Retina oddities and emergencies, a rural perspective

Mitch Hancock

Part one

Learning Objectives

- 1 Discuss the differences between retinal emergencies and urgencies
- 2 Recognise retinal emergencies and appropriately triage and refer
- 3 Use new imaging technologies to recognise change

Learning Objectives

- 1 Discuss the differences between retinal emergencies and urgencies

- 2 Recognise retinal emergencies and appropriately triage and refer

- 3 Use new imaging technologies to recognise change

- +++ So not pair and share but these will be the slides that need to take photo of and use to discuss in the breakout groups. ++++

Acknowledgements

Massive thanks you to Malcolm who worked away at powerpoint slide set up and many of the examples over the Victorian lockdown and in the many months since.

Malcolm Gin is self employed and has worked in South Gippsland for over 30 years.

He undertook clinical teaching at the University of Melbourne between 1995-2000 and is currently involved in the final year rural placement rotations for students.

Since 2014 he has lectured on co-management ACO-COT.

Malcolm has a particular interest in therapeutic and co-management of ocular disease and is passionate about independent optometry.

Acknowledgements

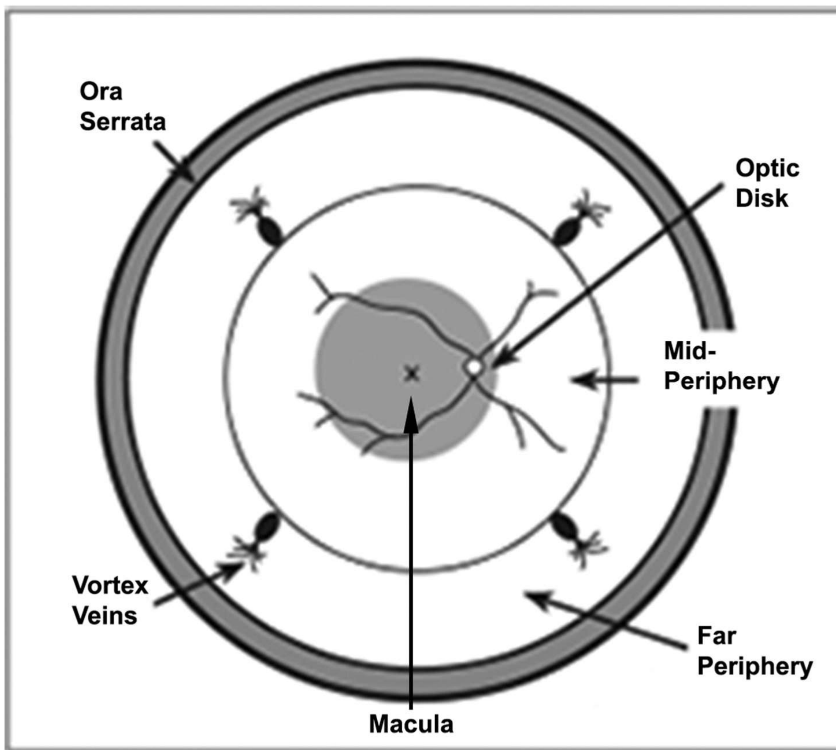
Acknowledgements

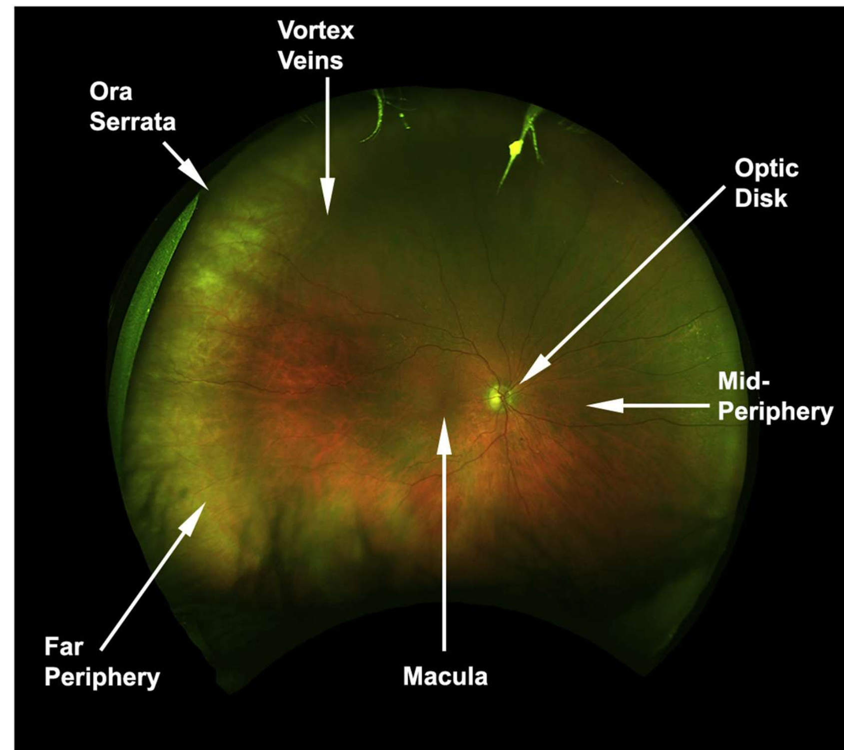
Emma Nutt - Martin Diep - Clarissa Sheehan

So what will begoals and state of play

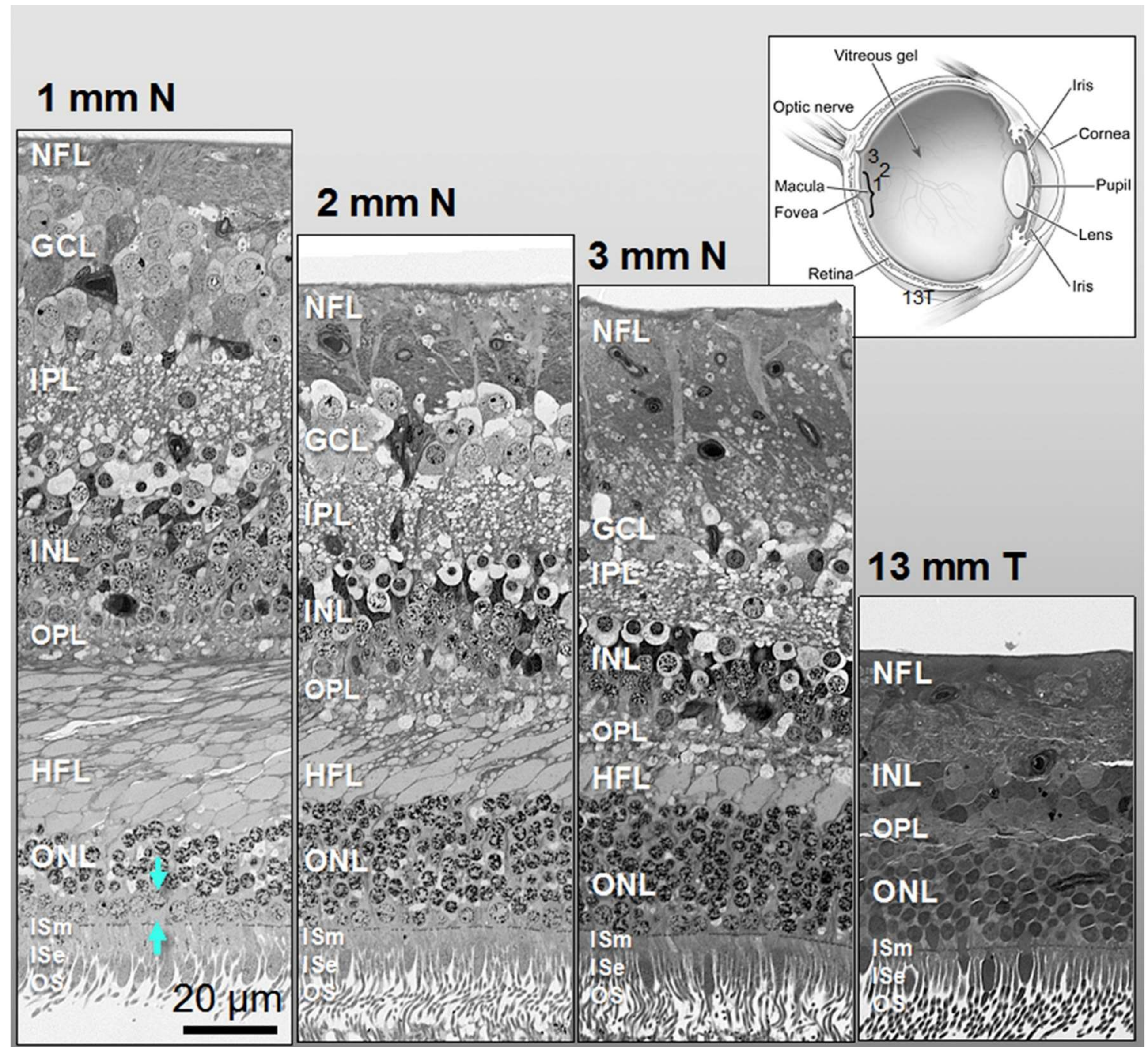
- This will be mostly case studies
- Macula the most important but essential everything else but the macula
- Interactive as possible
- I am not a retinal specialist
- If you know something, let's share
- If you want to know something, ask and chance are we will all learn something
- My action is not always correct
- I'm looking to learn as well

Peripheral Retinal Anatomy





Peripheral Retinal Anatomy



GROSS ANATOMY-REVIEW

The retina proper is a thin and delicate layer of nervous tissue- covers ¾ of inner eye wall

Grossly retina is divided into two parts;

Central retina

1. Foveala
2. Fovea
3. Para fovea
4. Peri
5. Macula

Rich in cones, has more ganglion cells per area than elsewhere, and is a relatively small portion of the entire retina.

Clinical function

- Designed for fine visual acuity,
- Photopic vision
- Stereopsis',
- Color vision

Peripheral retina

1. Near periphery
2. Mid periphery
3. Far periphery
4. Ora serrata

Makes up most of the retina, and rods dominate

Clinical function;

- Designed for gross vision and
- Scotopic/night vision
- Sensitive to motion and stimulates turning of eye/head

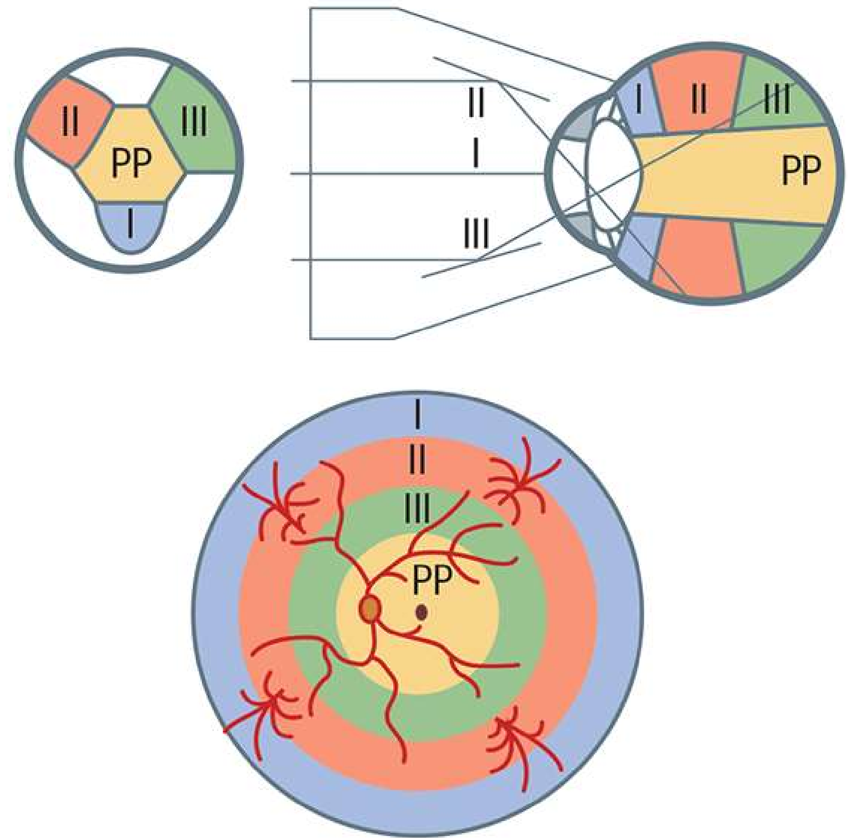
CTN….

- Vitreous base is 3-4mm wide stradding the ora serrata
- Vitreous is strongly adhered at vitreous base

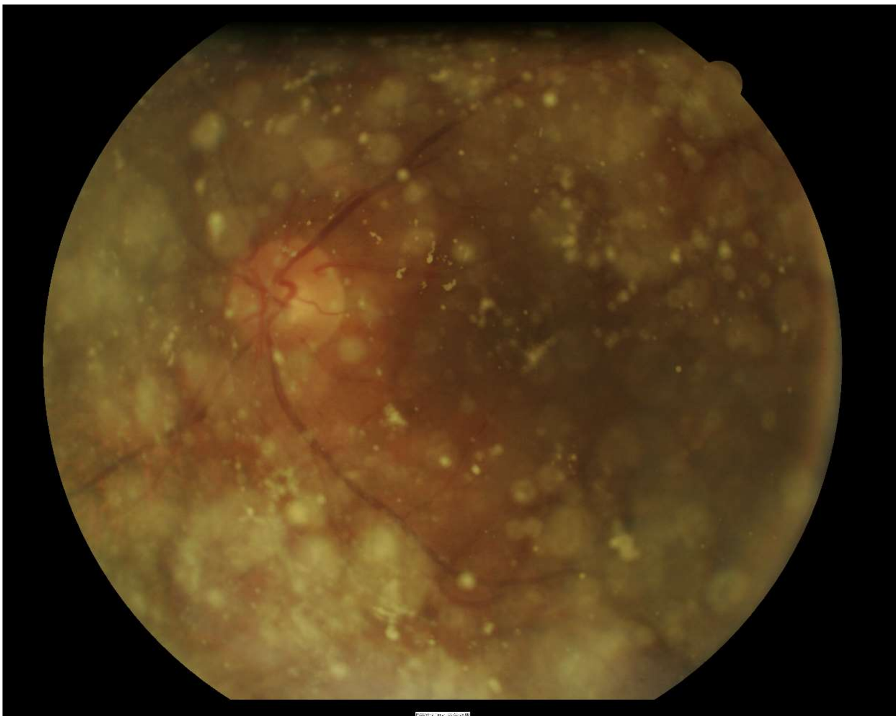
Implication-

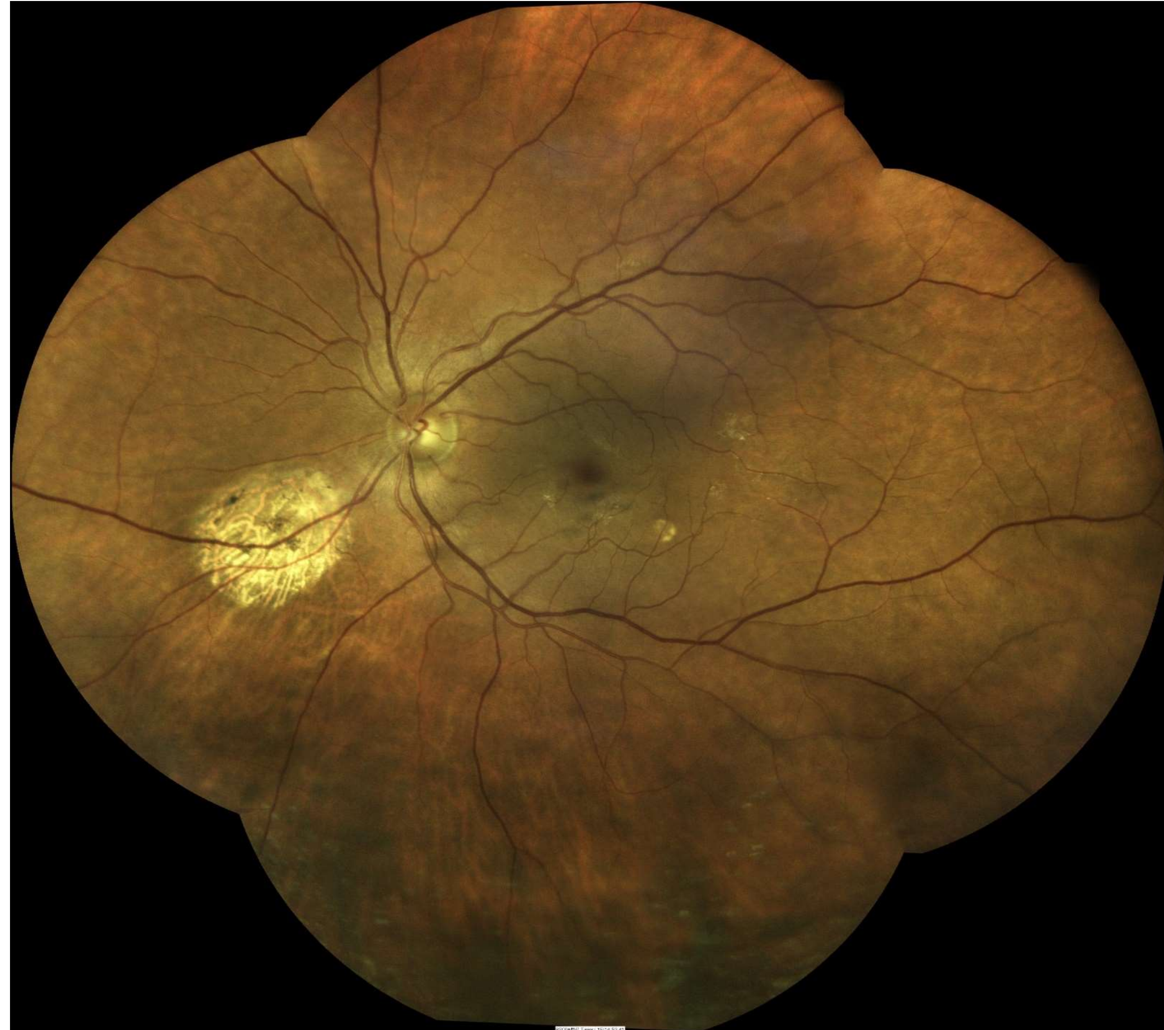
1. Posterior Vitreous detachment may case tractional retinal detachment
2. Blunt trauma may cause avulsion of thin ora serrata and vitreous base and tearing of pars plana and anterior border of retina

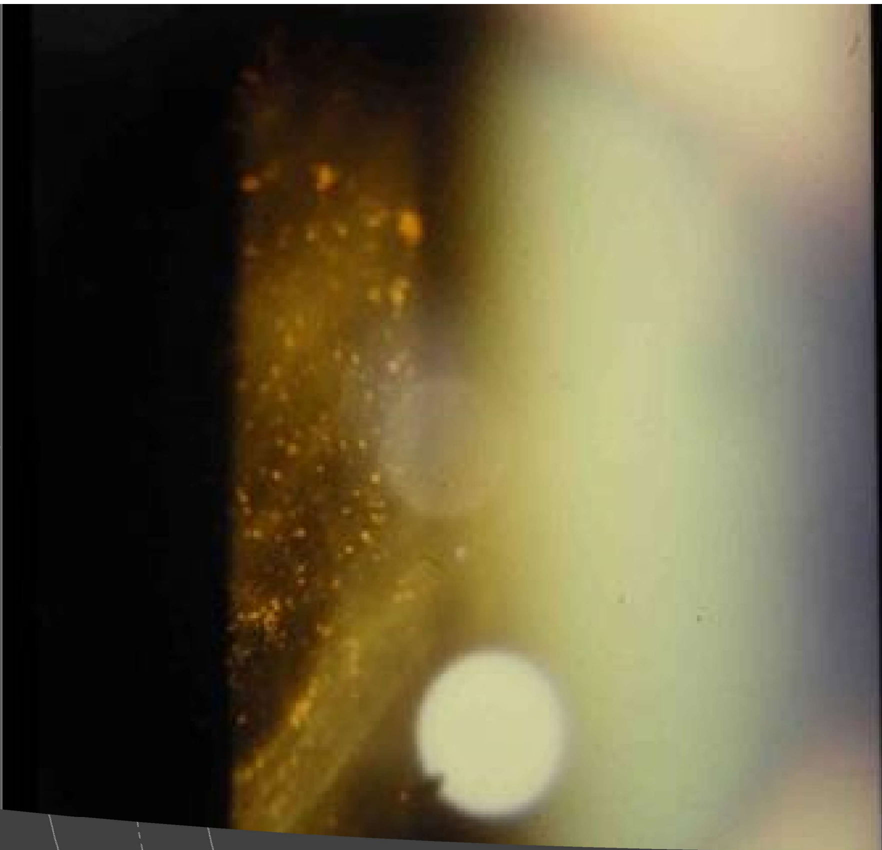
Tools for the job?



DGI vs eidon

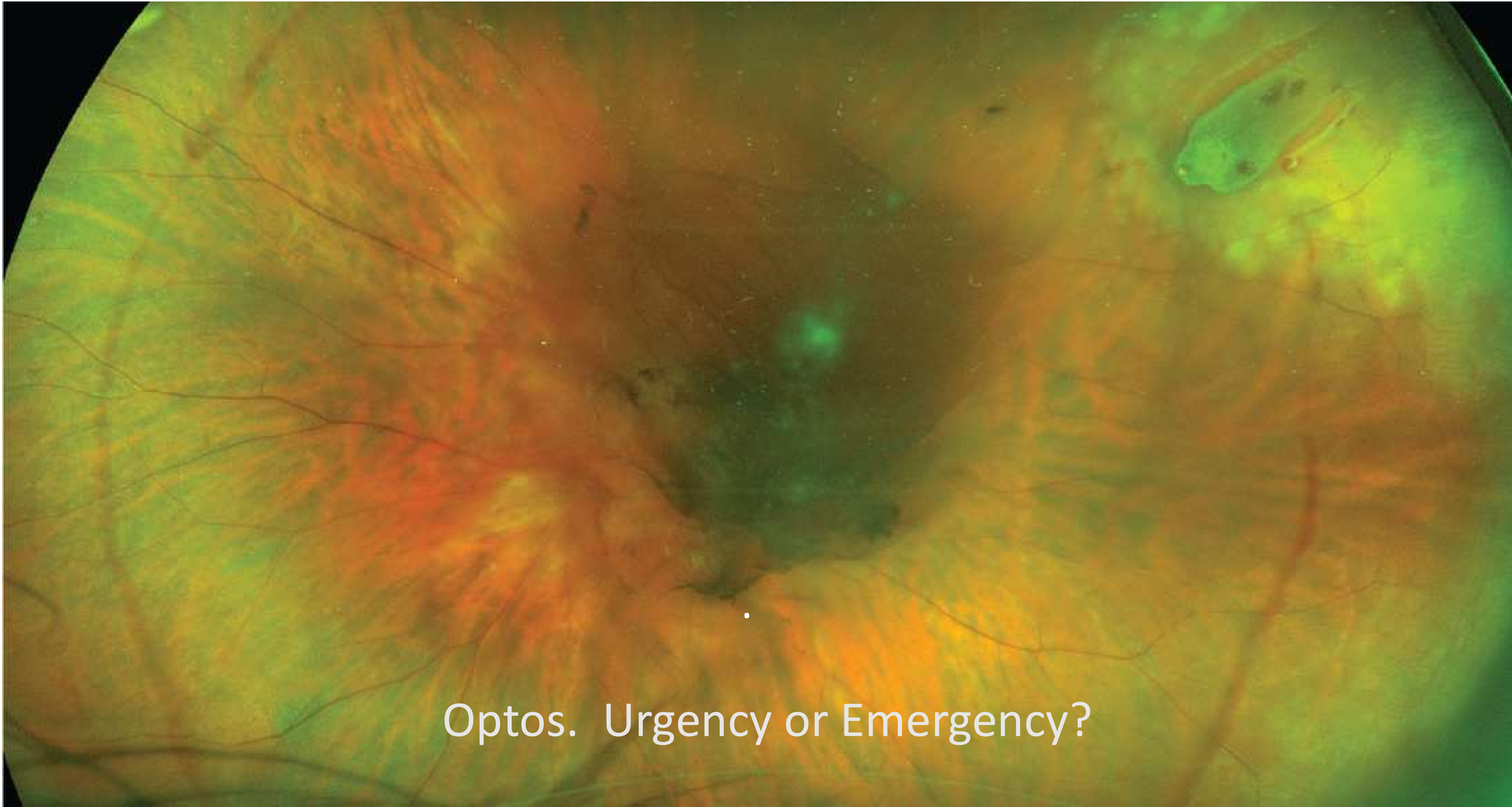






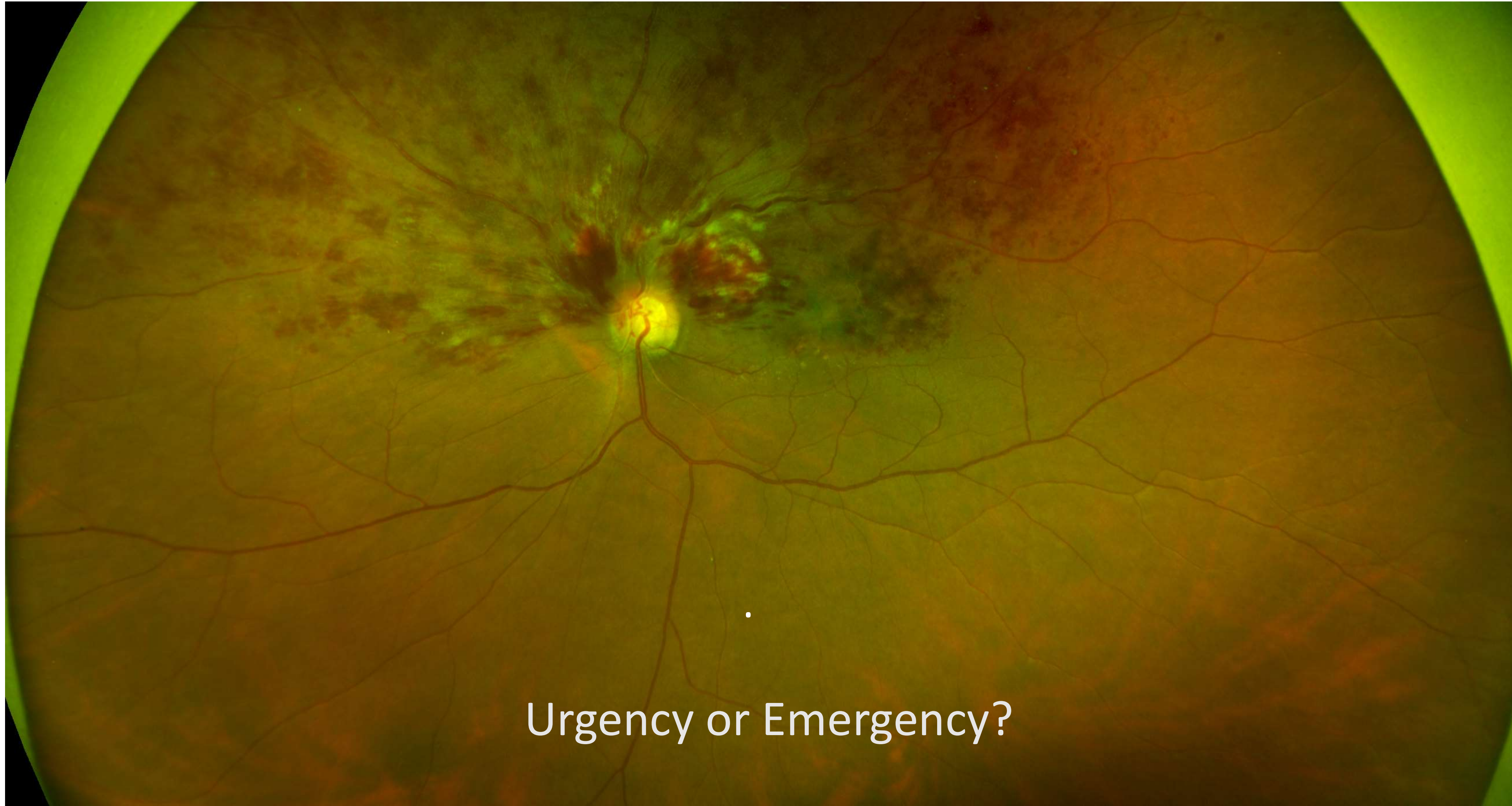
Shafers Sign?

- Slitlamp still valuable tool.


Optos. Urgency or Emergency?

Retinal horseshoes tears after cryotherapy around it

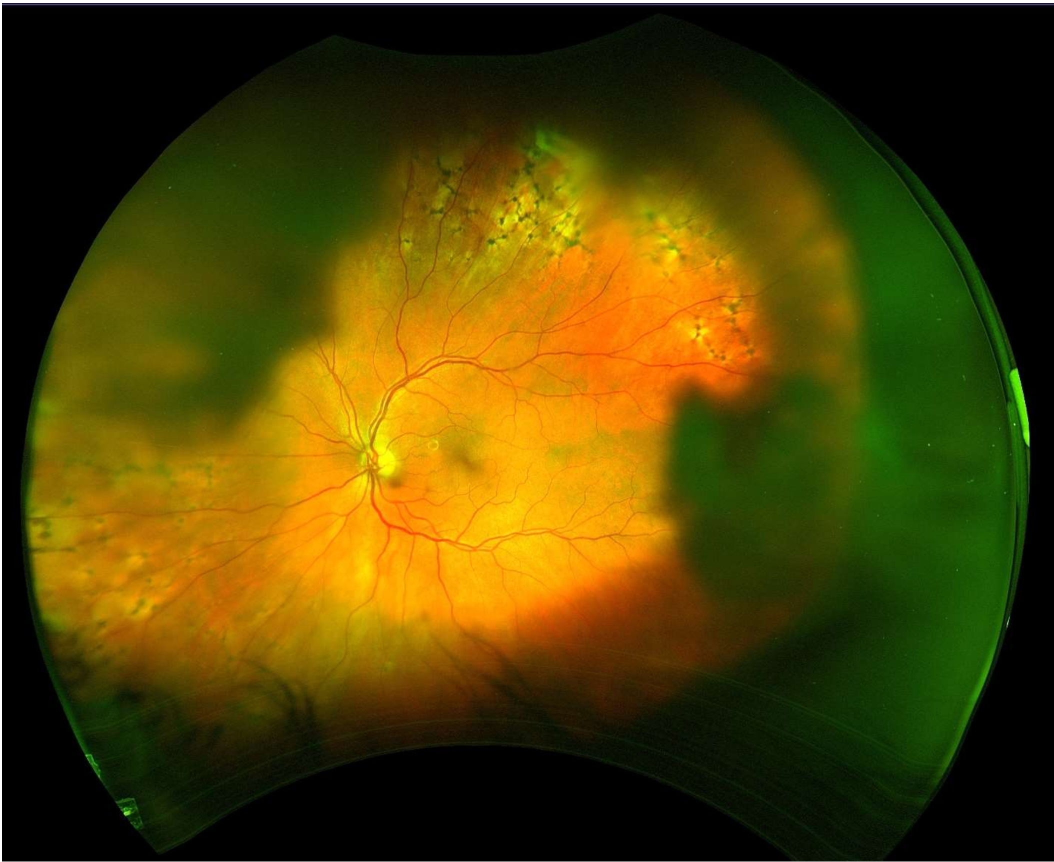
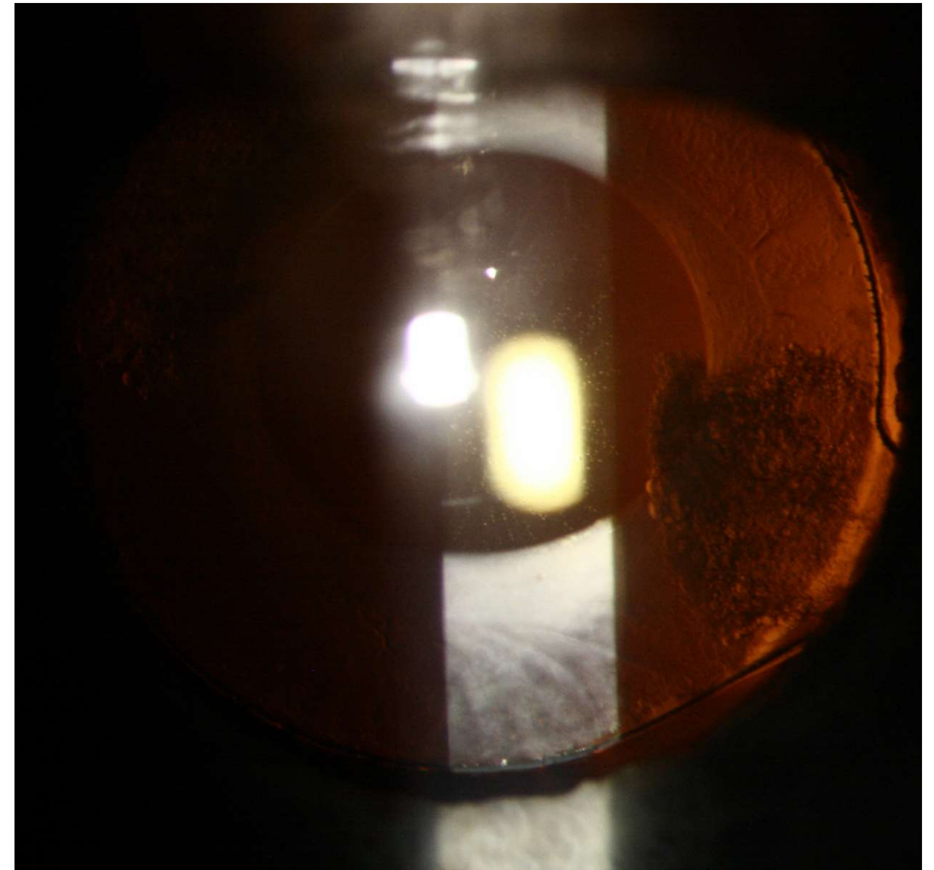
Note the change in the area that had cryo weeks before


Urgency or Emergency?

- **Emergency**
- a serious, unexpected, and often dangerous situation requiring immediate action, ie within 24 hours.

The main difference between emergency and urgency is that in emergency there is immediate threat to vision or ocular health whereas in urgency, there is no immediate danger but if not taken care in a given period of time, then the situation may turn into ..

- **Urgency**
- importance requiring swift action.
- Several days to a couple of weeks?

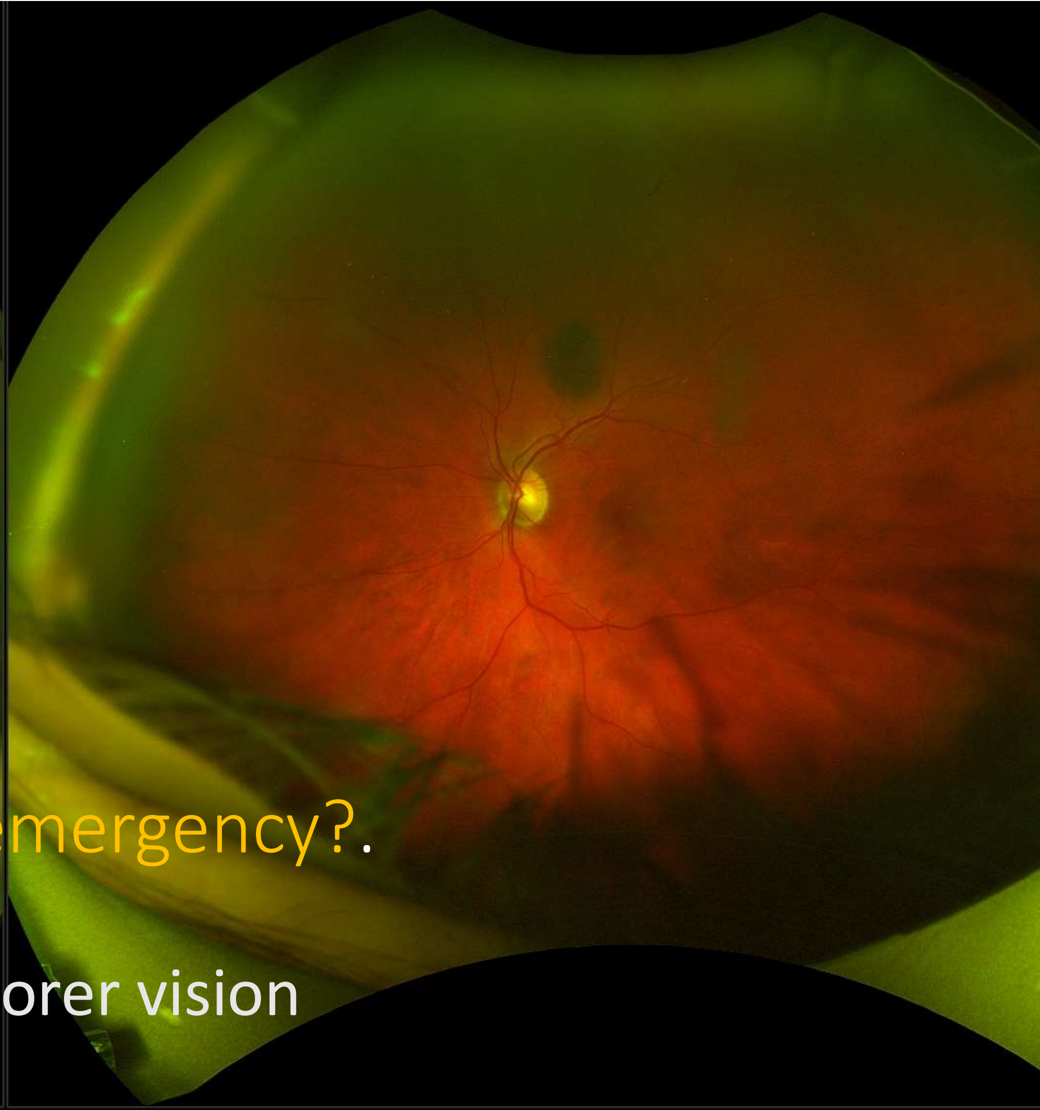



0.3-1.1% Cat Sx retained cortex

Capsular bag shields nucleus & cortex from body's immune system, otherwise antigenic inflammation
Phacoanaphylactic uveitis
What happens with capsulotomy?

Mrs. K.L. aet 69 RE

- Donor cornea Hazy
- Anterior Phimosis
- Pupil round and reactive
- No IN
- VA >6/60, 6/9.5
- R prev 6/24



Urgency Or emergency?.

RE has poorer vision

Vitreal Haemorrhage (non-diabetic cause)

- This case conservative treatment as Eye had reduced vision & COVID
- Emergency referral?
- Let Haemorrhage clear then B scan (This the traditional response)

- Now surgeons treat more aggressive as have poor outcomes with previous conservative approach
- 70% have retinal tear
- Vitrectomy, B Scan, find Retinal tear
- Emergency, triage with E & E or VR surgeon

Mr. T.T. aet 60

28-6-20

3 days floaters, cobwebs OD

vision OK

2 years ago happened to LE

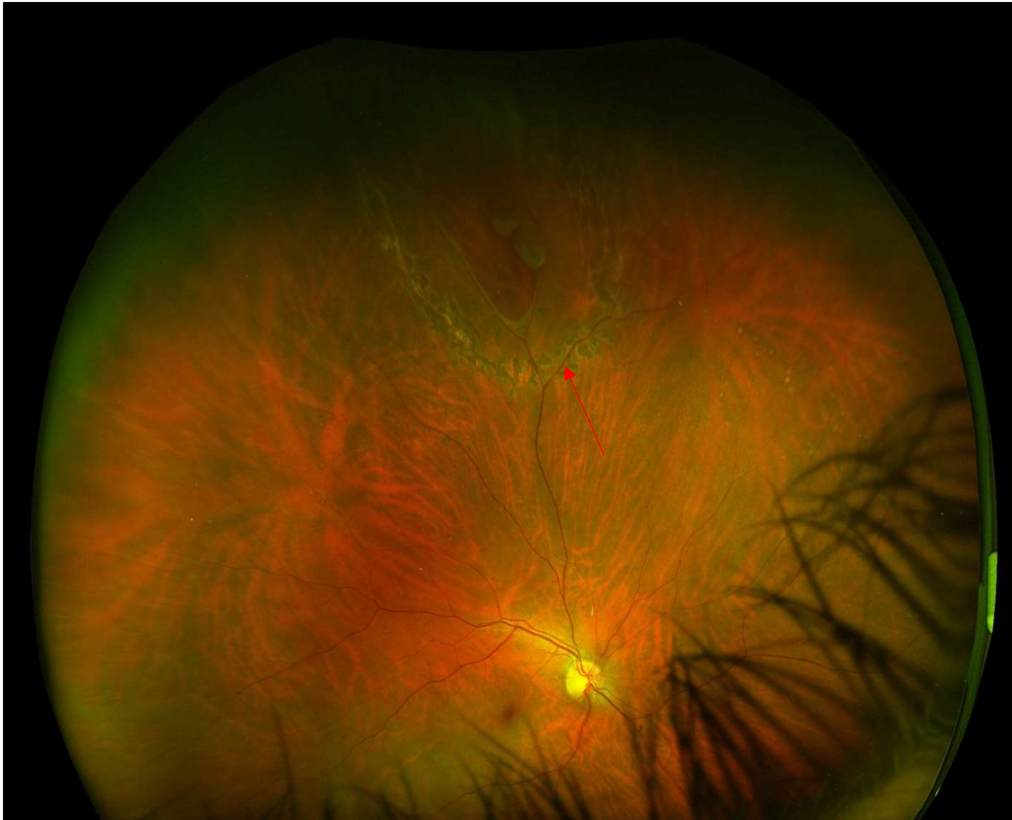
PVD and nil Shaeffer's

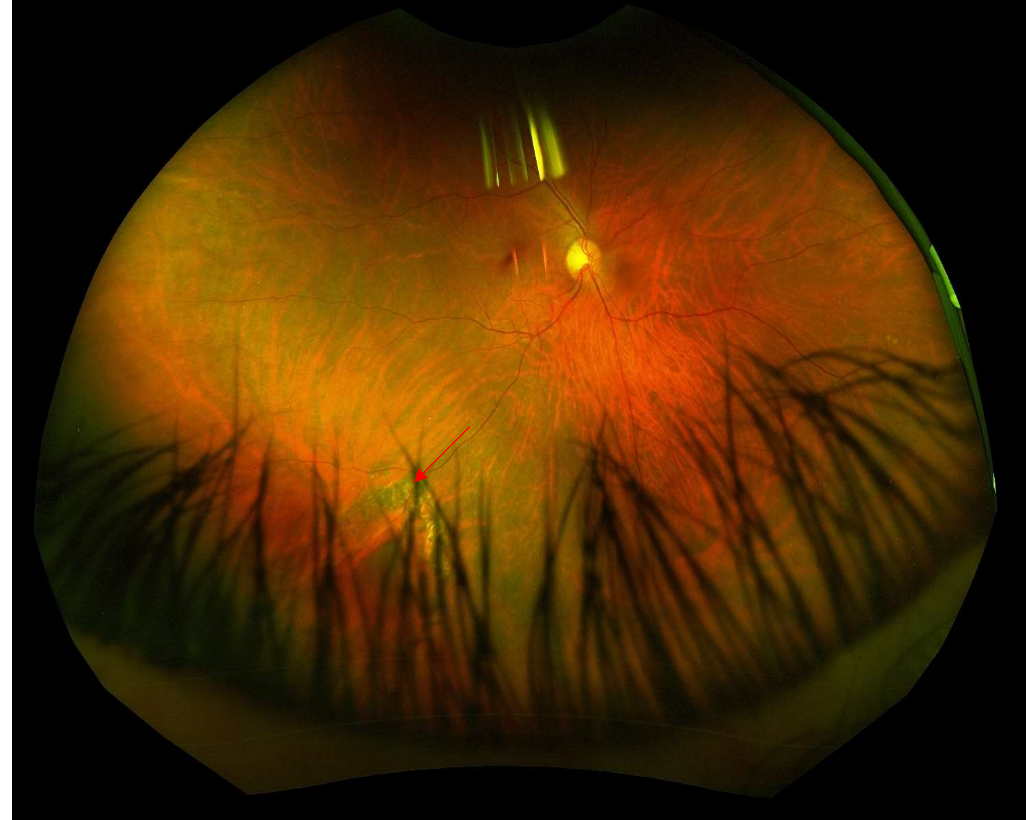
subhyaloid haem temporal

and vitreal haze & haem

Urgency or emergency?

Mr. T.T. horseshoe tears sup'ly and inf'ly 17/7/20 3 weeks later





Causes of Vitreous haemorrhage

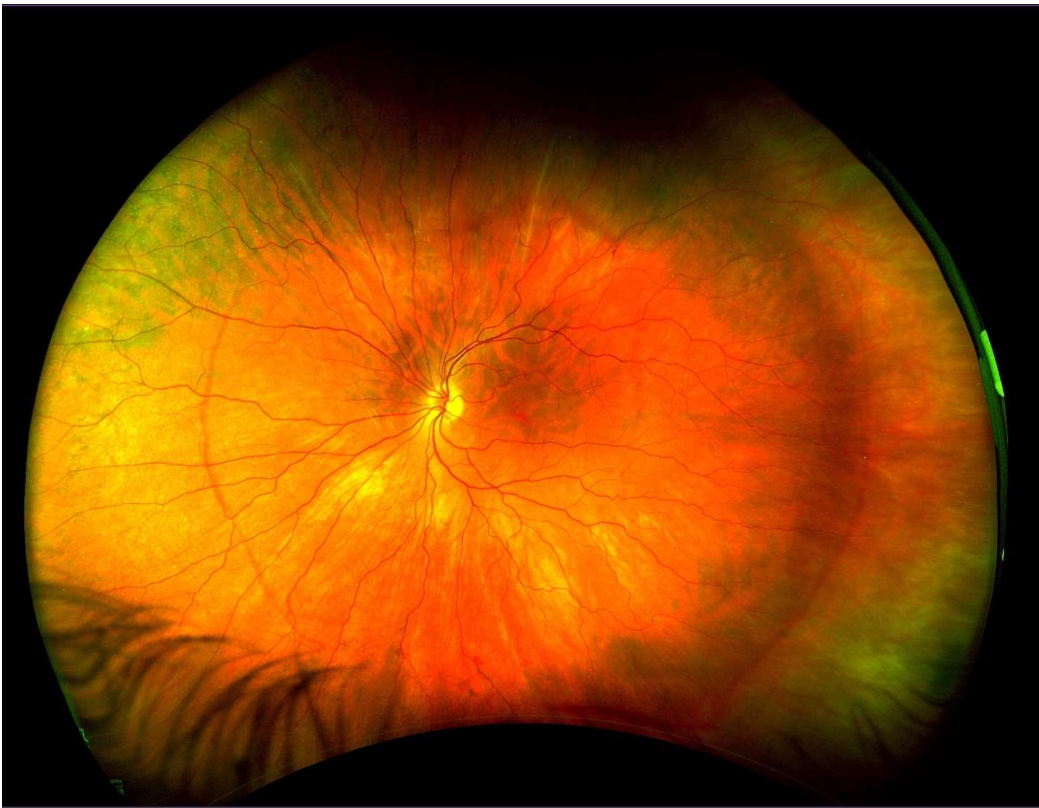
- Abnormal new retinal B.Vs = Ocular ischaemia, Diabetic, peripheral choroidal neovascularisation
- Retinal tears via PVD
- Retinal BV leak via PVD
- Trauma
- 7 in 100000 annually

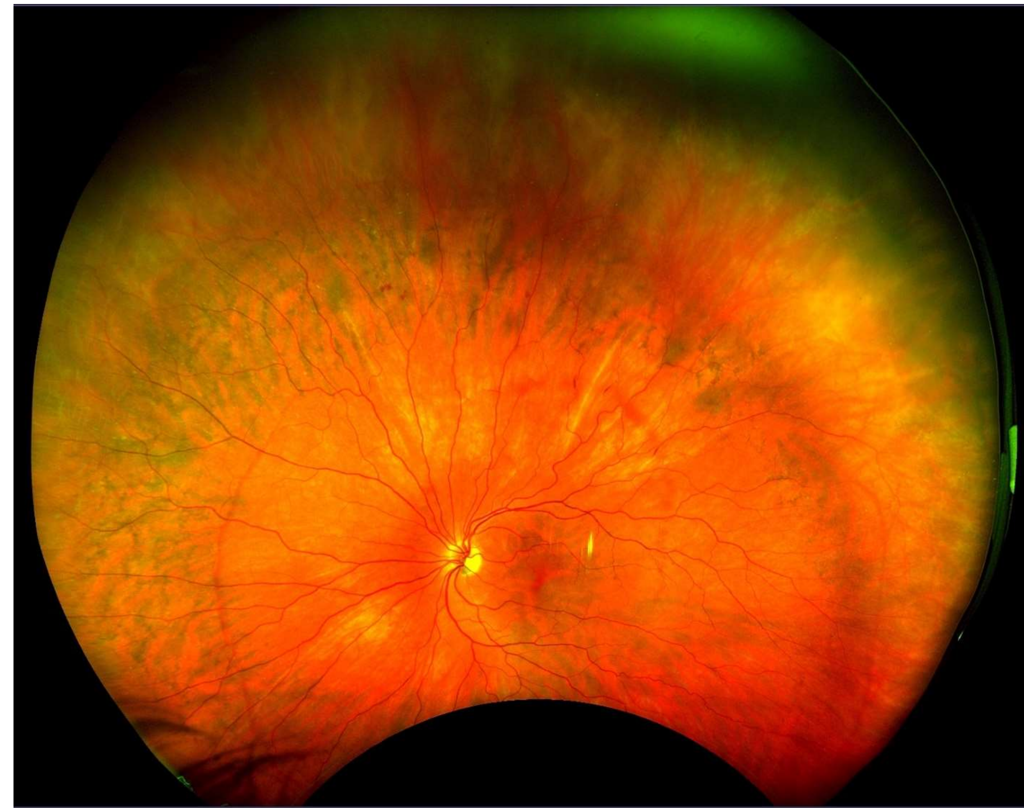
Mr. G.M. 6/11/2020

LE black spots & black circle for 3 days & occas flash NIDDM BSL 7

Nil Shafers, PVD, annular subhyaloid haem pooling inferiorly no obvious retinal tear/hole

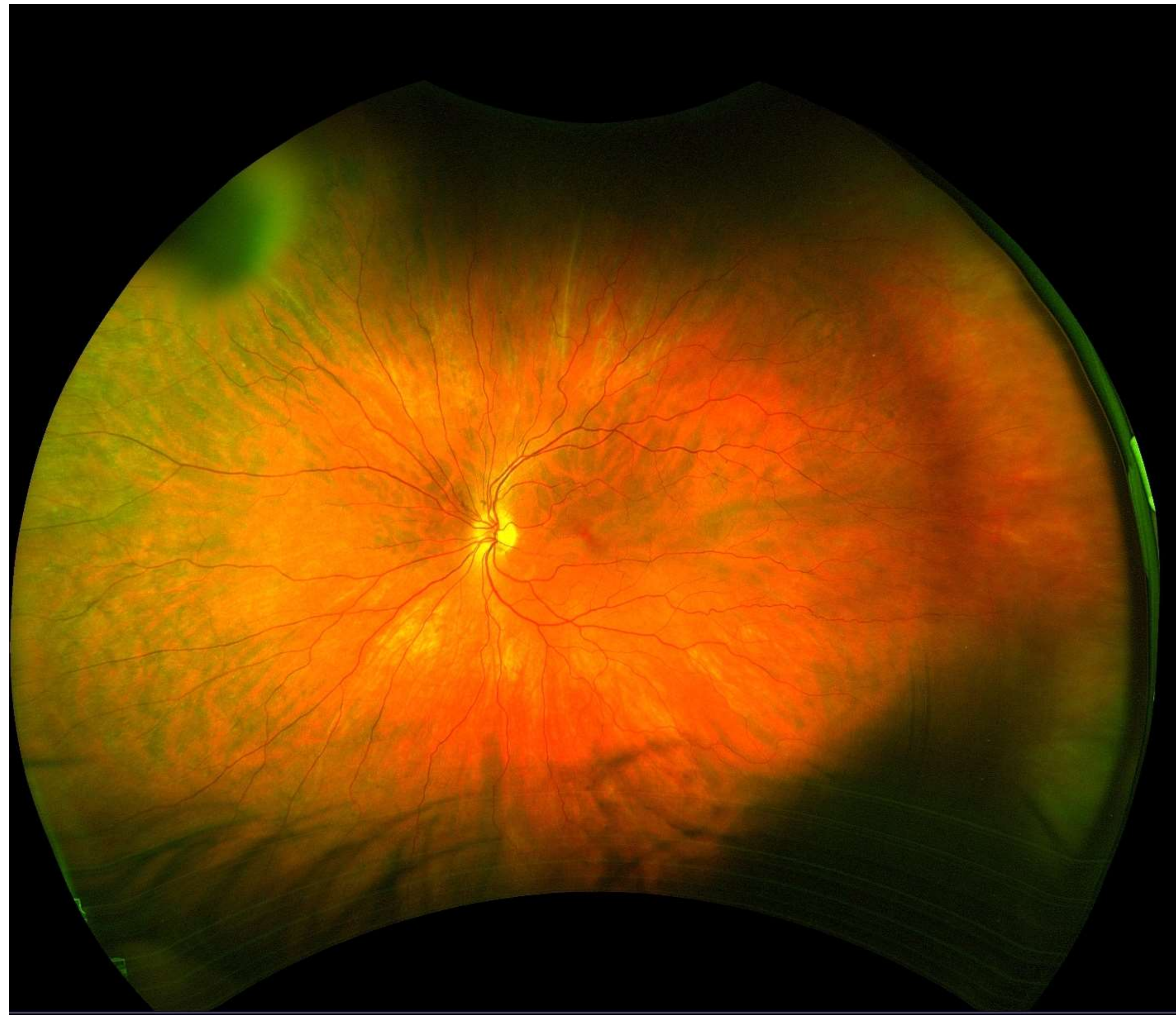
Urgency or emergency?





Mr. G.M. 3/12 later

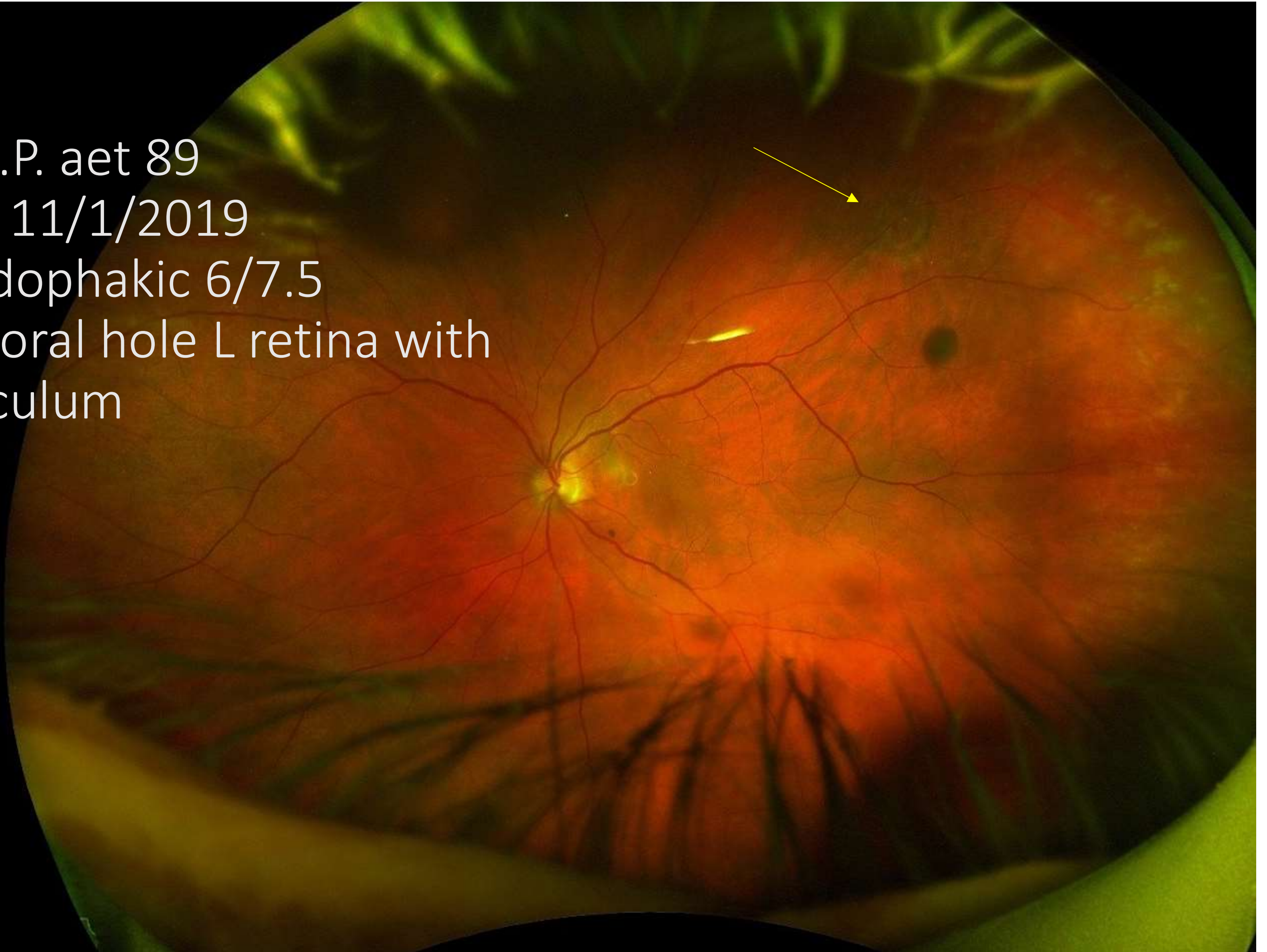
- Appt with VR 3 days after 1st visit
- Haemorrhagic PVD
- Subhyaloid haem
- Review with ophthal 1/12 later
- discharged



Quiz Vitreal haemorrhage
Which of the following is true?

1. Vitreal haemorrhages will clear on their own accord and are in themselves benign
2. Most vitreal haemorrhages are suspicious of a retinal tear
3. Vitreal haemorrhages are a common sequalae to PVD
4. Current treatment for a Vitreal haemorrhage includes vitrectomy, scleral buckle and cryotherapy

7.5% PVD have associated vitreal haemorrhage


Mr. B.P. aet 89
L eye 11/1/2019
Pseudophakic 6/7.5
temporal hole L retina with
operculum

Mr. B.P. 15/5/2020
L vision hazy past 4/52
COVID lockdown

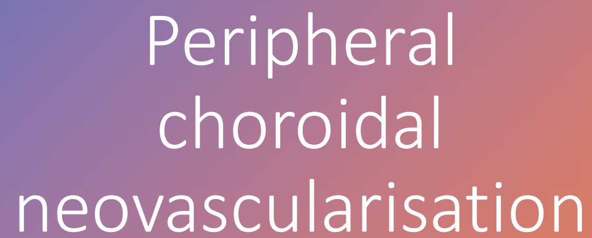
Urgency or emergency?

Mr. B.P.

- Conundrum
- All Ophthalmologists in lockdown
- Will not see anyone with watery eye, conjunctivitis
- E & E
- Risk an 89 yo exposure to Covid 19?
- Blind in one eye, death? What trumps?
- What's the differential Dx?

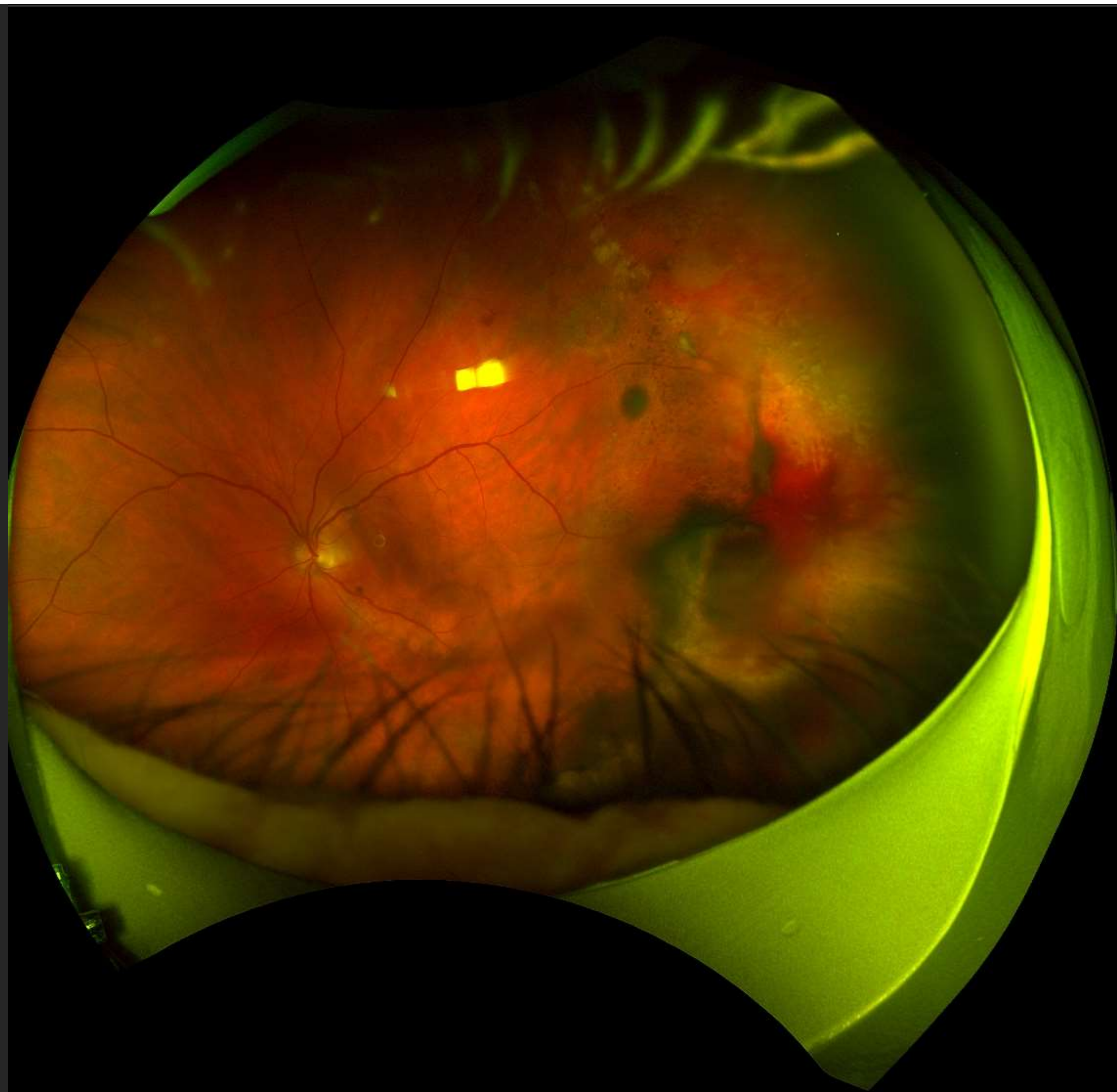
What did I do?

- Organise appt with POAG Ophthal for Monday morning
- Sunday I SMS his POAG Ophthal ‘RD LE macula on, where do I send him?’ & gave him Mr. B.P.’s contact numbers with Optos
- Send to E & E, I haven’t seen him in 2 years!
- I couldn’t raise B.P. and Surgeon said to pass on his number
- 6:10 pm surgeon sms me : not RD new choroidal vessel in periphery
- Conservative Tx no Anti veg F, no laser, no steroid
- Phoned B.P. E & E remarkably quiet 4 interns, consultant



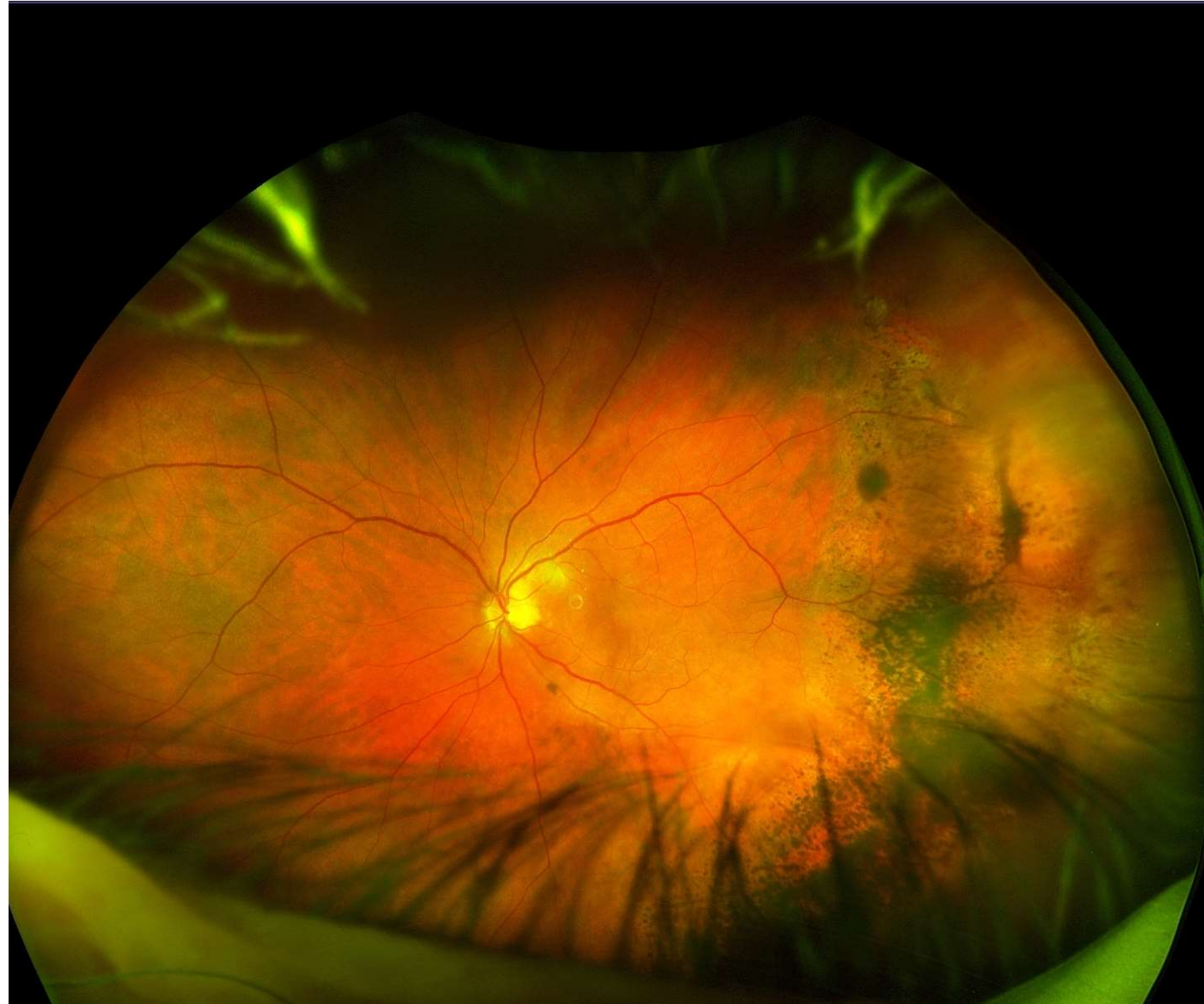
- Eccentric disciform degeneration, Peripheral exudative haemorrhagic chorioretinopathy, extra macular disciform degeneration
- Wet AMD not at the macula
- abnormal BV growth under the retina 50% also have Mac degen
- 70+, female, HT, anticoagulant
- No Tx maybe retinal laser, Anti vegF?
- Coats like response, abnormal BV development where endothelial cells allow leakage esp cholesterol crystals into retina & sub retina, leukocoria due to cholesterol deposition young males 1/100000

Mr. B.P.
15-6-20
1/12
later



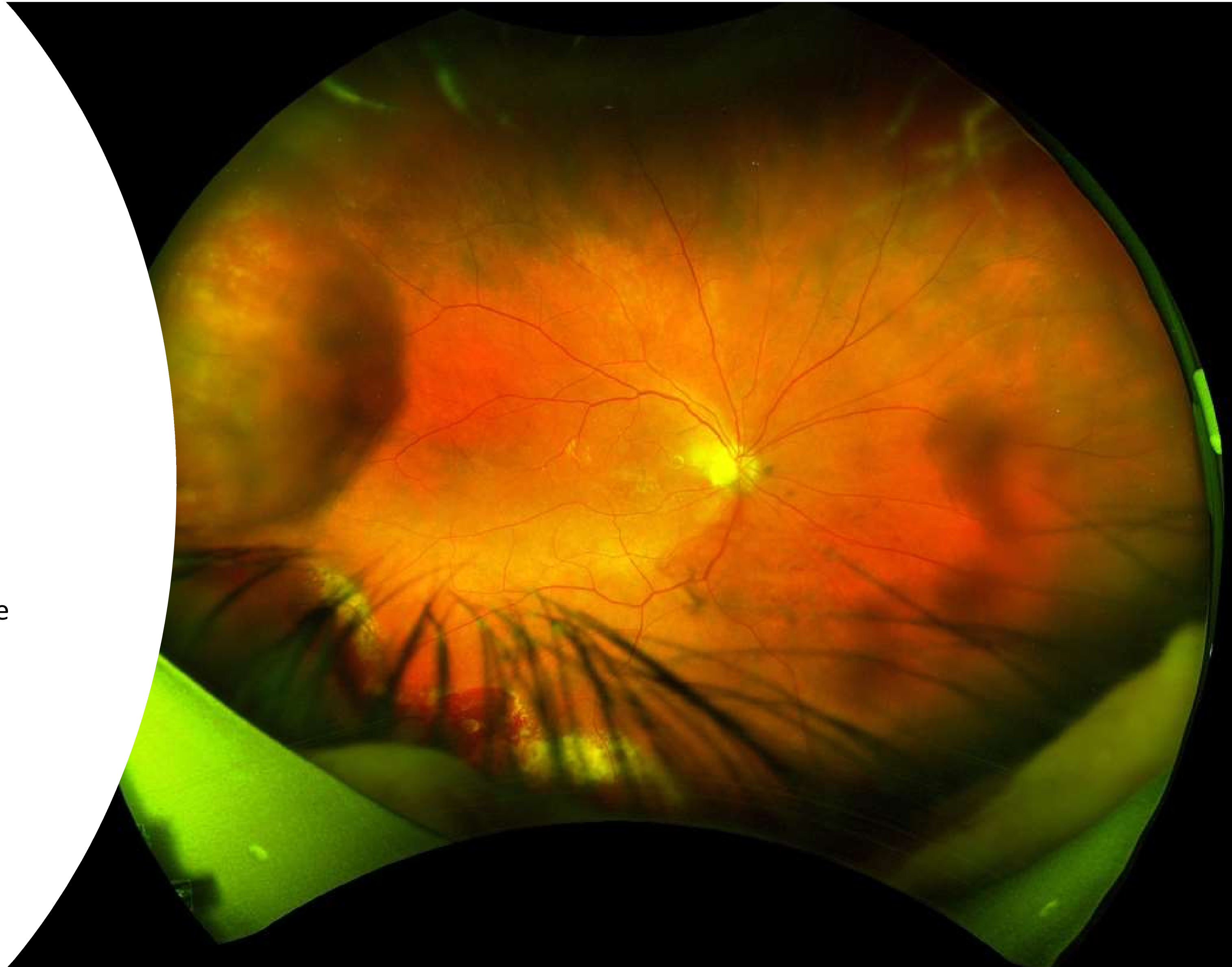
Mr. B.P. 15-10-2020
5/12 after

- Reluctant to go to Melbourne for review
- Pigmentary response and sealed



Mr. B.P. 1/2/2021

- Incidental RE finding
- Ophthal report
- No break, no haemorrhage
- No Tx
- Reassurred, review if an issue



Quiz Which of the following is a false statement regarding peripheral retinal neovascularisation?

1/ It is also known as Eccentric disciform degeneration

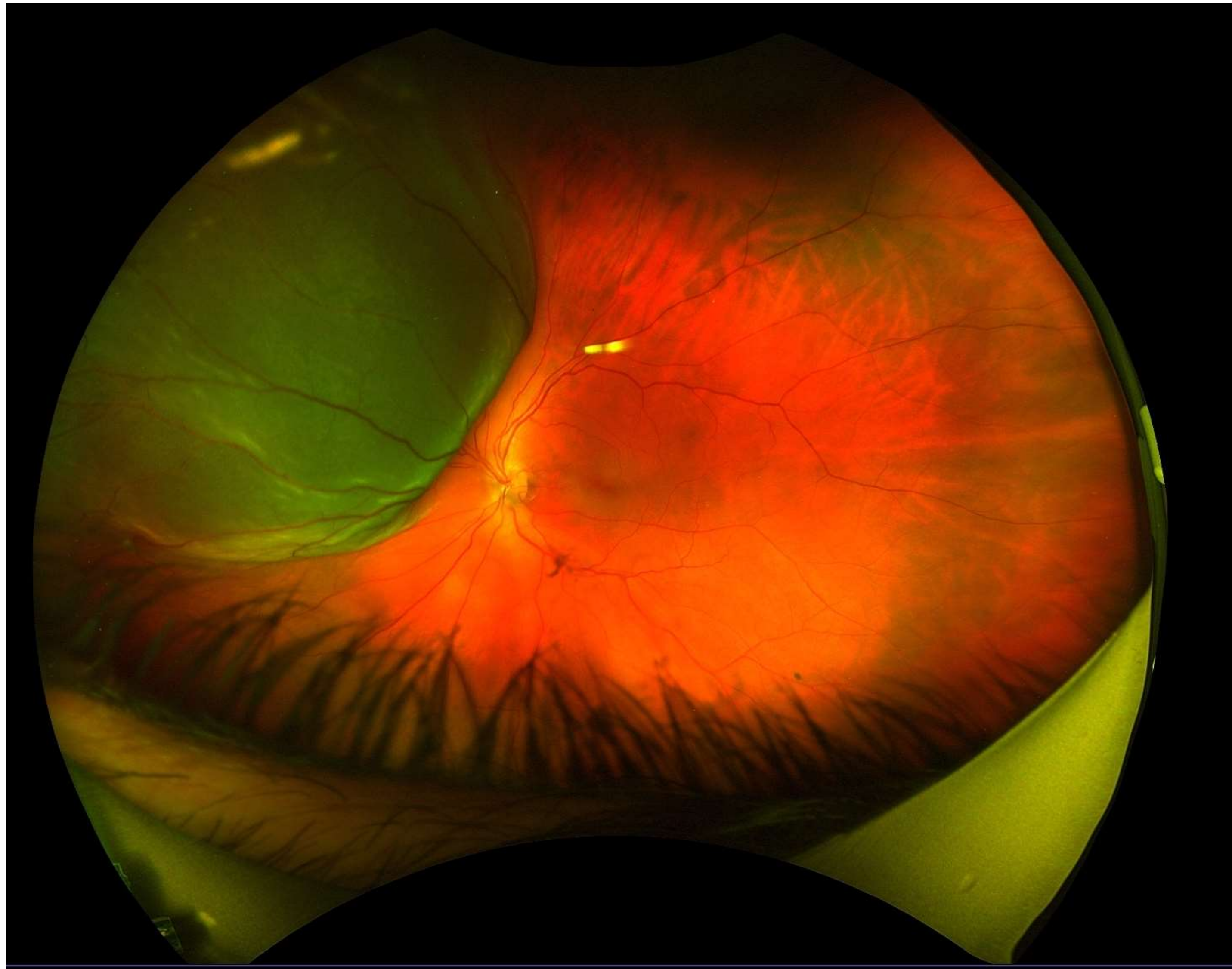
2/ It is amenable to Ranibizumab injections

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

4/ It is similar to dry macular degeneration

Mr. I.M. aet 59 May 20
'I have a retinal detachment'
Cat Sx 9/19
Floaters since cat Sx
occas temporal flash

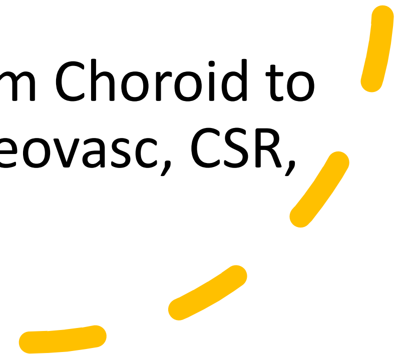
How do you triage?
Do you follow up?



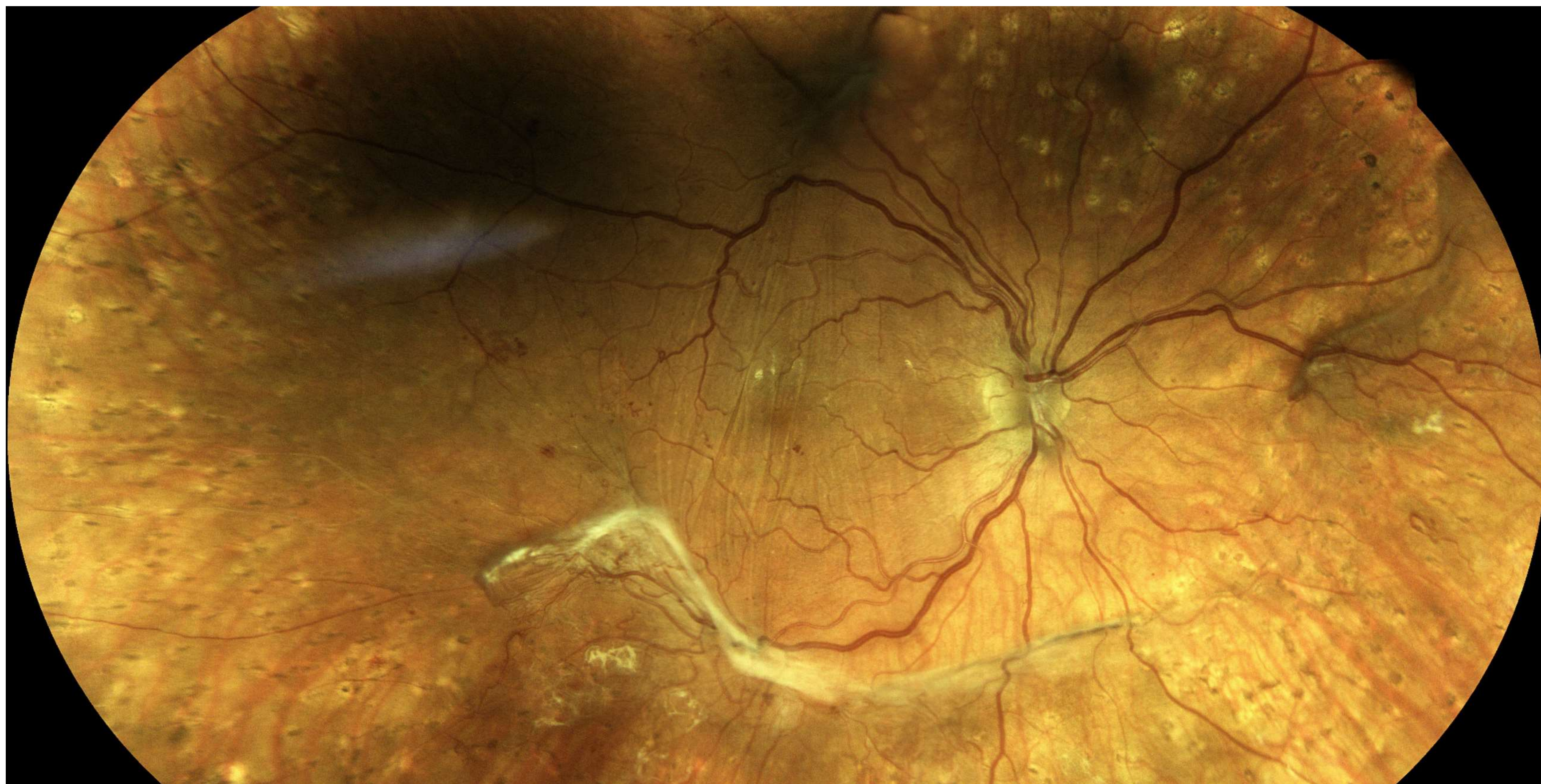
A Detached Retina – Surgery at Sydney Eye Hospital

Retinal detachment fun facts

- Separation from the retina proper and the RPE
- Rhegmatogenous rRD vs Non rhegmetogenous nRD
- rRD Rhegma = break retinal tear/hole, liquified vitreous to SRS, towards macula
- nRD absence of tear,
- Tractional : Proliferative diabetes, ocular ischaemia, CRVO
- Exudative : rpe damage fluid from Choroid to SRS ie AMD, peripheral retinal neovasc, CSR, choroidal tumour



nRD proliferative DM

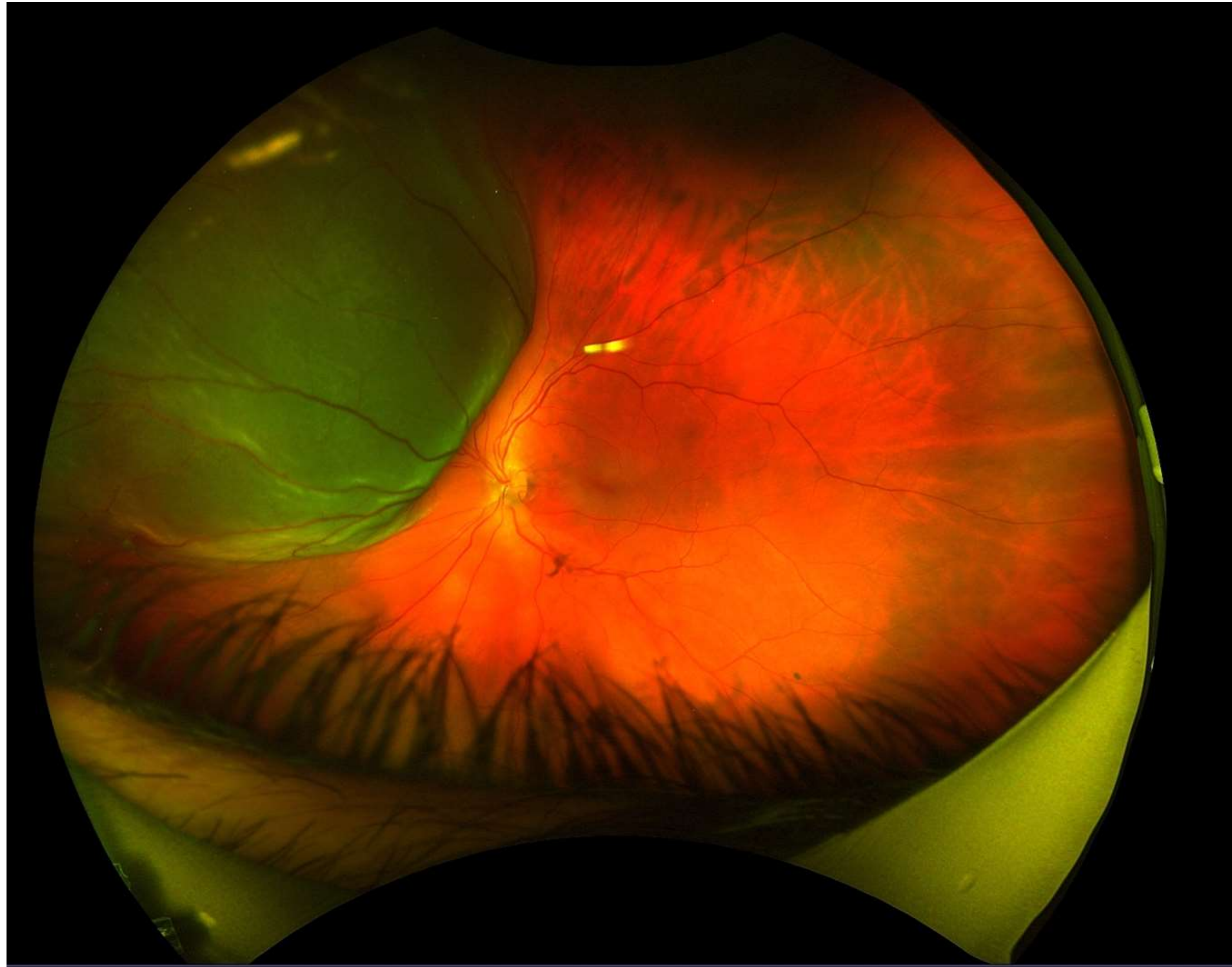


Epidemiology & risk factors RD

- 6.3-18/100,000 people ie 0.5-2/10,000
- Age 50+, males
- Trauma 6-16% rRD with break esp if < 50
- Up to 7% have bilateral RD = 7 % or less
- Risk of RD fellow eye = 3 - 10%
- pseudophakia, myopia, LD = 15%
- Myopia -1 to -3D = 4 x risk increase,
- Myopia > -3D = 10 x increase
- Cat Sx thinner IOL, more movement 10-33% increase
- Acute PVD 10-17% have retinal tears
- Pigment hypertrophy is my friend

Pseudophakic	10-33%
male	2%
50+	
PVD	10-17%

Ring Ophthal sms image and ask to triage at E & E
Nil food
Sip water?
Take pyjamas
Carer overnight in Melbourne
Lost more than half vision on arrival from 10:30 am to 1 pm



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

a/ Trauma

b/ female

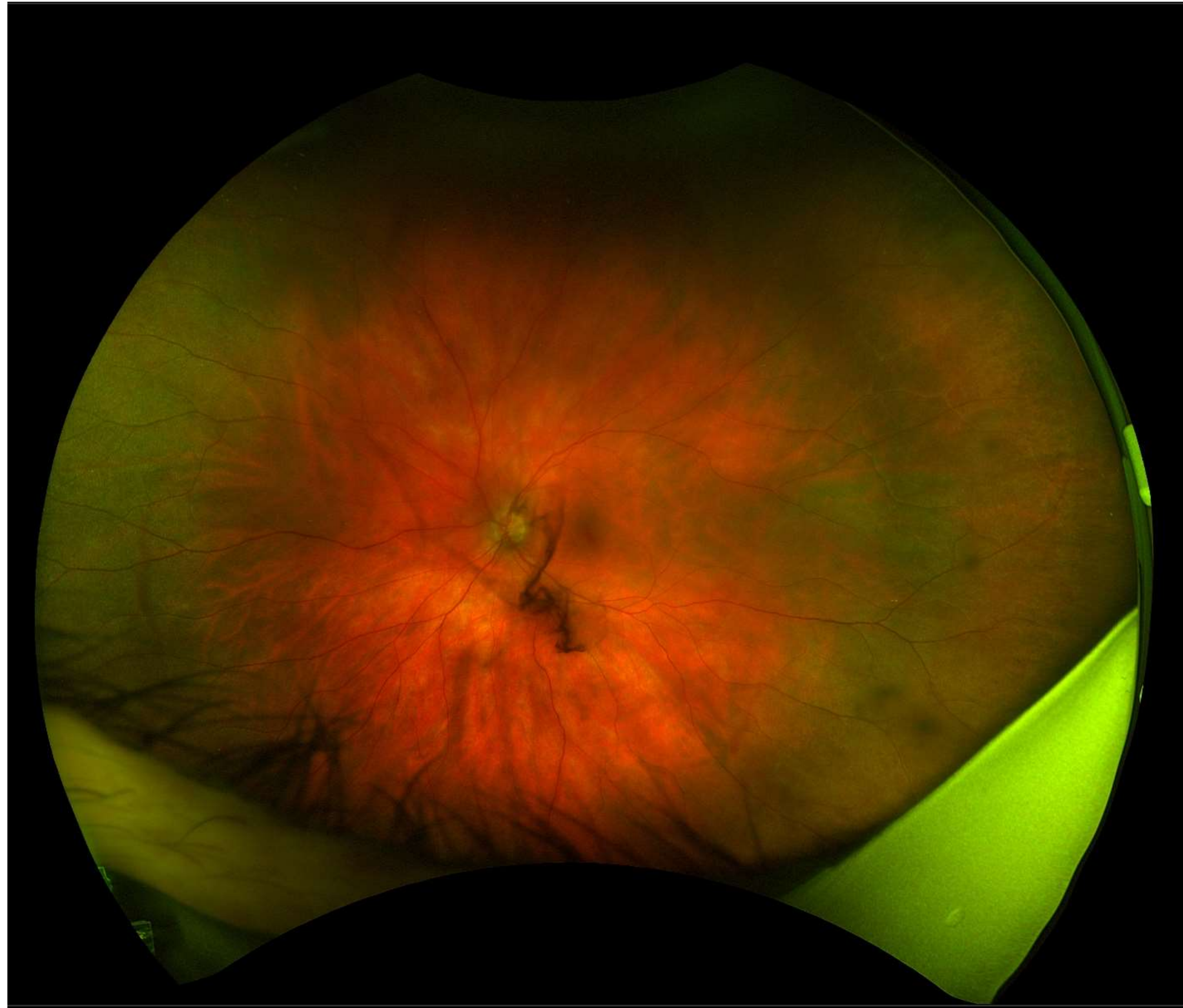
c/ prior cataract surgery

d/ vitreal haemorrhage

Ms. E.J. aet 60

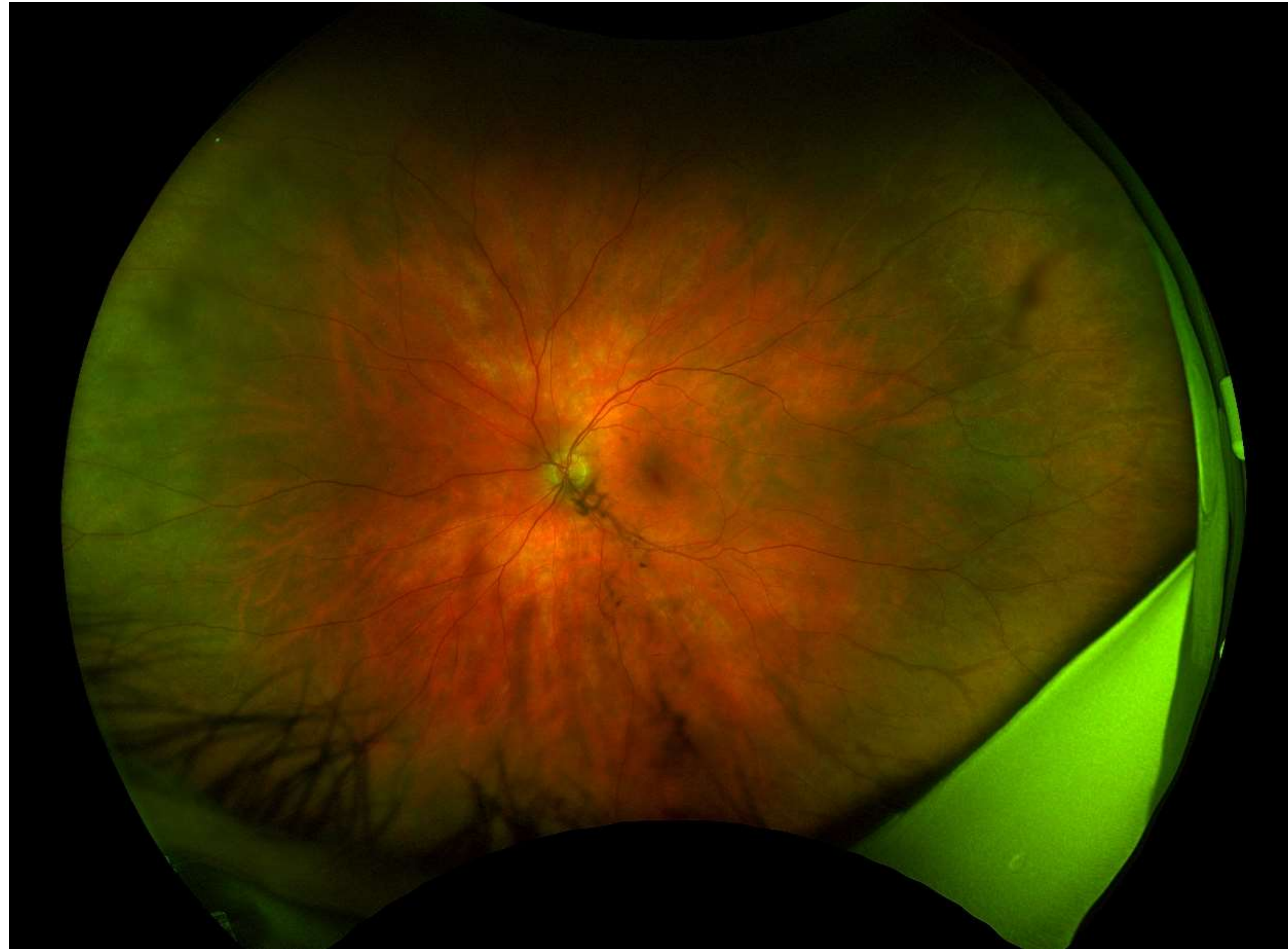
31-1-20
LE black line
comes & goes,
wavy shadow,
flashes
Vision fine
Youngest of 12, all
myopic
PRK
2 sisters & mother
RD

Weiss ring
action PVD
cautioned RD signs
& symptoms



Ms. E.J.

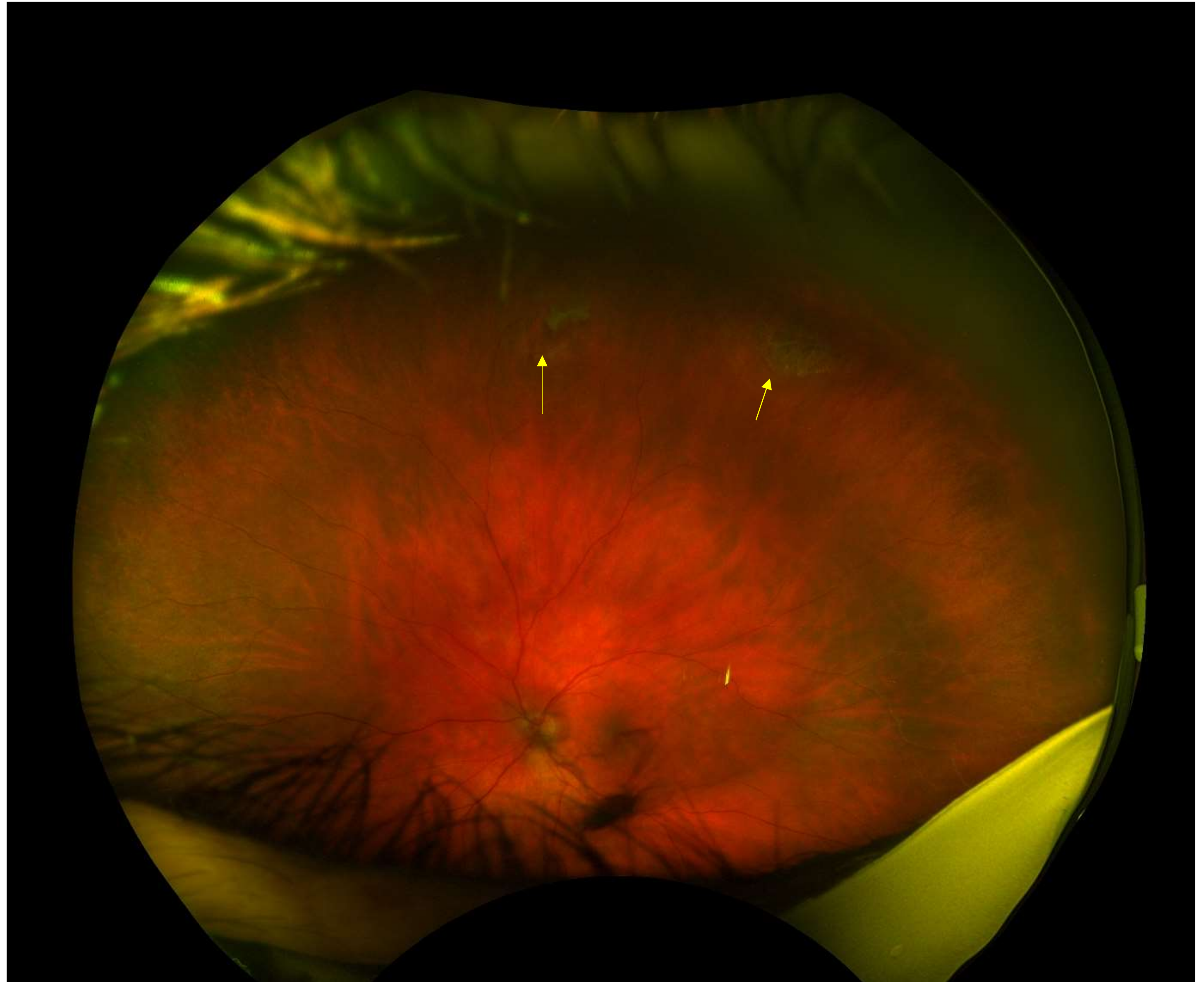
24-2-2020 1/12 later
cobwebs persist
bright lights temporal vision PVD
amsler NAD
PRK wore Rx since aet 6
High Myope
FOH mother, 2 sisters RD
Hx RD



Ms. E.J.

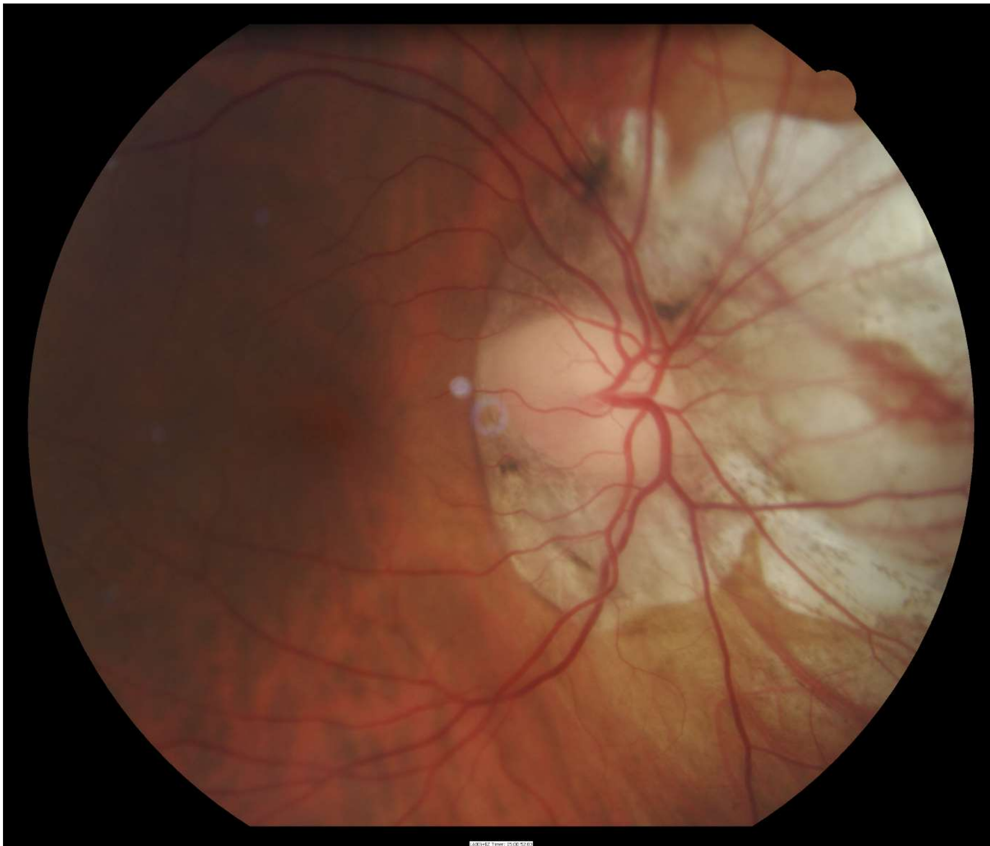
superiorly 2
horseshoe tears

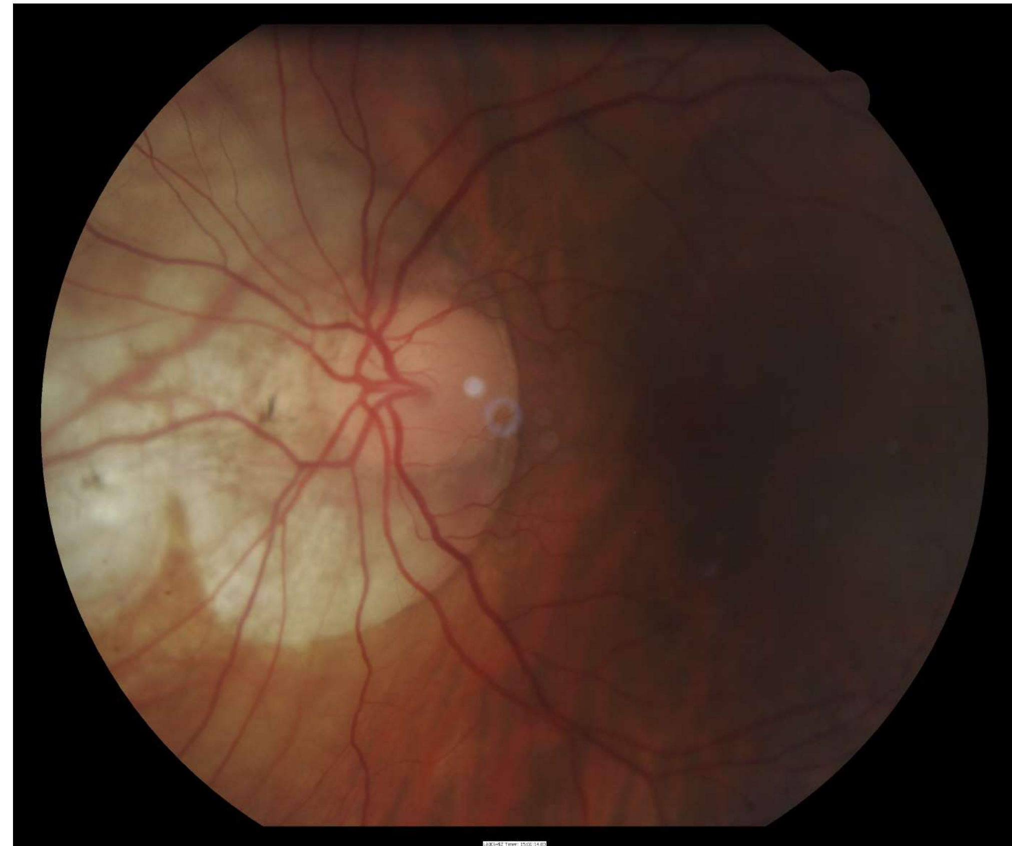
Moral
FOH
Myopia how
much?
Wide field
scanners vs BIO



Ms L.A. aet 55 13/01/2012 past 3/12 vision unstable D & N OU

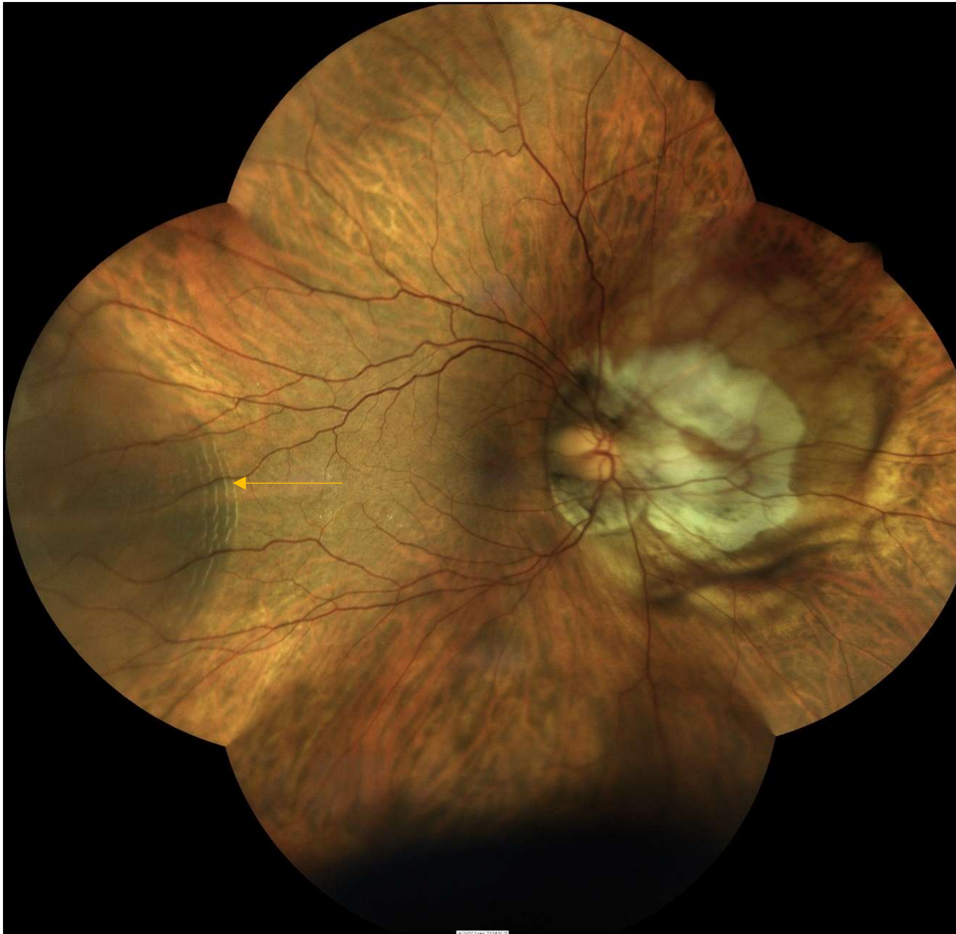
R -6.00/-2.75 x 45 L -6.50/-0.25 x 7.5 6/12 OU
Posterior staphyloma nasal to ONH
No flashes no distortion
Supero nasal RD to edge of staphyloma LE

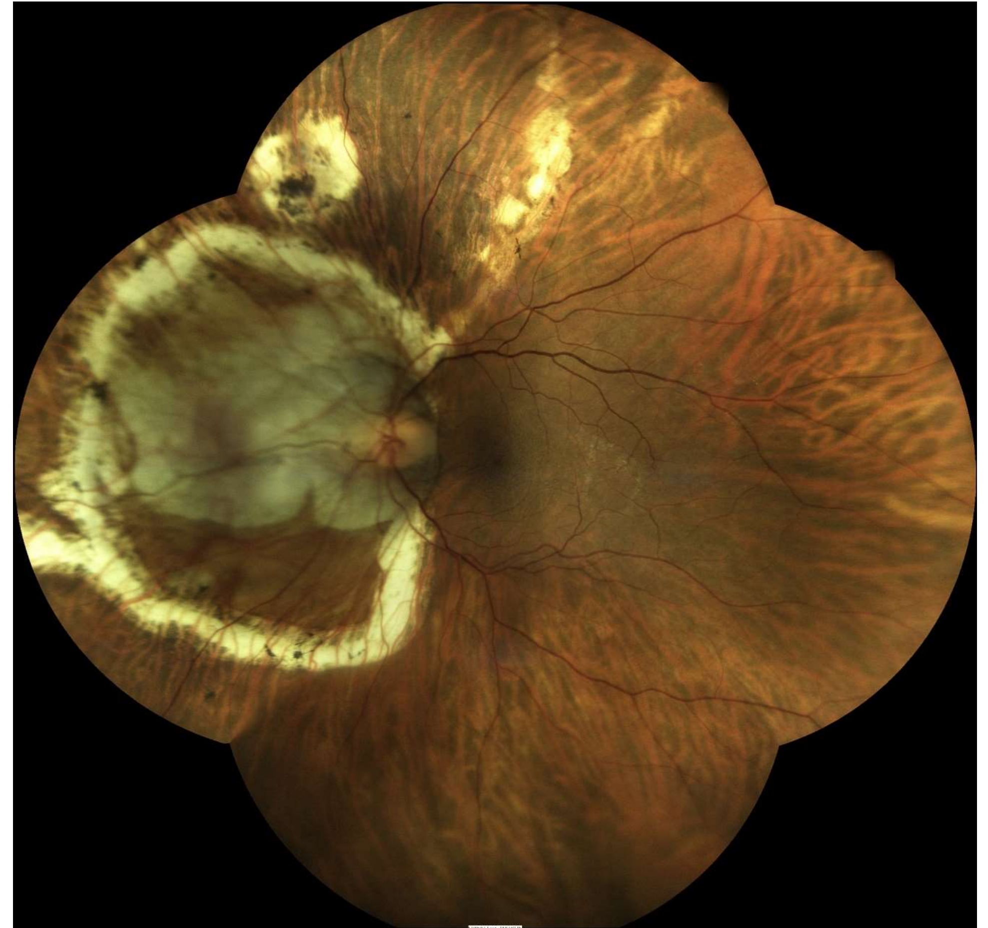




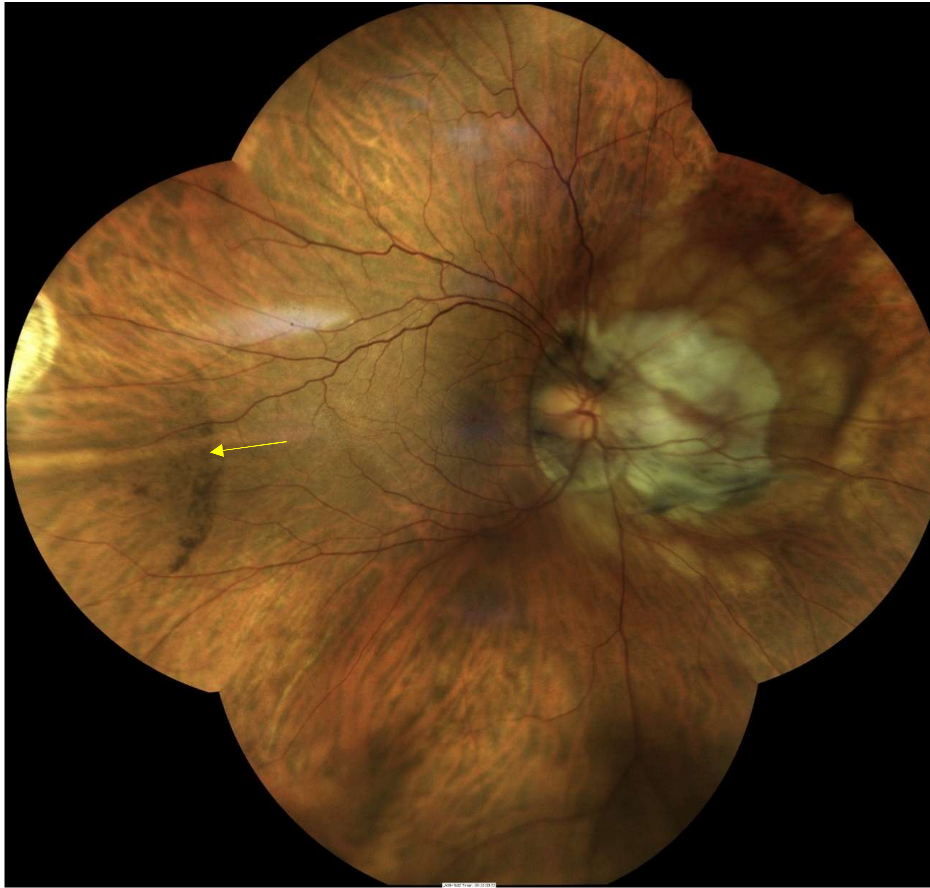
Ms. L.A.

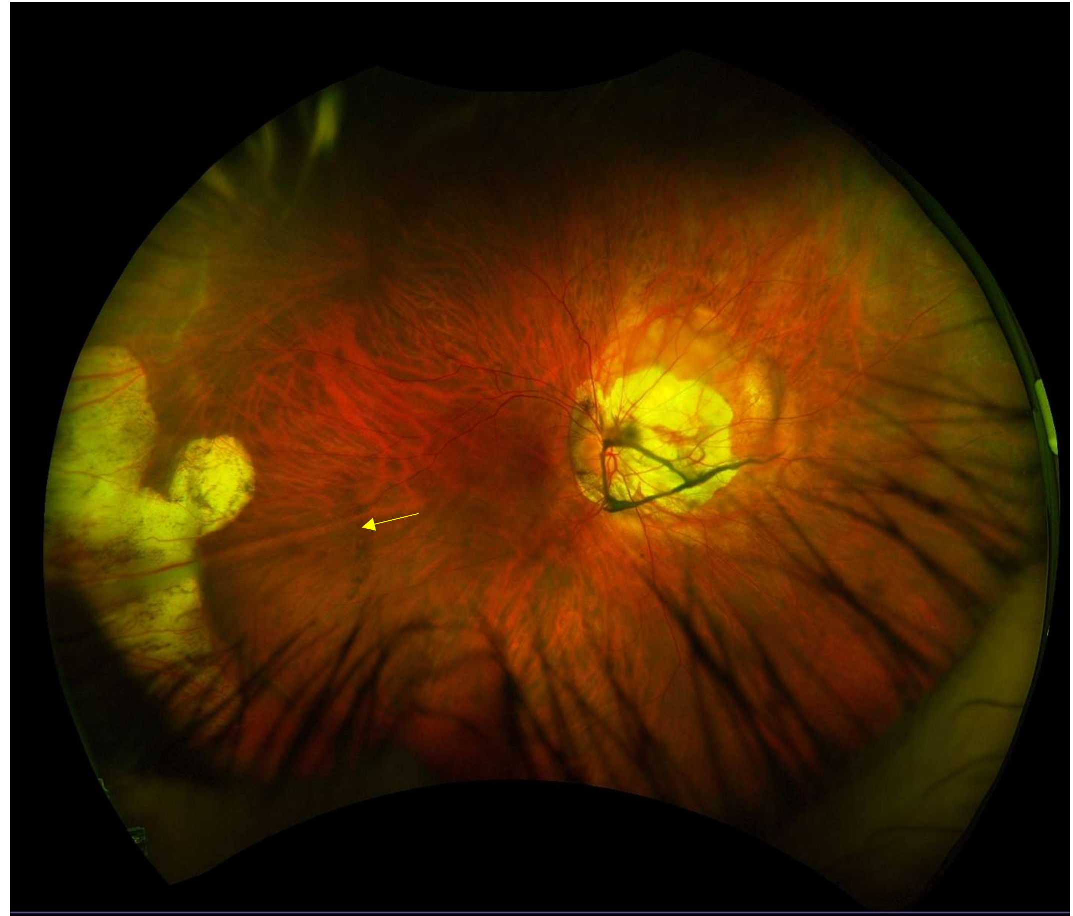
14-12-17 asymptomatic LE has had laser & gas
High Myope
Prior RD
50+





Ms. L.A. RE : Buckle, gas cryo





PVD

REVIEW of OPHTHALMOLOGY Clinical advice you can trust

Dean Eliott, MD, Detroit

PUBLISHED 15 MARCH 2004

Evaluation and Management of PVD

Firm vitreous attachment Vitreous base 3mm b/n PP & Ora, retinal scars, lattice deg'n & like, ONH & retinal vessels

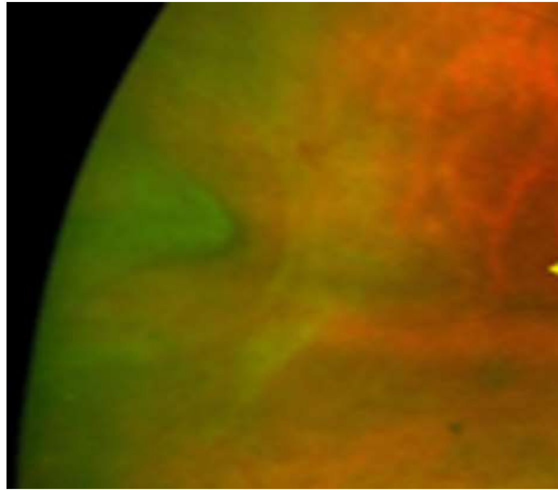
PVD = vitreous syneresis, then liquefied vitreous passes through hyaloid membrane shearing posterior hyaloid from retina

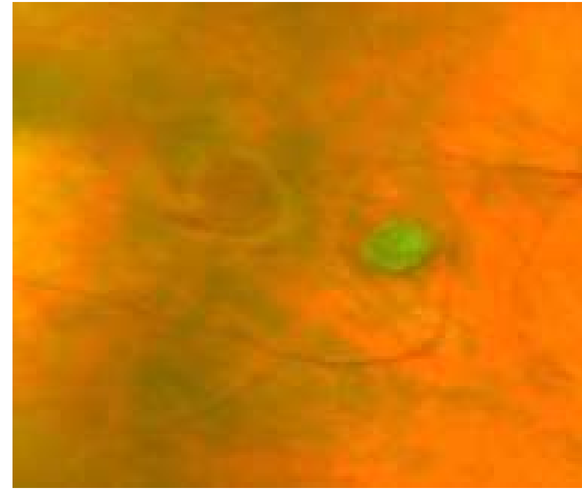
Age 30-59 10% 60-69 27% 70+ 63%

Axial length (myopia 10 yrs earlier), trauma, Cat Sx

Firm vitreal attachment + vitreo retinal traction = HST or hole & operculum
HST = vitreous into sub retinal space = rRD (split sensory retina & RPE)

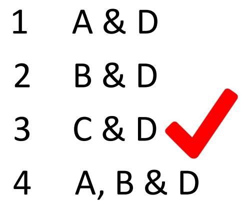
10 – 15 % acute PVD have retinal tear

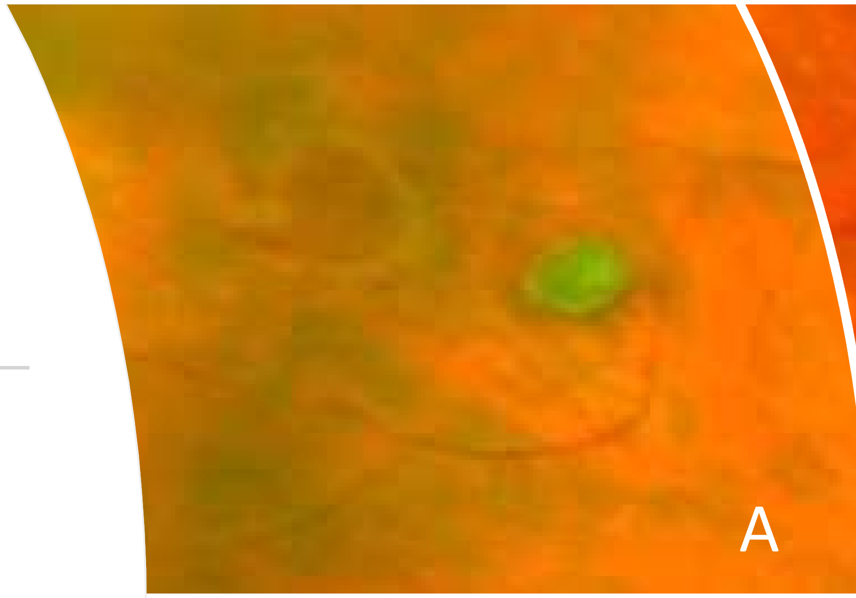


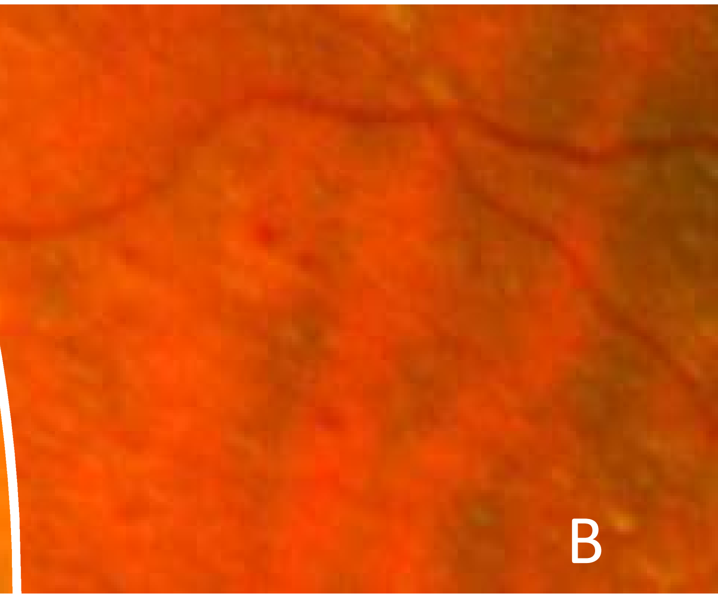


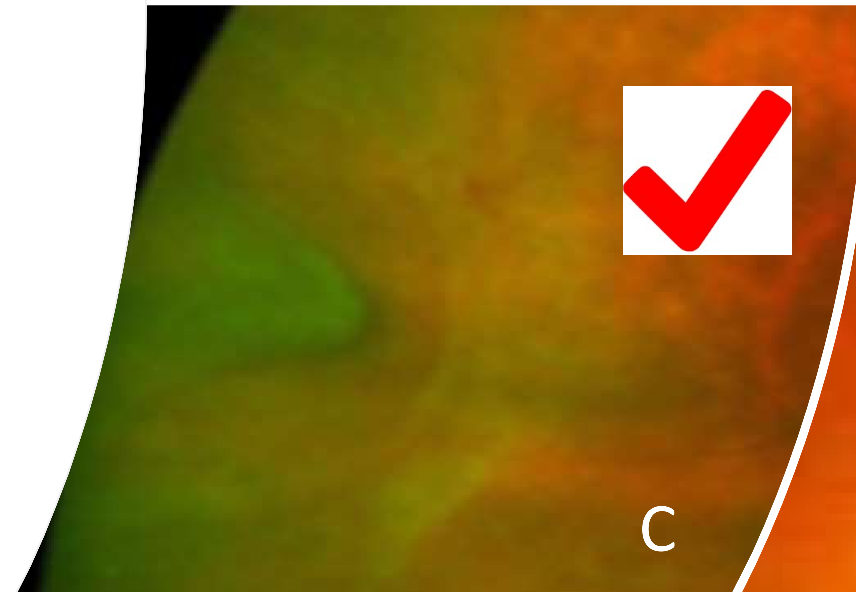
RPE pigment cells migrate through tear to vitreous (Shafer's)
Peripheral dot (punctate) haems =VR traction (impending tear?)
Flashes (VR traction) Floaters (Weiss, blood, condensed vitreal collagen)
Review 4-6/52 as breaks may form after symptoms
Unlikely to have break if not there at 4/52, but can happen up to couple years, counsel RD S & S
Laser = CR scar to stop communication b/n vitreous & SRS
Cryo if media Opacities

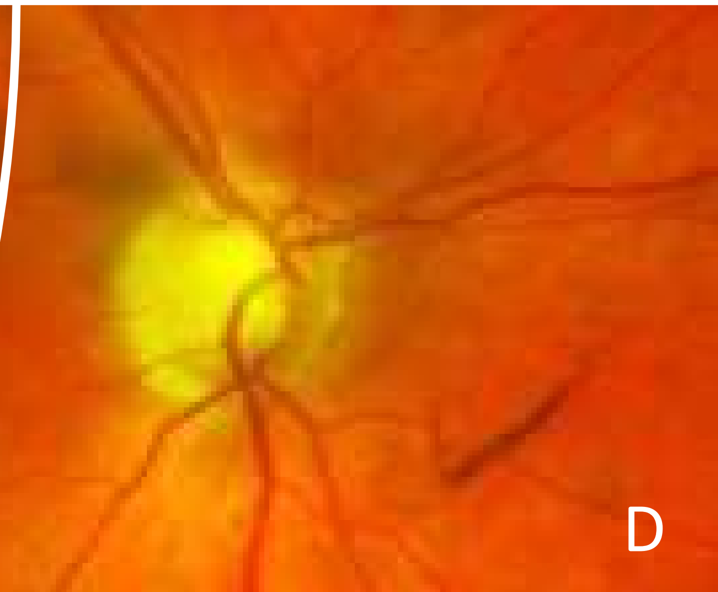
Quiz Which of the following requires urgent referral?

1 A & D
2 B & D
3 C & D 
4 A, B & D









Shafer's sign

REVIEW of OPTOMETRY Leadership in clinical care

A Sign of Trouble
How to locate and identify a telltale finding that could prevent a near-future retinal detachment.
By Bisant A. Labib, OD 15th March 2018

Shafer's sign refers to the presence of a collection of brown pigmented cells in the anterior vitreous following a PVD

25 to 90% proceed to RD

Absence does not mean retina intact

Red blood cells = 70% correlation retinal tears (vitreal haem)

Acute posterior vitreous detachment: the predictive value of vitreous pigment and symptomatology V Tanner et al
Br J Ophthalmol. 2000 Nov;84(11):1264-8

In 200 eyes presenting with an acute PVD, 25 were found to have an associated retinal break, 23 of which were also Shafer positive

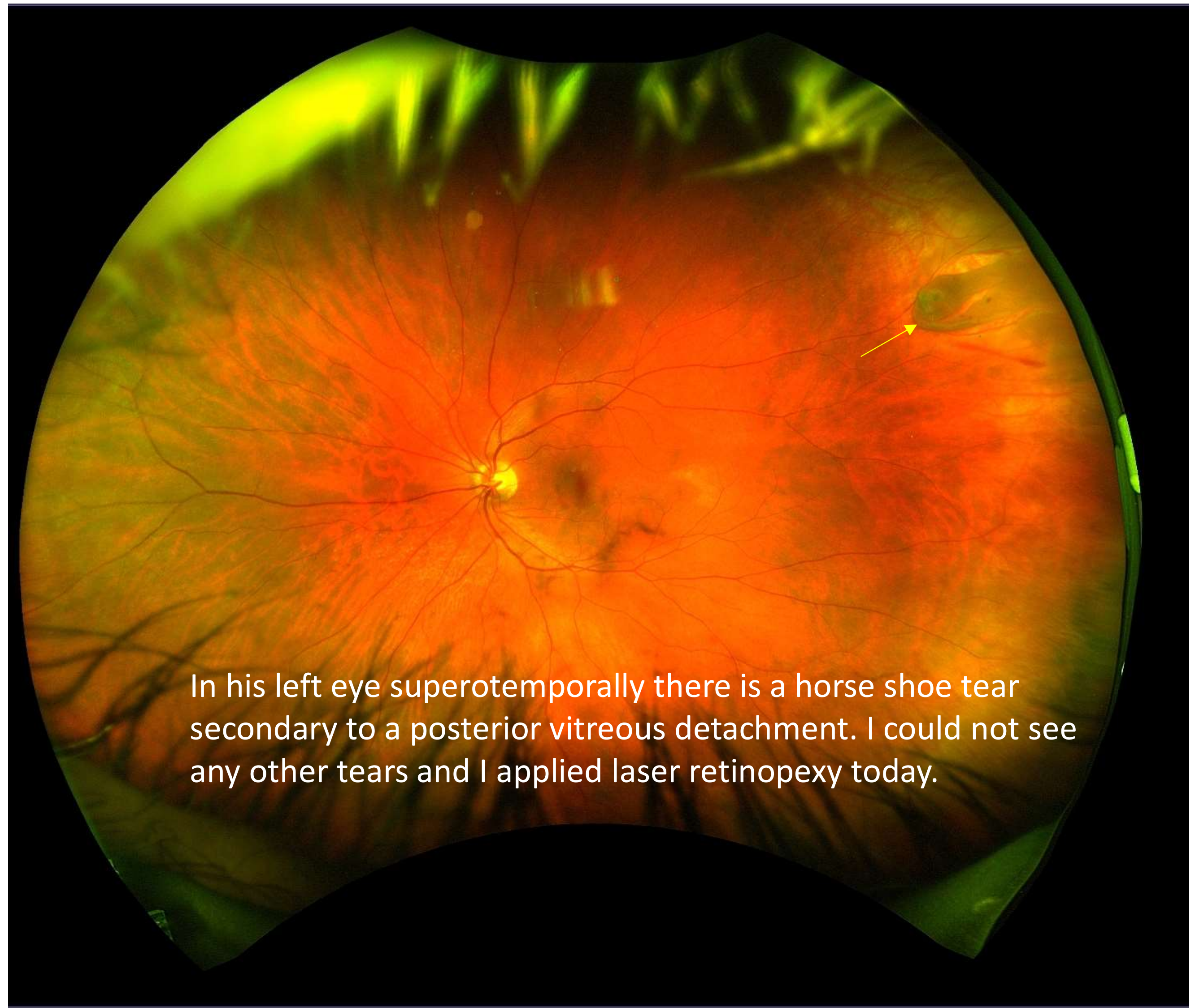
Table 1. Types of Cells Found in the Anterior Vitreous and their Clinical implications

Abnormal Vitreous Cells	Source	Clinical Indication
Brown (Shafer's sign) cells	Pigment from RPE of retina	Retinal break
Red cells	Red blood cells from hemorrhage	Retinal break or proliferative retinal process
White cells	Inflammatory white blood cells	Vitritis, pars planitis

Mr. D.J. aet 63 9/10/19

Farmer & rowing coach
LE 6 days cobwebs & flashes temporally
sl blur unaided VA 6/6 6/6 =
Urgency or emergency?

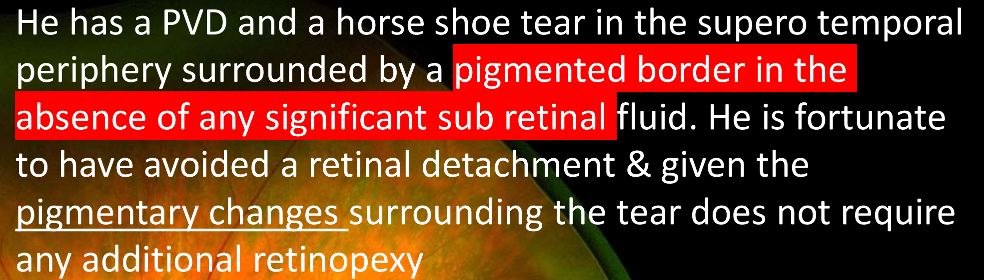
Vitreal haem (under mac)
Horse shoe tear
Preretinal haem
Referred that day



It was a pleasure seeing …. He has dense cataracts OU and an asymptomatic operculated hole temporally LE. I will perform R cataract surgery first followed by left a month later

What if it was a HST?

Mr. R.P. Aet 68 13/10/20 Reduced vision 6/12 -2.75 6/15 -1.75/-1.00 x 70 6/15
dense cataracts can't remember last EE urgency or emergency?



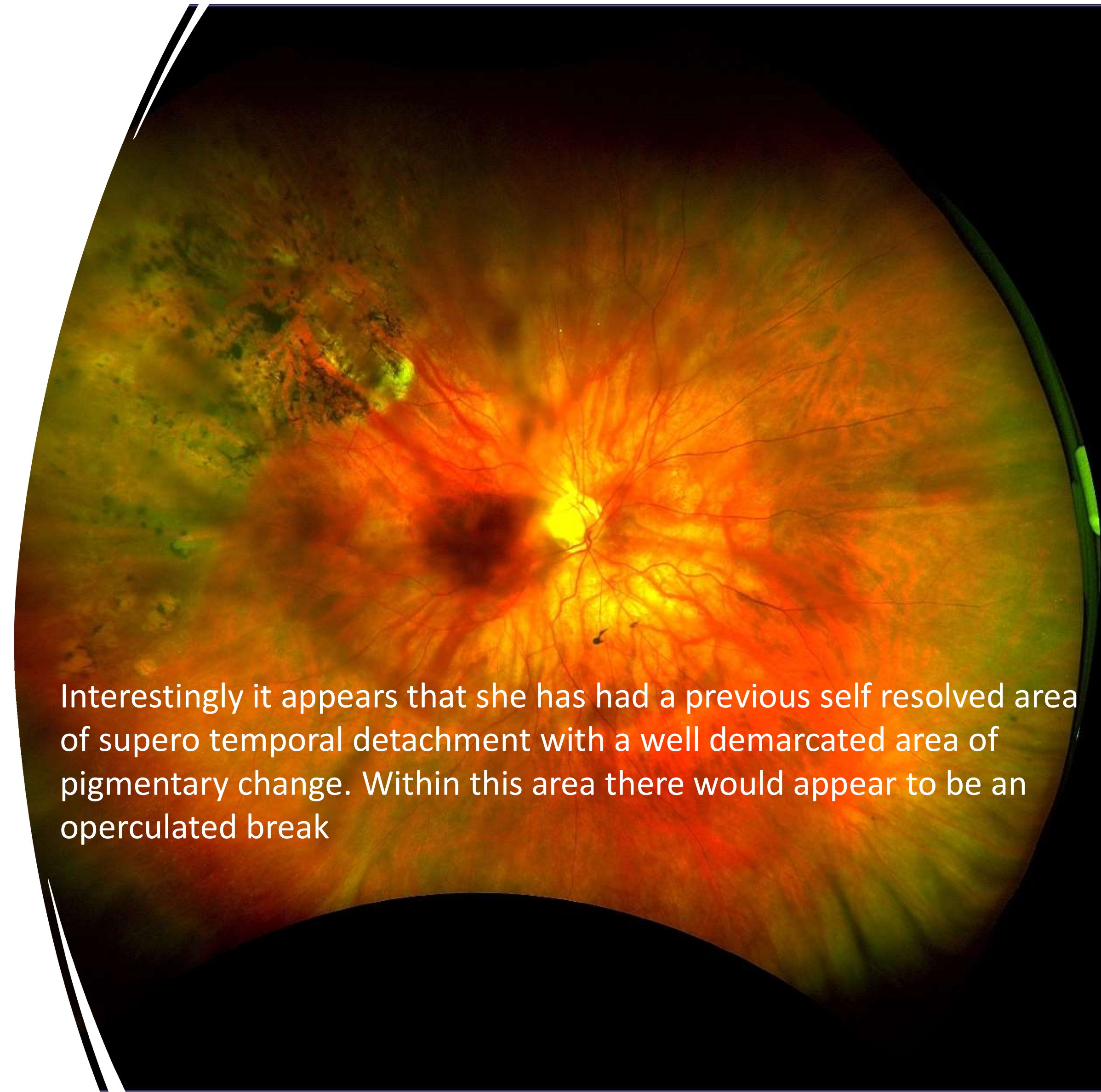
- Mr. O.T. Aet 88 routine review 18/12/18 bilateral pseudophake 2015 previous low hyperope asymptomatic
- Pigmented posterior edge? Subretinal fluid?

Urgency or emergency?

Ms. M.S. aet 62 4/12/19

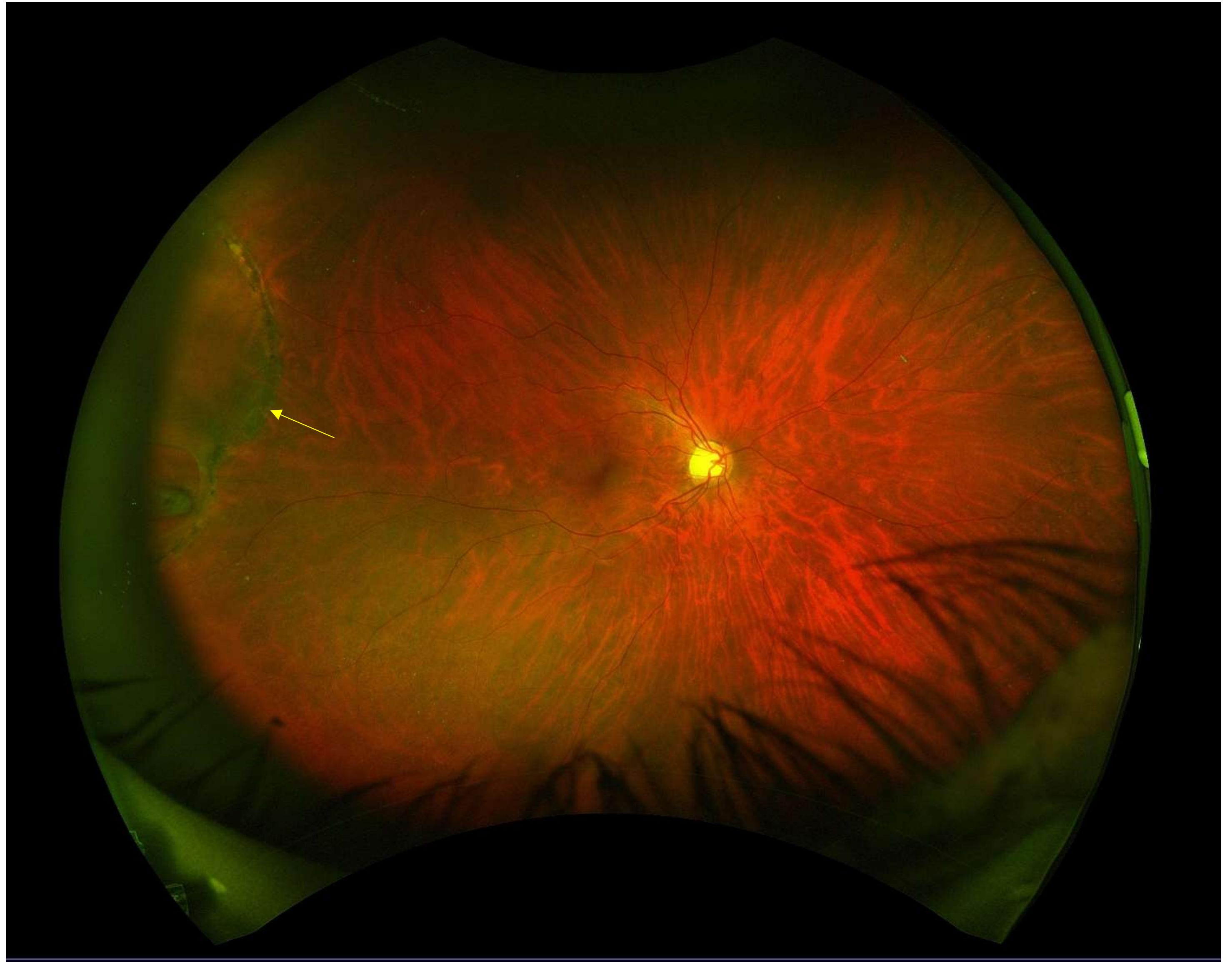
under surveillance for R pigmentary changes since 2011
R -12.00/-2.00 x 62.5 6/9 -10.25/-1.50 x 120 6/6
no flash/floaters, denied trauma
Urgency or emergency?

- Doesn't smell right
- Non urgent referral



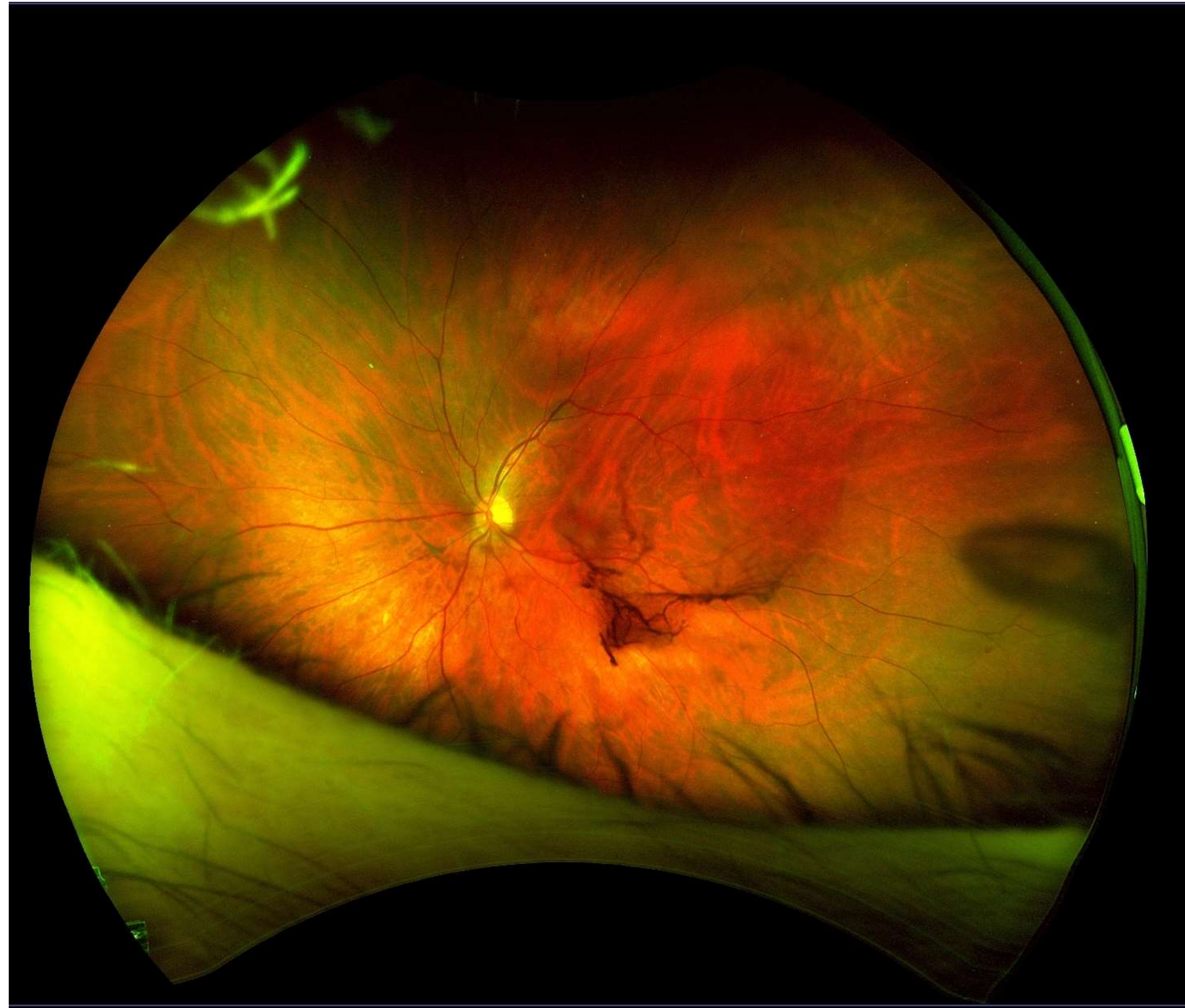
Mrs.JM aet 70
asymptomatic
Refer or not refer?
When?

Non urgent referral
Vision 6/6 R 6/9.5 L
Bilateral PVD
Horseshoe tear with shallow sub retinal fluid
Pigment hypertrophy =chronicity (like retinal laser)
POAG more issue
Monitor, no active Tx necessary



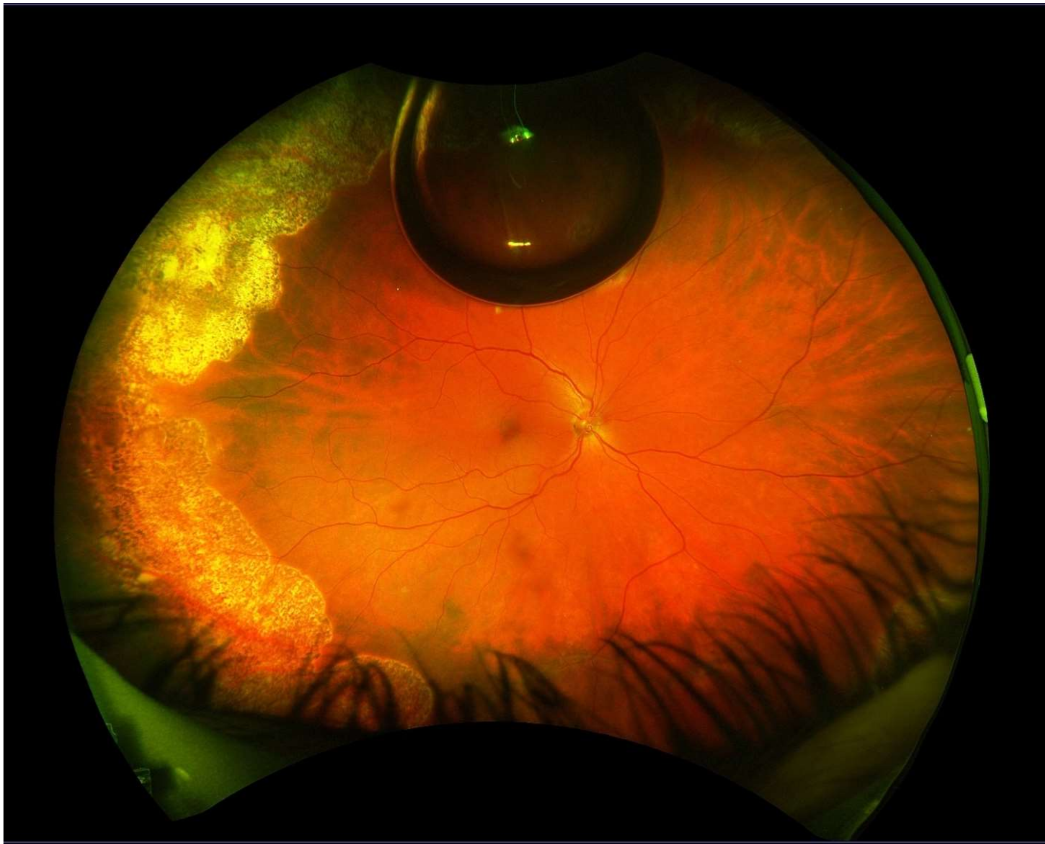
Mrs. J.H. aet 60

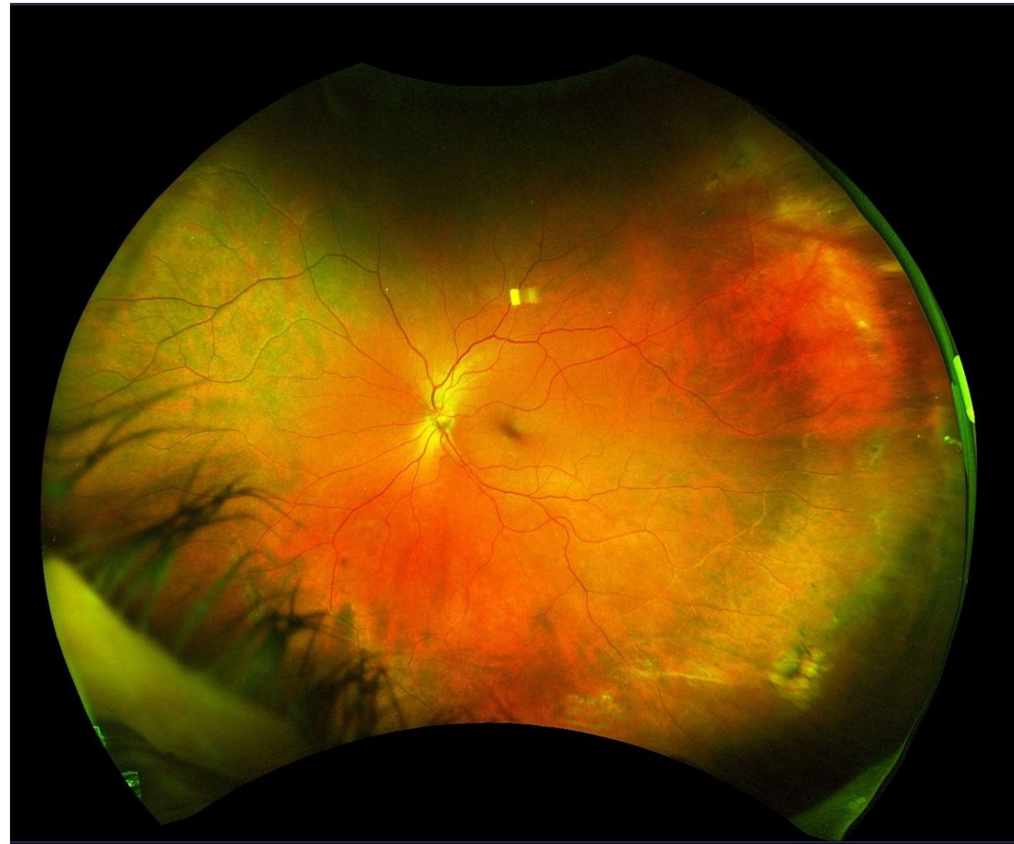
1st presentation to clinic
23-02-21 past couple of days black spot and temporal flashes OS
PVD with white cells only, no Schaeffers sign and temporal blot haems
9/20 ERM peel and vitrectomy RE
Urgency or Emergency?



Ophthal 2 days VR surgeon 2 days after
Left very peripheral superonasal tear
In office barrier laser insufficient?
Dx Theatre and EUA and cryotherapy or indirect laser
'Chance of missing more tears by attempting office based laser is quite high'

Mrs. S.A. aet 60 3-1-19 RD SX RE had 8 tears following blunt trauma (toggle)
angle recession, vossius ring, LD in LE
referred high IOP post Sx Diamox, Lumigan, Cosopt, Eniden, PF





End

- GET PHONE and Camera ipad etc ready, there are 13 slides to copy
- Introduce self to the rest of your breakout team

Retinal odities and emergencies, a rural perspective- Breakout discussions

Mitch Hancock

Quiz Which of the following patients needs an emergency 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

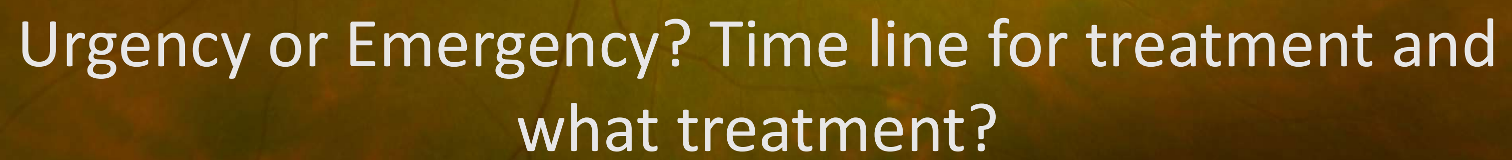
Quiz Which of the following are possible sequalae following RD Sx

- a/ Diplopia
- b/ High IOP
- c/ Increased glare intolerance
- d/ Haloes
- e/ Cataracts
- f/ all of the above

Quiz Vitreal haemorrhage. Make the following statement most true

1 Moderate Vitreal haemorrhages will (seldom/mostly/always) clear on their own accord and are in themselves (serious/benign)
2 All vitreous haemorrhages are suspicious of a retinal tear except ?
3 Vitreal haemorrhages are a very rare/occasional/ very common sequalae to PVD
4 Current treatment for a Vitreal haemorrhage/Retinal detachment includes vitrectomy, scleral buckle and cryotherapy

2%/ 7.5%/ 15% of PVD have associated vitreal haemorrhage


Urgency or Emergency? Time line for treatment and
what treatment?

Quiz Which of the following is a false statement regarding peripheral retinal neovascularisation?

1/ It is also known as Eccentric disciform degeneration

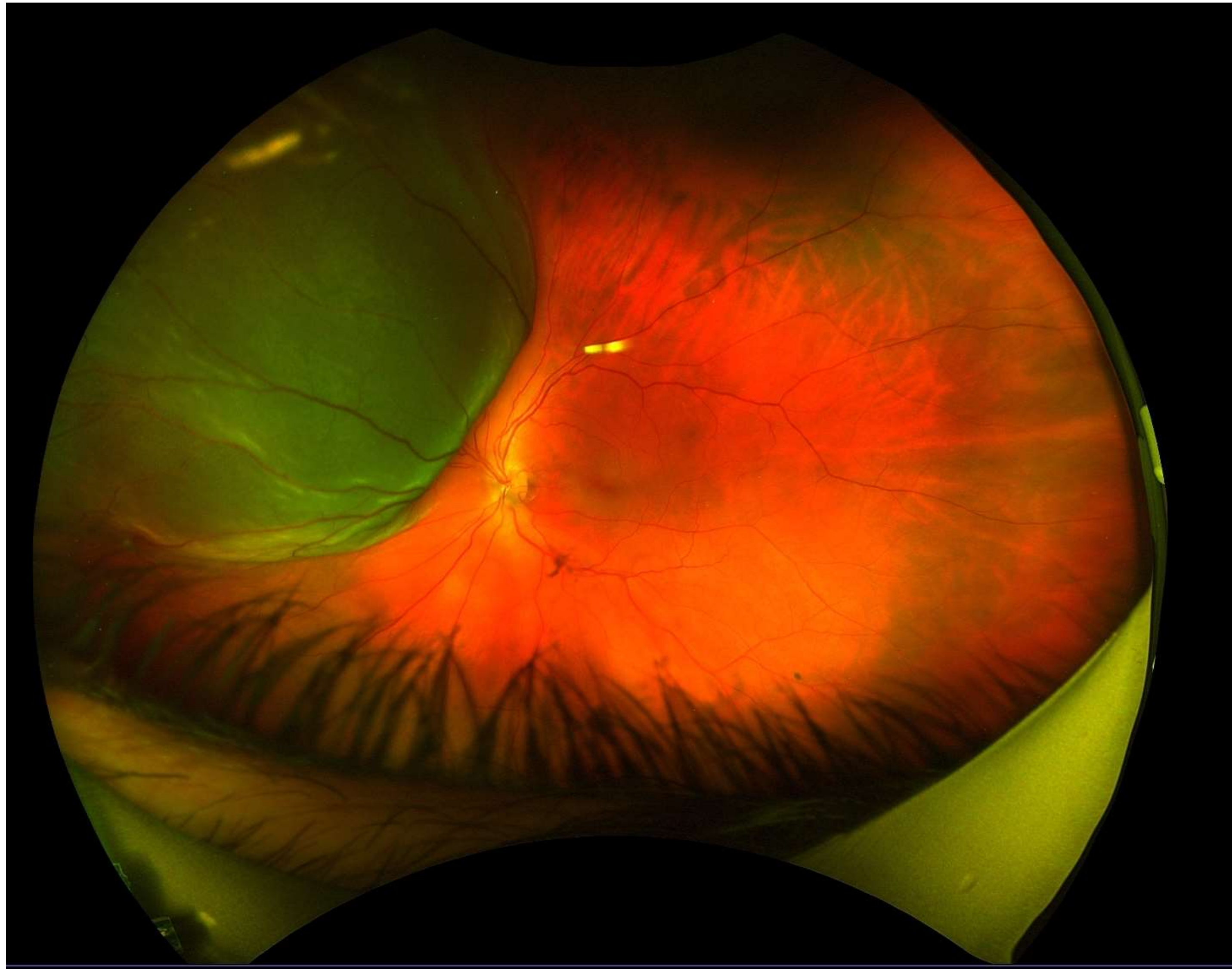
2/ It is amenable to Ranibizumab injections

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

4/ It is similar to dry macular degeneration

Mr. I.M. aet 59 May 20
'I have a retinal detachment'
Cat Sx 9/19
Floaters since cat Sx
occas temporal flash

How do you triage?
Do you follow up?



Quiz

RD triaged Pt, phoned Ophthal, sent images, expecting Pt at tertiary hospital,

What are the next instructions?

- Hints
- Ambulance
- Food
- Logistics

- What if practicing 2 hours drive from RAH?
- 4 hours?
- 8 hours?
- 12 hours?

Local = vitrectomy, bubble, laser
GA = Cryo, buckle, bubble

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

a/ Trauma

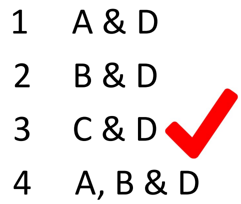
b/ female

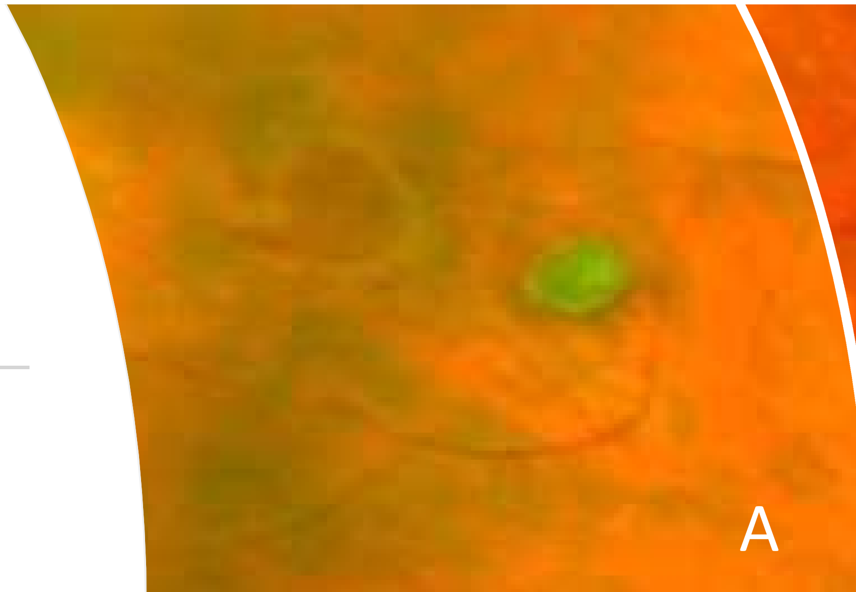
c/ prior cataract surgery

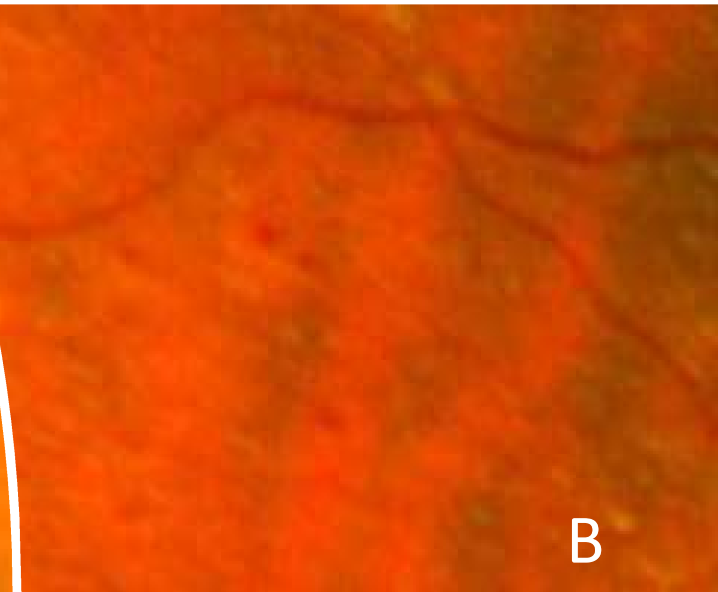
d/ vitreal haemorrhage

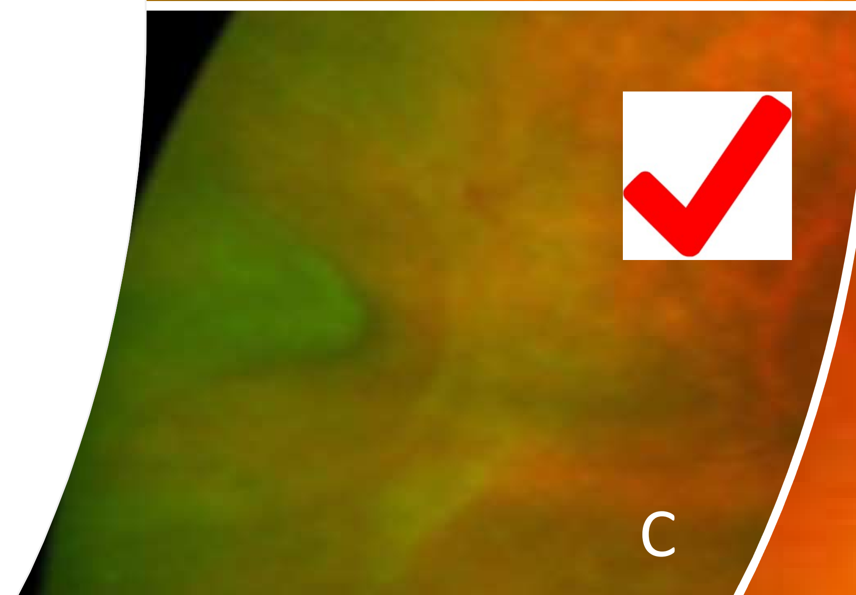
Quiz Which of the following requires urgent referral?

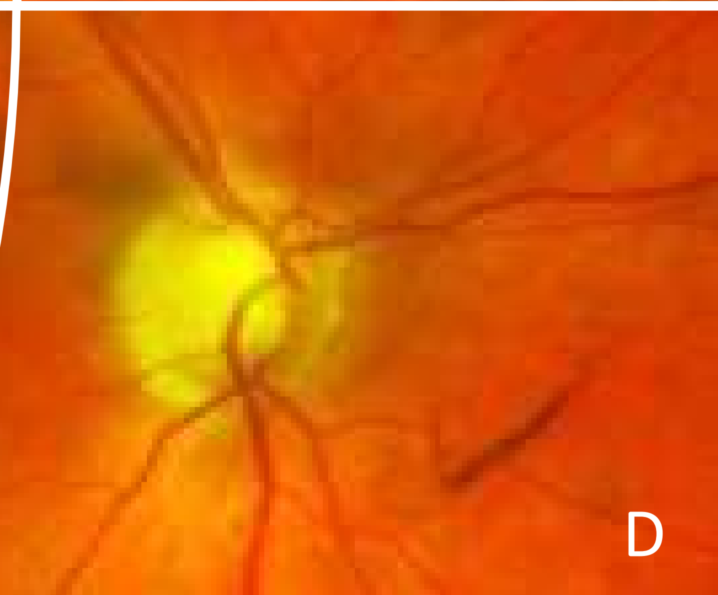
1 A & D
2 B & D
3 C & D
4 A, B & D







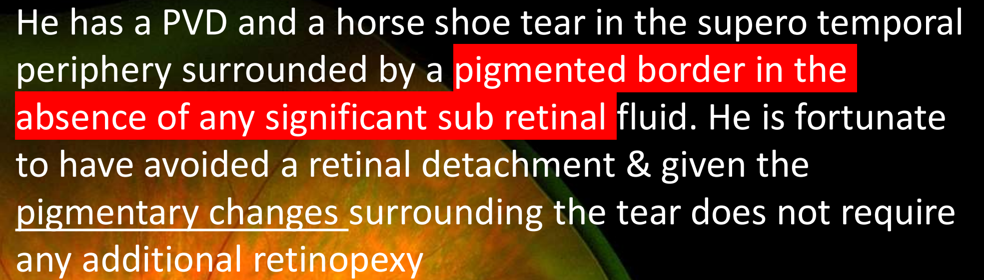




It was a pleasure seeing …. He has dense cataracts OU and an asymptomatic operculated hole temporally LE. I will perform R cataract surgery first followed by left a month later

What if it was a HST?

Mr. R.P. Aet 68 13/10/20 Reduced vision 6/12 -2.75 6/15 -1.75/-1.00 x 70 6/15
dense cataracts can't remember last EE urgency or emergency?



He has a PVD and a horse shoe tear in the supero temporal periphery surrounded by a pigmented border in the absence of any significant sub retinal fluid. He is fortunate to have avoided a retinal detachment & given the pigmentary changes surrounding the tear does not require any additional retinopexy

- Mr. O.T. Aet 88 routine review 18/12/18 bilateral pseudophake 2015 previous low hyperope asymptomatic
- Pigmented posterior edge? Subretinal fluid?

Urgency or emergency?

Quiz Which of the following patients needs an emergency 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

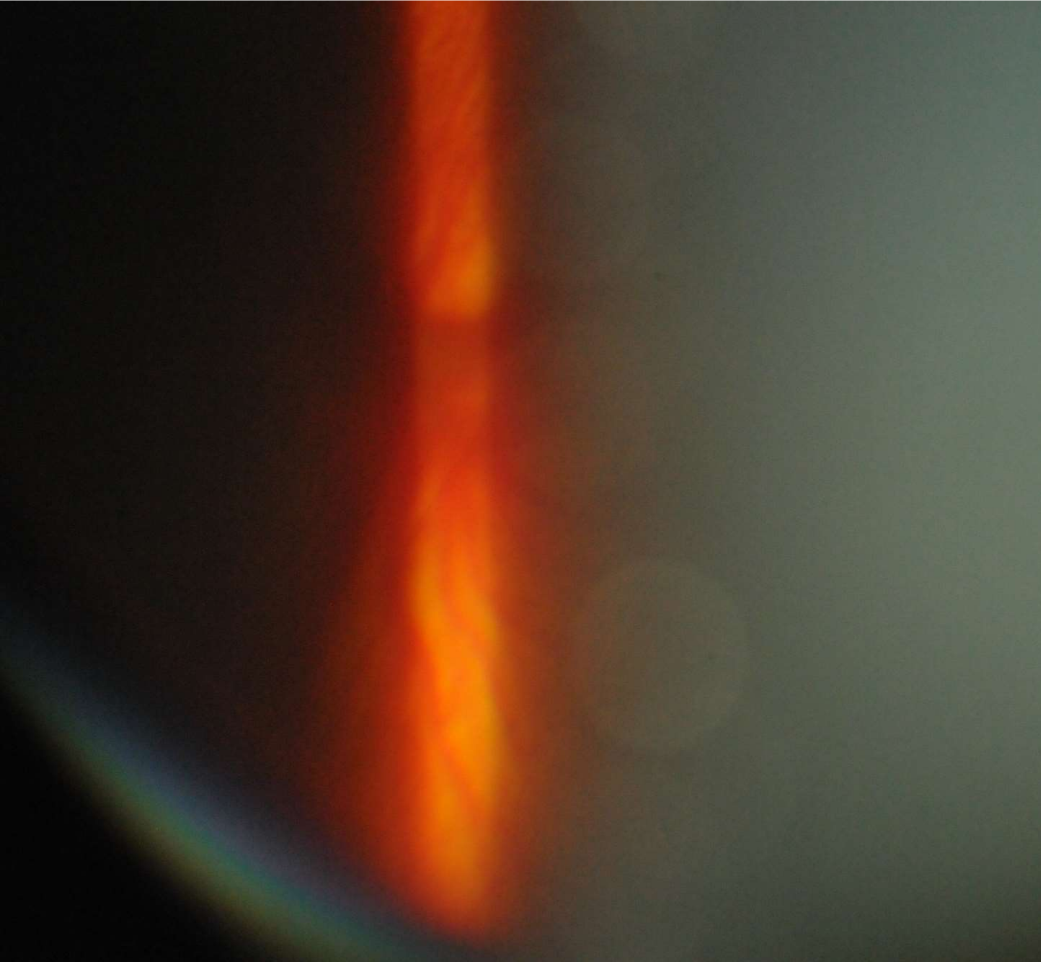
3 Low myope with vitreal haze following blunt trauma and occasional flashes

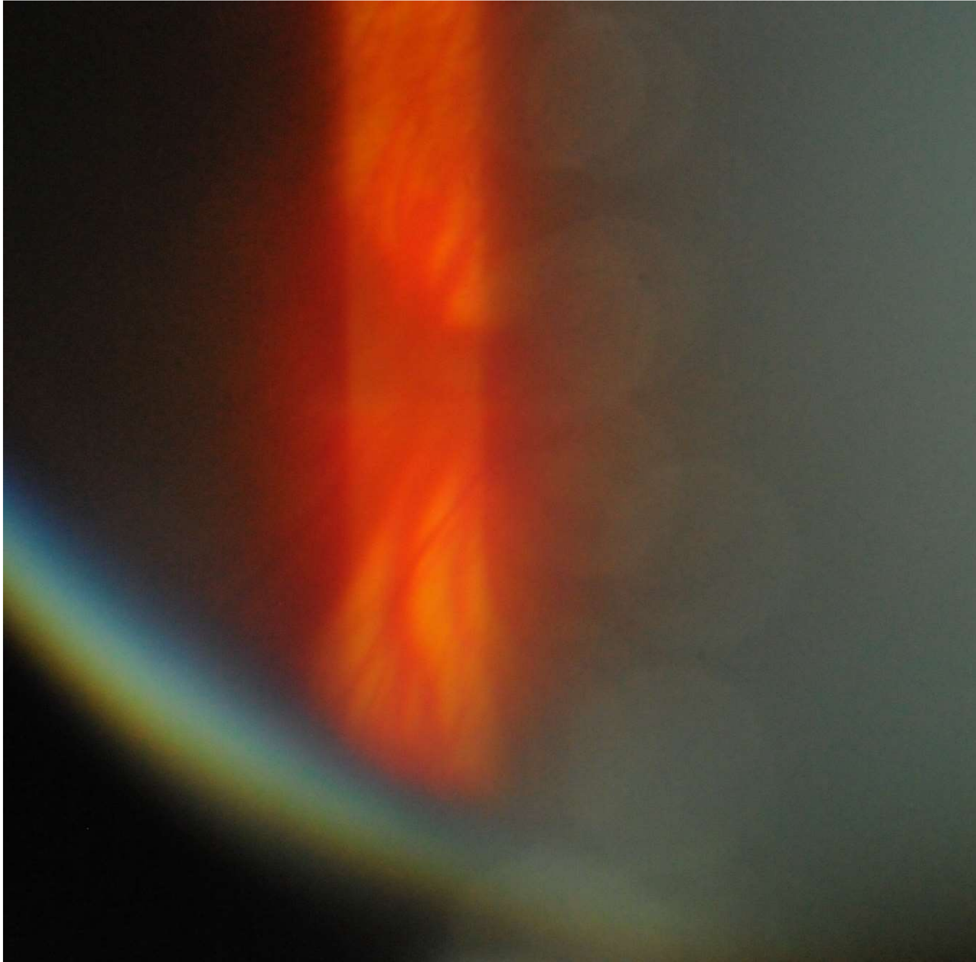
4 High myope with peripheral lattice degeneration, no PVD, good vision and asymptomatic

Quiz Which of the following are possible sequalae following RD Sx

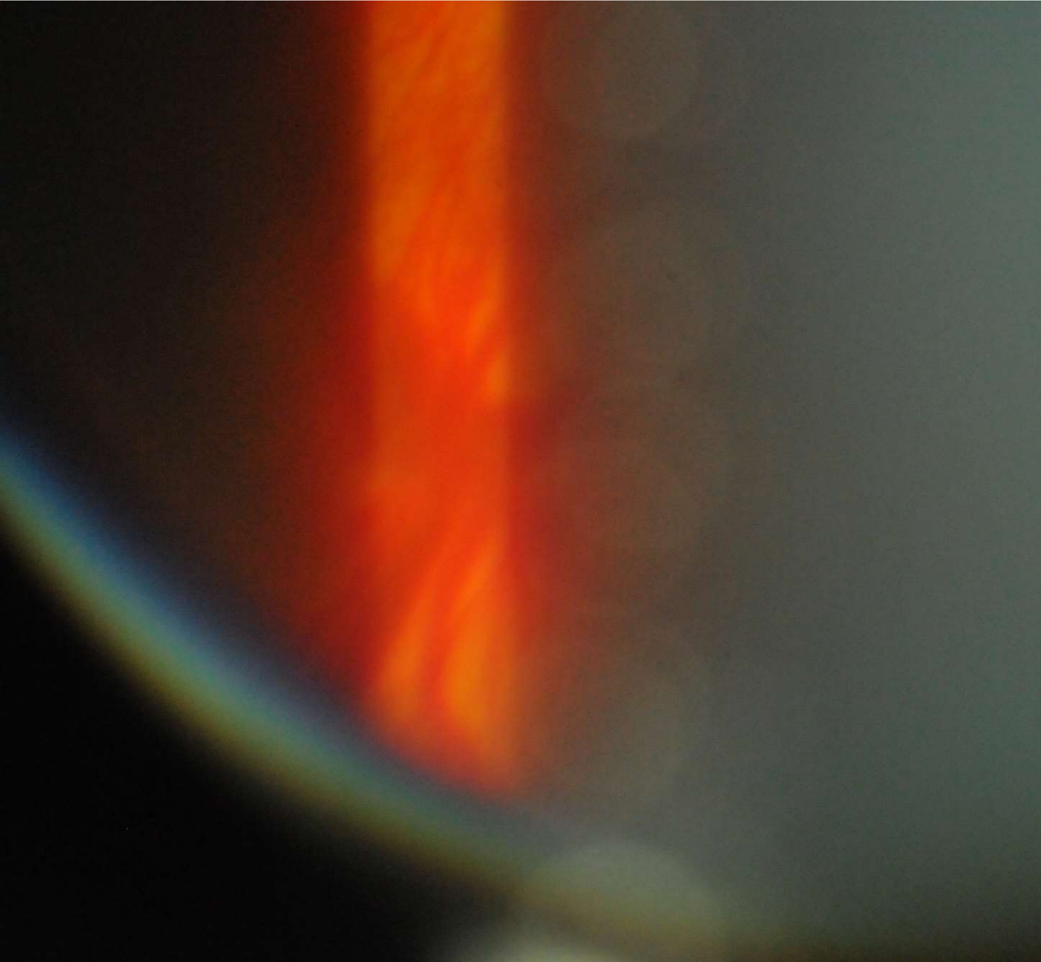
- a/ Diplopia
- b/ High IOP
- c/ Increased glare intolerance
- d/ Haloes
- e/ Cataracts
- f/ all of the above

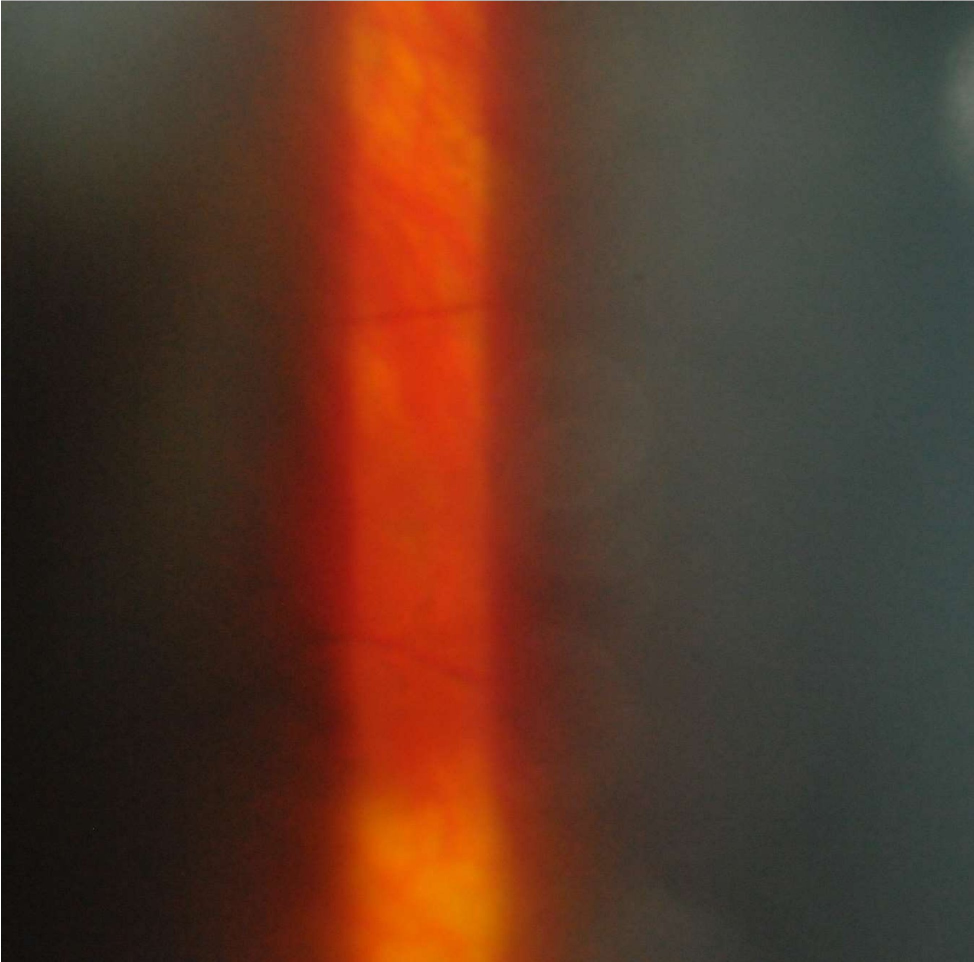
So what is this?

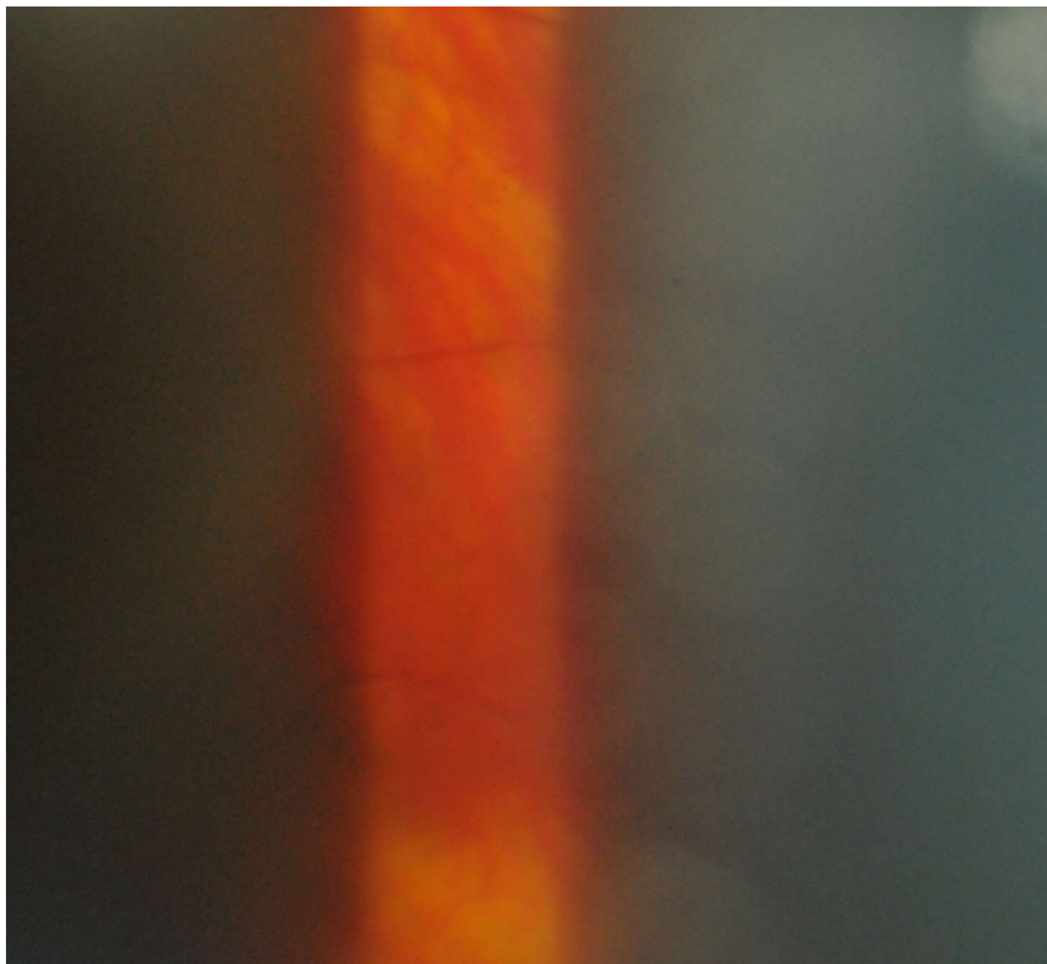
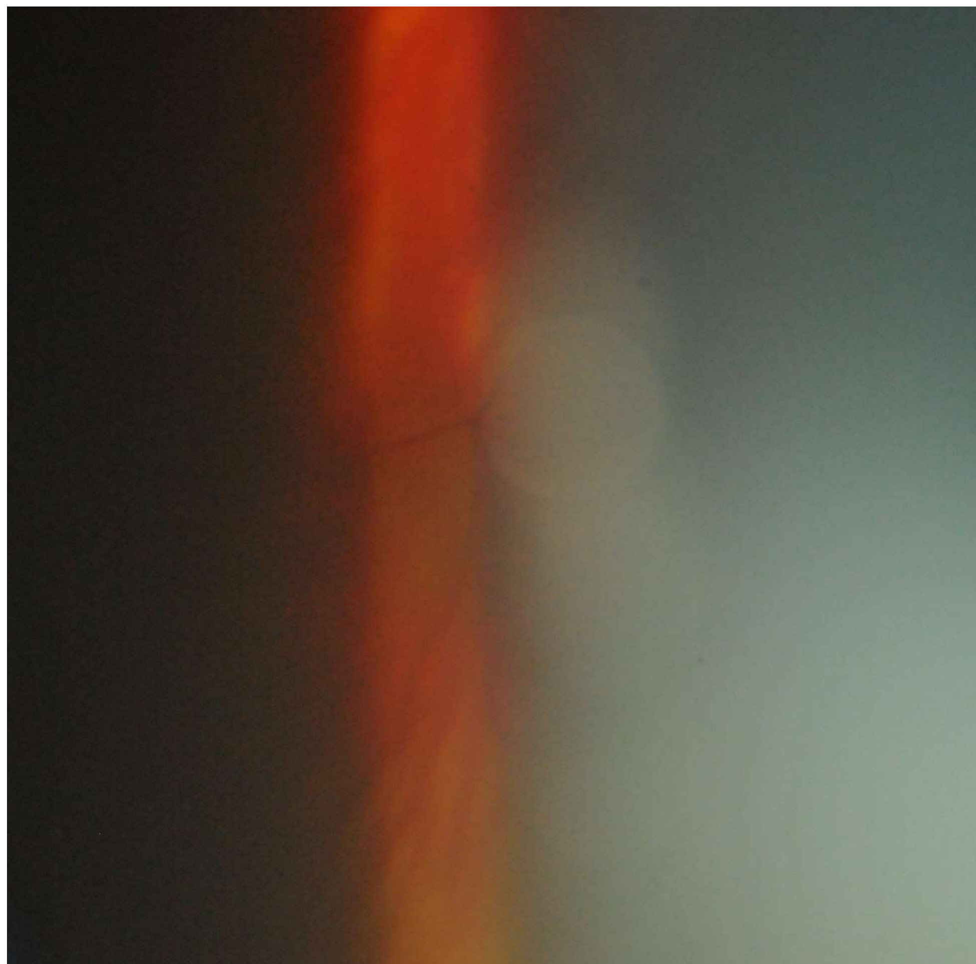


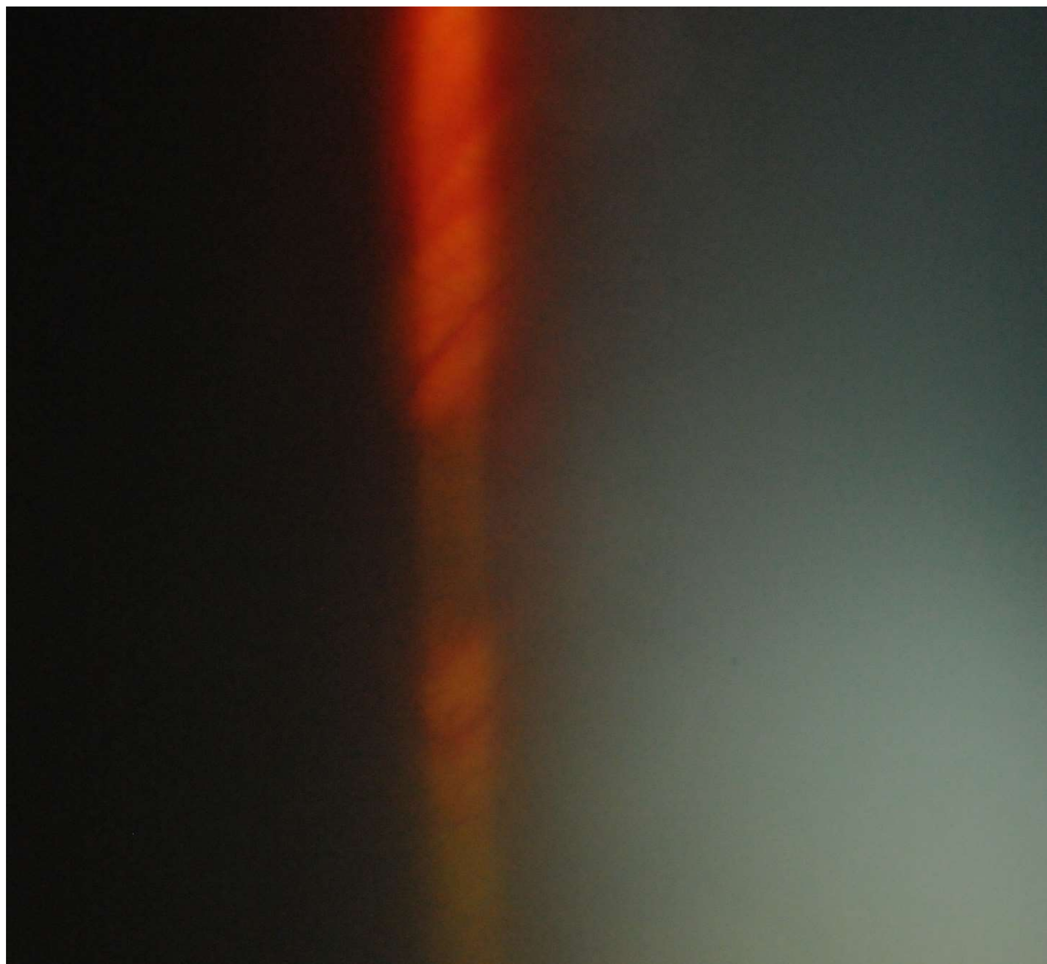
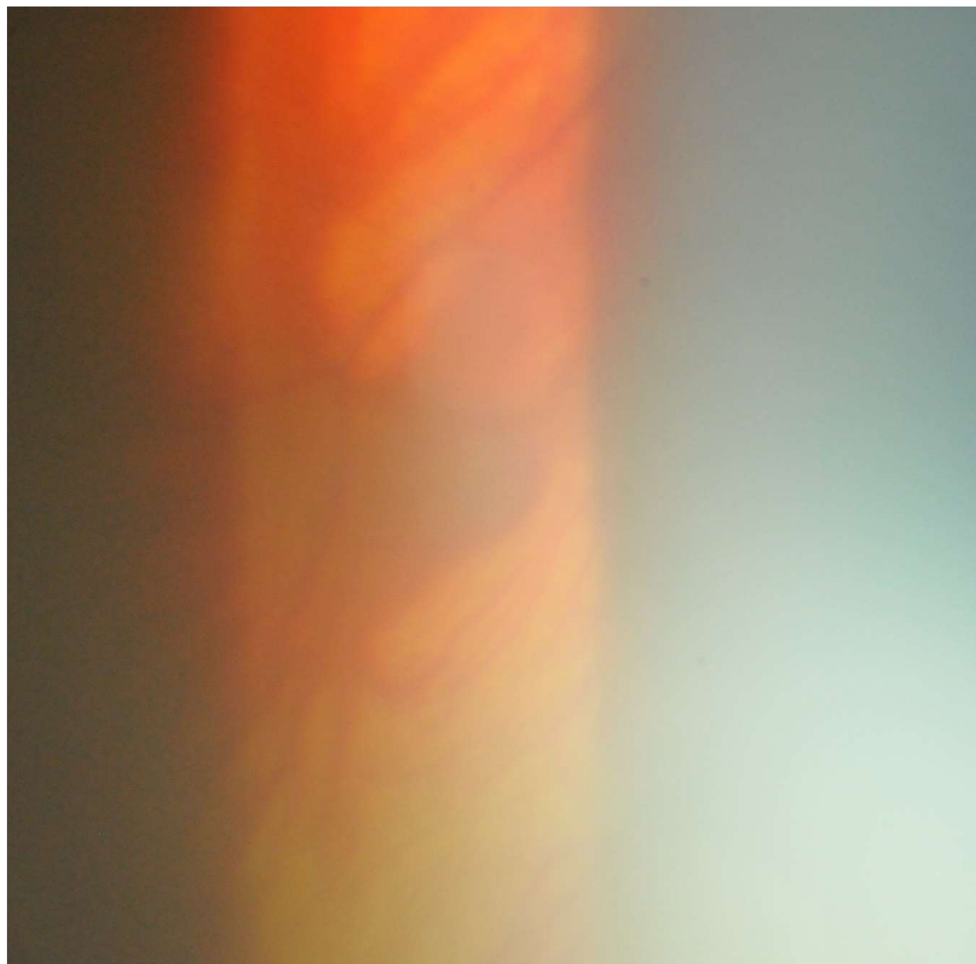


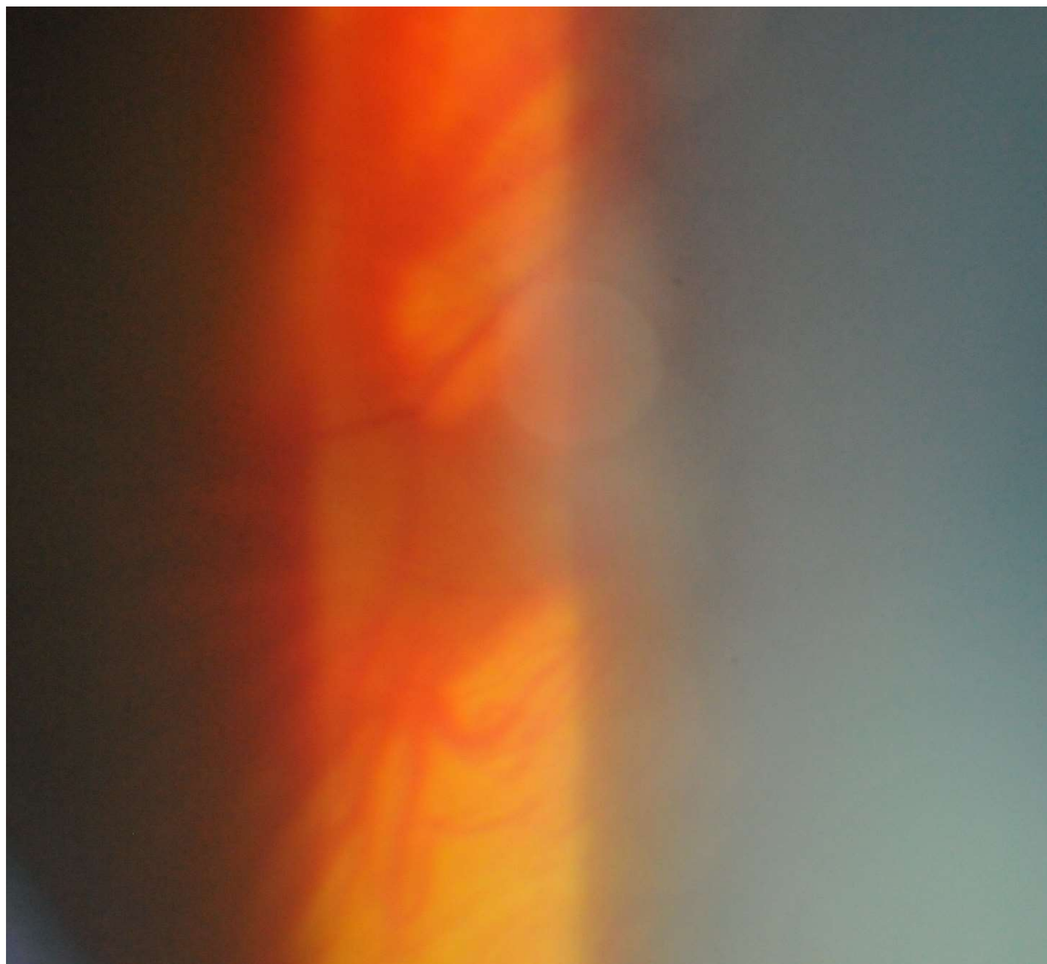
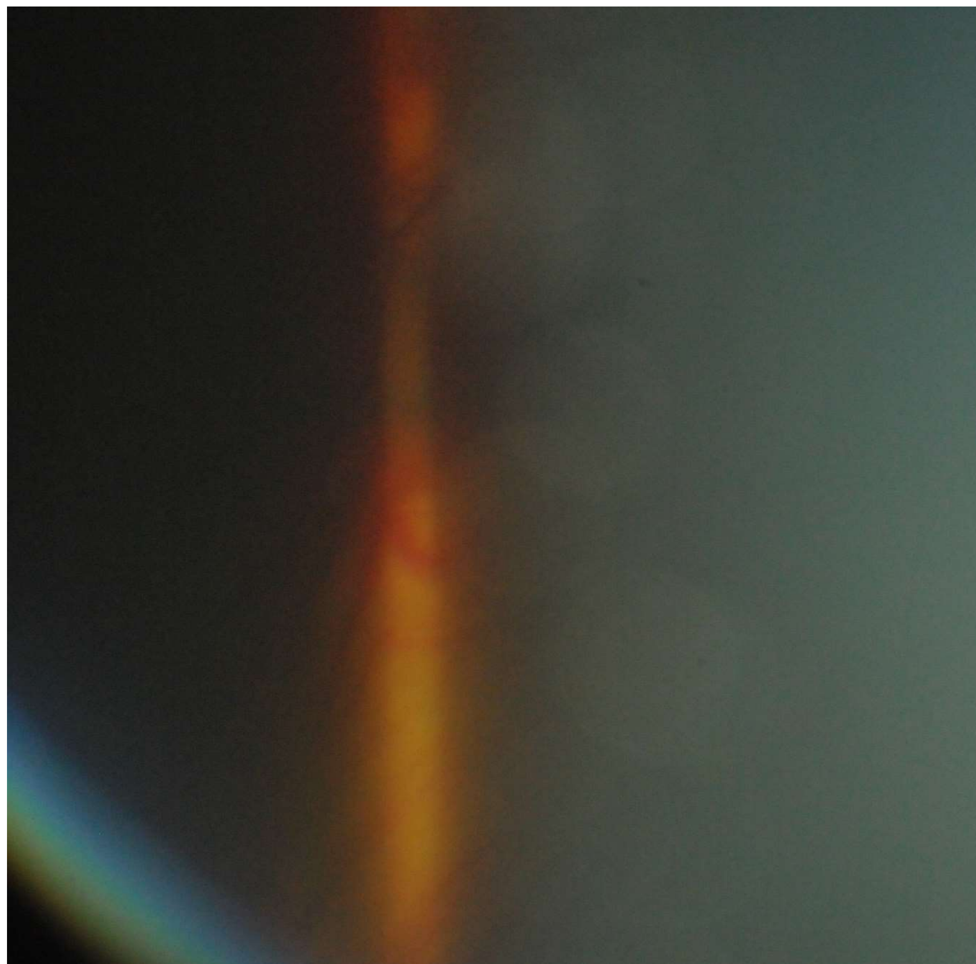
So what is this?





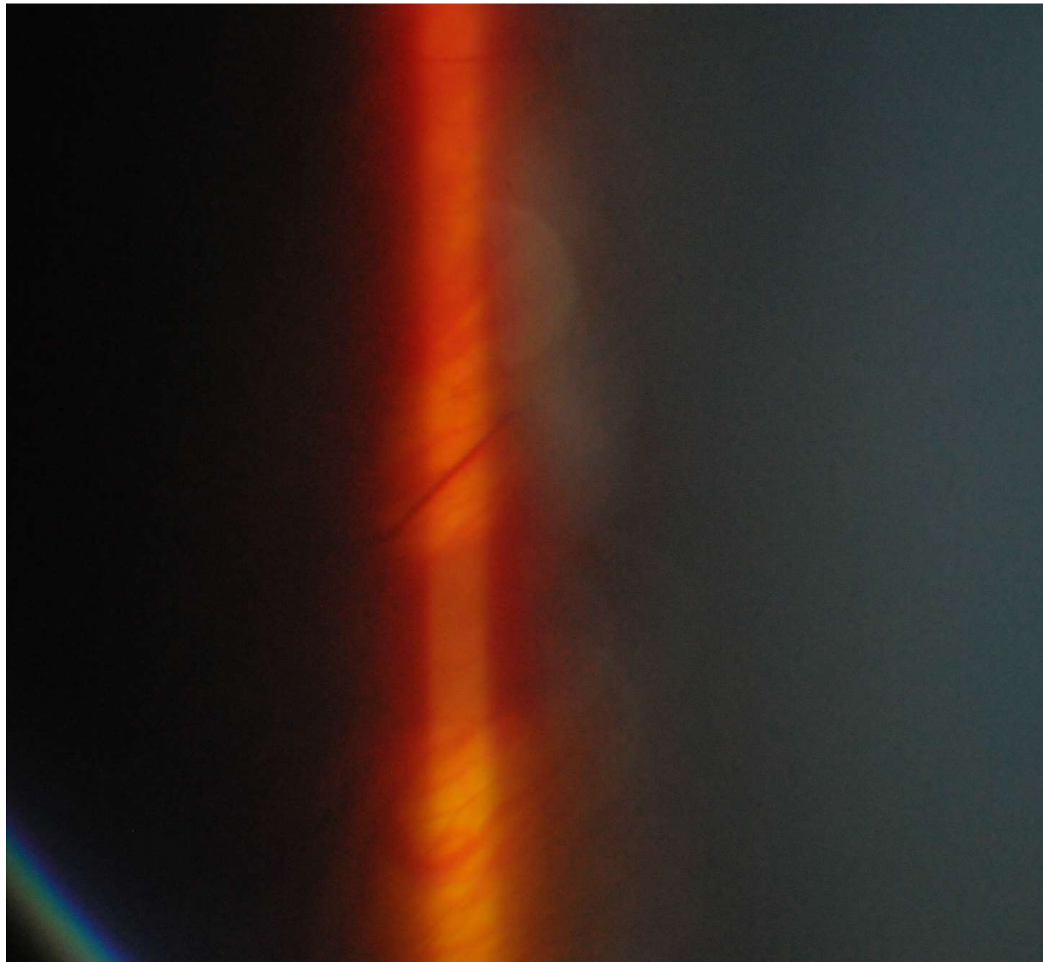



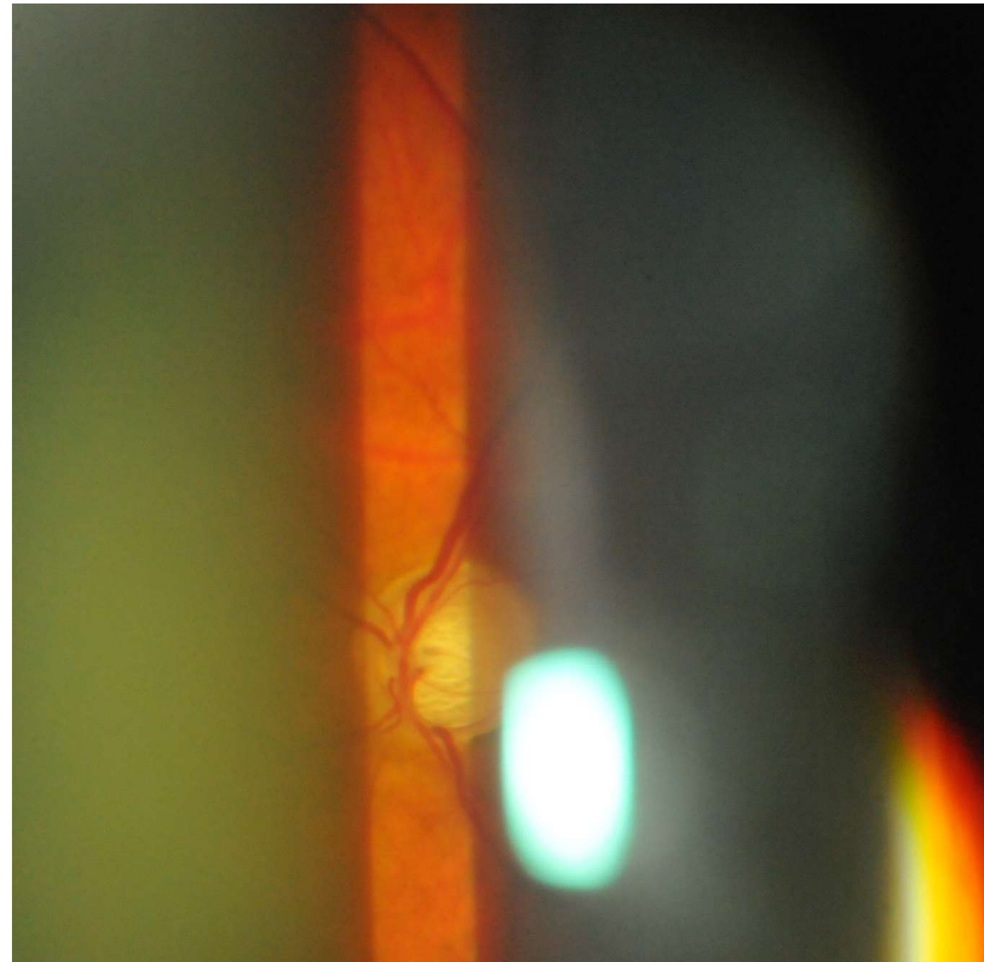



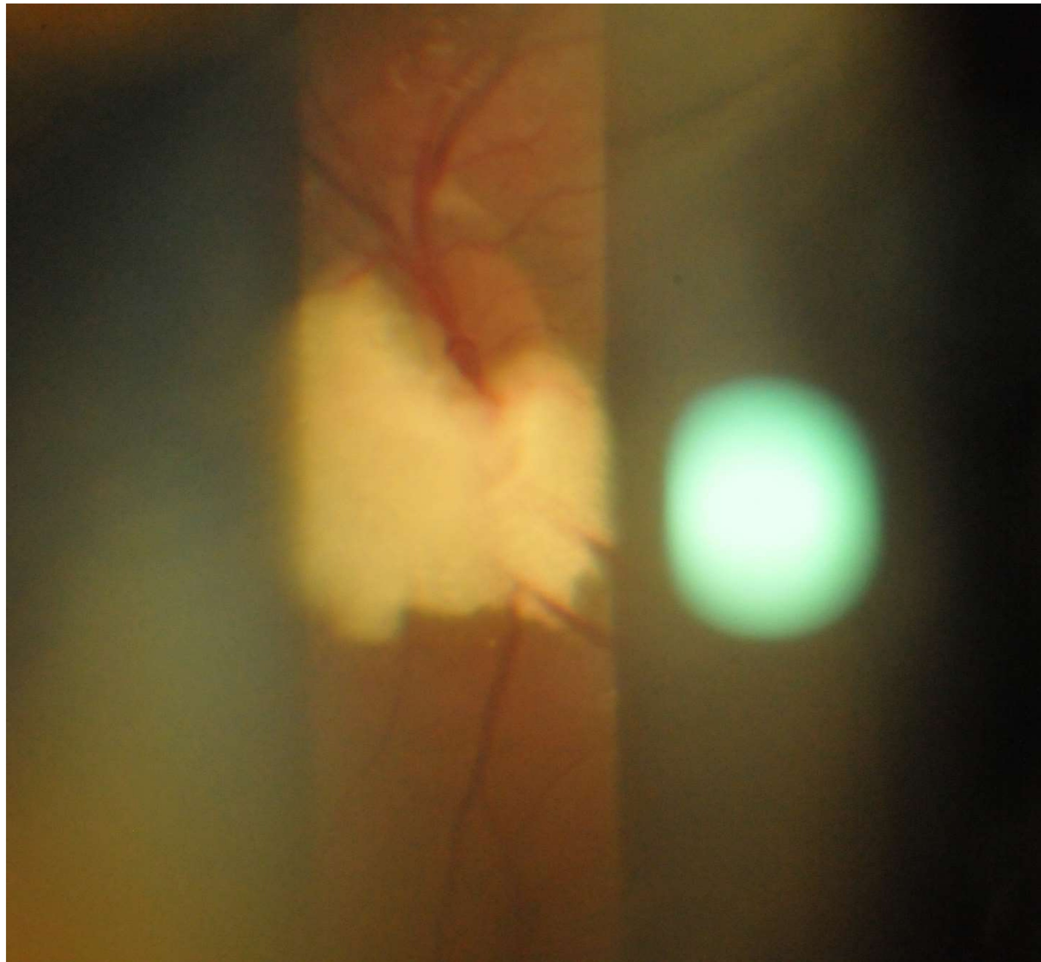
So is it flat?

Is this nerve OK?

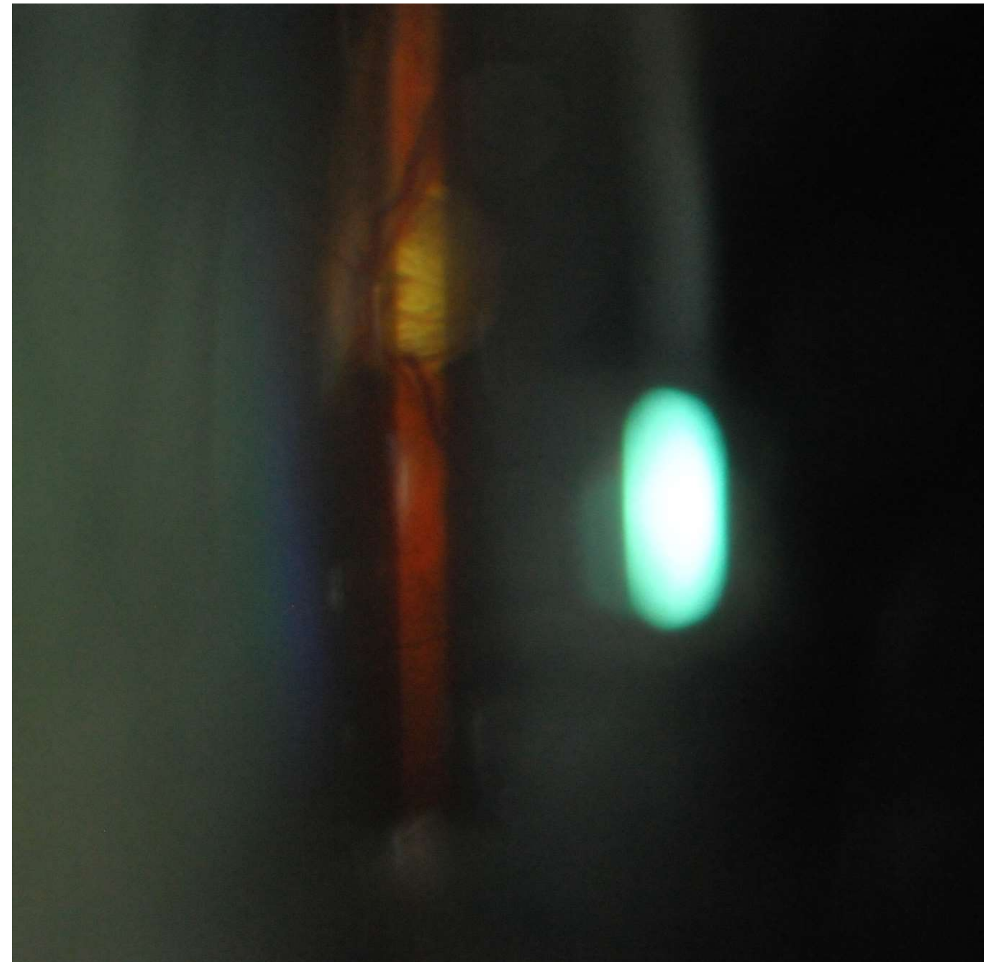




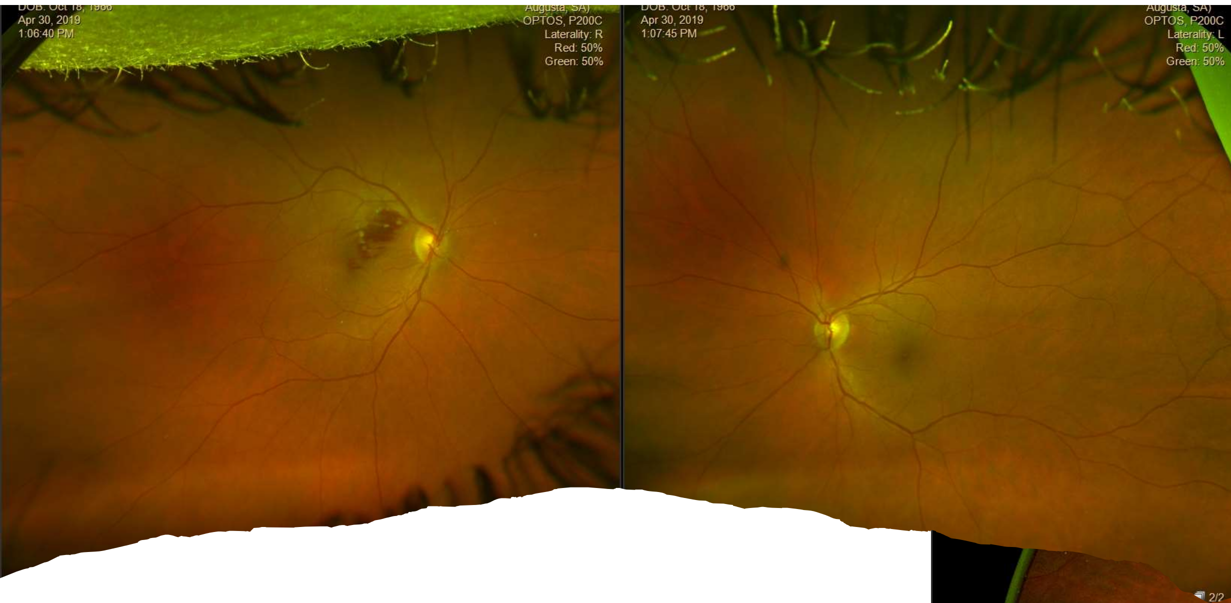
And this disc is?

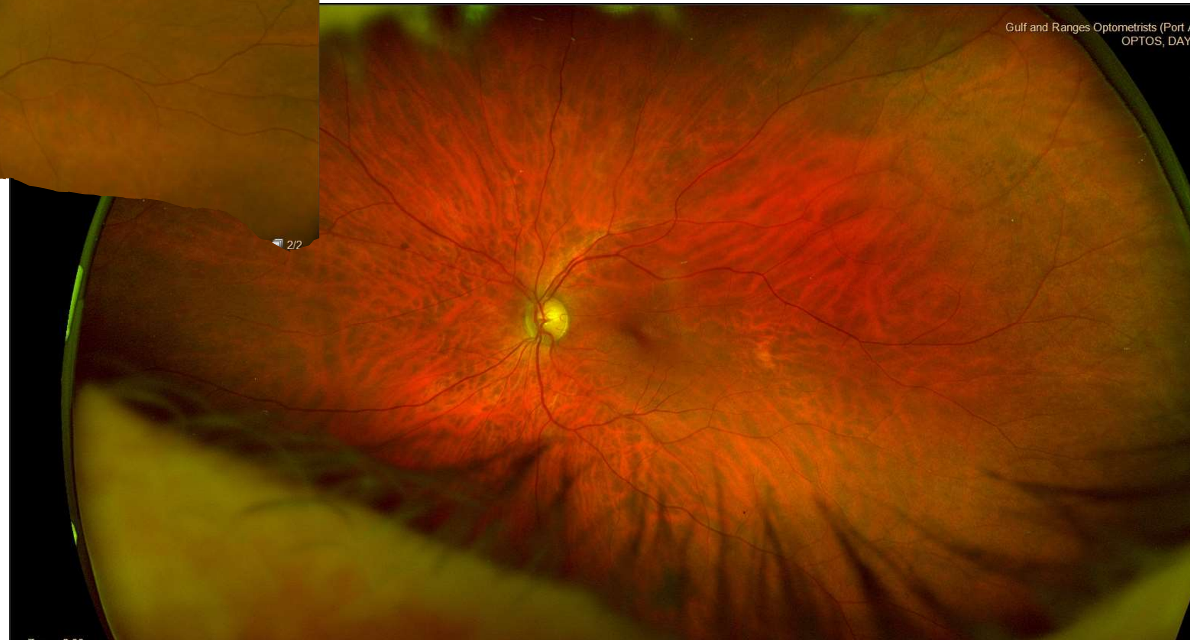


What about this disc?

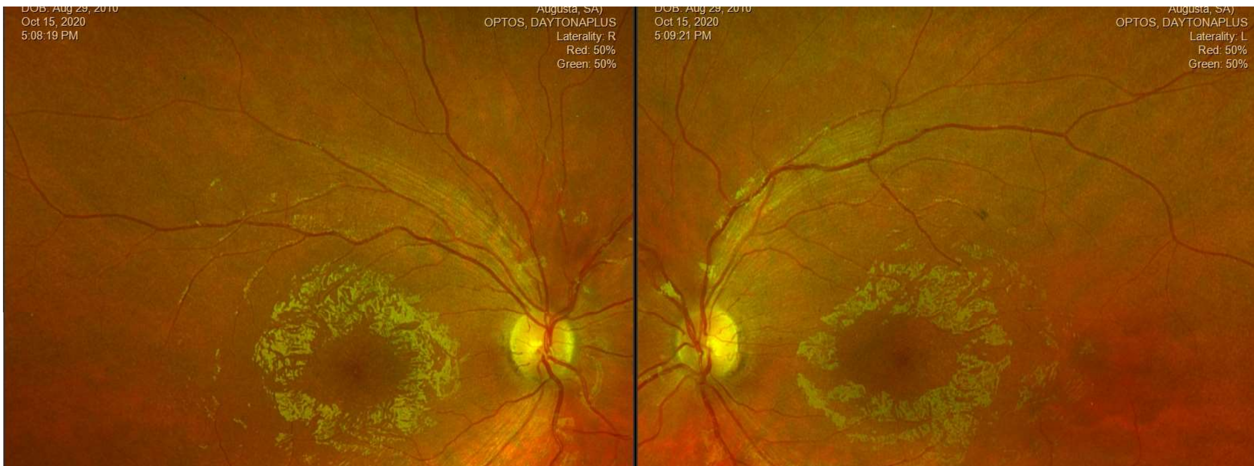


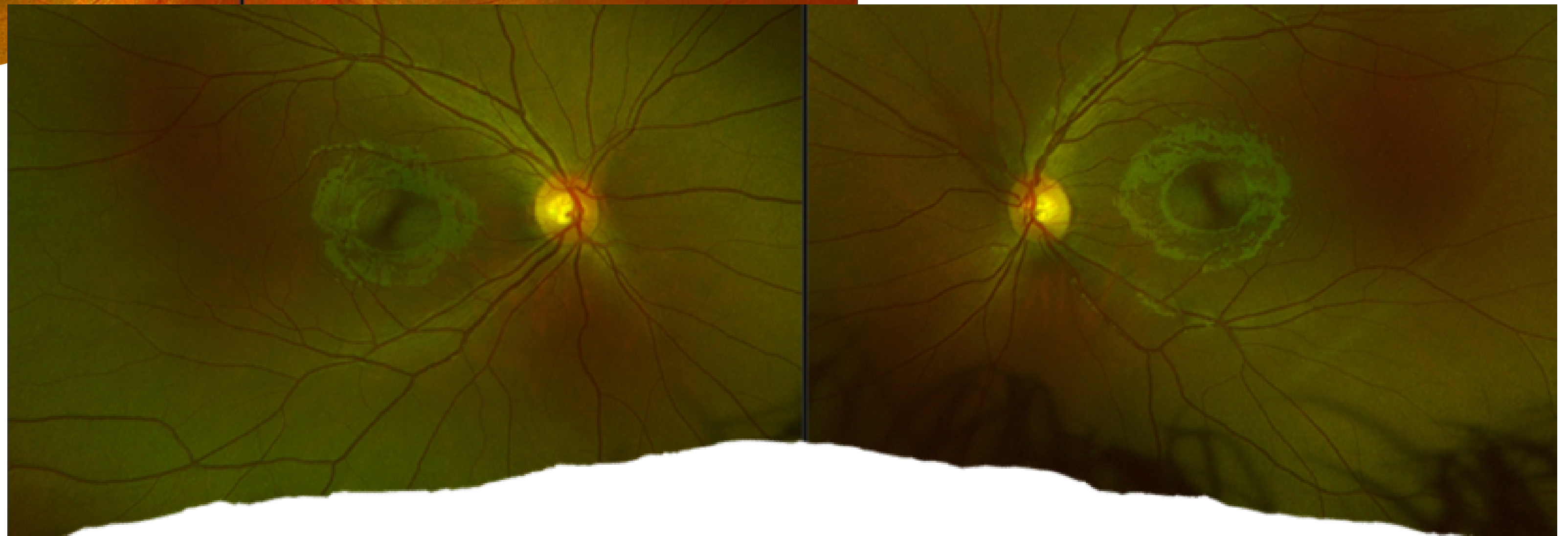
A. Which are normal? PHOTO B.



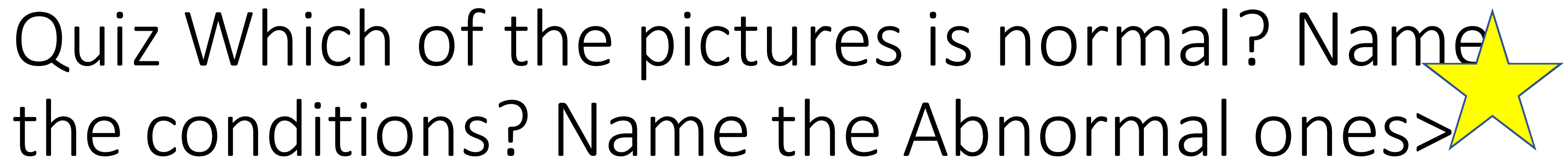


C. Which are normal? Photo D.





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

End

- Ok, about to go to breakout teams.

- Introduce self to the rest of your breakout team