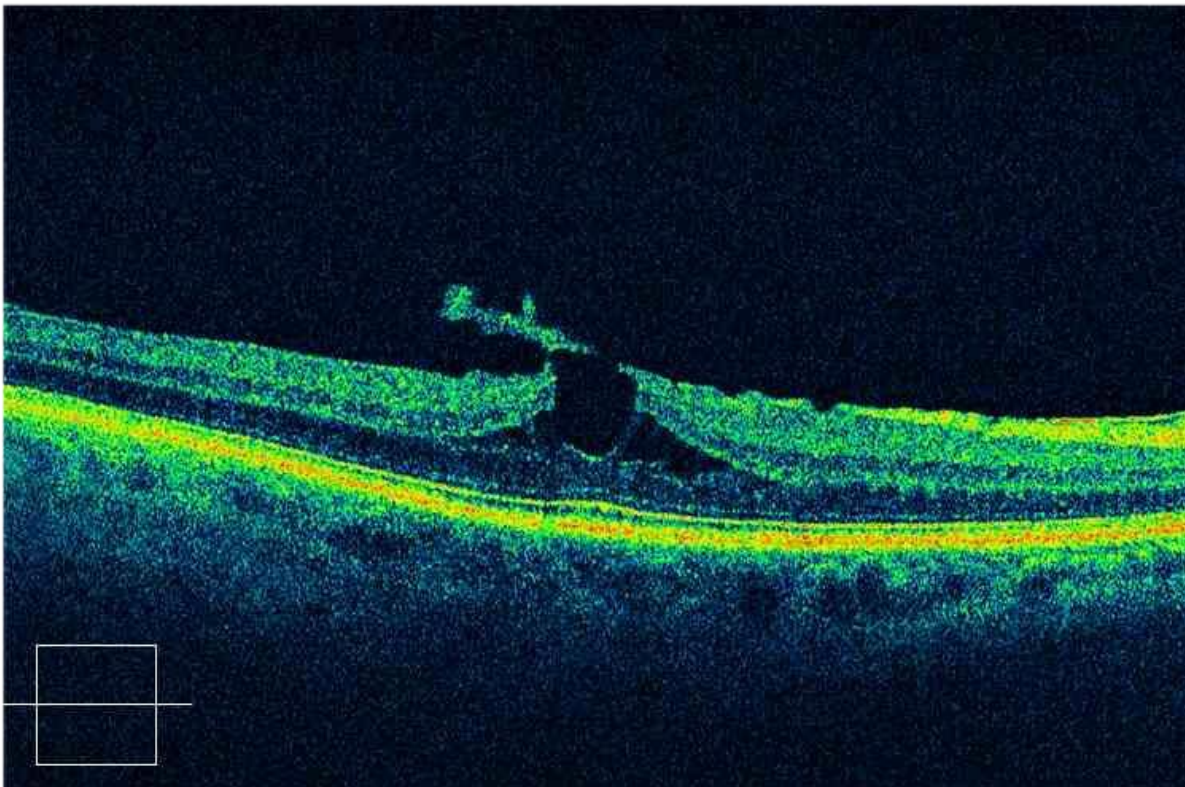
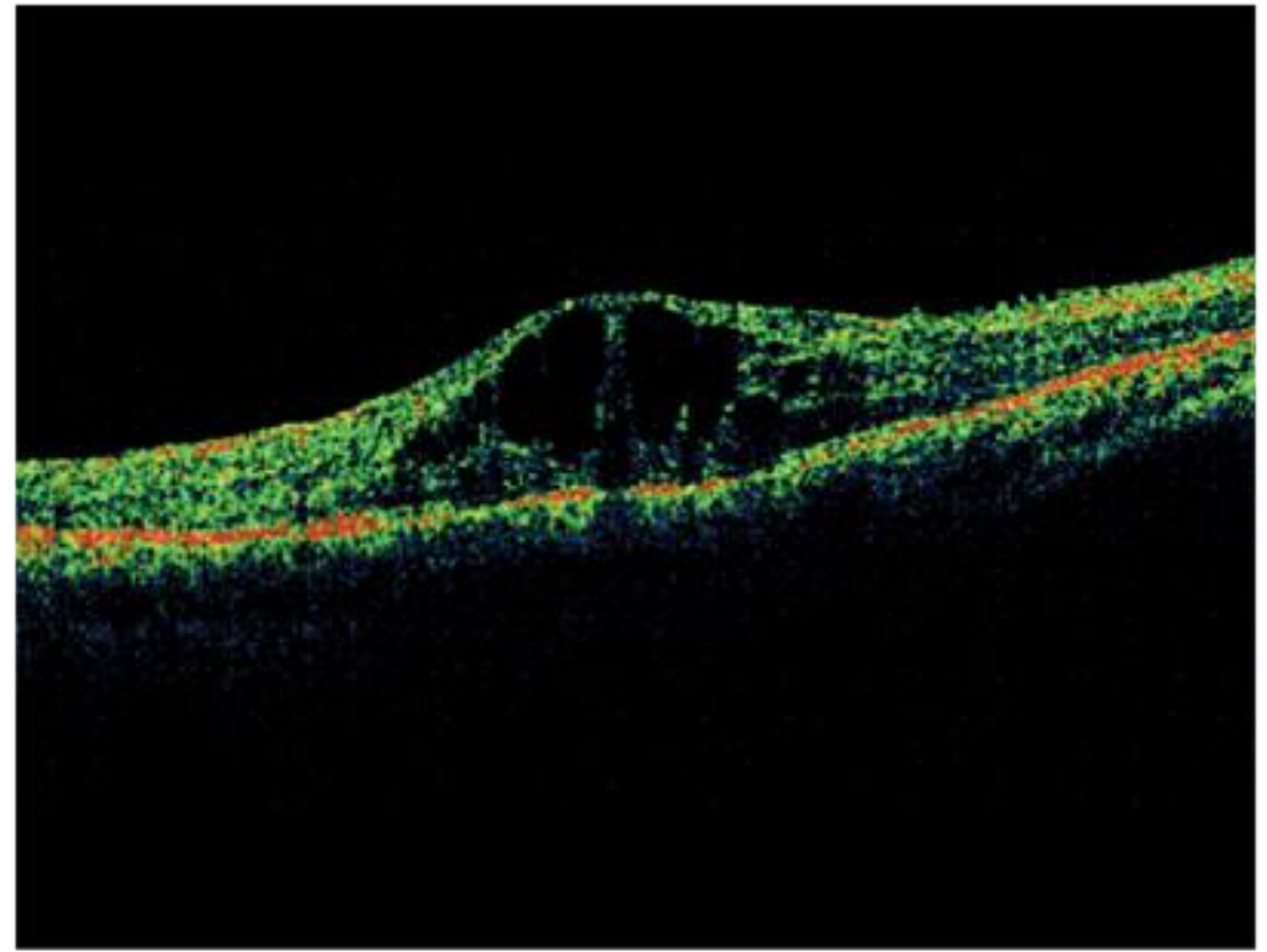
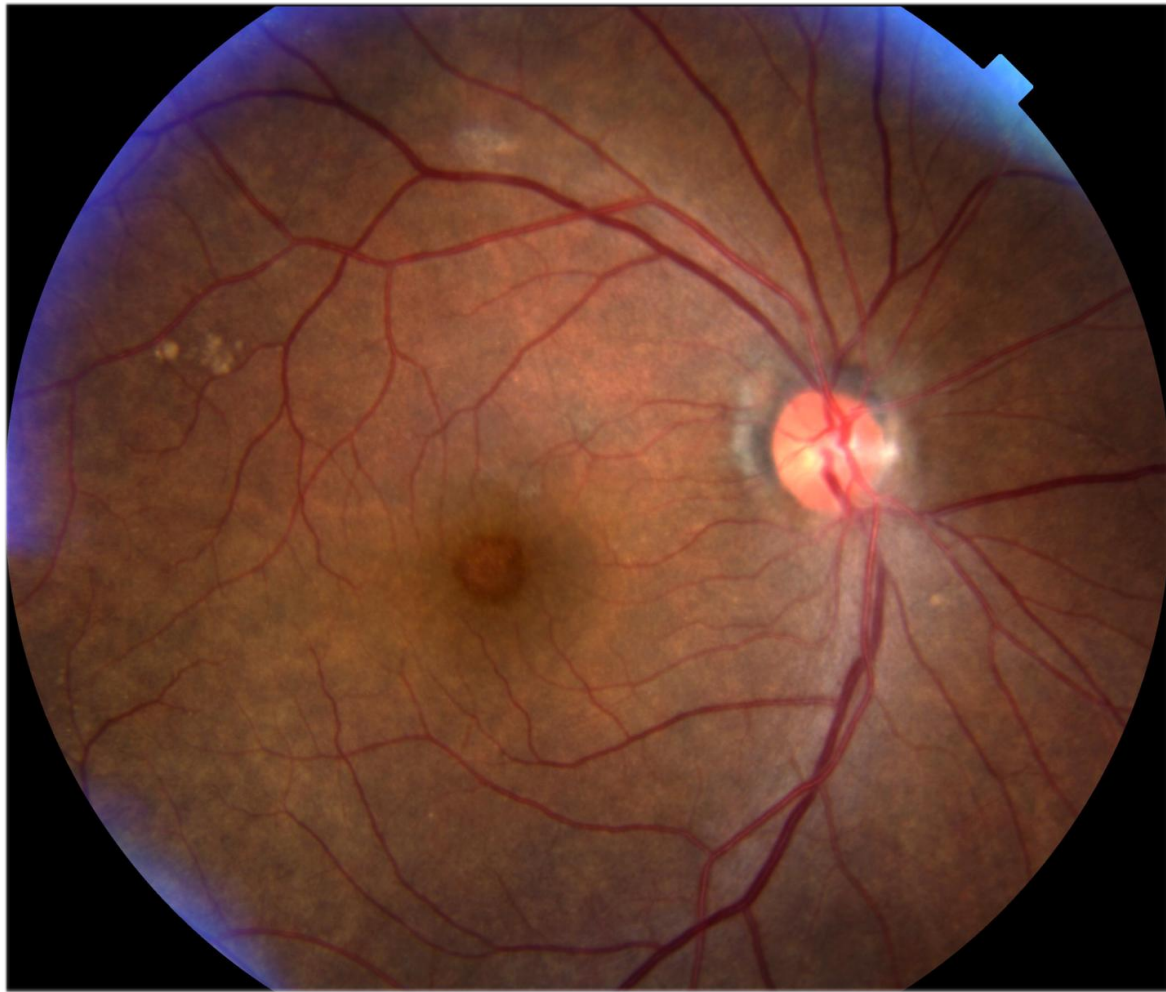




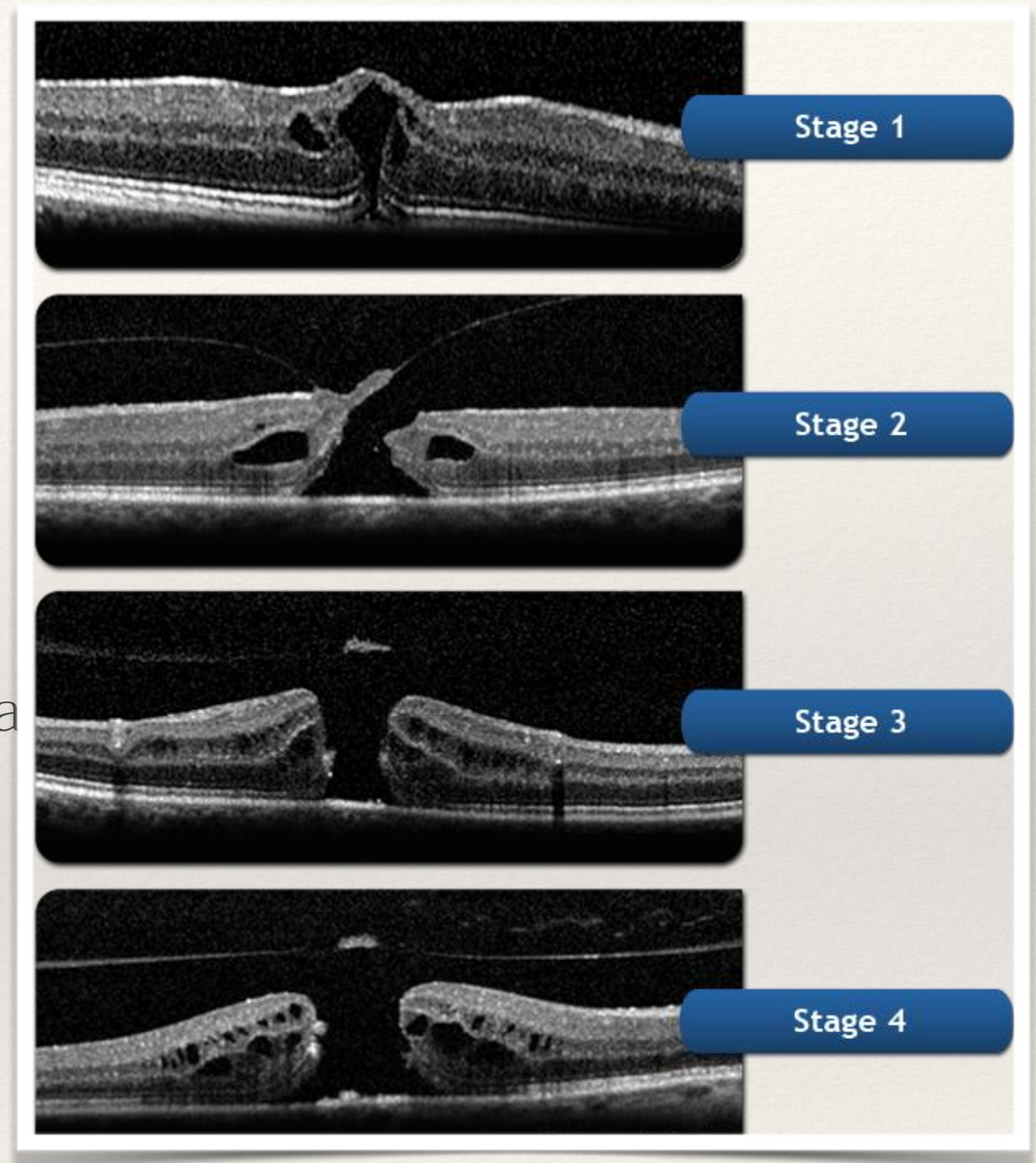
❖ Differential diagnosis:

- ❖ pseudohole
- ❖ CME/DME
- ❖ solar retinopathy
- ❖ lamellar hole
- ❖ subfoveal drusen
- ❖ CSR
- ❖ adult-vitelliform foveomacular vitelliform dystrophy





- ❖ stage 1
 - ❖ impending hole
- ❖ stage 2
 - ❖ full-thickness break
 - ❖ $<400\mu\text{m}$
- ❖ stage 3
 - ❖ vitreous detached over macula
 - ❖ $\geq 400\mu\text{m}$;
- ❖ stage 4
 - ❖ stage 3 + complete PVD



❖ Management:

- ❖ vitrectomy
- ❖ observation
- ❖ Jetrea



Retinal Vessels

“We are all mortal until the first kiss and
the second glass of wine.”

—Eduardo Galeano

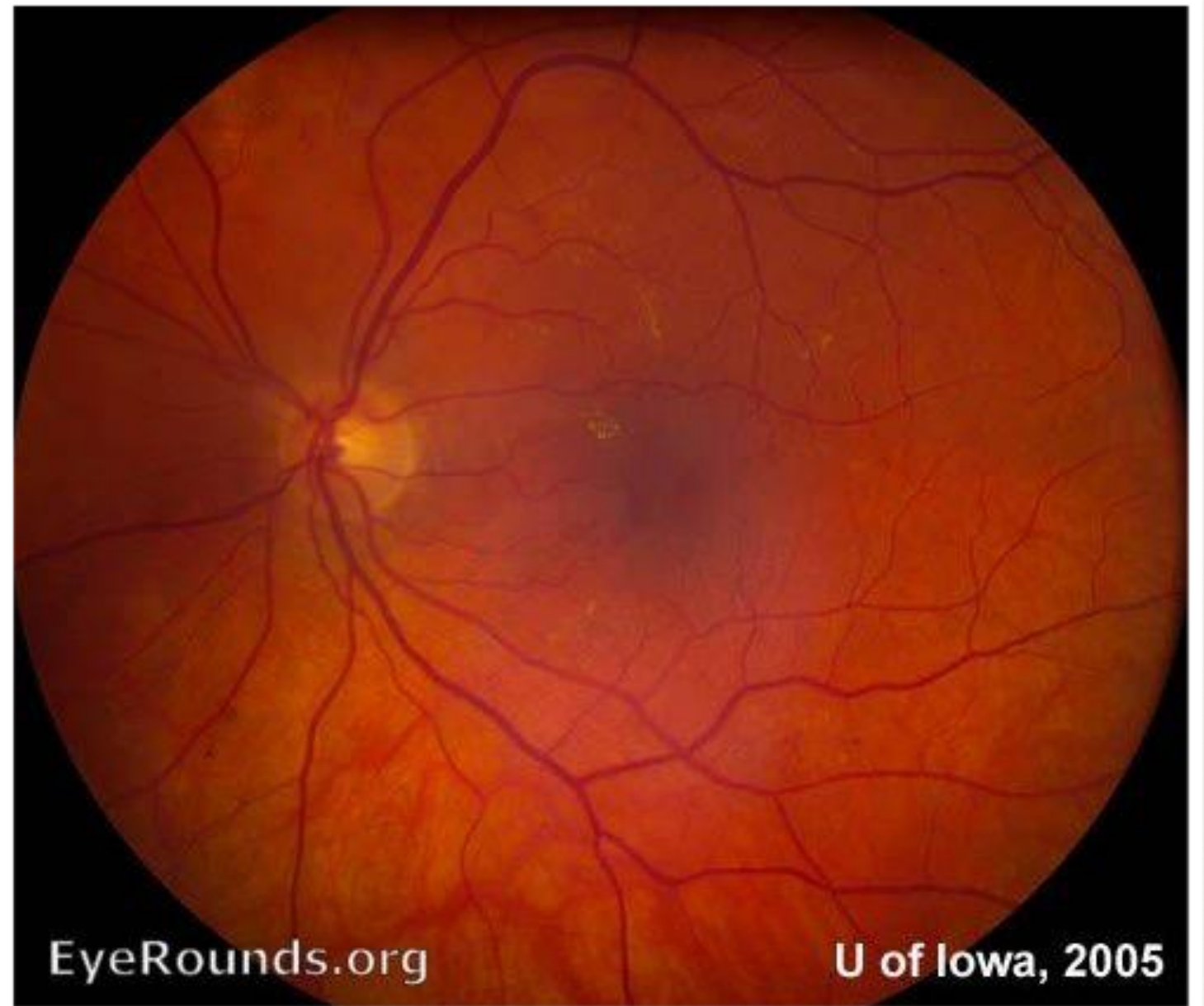
Nonproliferative Diabetic Retinopathy

❖ Presentation:

- ❖ blurred vision (if CSME)
- ❖ known DM, but ODs, MDs are sometimes first to diagnose
- ❖ often asymptomatic



- ❖ Mild NPDR
- ❖ Dot-and-blot hemes
- ❖ microaneurysms
- ❖ hard exudates



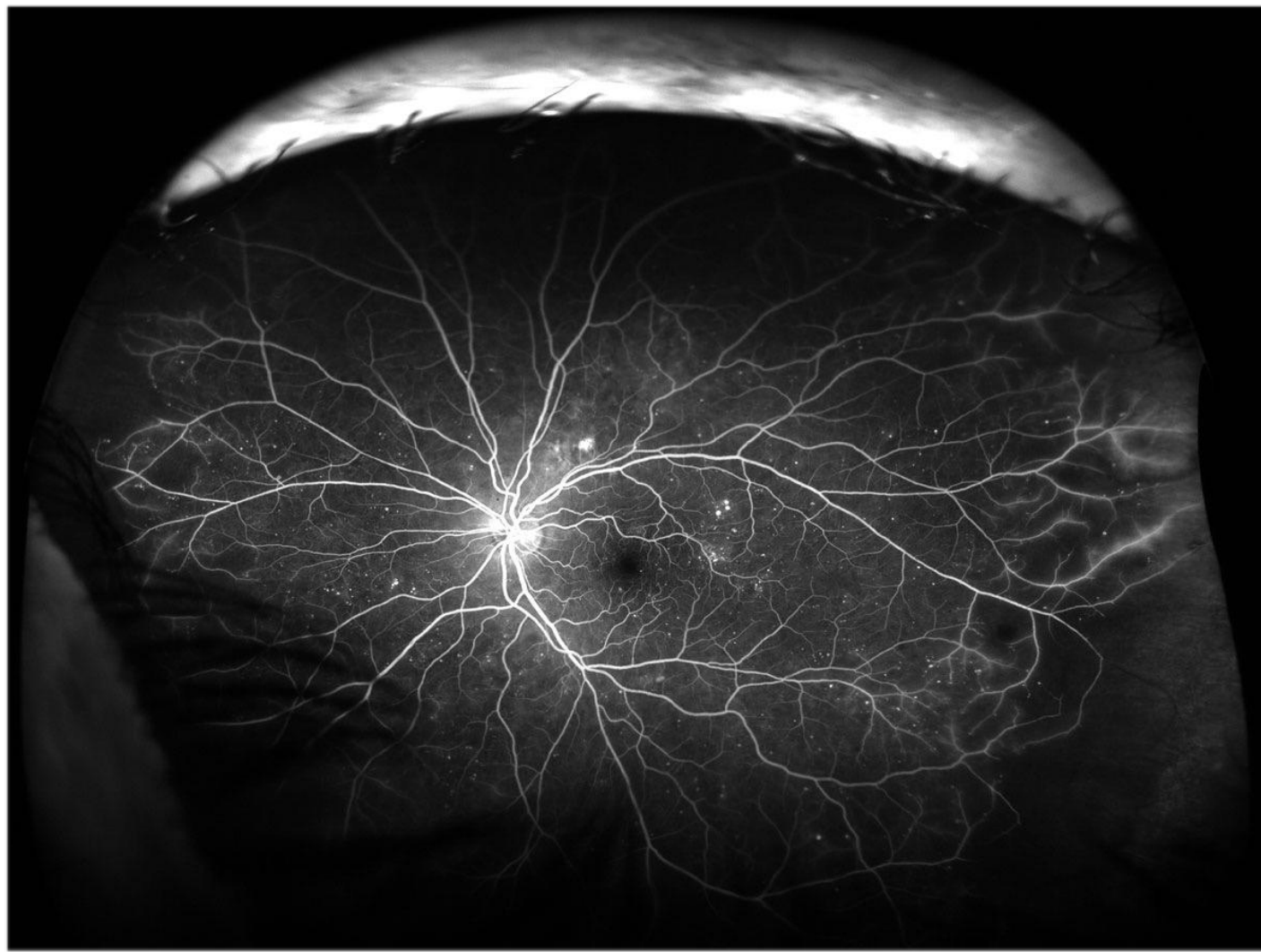


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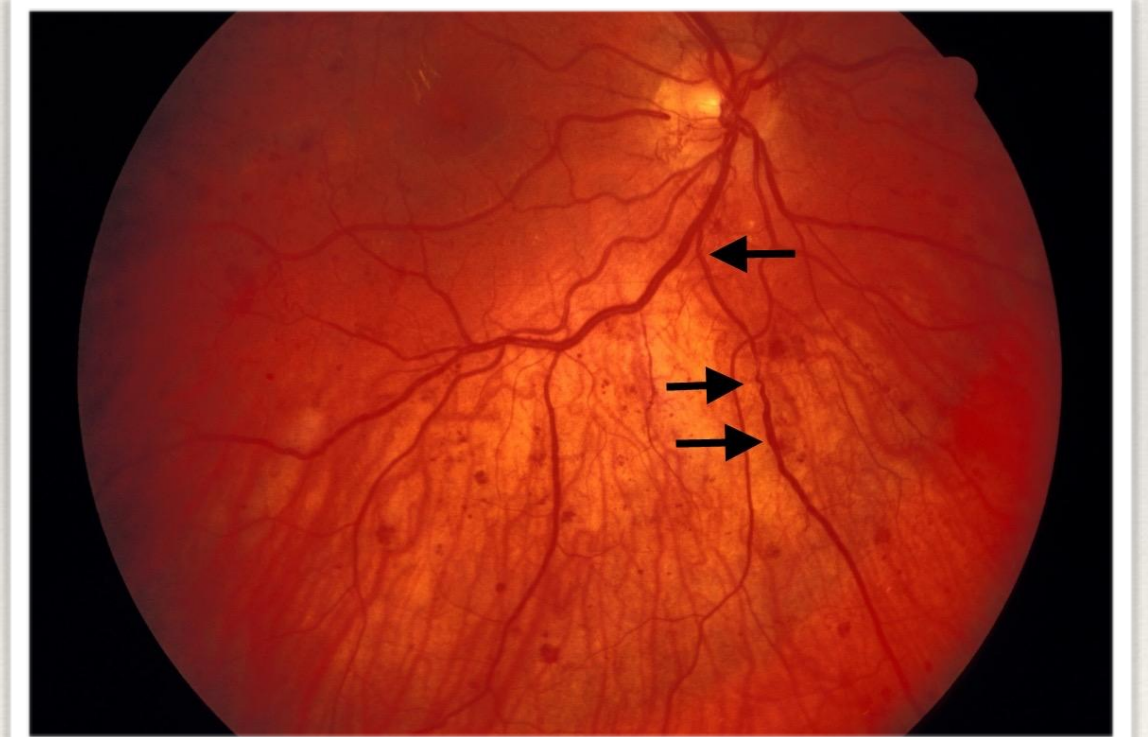
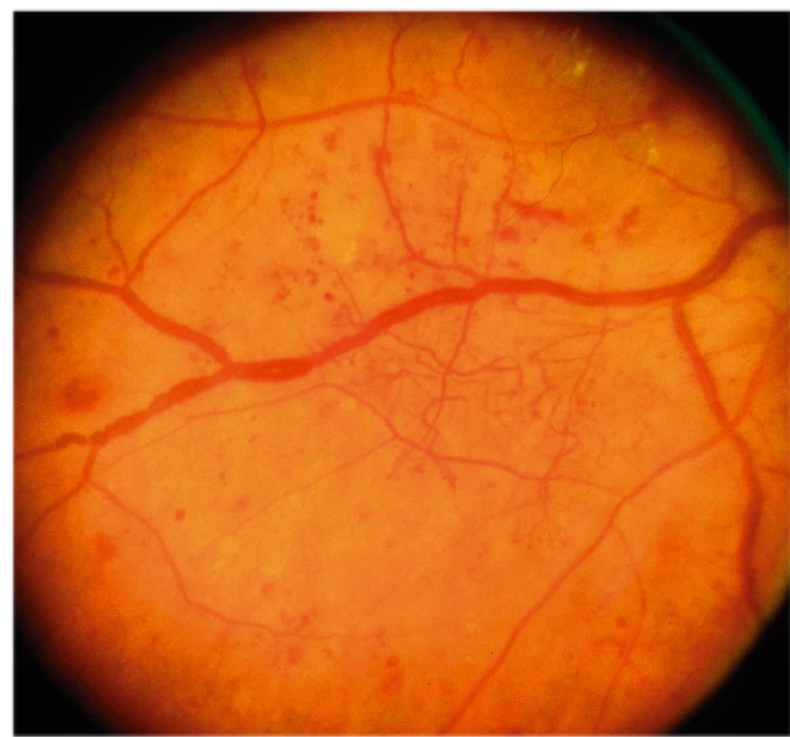
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❖ Moderate NPDR:

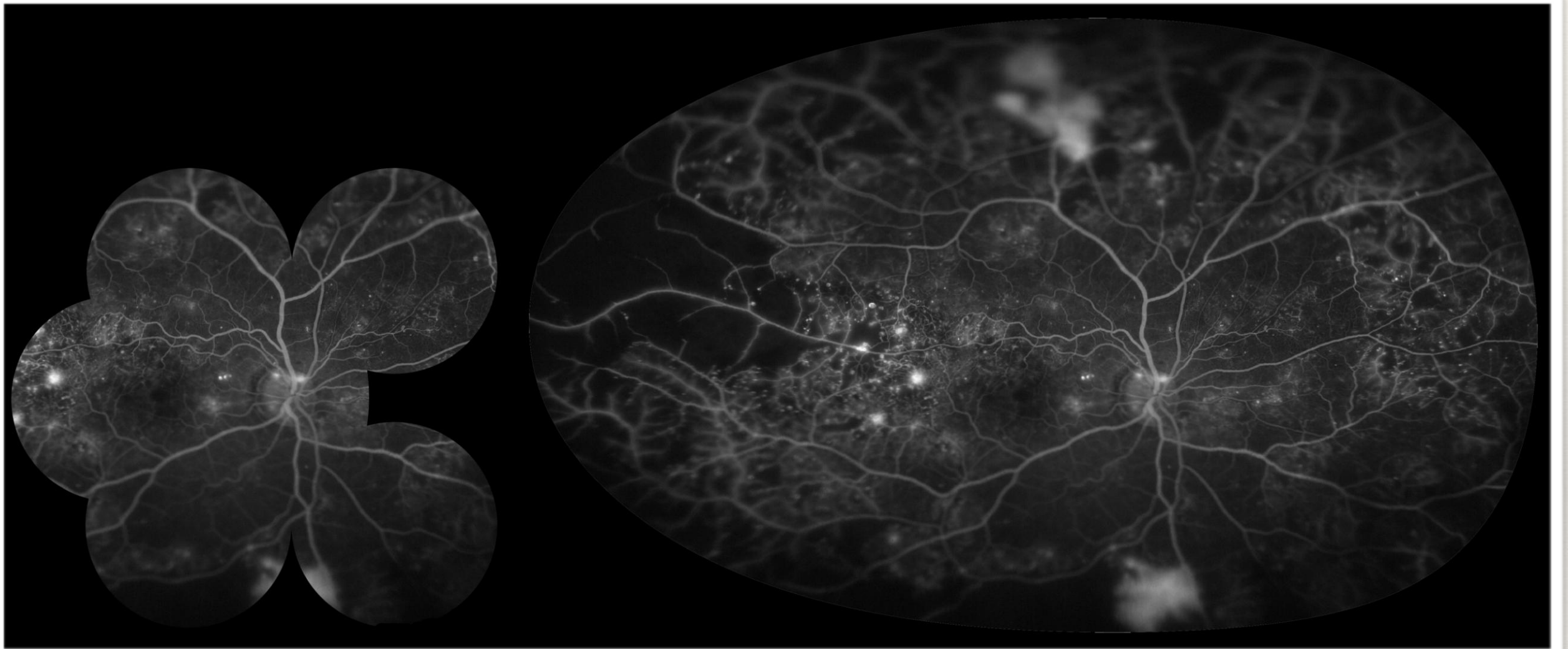
❖ Mild NPDR + CWS, venous beading, moderate CNP



- ❖ Severe NPDR (4:2:1 rule)
- ❖ 4 quadrants DBH
- ❖ 2 quadrants venous beading
- ❖ 1 quadrant intraretinal microvascular abnormalities (IRMA)

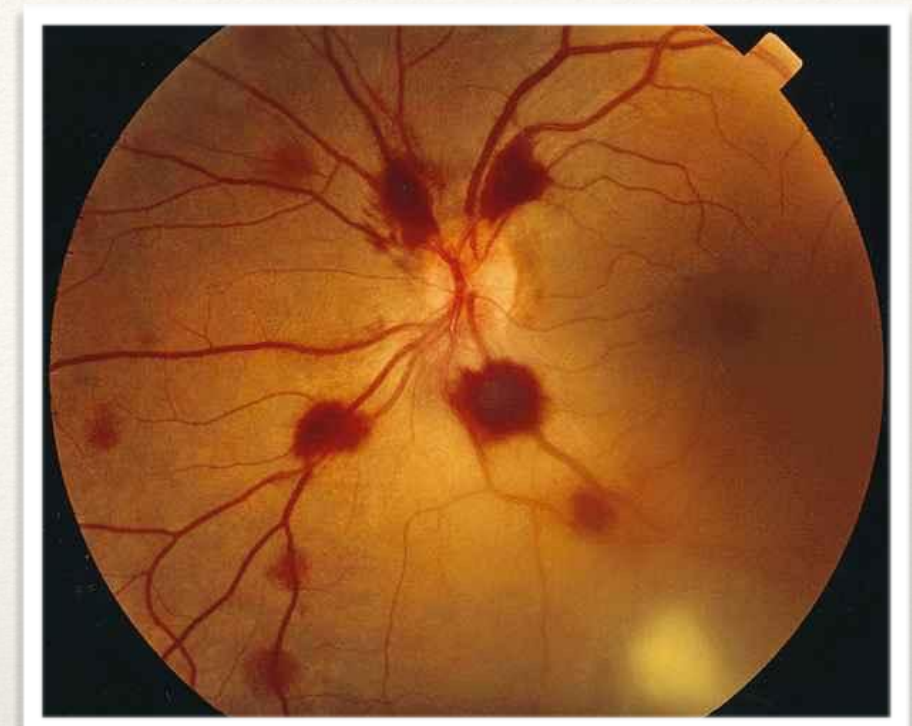


Widfield fluorescein angiography



❖ Differential diagnosis:

- ❖ HTN retinopathy
- ❖ RVO
- ❖ OIS
- ❖ radiation retinopathy
- ❖ other causes of retinal bleeding
 - ❖ valsalva retinopathy
 - ❖ Terson's syndrome
 - ❖ hematological/oncological
 - ❖ HIV retinopathy
 - ❖ etc.



- ❖ Clinically significant macular edema (*CSME*):
 - ❖ thickening within 500 μ m of the center of the macula
 - ❖ hard exudate within 500 μ m of the center of the macula if adjacent thickening
 - ❖ thickening within 1DD of center of macula if at least 1DD in size



❖ Management:

- ❖ Referral to PMD if not previously diagnosed with DM
- ❖ Check BP
- ❖ CSME treated with:
 - ❖ anti-VEGF
 - ❖ steroids
 - ❖ focal laser
 - ❖ PRP (if severe ischemia)



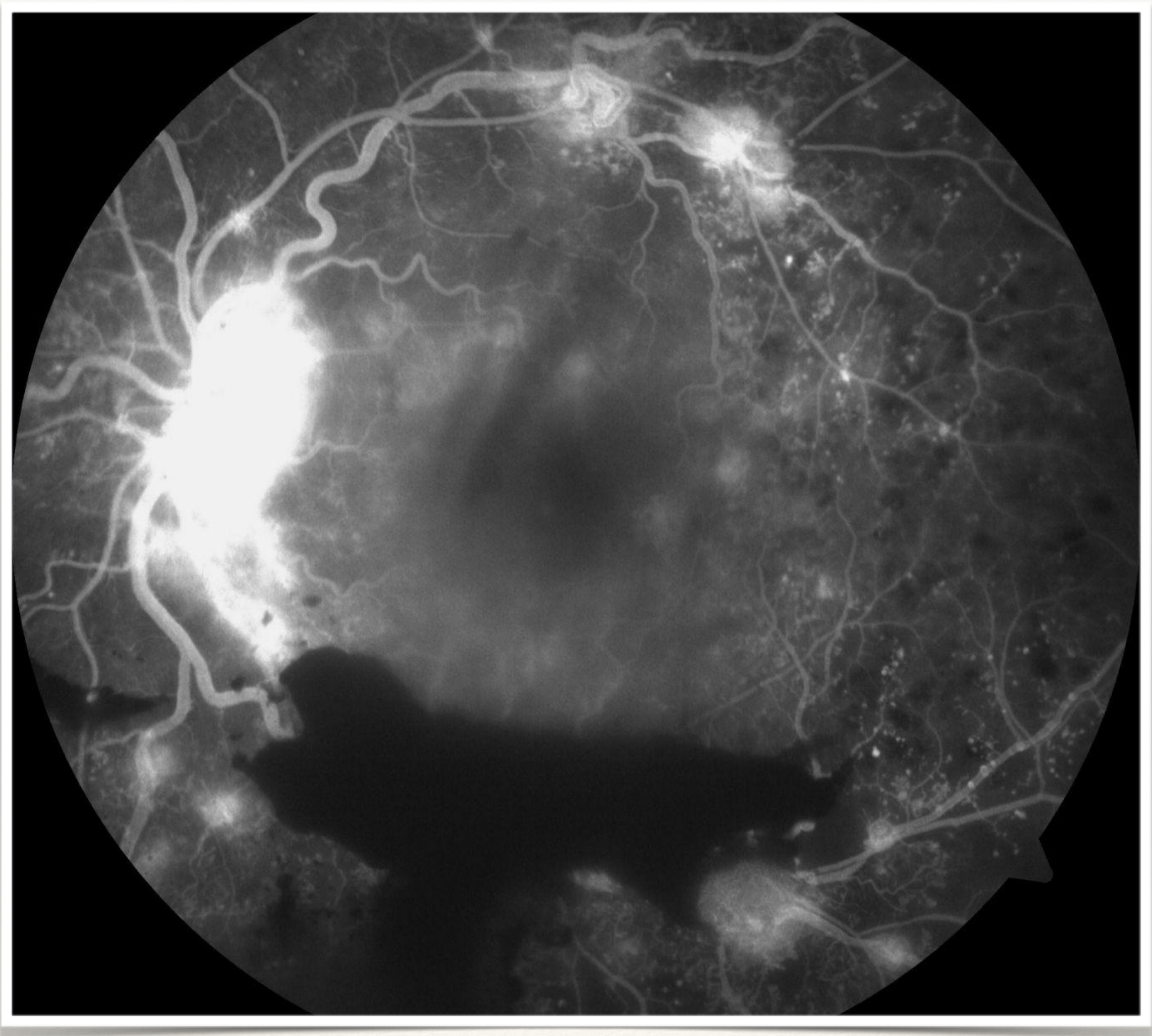
NAVILAS

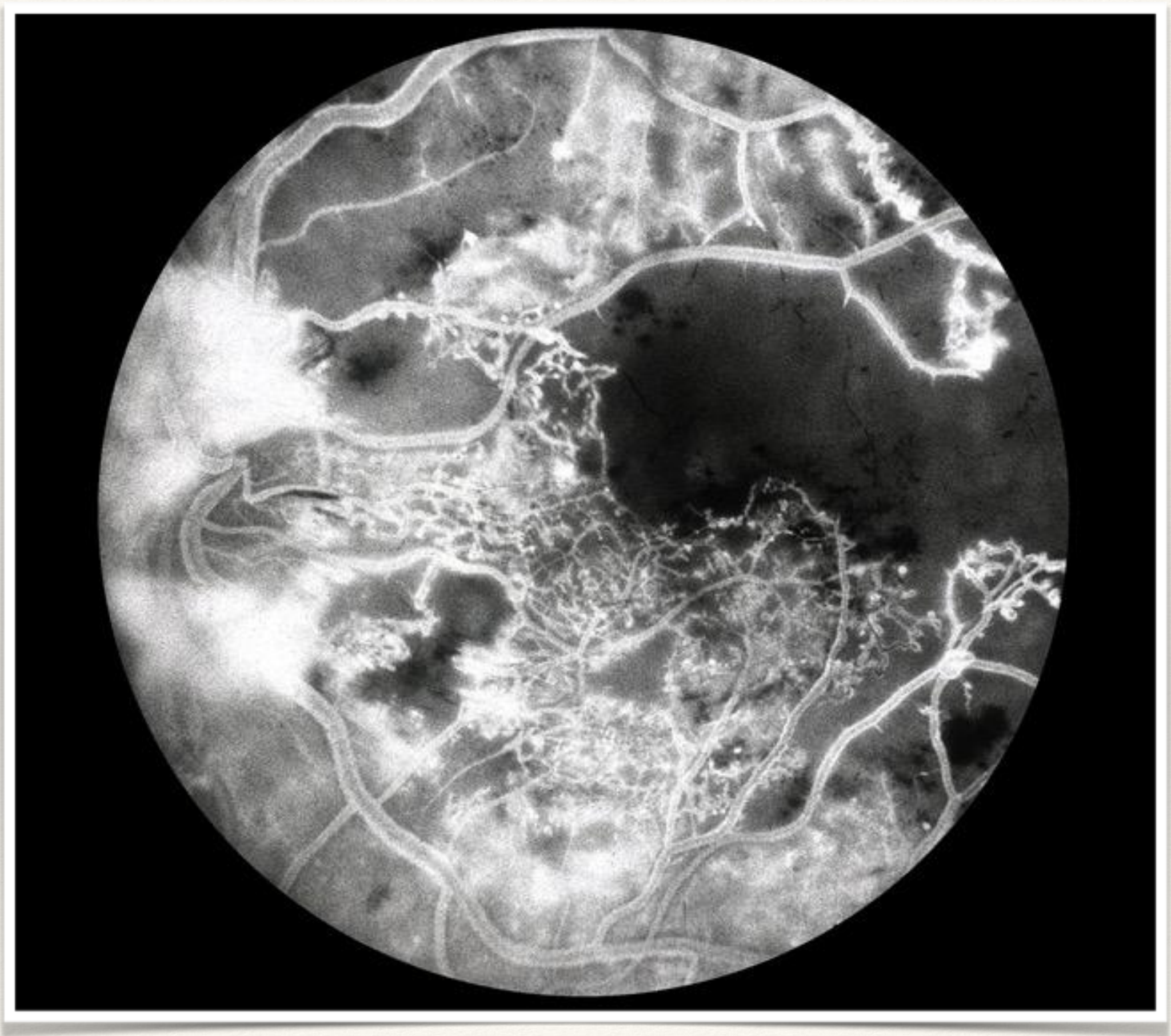
Proliferative Diabetic Retinopathy

❖ Presentation:

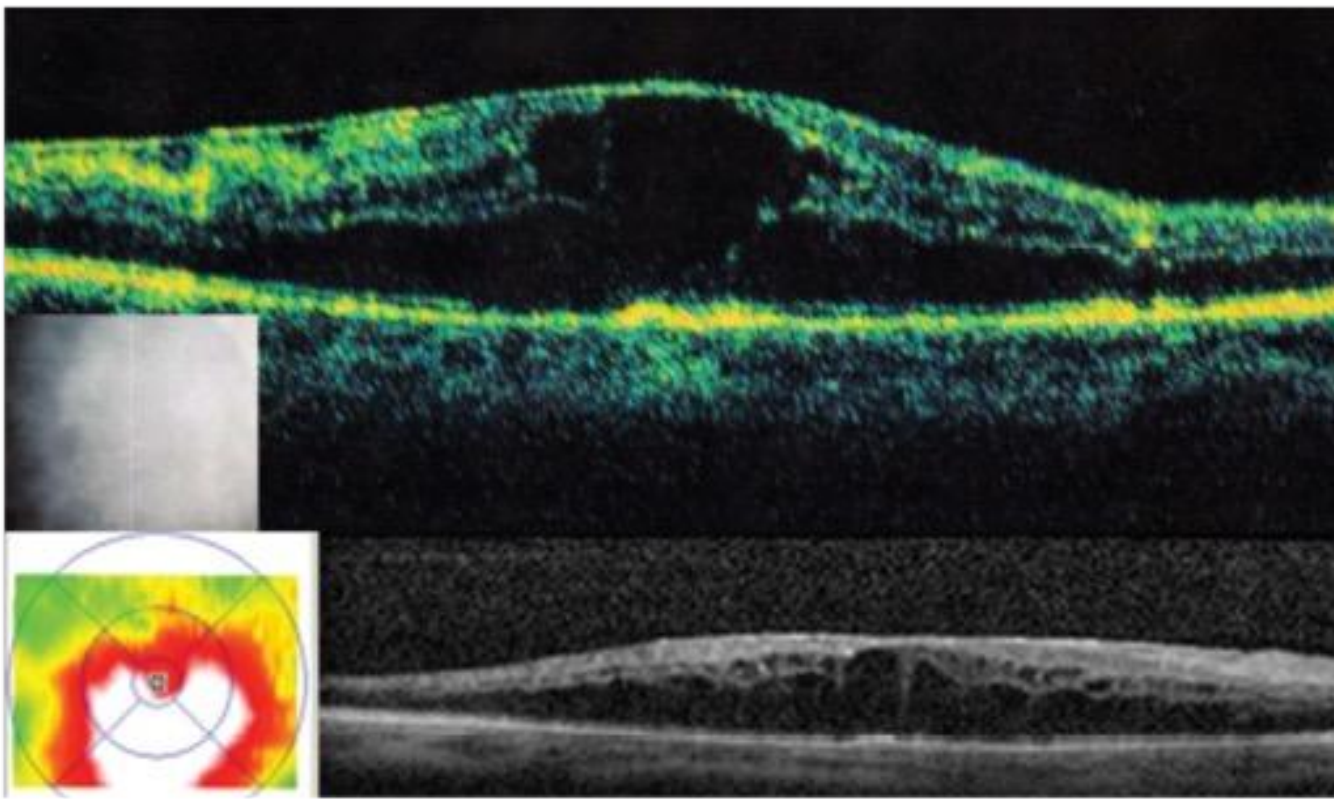
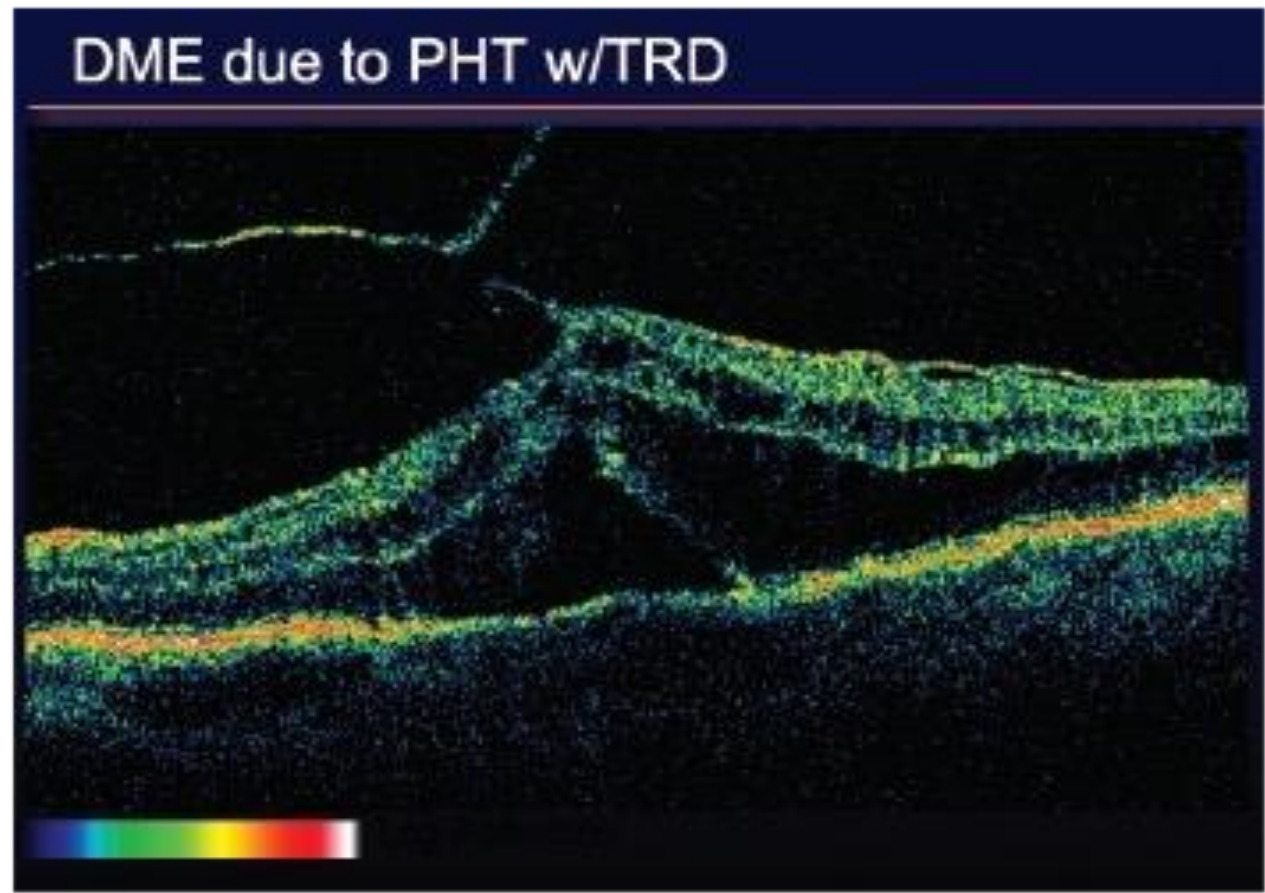
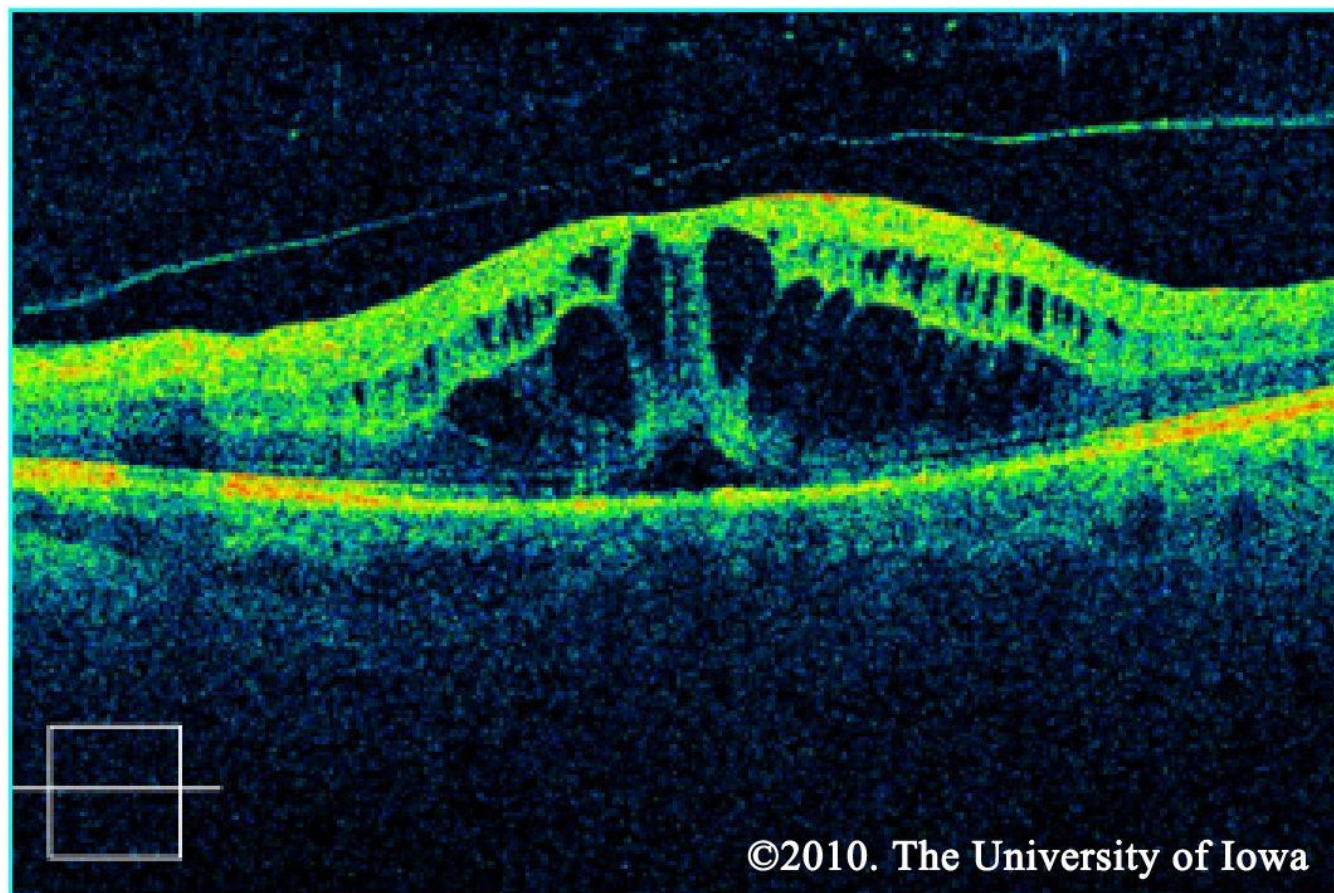
- ❖ decreased vision (VH, CSME, ischemic maculopathy)
- ❖ occasionally asymptomatic
- ❖ NVD, NVE, NVI/NVA
- ❖ bilateral, can be asymmetric
 - ❖ order carotid doppler US to r/o occlusion

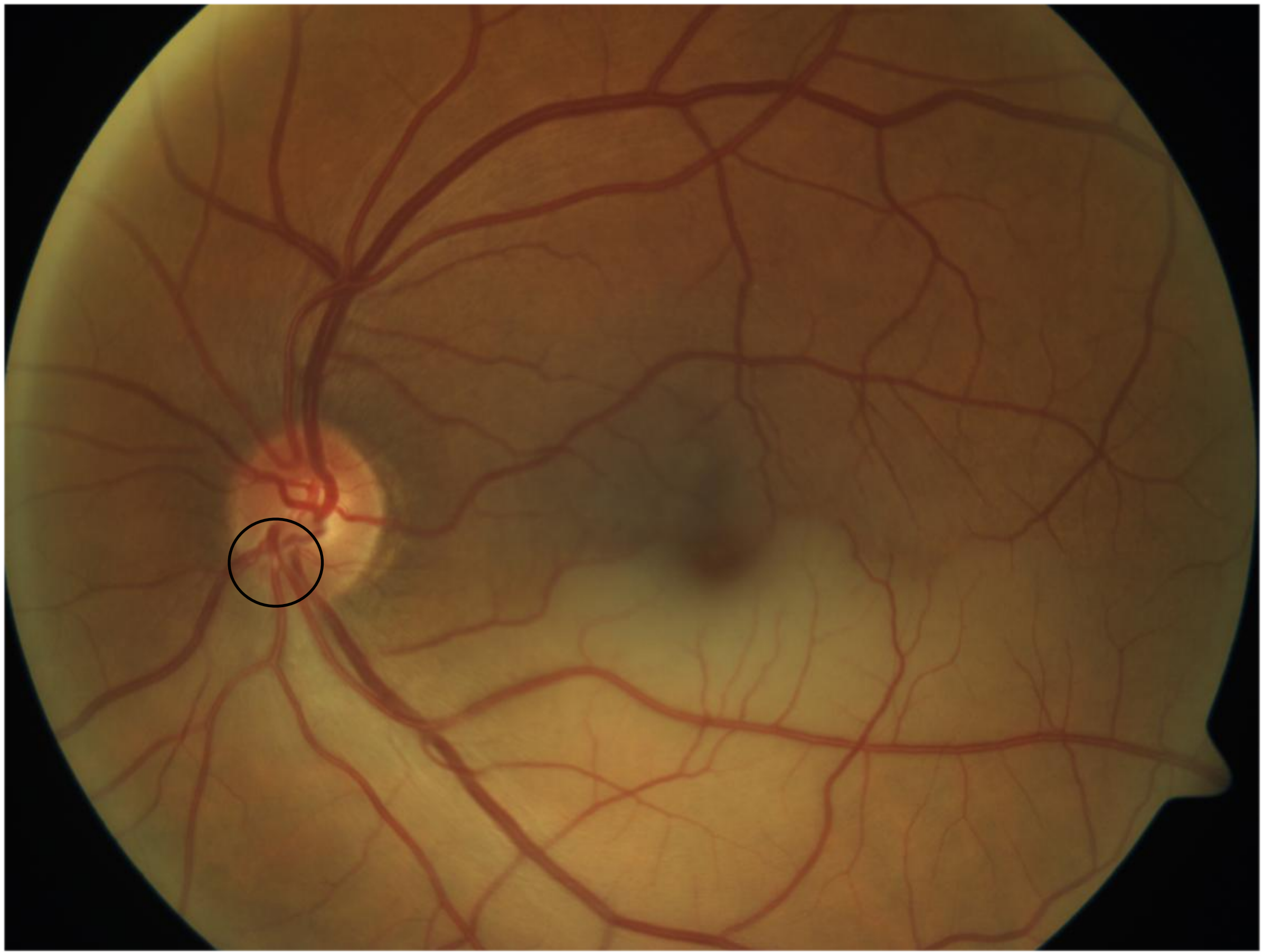




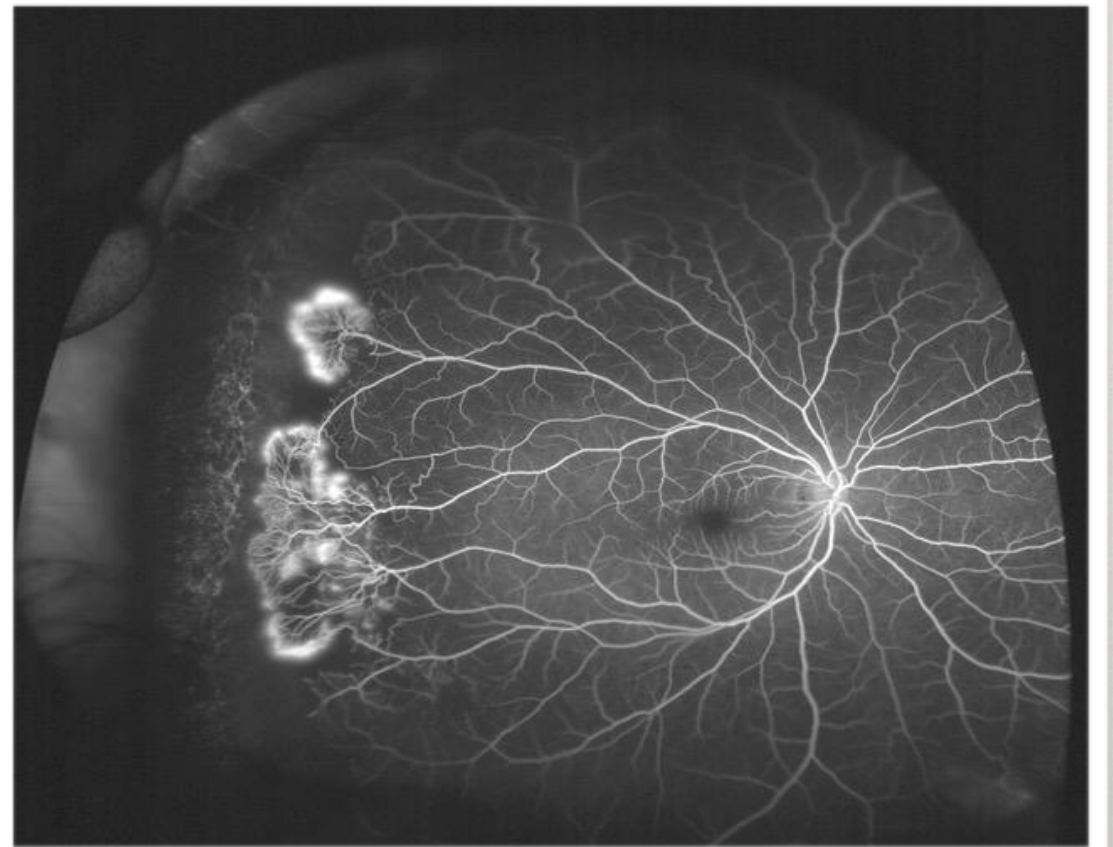


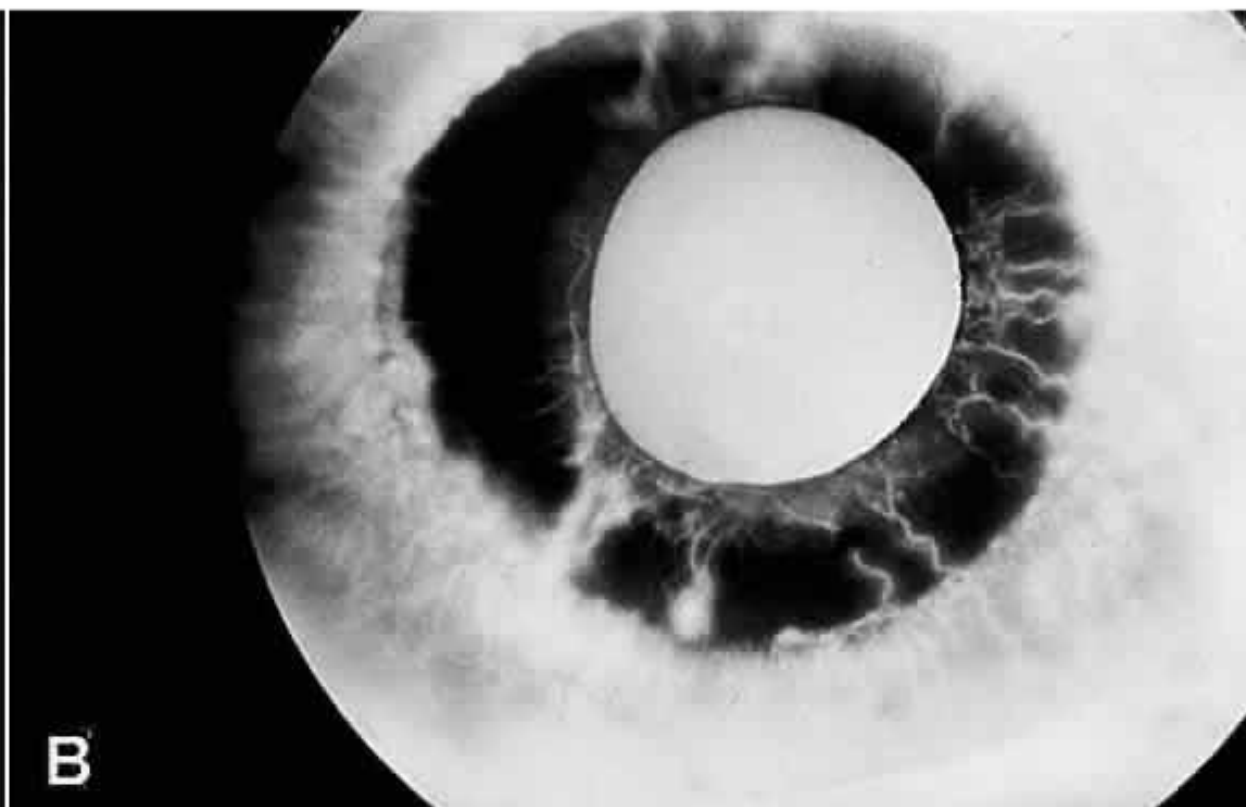
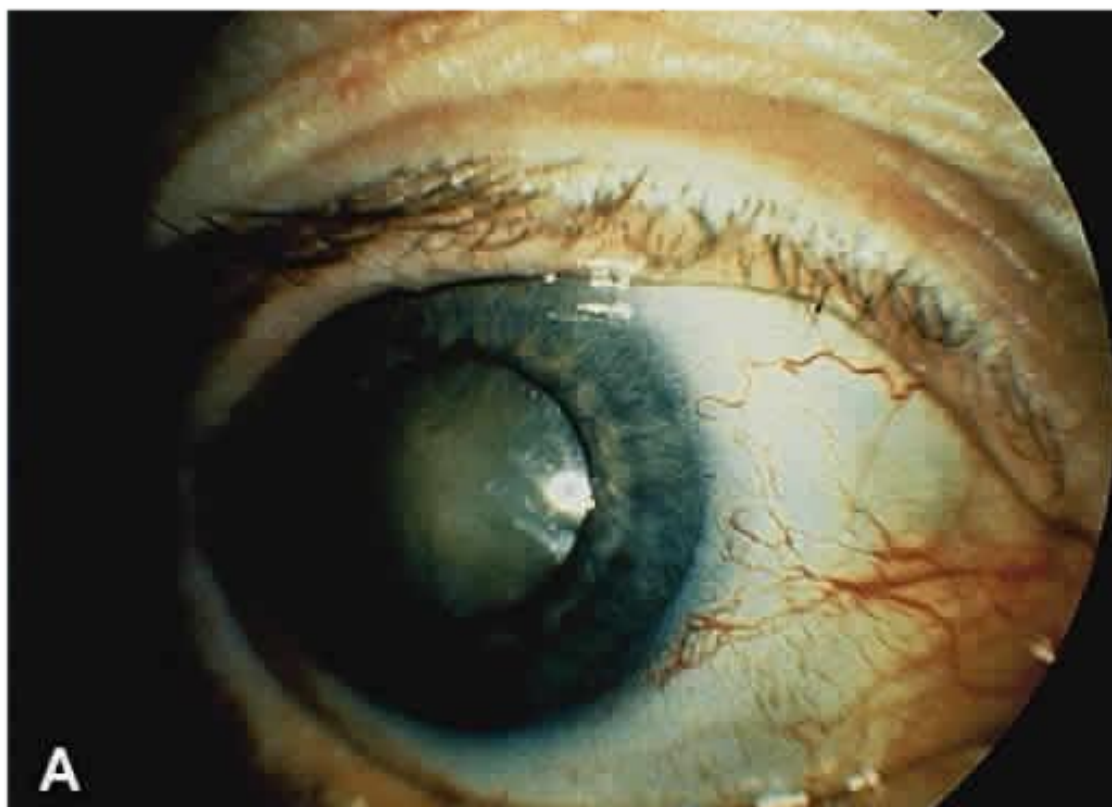






- ❖ Differential diagnosis:
 - ❖ NV from RVO
 - ❖ sickle cell retinopathy
 - ❖ sarcoidosis
 - ❖ OIS
 - ❖ radiation retinopathy





- ❖ Management:

- ❖ PRP
- ❖ anti-VEGF injections
- ❖ PPV/TRD repair



PASCAL

Retinal Artery Occlusion

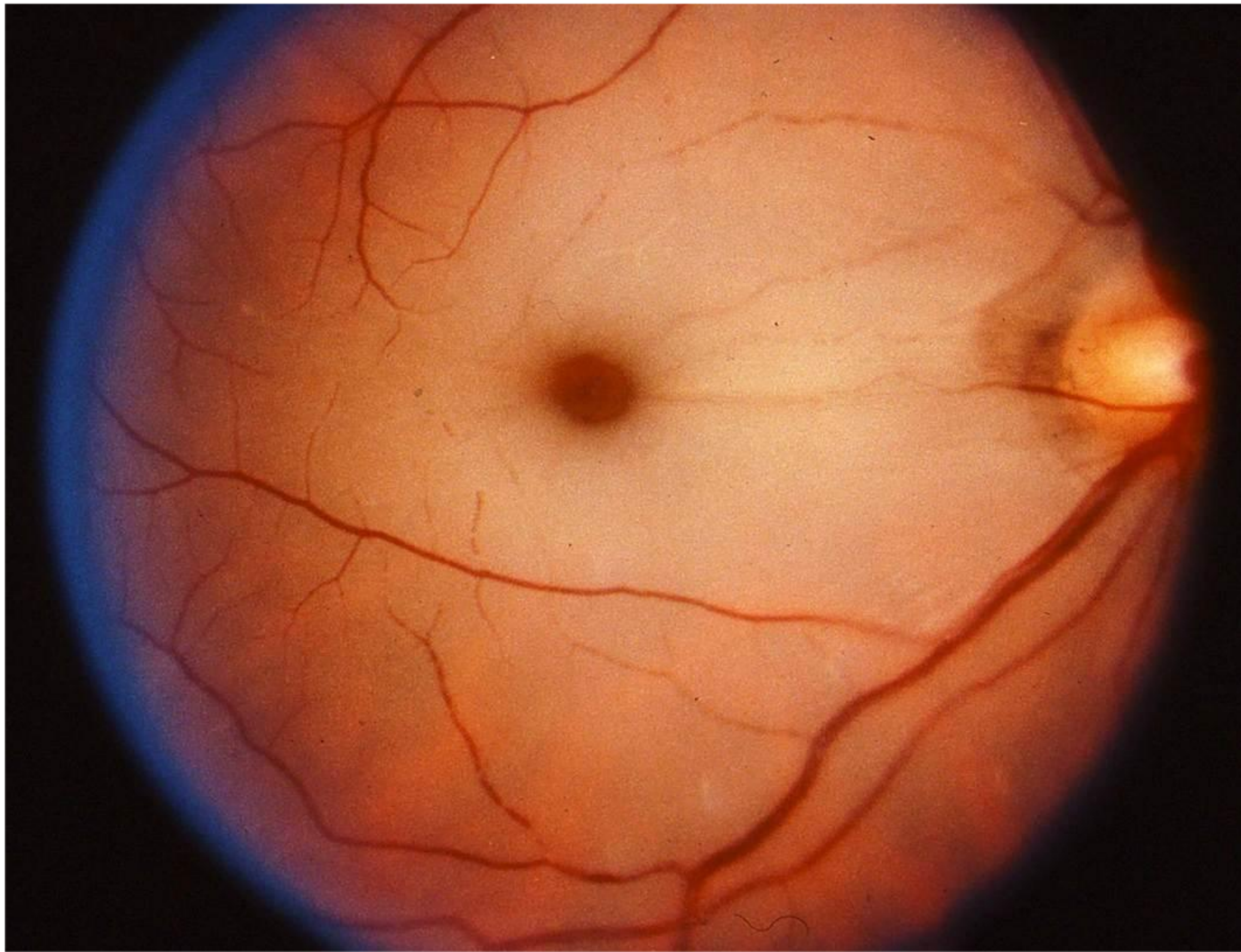
- ❖ Presentation:

- ❖ CRAO:

- ❖ unilateral, painless, acute vision loss
 - ❖ h/o amaurosis fugax
 - ❖ marked APD
 - ❖ whitening of the superficial retina with cherry red spot
 - ❖ box-carring in arterioles
 - ❖ CF-LP

- ❖ BRAO:

- ❖ unilateral, painless, acute partial vision loss

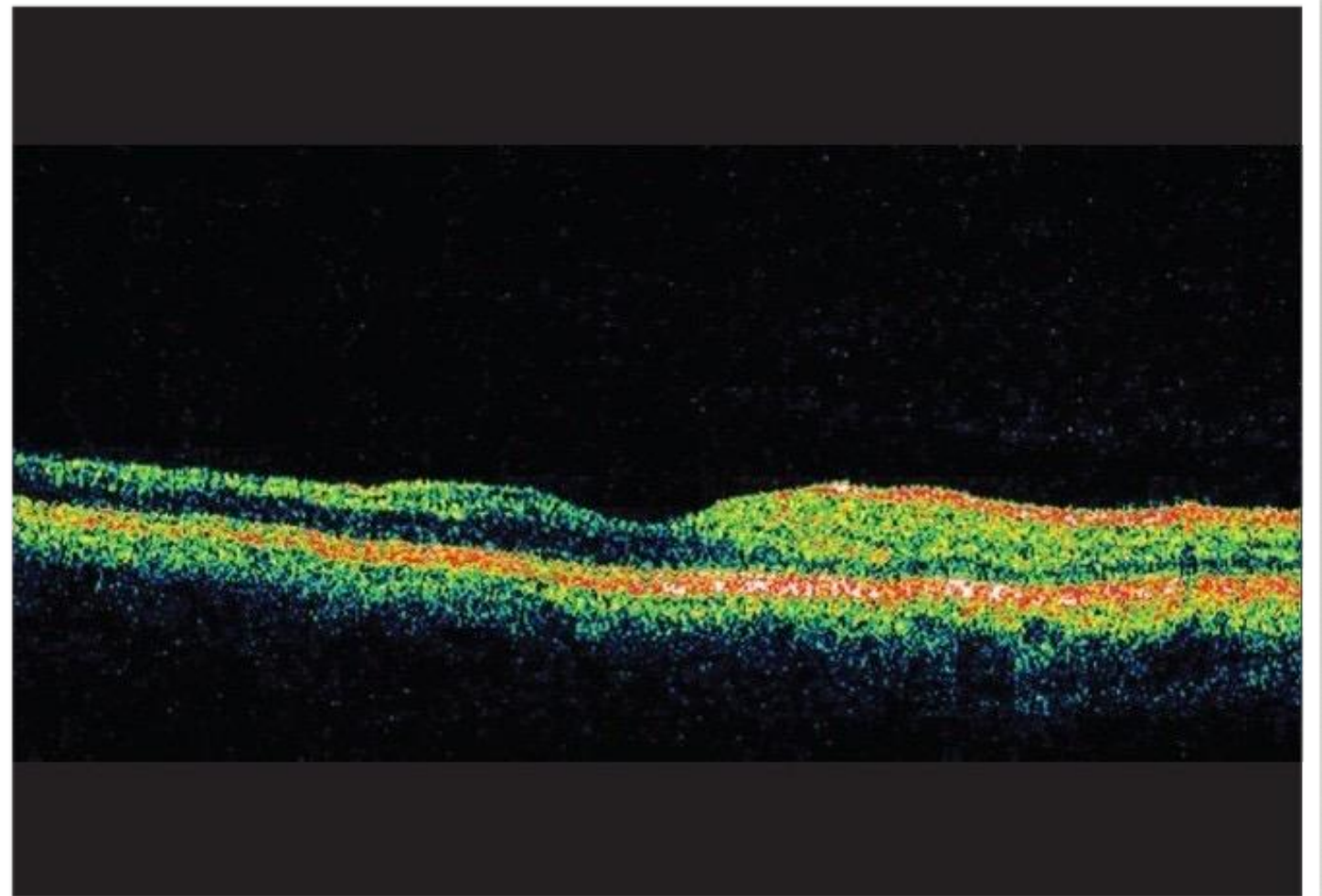
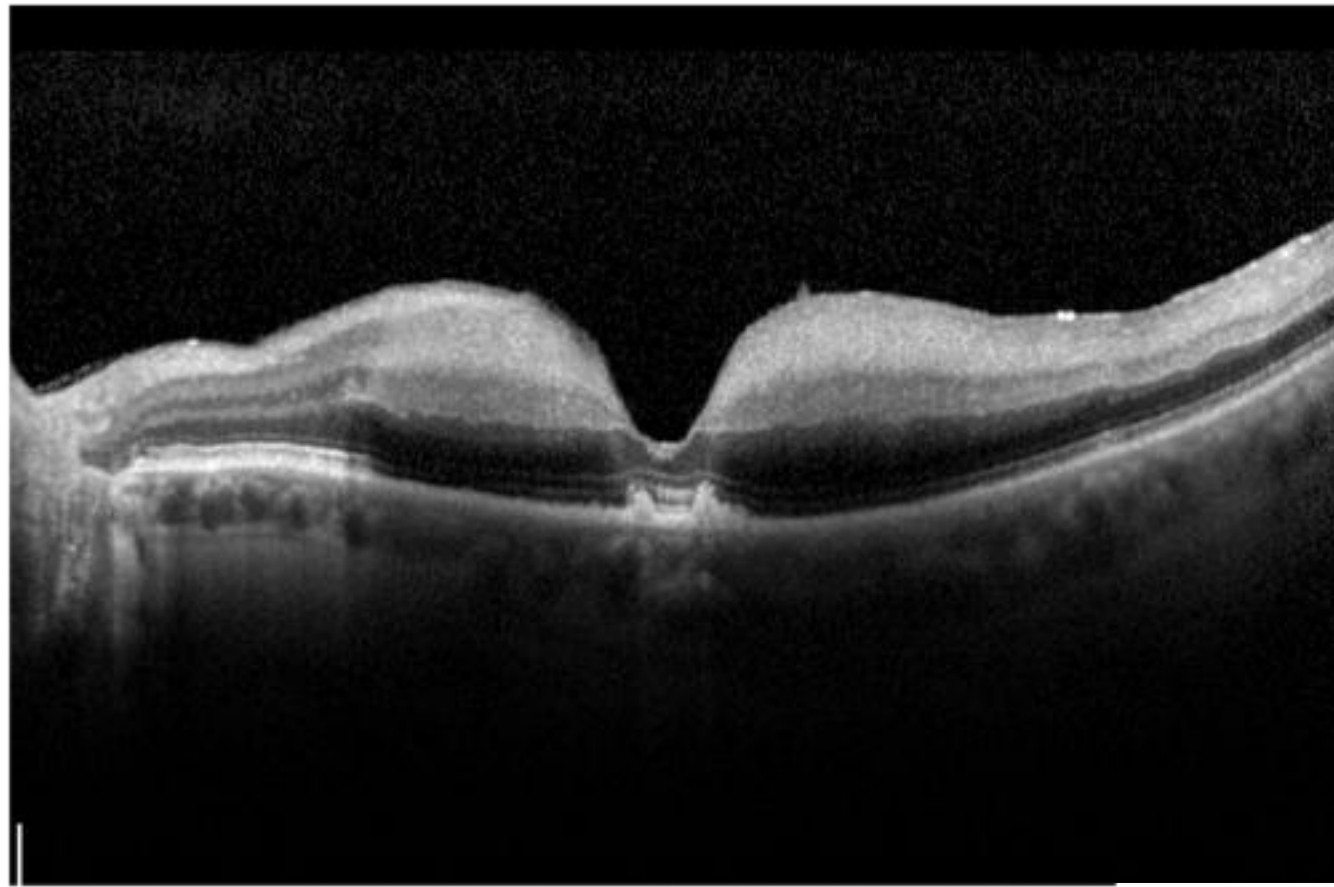




200 µm

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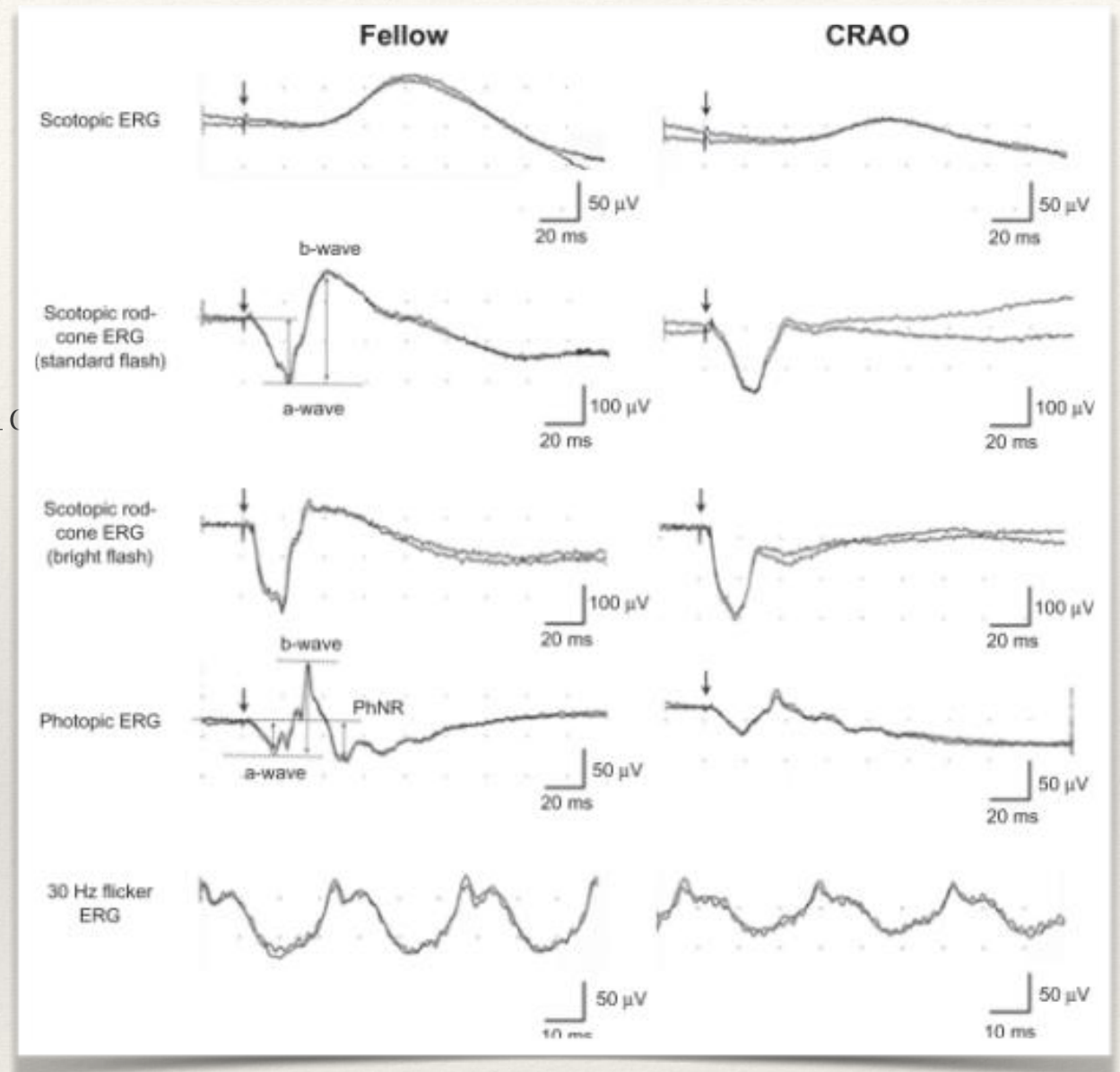


❖ **Differential diagnosis:**

- ❖ acute ophthalmic artery occlusion
 - ❖ no cherry red spot
 - ❖ vision LP/NLP
- ❖ Tay-Sachs or other storage disease
 - ❖ presents early in life
- ❖ Inadvertant intraocular injection of gentamicin

❖ **Etiology**

- ❖ embolus
- ❖ thrombosis
- ❖ GCA
- ❖ CVD (SLE, PAN, etc.)
- ❖ hypercoagulable state
- ❖ trauma



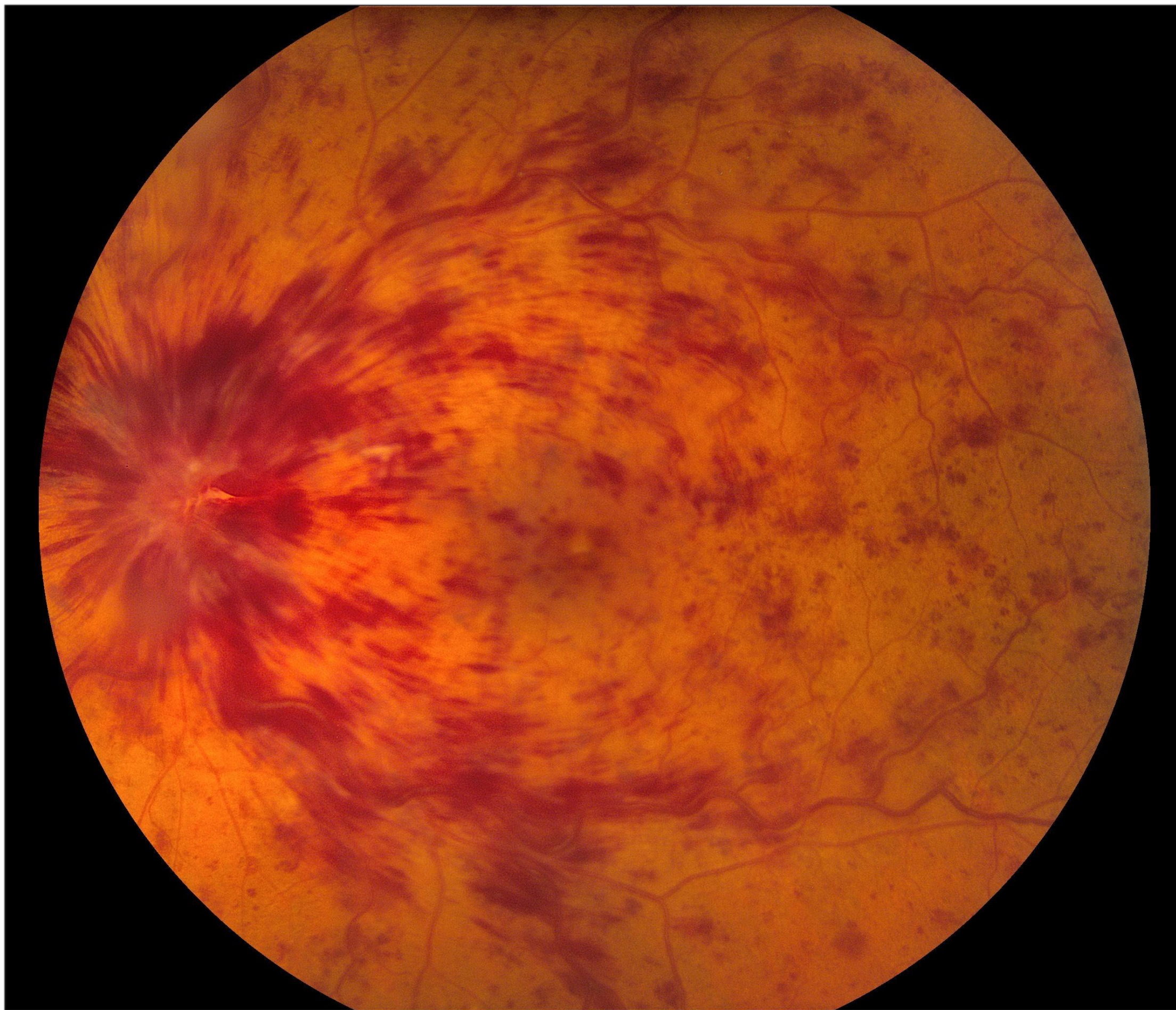
❖ Management:

- ❖ time frame: within 90–120 minutes
- ❖ AC paracentesis
- ❖ ocular massage
- ❖ diamox or topical beta-blocker
- ❖ refer to internist for complete work-up
- ❖ repeat exam in 1–4 wks. to check for NVI/NVD
 - ❖ 20% at 4 wks. (CRAO)
 - ❖ PRP

Retinal Vein Occlusion

❖ Presentation:

- ❖ painless, unilateral loss of vision
- ❖ diffuse retinal hemorrhages
 - ❖ “blood and thunder”
- ❖ tortuous vessels
- ❖ disc edema and heme, CWS, optociliary shunt vessels on disc
- ❖ NVD/NVE/NVI
- ❖ h/o HTN



- ❖ Etiology

- ❖ CRVO

- ❖ HTN

- ❖ ONH edema

- ❖ glaucoma

- ❖ optic disc drusen

- ❖ hypercoagulable state

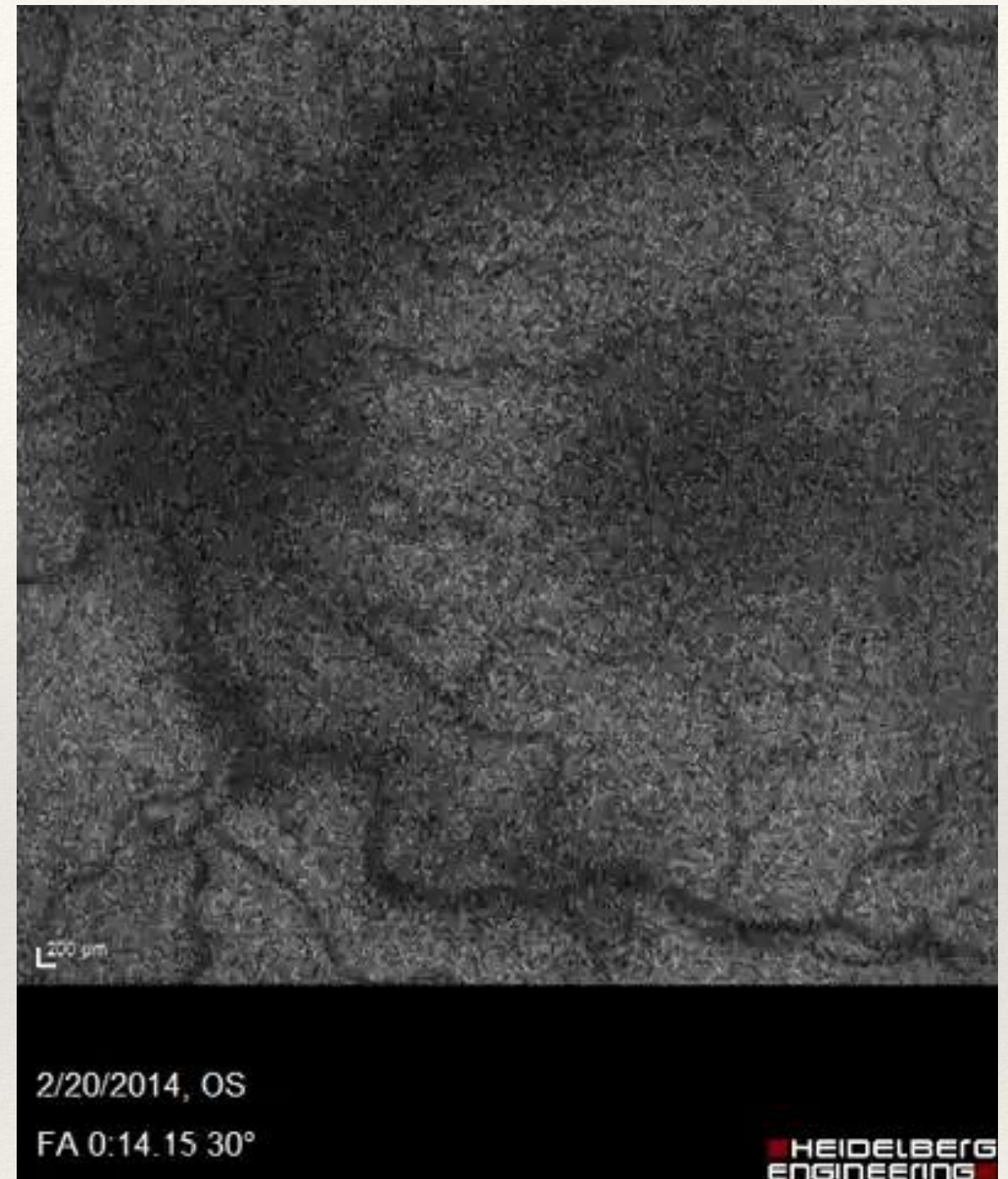
- ❖ drugs (OCPs, diuretics)

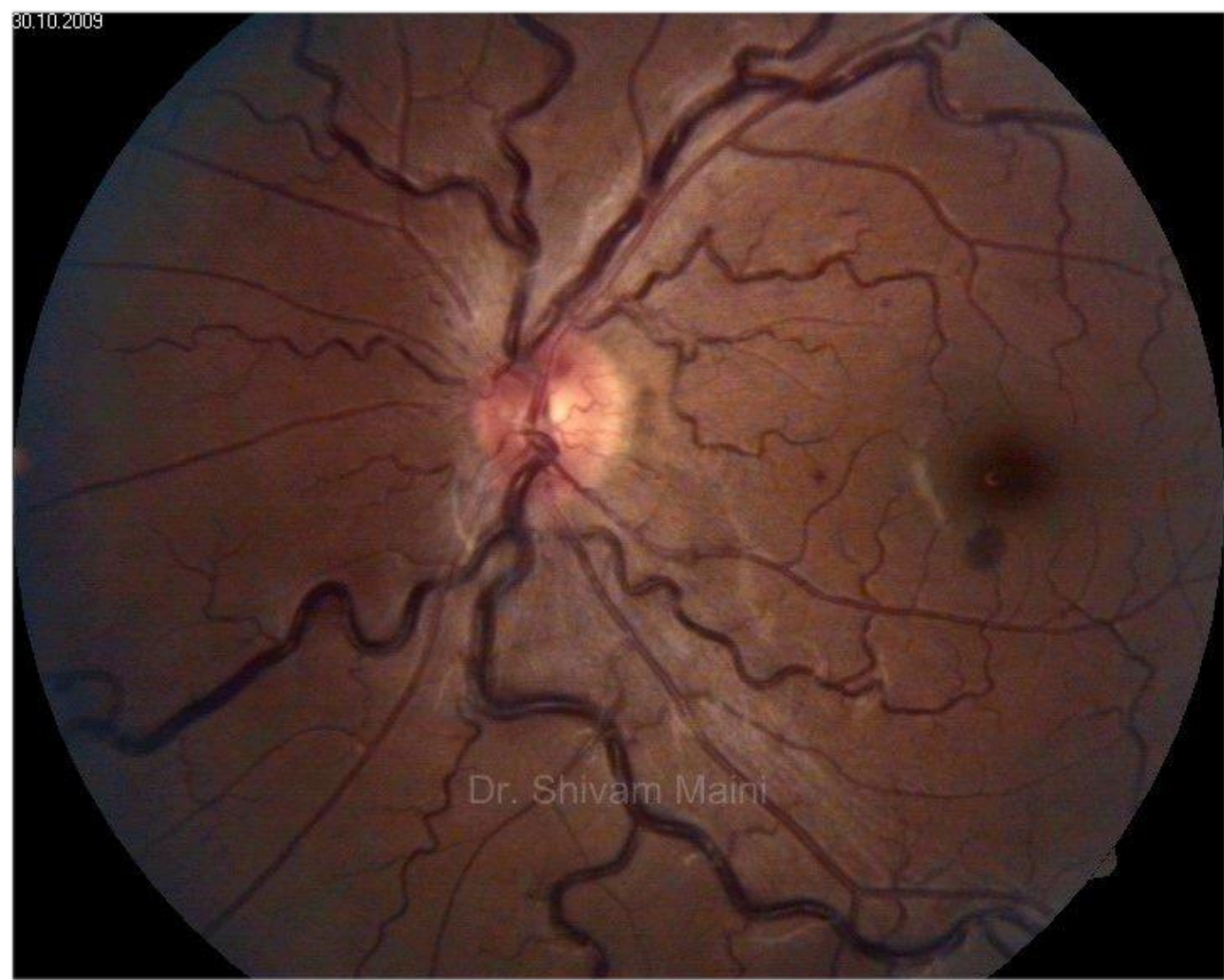
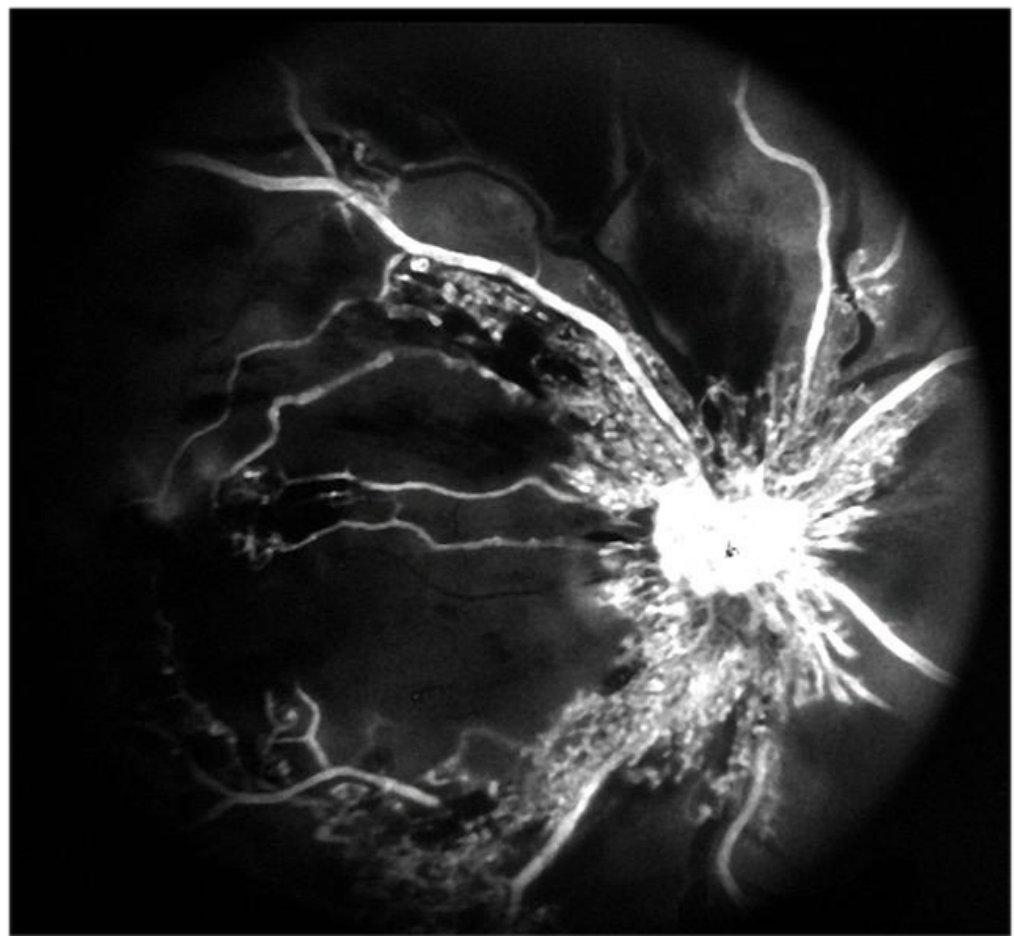
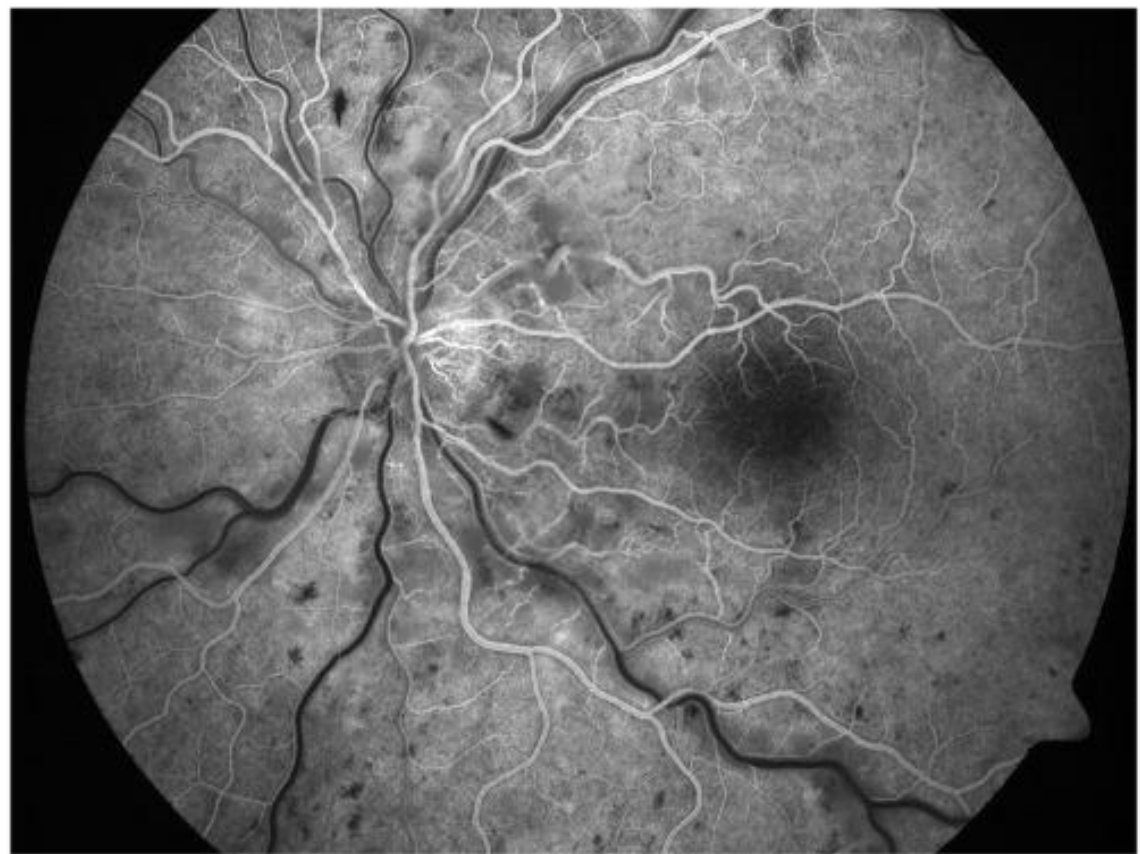
- ❖ orbital tumor

- ❖ vasculitis

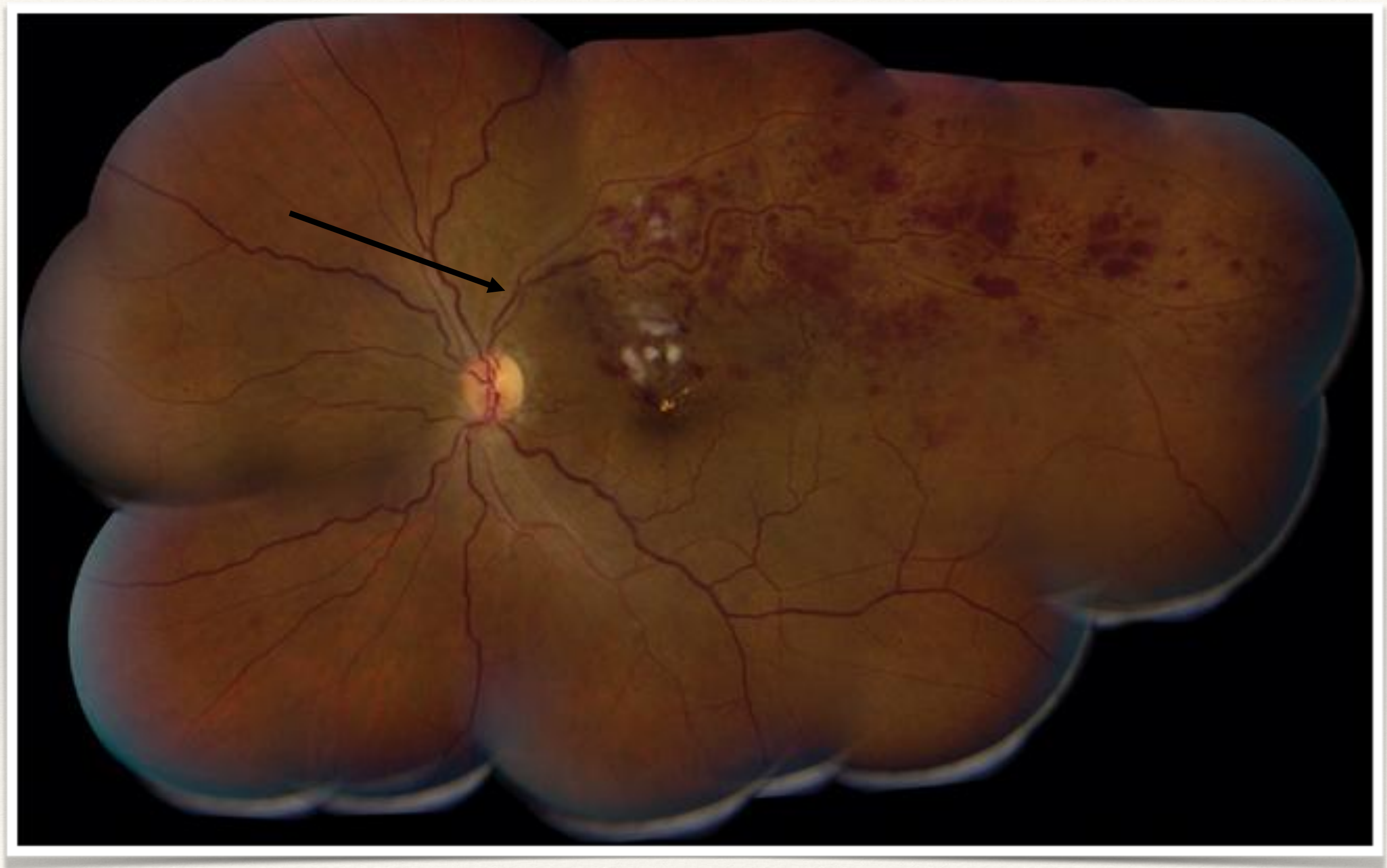
- ❖ BRVO

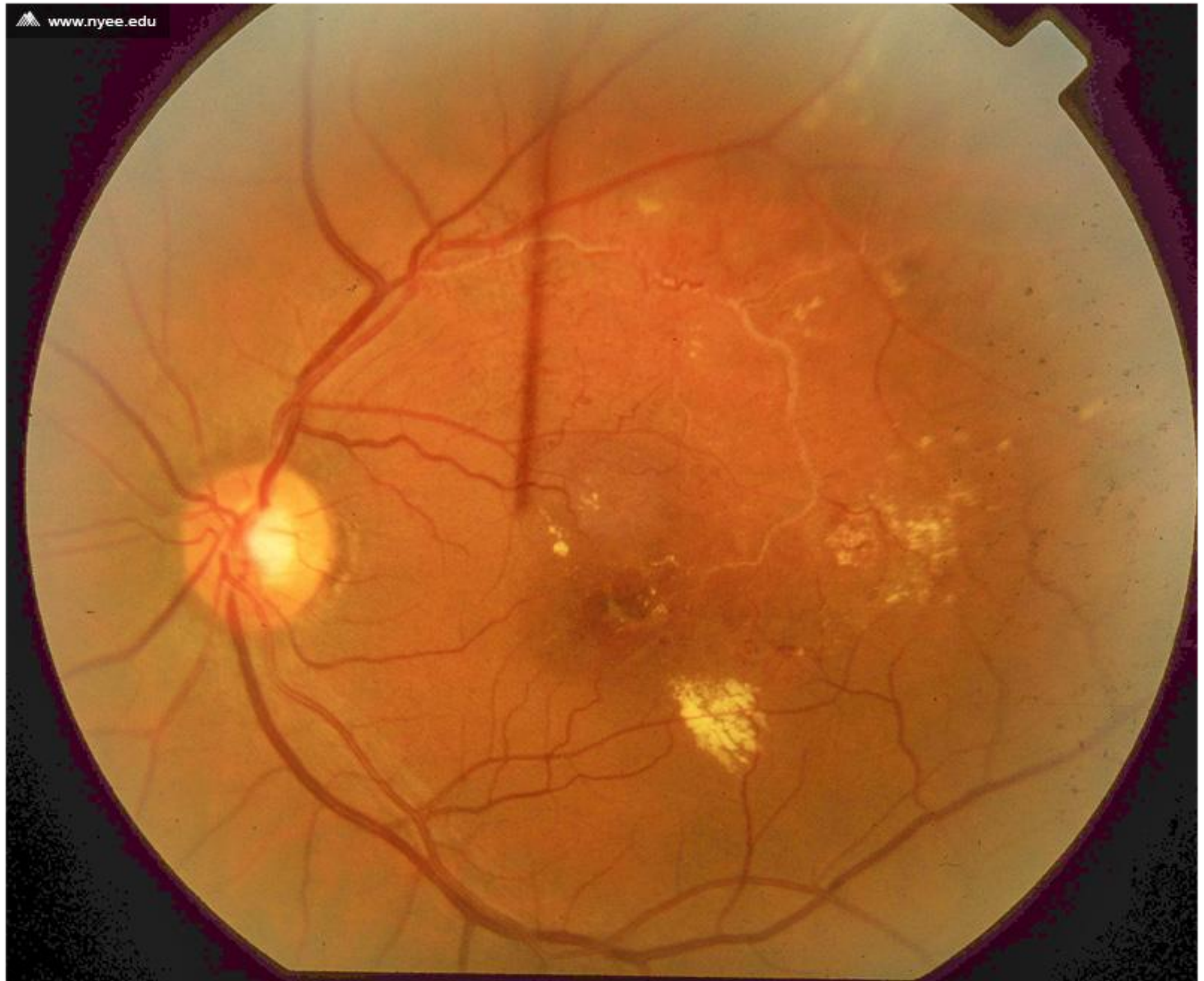
- ❖ HTN (compression at AV crossing)











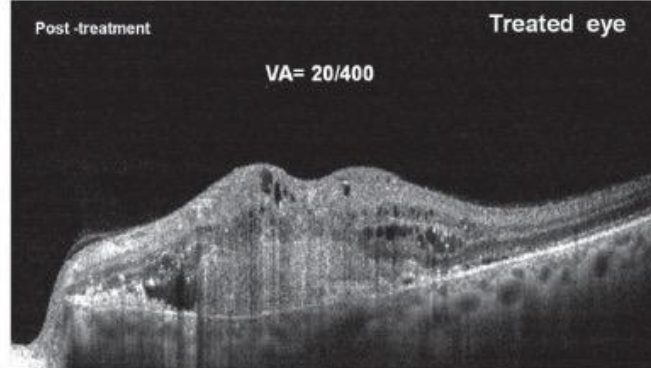
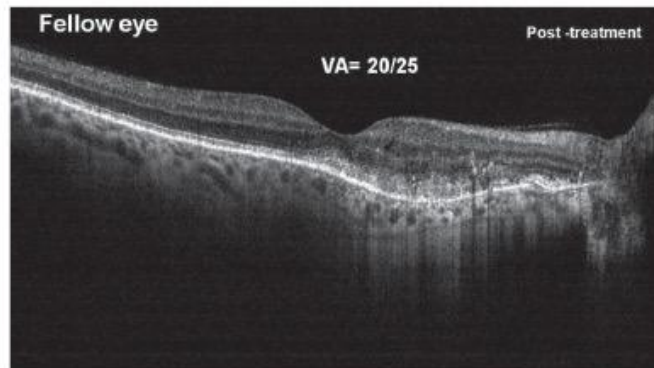
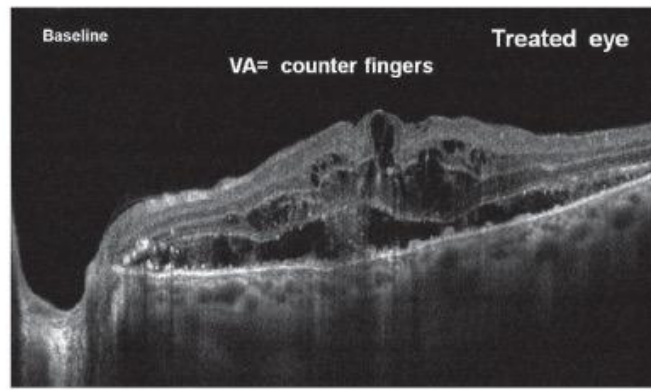
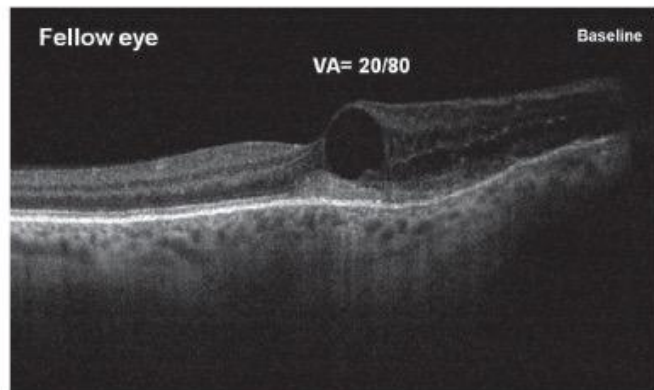
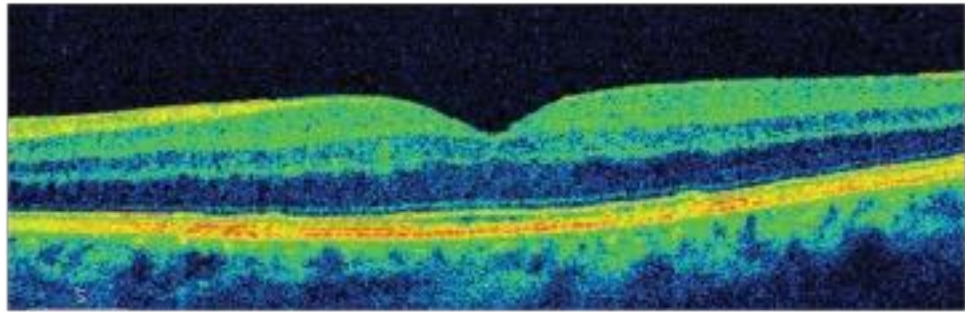
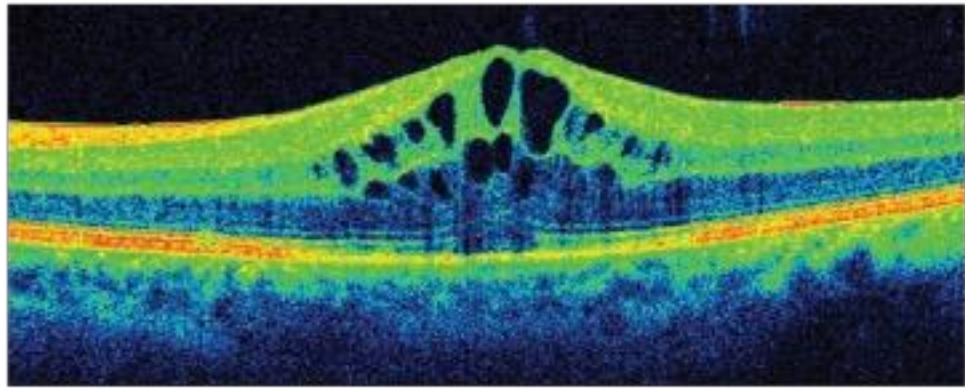


Figure 2: 15-days after an unilateral intravitreal injections of ranibizumab (Lucentis) in the left eye; optical coherence tomography demonstrates regression of the neovascular complex in the right eye (fellow eye) and partial fluid absorption of the left eye (treated eye); there was improvement of vision in both eyes

❖ Differential diagnosis:

- ❖ OIS
- ❖ DR
- ❖ papilledema
- ❖ radiation retinopathy
- ❖ HTN retinopathy



❖ Management:

- ❖ FA to determine extent of ischemia
- ❖ systemic work-up (if under 50 yrs. or unusual presentation)
- ❖ treat underlying disease
- ❖ gonioscopy
- ❖ PRP if NV develops
- ❖ steroids, anti-VEGF injections, and FLT to treat associated CME

RPE/Bruch's membrane

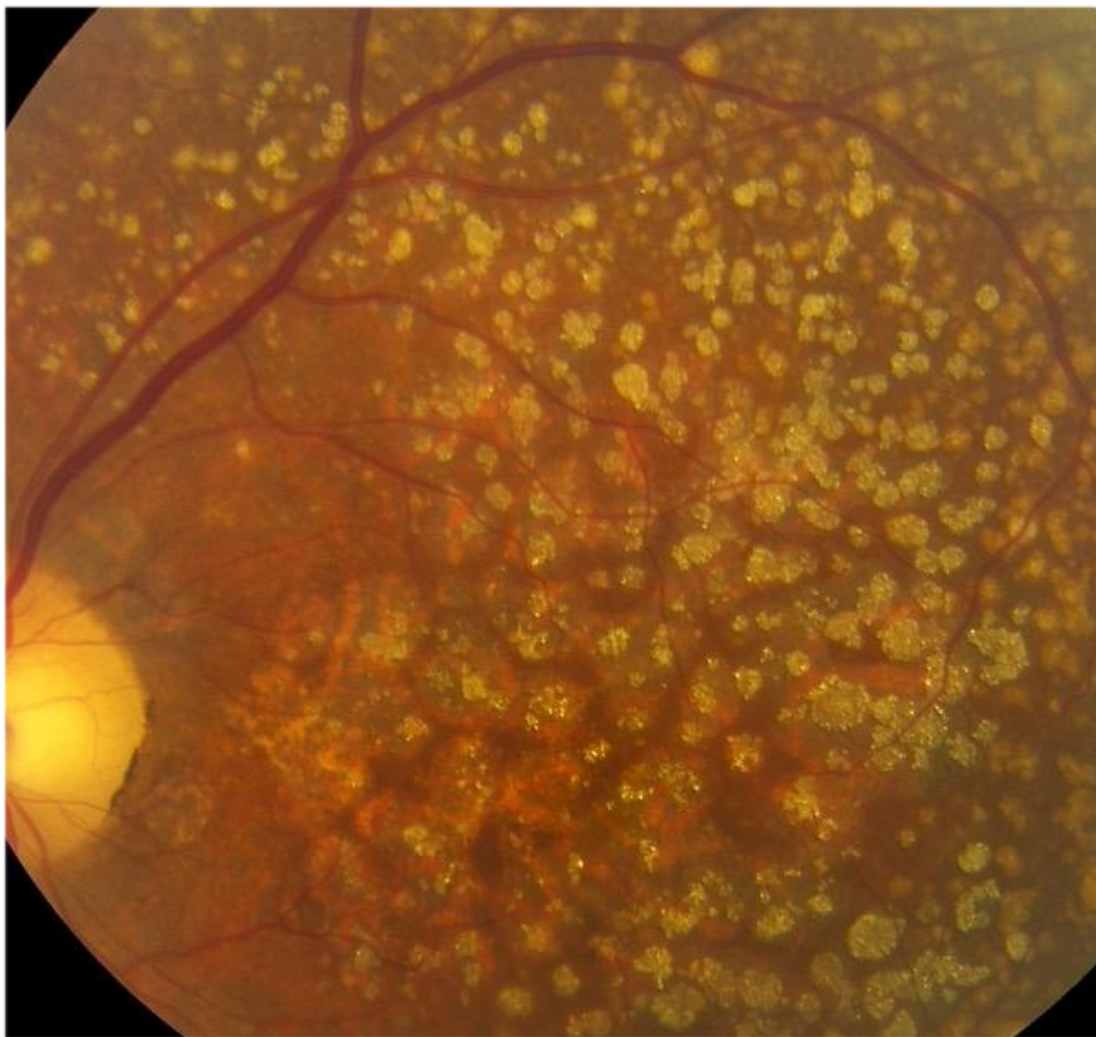
"his lips drink water
but his heart drinks wine"

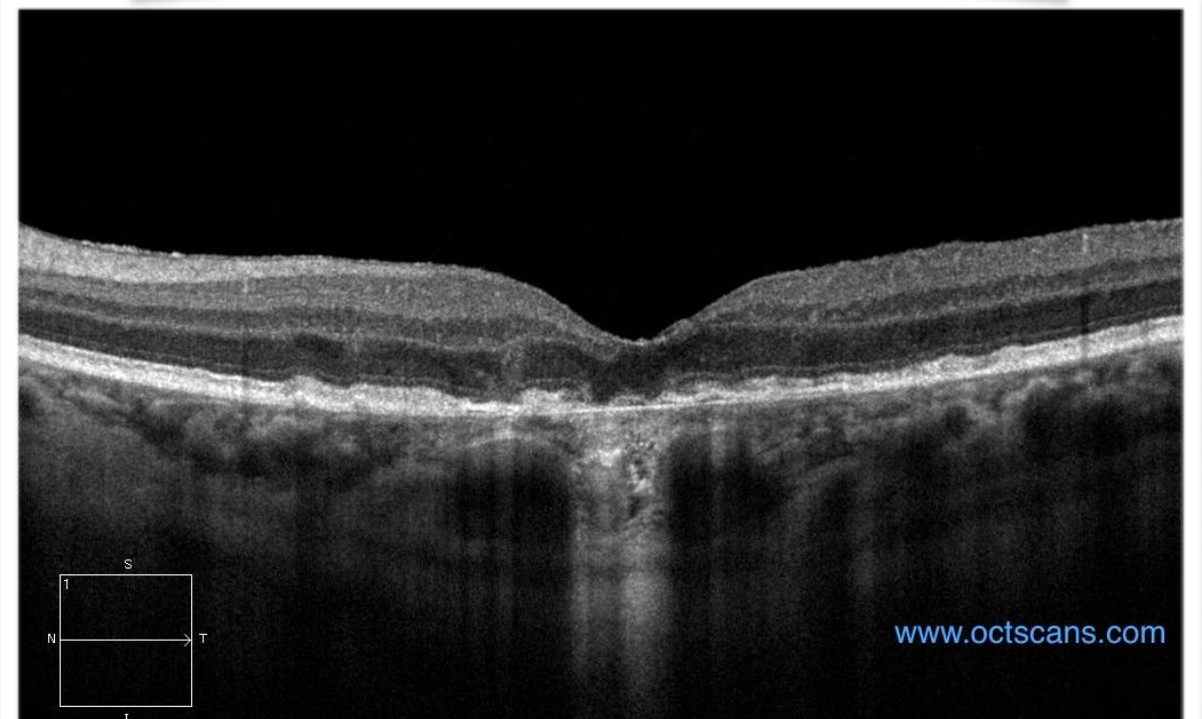
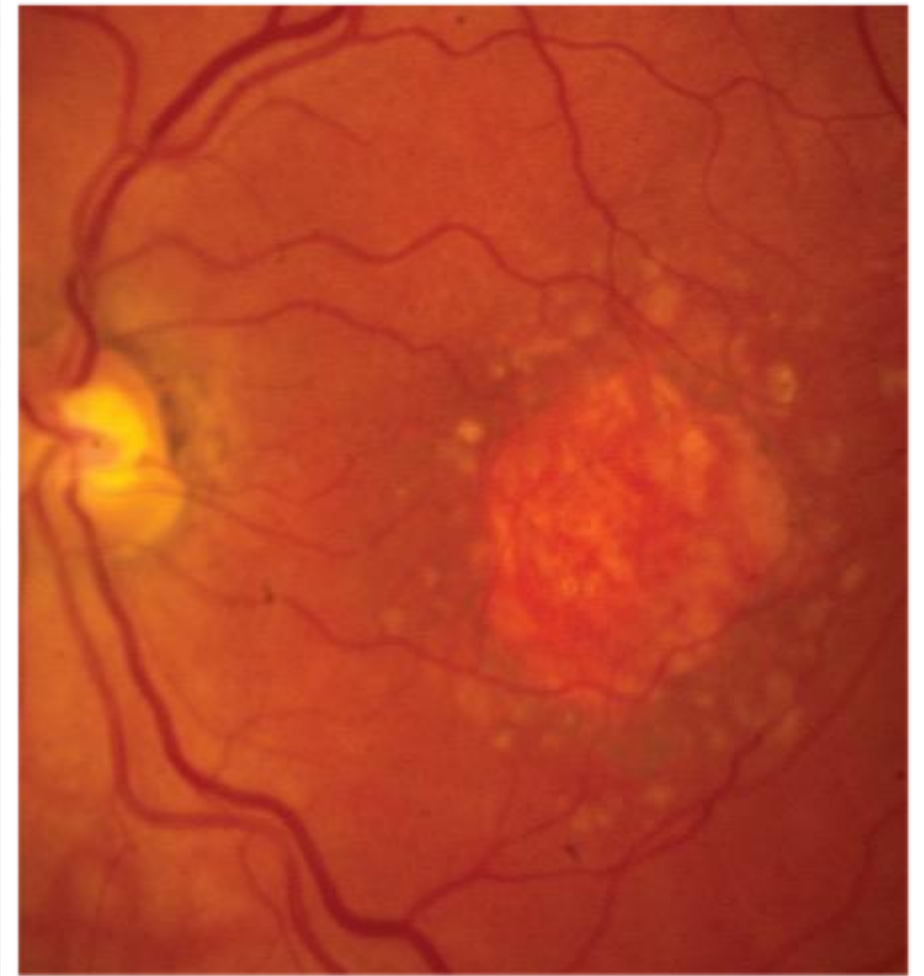
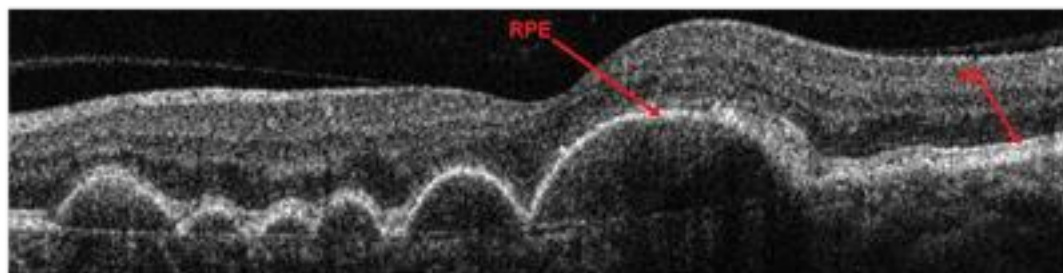
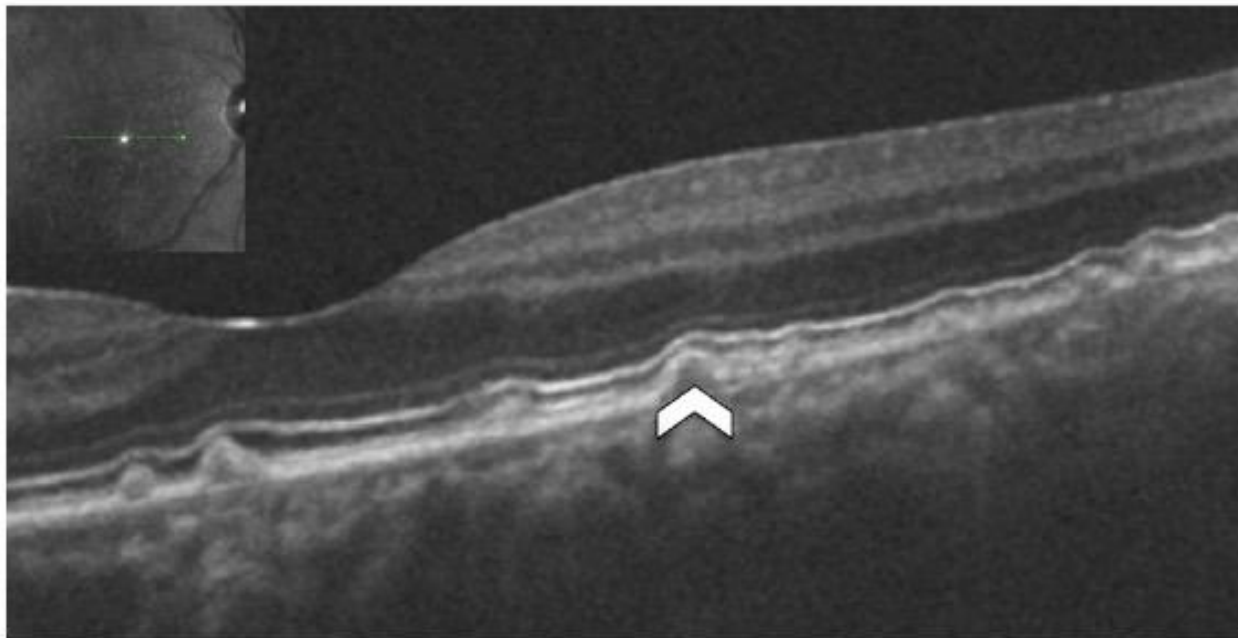
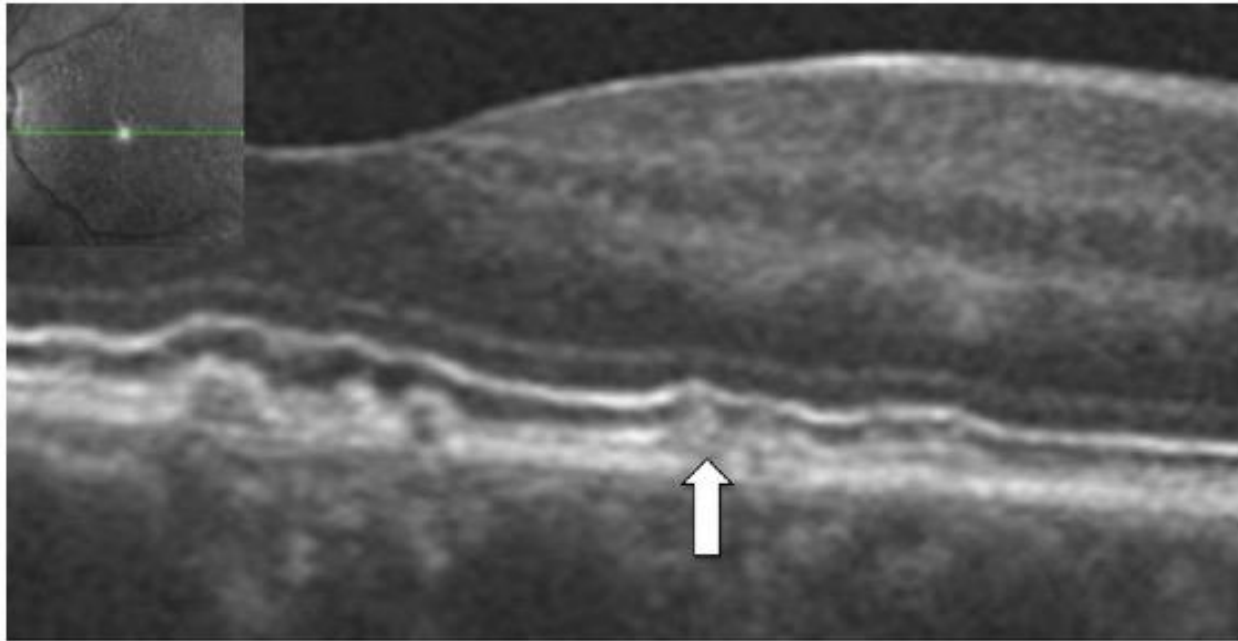
-e e cummings

Nonexudative (Dry) ARMD

❖ Presentation:

- ❖ gradual loss of central vision
- ❖ Amsler grid changes
- ❖ may be asymptomatic
- ❖ drusen, RPE clumping/atrophy
- ❖ GA
- ❖ bilateral (may be asymmetric)





❖ Differential diagnosis:

- ❖ peripheral drusen
- ❖ myopic degeneration (no drusen)
- ❖ resolved CSCR
- ❖ retinal dystrophies
- ❖ toxic retinopathies



❖ Management:

- ❖ AREDS2 vitamins
- ❖ Amsler grid monitoring
- ❖ low vision aids
- ❖ biannual examination (more frequently if monocular, unreliable, or confluent/extensive drusen)
- ❖ genetic testing (MaculaRisk, RetnaGene, etc.)
- ❖ implantable miniature telescope (IMT)

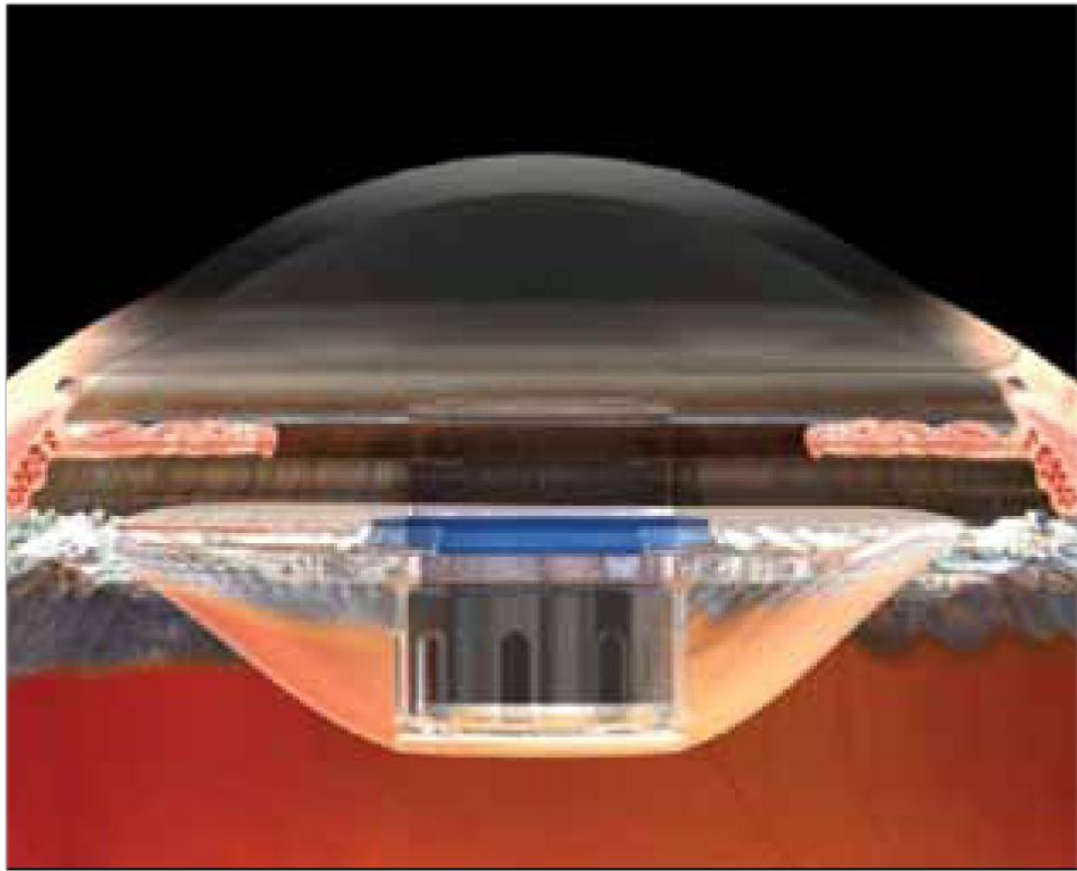
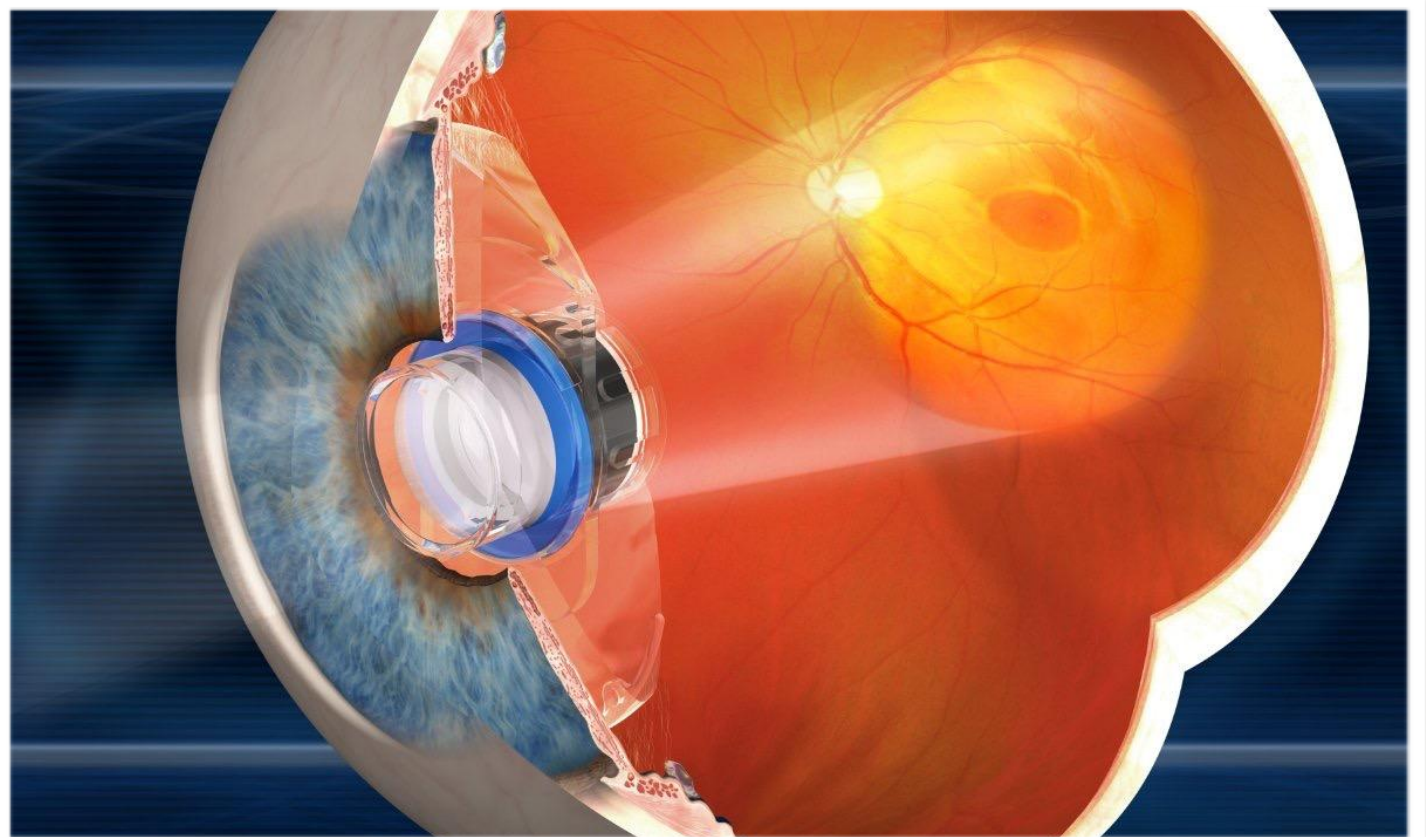
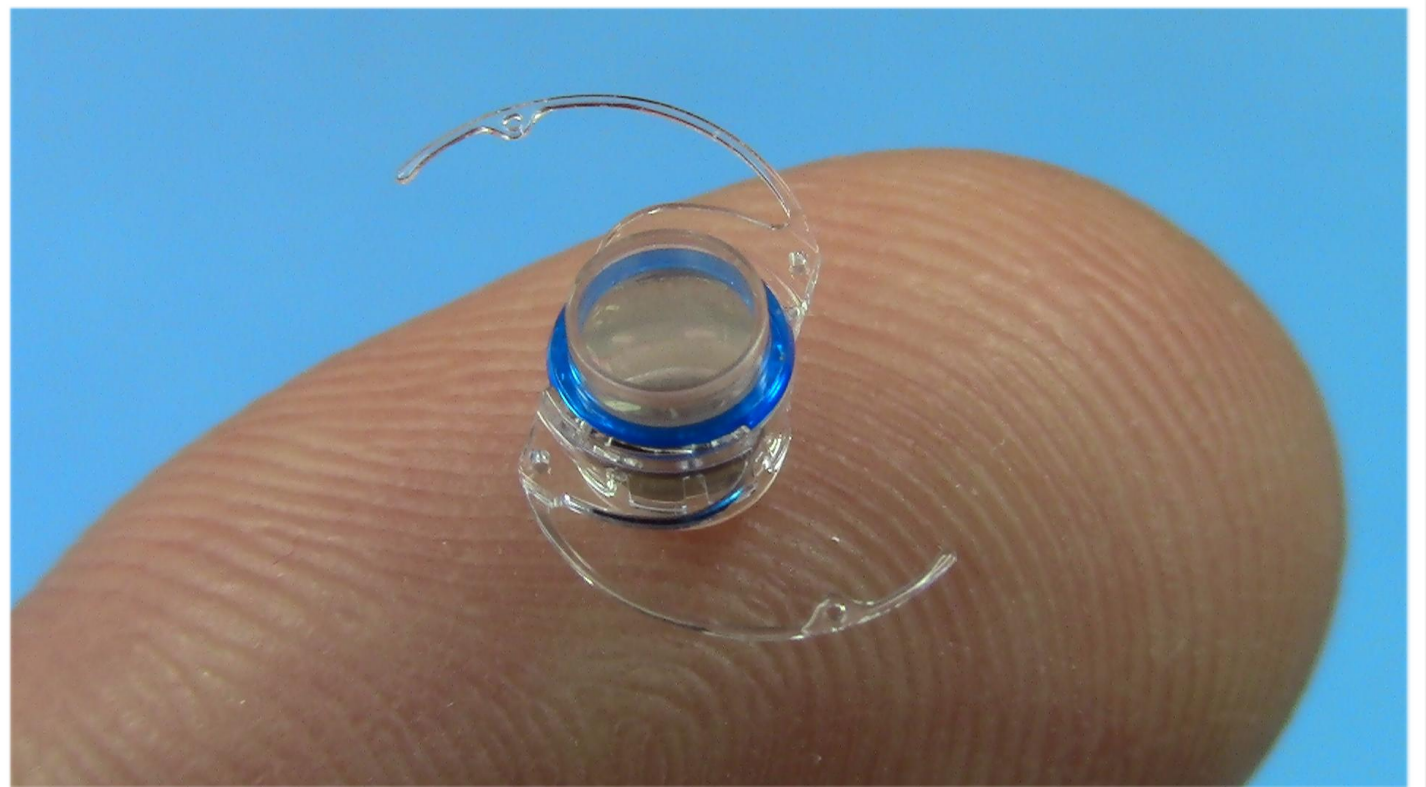
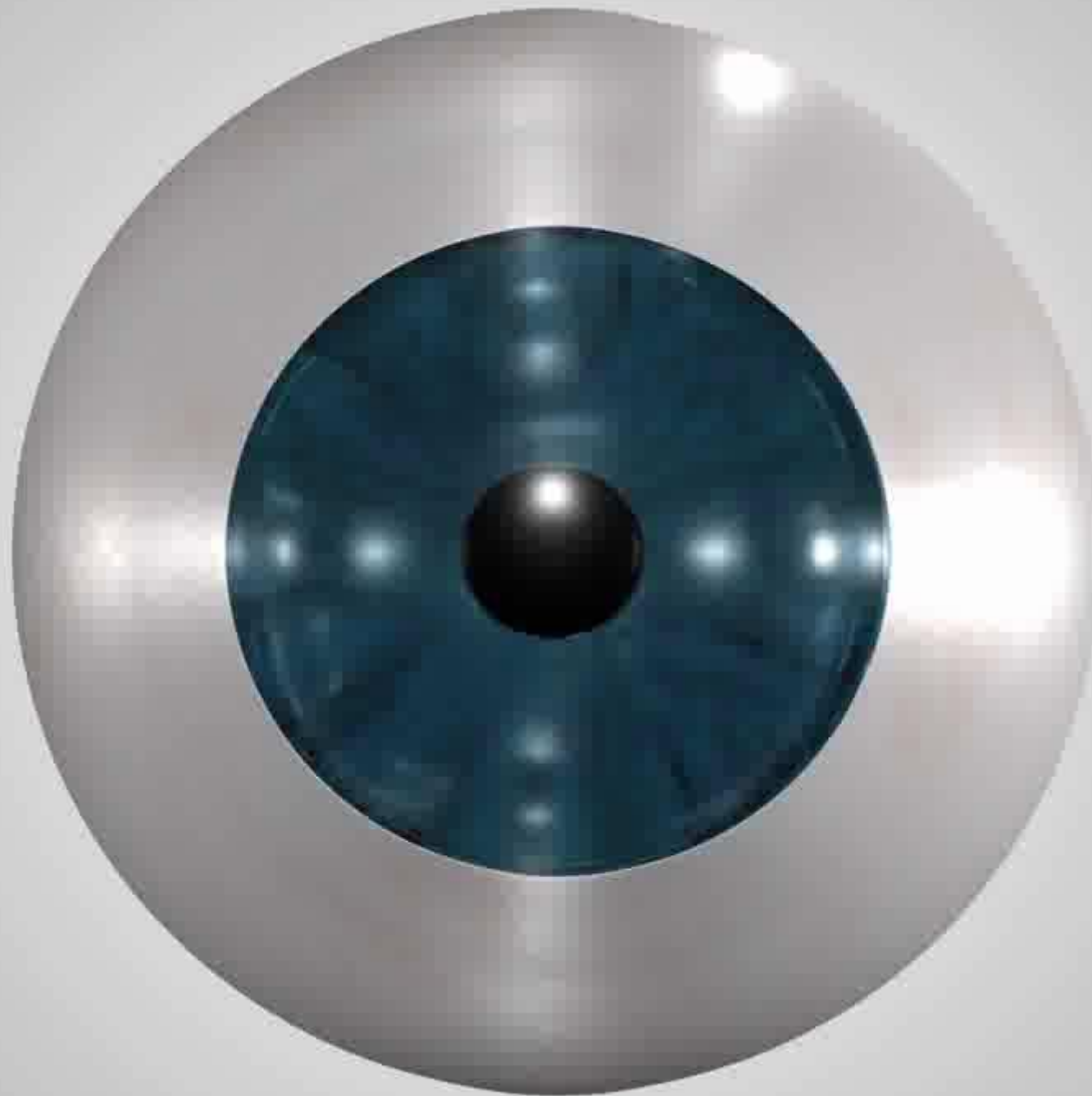


Figure 3. The IMT is implanted in place of the eye's lens to help improve vision.



Subretinal Stem Cell Delivery Surgery



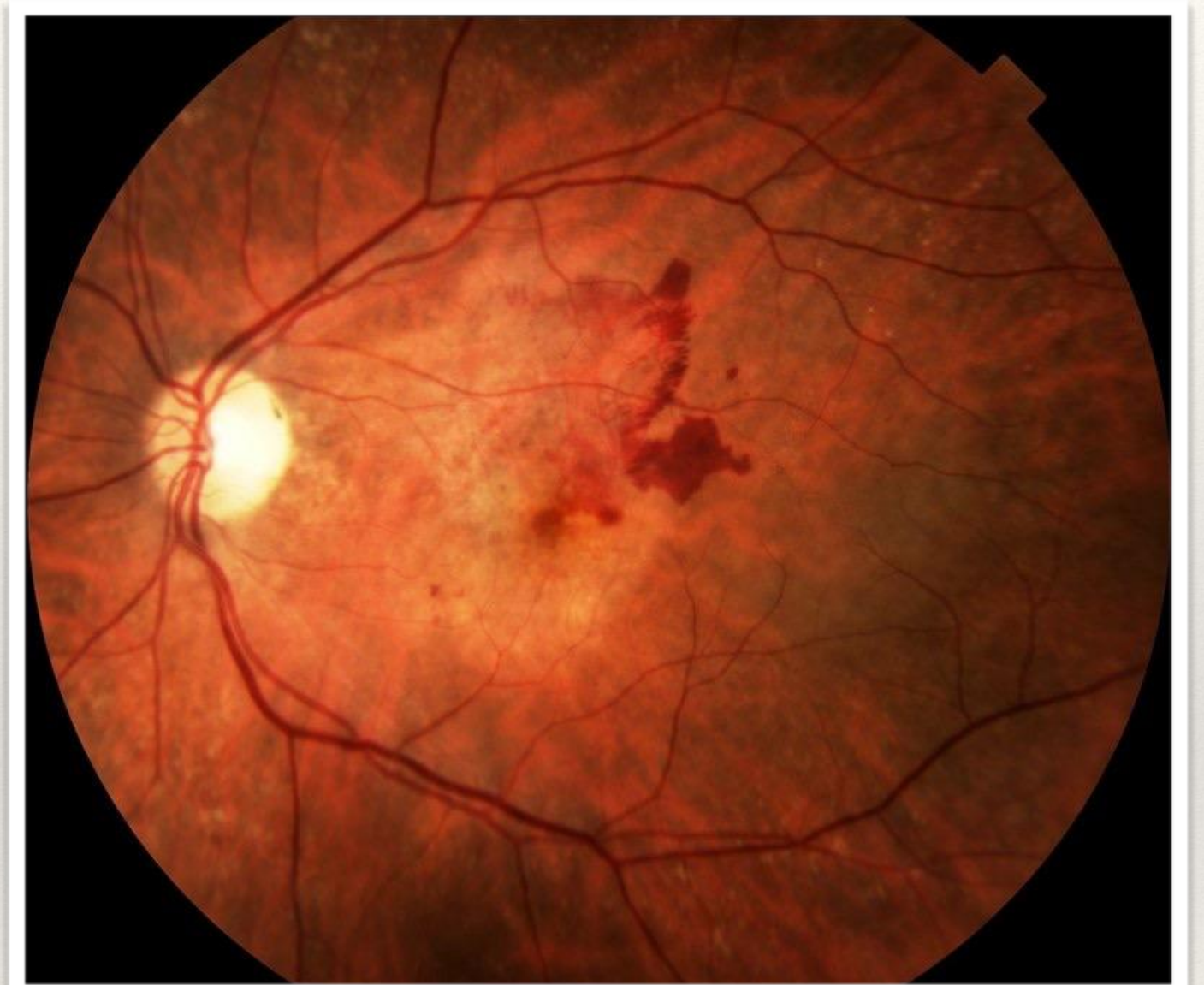
Exudative (Wet) ARMD

❖ Presentation:

- ❖ distortion
- ❖ rapid onset of visual loss
- ❖ central/paracentral blind spot
- ❖ drusen with CNVM (grayish/greenish membrane)
- ❖ RPE detachment
- ❖ hemorrhage (vitreous/retinal/subretinal)
- ❖ lipid exudate

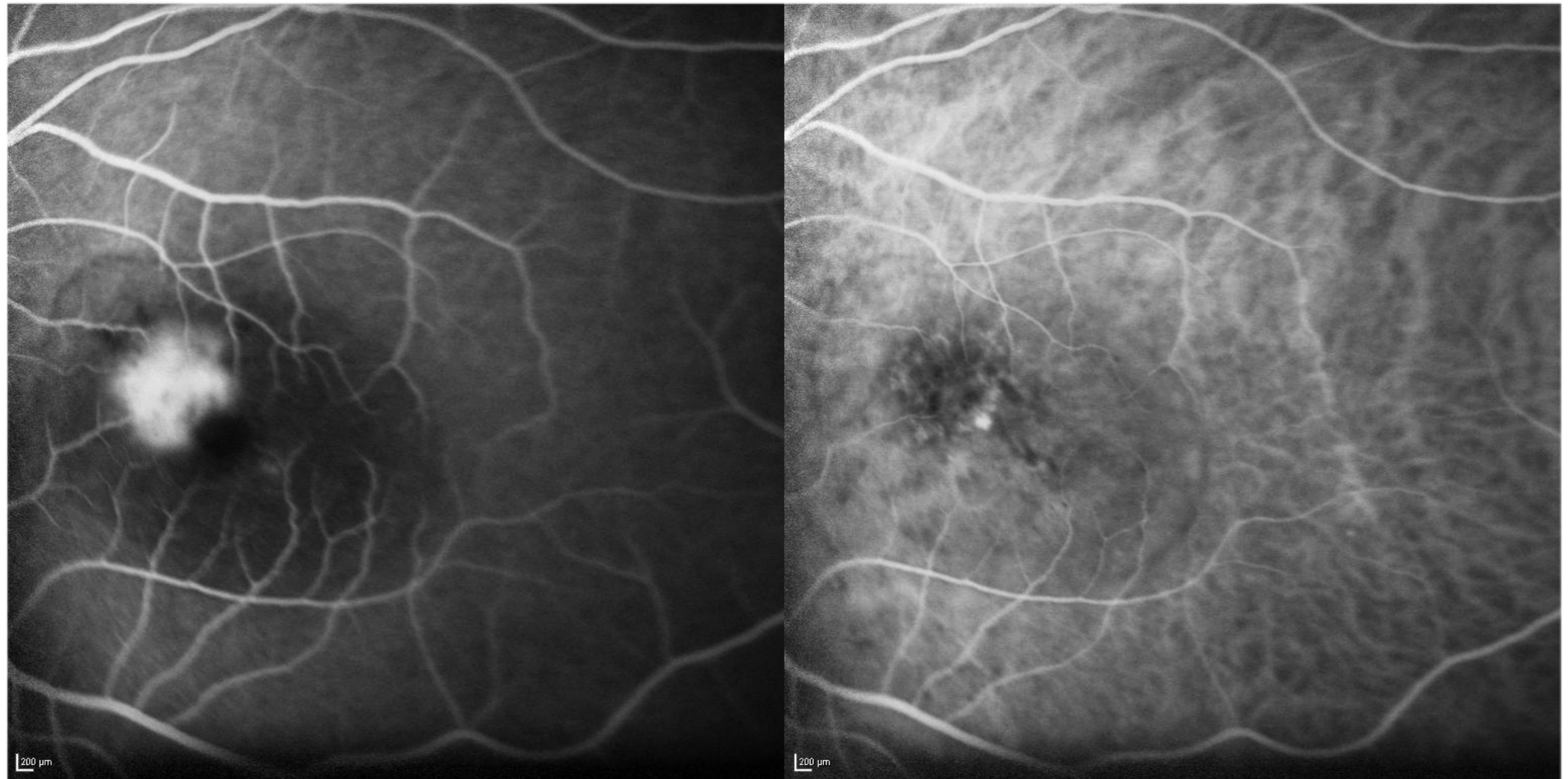
❖ Risk factors for loss of vision:

- ❖ age
- ❖ family history
- ❖ soft drusen
- ❖ focal pigment clumping
- ❖ RPE detachments
- ❖ smoking
- ❖ HTN
- ❖ obesity
- ❖ high cholesterol





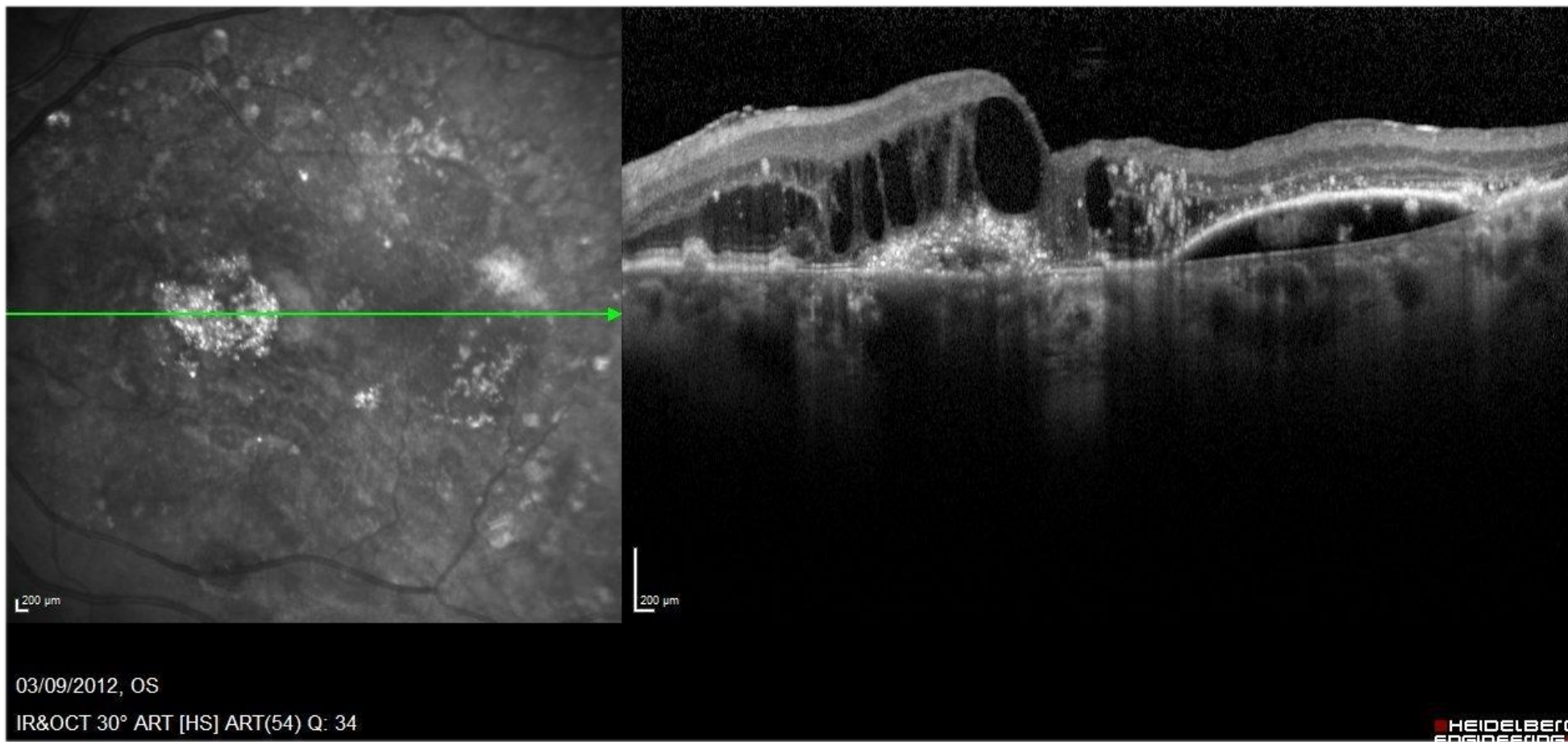
FA/ICG



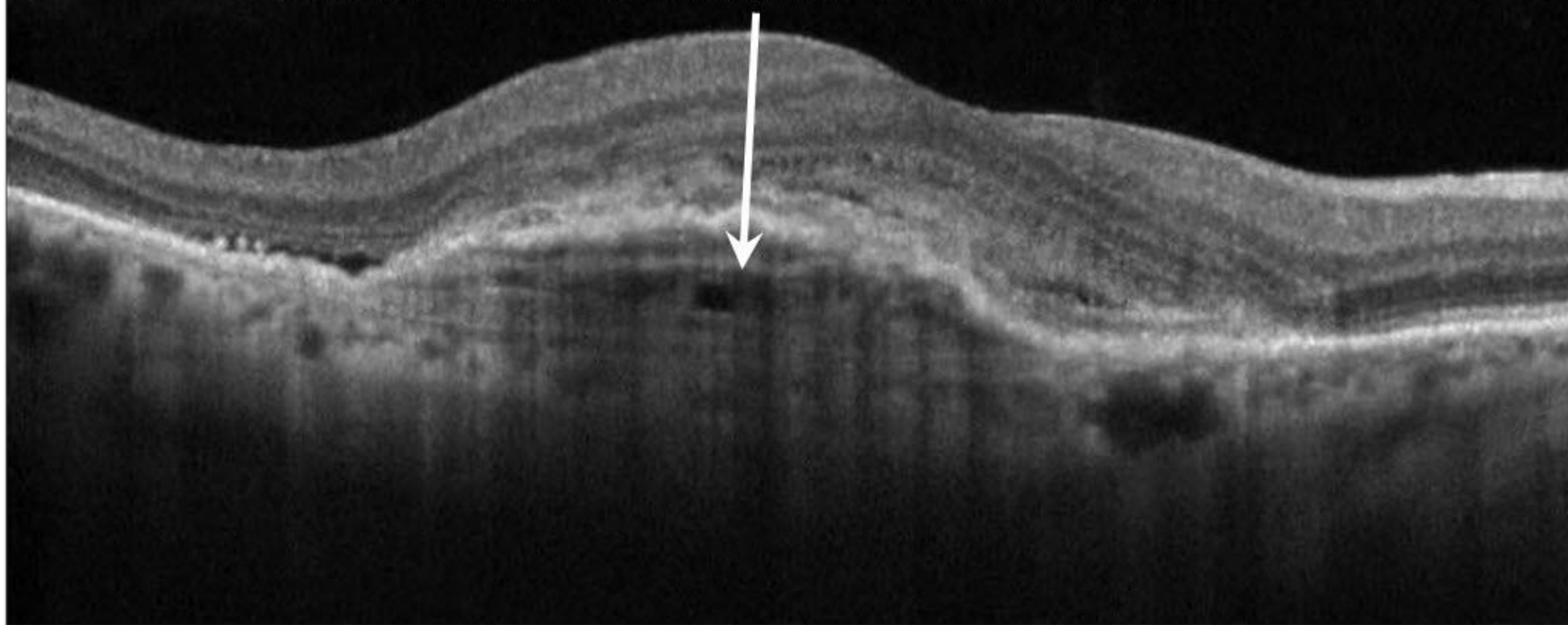
2/22/2011, OS

FA&ICGA 3:41.17 30° ART(12) 3:41.10 30° ART(12)

HEIDELBERG
RESEARCH



**Wet AMD, note elevation of retina and
abnormal membrane under retina**



❖ Differential diagnosis:

- ❖ any condition associated with CNV

- ❖ POHS

- ❖ angioid streaks

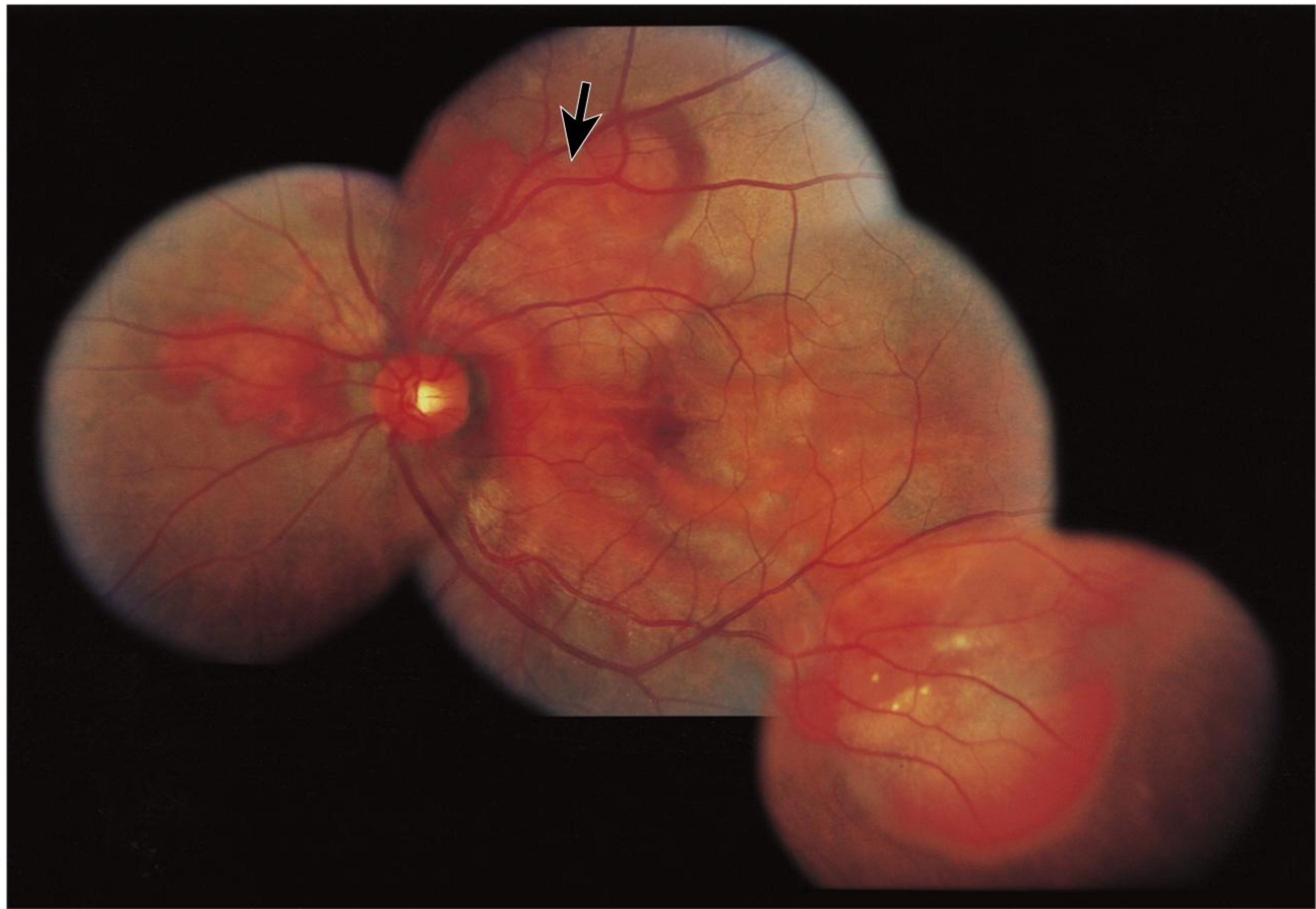
- ❖ high myopia

- ❖ PCV

- ❖ traumatic choroidal rupture

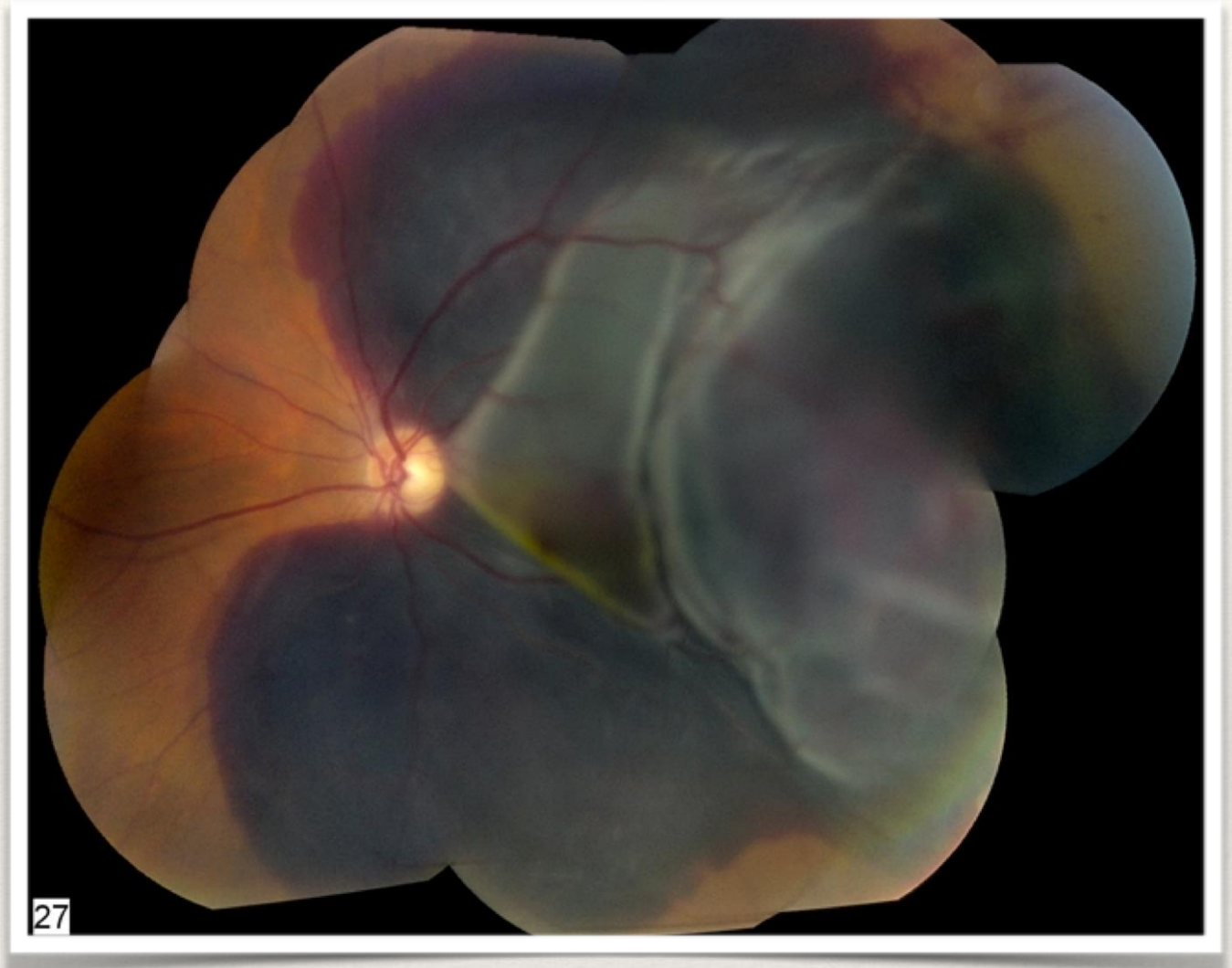
- ❖ idiopathic

- ❖ tumors, laser scars, ONH drusen, others



❖ Management:

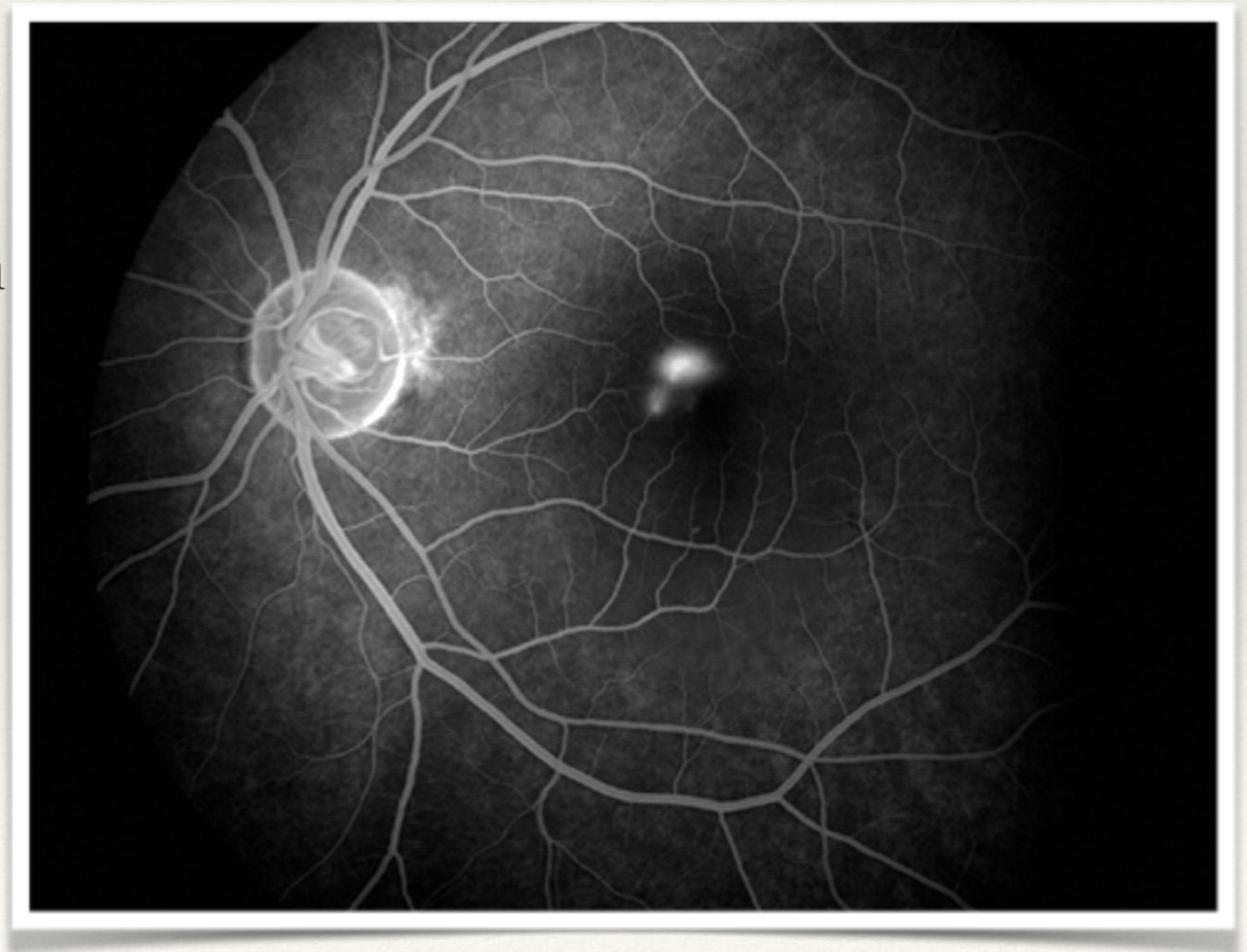
- ❖ anti-VEGF agents
 - ❖ bevacizumab (Avastin)
 - ❖ ranibizumab (Lucentis)
 - ❖ aflibercept (Eylea)
- ❖ PDT (“cold” laser)
- ❖ “hot” laser
- ❖ observation
- ❖ surgery for severe submacular hemorrhage

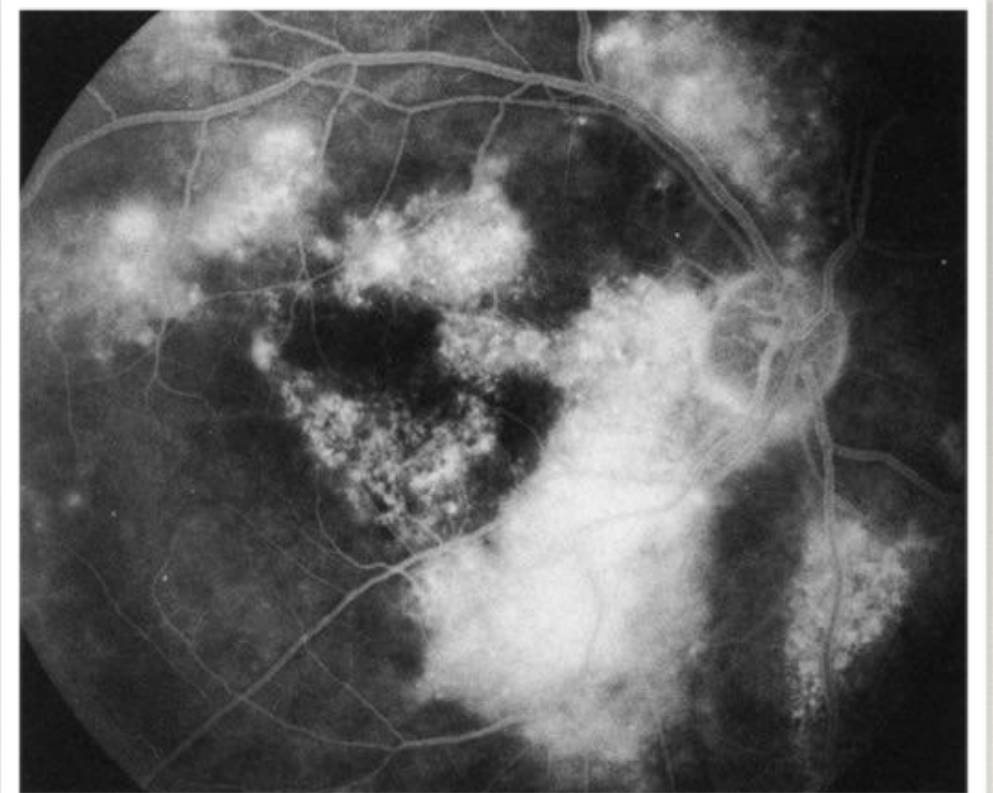
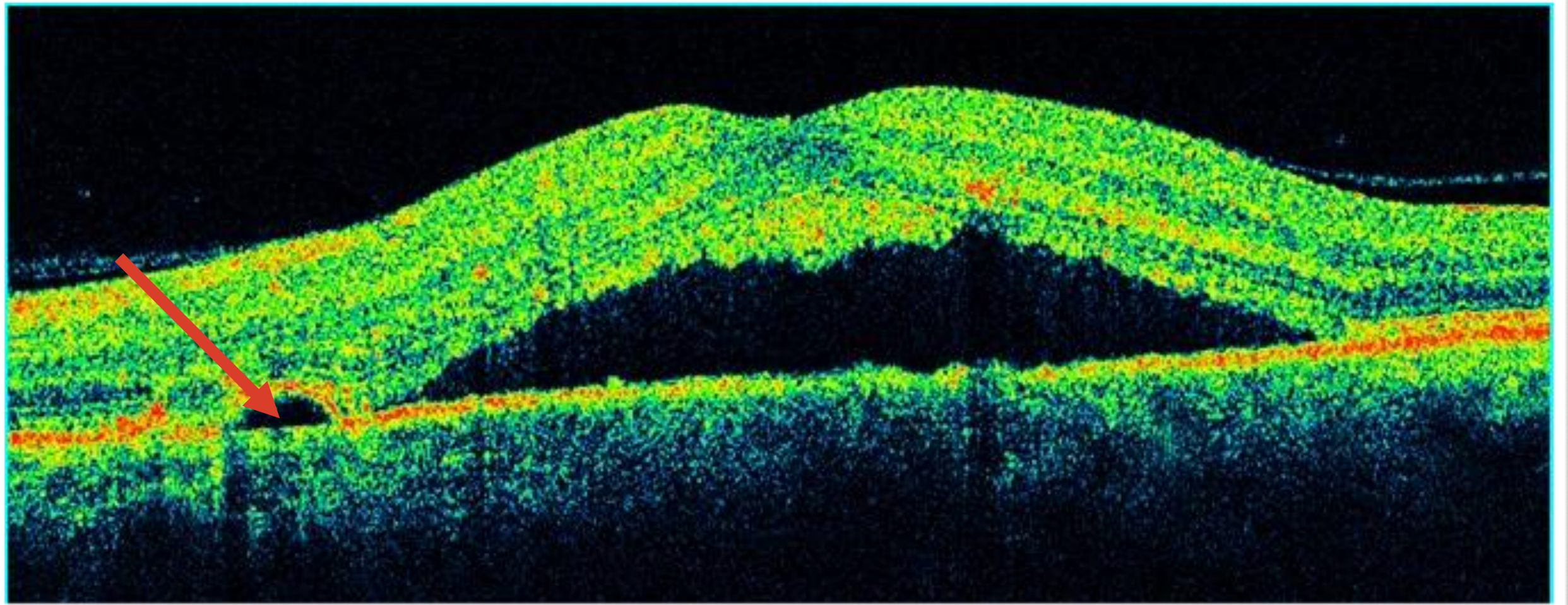


Central Serous Retinopathy

❖ Presentation:

- ❖ unilateral blurred/dim vision
- ❖ distortion
- ❖ micropsia
- ❖ “washed out” color vision
- ❖ central scotoma
- ❖ men > women
- ❖ 25–50 yrs.





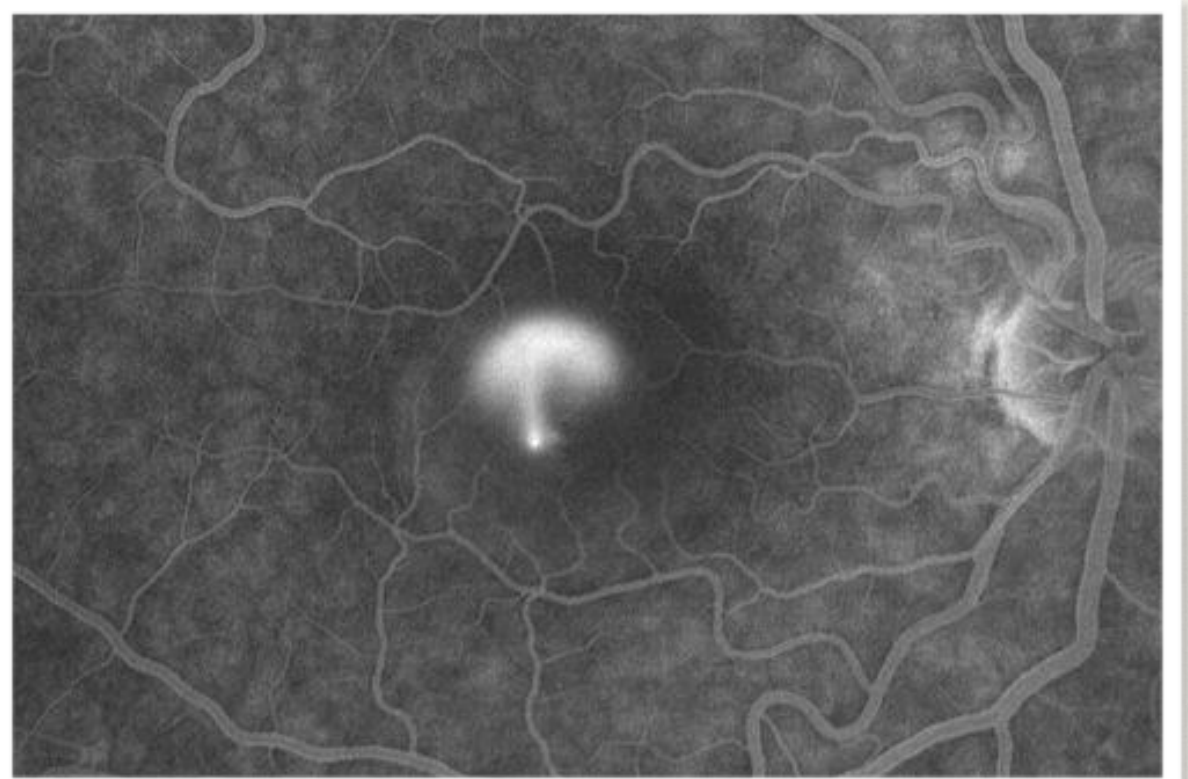
❖ Differential diagnosis:

- ❖ ARMD
- ❖ optic pit
- ❖ RRD
- ❖ choroidal tumor
- ❖ PED



❖ Management:

- ❖ ask about steroids (oral, skin creams, nasal sprays, etc.)
- ❖ in severe bilateral disease of increased cortisol
- ❖ observation
- ❖ intervention:
 - ❖ focal laser
 - ❖ reduced-fluence PDT
 - ❖ oral anti-aldosterone agents (epleronone, spironolactone, others)



“It is much more important to know what sort of a patient has a disease than what sort of a disease a patient has.”

-William Osler



Thank you!