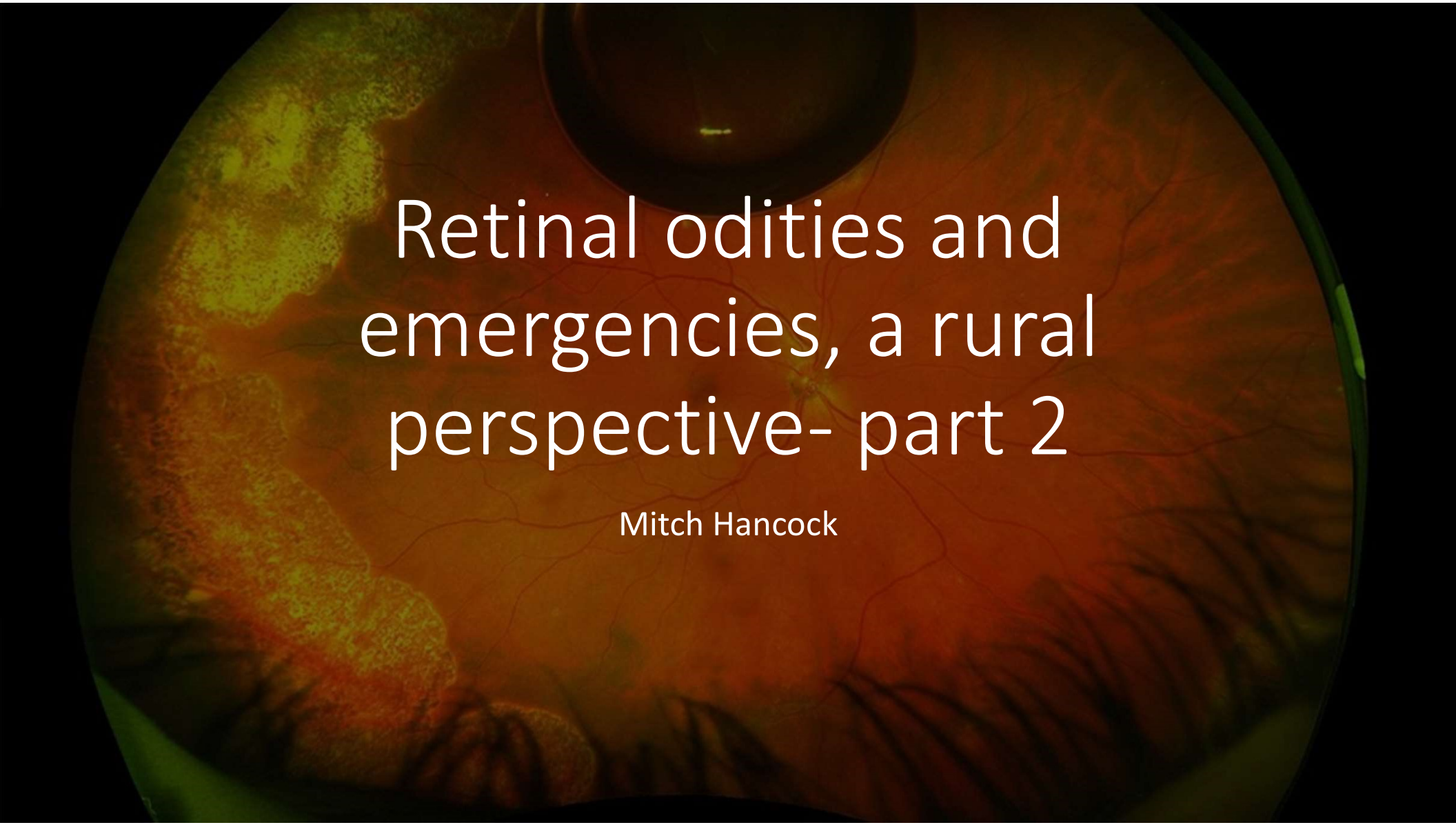


Retinal odities and emergencies, a rural perspective- part 2

Mitch Hancock

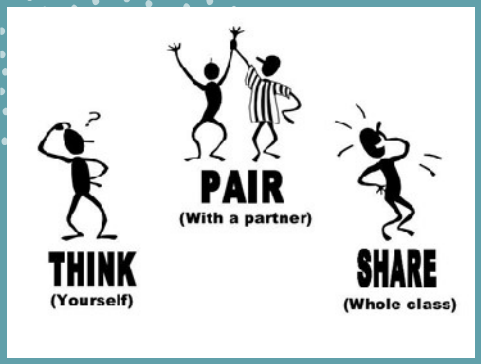
Quiz Which of the following is a <u>false</u> statement regarding peripheral retinal neovascularisation?

1/ It is also known as Eccentric disciform degeneration

2/ It is amenable to Ranibizumab injections

3/ 50% of patients with peripheral retinal neovascularisation also have macular degeneration

4/ It is similar to dry macular degeneration ✓



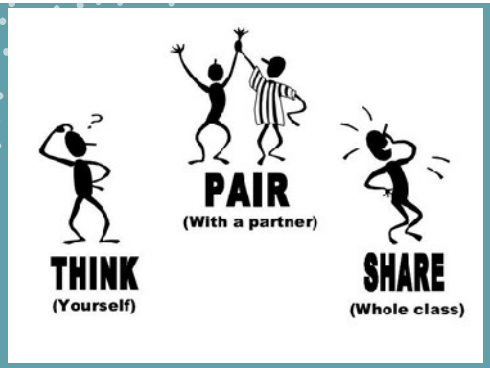
Quiz Which of the following patients needs an urgent referral?

1 asymptomatic high myope with retinal hole with operculum and prior PVD

2 68 yo low hyperope with a temporal horse shoe tear with pigmented posterior edge and no obvious subretinal fluid

3 Low myope with vitreal haze following blunt trauma and occasional flashes

4 High myope with peripheral lattice degeneration, no PVD, good vision and asymptomatic



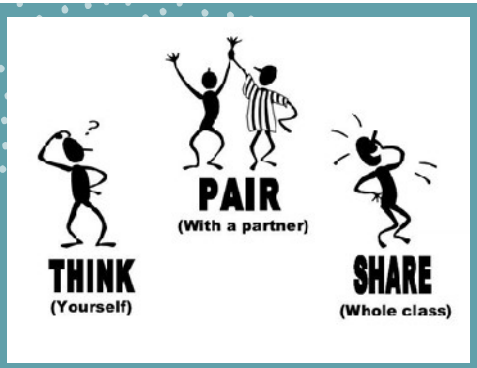
Quiz Which of the following is less of a risk factor for retinal detatchment

a/ Trauma

b/ female

c/ prior cataract surgery

d/ vitreal haemorrhage



Quiz Which of the following are possible sequalae following RD Sx

a/ Diplopia

b/ High IOP

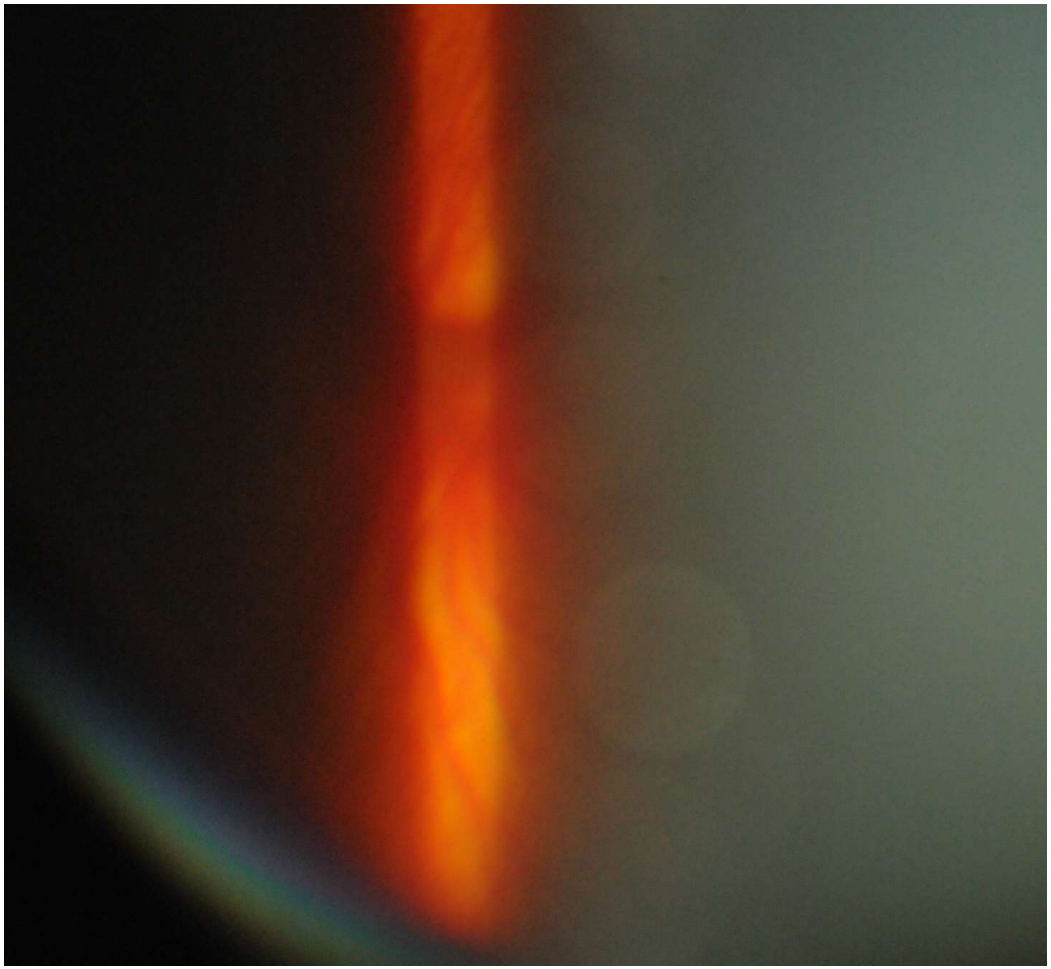
c/ Increased glare intolerance

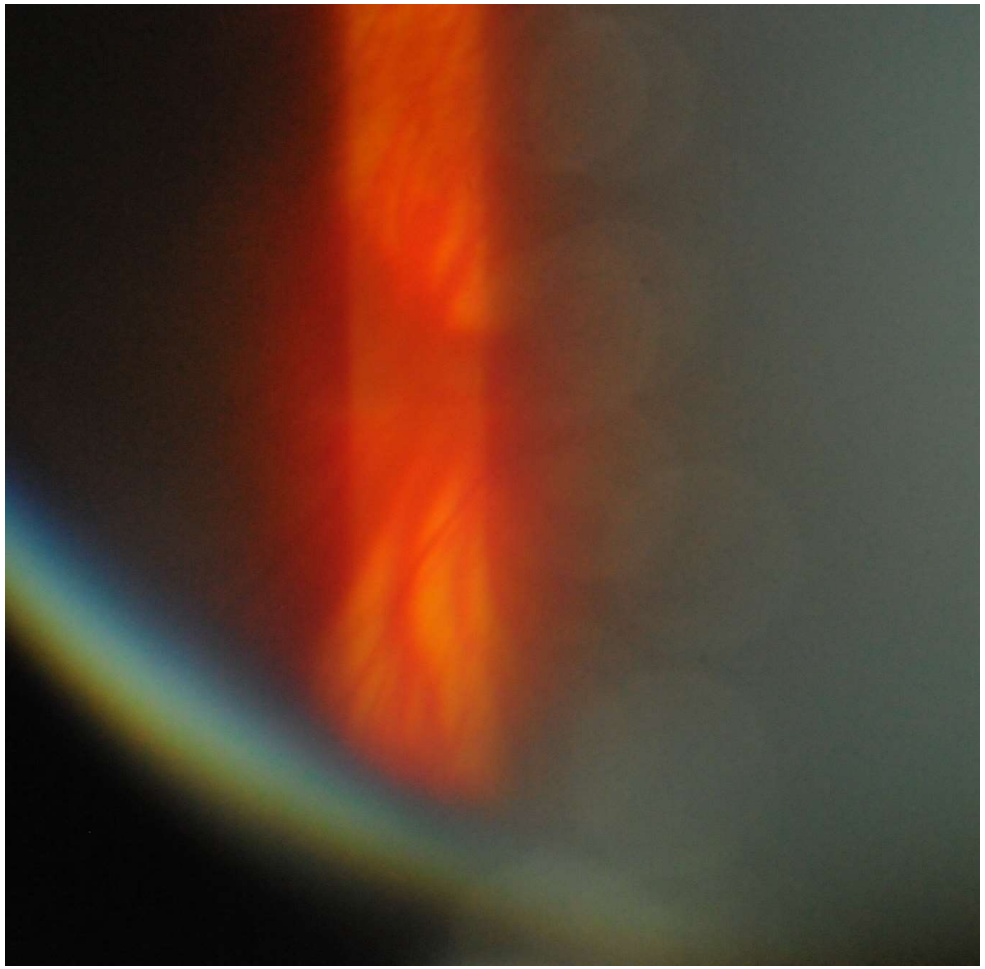
d/ Haloes

e/ Cataracts

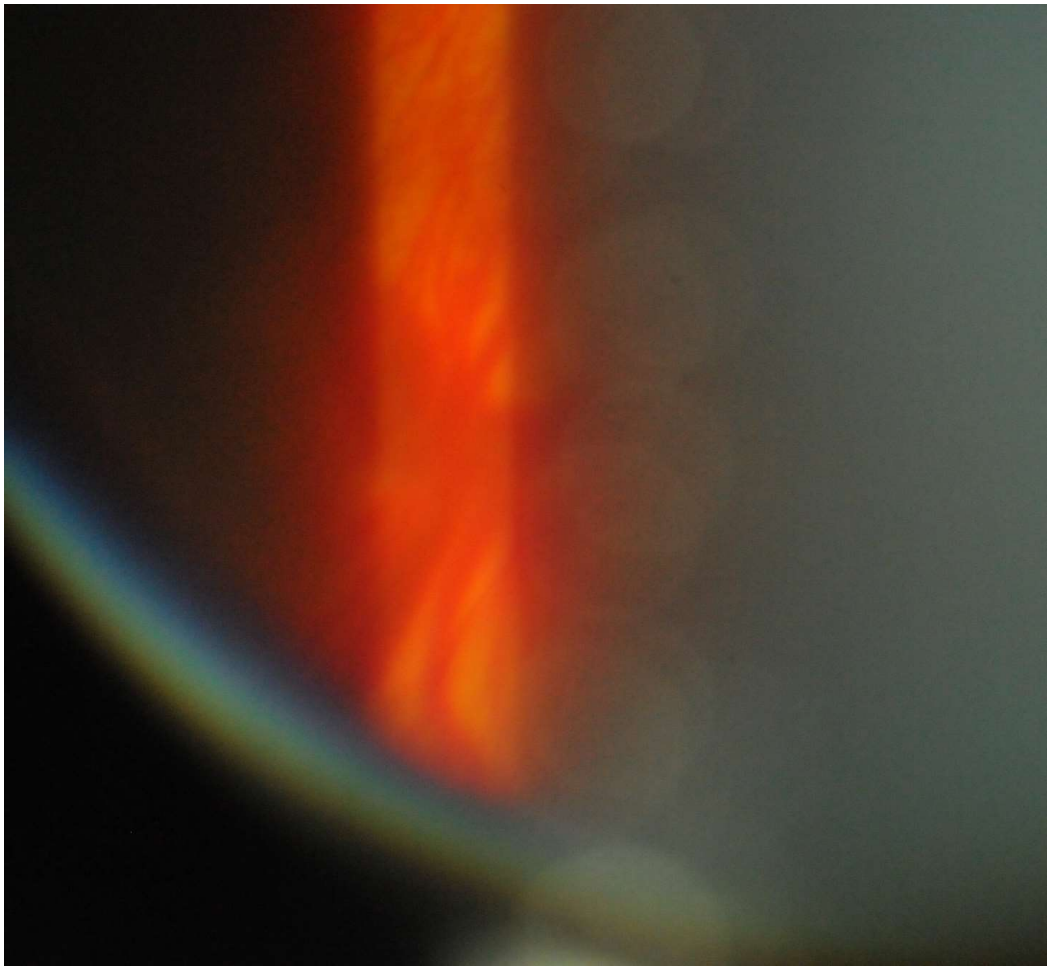
f/ all of the above

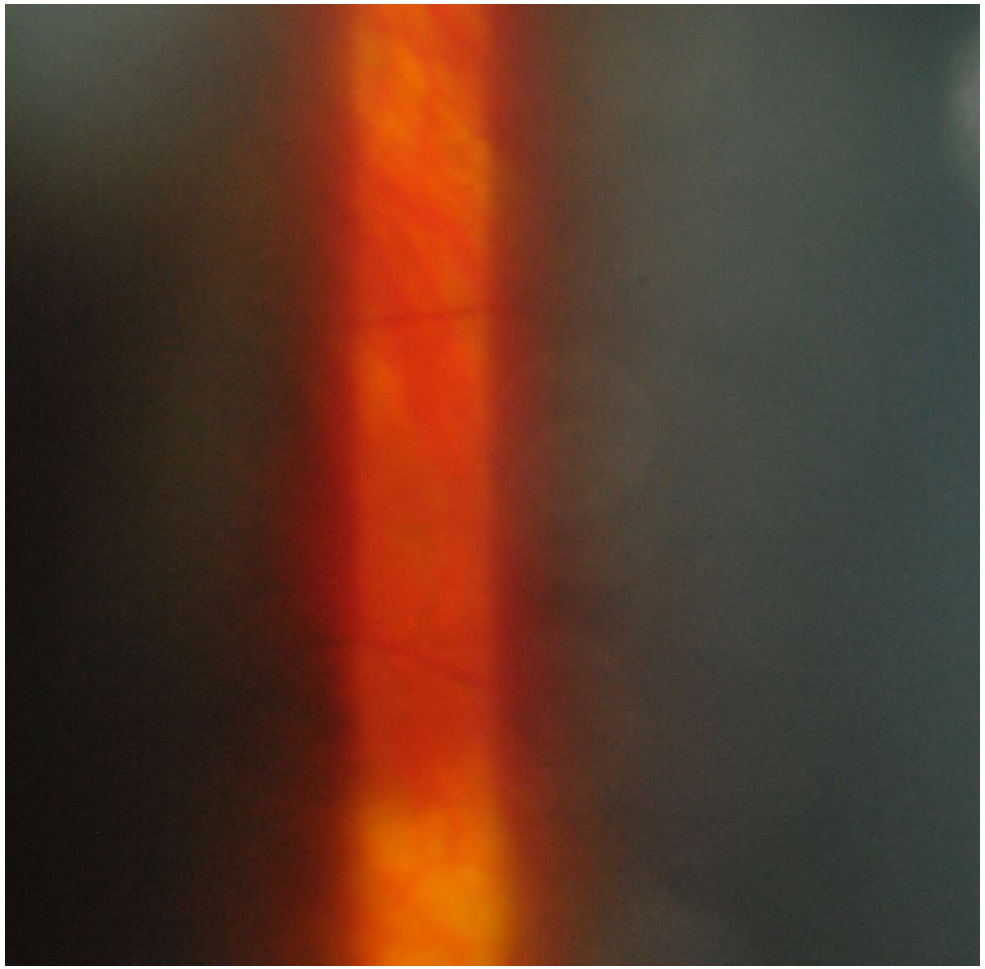
So what is this?

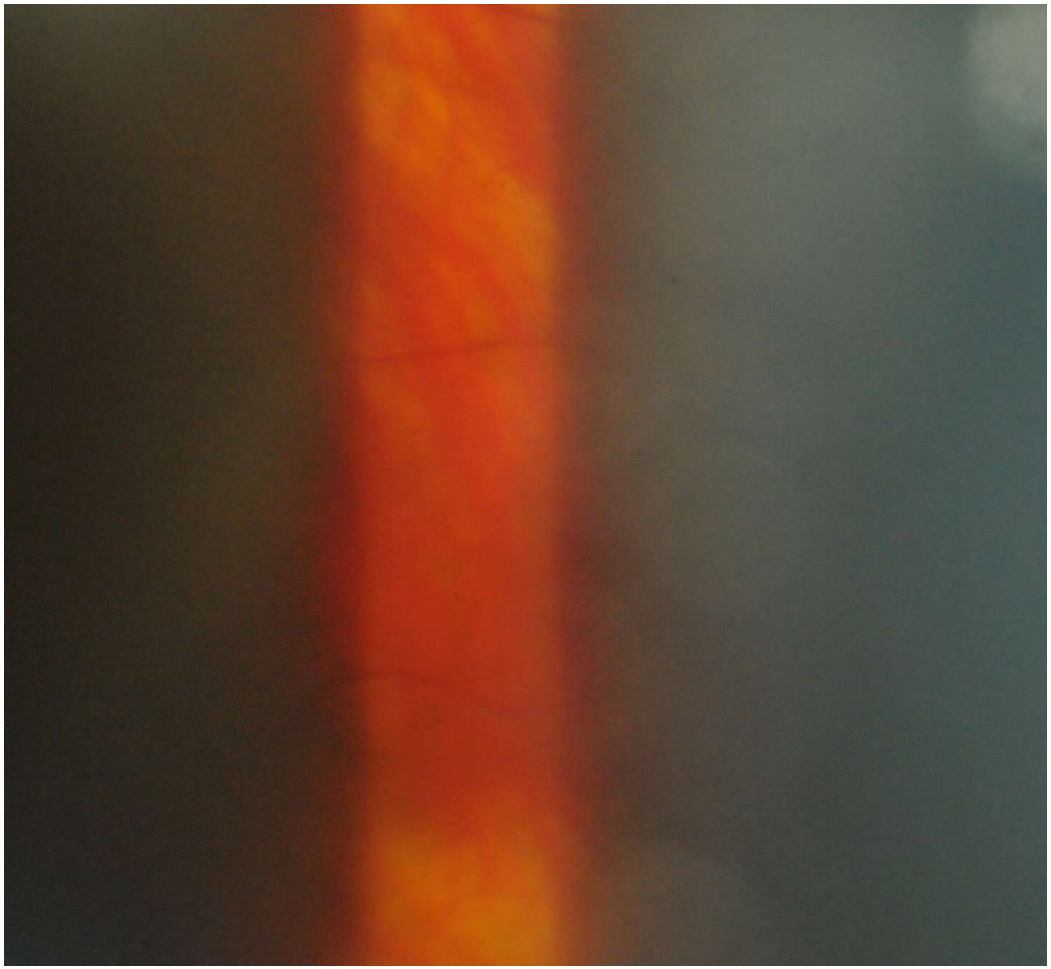


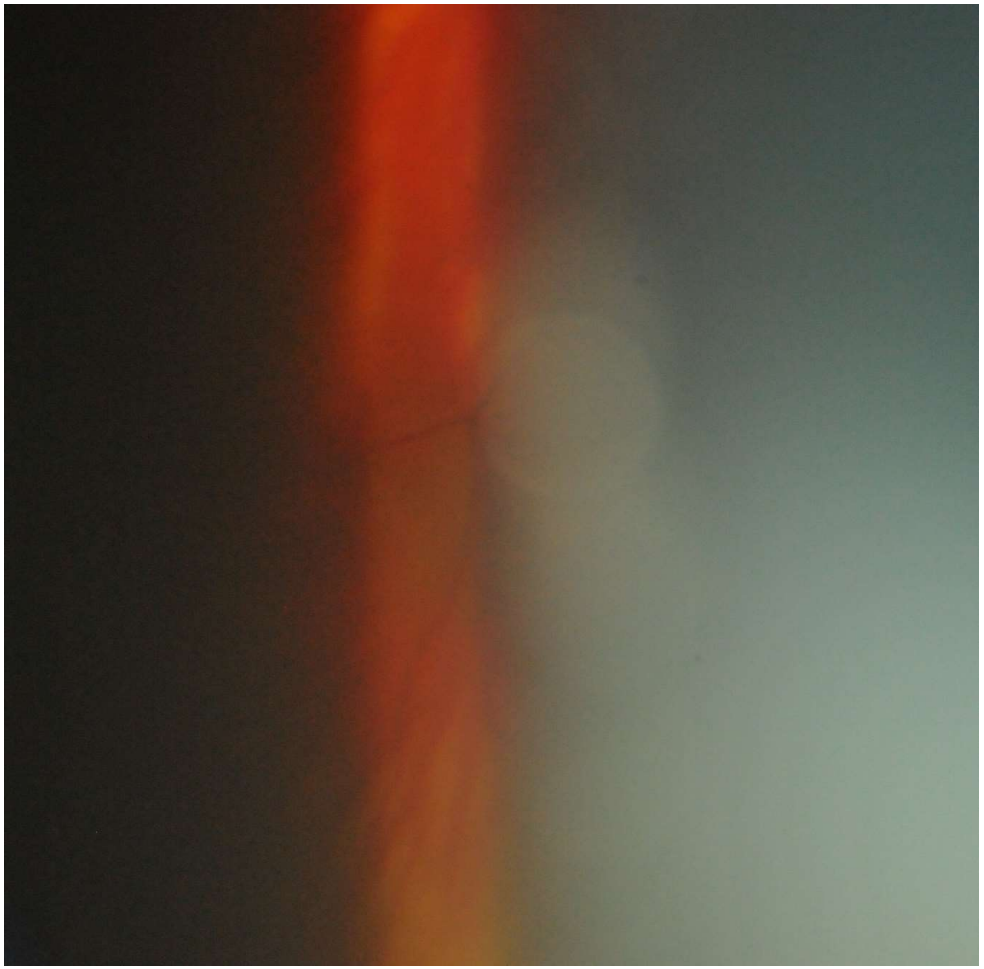


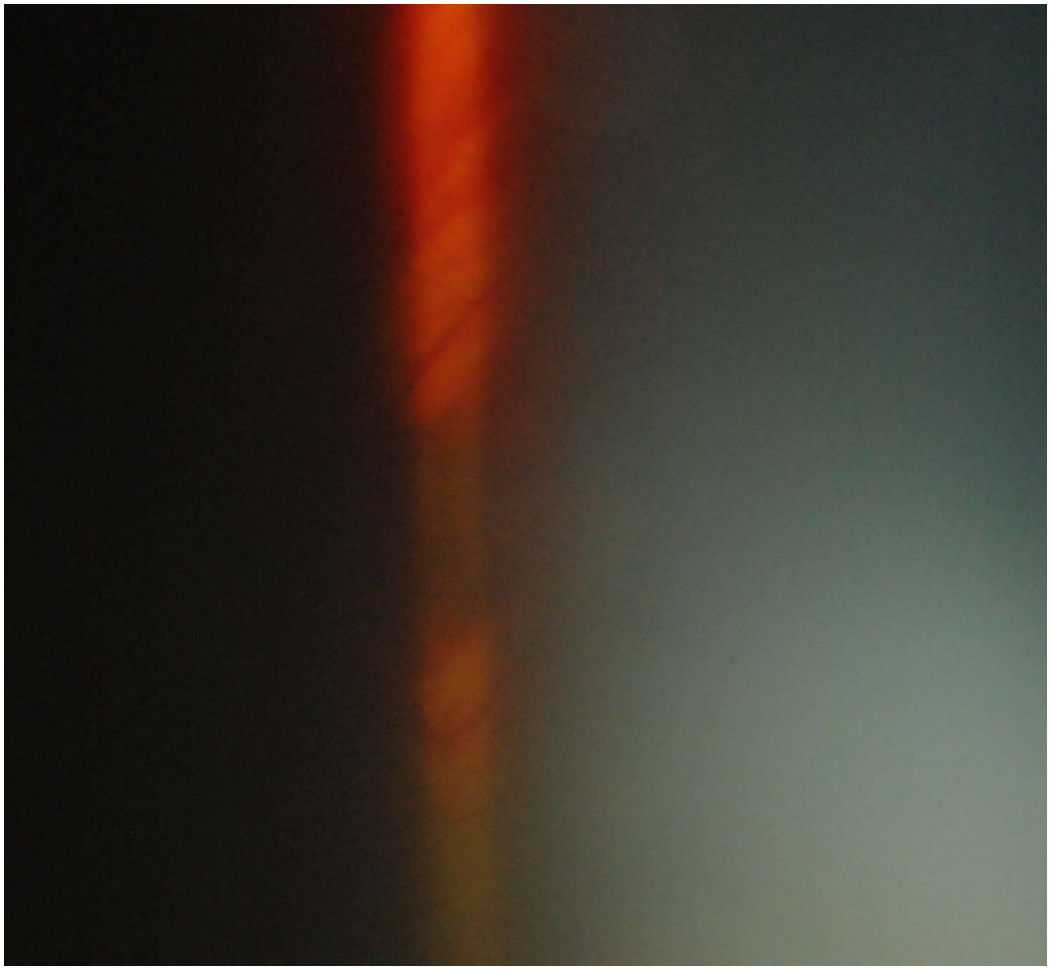
So what is this?

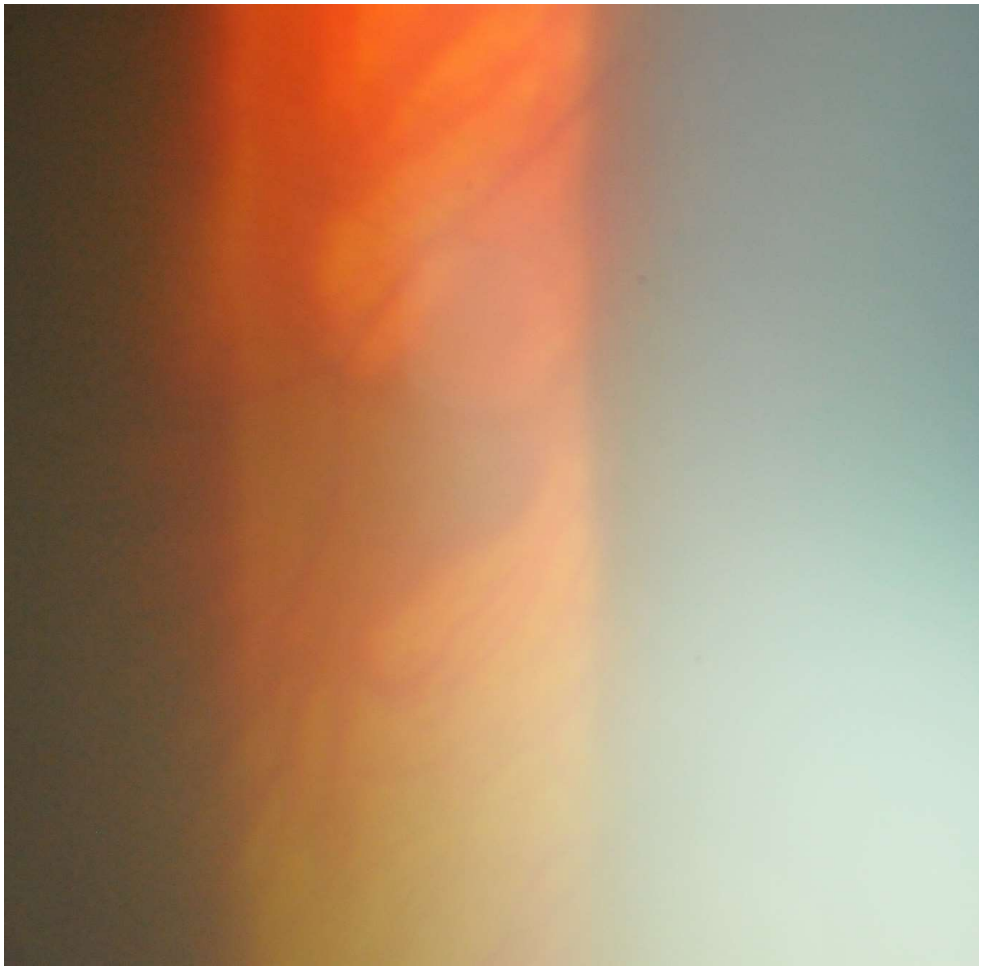


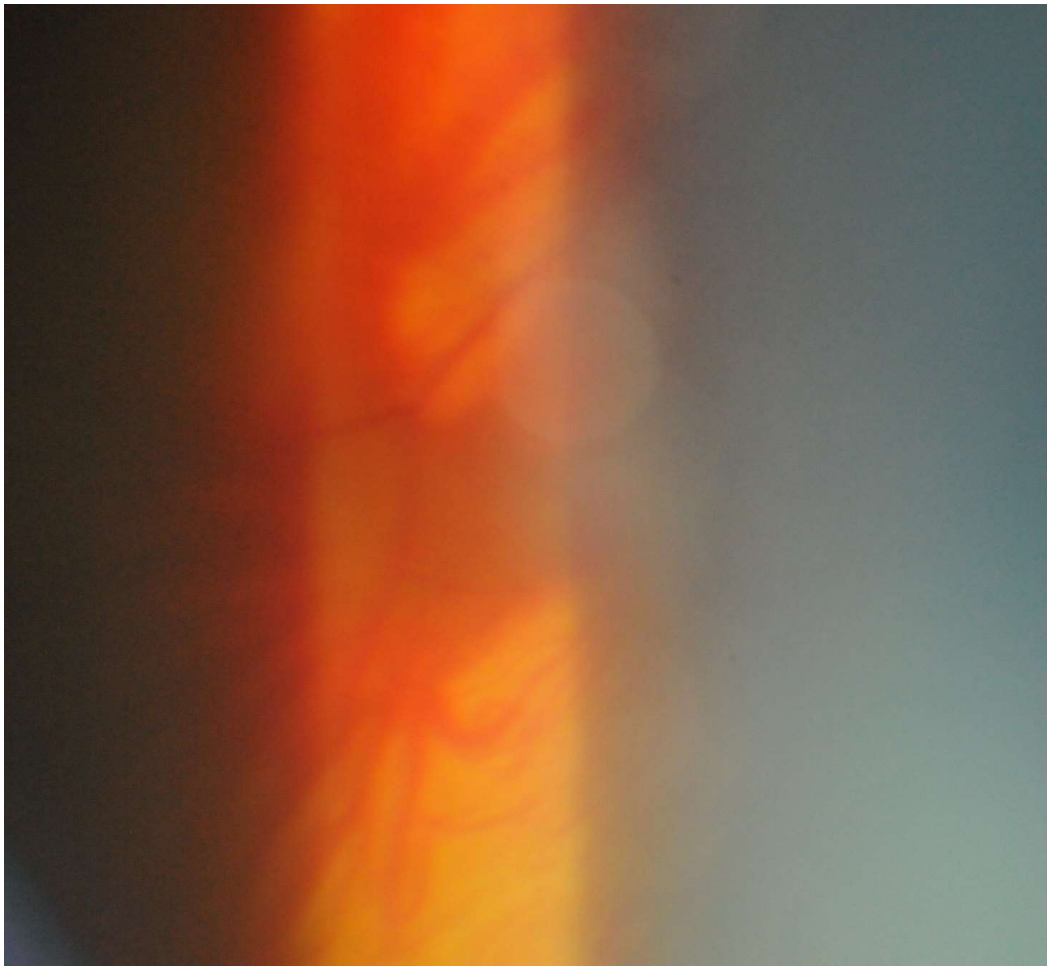


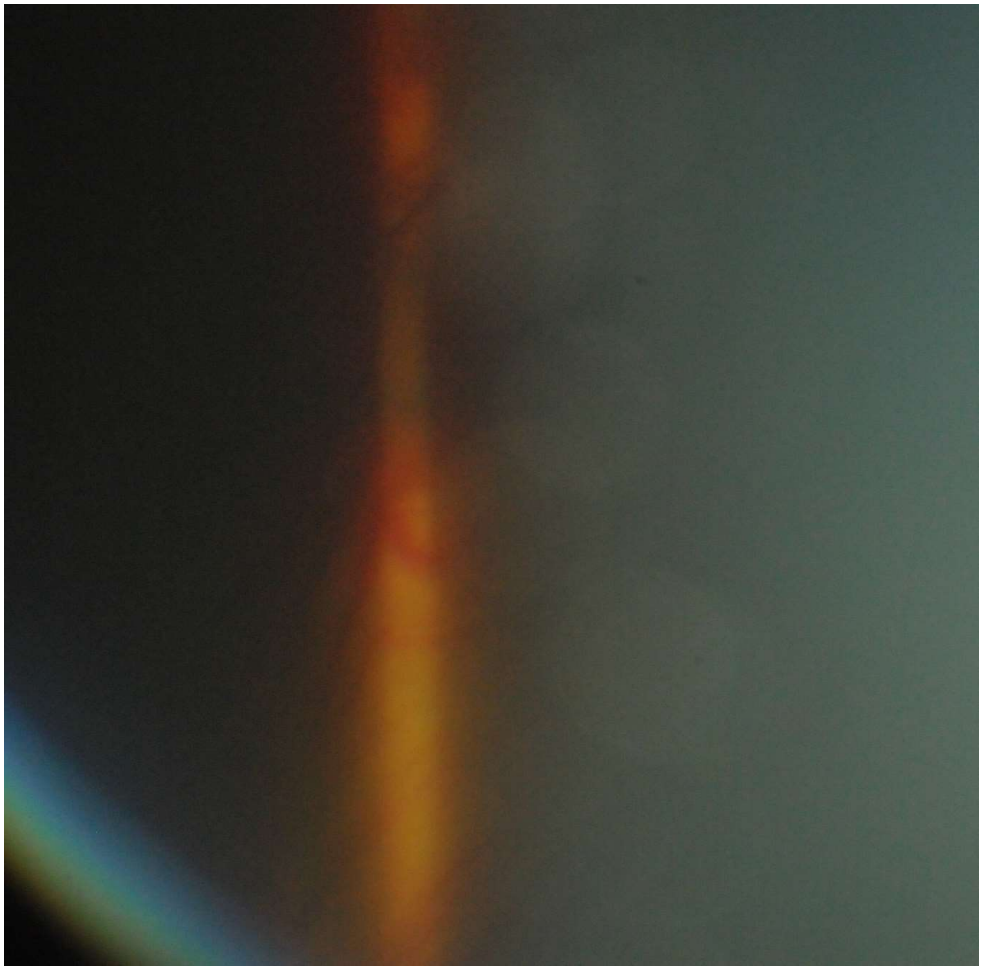




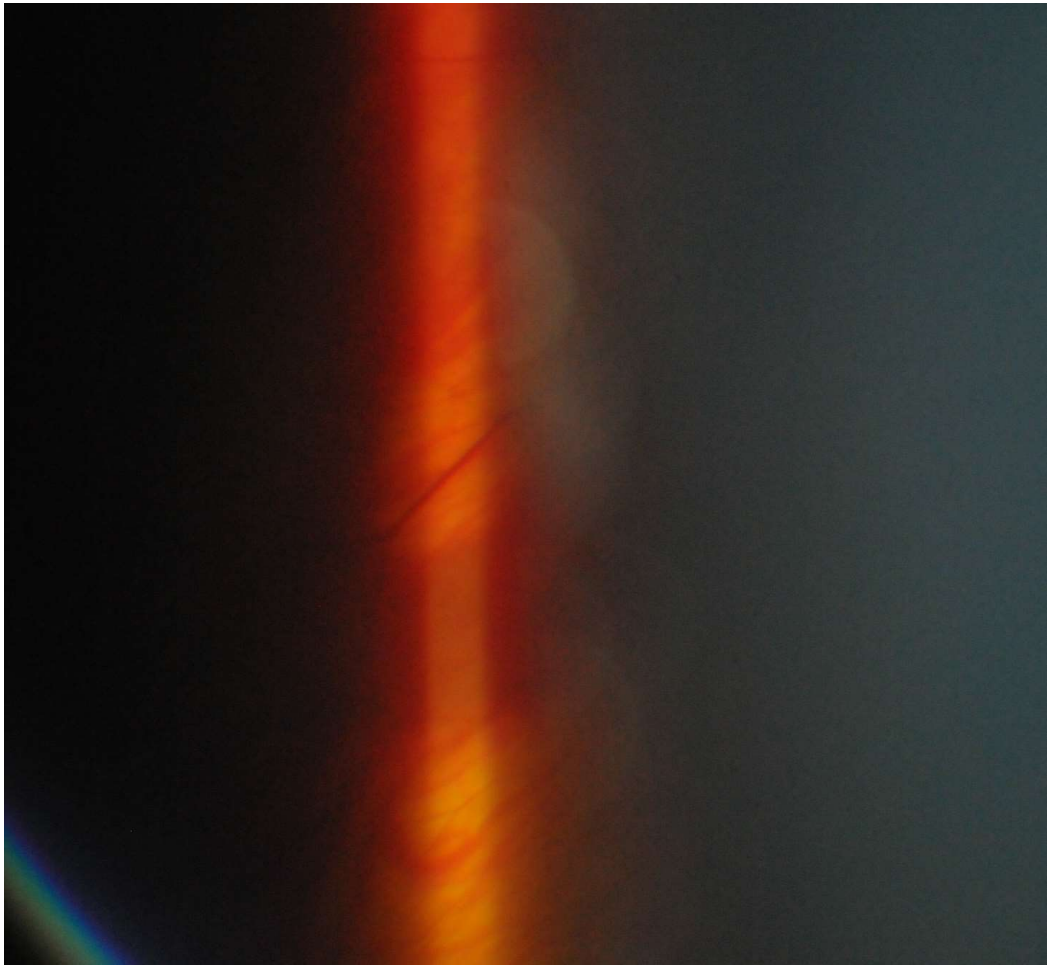




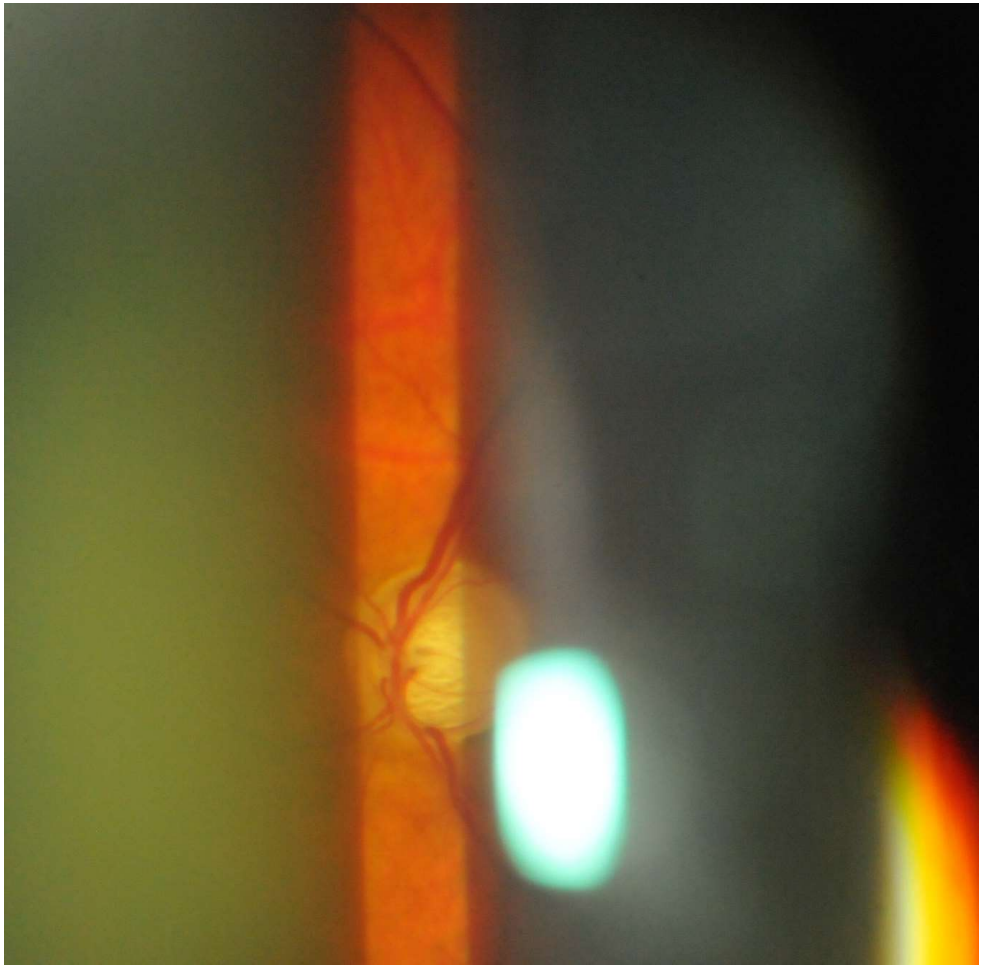




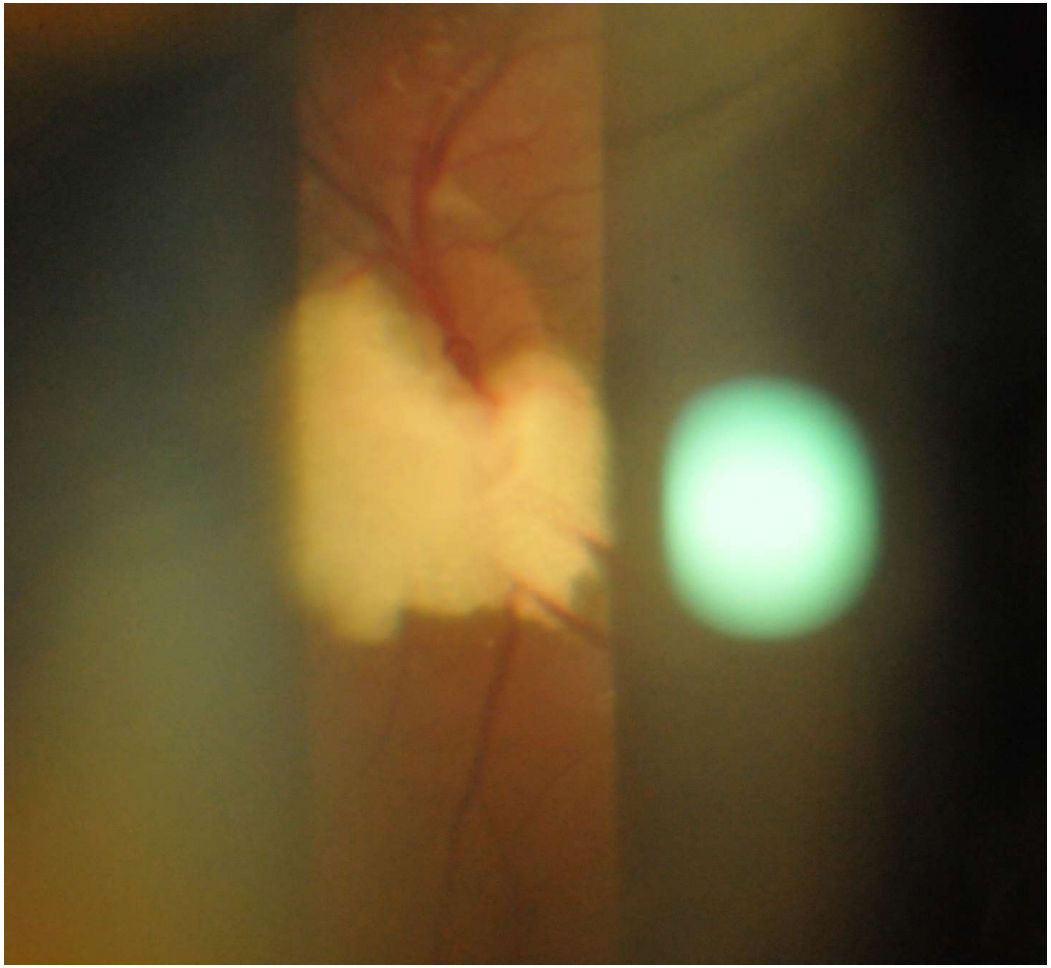
So is it flat?



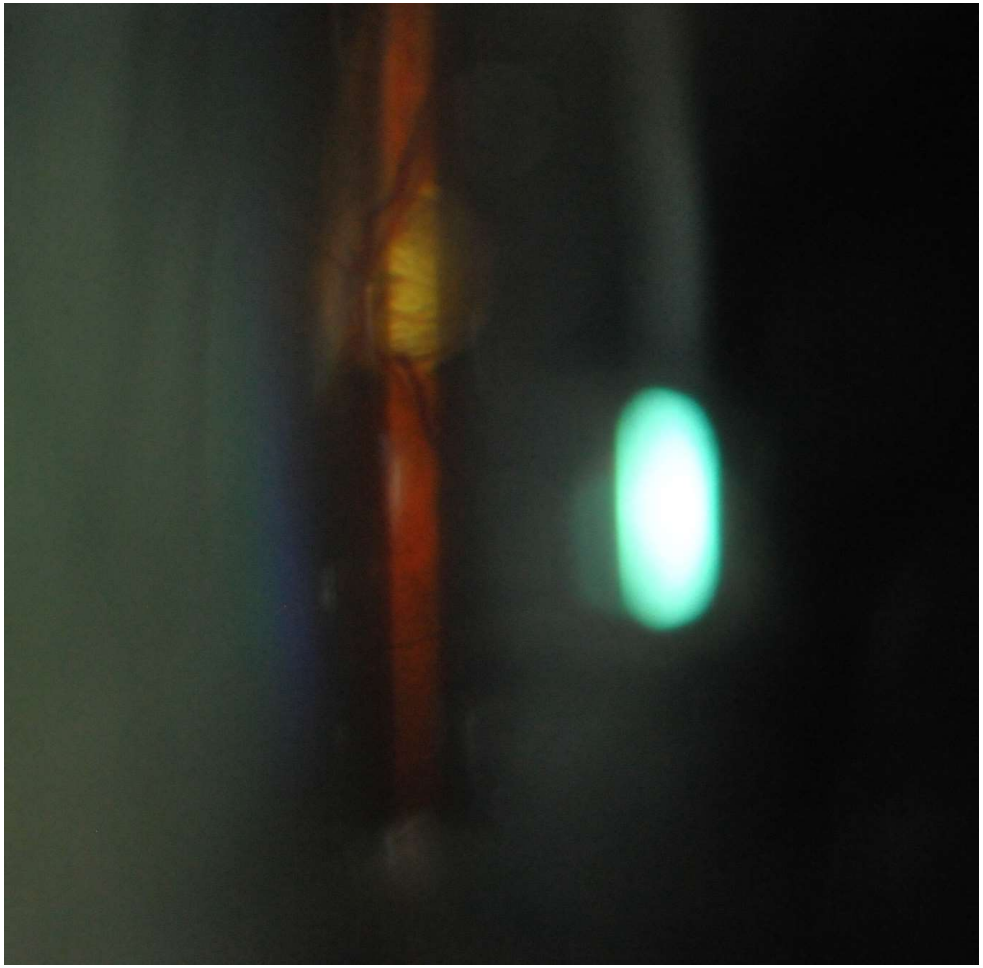
Is this nerve OK?



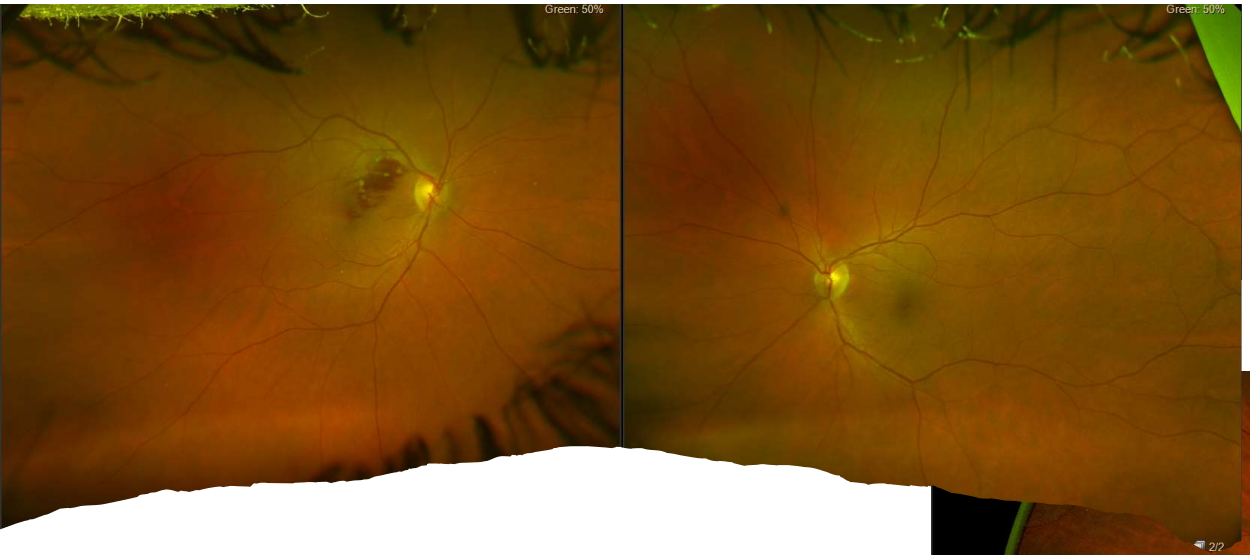
And this disc is?

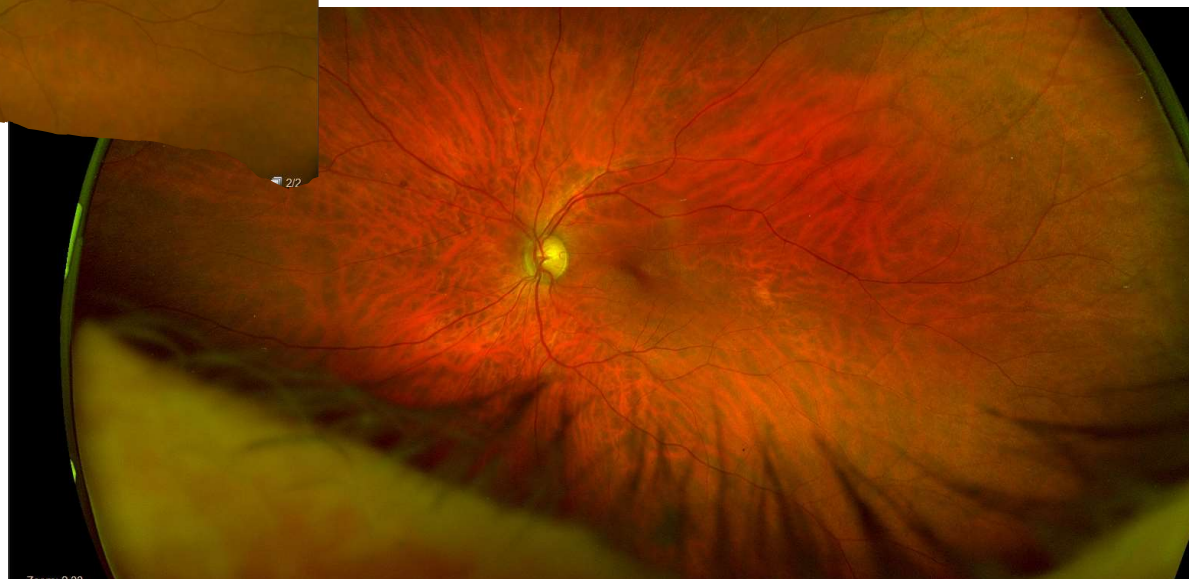


What about this disc?

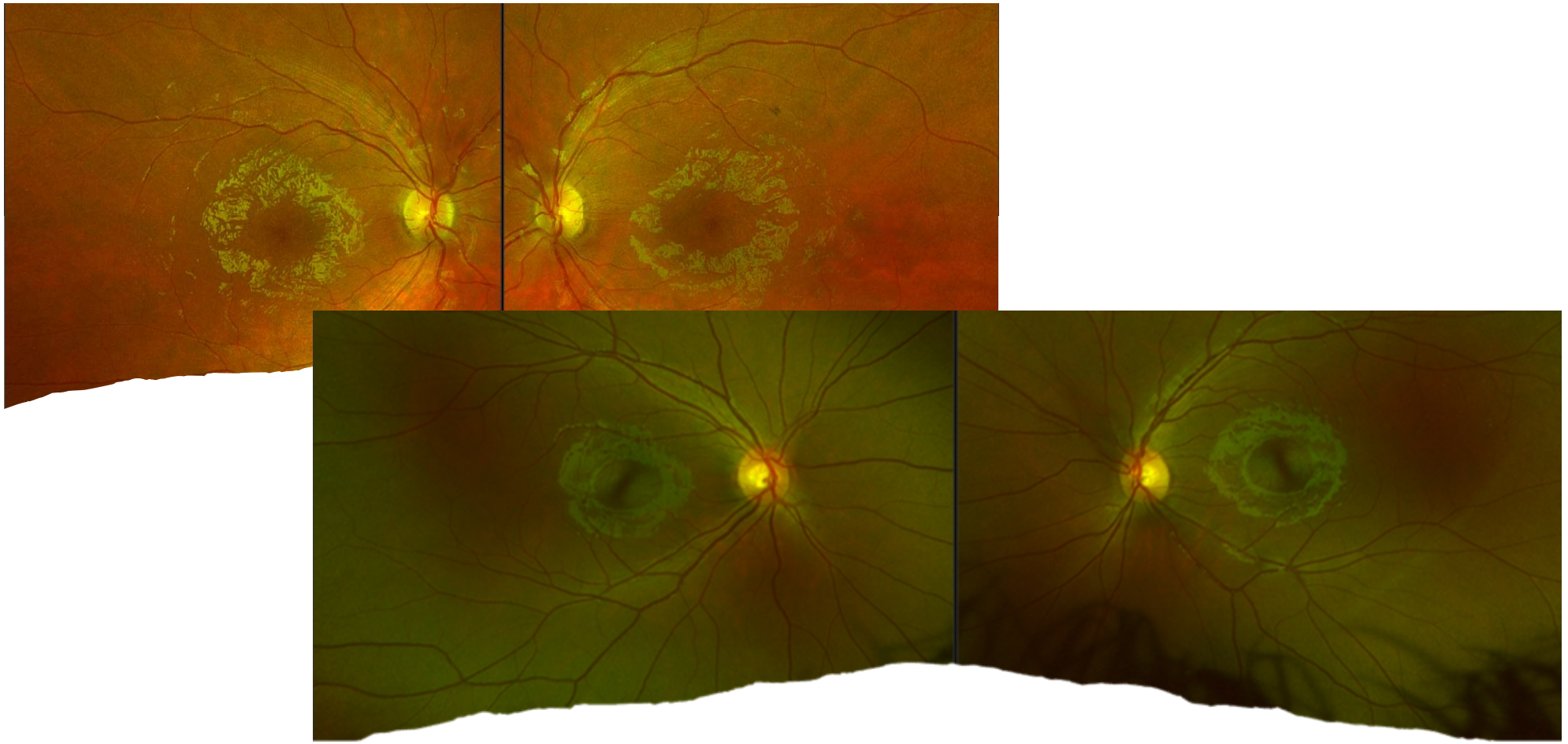


A. Which are normal? PHOTO B.





C. Which are normal? Photo D.



Quiz Which of the pictures is normal? Name the conditions? Name the Abnormal ones>

a/ B and D

b/ B and C

c/ D

d/ C and D

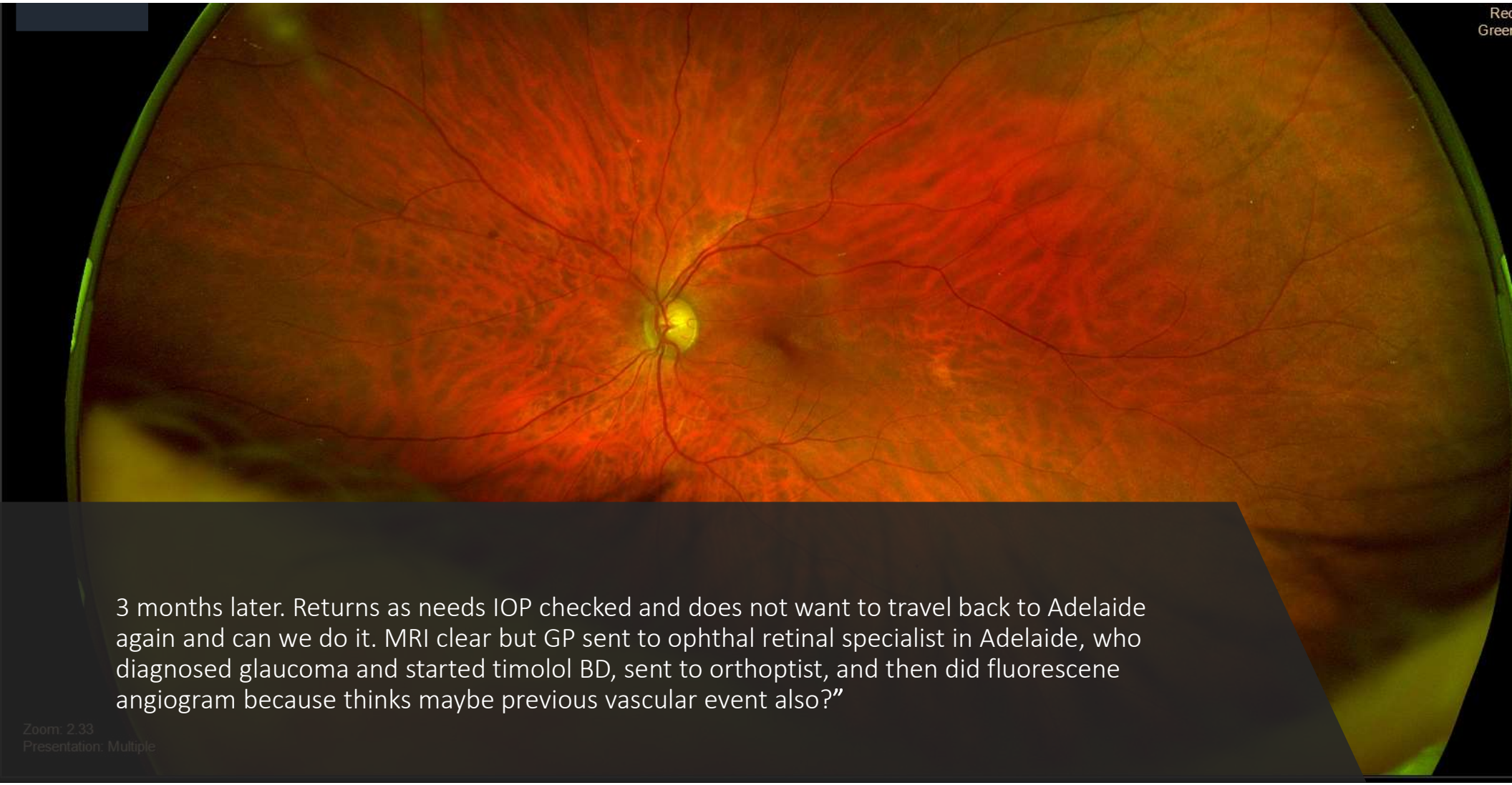
So finding the important means looking closely

- So imaging helps but must use all the features
- Red free and choroidal view and wide and zoom, especially zoom and pan
- History and context is essential
- Let’s look at each case in detail

Case B

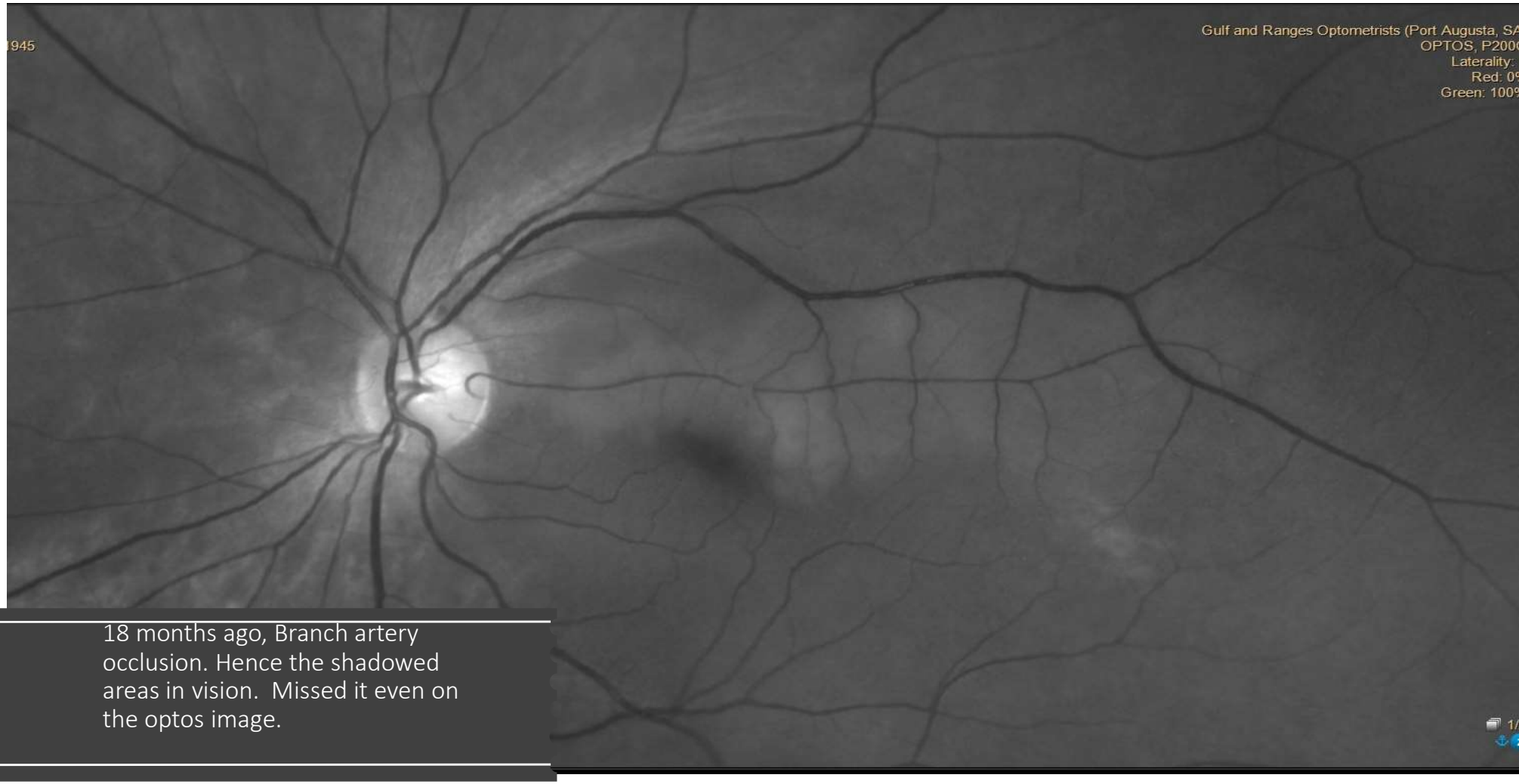
Case B. Mr. J.S. Presented Feb 2021, age 76

- Patient seen 3-4 times over last 7-8 years. Last time for LE PVD 18 months ago. Dilated and no tears or detachments. Mild hyperopia and wears glasses for close work.
- Presents Feb 2021 with signs and symptoms which relate to a small fourth nerve palsy. Especially looking down to read double and disorientating.
- Musician, former music store owner and music teacher (still playing and doing bit), active community member, tall, thin and relatively fit. Walks everyday.
- Dist primary gaze 3eso and 3 bup right eye.
- Vision good. Pupils normal. IOP 13 and 13 mmHg
- Referred to GP for systemic work up and exclude cerebral vascular or lesion events


Red
Green
3 months later. Returns as needs IOP checked and does not want to travel back to Adelaide again and can we do it. MRI clear but GP sent to ophthal retinal specialist in Adelaide, who diagnosed glaucoma and started timolol BD, sent to orthoptist, and then did fluorescene angiogram because thinks maybe previous vascular event also?”
Zoom: 2.33
Presentation: Multiple


Gulf and Ranges Optometrists (Port August
OPTOS, DAYTONA
Later
Rec
Green
So was ophthal involvement justified? Was FFA angiogram justified? Did he need 4 trips, 8 hour return each trip to Adelaide? Timolol makes feel ill. No report from ophthal and had to chase. What value the Orthoptist and then repeat orthoptist?
Zoom: 2.33
Presentation: Multiple

Mr. J. S retinal image 18 months ago when came in with shadow area in vision. Junior optom examined dilated and looks like recent PVD but no signs detachment, vision till good, warned all the symptoms and plan review 12 months. What did she miss?”



18 months ago, Branch artery occlusion. Hence the shadowed areas in vision. Missed it even on the optos image.

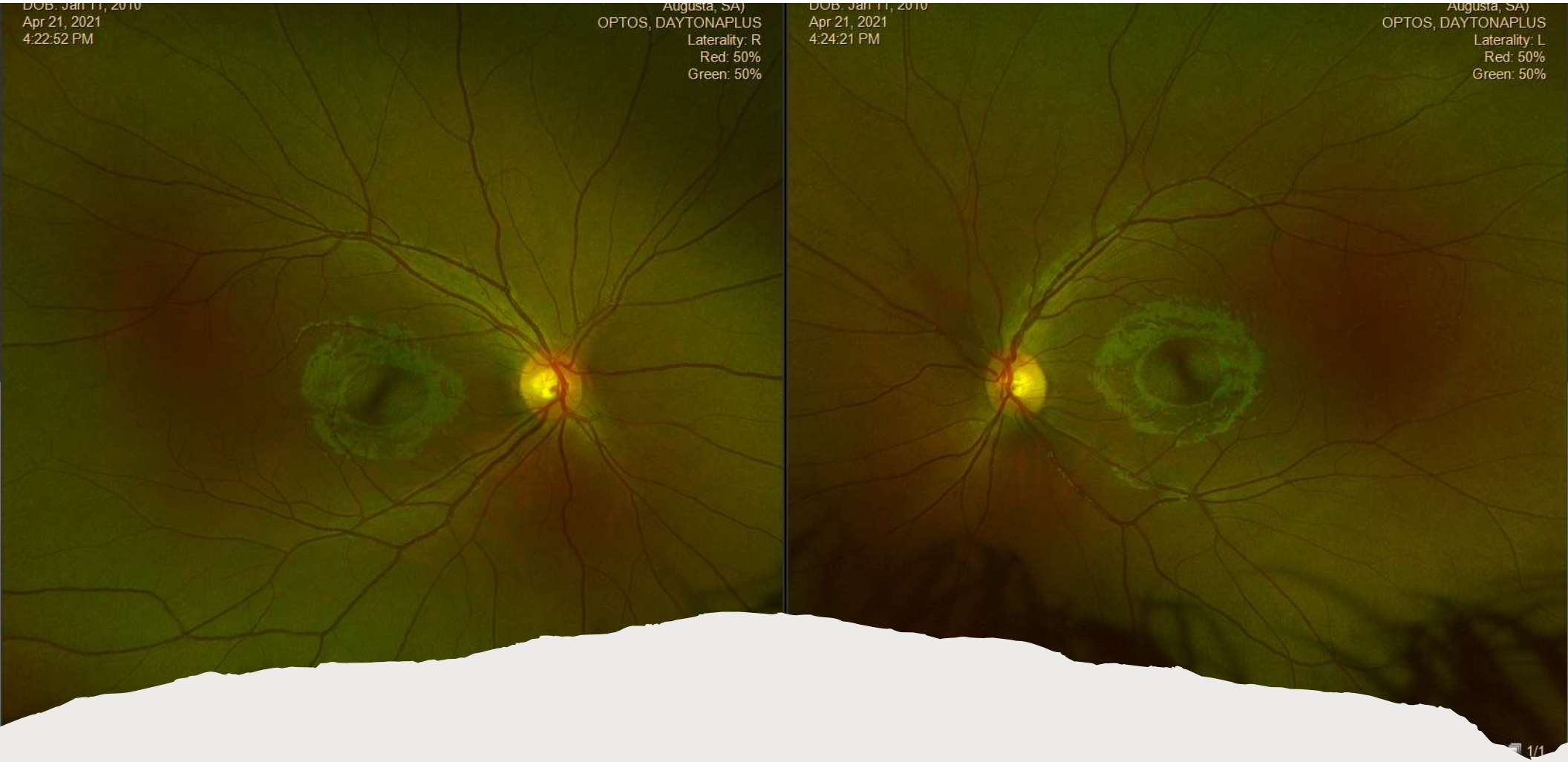
Branch artery occlusion 18 month later in May 2021. Ghosted vessel and splinter NFL defects

Case B. Mr. J.S. Presented May 2021, age 76

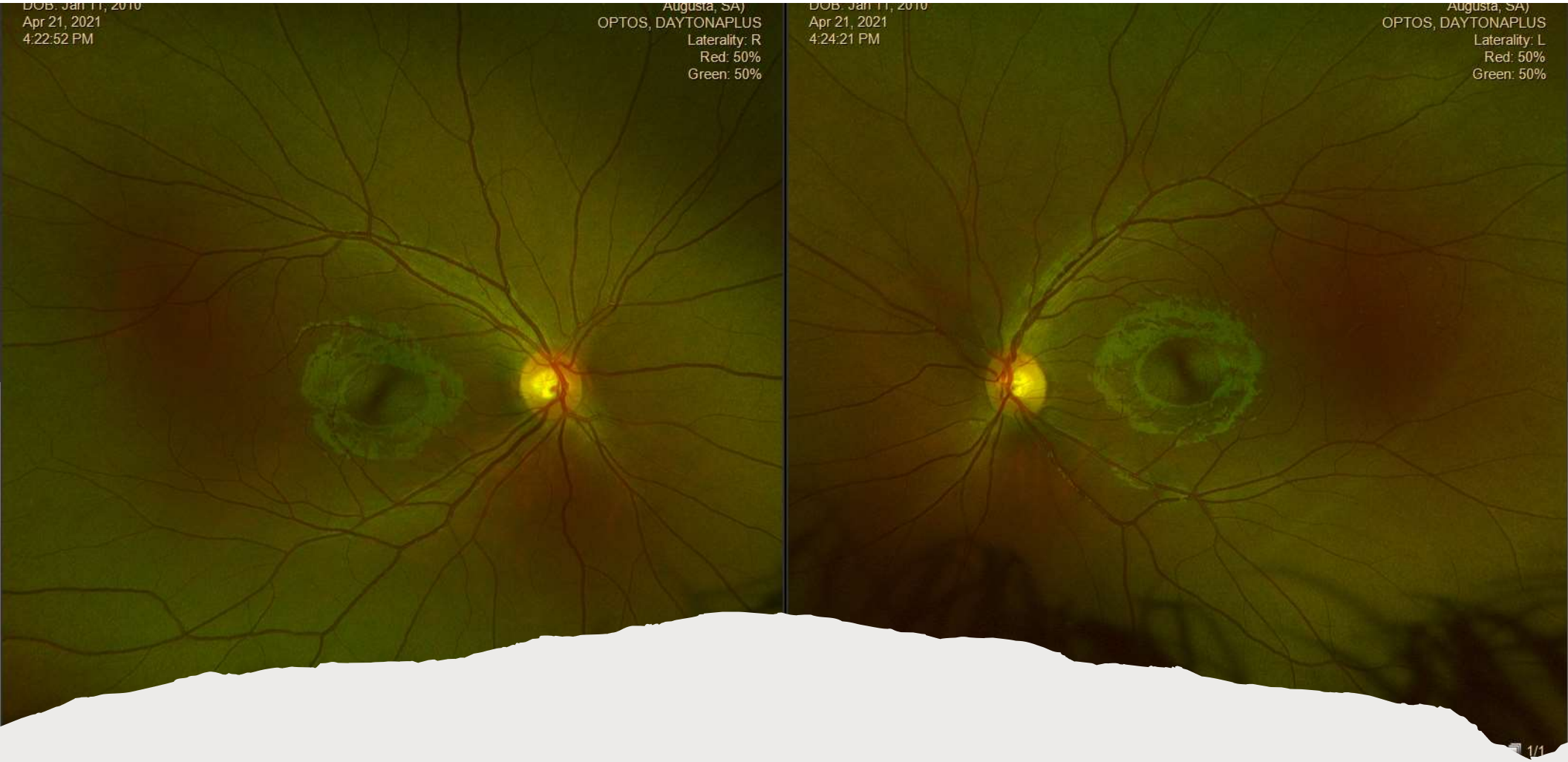
- OCT shows minimal overall defect just splinter defect in the area of old arteriol occlusion
- IOP reduced from 13 (and similar previous exams) to 11mmHg
- Previous records show ortho distance vertical horizontal phoria on 2 previous exams so vertical defect is new.
- Fourth nerve palsy now less symptoms, really just when reclines and reads, when straight on fine. Primary gaze phoria was ortho and 1 bur. On 20 degrees downgaze at near increases to 1.5 base down right eye. So mostly recovered.
- So what is the action plan?

- TAKE PHOTO AND DISCUSS IN NEXT BREAKOUT SESSION

Case D



So this is Image D. Why the colour and the shine? Did anyone have it as possibly abnormal?



So this is Image D. Why the colour and the shine? 11 Year old aboriginal girl. Healthy and 6/6 OU.

Case C

This is image C. Why so shiny? 11 Year boy blond and fair skin. So normal for him? Paediatric ophthalmologist dilated retinal exam 2 months ago and letter says all good. Referred for behavioural and learning difficulties assessment.

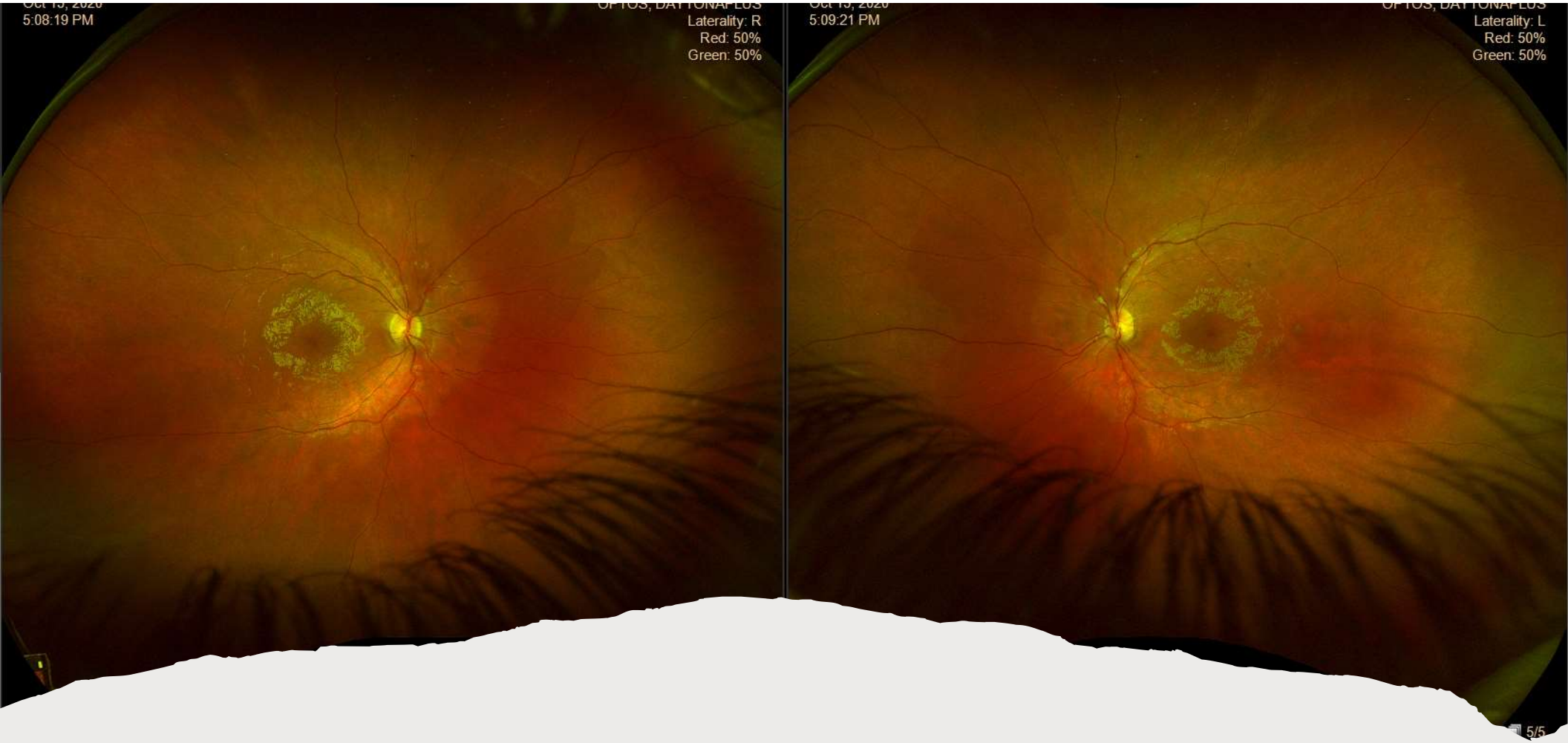
Case C. Master K. M. First presented August 2019, age 10

- Examined by 4 year out optometrist 10 months prior. Some unusual eye movements and started looking to side when ball thrown to him and school performance dropping.
- Best correctable VA was 6/12 RE and LE 6/12 and OU 6/9
- Colour vision slightly funny. ? Malingering?
- Retinal exam normal. Referral to paediatric Ophthal who visits 3 monthly.
- Paeditrician involved as school performance and other funny signs worse. Stopped looking directly at faces.

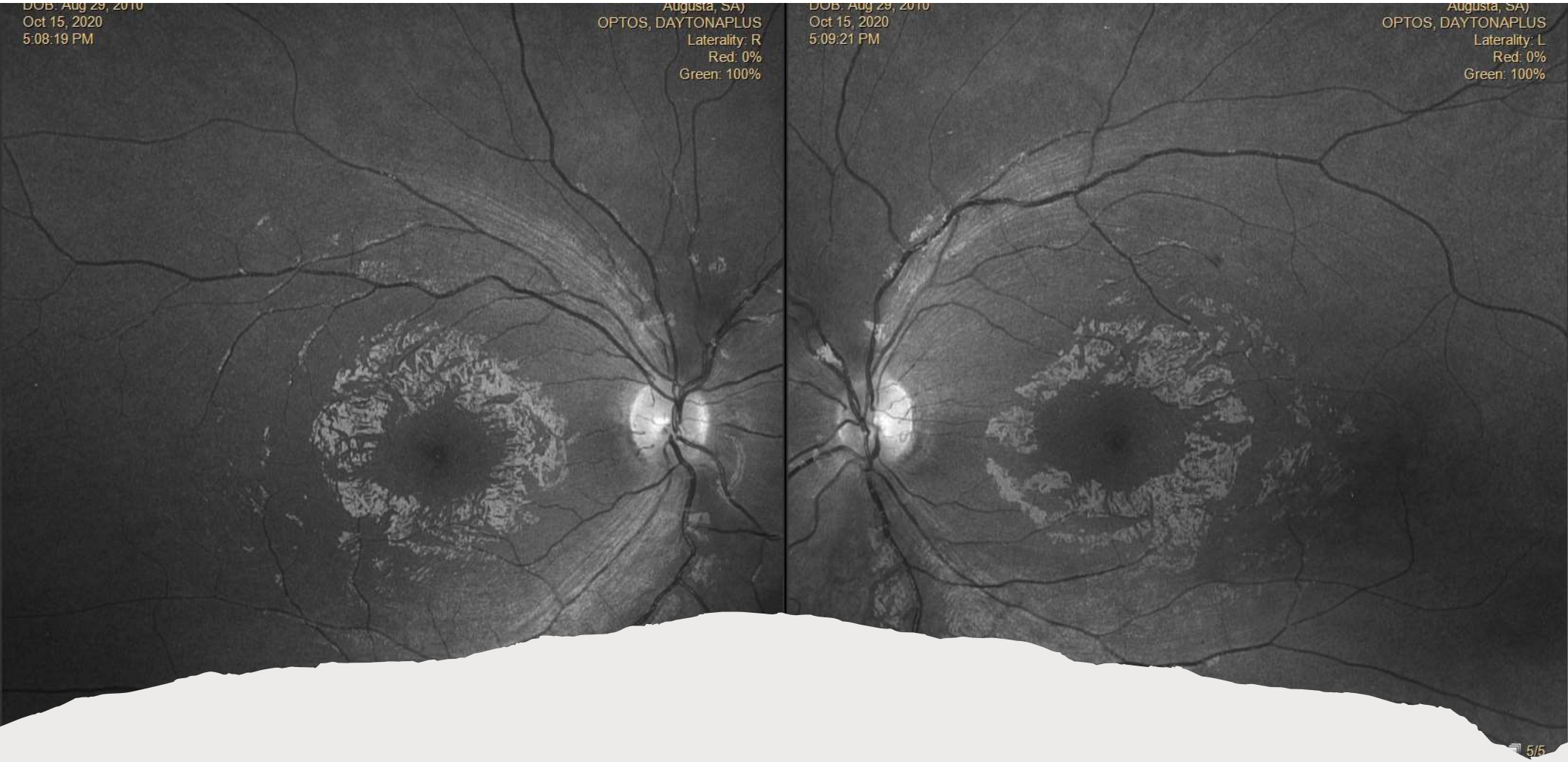
Case C. Master K.M. Review 15/10/2021

- PC: seen by paediatric Ophthalmologist. Concluded eye examination normal aside VA of 6/15 each eye. Suggested behavioural element and to work with paediatrician. Today is scheduled 6 month review from date referral sent.
- Examination:
  - VA: RE 6/39, LE 6/35 (eccentric fixation, single letter)
  - Anterior: unremarkable.
  - Posterior: **see next slides.**

- **PHOTO FOR BREAKOUT PLEASE for this and next 2 slides ##### Breakout. What do you think now, next tests?**


5:08:19 PM
Laterality: R
Red: 50%
Green: 50%
5:09:21 PM
Laterality: L
Red: 50%
Green: 50%
5/5

OPTOS Image

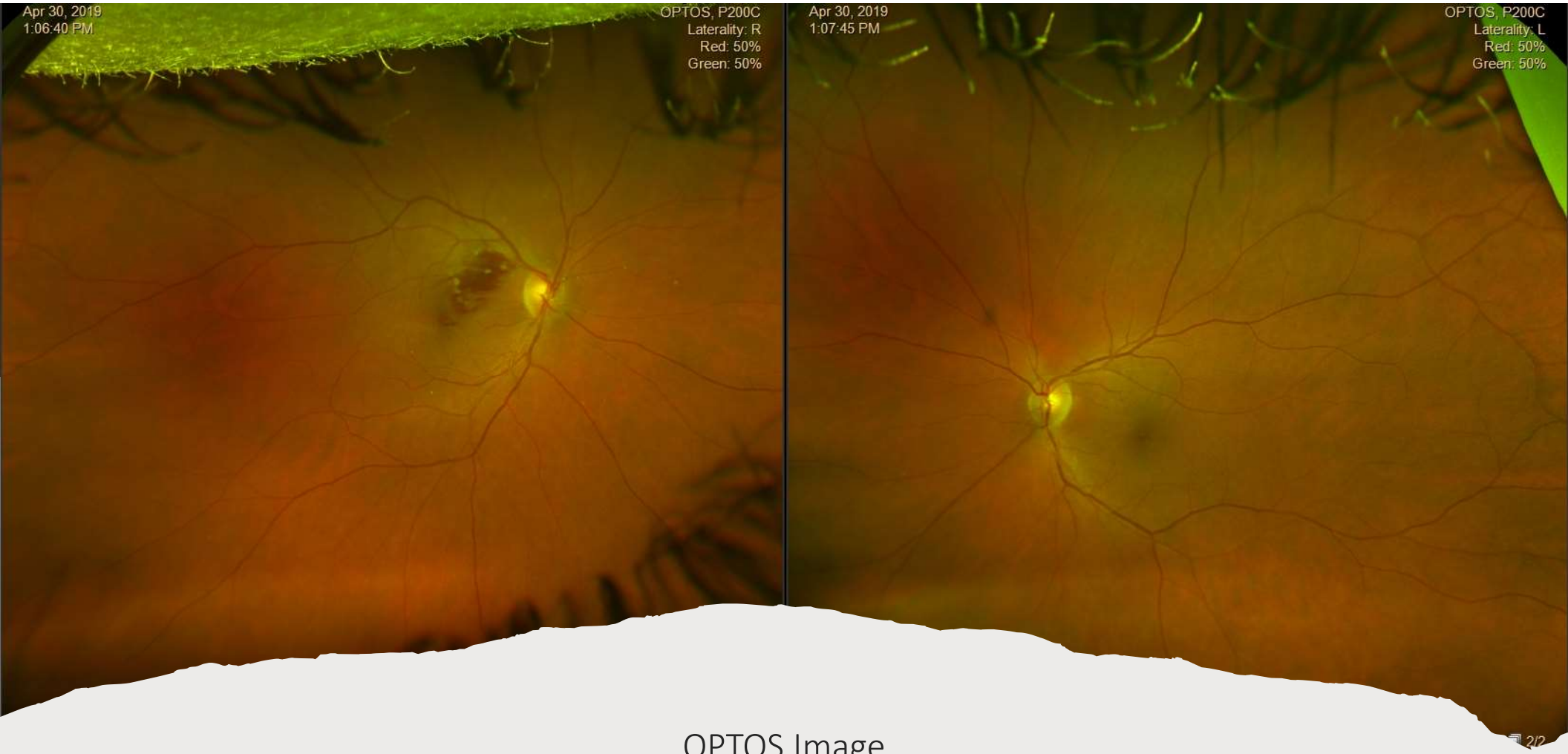


OPTOS Image Red Free

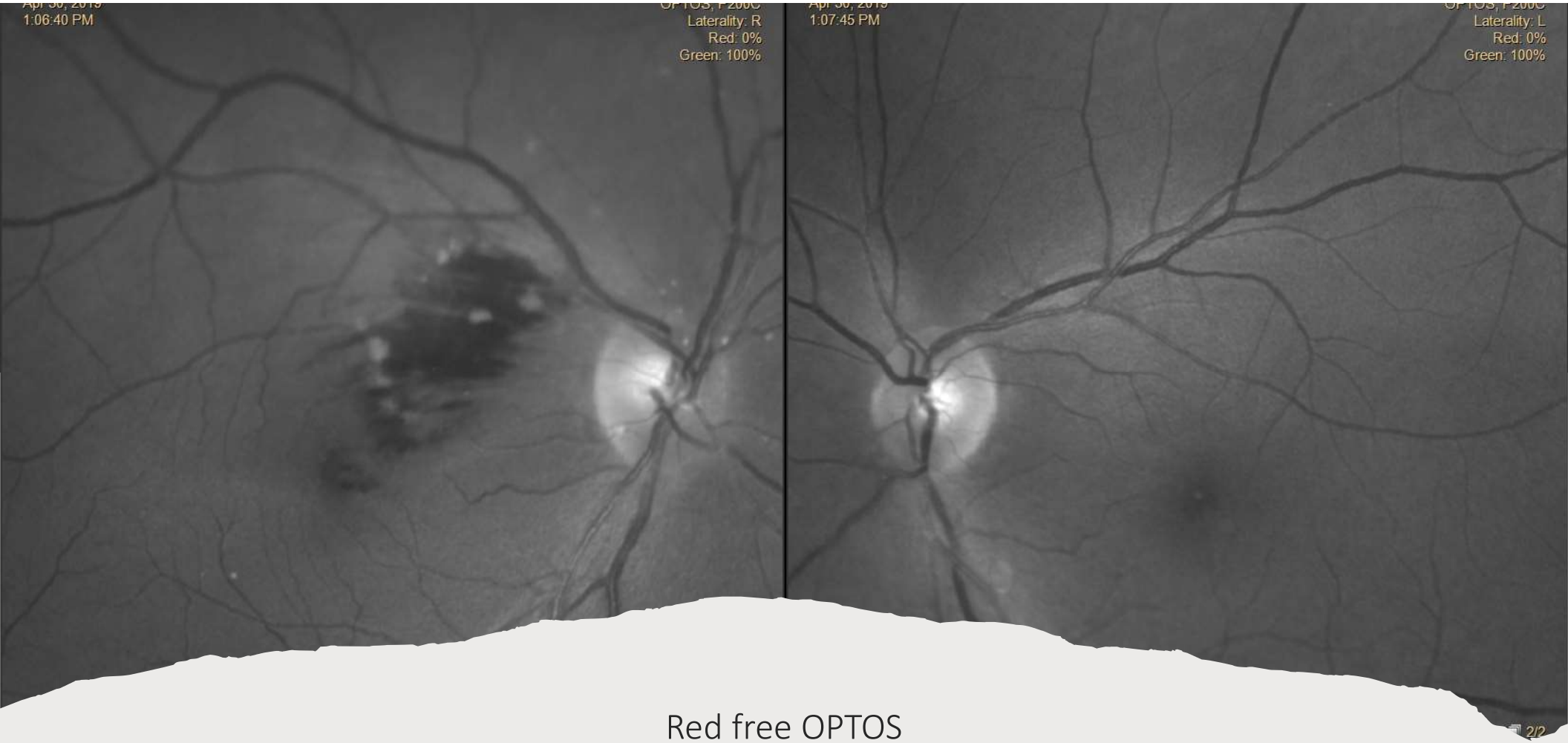
Case A

Case A. Mrs. A.H. 30/04/2019: presenting for routine eye examination.

- PC: Feels distance/ near vision could be better. 4 years since last eye examination. Right eye watery, drops help intermittently. Vertigo symptoms, resolved with physio.
- GH: no medications, no known issues.
- POH: 2006 diagnosed keratoconus.
- FOH: father POAG.
- Examination:
  - BCVA: RE 6/6.5+, LE 6/10+
  - IOP: RE 11mmHg, LE 6mmHg
  - Anterior: RE lacrimal duct blocked
  - Posterior: **see next slide.**

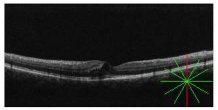
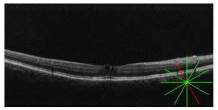
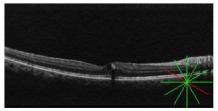
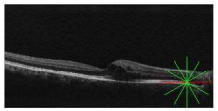
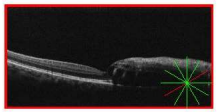
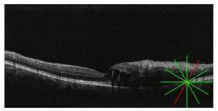


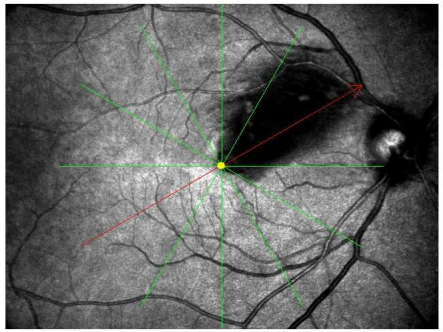
OPTOS Image
Diagnosis?
Further Imaging?

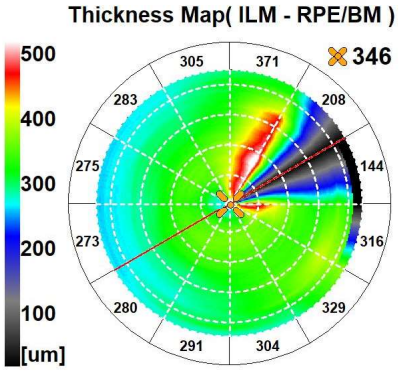


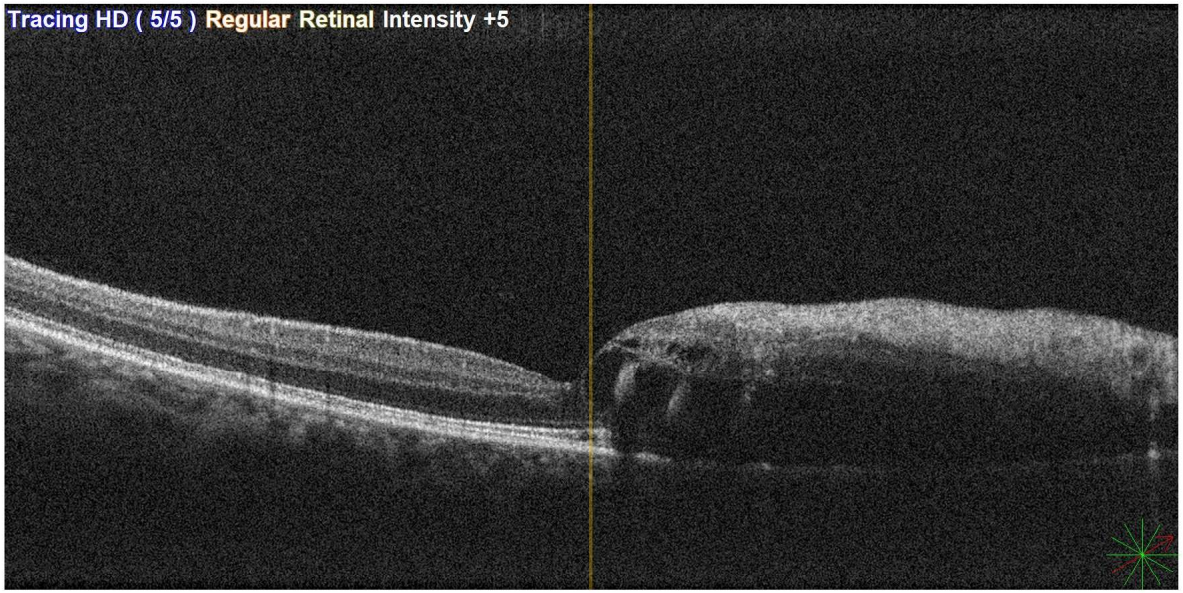
Red free OPTOS
What extra information does this provide?
Further investigation?

R 650616 21000/2.10.00 30/04/2019 12:55:20 5/5 7/10 Wide +2.25 Gullstrand

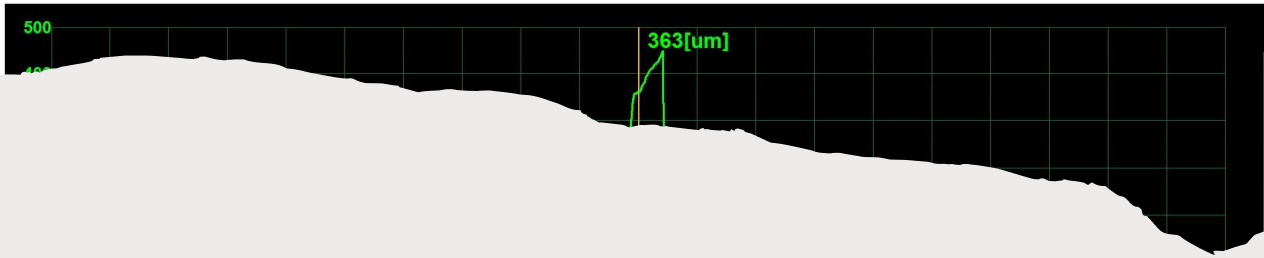






Select OCT

Thickness Graph(ILM - RPE/BM)



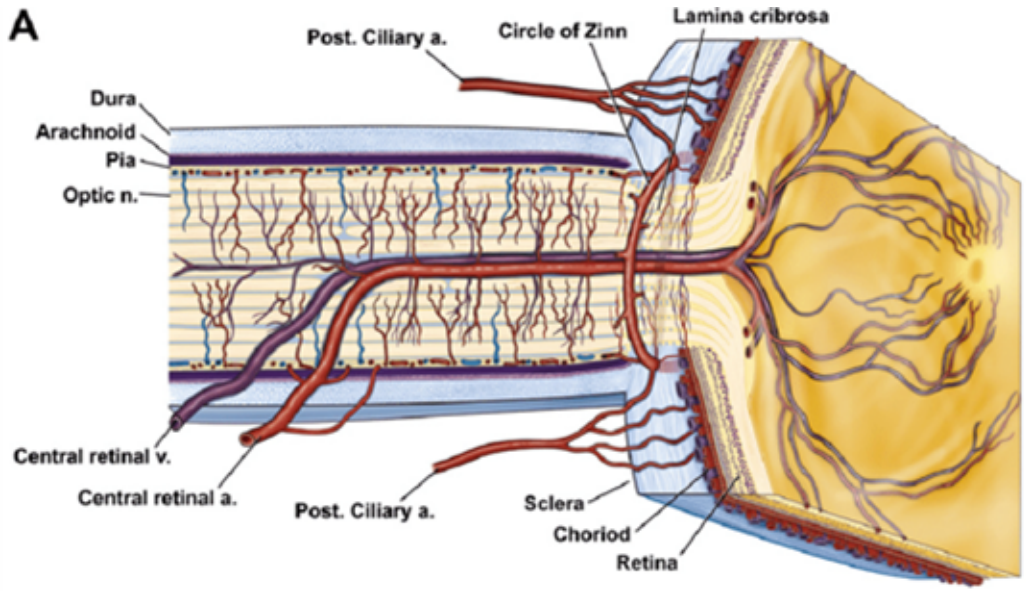
Management?

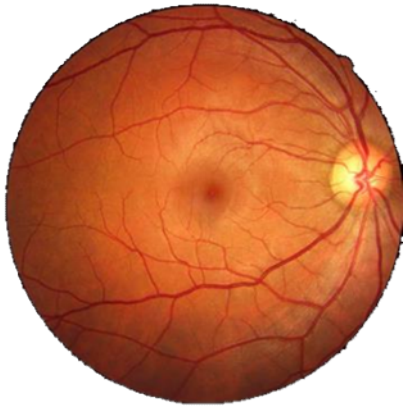
Management

- Diagnosis: right eye superior BRVO.
- Report to GP for blood tests.
  - All bloods came back clear, cause never established.
  - When referring also consider artery crossing veins to be cause rather than veins.
- Referral to be seen within the week for vitreo-retinal Ophthalmologist for treatment of macula odema with intra-vitreal anti-VEGF.
  - Currently still on 3 monthly anti-VEGF injections.

BRVO

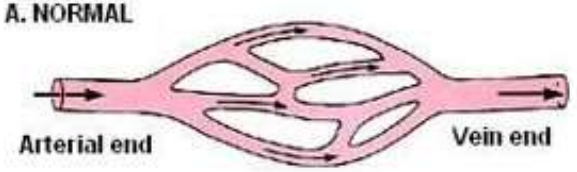
- 2nd most common cause of retinal vascular disease after diabetic retinopathy.
- Characteristically causes sudden painless vision loss
  - Macular oedema is the main cause of vision loss
    - Inflammatory cascades
    - Increased vascular permeability
- Risk factors
  - Age
  - Hypertension
  - Hyperlipidaemia
  - BMI



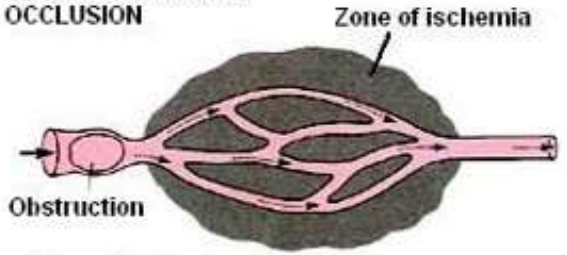


OCCLUSION OF THE RETINAL ARTERY AND VEIN

A. NORMAL

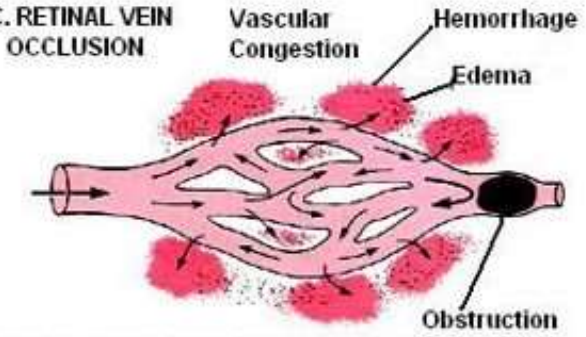


B. RETINAL ARTERIAL OCCLUSION



Neuronal Functional impairment > Visual loss
Edema > Pallor

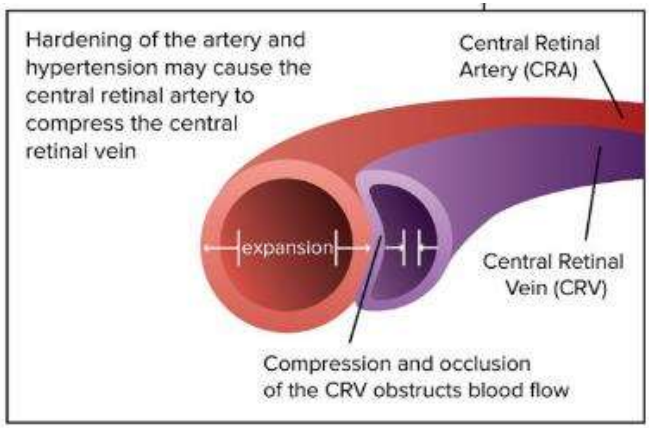
C. RETINAL VEIN OCCLUSION

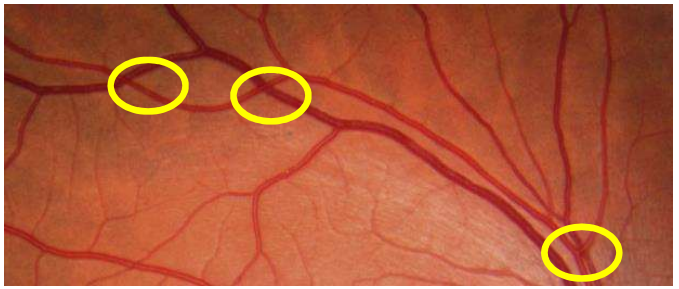


Mild ischemia : Normal Neuronal Function

Pathophysiology BRVO – Virchow's Triad

- 1. Vessel wall: Mechanical compression at arteriovenous crossings (due to atherosclerosis/ arteriolar thickening)
  - 97.6% of cases have artery anterior to vein
- 2. Blood flow: Vascular degeneration
  - Turbulent blood flow can be triggered by obstructed AV crossing, causing venous endothelial damage --> vein occlusion.
- 3. Blood components: Hypercoagulable factors (dysregulation causes thrombosis)
  - Dysregulation of thrombosis-fibrinolysis balance can cause thrombus formation --> vein occlusion.
    - The coagulation cascade responsible for this results in production of thrombin --> converts circulating fibrinogen to fibrin. Regulated by anti-coagulants i.e. protein C, protein S, anti-thrombin). *important for next slide management.





Diagnostic Work-Up

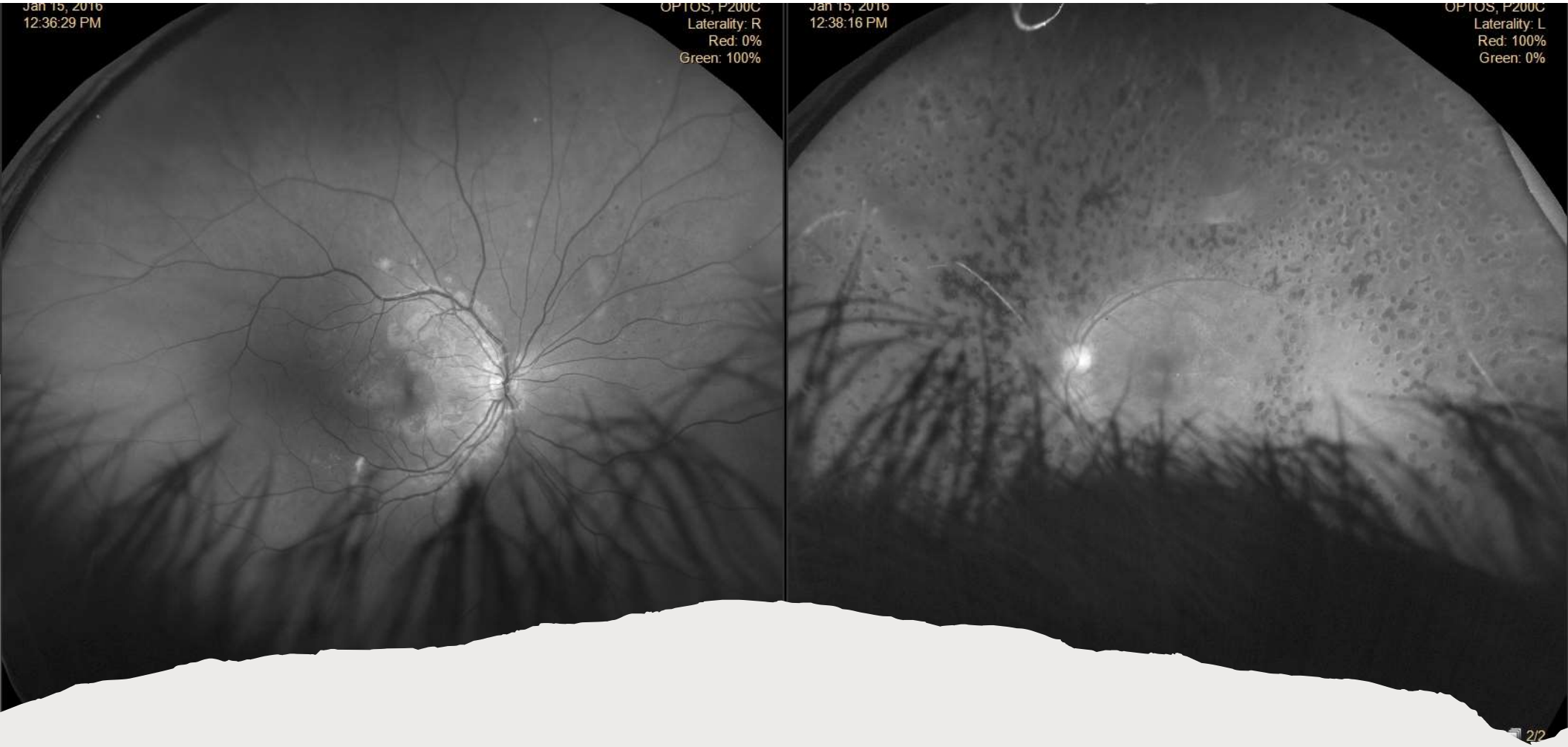
: relates to atherosclerosis
: relates to thrombosis-fibrinolysis balance

- Full ophthalmic evaluation
- Lab tests
  - Metabolic panel
  - Lipid panel
- In patients <50 years old, further investigations are needed
  - Risk factors for hypercoagulable states, including medications (e.g. oral contraceptives)
    - Prothrombin time/partial thromboplastin time
    - Vitamin B6/B12, folate levels
    - Activated protein C resistance
    - Antiphospholipid antibodies
    - Homocysteine level
  - Vasculitis

Case 5

Case 5. Miss. M.S. 15/01/2016: presenting after LE PRP for diabetic retinopathy. Case 5.

- PC: 1 month ago LE treated with panretinal photocoagulation for proliferative diabetic retinopathy. Now feels vision poor LE.
- GH: type 2 diabetic, HbA1c 10%. Medication – insulin.
- POH: extensive panretinal photocoagulation 1 month ago LE.
- FOH: none.
- Examination:
  - BCVA: RE 6/5, LE 6/5=
  - Anterior: unremarkable.
  - Posterior: **see next slide.**



OPTOS Image – 15/01/2016
RE currently no treatment.

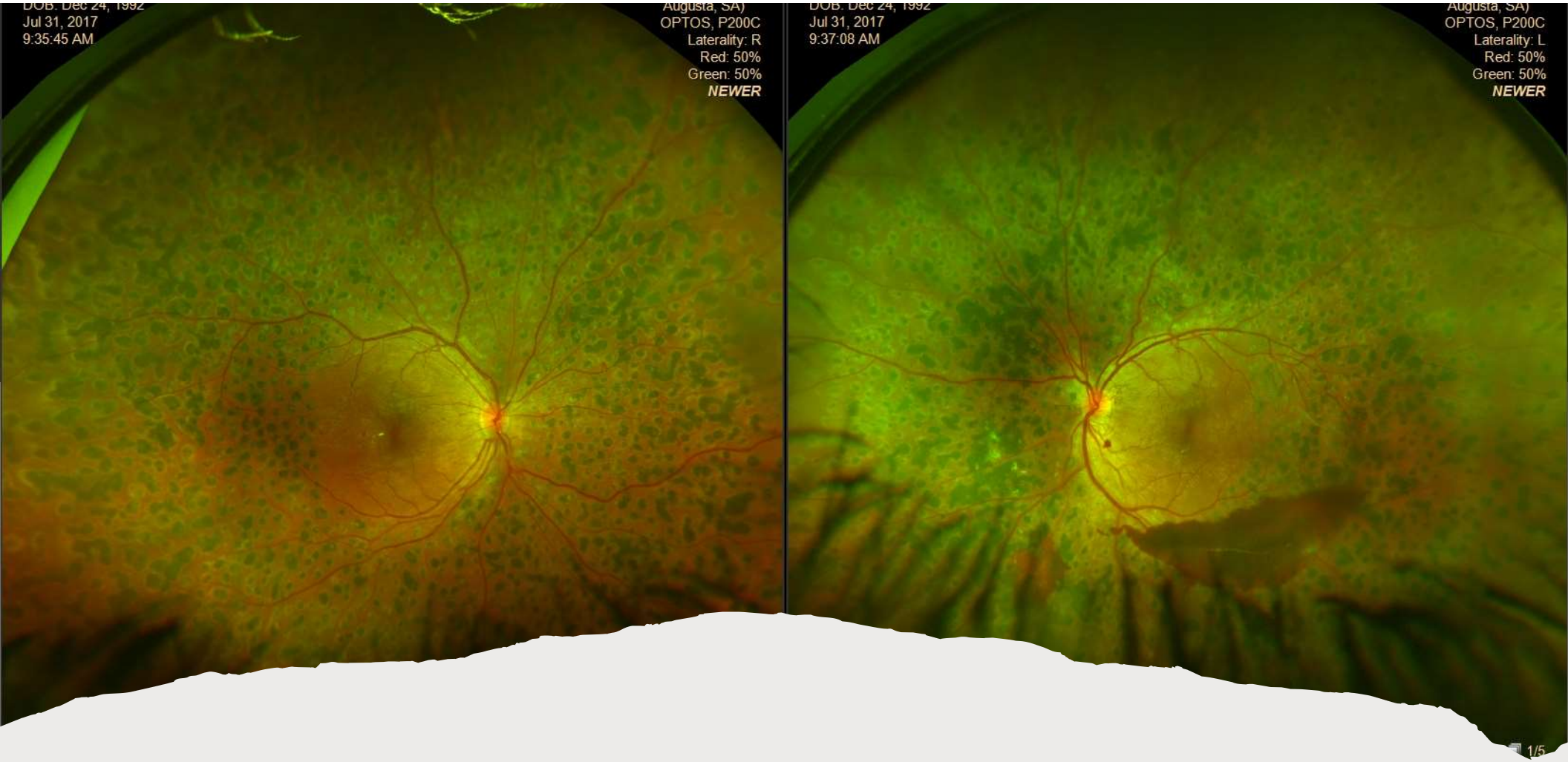
Miss. M.S. 30/09/2016: presenting for updated referral to Ophthalmology for diabetic retinopathy – 8 months later

- PC: seen regularly for mangement of proliferative diabetic retinopathy. RE become proliferative and treatment initiated. Further treatment of LE done.
- GH: type 2 diabetic, HbA1c 10%. Medication – insulin.
- POH: extensive panretinal photocoagulation both eyes.
- FOH: none.
- Examination:
  - BCVA: RE 6/7.5, LE 6/7.5
  - Anterior: unremarkable.
  - Posterior: **see next slide.**

OPTOS Image – 30/09/2016

Case 5. Miss. M.S. 31/07/2017: 10 months later, sudden onset LE blur

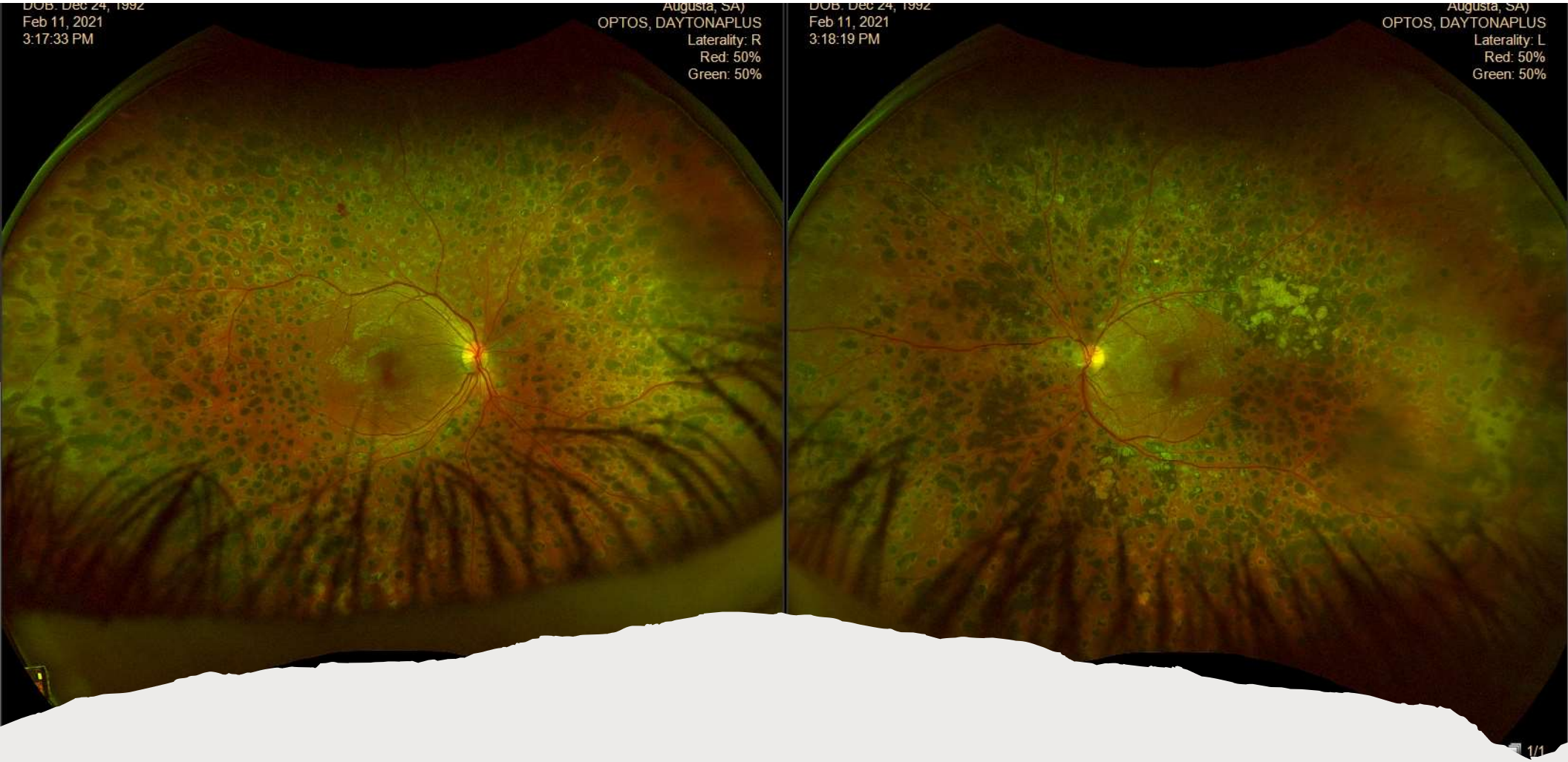
- PC: had been monitored and controlled well over past 10 months, until sudden onset blur LE.
- **See posterior on next slide.**



OPTOS Image – 10 months later
Management?

Miss M.S. 31/07/2017

- Diagnosis: left eye inferior vitreous haemorrhage.
- Management: vitrectomy, PRP and avastin.
- Around 30 injections



OPTOS Image – 4 years later

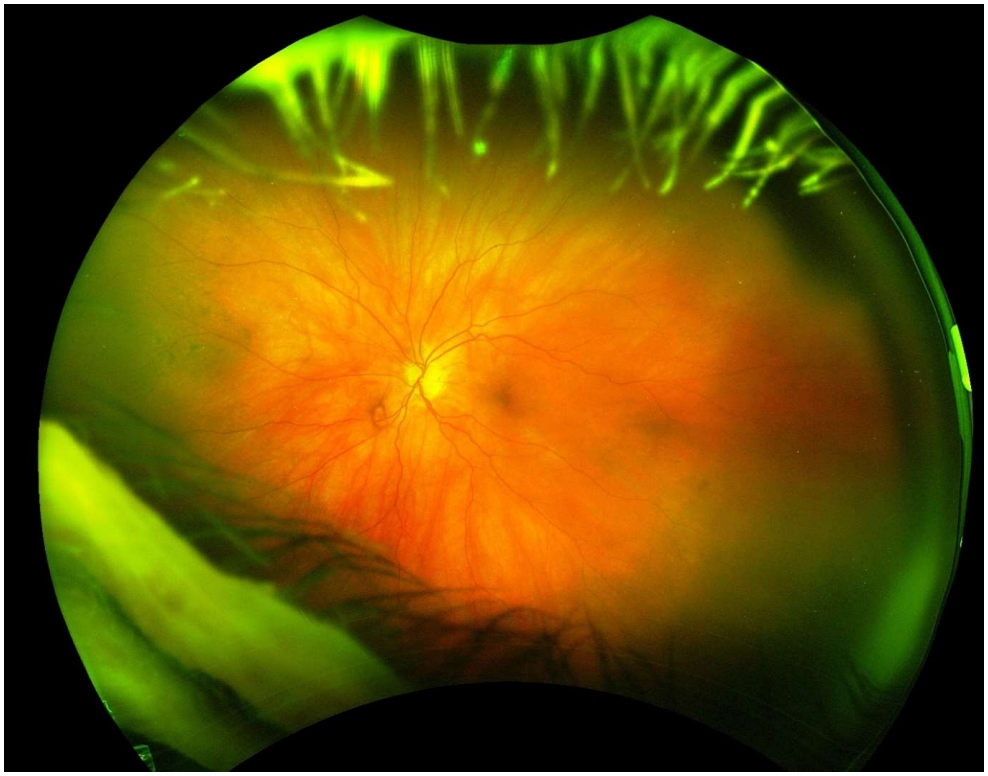
Diabetic retinopathy been relatively stable, monitoring 6 monthly.

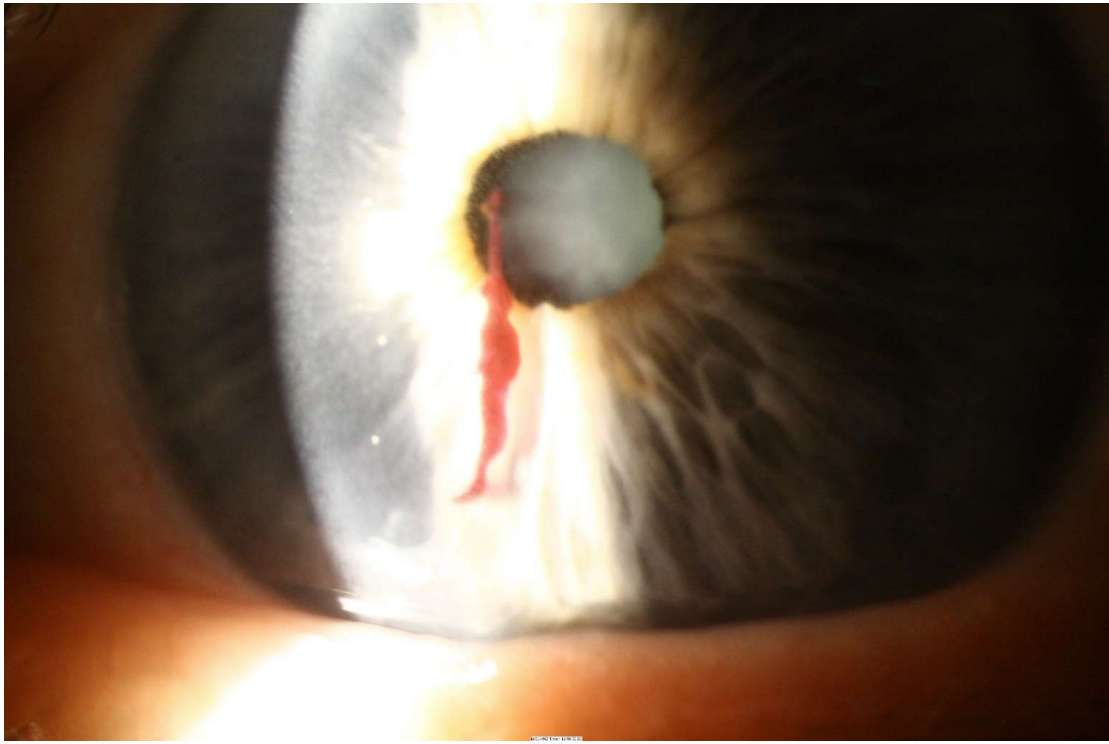
Case 6a and 6b

A little diversion

A little diversion

Mrs. B.K. aet 81 NIDDM 13 years , blurred L lower vision amsler NAD 6/7.5+
ACLO changes 3+ hyphaema no flare PERRLA PIOP R 16 L 26 mmHg
action : Hba1c <7% refer to ophthal





Case 6a. Mrs. B.K.

- Ophthal opinion 2 days later
- Completely resolved (sent image) VA 6/6 IOP 16 mmHg
- Differential Dx : Trauma, Valsalva, Rubeosis, Iris tumour,
- No PDR, no iris vasculature anomaly, no IN
- Action : not active, Trauma through sleep?

- **Case 6b.** Treat the Iritis. Cycloplegia or not? Fully resolved within 36 hours except small hyphema and that resolved 3 days.

Case 7

Mr J.S. - 19/08/2020 - 53 year old male

- PC: 1 week onset of decreased vision, feels 50% duller from left eye.
- GH: endone, panadein forte, exforge HCT. Pre-diabetic, BSL 6.4mmol/L, diet/ exercise controlled.
- POH: none.
- FOH: none.
- Examination:
  - BCVA: RE 6/6, LE 6/9.6 NIPH
  - Anterior: unremarkable.
  - Posterior: see next slides.

OCT Setting:MACULA RADIAL 6(9.0mm[1024]) Eye:Both

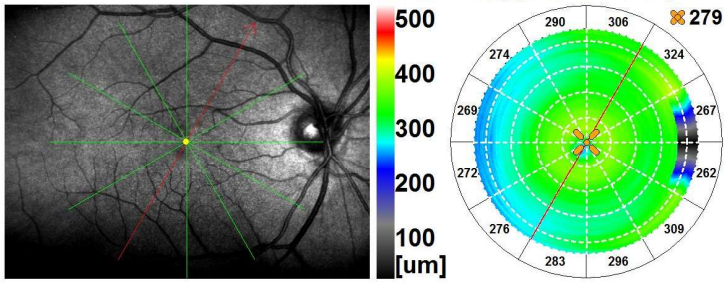
RS-3000 OCT RetinaScan Advance

Both		S/N	Version(F/S)	Date	SQI	SSI	SLO	Focus[D]	Axial[mm]
	R	650616	21000/2.10.00	19/08/2020 15:28:25	5/5	10/10	Wide	-0.25	Gullstrand
	L	650616	21000/2.10.00	19/08/2020 15:27:55	4/5	8/10	Wide	-0.25	Gullstrand

R

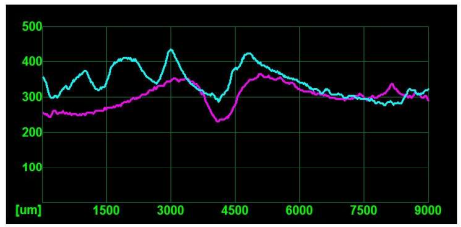
L

Thickness Map(ILM - RPE/BM)

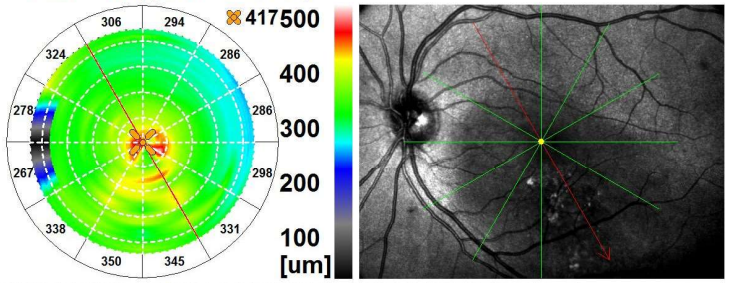


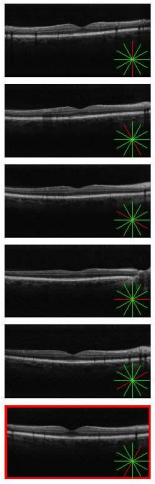
Select OCT

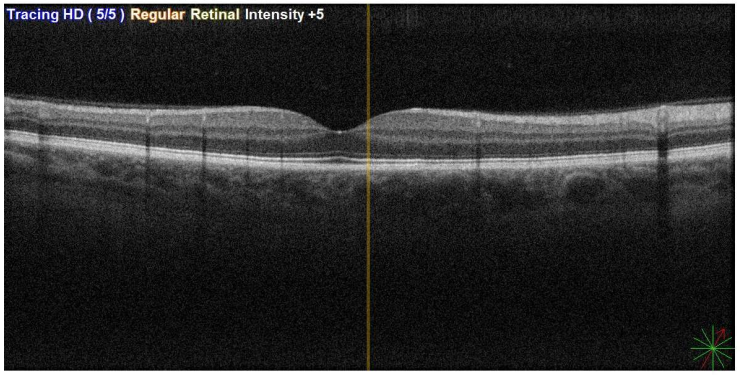
Thickness Graph(ILM - RPE/BM)

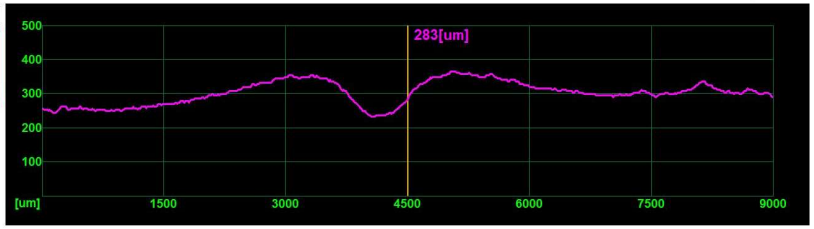


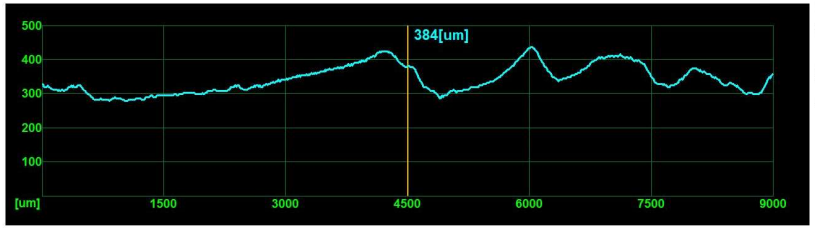
Thickness Map(ILM - RPE/BM)

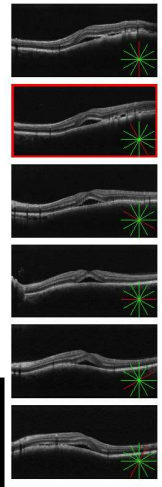












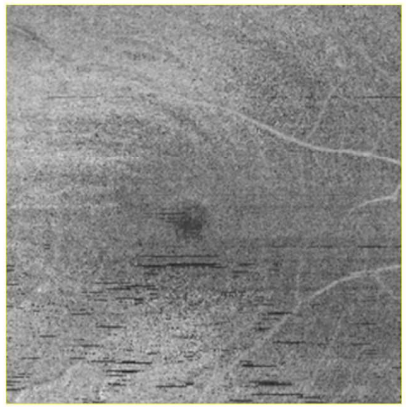
OCT Setting:MACULA MAP A X-Y(4.5mm x 4.5mm[256 x 256]) Eye:L

RS-3000 OCT RetinaScan Advance

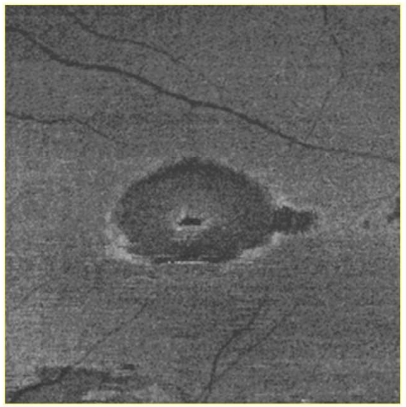
L En face

	S/N	Version(F/S)	Date	SQI	SSI	SLO	Focus[D]	Axial[mm]
L	650616	21000/2.10.00	19/08/2020 15:34:28	2/5	8/10	Wide	-0.25	Gullstrand

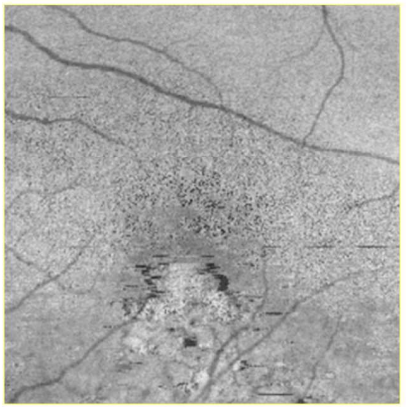
Vitreous interface
HIP, ILM+0um, Thick:42um



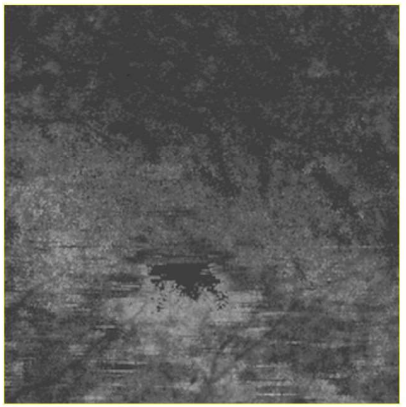
Inner retina
HIP, IPL/INL+21um, Thick:42um



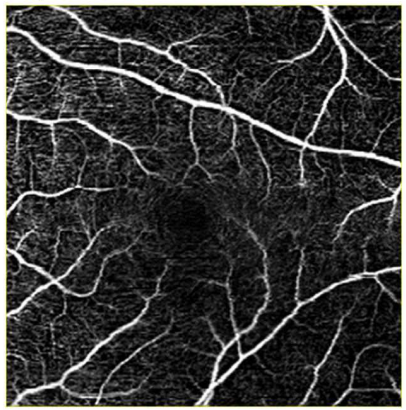
RPE
HIP, RPE/BM-42um, Thick:42um



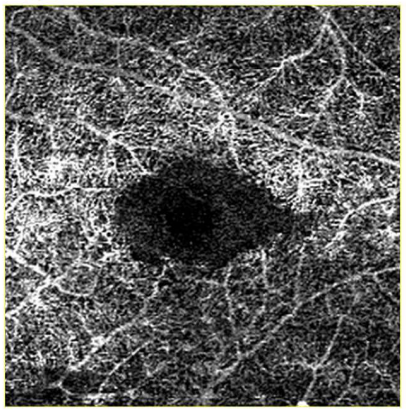
Choroid
HIP, RPE/BM+0um, Thick:125um



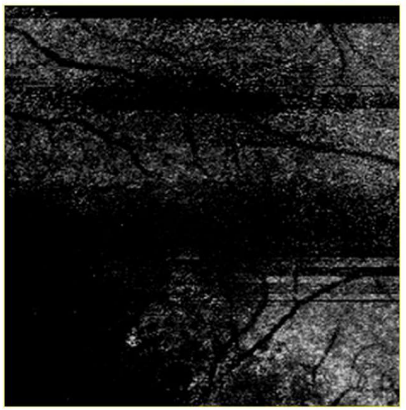
RPCP+SCP+ICP
AIP, ILM+0um to IPL/INL+8um



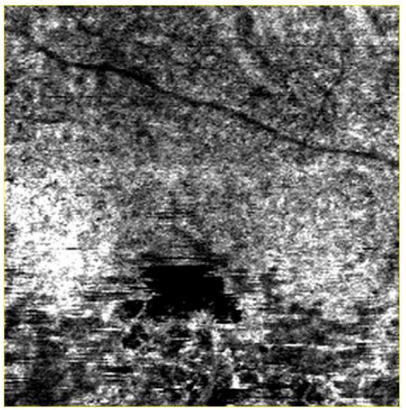
DCP
AIP, IPL/INL+13um to IPL/INL+88um

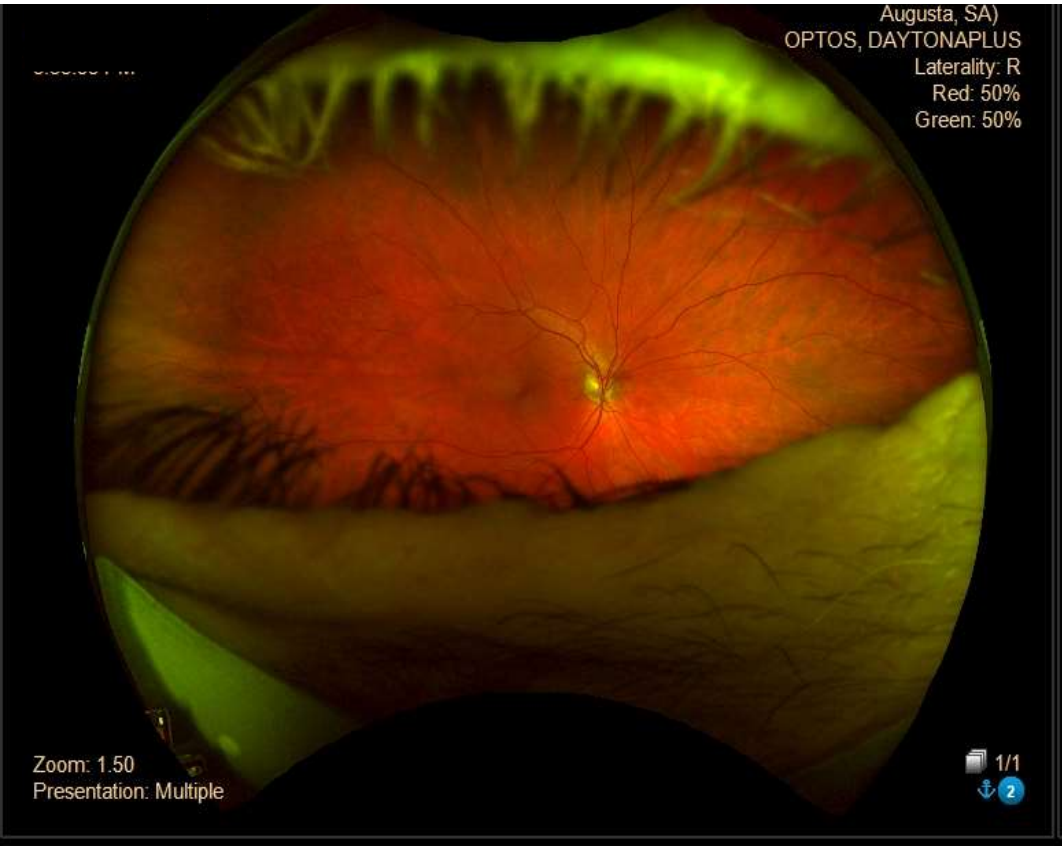


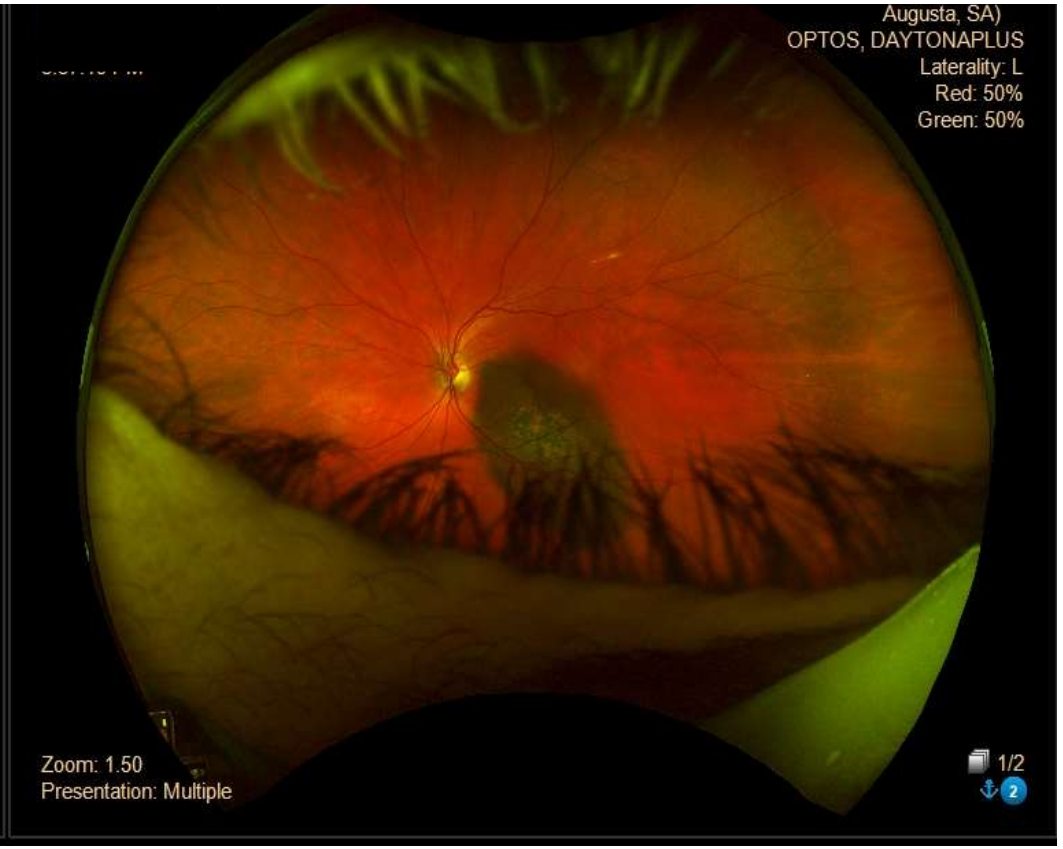
Outer retina
IPL/INL+92um to RPE/BM surface fit+0um

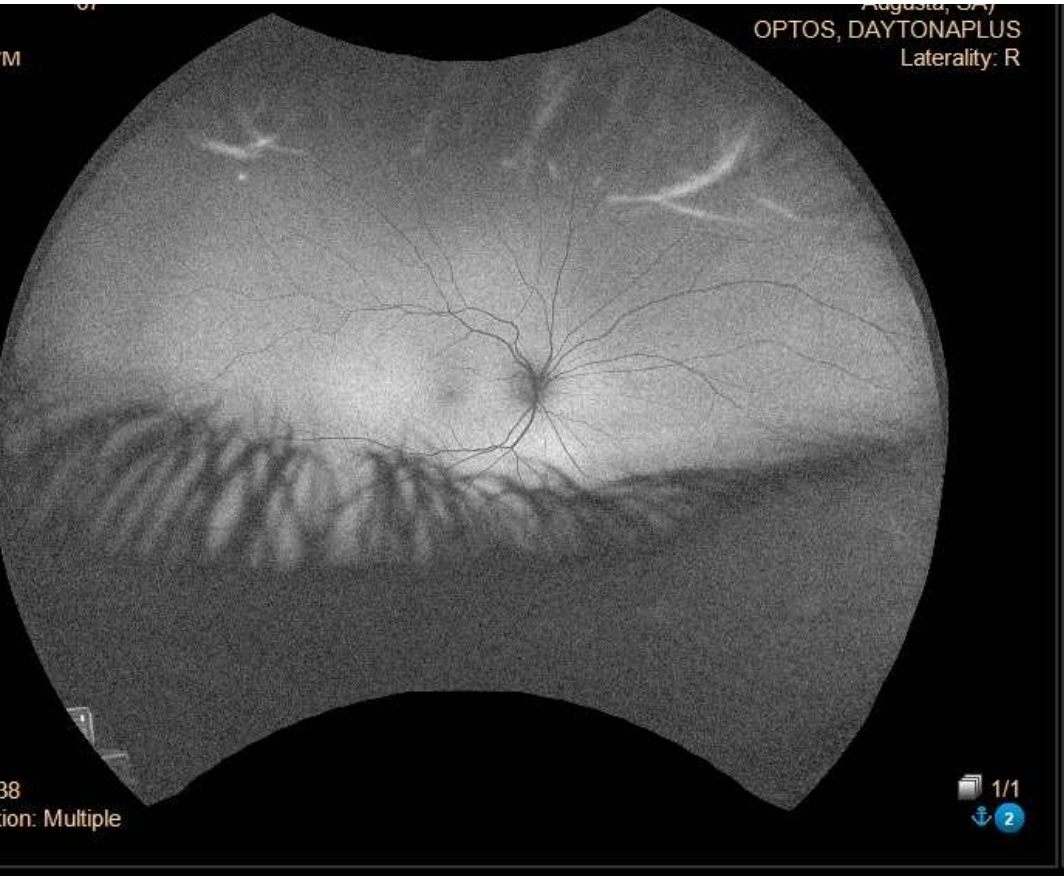


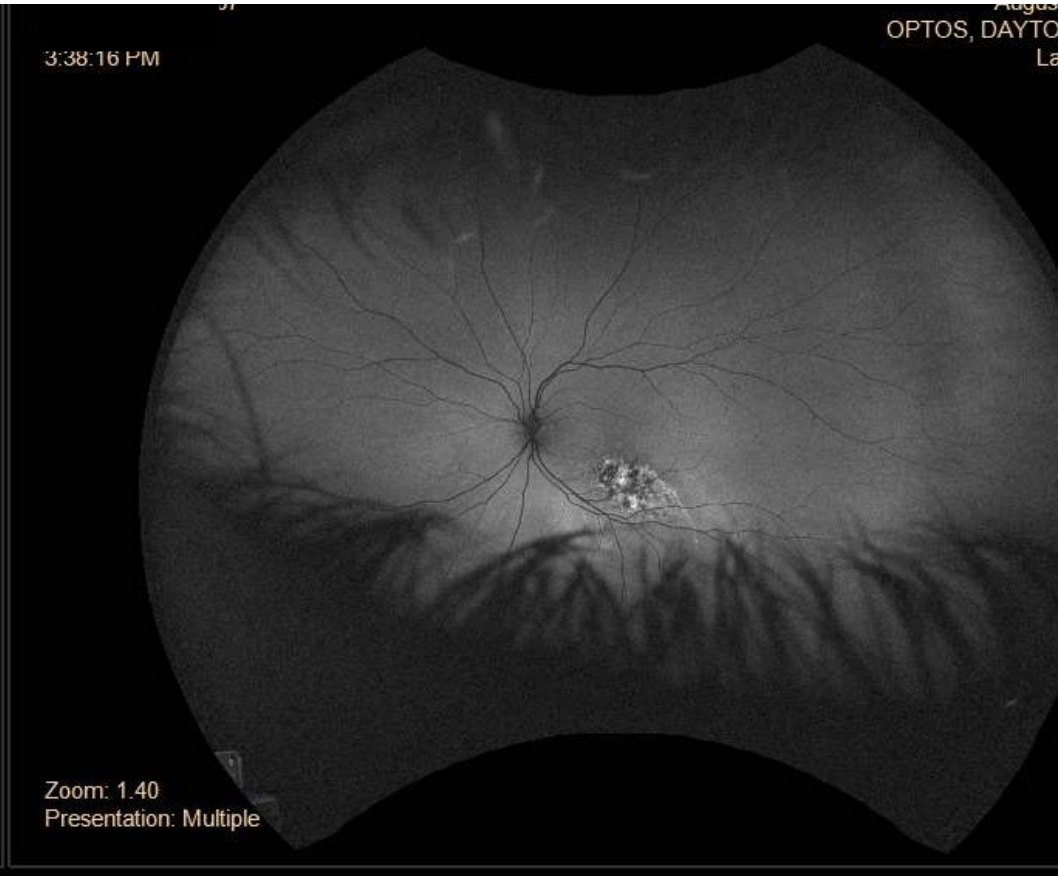
Choroid
AIP, RPE/BM+4um to RPE/BM+63um




Augusta, SA)
OPTOS, DAYTONAPLUS
Laterality: R
Red: 50%
Green: 50%
Zoom: 1.50
Presentation: Multiple
1/1
2


Augusta, SA)
OPTOS, DAYTONAPLUS
Laterality: L
Red: 50%
Green: 50%
Zoom: 1.50
Presentation: Multiple
1/2
2


OPTOS, DAYTONAPLUS
Laterality: R
1/1
2


3:38:16 PM
Zoom: 1.40
Presentation: Multiple

Case 7. Mr J.S. Management

- Referred to oncology Ophthalmologist, seen next day.
- Treated as choroidal melanoma with plaque brachytherapy.
- Liver scans and liver function tests arranged.

Case 7. Mr J.S. 22.12.2021

- PC: since plaque bradytherapy treatment vision been fluctuating, feelings of dizziness and diplopia.
- Examination:
  - BCVA: RE 6/6, LE 6/7.5
  - 4bu pd RE
  - Anterior: right eye pseudoexfoliative material pupil margin. Left eye conjunctiva scars from surgery.
  - Posterior: see next slides.

OCT Setting:MACULA RADIAL 12(9.0mm[1024]) Eye:Both

RS-3000 OCT RetinaScan Advance

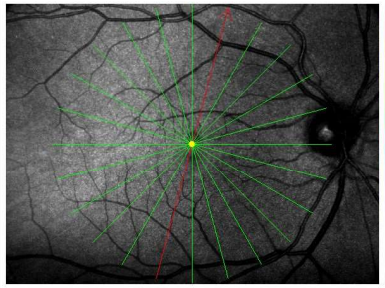
Both

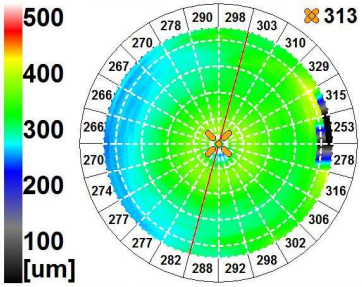
	S/N	Version(F/S)	Date	SQI	SSI	SLO	Focus[D]	Axial[mm]
R	650616	21000/2.10.00	22/12/2020 15:57:58	5/5	9/10	Wide	-0.25	Gullstrand
L	650616	21000/2.10.00	22/12/2020 15:57:02	4/5	7/10	Wide	-0.25	Gullstrand

R

L

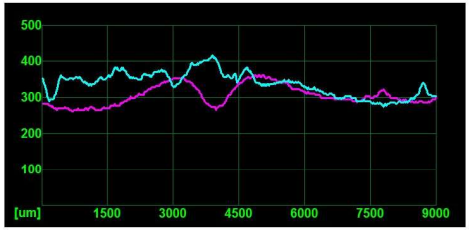
Thickness Map(ILM - RPE/BM)



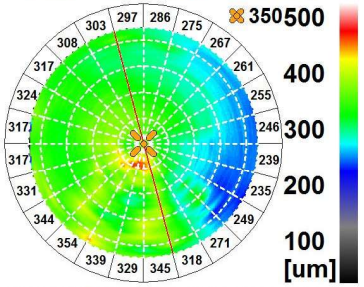


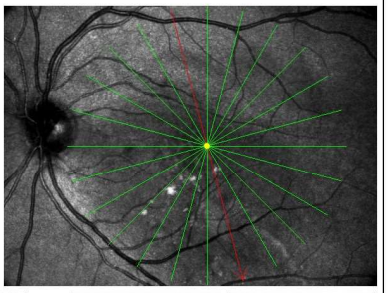
Select OCT

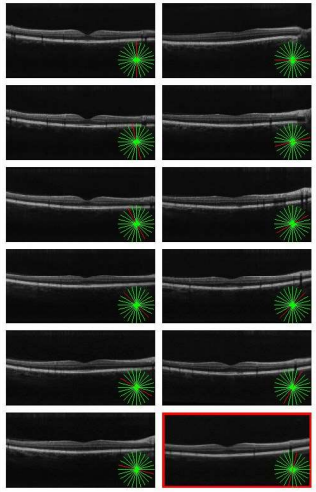
Thickness Graph(ILM - RPE/BM)

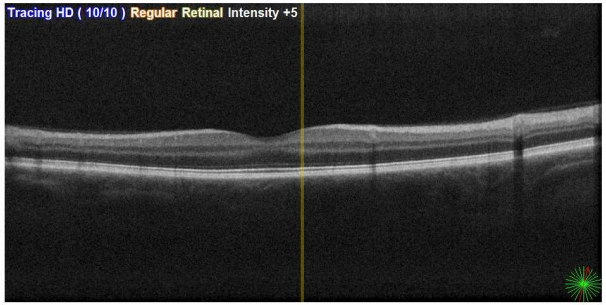


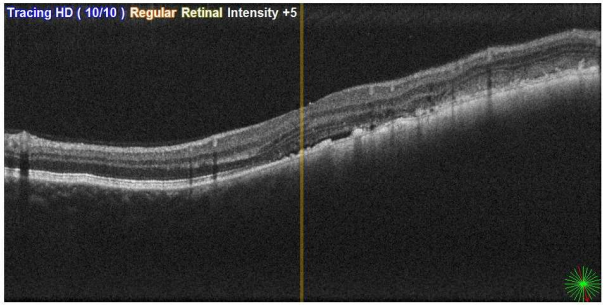
Thickness Map(ILM - RPE/BM)

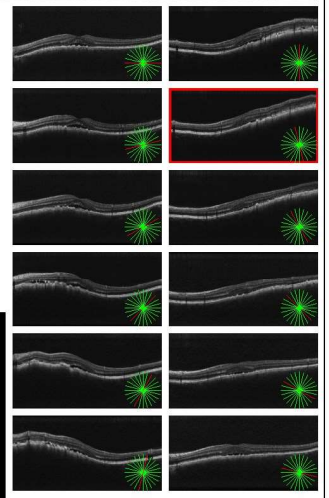


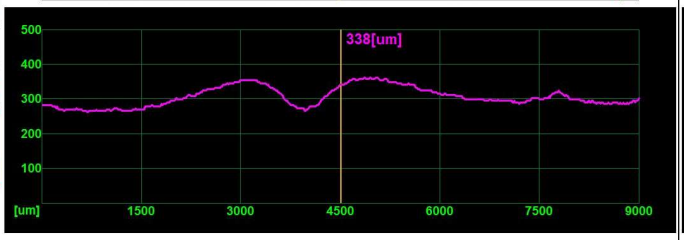


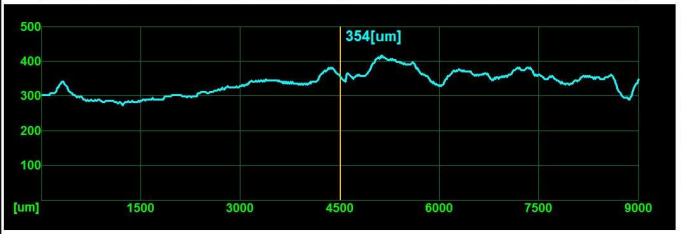


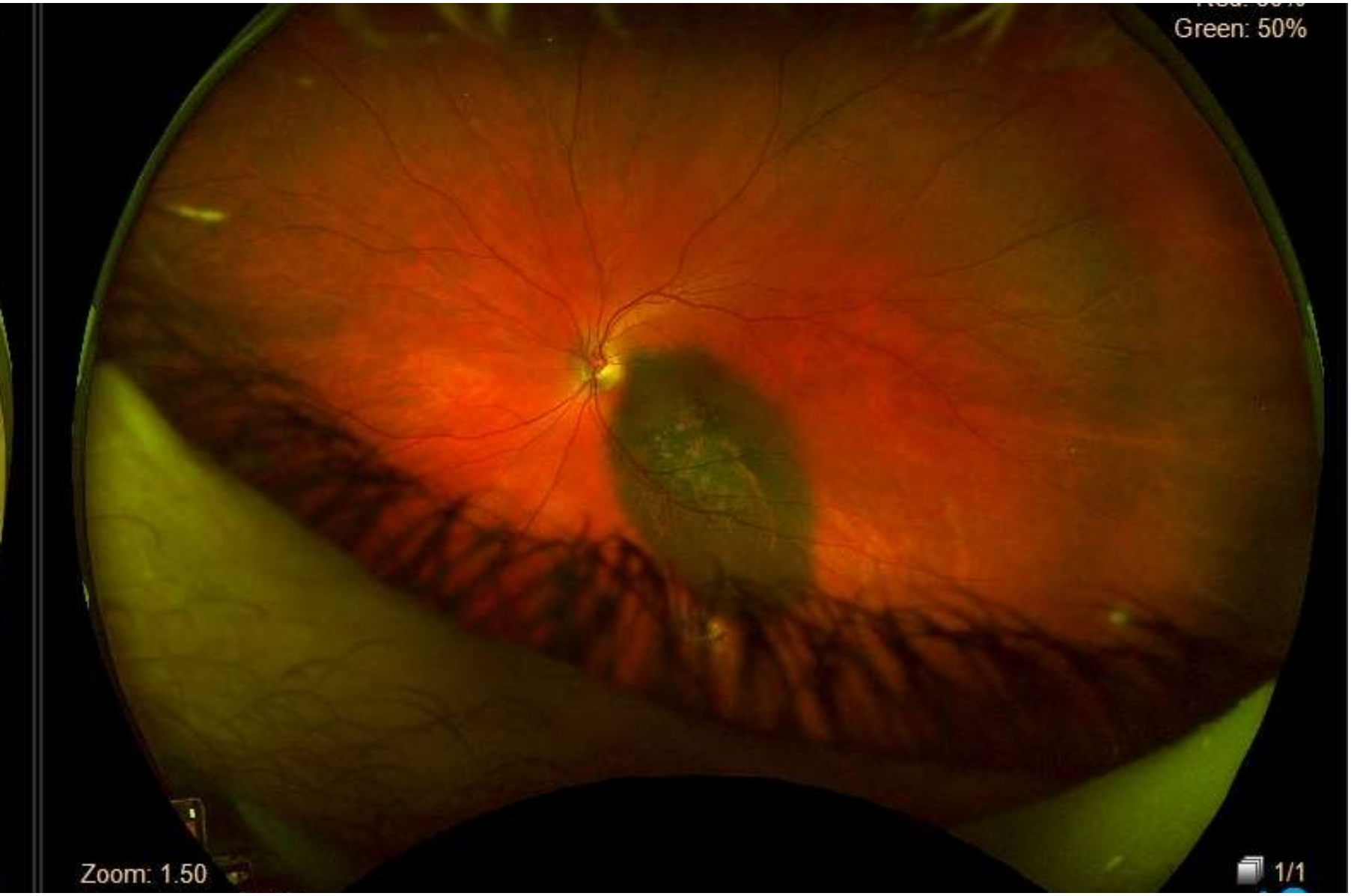


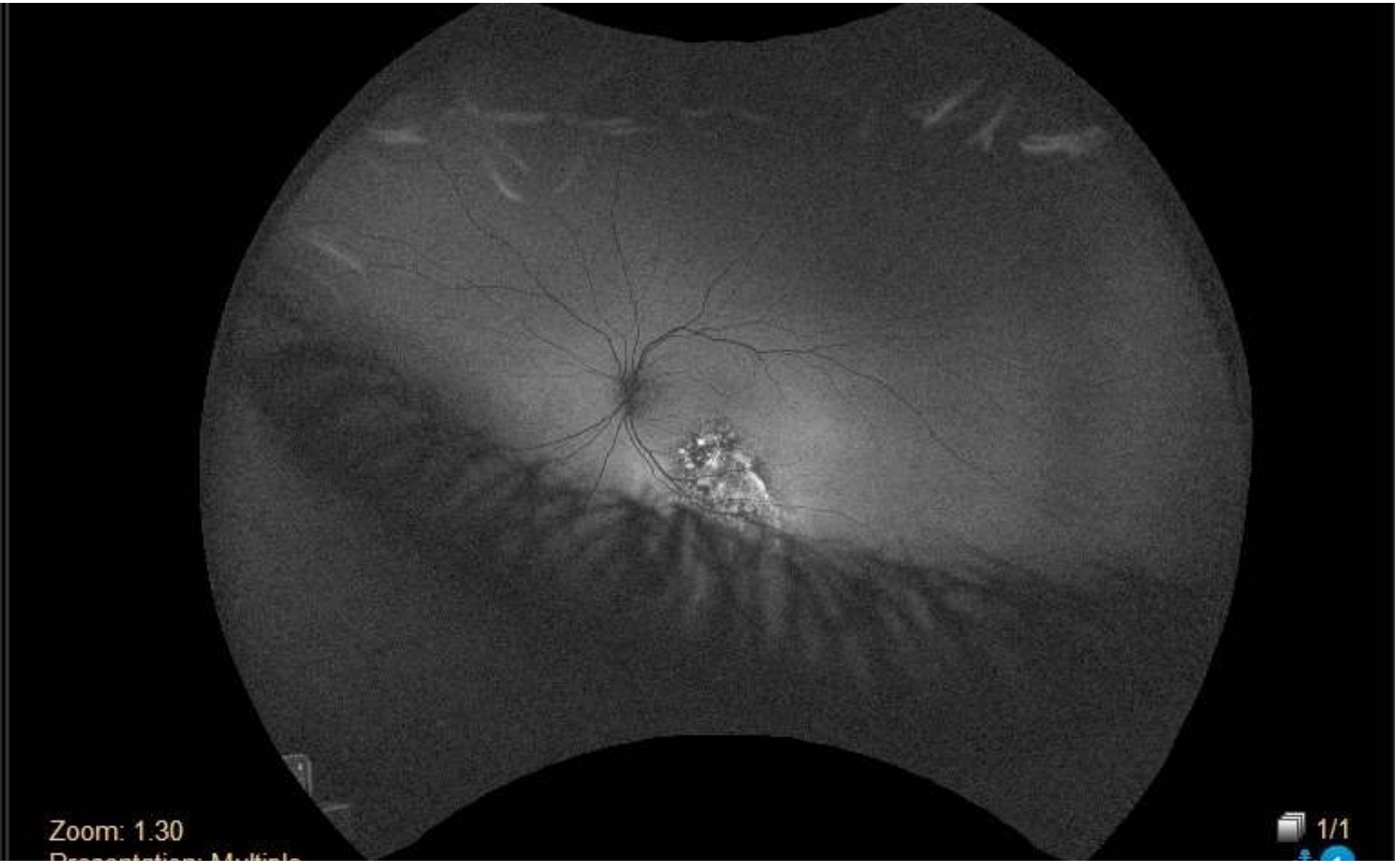









Green: 50%
Zoom: 1.50
1/1


Zoom: 1.30
1/1

Mr J.S. Future Management

- Glasses prescribed for diplopia.
- Update sent to Ophthalmologist regarding LE choroidal melanoma and RE pseudoexfoliation – being monitored 3 monthly as well as frequent systemic checks.

Case 7- CHRPE

Mrs. I.D. aet 57

Blepharoplasty 2016

Vitreous haem 2018

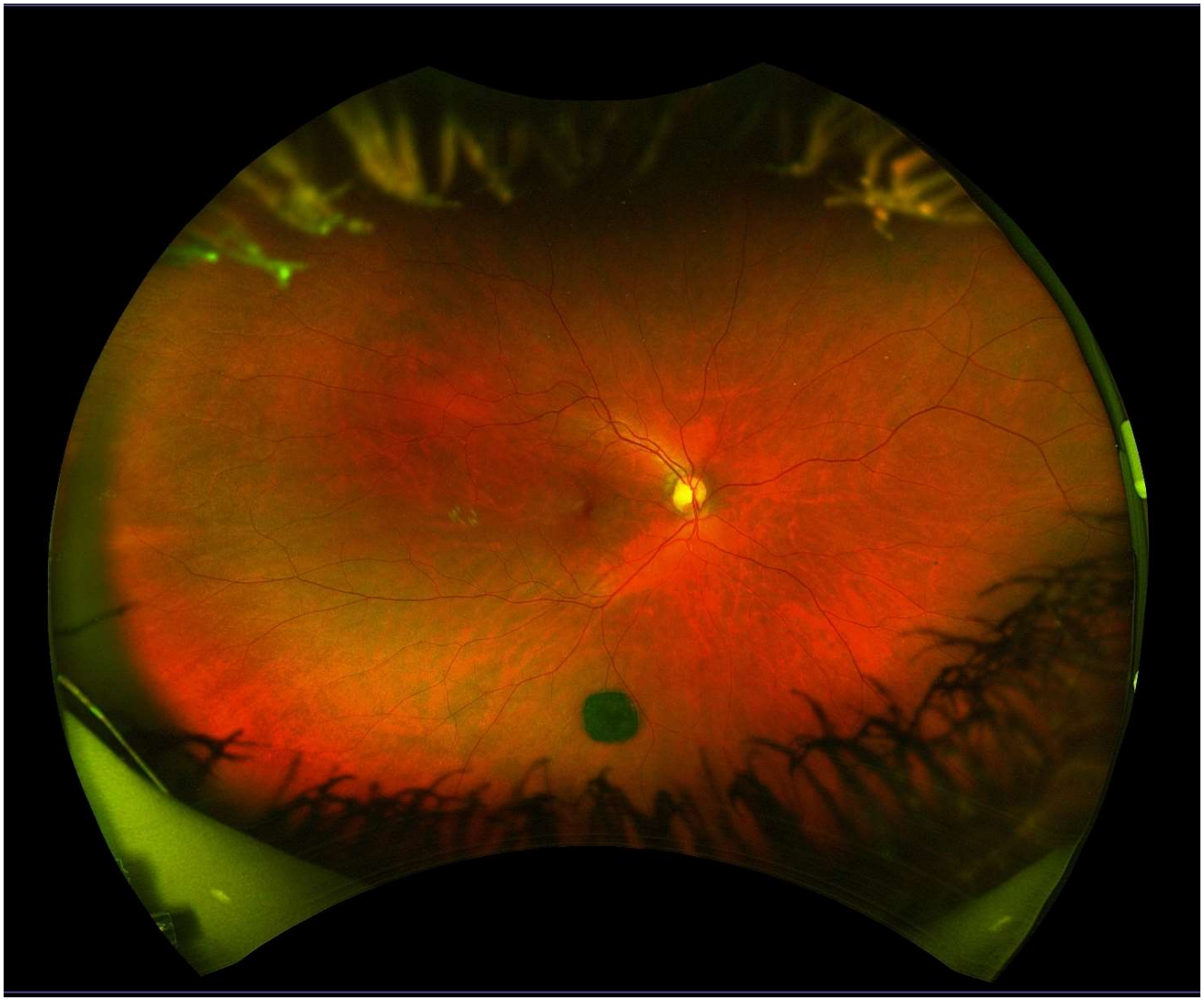
Routine eye examination

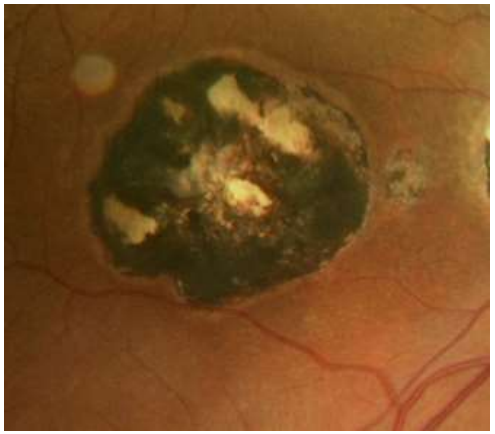
Even grey circular 2DD lesion

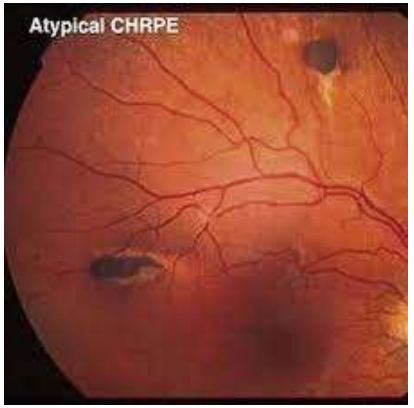
Flat?

No comment from either Ophthalmologist

CHRPE

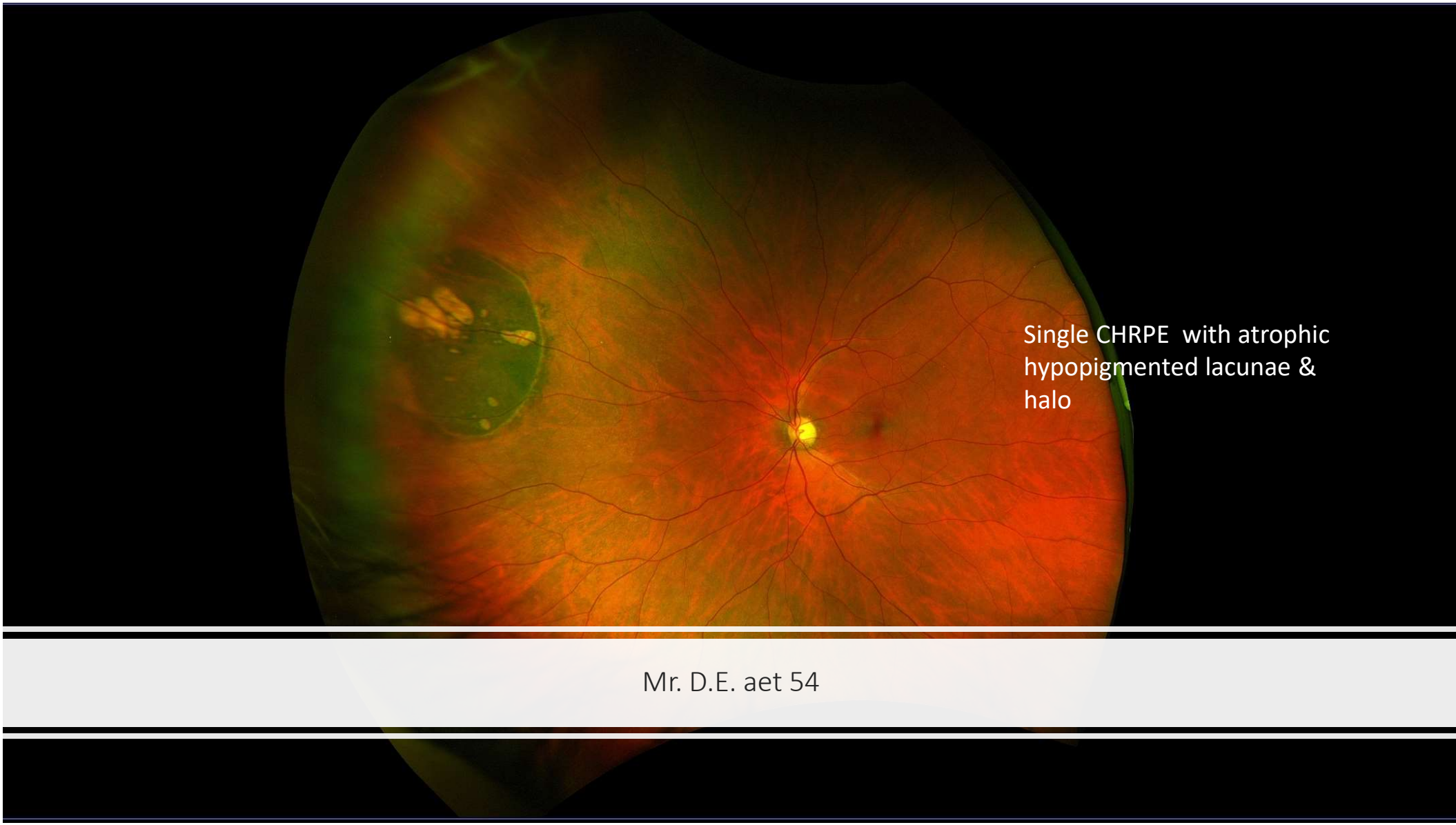






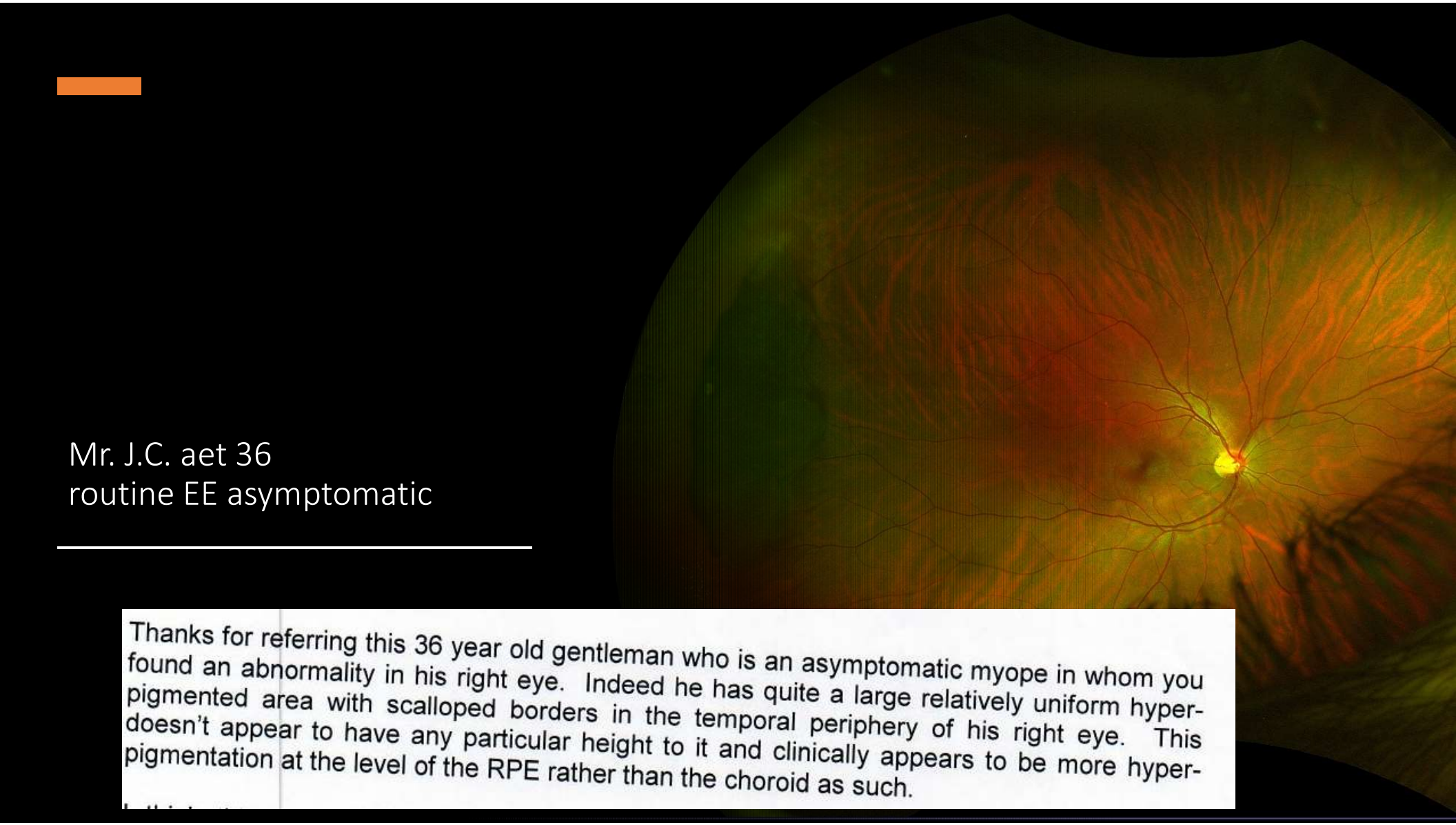
Single	Grouped	Atypical (familial adenomatous polyposis (FAP))
‘’regular & Round” shape	Regular, round, multiple	Bilateral 78%
	Bear track	Retinal invasion
		90% colorectal Ca
		Retinal vascular changes

Congenital hypertrophy of the retinal pigment epithelium (CHRPE)
1.2-4.4%
All can have depigmented haloes or lacunae
Hypo autofluoresence due to melanin
Can grow

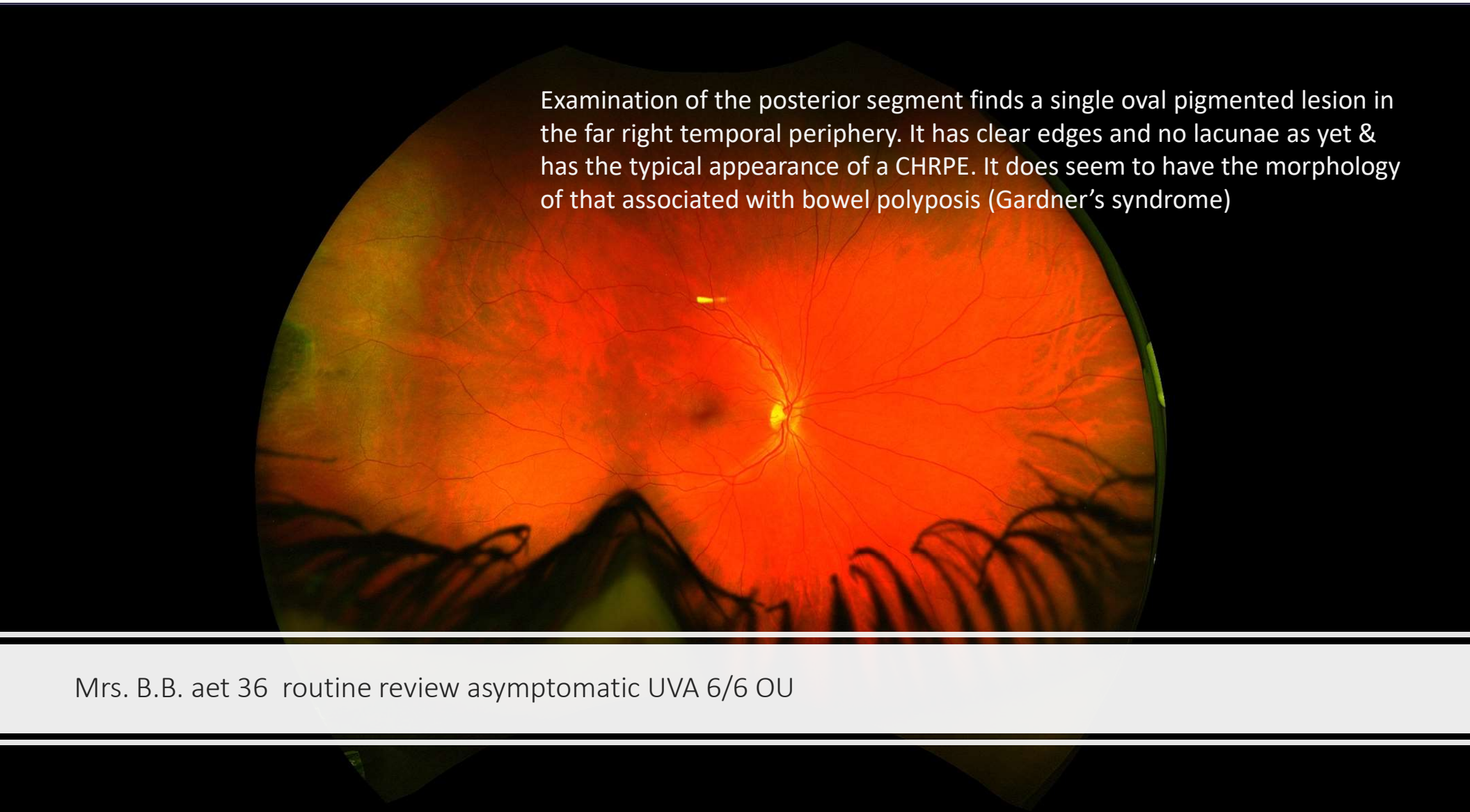


Mr. D.E. aet 54

Mr. J.C. aet 36
routine EE asymptomatic



Thanks for referring this 36 year old gentleman who is an asymptomatic myope in whom you found an abnormality in his right eye. Indeed he has quite a large relatively uniform hyper-pigmented area with scalloped borders in the temporal periphery of his right eye. This doesn't appear to have any particular height to it and clinically appears to be more hyper-pigmentation at the level of the RPE rather than the choroid as such.



Examination of the posterior segment finds a single oval pigmented lesion in the far right temporal periphery. It has clear edges and no lacunae as yet & has the typical appearance of a CHRPE. It does seem to have the morphology of that associated with bowel polyposis (Gardner's syndrome)

Mrs. B.B. aet 36 routine review asymptomatic UVA 6/6 OU

CHRPE vs melanoma

May 01, 2005
Differential diagnosis of ocular melanoma vs. choroidal nevus is crucial By Jennifer Byrne

	Melanoma	Choroidal Naevus	CHRPE
Optomap 100% Red Choroid only	Visible & dark	Visible & dark	Halo & lacunae obvious hyperpigmented
Optomap 100% green retina only	Dark & fuzzy edges	Not visible	Halo & lacunae obvious Less pigmented
3D	elevated	Flat, can have halo	Sl raised
vascularity	Own circulation (FA takes up more dye = metabolic activity)		
appearance	Raised, vascular? Subretinal fluid, orange	Drusen = chronocity	Surrounding halo & lacunae
associations	Dermal melanoma		Colon cancer (FAP)

AMERICAN ACADEMY OF OPHTHALMOLOGY®

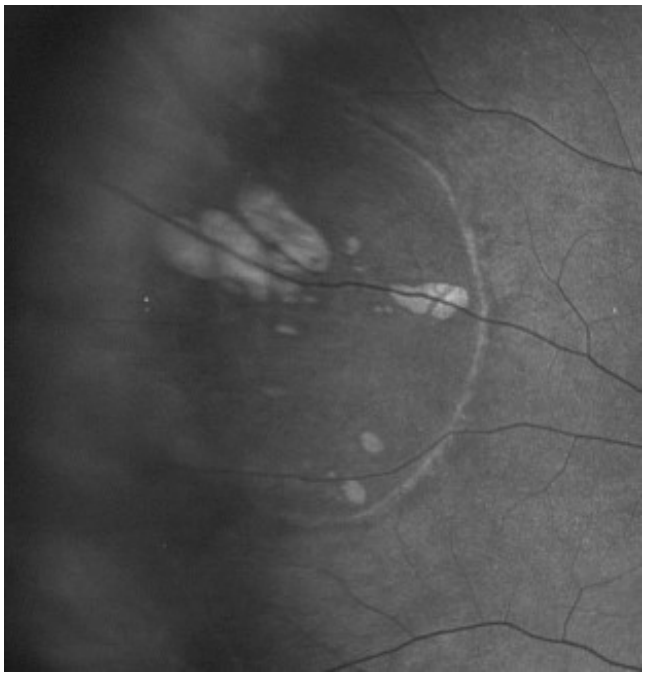
Distinguishing a Choroidal Nevus From a Choroidal Melanoma

Written By: Albert Cheung, Ingrid U. Scott, MD, MPH, Timothy G. Murray, MD, and Carol L. Shields, MD
Edited by Ingrid U. Scott, MD, MPH, and Sharon Fekrat, MD

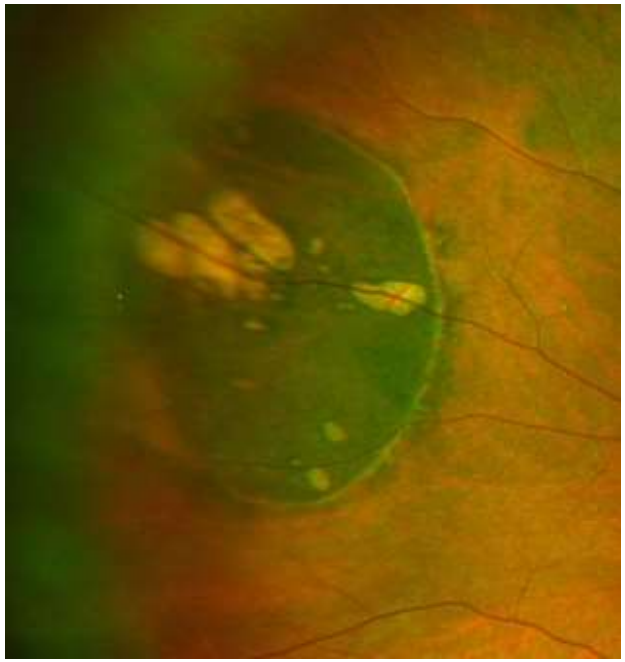
To Find Small Ocular Melanoma Using Helpful Hints Daily" (TFSOM-UHHD) has been proposed. This stands for thickness greater than 2 mm, subretinal fluid, symptoms, orange pigment present, margin within 3 mm of the optic disc, ultrasonographic hollowness (versus solid/flat), absence of halo and absence of drusen.

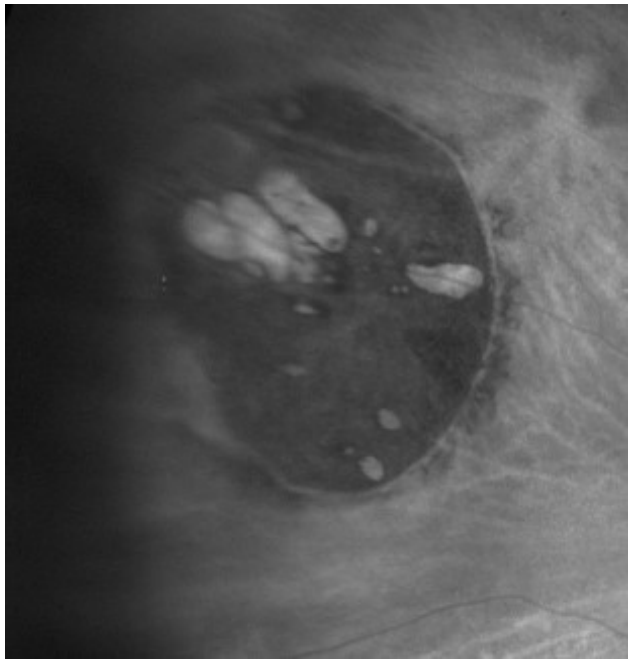
BMES Choroidal naevi 6.5% middle aged white Australians
Choroidal melanoma 6 per million

Optos CHRPE



100% green





100% red

Quiz A solo flat, pigmented lesion is found in the temporal periphery of one eye. It has both hypopigmented lacunae and a halo. Appropriate course of action is PHOTO ####

a/ Image the lesion and review in 6 months
b/ Assess for FAF hypoautofluoresence with fluorescence of only the lacunae & halo
c/ Refer to GP on suspicion of Gardner's syndrome
d/ Refer to retinal Ophthalmologist as they are difficult to tell between typical & atypical
e/ all of the above

Breakout