Glaucoma or Masquerader?

Clinical Pearls and Systematic Approach for Accurate Diagnosis

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What we'll cover

- Real Life Scenarios
- Common masqueraders
- Key diagnostic features of each
- Tips and tricks

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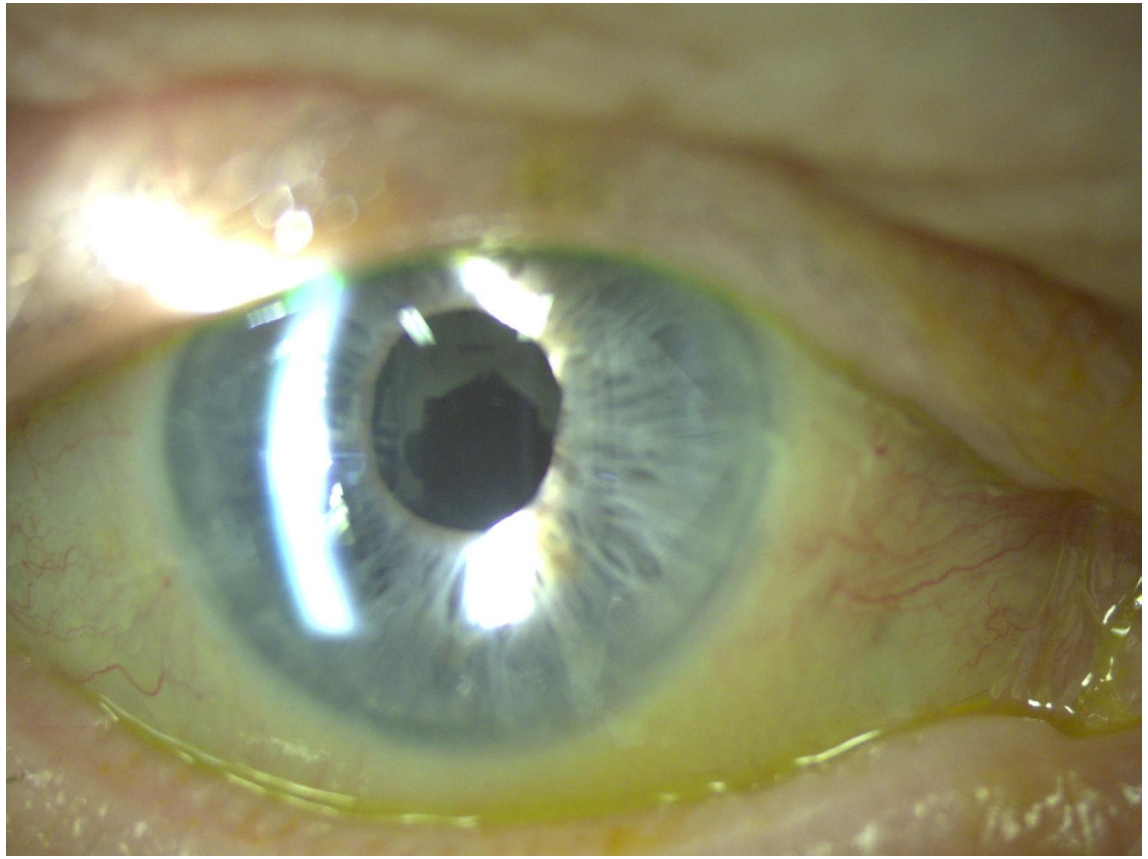
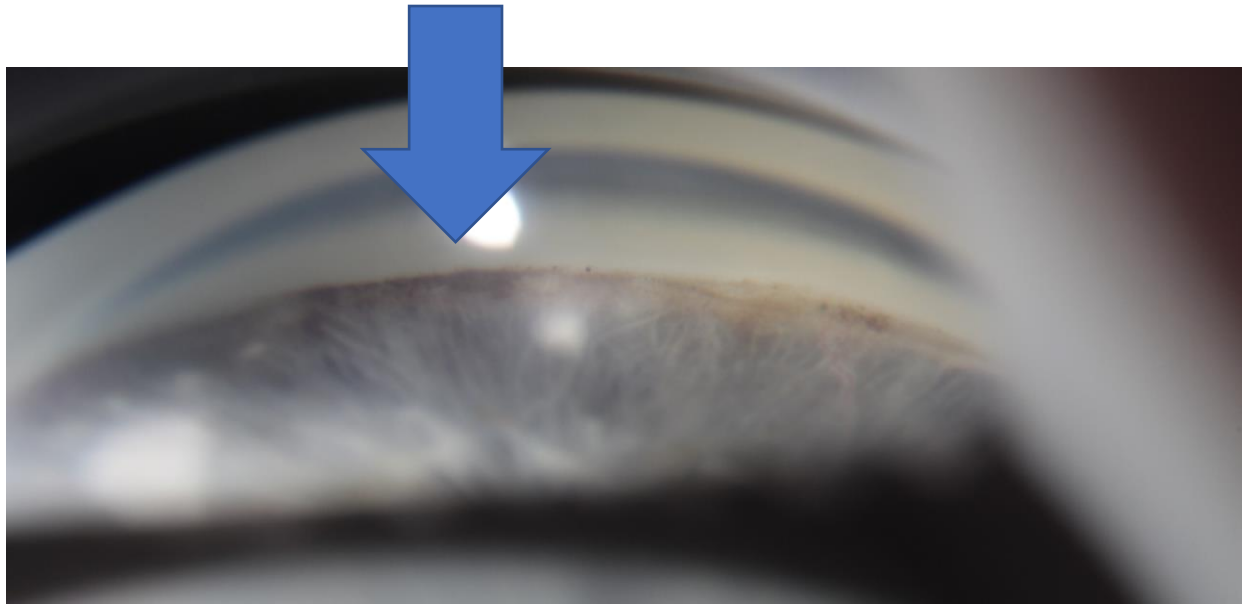
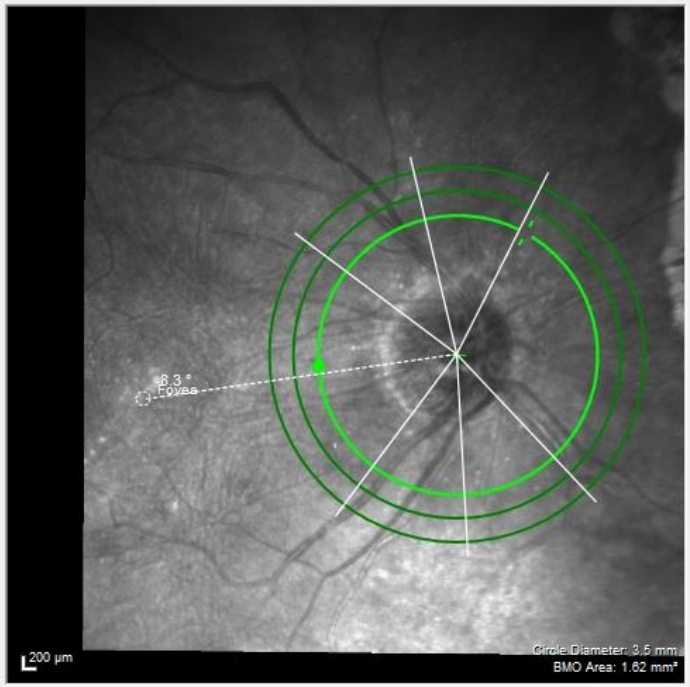
Case 1. Mrs KF- 73yo female known diabetic

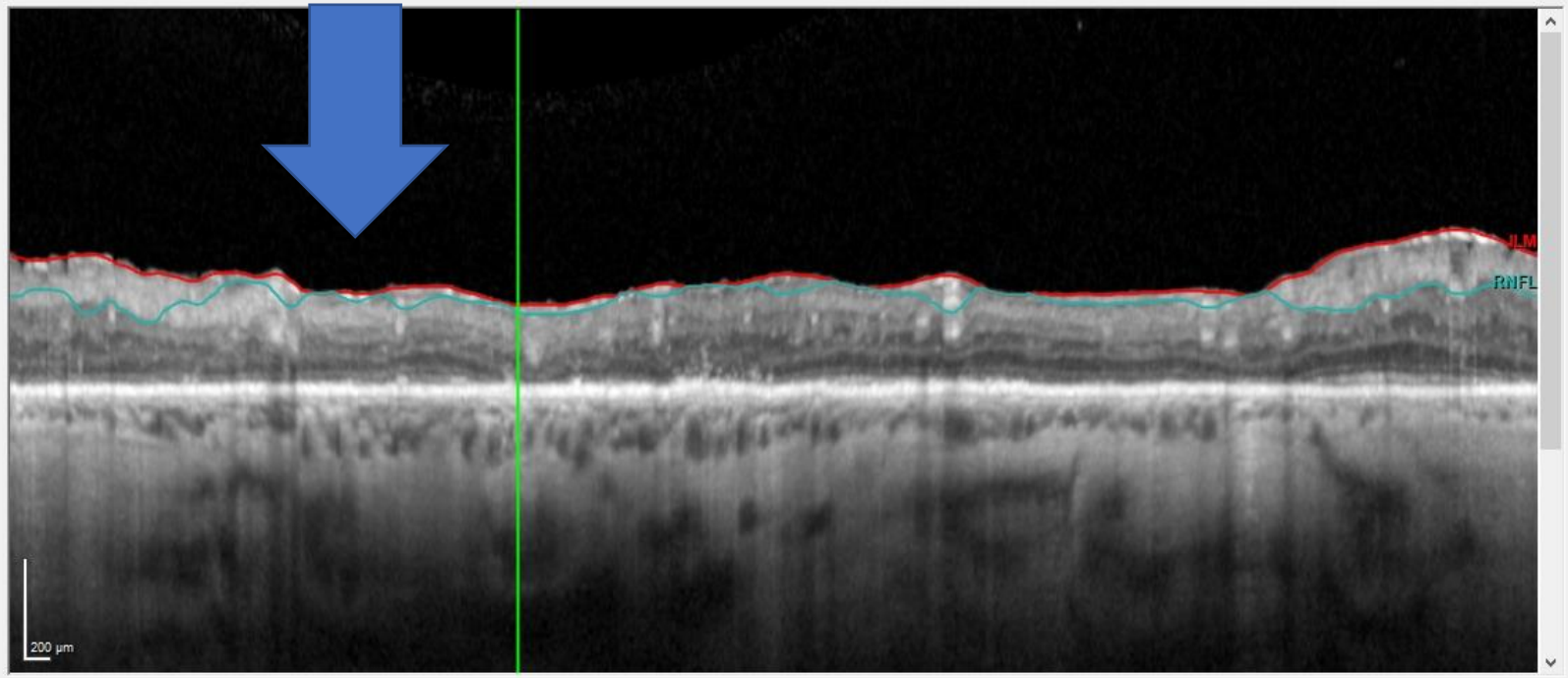




POHx

- Bilateral vitrectomy for PDR and tractional RD OU
- Left fine NVI with rubeosis
- VA R 6/60 NIPH L 6/12 NIPH
- IOP 16/18

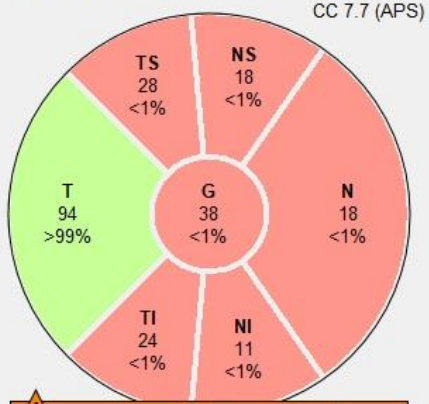




1:1 pixel | 1:1 µm

Peripapillary RNFLT Classification

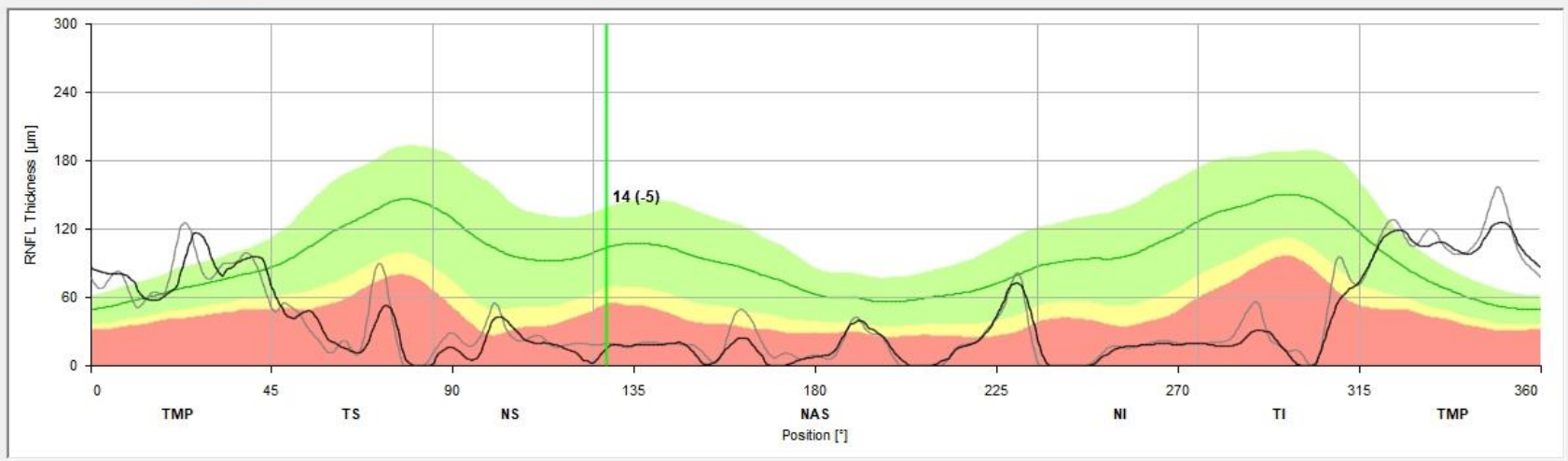
CC 7.7 (APS)



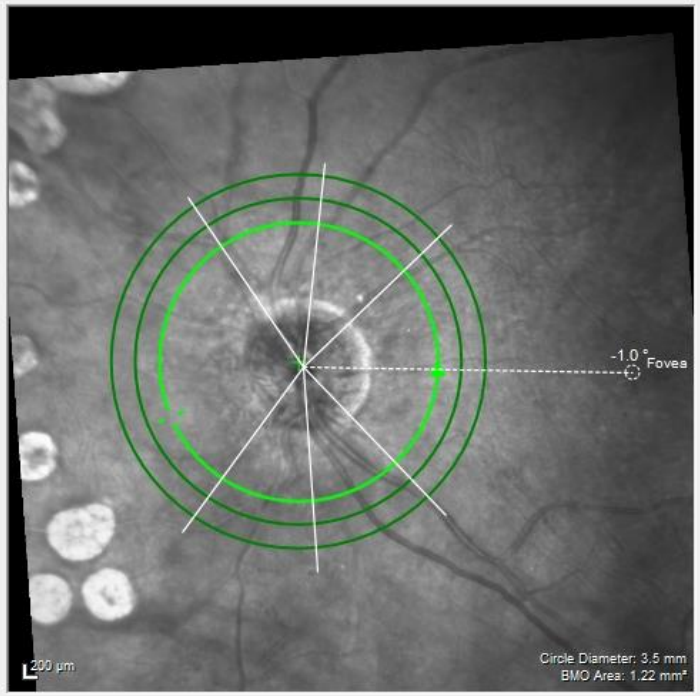
Segmentation unconfirmed

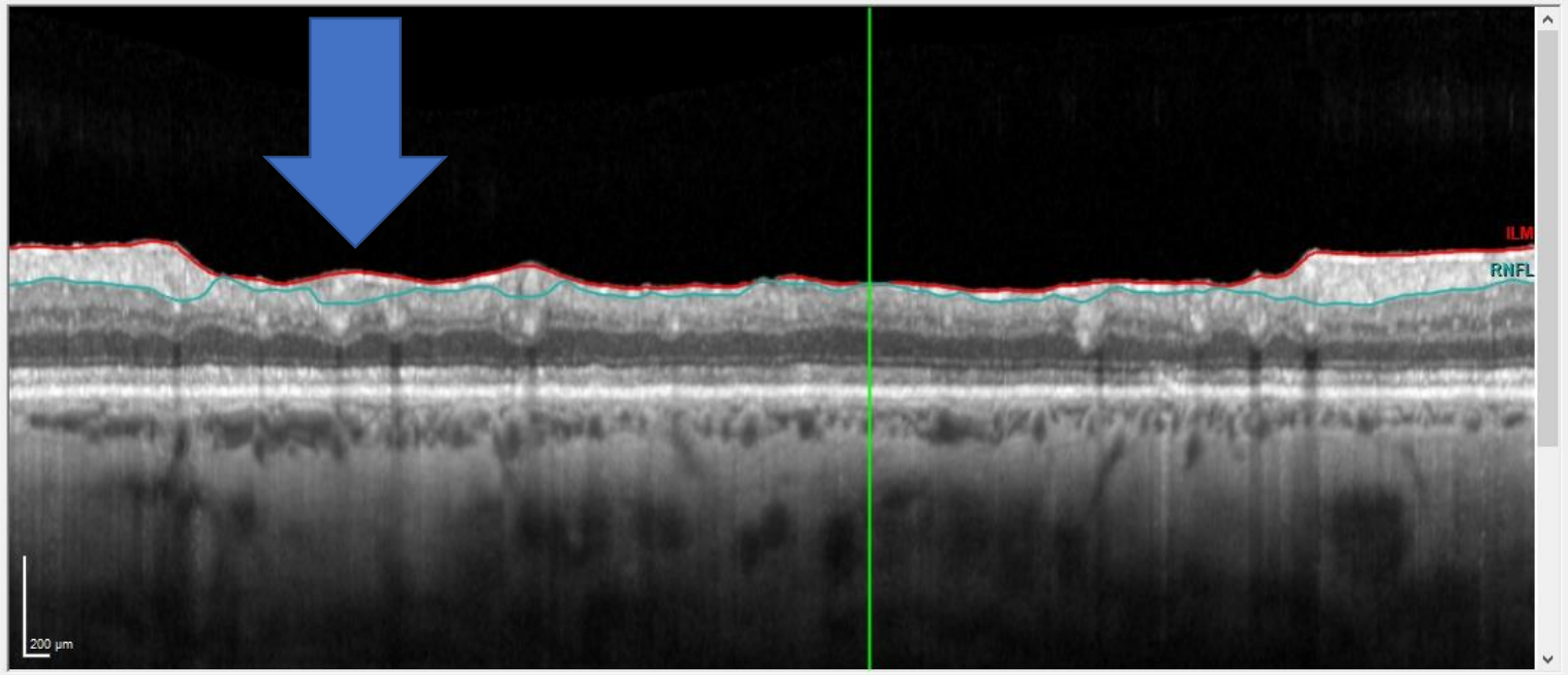
Outside Normal Limits

1

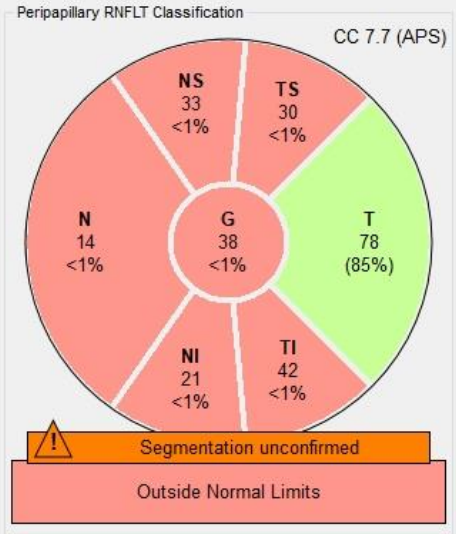


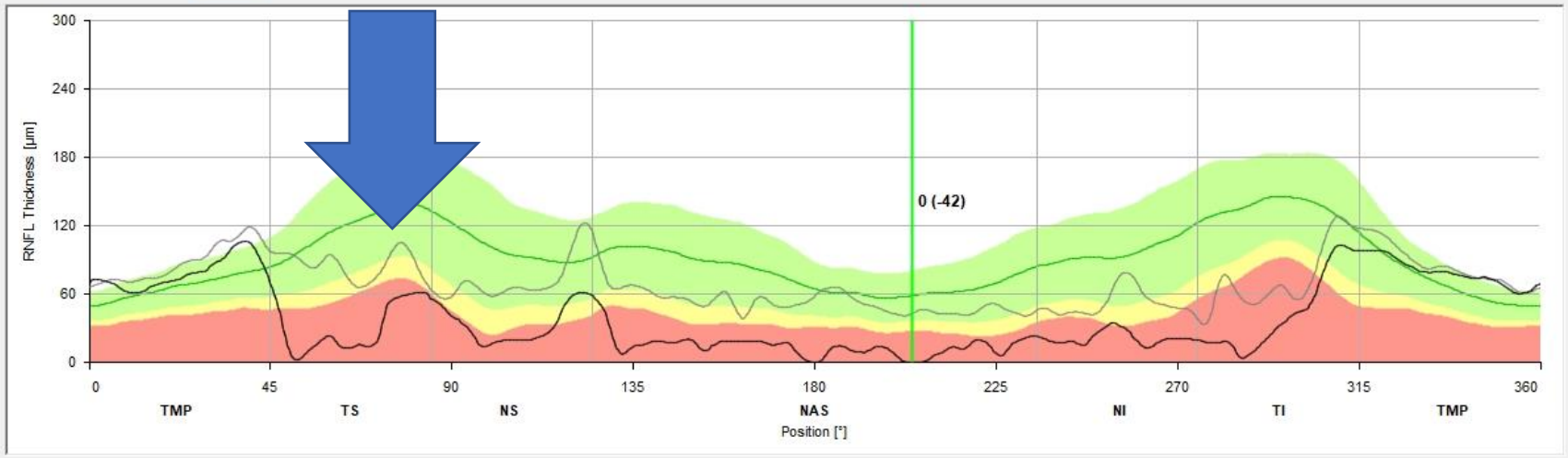
Reference database: European Descent (2014)





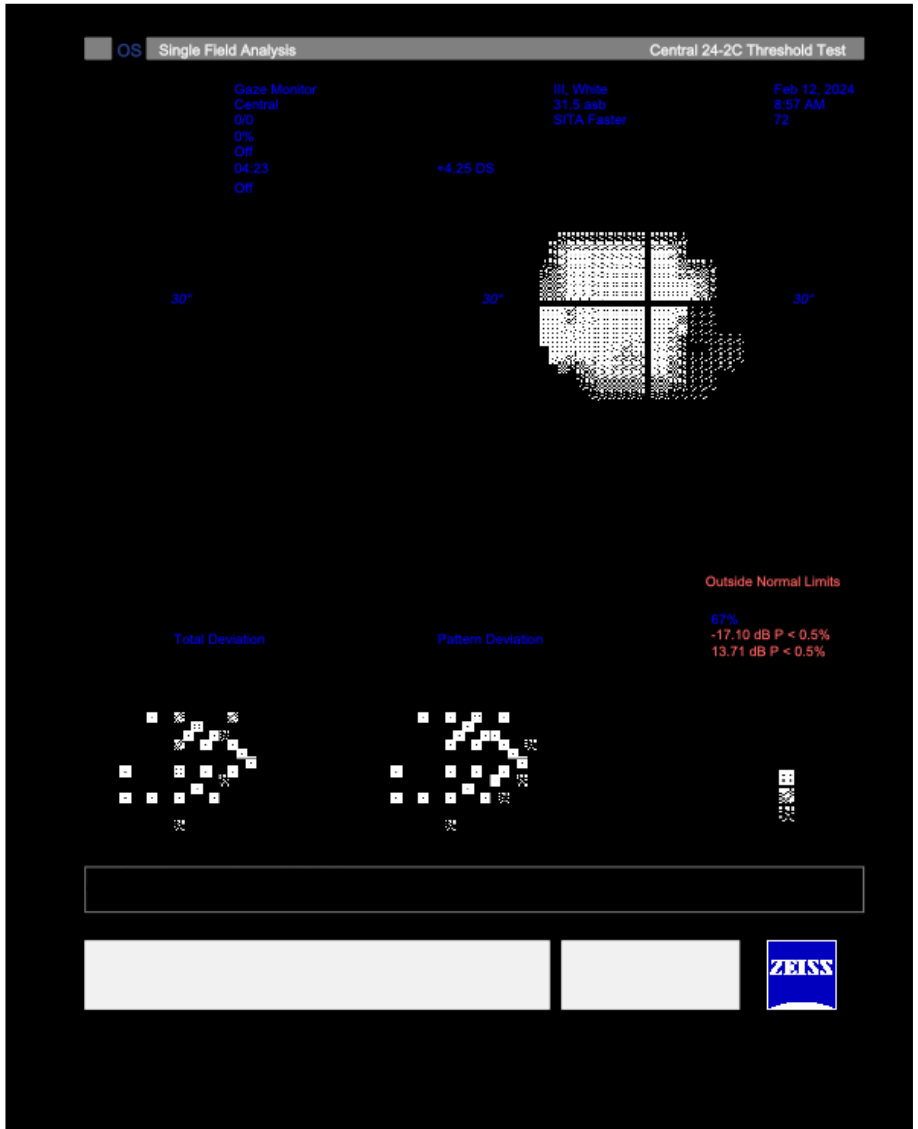
1:1 pixel | 1:1 µm

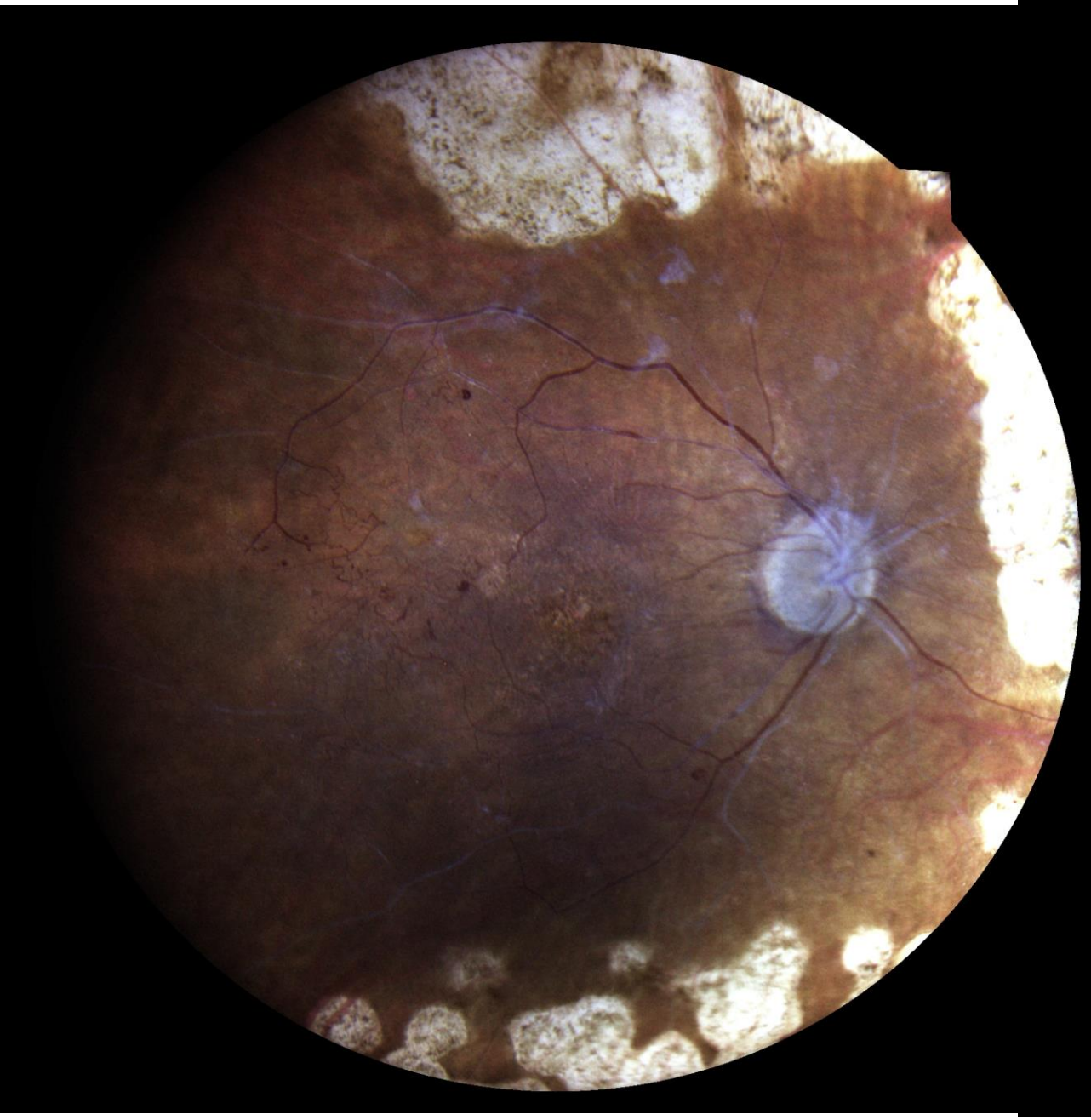


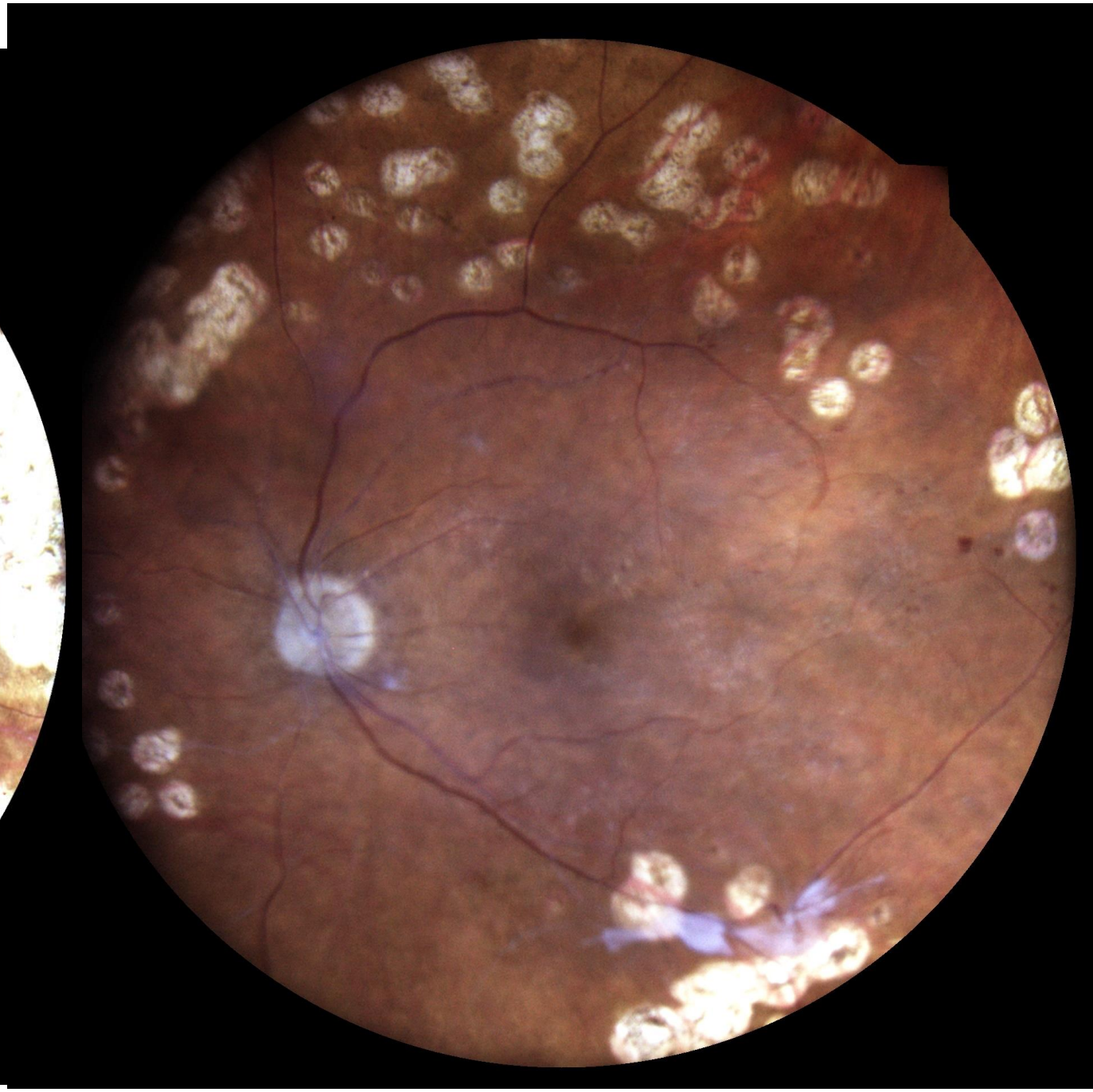


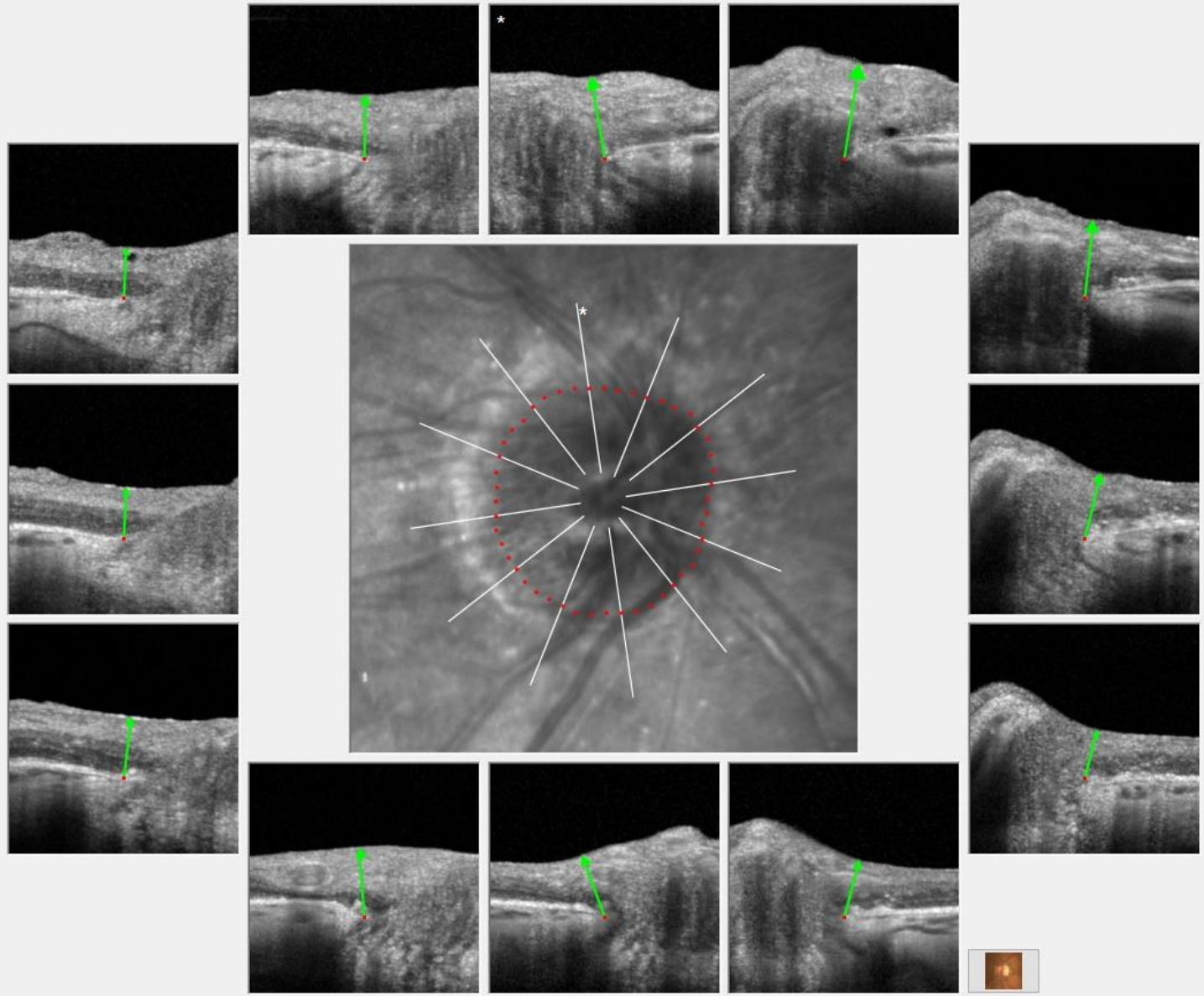
Reference database: European Descent (2014)

Is this glaucoma?









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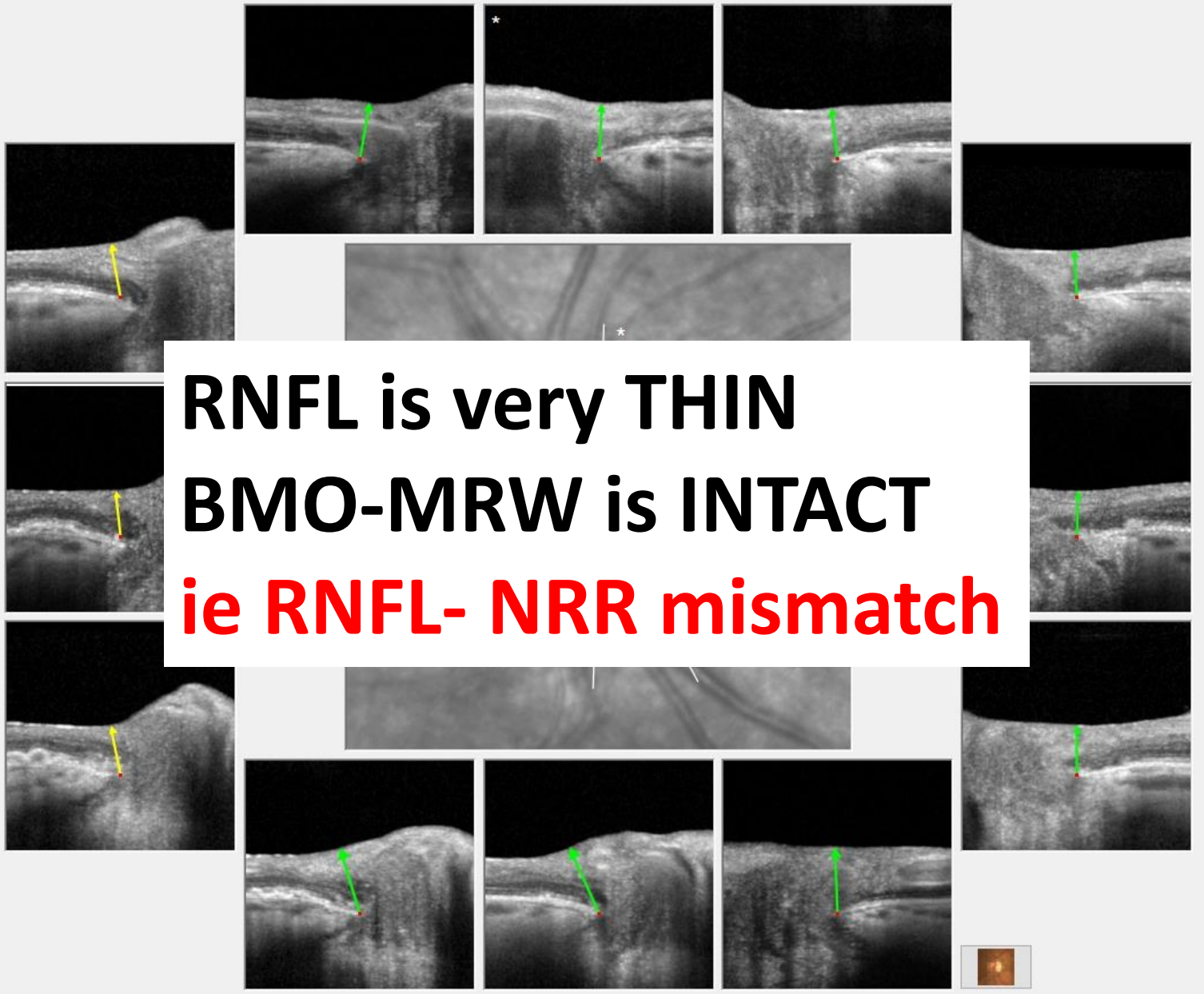


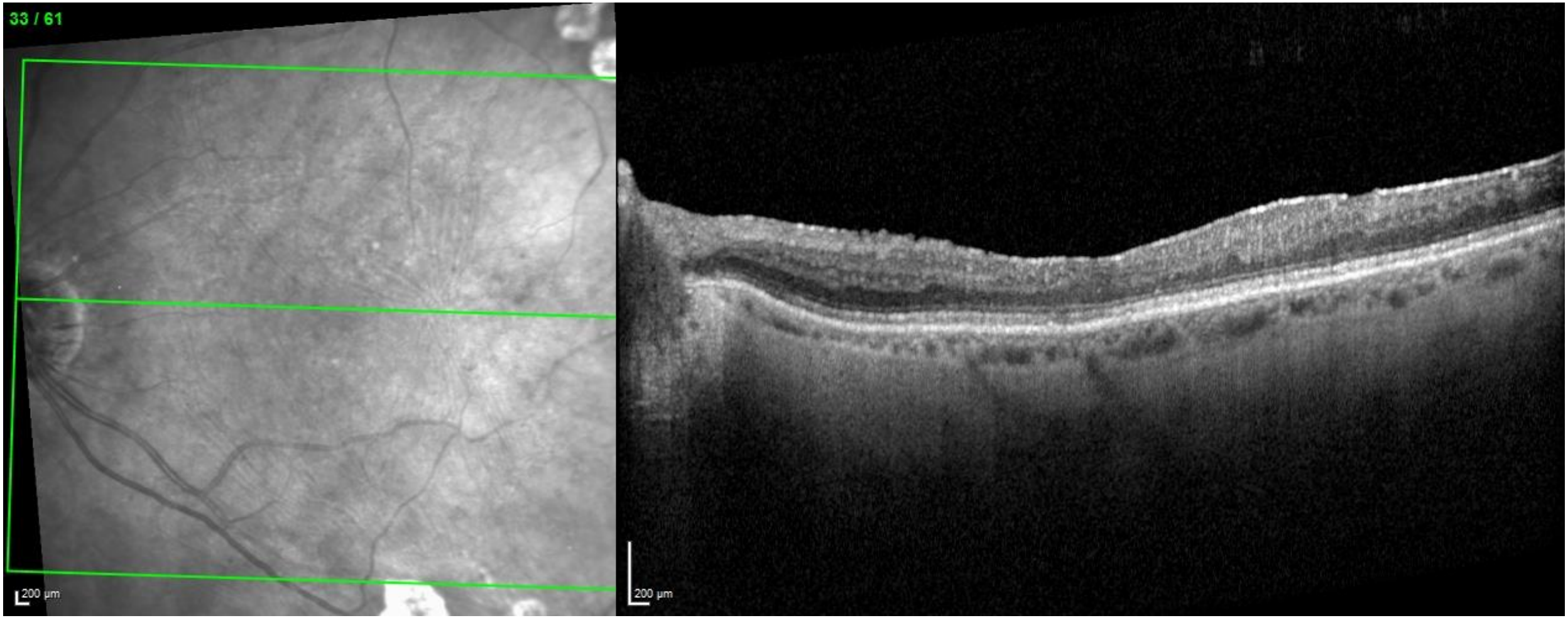
RNFL is very THIN

BMO-MRW is INTACT

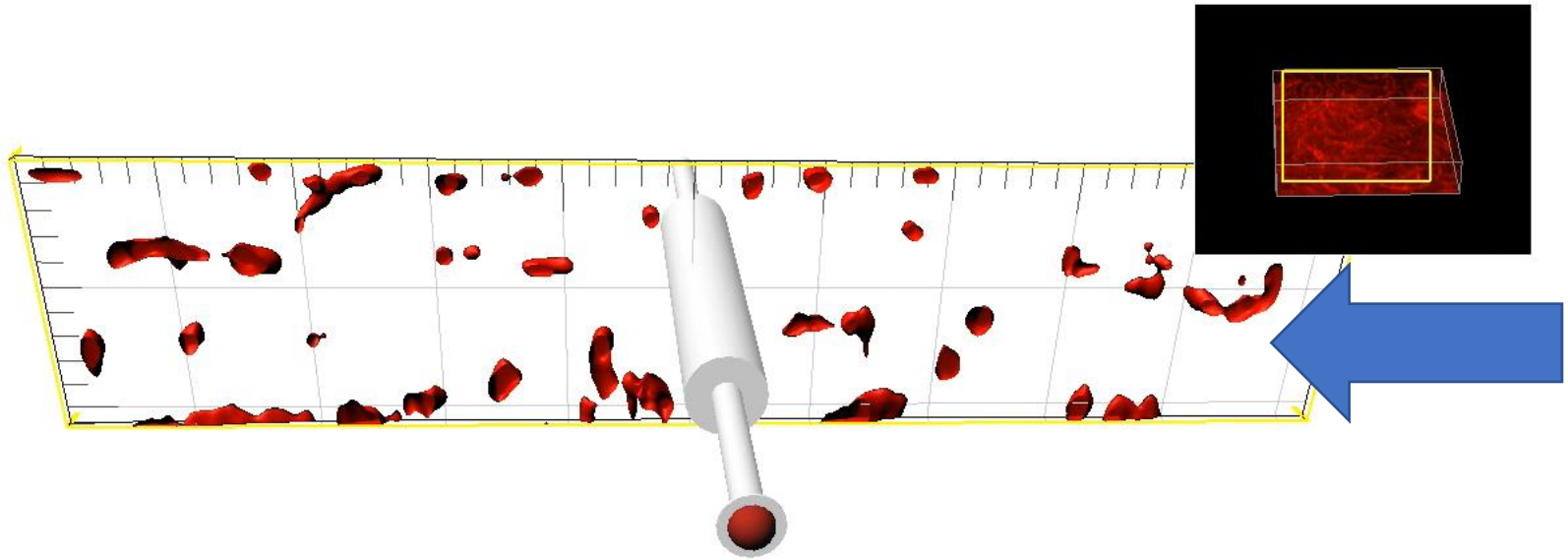
ie RNFL- NRR mismatch

Reference database: European Descent (2014)


31 / 61
200 µm
200 µm

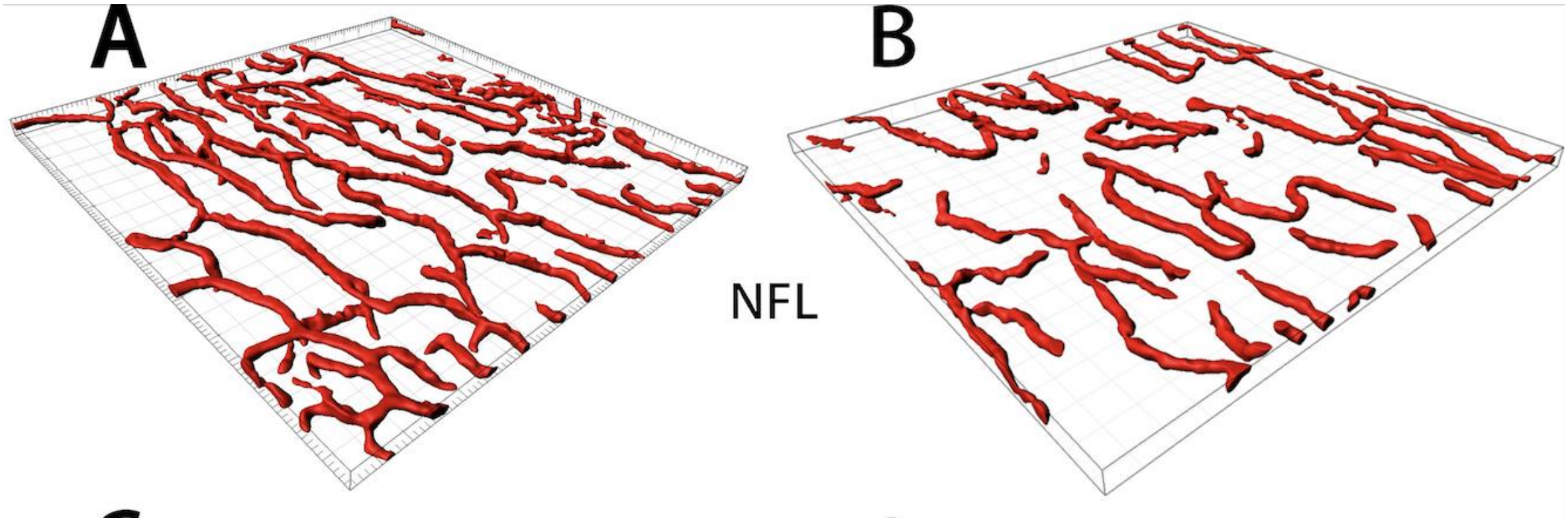

33 / 61
200 µm
200 µm

Why is there nerve thinning in diabetics?

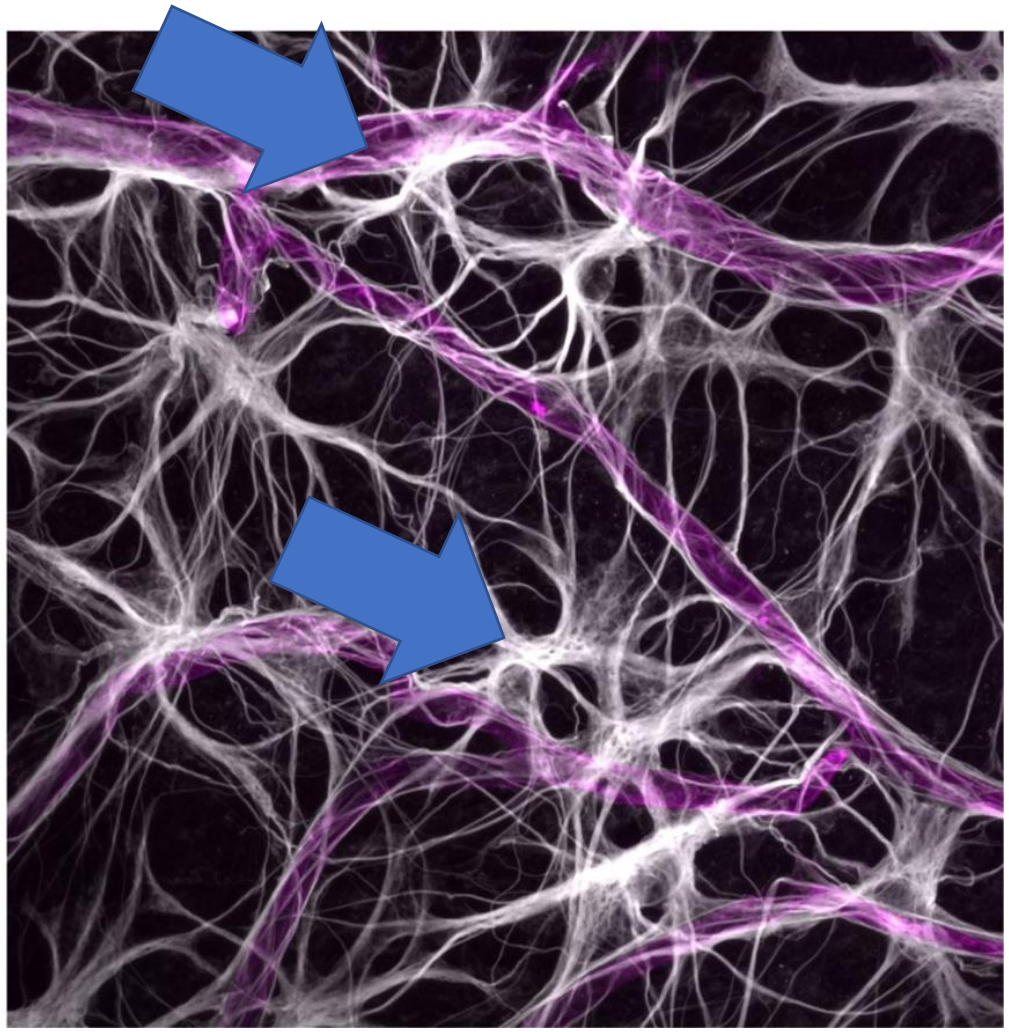


50 um

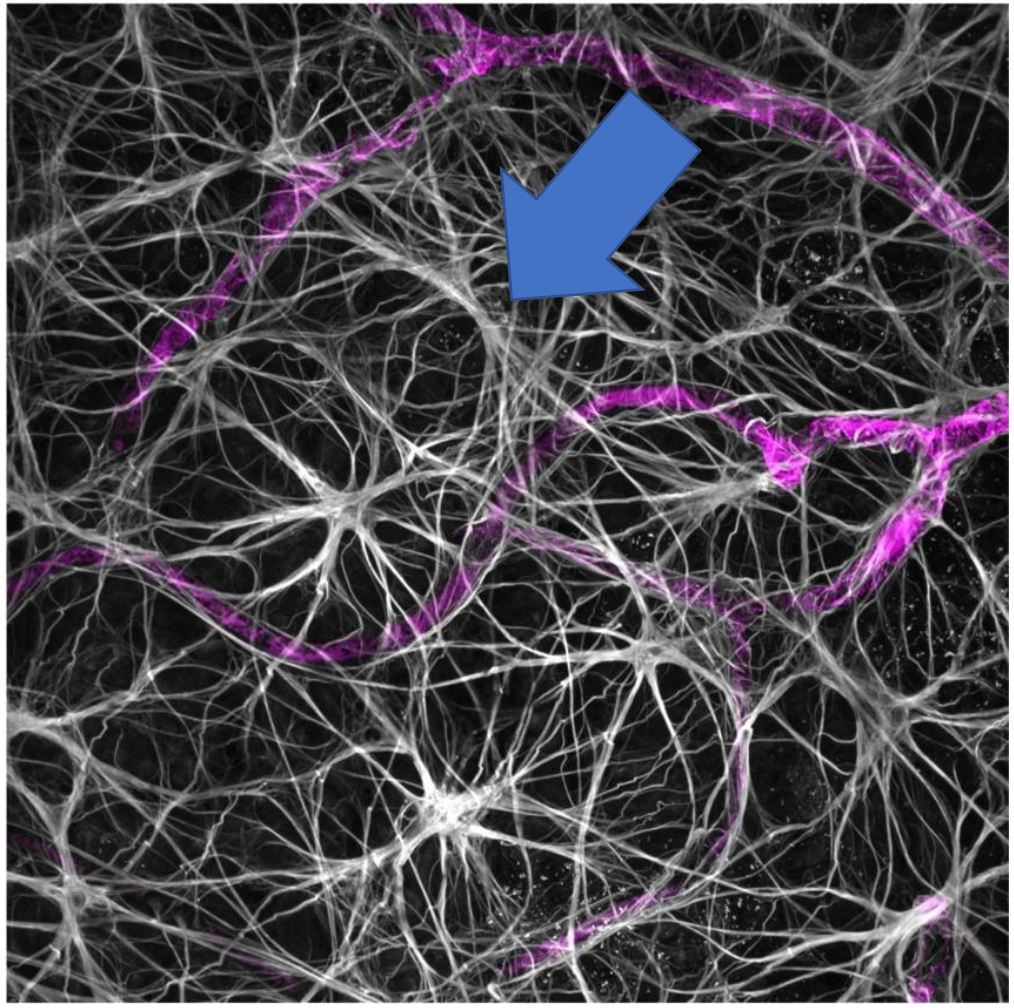
Chan G, Balaratnasingam C, Yu PK, Morgan WH, McAllister IL, Cringle SJ, Yu DY. Quantitative morphometry of perifoveal capillary networks in the human retina. Invest Ophthalmol Vis Sci. 2012 Aug 13;53(9):5502-14.


A
B
NFL

CONTROL



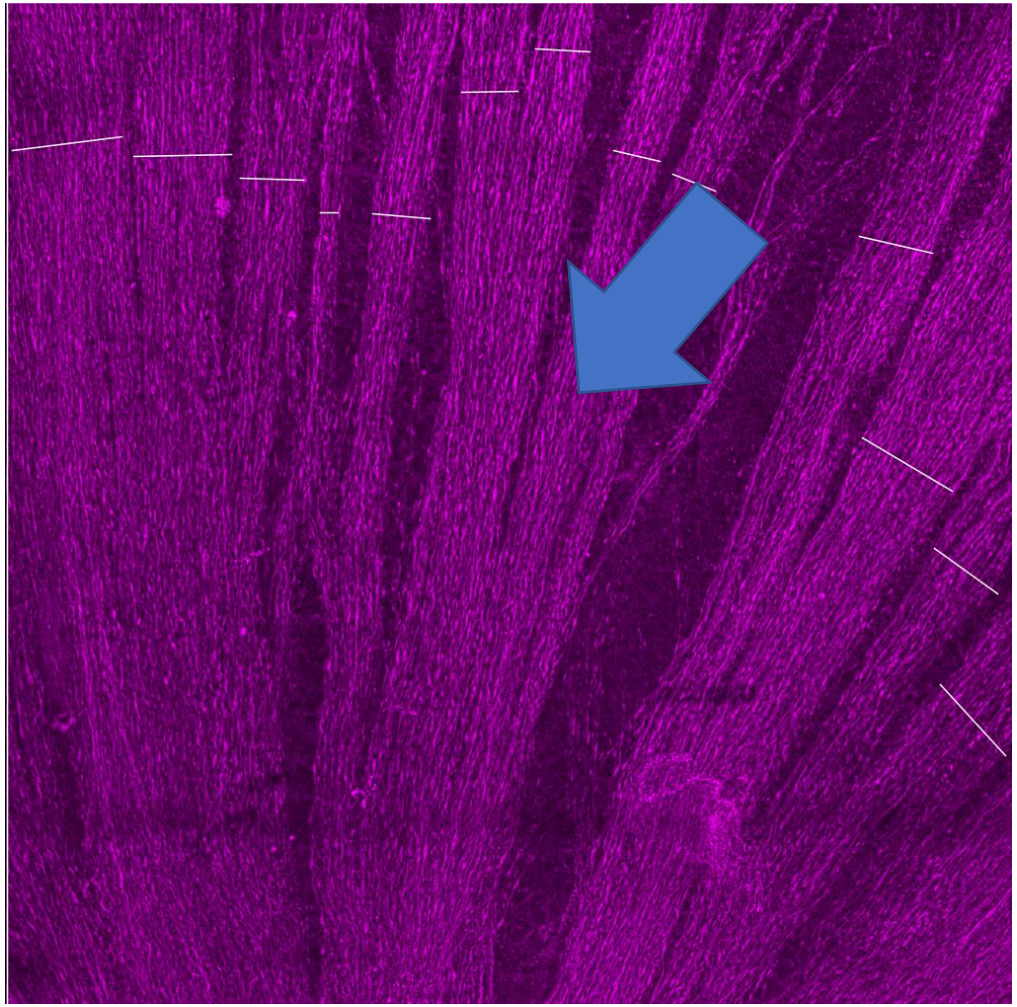
STREPTOZOTOCIN-induced diabetes (rats)

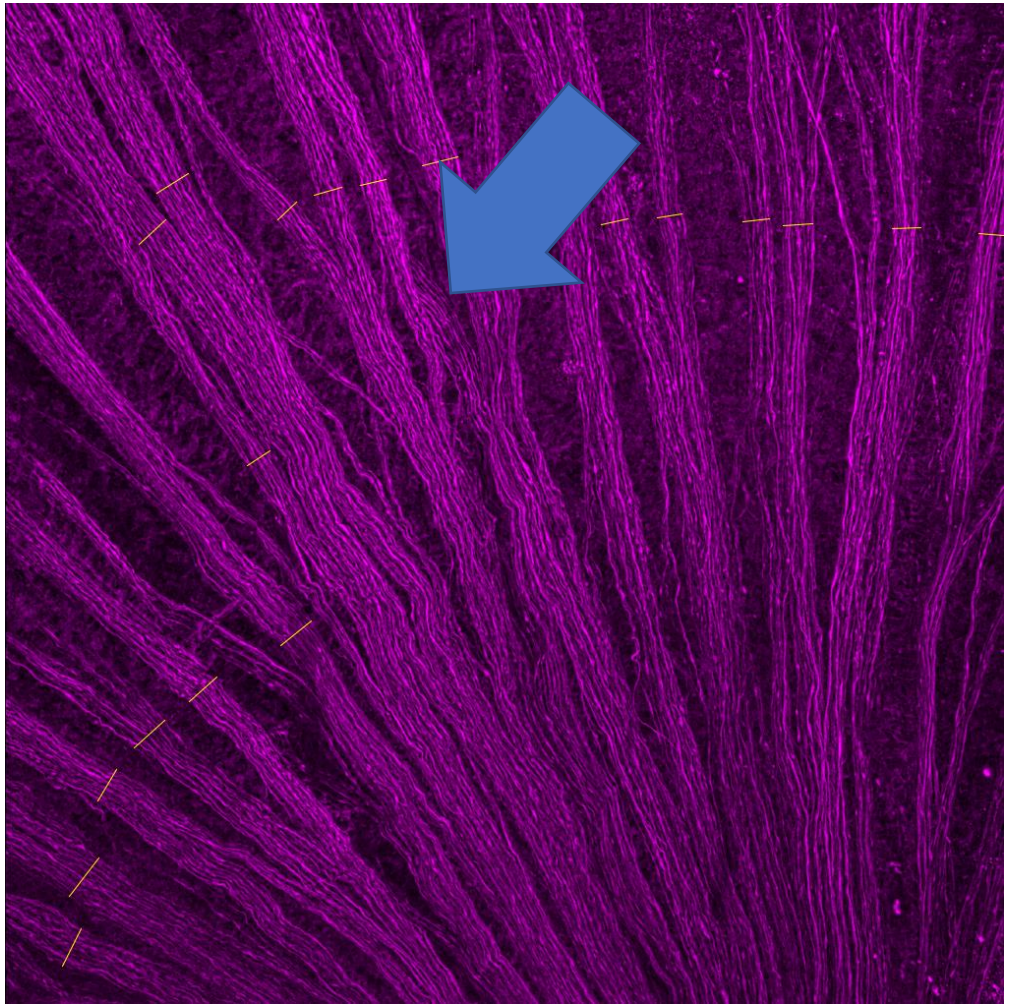


Control

Neurofilament-M

Diabetic





Control
Total bundles: 13
Mean: 43.41 microns
Median: 39.47 microns
Area coverage: 83.5%

Diabetic_sp115
Total bundles: 20
Mean: 20.49 microns
Median: 20.17 microns
Area coverage: 68.77%

Clinical Pearls : Diabetes Mellitus

- Diabetes causes RNFL thinning independent of a glaucomatous disease process
- **RNFL vs. Neuroretinal Rim Mismatch**
  - Think of non-glaucomatous causes.
- **Neurodegeneration & Microvascular Damage**
  - Retinal neurodegeneration may occur before visible microvascular changes.

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Case 2. Mr RT - 77yo male

Mr X presents to our practice for his review of progressing cataracts. His wife has had her cataracts removed from you this year and has had a pleasant experience so he would like to be seen by you as well. He wears SVD normally and reads with SVN.

His BCVA is R: 6/7.5-1 L: 6/6-2 OU: 6/6-1
IOPs R: 25mmHg L: 25mmHg at 8:48am. CCT R 549 L 573
His pupils were responsive, no RAPD.

I performed a VF for baseline due to high pressures and flagged OCTs, since it was the first time the results were not the most reliable but there were significant defects in the RE. I've advised Mr X I will send all the details through to you for a workup.

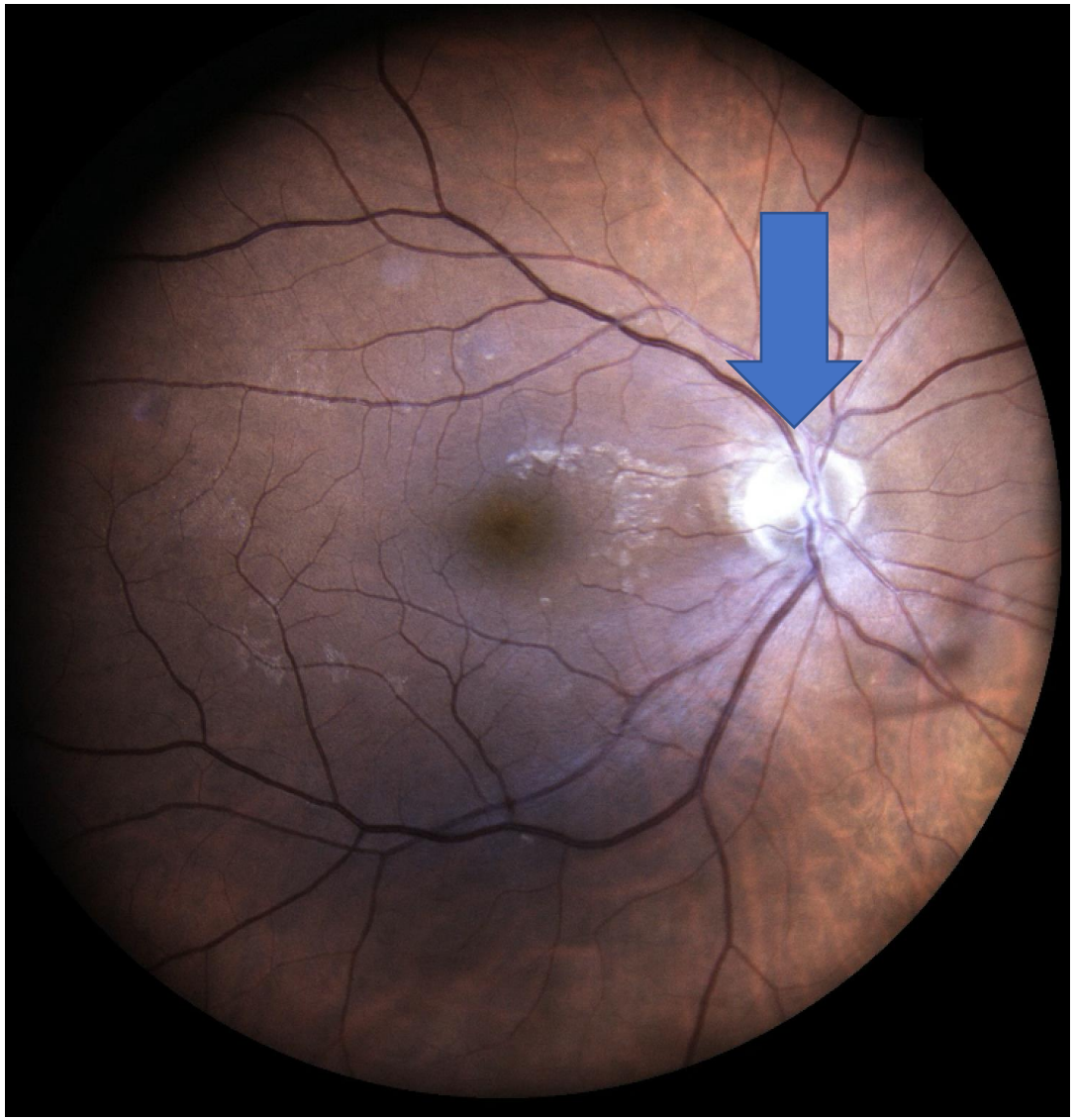
POHx

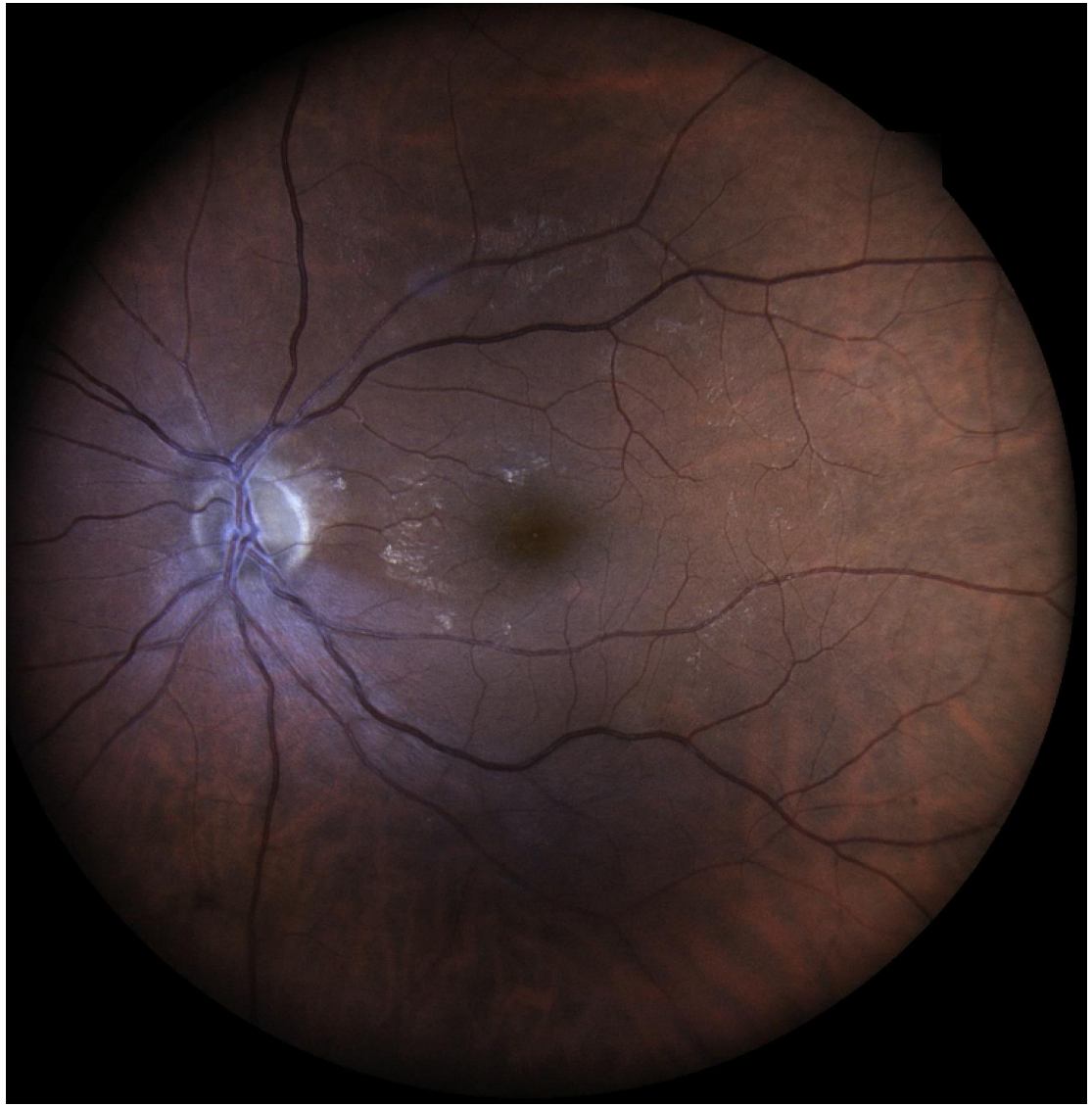
- Nil

PMHx

- Hypertension
- Anxiety
- Previous smoker

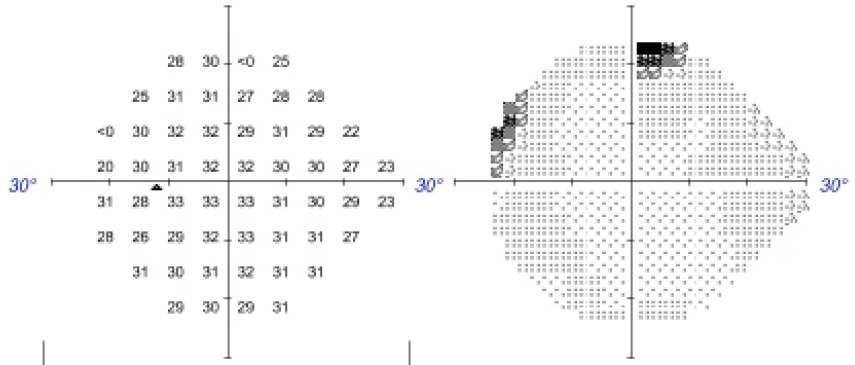
Family history of maternal glaucoma

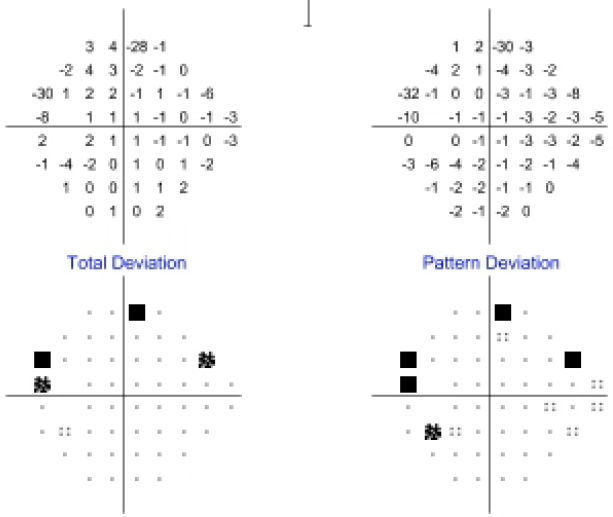




OS Single Field Analysis — Central 24-2 Threshold Test

Fixation Monitor:	Blind Spot	Stimulus:	III, White	Date:	Apr 27, 2023
Fixation Target:	Central	Background:	31.5 asb	Time:	9:50 AM
Fixation Losses:	5/11 XX	Strategy:	SITA Fast	Age:	75
False POS Errors:	6%	Pupil Diameter:			
False NEG Errors:	12%	Visual Acuity:			
Test Duration:	03:59	Rx:	+7.50 DS		
Fovea:	Off				





GHT: Outside Normal Limits

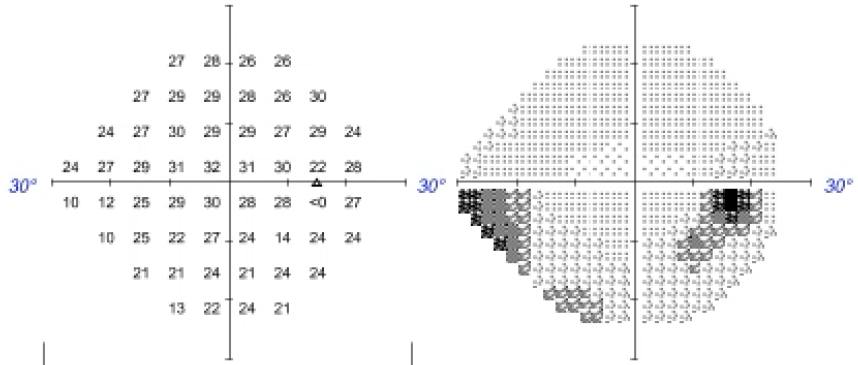
VFI24-2: 96%
MD24-2: -0.76 dB
PSD24-2: 5.40 dB P < 0.5%

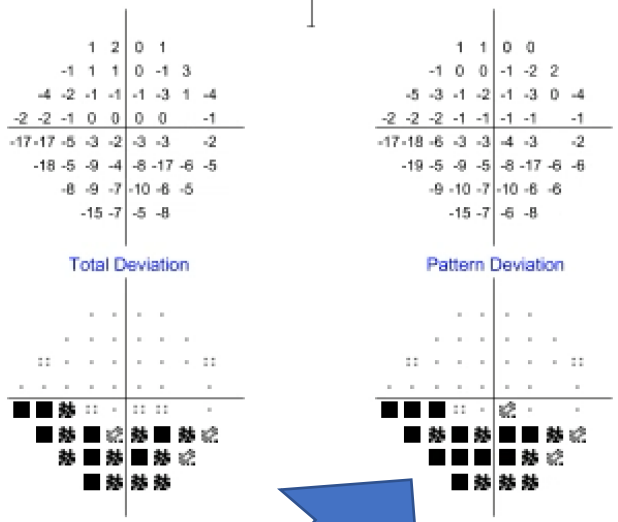
*** Low Test Reliability ***

:: P < 5%
P < 2%
P < 1%
P < 0.5%

OD Single Field Analysis — Central 24-2 Threshold Test

Fixation Monitor:	Gaze/Blind Spot	Stimulus:	III, White	Date:	Apr 27, 2023
Fixation Target:	Central	Background:	31.5 asb	Time:	9:46 AM
Fixation Losses:	1/11	Strategy:	SITA Fast	Age:	75
False POS Errors:	6%	Pupil Diameter:			
False NEG Errors:	6%	Visual Acuity:			
Test Duration:	03:25	Rx:	+7.25 DS		
Fovea:	Off				



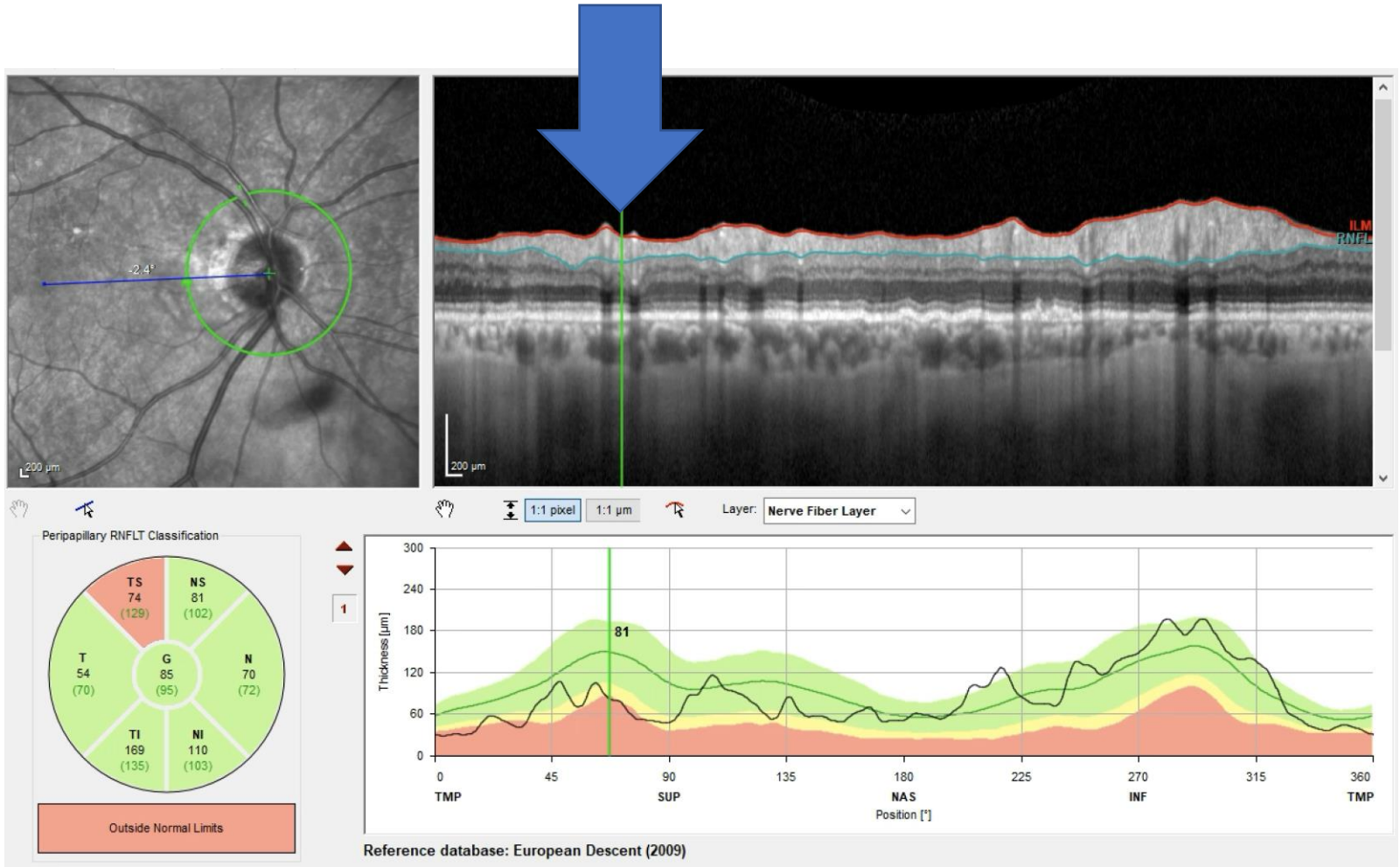


GHT: Outside Normal Limits

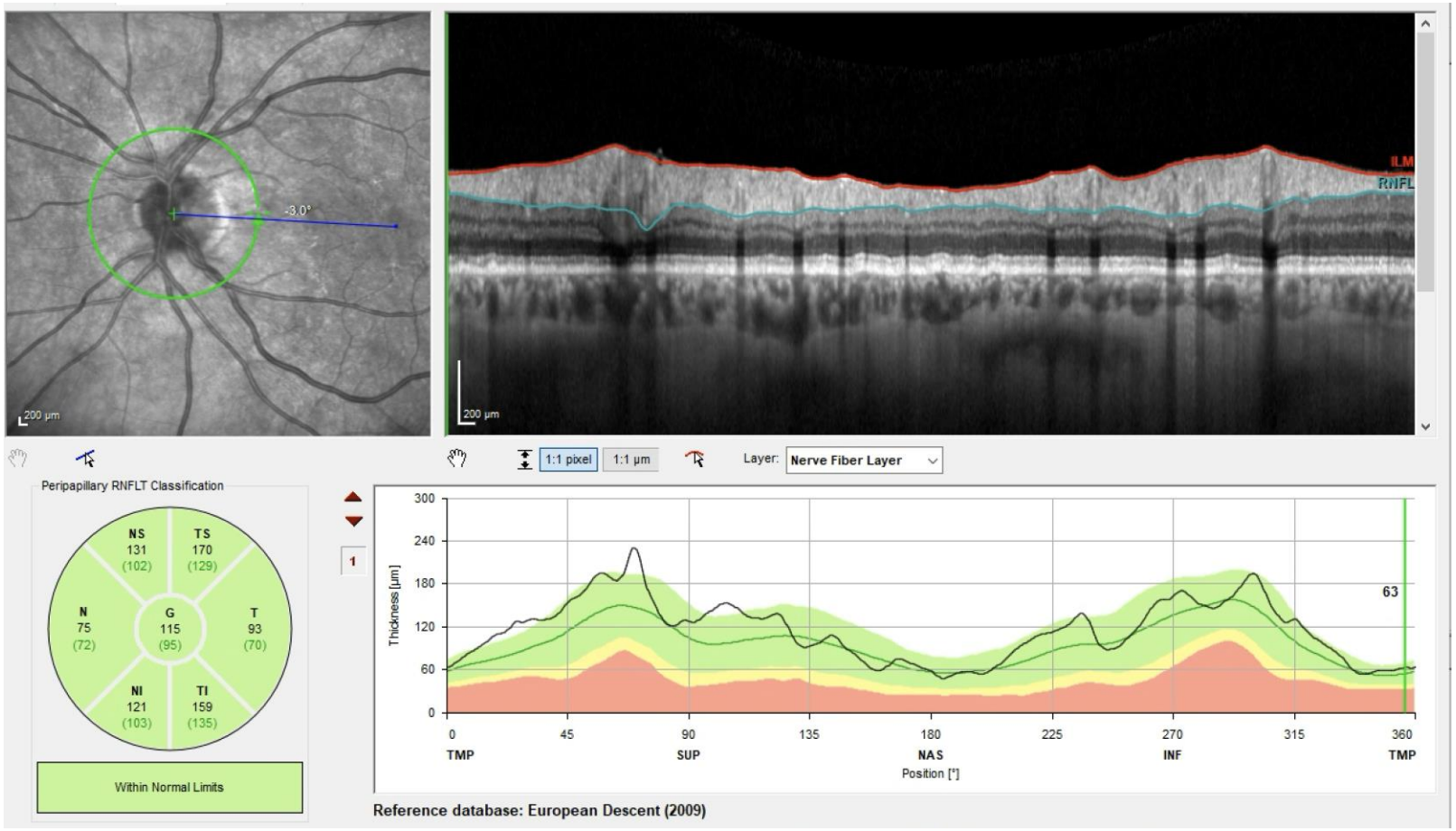
VFI24-2: 90%
MD24-2: -4.16 dB P < 1%
PSD24-2: 5.16 dB P < 0.5%

:: P < 5%
P < 2%
P < 1%
P < 0.5%

RE IOP 19

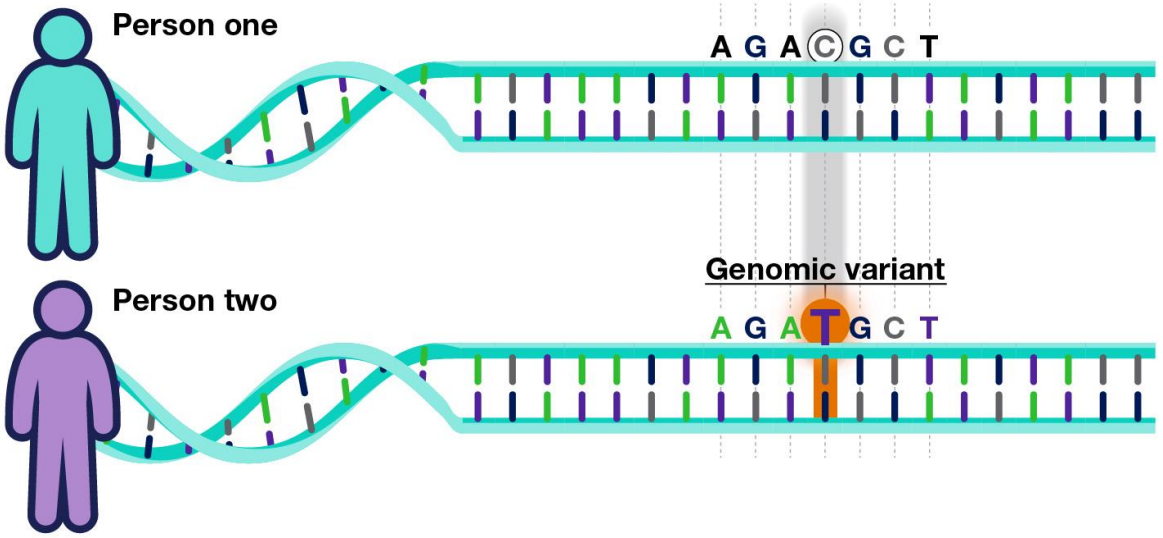

-2.4°
200 µm
200 µm
ILM
RNFL
1:1 pixel
1:1 µm
Layer:
Nerve Fiber Layer
Peripapillary RNFLT Classification
TS
74
(129)
NS
81
(102)
T
54
(70)
G
85
(95)
N
70
(72)
TI
169
(135)
NI
110
(103)
Outside Normal Limits
1
Thickness [µm]
300
240
180
120
60
0
81
0
45
90
135
180
225
270
315
360
TMP
SUP
NAS
INF
TMP
Position [°]
Reference database: European Descent (2009)

LE IOP 17


-3.0°
200 µm
ILM
RNFL
200 µm
1:1 pixel
1:1 µm
Layer:
Nerve Fiber Layer
Peripapillary RNFLT Classification
NS
131
(102)
TS
170
(129)
N
75
(72)
G
115
(95)
T
93
(70)
NI
121
(103)
TI
159
(135)
Within Normal Limits
1
Thickness [µm]
300
240
180
120
60
0
63
0
45
90
135
180
225
270
315
360
TMP
SUP
NAS
INF
TMP
Position [°]
Reference database: European Descent (2009)

Uneventful cataract surgery OU

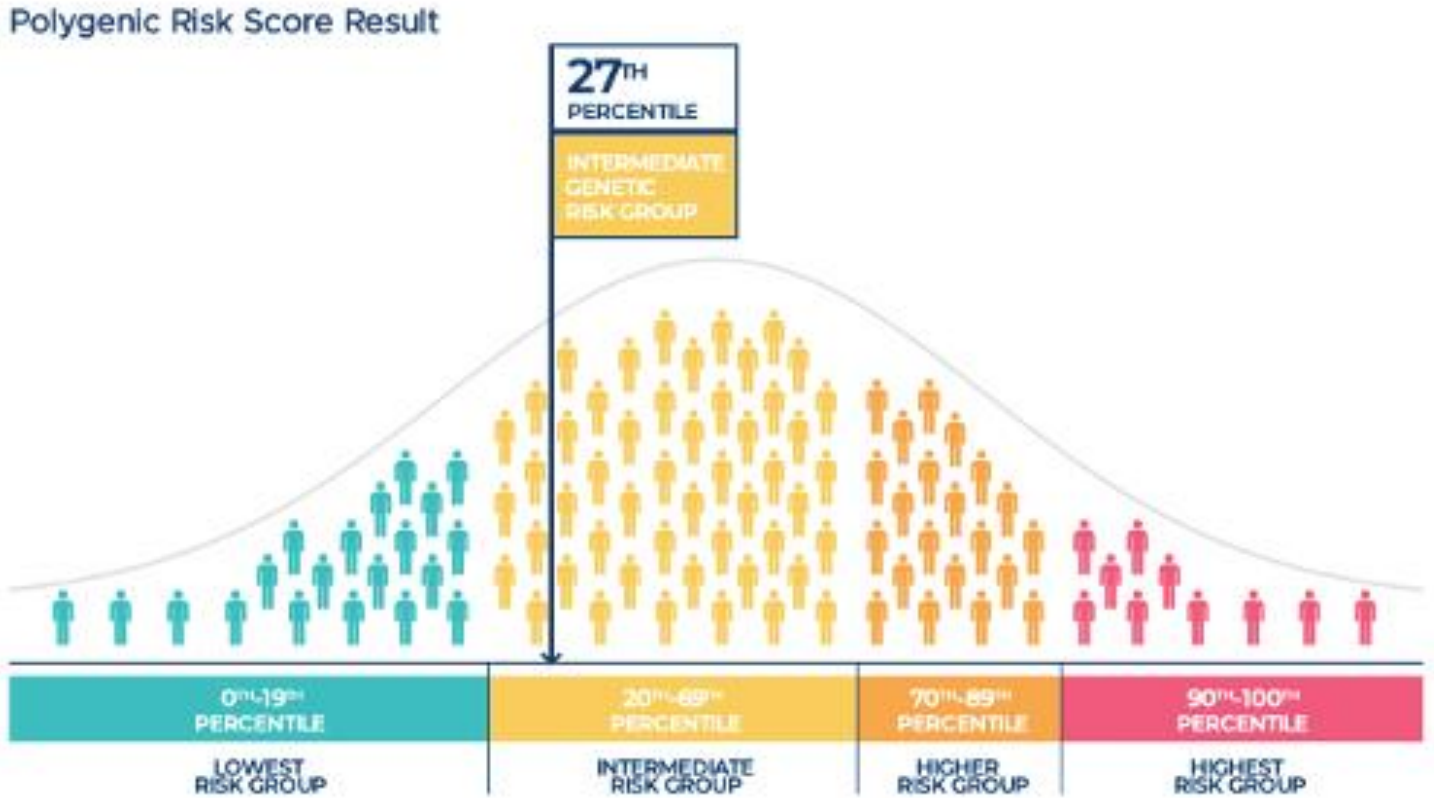
Should I be worried about glaucoma in my right eye?



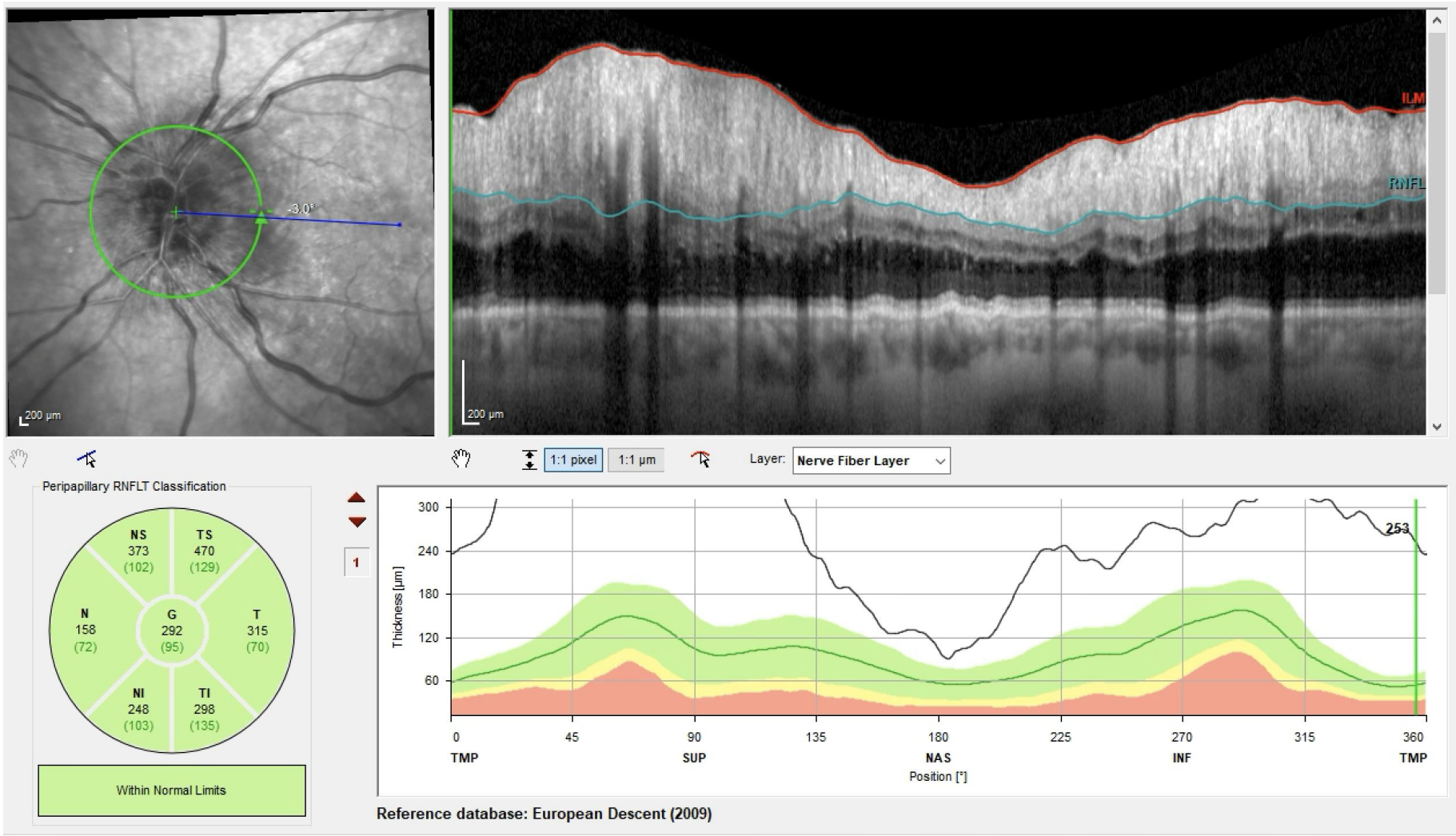
Polygenic risk scoring

X is in the **Lowest Glaucoma suspect/OHT Risk Group:**

- Polygenic risk score in general population: **27th percentile (Intermediate Genetic Risk Group)**
- Polygenic risk score in Glaucoma suspect/OHT population: **17th percentile (Lowest Glaucoma**

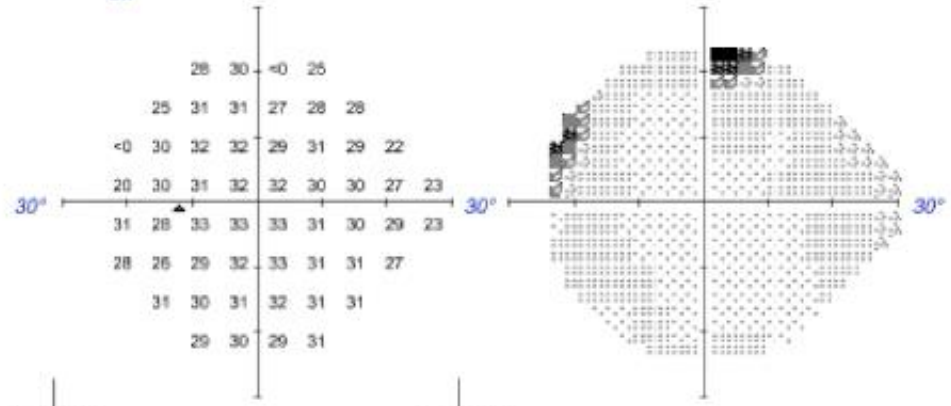


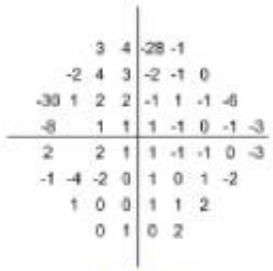
12 months later…

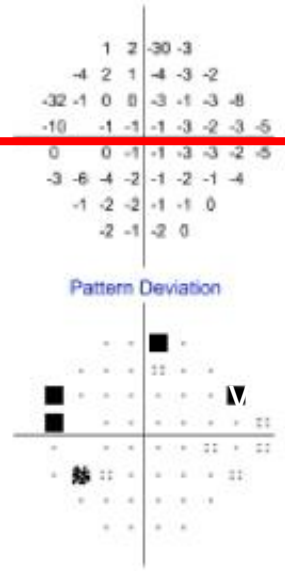


OS Single Field Analysis — Central 24-2 Threshold Test

Fixation Monitor:	Blind Spot	Stimulus:	III, White	Date:	Apr 27, 2023
Fixation Target:	Central	Background:	31.5 asb	Time:	9:50 AM
Fixation Losses:	5/11 XX	Strategy:	SITA Fast	Age:	75
False POS Errors:	6%	Pupil Diameter:			
False NEG Errors:	12%	Visual Acuity:			
Test Duration:	03:59	Rx:	+7.50 DS		
Fovea:	Off				







GHT: Outside Normal Limits

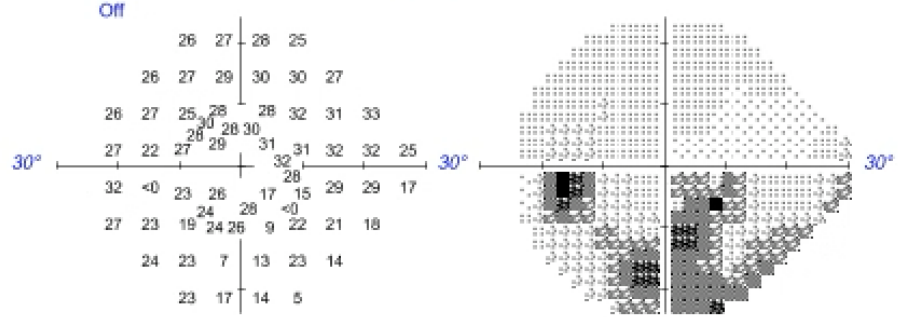
VFI24-2: 96%
MD24-2: -0.76 dB
PSD24-2: 5.40 dB P < 0.5%

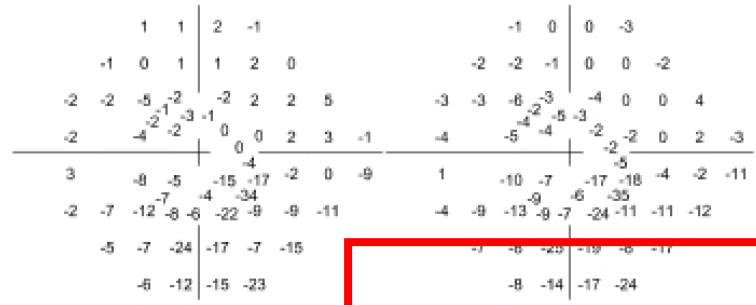
*** Low Test Reliability ***

:: P < 5%
P < 2%
P < 1%
P < 0.5%

OS Single Field Analysis — Central 24-2C Threshold Test

Fixation Monitor:	Gaze Monitor	Stimulus:	III, White	Date:	May 29, 2024
Fixation Target:	Central	Background:	31.5 asb	Time:	9:19 AM
Fixation Losses:	0/0	Strategy:	SITA Faster	Age:	76
False POS Errors:	5%	Pupil Diameter:			
False NEG Errors:	Off	Visual Acuity:			
Test Duration:	03:04	Rx:	+2.75 DS		
Fovea:	Off				





GHT: Outside Normal Limits

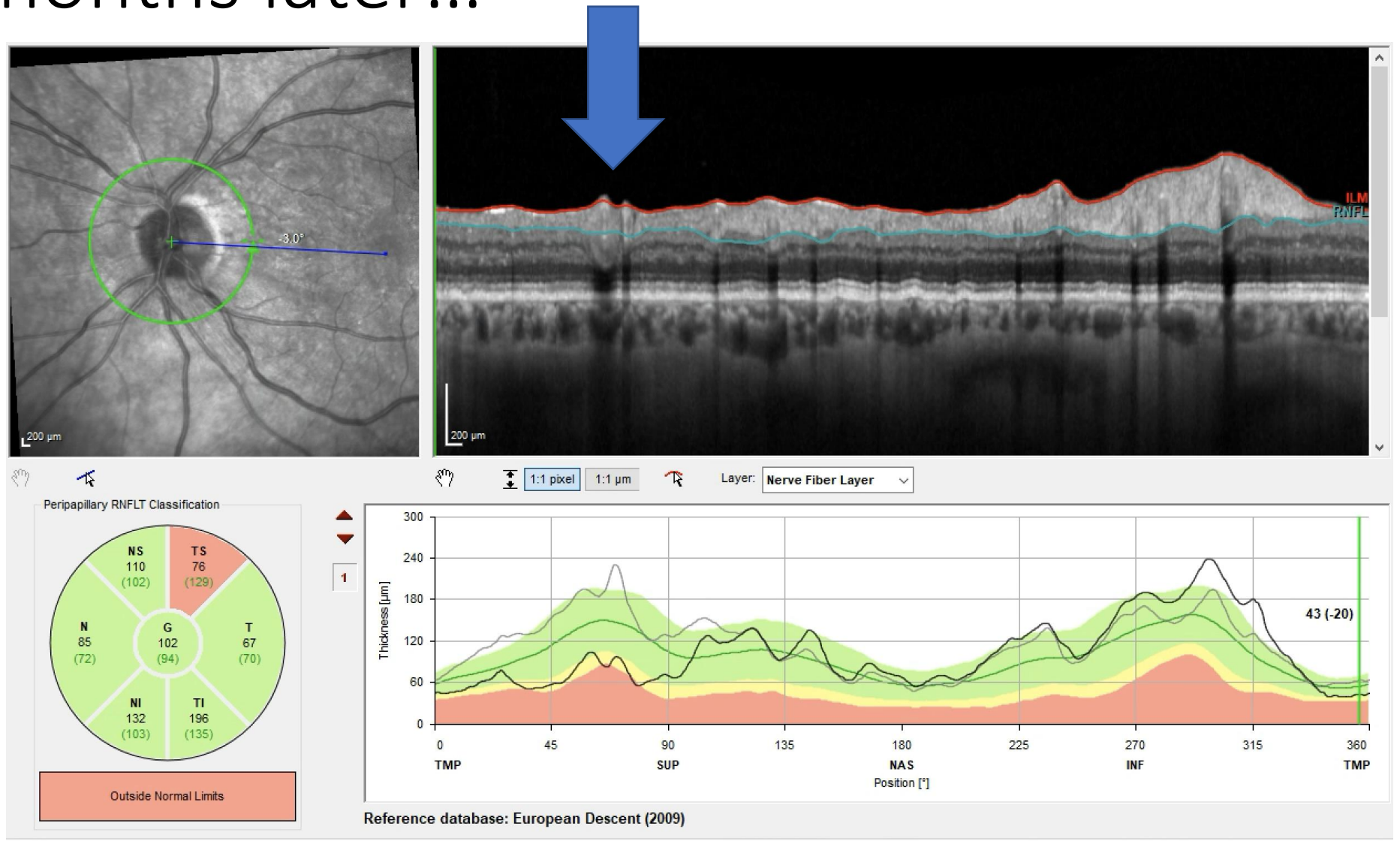
VFI24-2C: 83%
MD24-2C: -5.64 dB P < 0.5%
PSD24-2C: 8.25 dB P < 0.5%

:: P < 5%
P < 2%
P < 1%
P < 0.5%

Comments

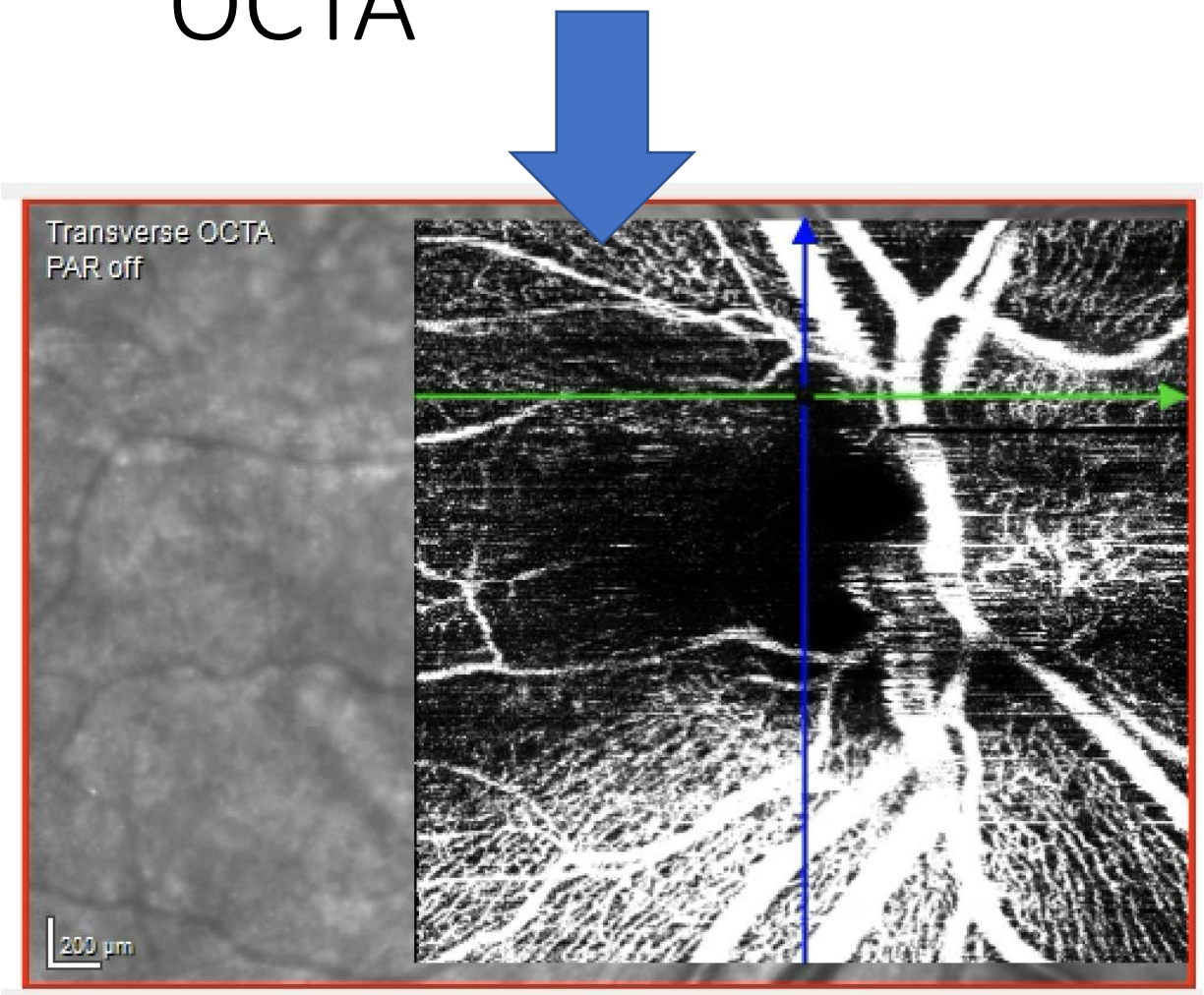
Signature

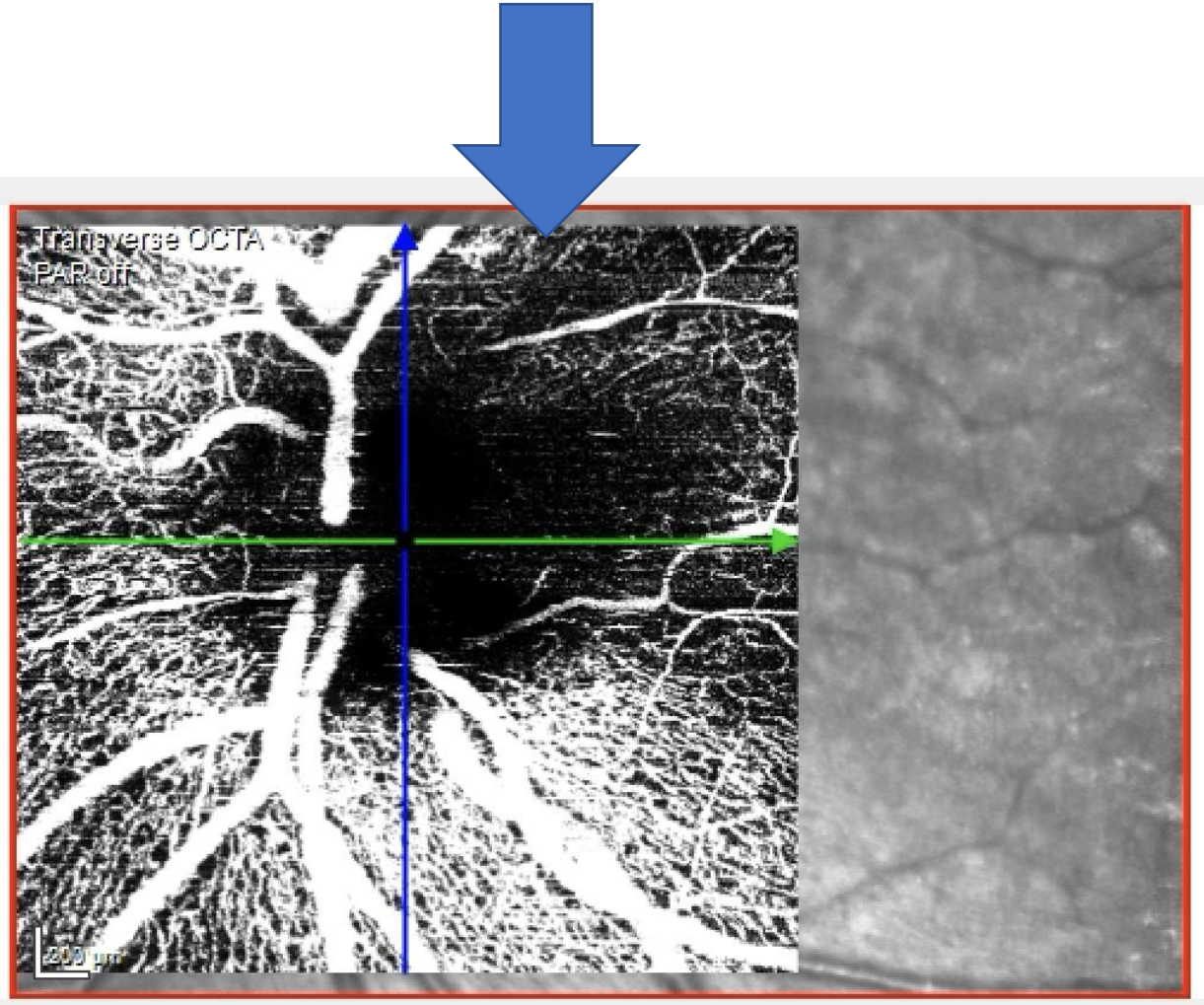
3 months later…

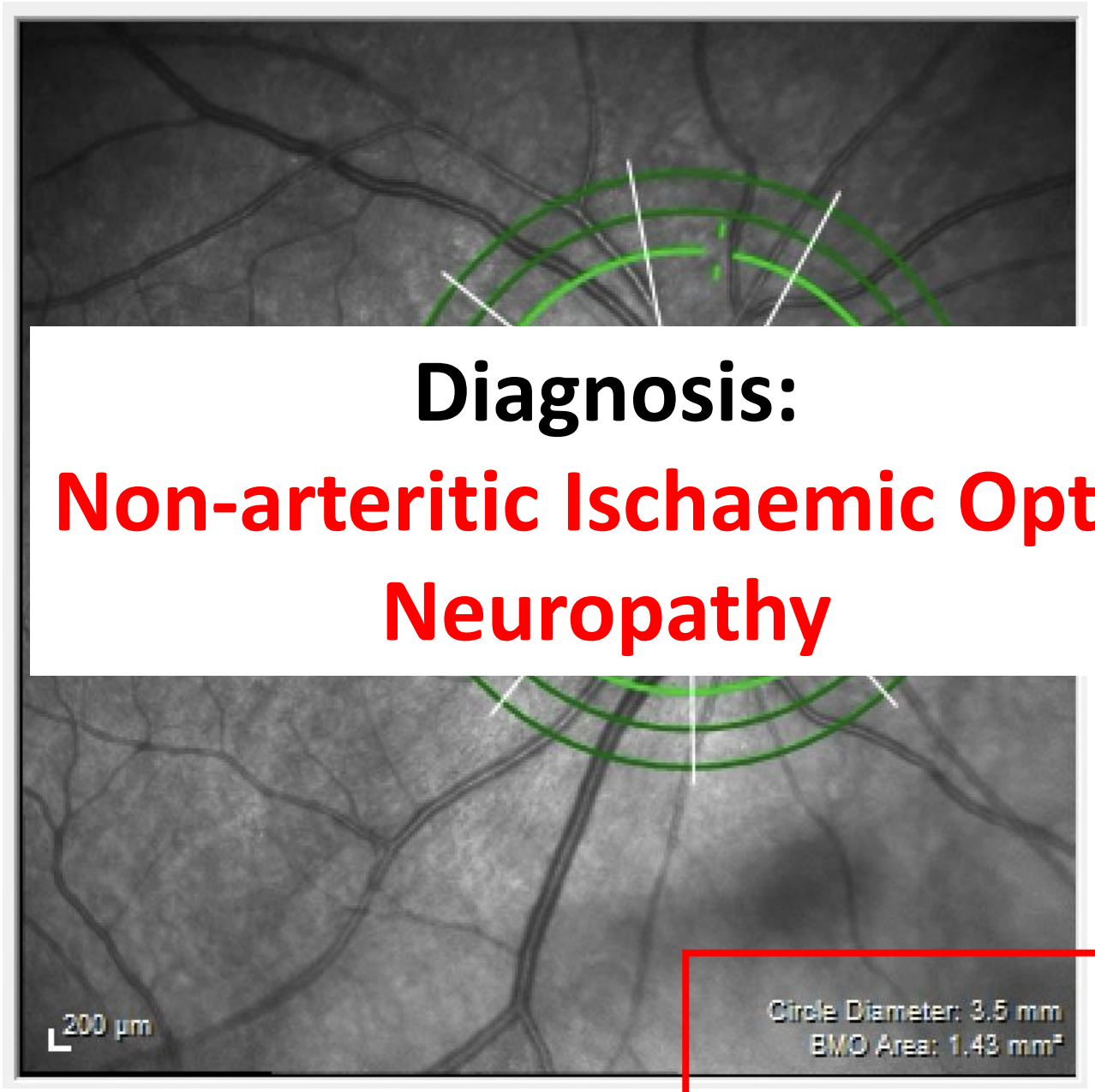



Display
3D View
Thickness Profile
Progression
200 µm
200 µm
Auto
Auto
1:1 pixel
1:1 µm
Reference: 27/04/2023
200 µm
200 µm
Examination: 26/10/2023
IR: 768 x 768 [HS] 30° (8.3 mm) ART (21)
OCT: 768 x 496 [HS] ART (100) Q: 32

OCTA


Transverse OCTA
PAR off
200 µm

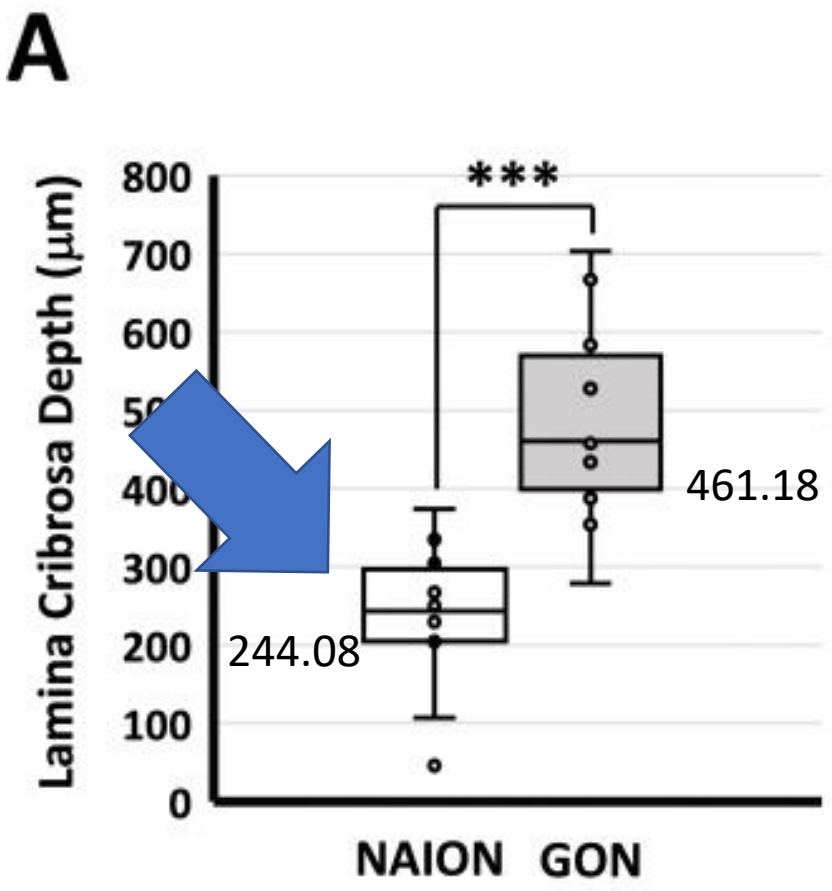

Transverse OCTA
PAR off
200 µm

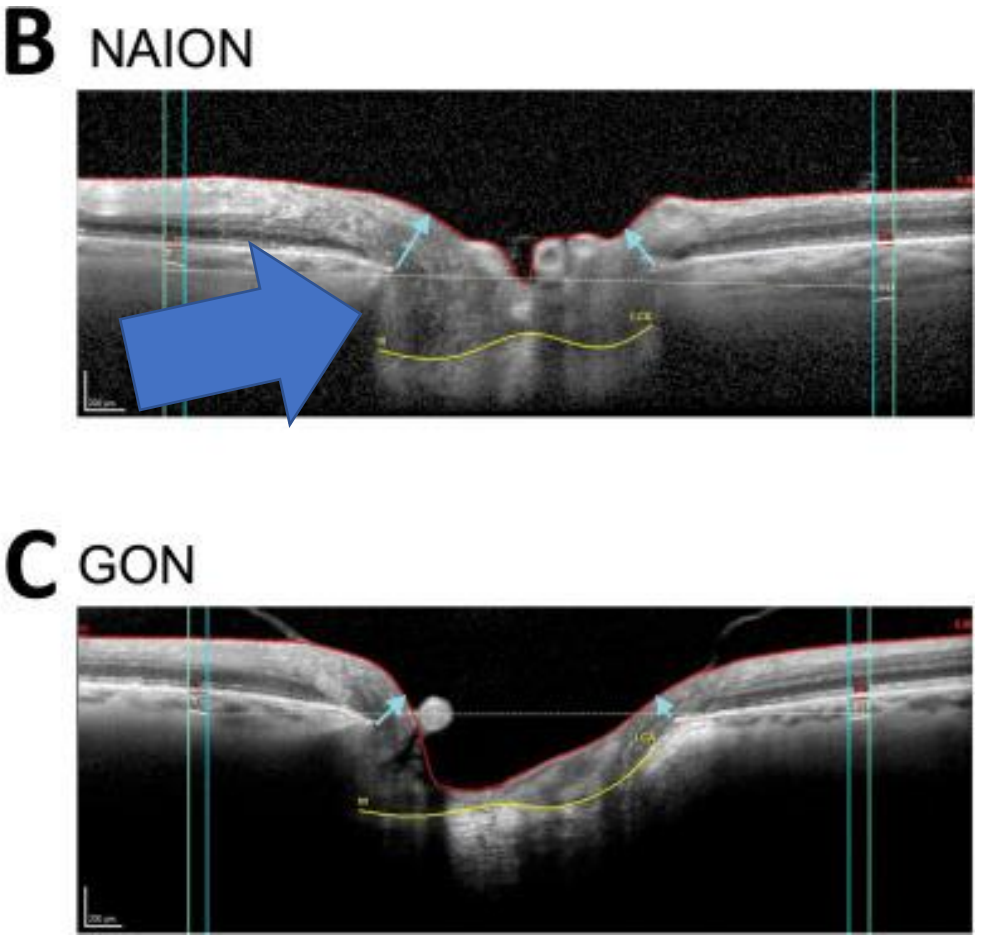


Diagnosis:

Non-arteritic Ischaemic Optic Neuropathy

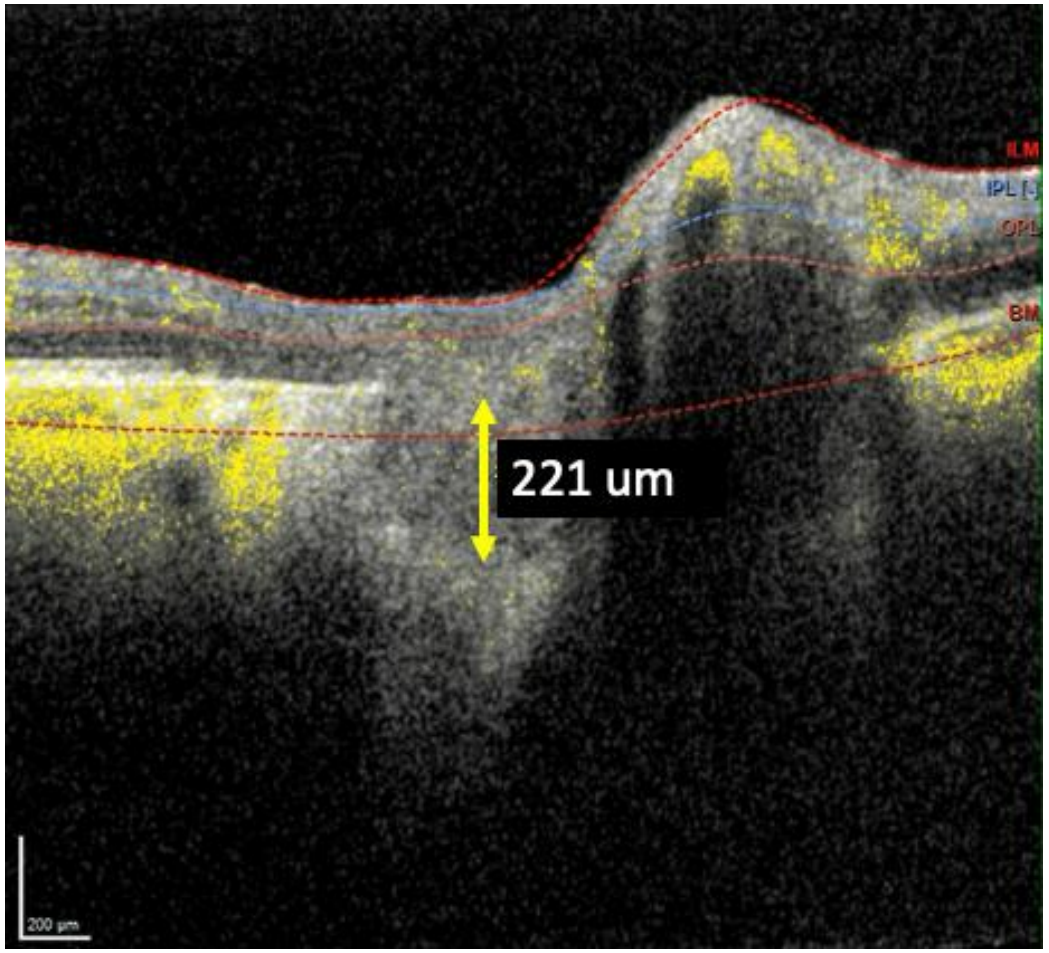
LC Depth significantly greater in the GON group compared to NAION

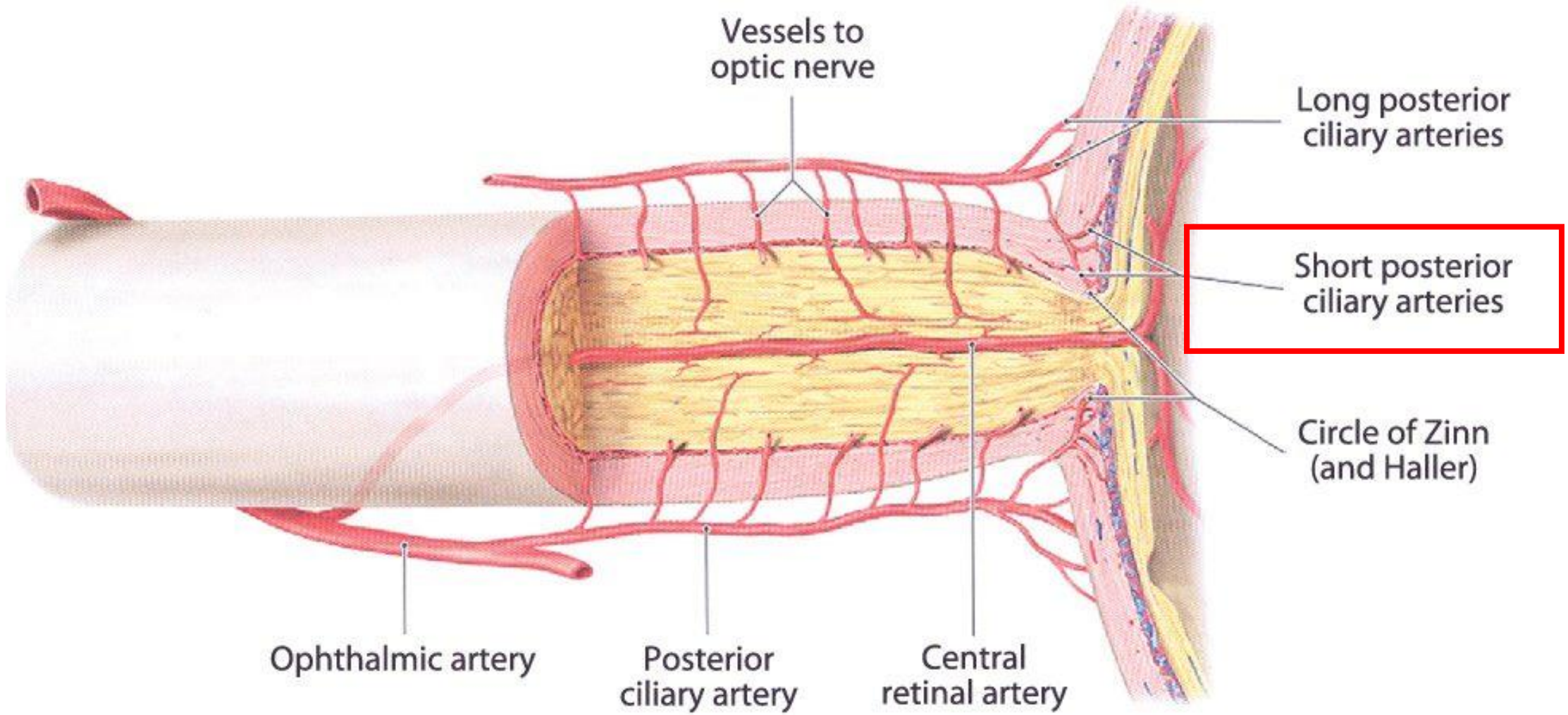




Eadie BD, Dyachok OM, Quach JH, Maxner CE, Rafuse PE, Shuba LM, Vianna JR, Chauhan BC, Nicolela MT. Non-arteritic anterior ischemic and glaucomatous optic neuropathy: Implications for neuroretinal rim remodeling with disease severity. PLoS One. 2023 May 18;18(5):e0286007.

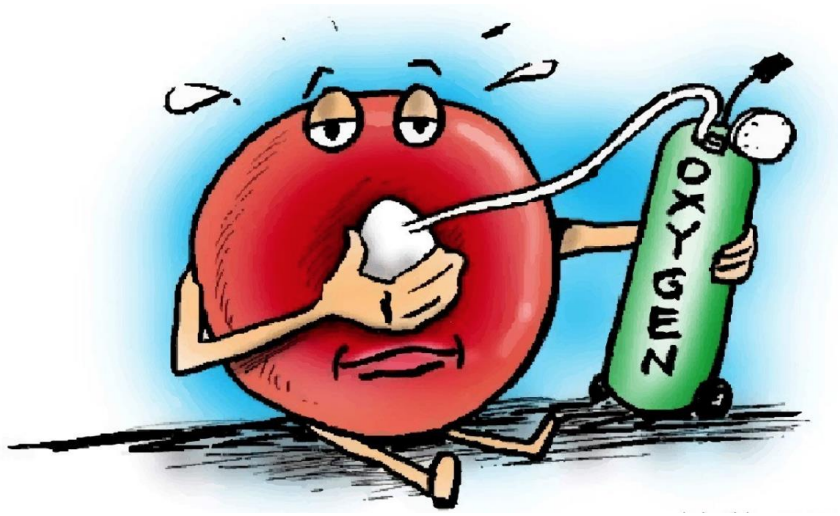
Laminar Cribrosa Depth in our patient:




Vessels to optic nerve
Long posterior ciliary arteries
Short posterior ciliary arteries
Circle of Zinn (and Haller)
Ophthalmic artery
Posterior ciliary artery
Central retinal artery

Clinical Pearls: NAION

- Dense altitudinal field defects common
- Small Crowded Optic Disc ‘Disk at risk’ are the typical give-a-way
- Defects are static over time
- **Lamina Cribrosa Depth:** Deeper in GON group.
- **OCTA** can be useful for vascular causes of optic nerve thinning



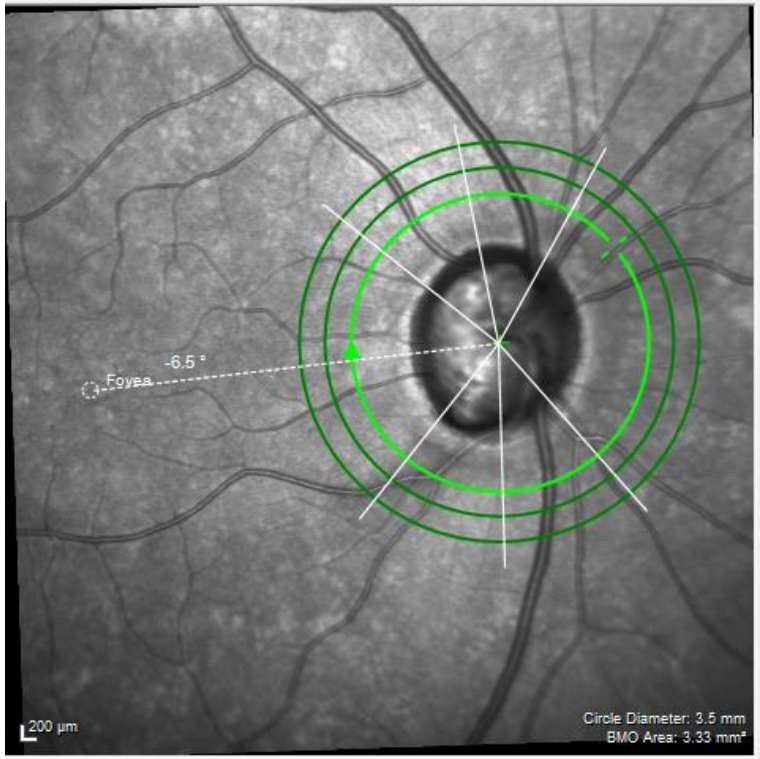
Optometry
WESTERN AUSTRALIA

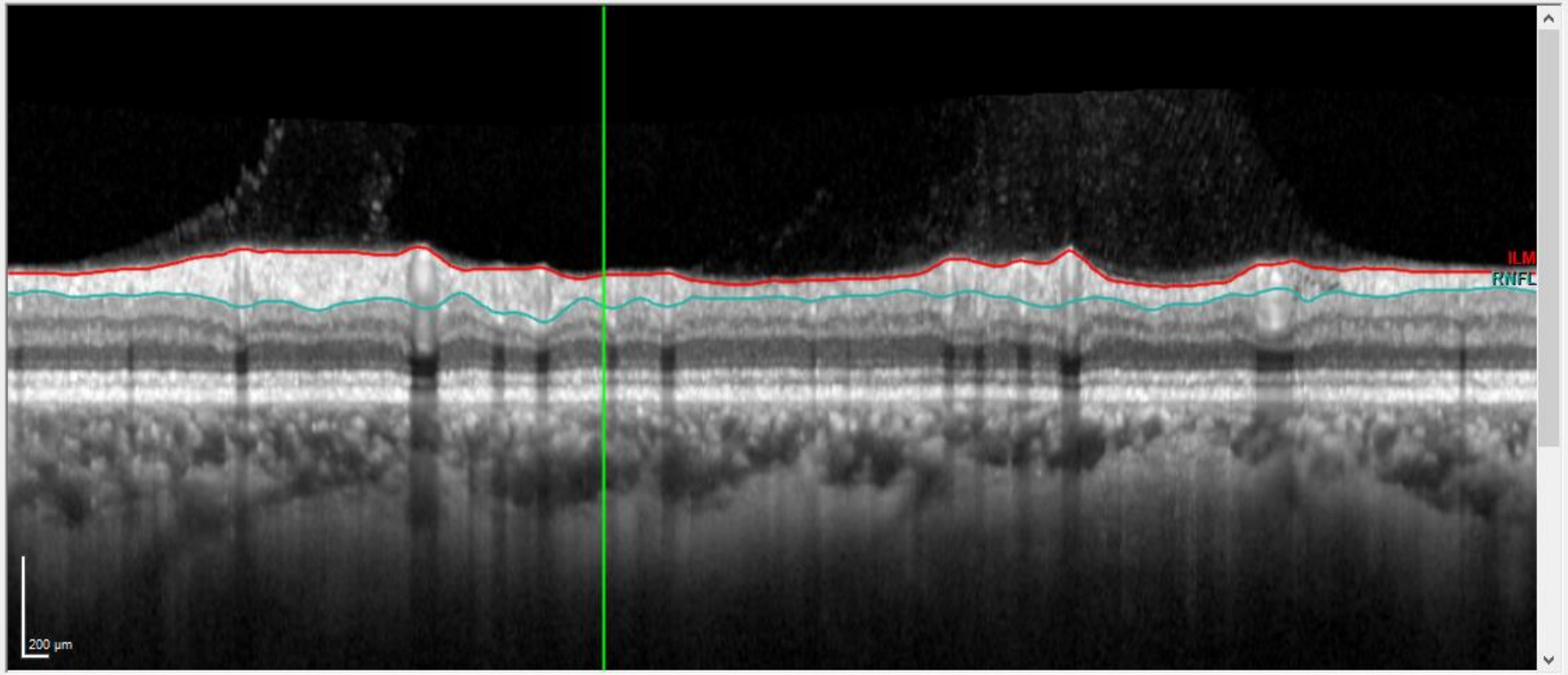
Lions Eye Institute

Case 3. Mrs MB – 43yo female

	R	L
BCVA	6/6	6/6
IOP	16	12

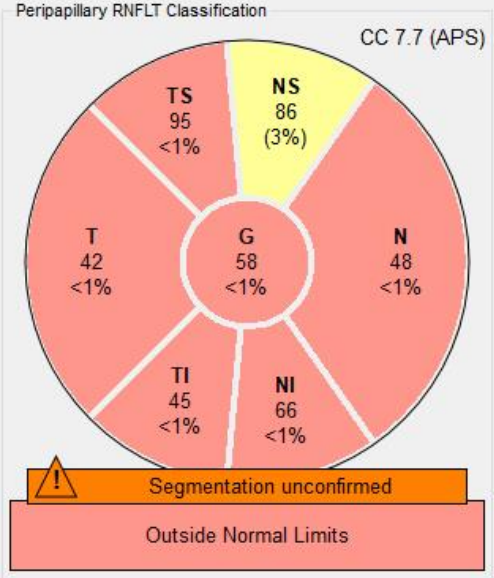
Display | BMO Rim Analysis | BMO Overview | RNFL Thickness | Progression

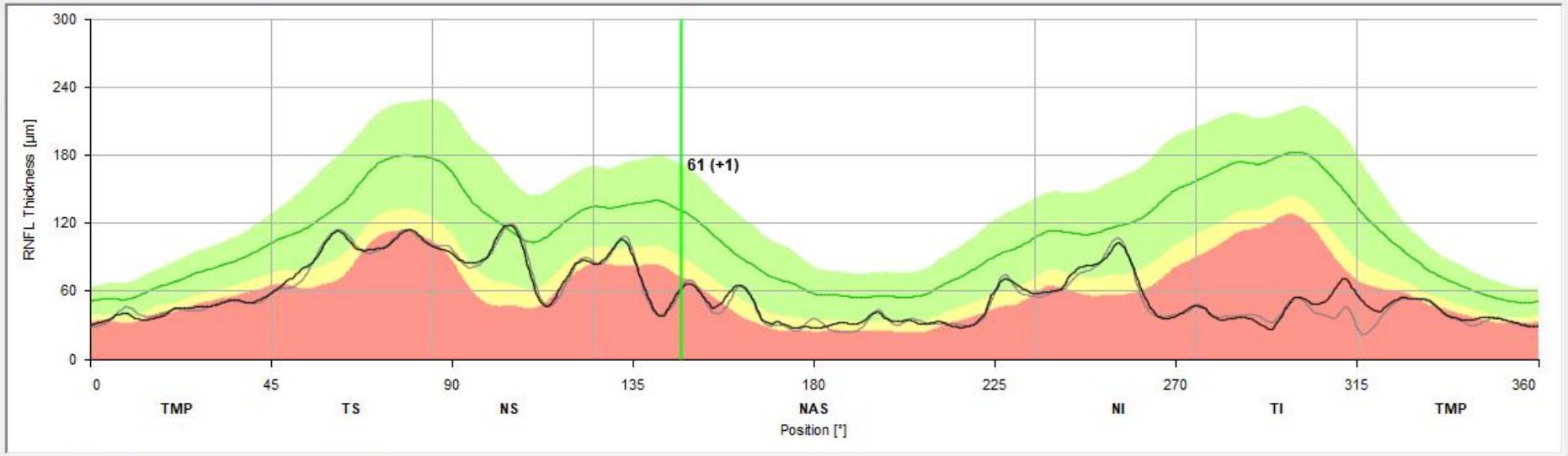




1:1 pixel | 1:1 µm

Peripapillary RNFLT Classification





Reference database: European Descent (2014)

Display | 3D View | Thickness Profile | Thickness Map | Posterior Pole | Deviation Map

Default slabs

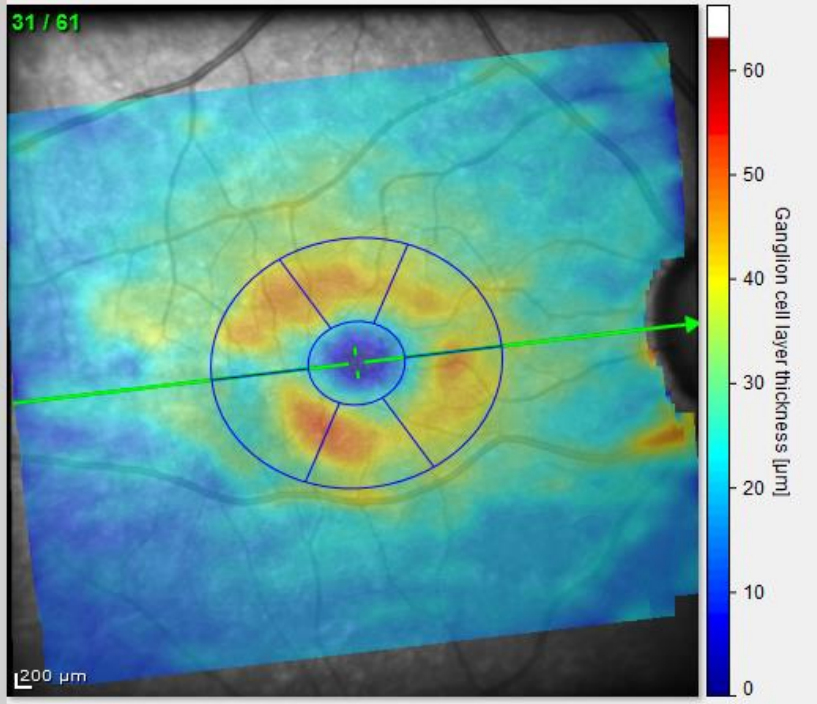
Retina: RNFL | GCL | IPL

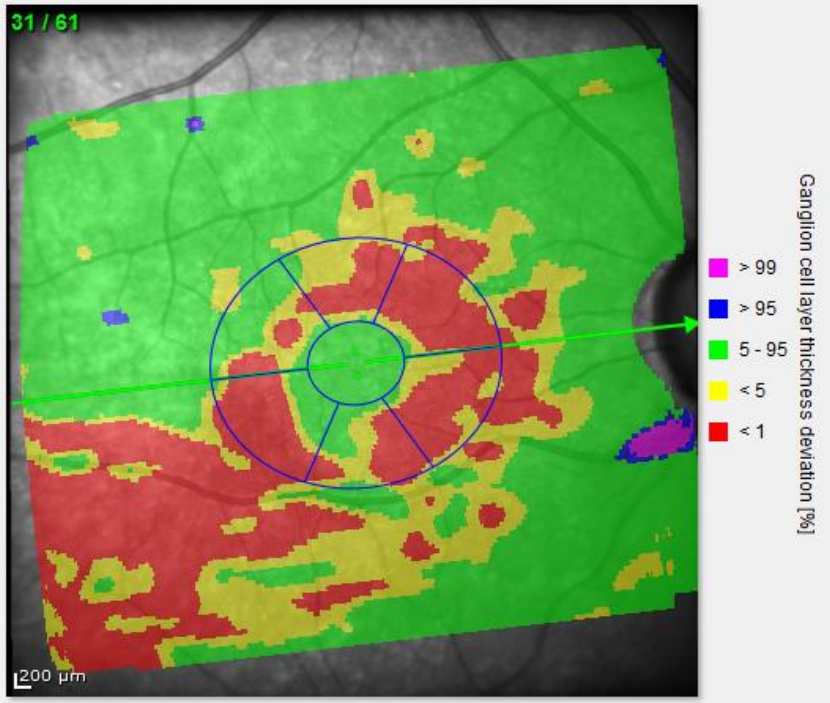
Overlay:

Segmentation

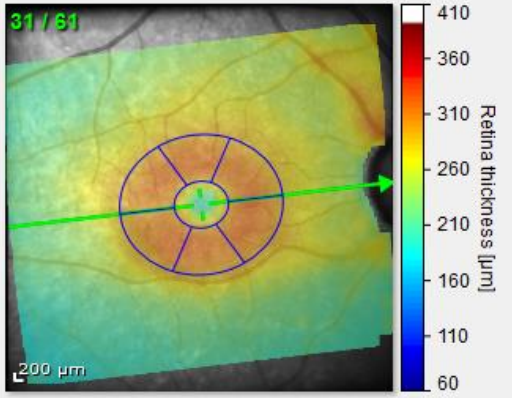
Edit

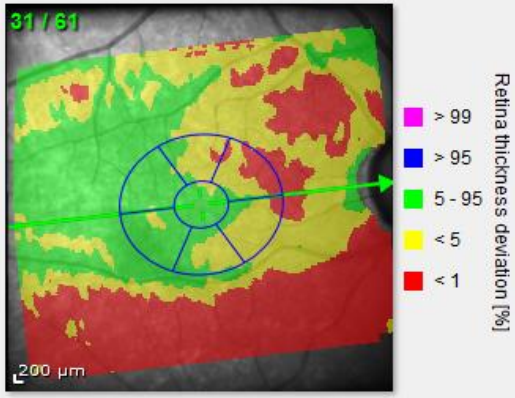
GCL





Retina





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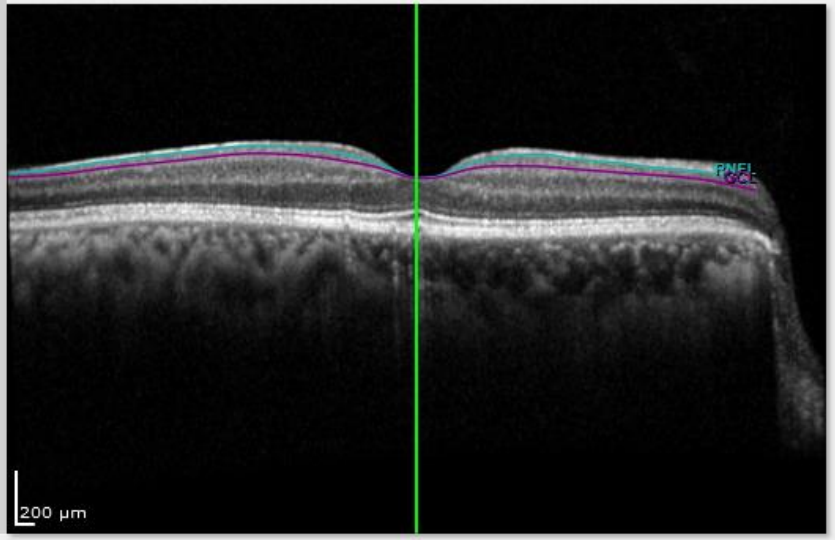
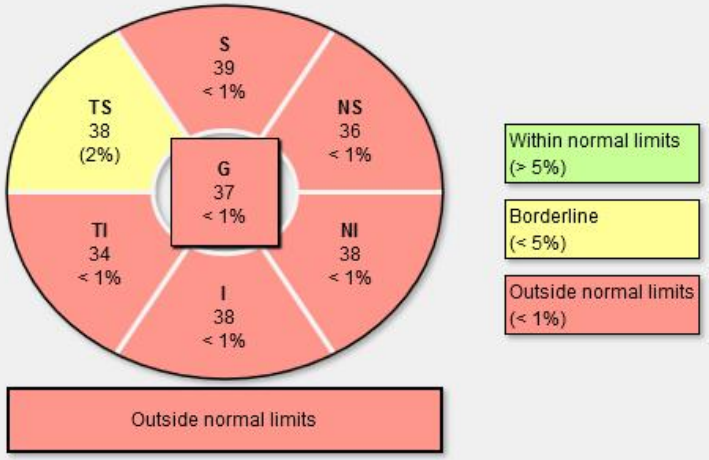
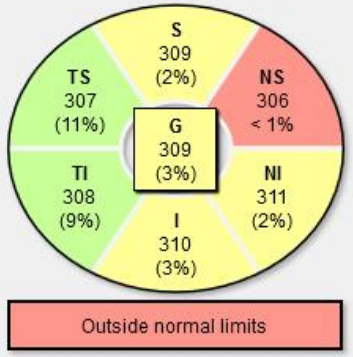


Macular ganglion cell layer classification

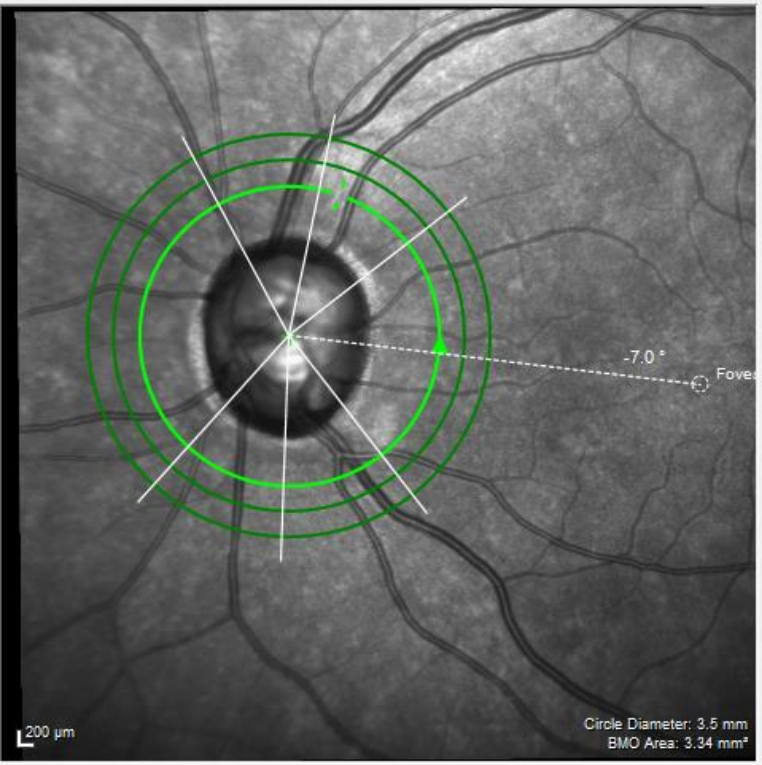


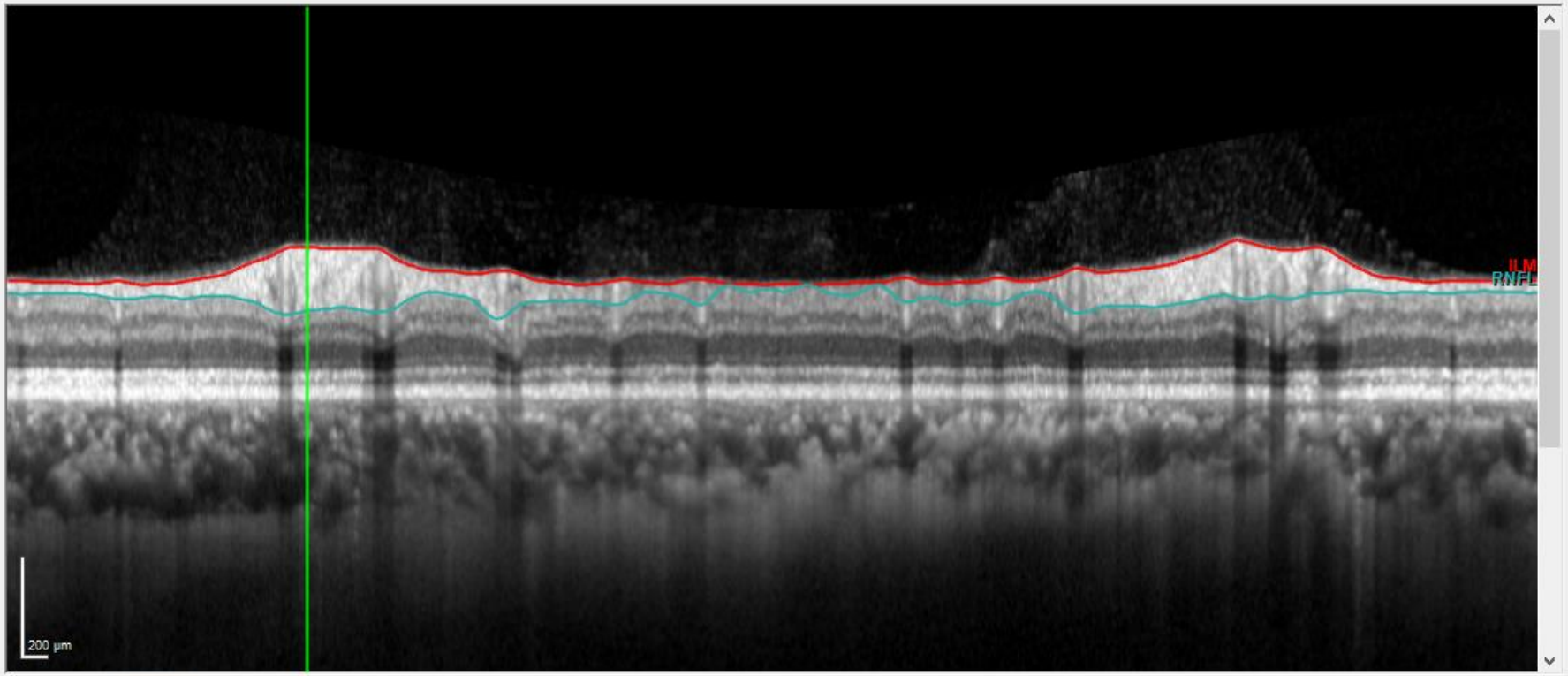
Macular retina classification



Reference database: European descent (2014)

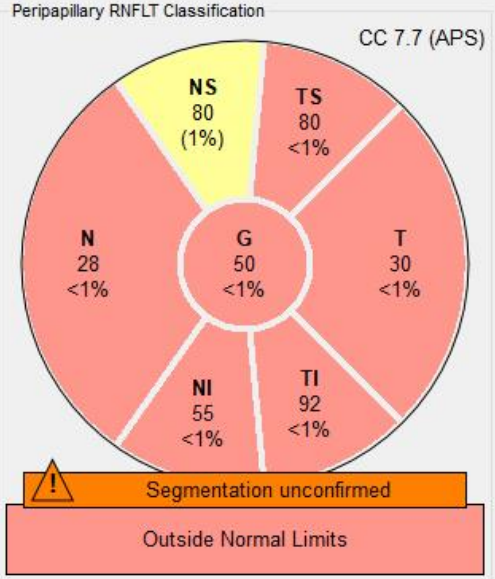
Display | BMO Rim Analysis | BMO Overview | RNFL Thickness | Progression

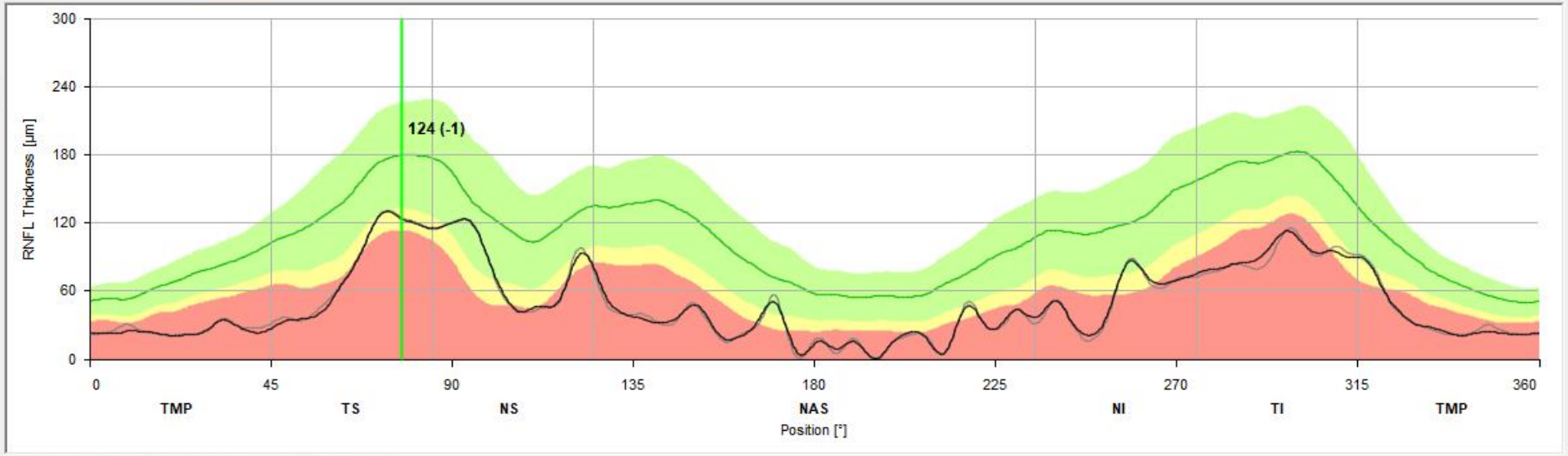




1:1 pixel | 1:1 µm

Peripapillary RNFLT Classification





Reference database: European Descent (2014)

Display | 3D View | Thickness Profile | Thickness Map | Posterior Pole | Deviation Map

Default slabs

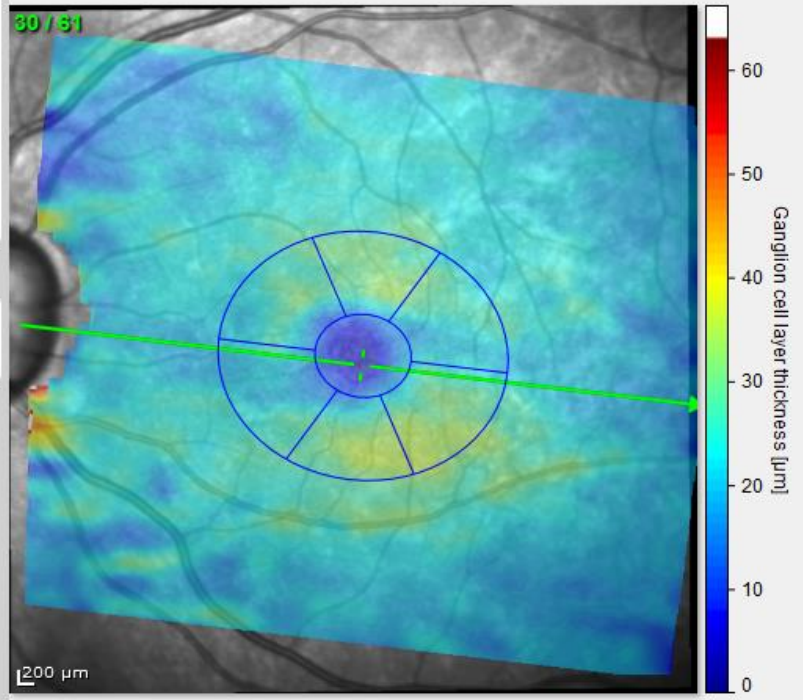
Retina: RNFL | GCL | IPL

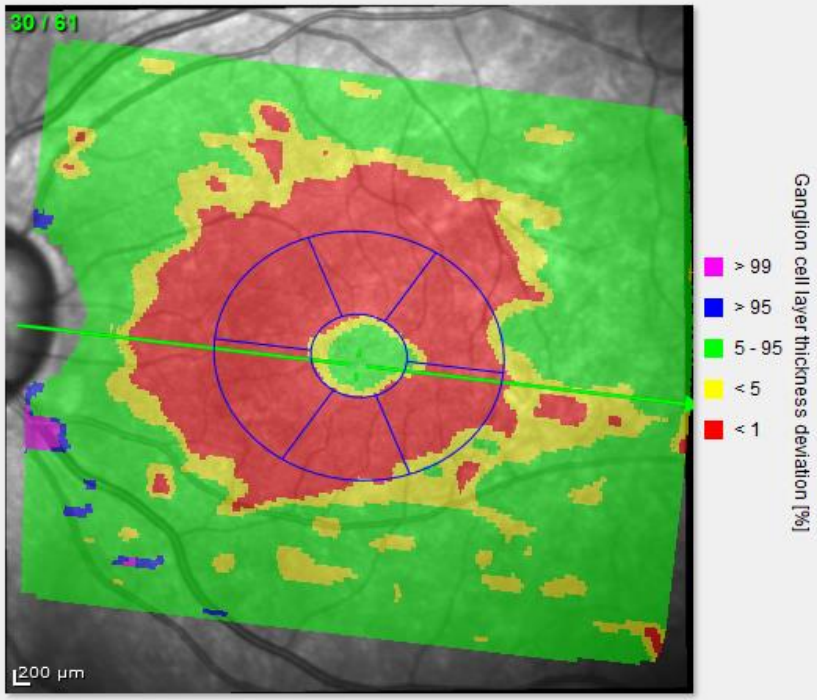
Overlay:

Segmentation

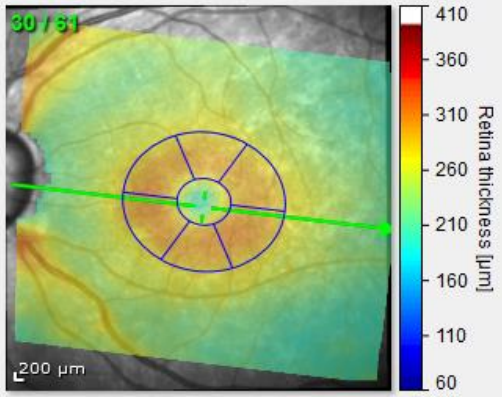
Edit

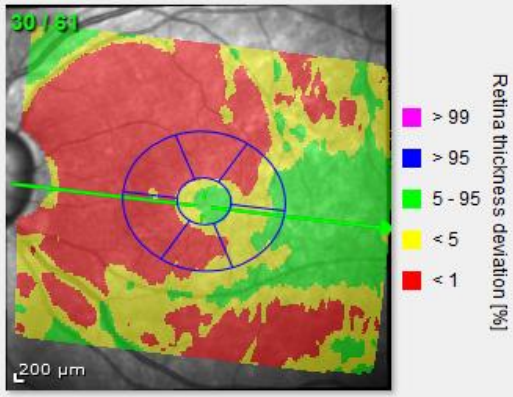
GCL



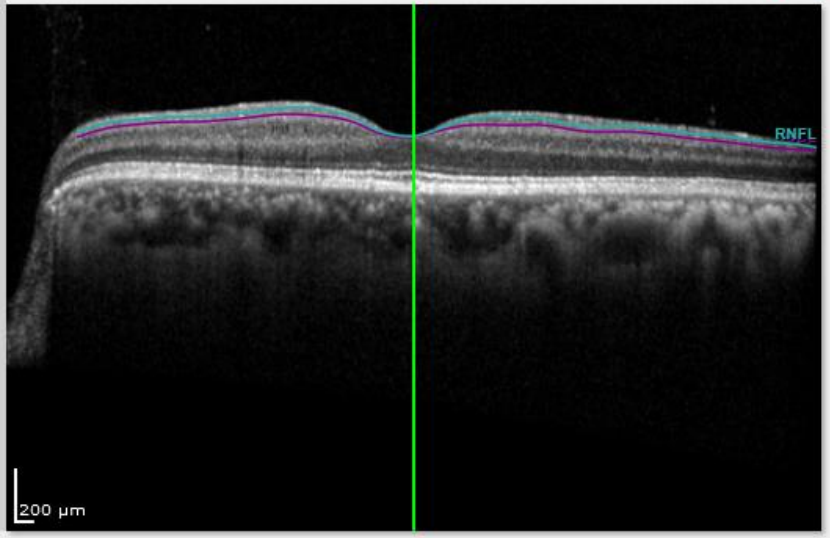


Retina



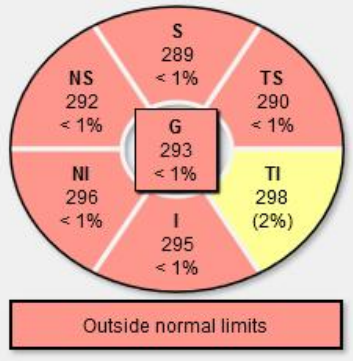


Auto



Macular ganglion cell layer classification

Macular retina classification

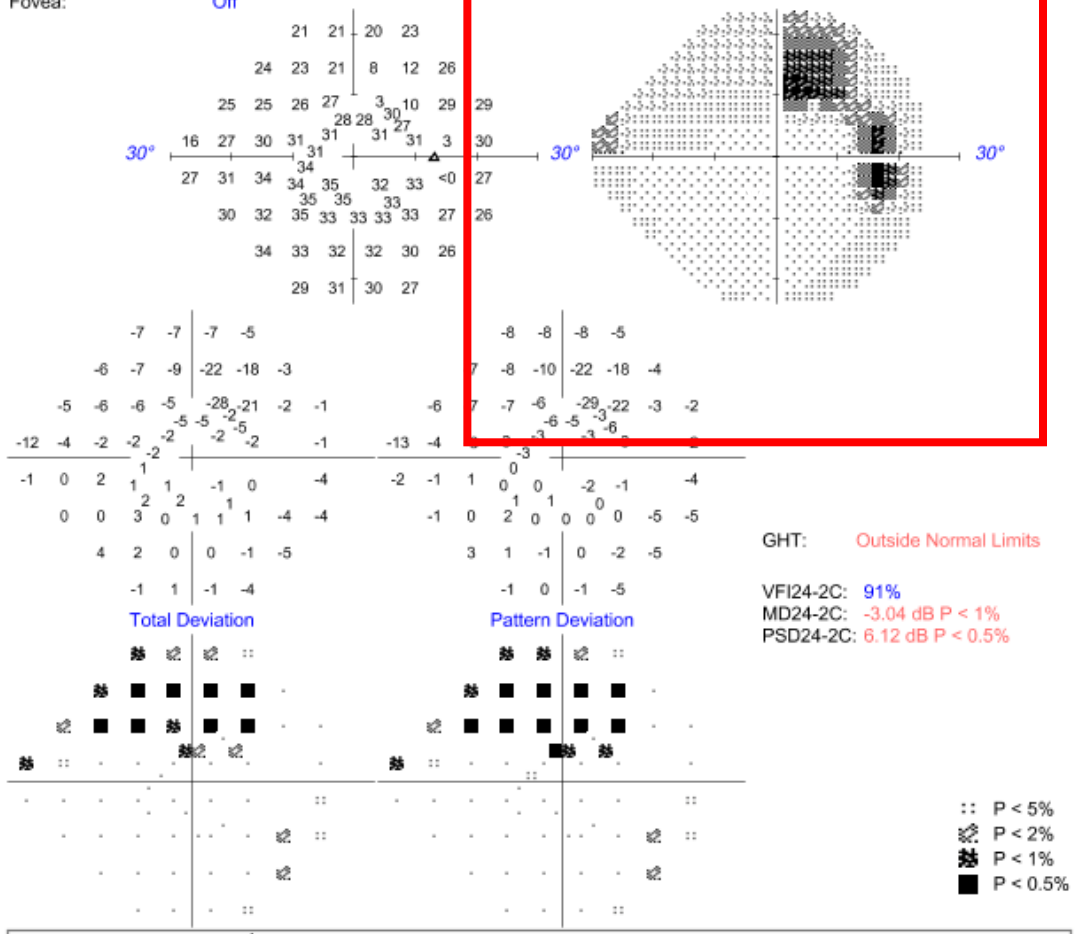


Reference database: European descent (2014)

OD Single Field Analysis — Central 24-2C Threshold Test

Fixation Monitor:	Gaze/Blind Spot	Stimulus:	III, White	Date:	Feb 27, 2024
Fixation Target:	Central	Background:	31.5 asb	Time:	9:52 AM
Fixation Losses:	4/12 XX	Strategy:	SITA Faster	Age:	46
False POS Errors:	12%	Pupil Diameter:			
False NEG Errors:	9%	Visual Acuity:			
Test Duration:	04:44	Rx:	+2.25 DS		
Fovea:	Off				

*** Low Test Reliability ***



GHT: Outside Normal Limits

VFI24-2C: 91%
MD24-2C: -3.04 dB P < 1%
PSD24-2C: 6.12 dB P < 0.5%

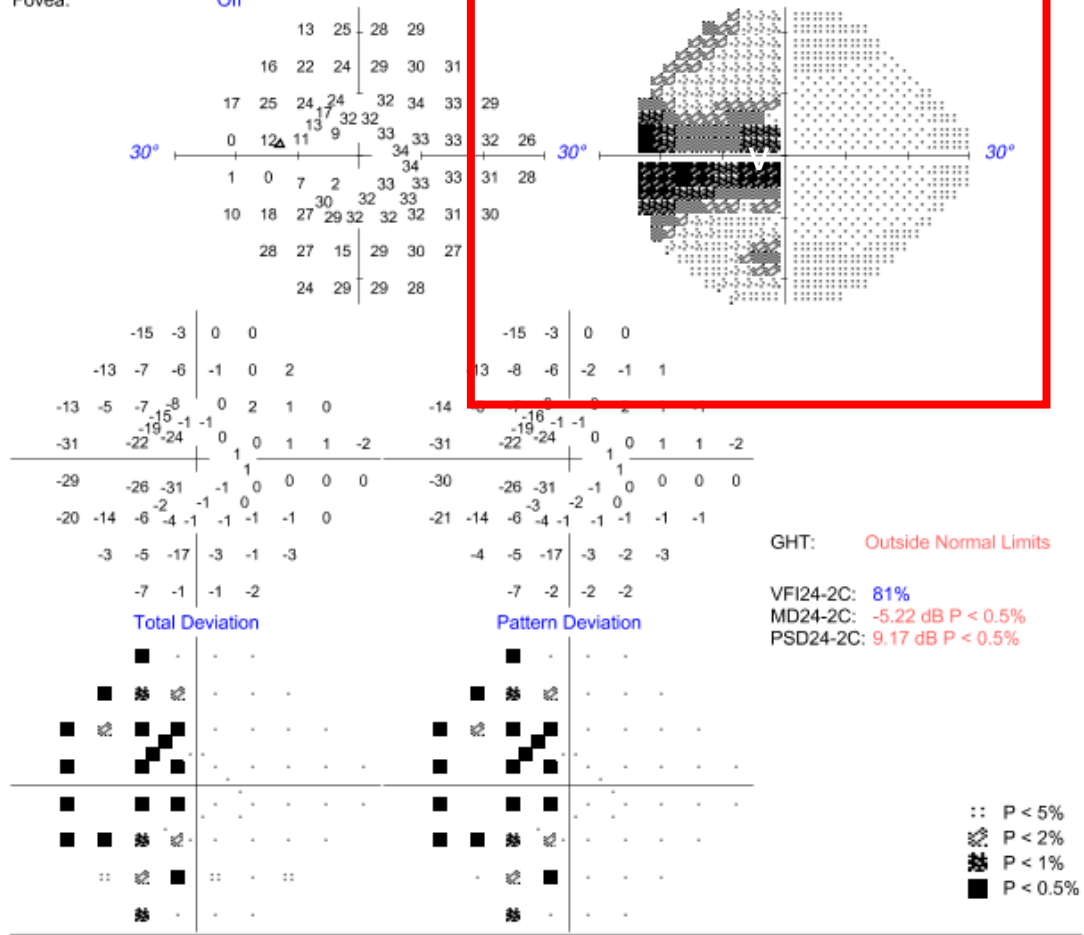
:: P < 5%
P < 2%
P < 1%
P < 0.5%

Comments

Signature

OS Single Field Analysis — Central 24-2C Threshold Test

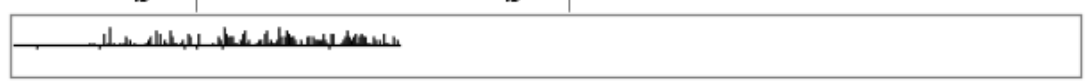
Fixation Monitor:	Gaze/Blind Spot	Stimulus:	III, White	Date:	Feb 27, 2024
Fixation Target:	Central	Background:	31.5 asb	Time:	9:58 AM
Fixation Losses:	0/12	Strategy:	SITA Faster	Age:	46
False POS Errors:	8%	Pupil Diameter:			
False NEG Errors:	16%	Visual Acuity:			
Test Duration:	05:23	Rx:	+2.50 DS		
Fovea:	Off				



GHT: Outside Normal Limits

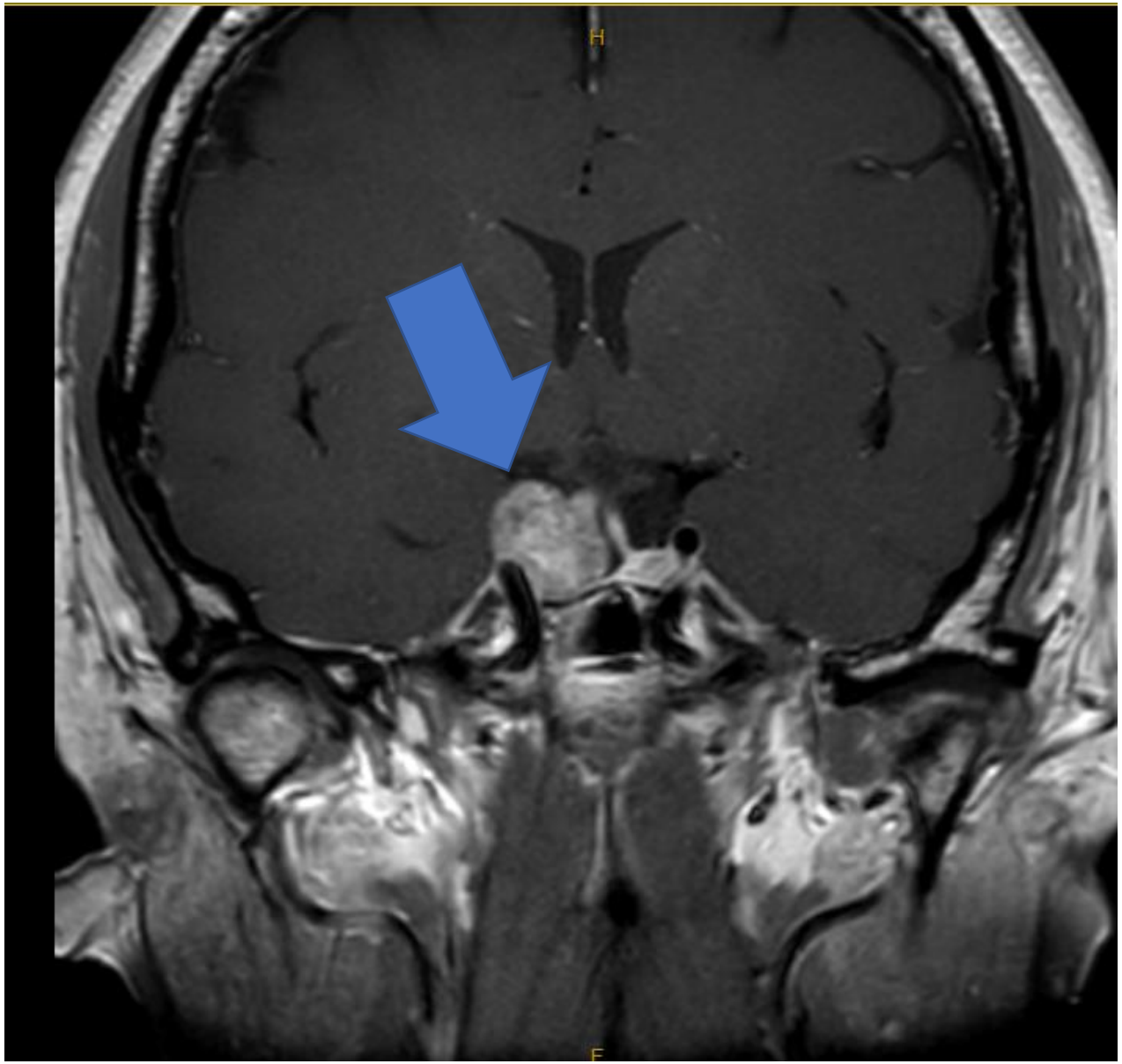
VFI24-2C: 81%
MD24-2C: -5.22 dB P < 0.5%
PSD24-2C: 9.17 dB P < 0.5%

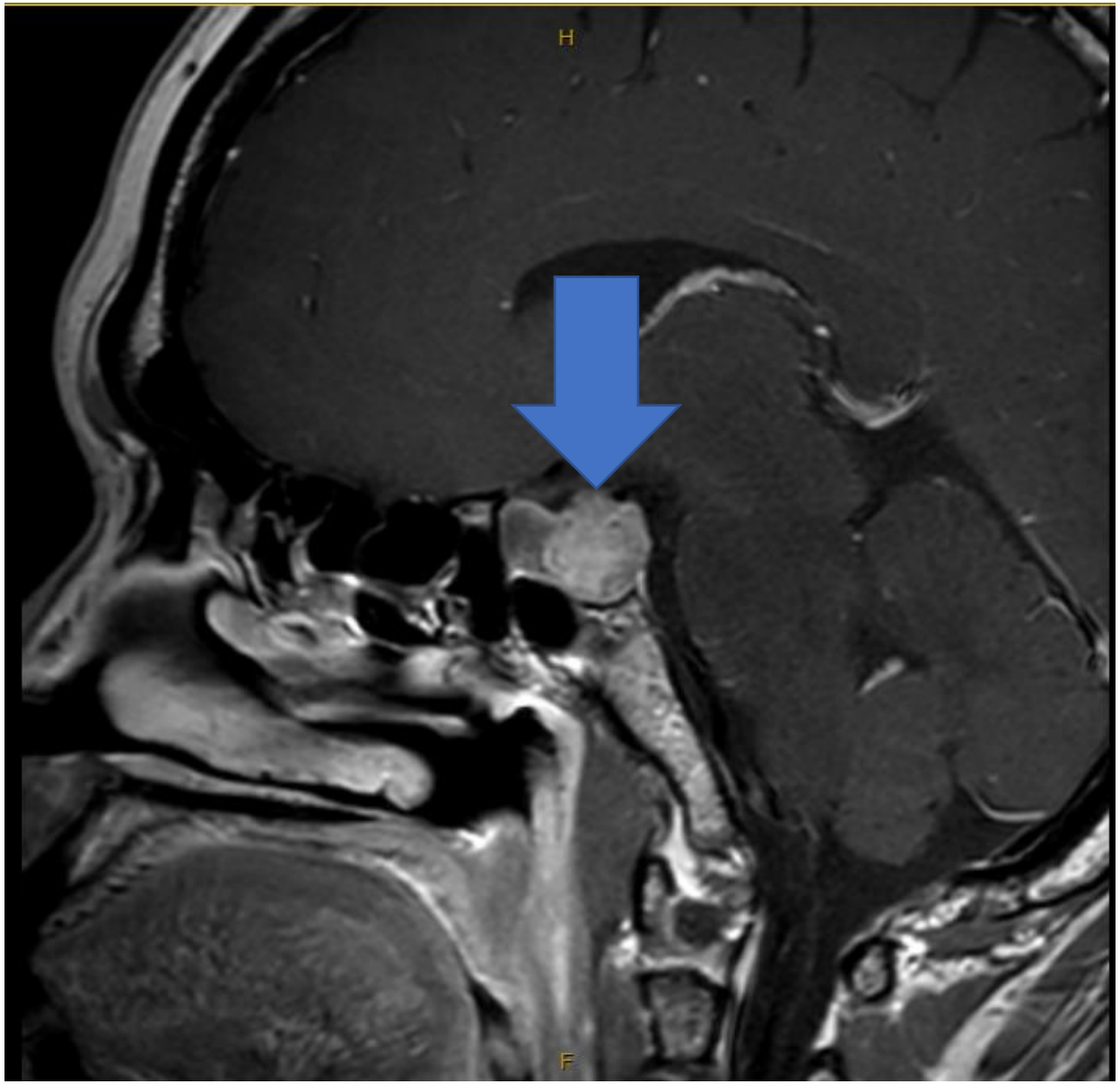
:: P < 5%
P < 2%
P < 1%
P < 0.5%



Comments

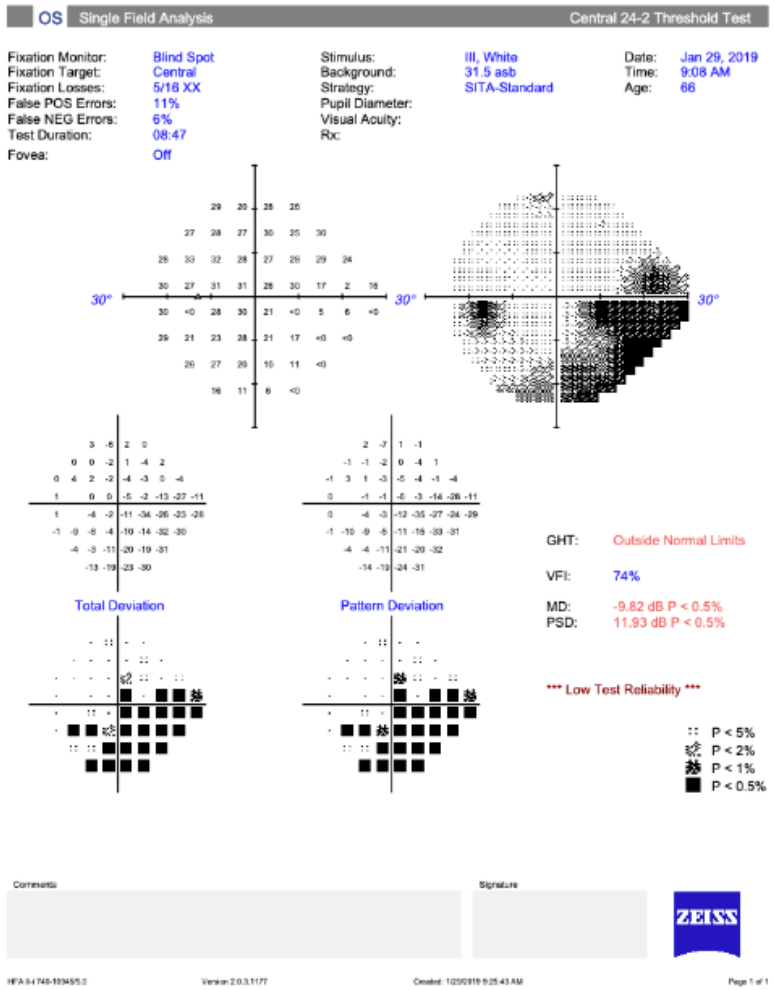
Signature

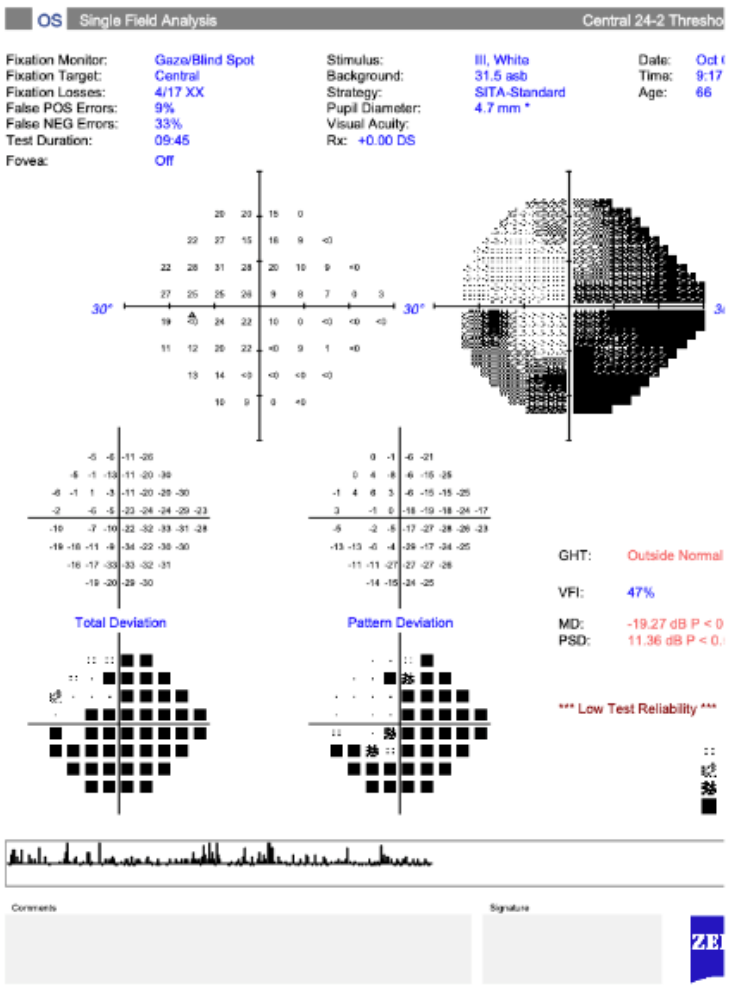

H
F

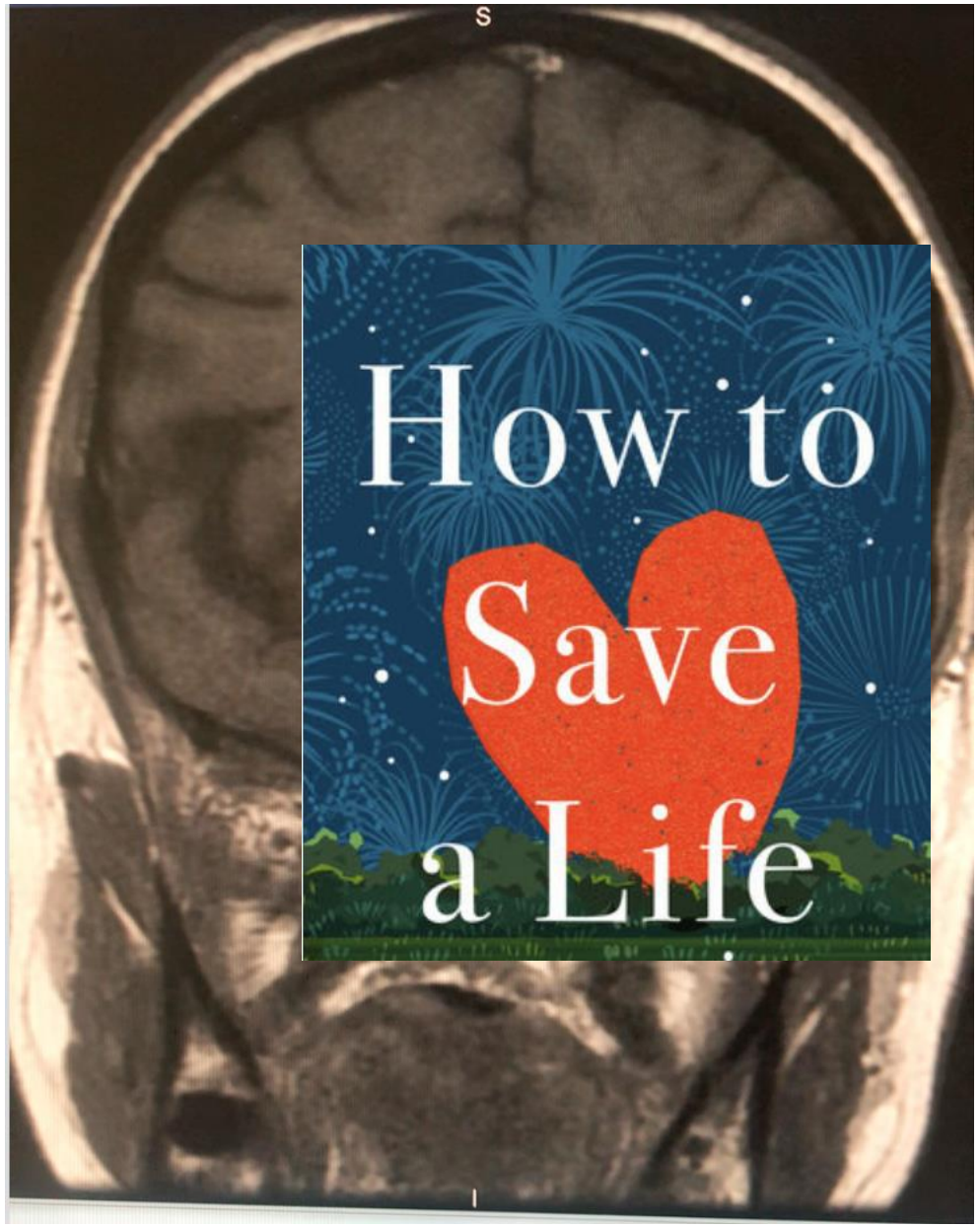

H
F

Another patient referred for glaucoma assessment...

6 months later…






S
I
How to
Save
a Life

Atypical NTG: Predictive factors for compressive lesions

- Age younger than 50 years
- Visual acuity worse than 6/12
- Fast VF progression
- Visual field defects involving the vertical midline
- Pallor disproportionate to the disc cupping

Neuroimaging in Patients with Atypical Normal-Tension Glaucoma

126 NTG patients

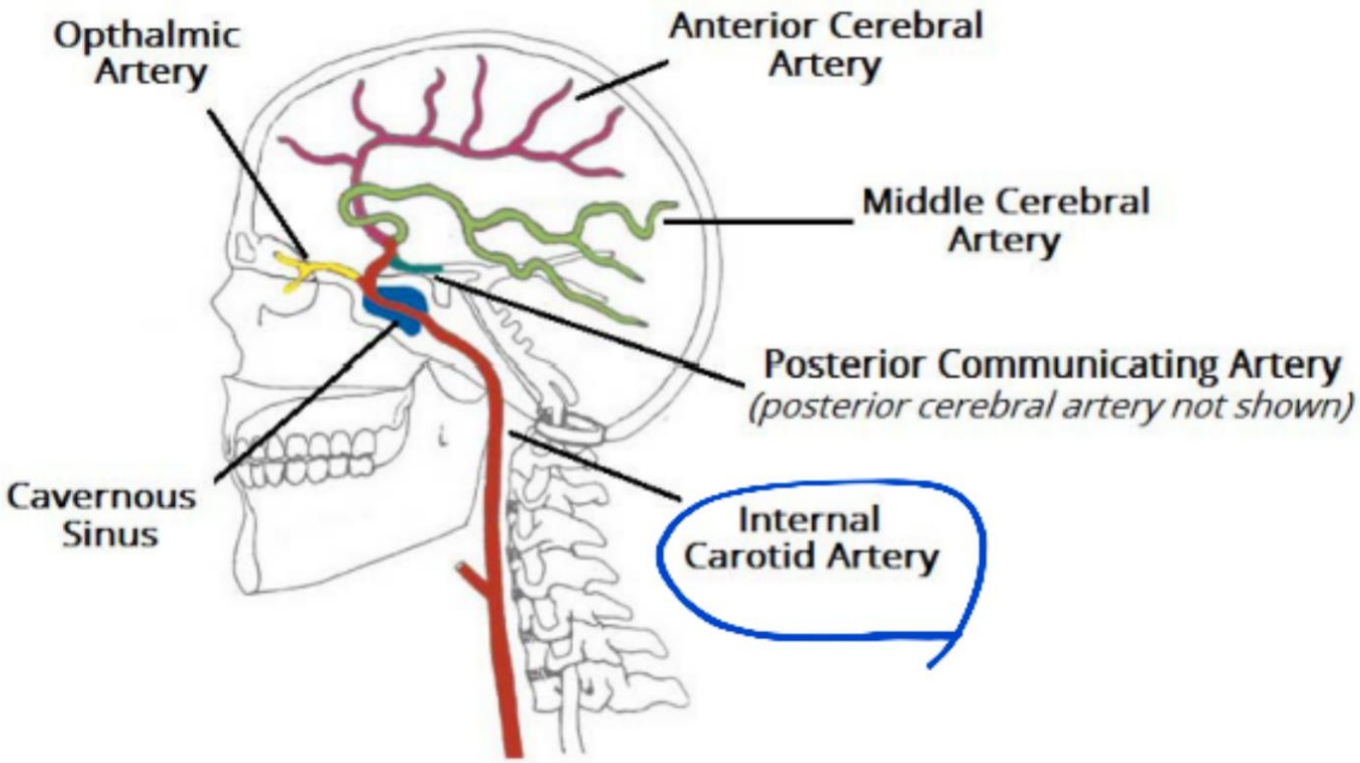
- 29 (23%) patients were qualified as positive

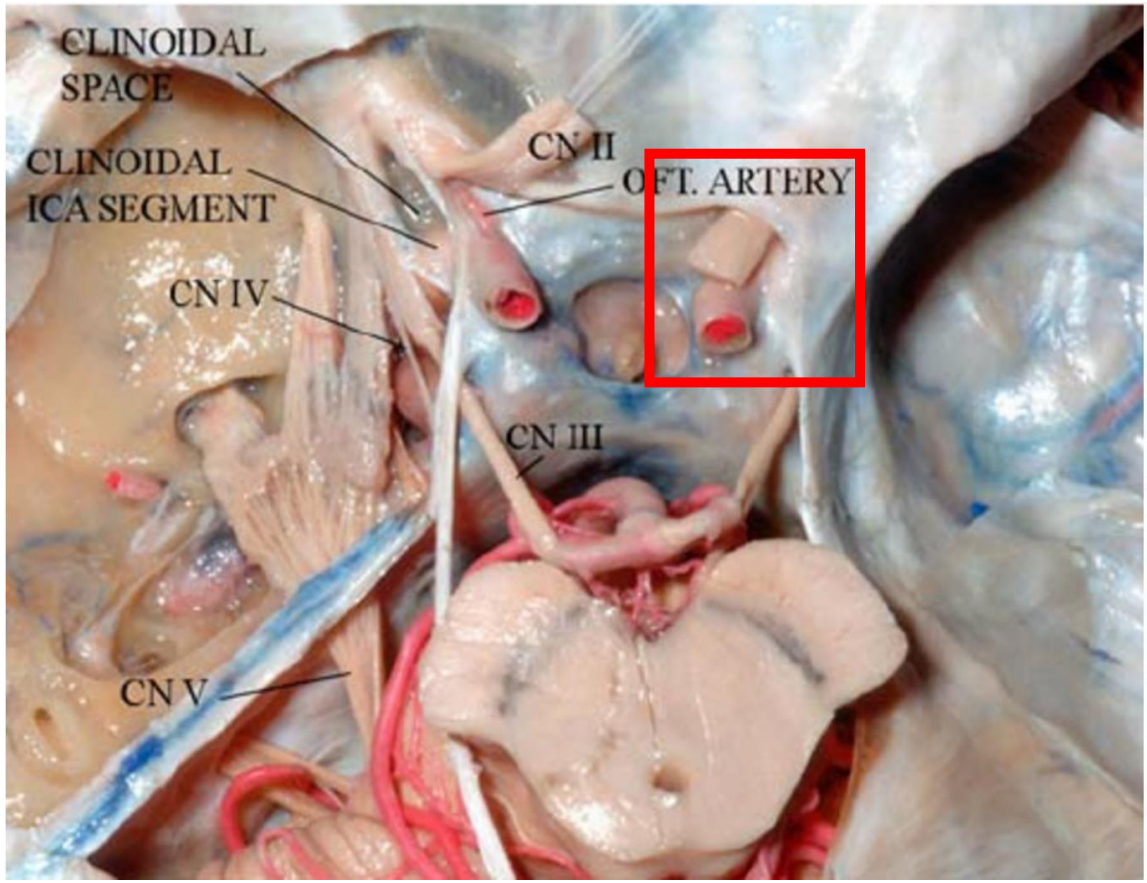
- **Pathology Breakdown:**
  - Pituitary adenomas: 6 patients (4.5%).
  - Intracranial meningiomas: 4 patients (3.1%).
  - Optic nerve sheath meningiomas: 3 patients (2.4%).
  - Brain glioma: 1 patient (0.8%)

- **Key Predictors for Detection:**
  - Worsening best-corrected visual acuity (BCVA).
  - Fast visual field (VF) progression.

Imaging Kosior-Jarecka E, Wróbel-Dudzińska D, Pietura R, Pankowska A, Szczuka B, Żarnowska I, Łukasik U, Żarnowski T. Results of Neuroimaging in Patients with Atypical Normal-Tension Glaucoma. Biomed Res Int. 2020 Aug 18;2020:9093206. doi: 10.1155/2020/9093206. PMID: 32908924; PMCID: PMC7450348.

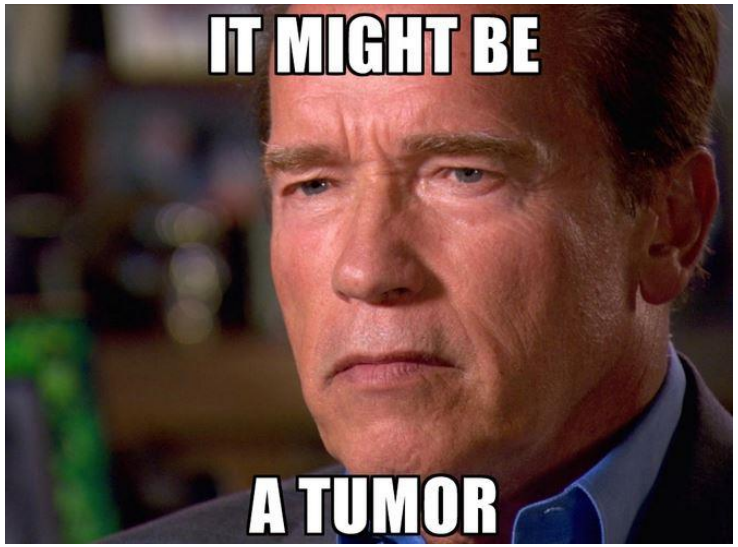
Supraclinoid- ophthalmic segment (C6)





Clinical Pearls: Compressive optic neuropathy

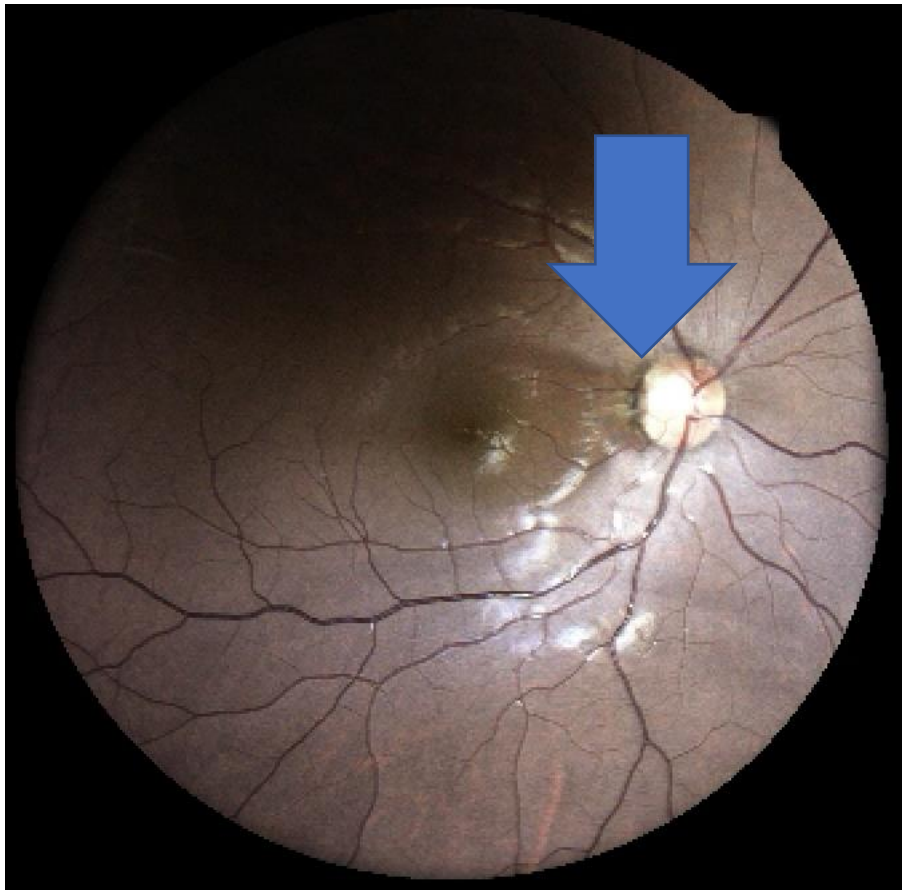
- Central or centrocecal scotomas are common
- Field defects often respect the vertical midline.
- Look for Optic disc pallor (especially temporal pallor)
- Consider if rapid VF progression
- Early and disproportionate color vision loss (dyschromatopsia)
- RAPD if unilateral or asymmetric.



Optometry
WESTERN AUSTRALIA

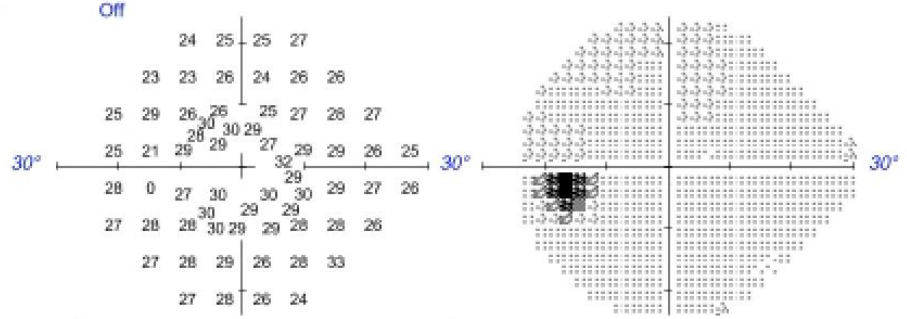
Lions Eye Institute

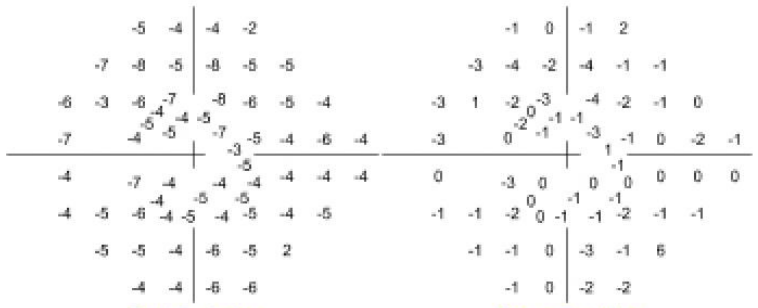
Case 4. MRS NP- 29yo female referred with right thin optic nerve



OS Single Field Analysis — Central 24-2C Threshold Test

Fixation Monitor:	Gaze Monitor	Stimulus:	III, White	Date:	Nov 27, 2024
Fixation Target:	Central	Background:	31.5 asb	Time:	11:33 AM
Fixation Losses:	0/0	Strategy:	SITA Faster	Age:	29
False POS Errors:	10%	Pupil Diameter:			
False NEG Errors:	Off	Visual Acuity:			
Test Duration:	02:30	Rx:	-6.50 DS		
Fovea:	Off				





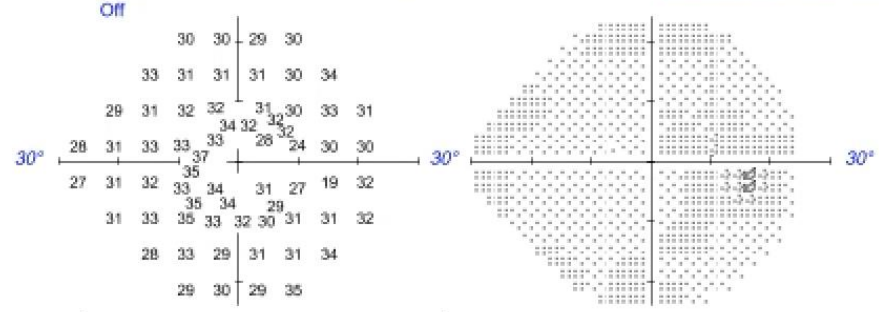
GHT: General Reduction of Sensitivity
VFI24-2C: 98%
MD24-2C: -4.86 dB P < 0.5%
PSD24-2C: 1.51 dB

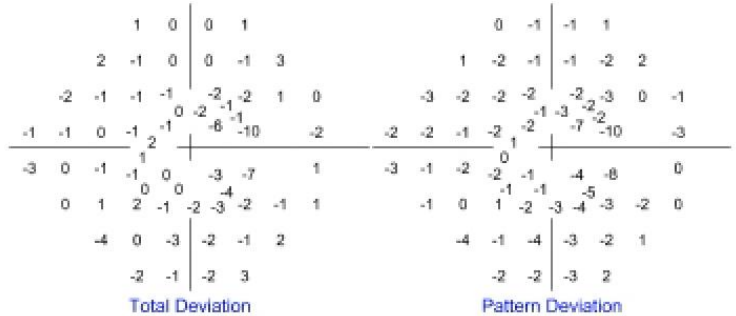
:: P < 5%
P < 2%
P < 1%
P < 0.5%

OD Single Field Analysis — Central 24-2C Threshold Test

Fixation Monitor:	Gaze Monitor	Stimulus:	III, White	Date:	Nov 27, 2024
Fixation Target:	Central	Background:	31.5 asb	Time:	11:31 AM
Fixation Losses:	0/0	Strategy:	SITA Faster	Age:	29
False POS Errors:	19% XX	Pupil Diameter:			
False NEG Errors:	Off	Visual Acuity:			
Test Duration:	02:12	Rx:	+0.00 DS		
Fovea:	Off				

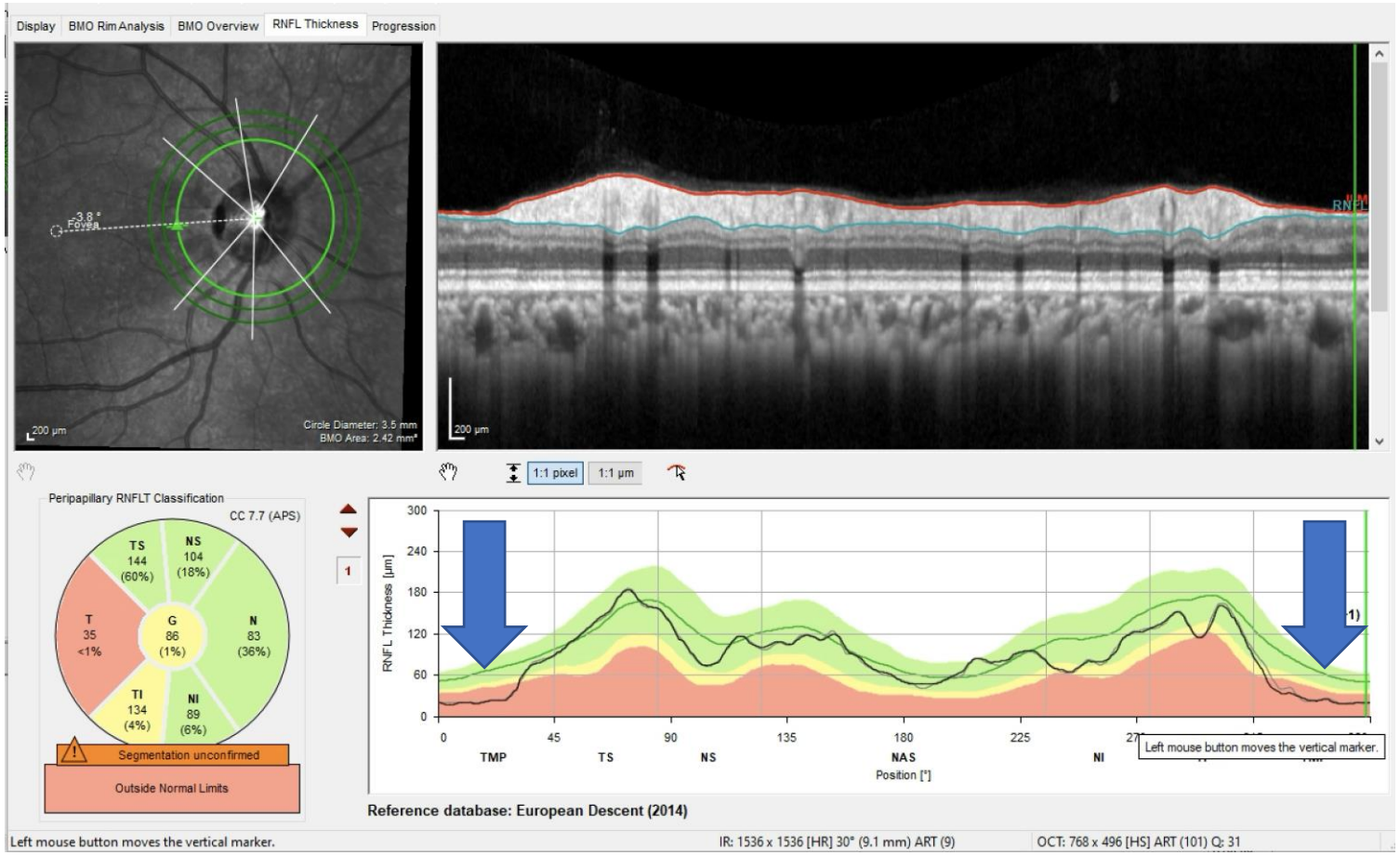
*** Excessive High False Positives ***

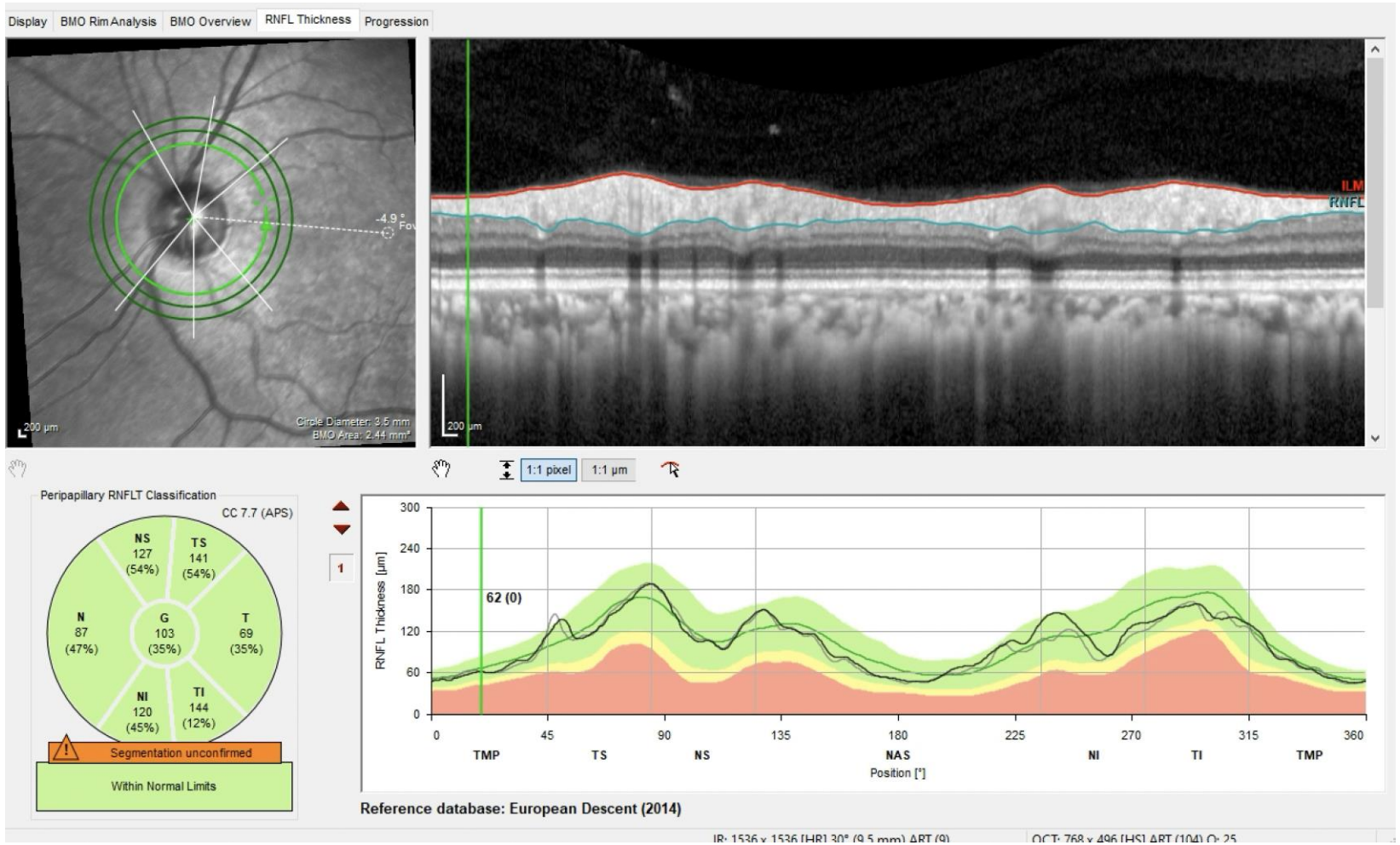


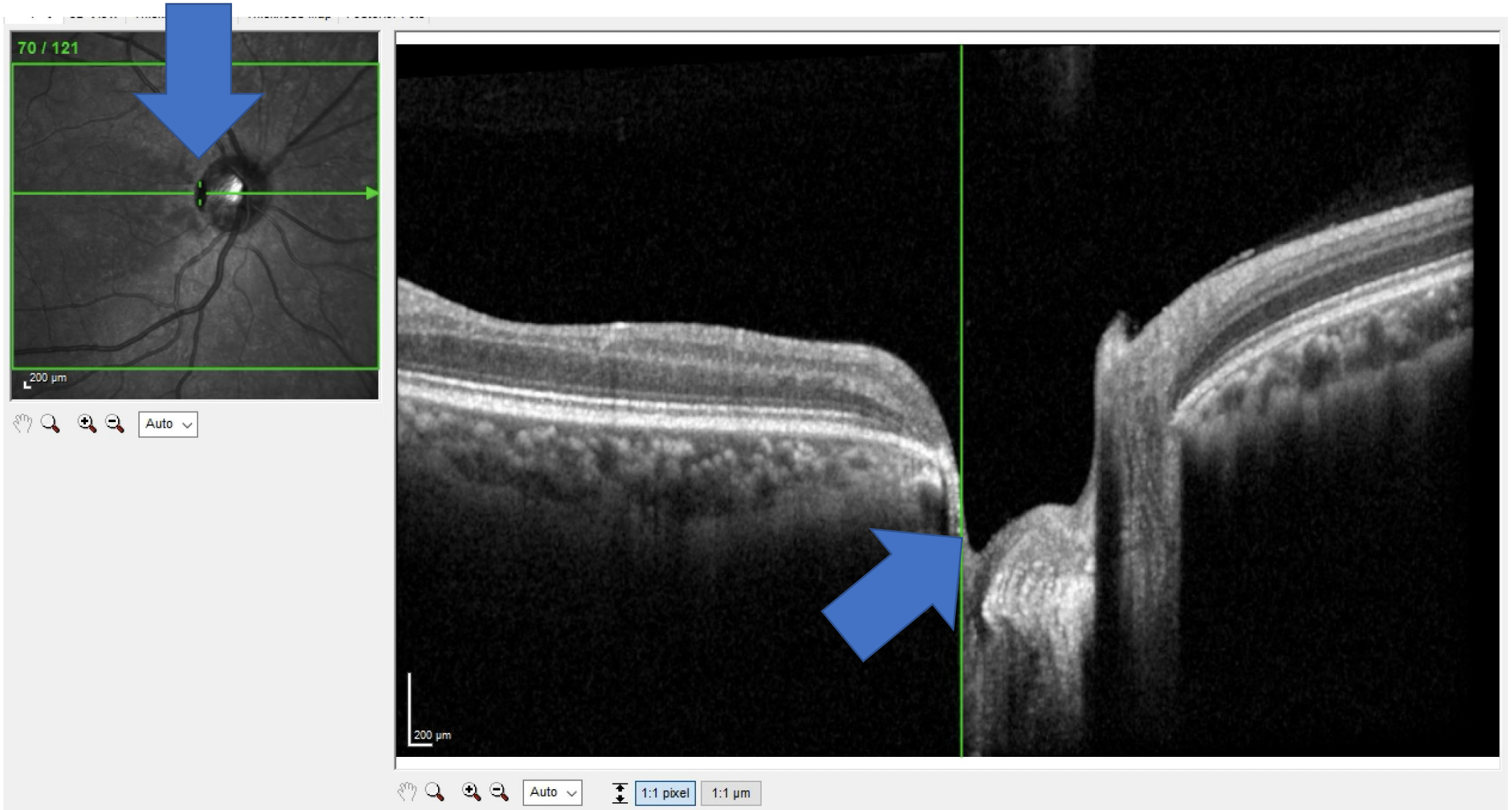


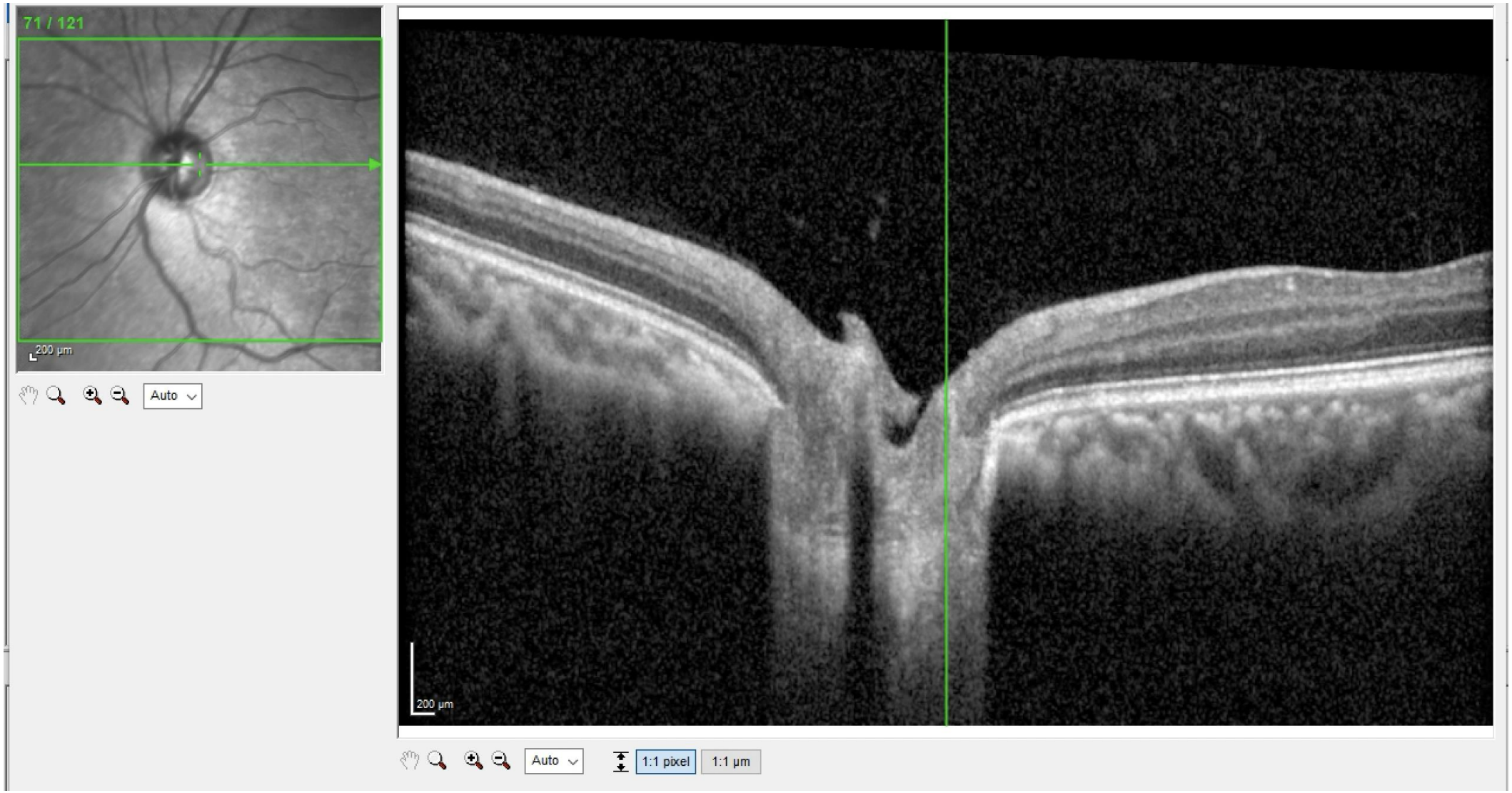
GHT: Within Normal Limits
VFI24-2C: 97%
MD24-2C: -1.00 dB
PSD24-2C: 2.22 dB P < 5%

:: P < 5%
P < 2%
P < 1%
P < 0.5%


Display
BMO Rim Analysis
BMO Overview
RNFL Thickness
Progression
-3.8 °
Fovea
200 µm
Circle Diameter: 3.5 mm
BMO Area: 2.42 mm²
200 µm
RNFL
1:1 pixel
1:1 µm
Peripapillary RNFLT Classification
CC 7.7 (APS)
TS
144
(60%)
NS
104
(18%)
T
35
<1%
G
86
(1%)
N
83
(36%)
TI
134
(4%)
NI
89
(6%)
Segmentation unconfirmed
Outside Normal Limits
1
RNFL Thickness [µm]
300
240
180
120
60
0
0
45
90
135
180
225
TMP
TS
NS
NAS
NI
Position [°]
1)
Left mouse button moves the vertical marker.
Reference database: European Descent (2014)
Left mouse button moves the vertical marker.
IR: 1536 x 1536 [HR] 30° (9.1 mm) ART (9)
OCT: 768 x 496 [HS] ART (101) Q: 31

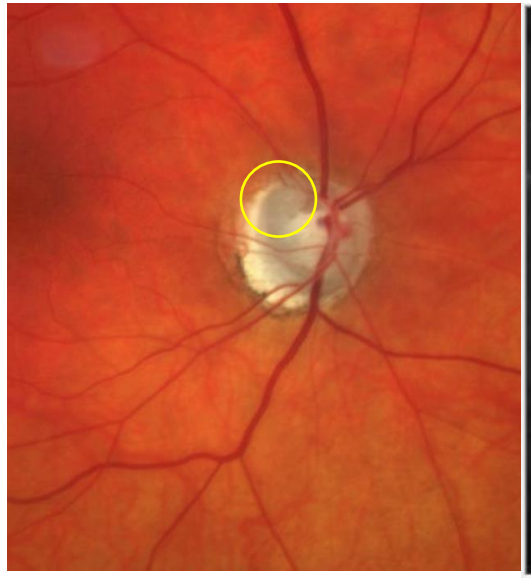

Display
BMO Rim Analysis
BMO Overview
RNFL Thickness
Progression
200 µm
Circle Diameter: 3.6 mm
BMO Area: 2.44 mm²
ILM
RNFL
1:1 pixel
1:1 µm
Peripapillary RNFLT Classification
CC 7.7 (APS)
NS 127 (54%)
TS 141 (54%)
N 87 (47%)
G 103 (35%)
T 69 (35%)
NI 120 (45%)
TI 144 (12%)
Segmentation unconfirmed
Within Normal Limits
RNFL Thickness [µm]
62 (0)
Position [°]
TMP
TS
NS
NAS
NI
TI
TMP
Reference database: European Descent (2014)

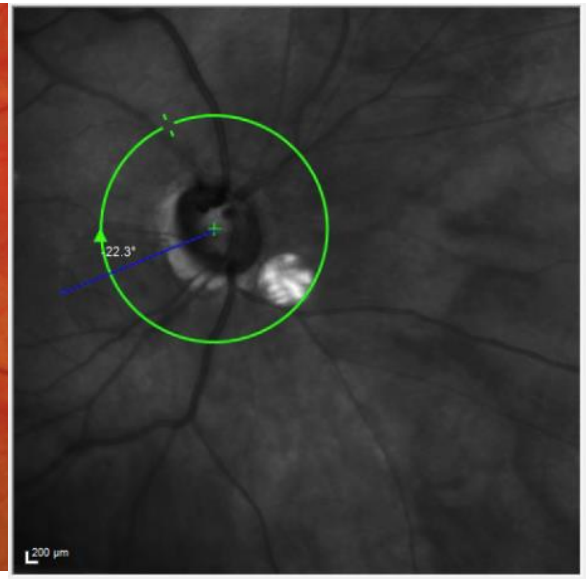

70 / 121
200 µm
Auto
200 µm
Auto
1:1 pixel
1:1 µm

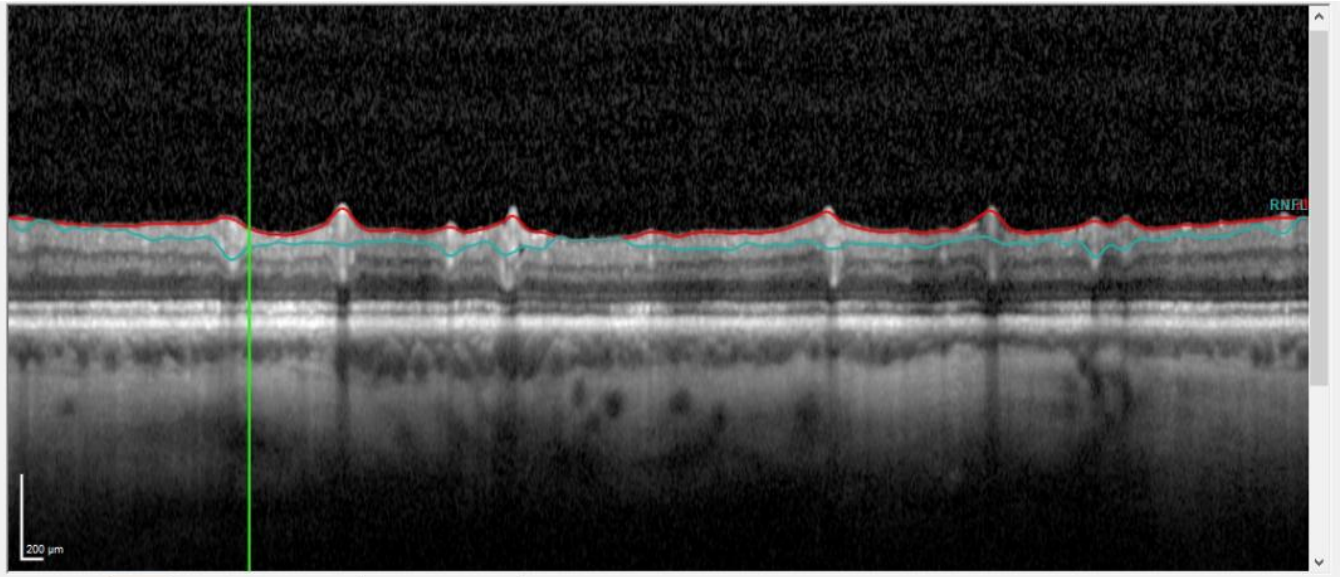

71 / 121
200 µm
Auto
200 µm
Auto
1:1 pixel
1:1 µm

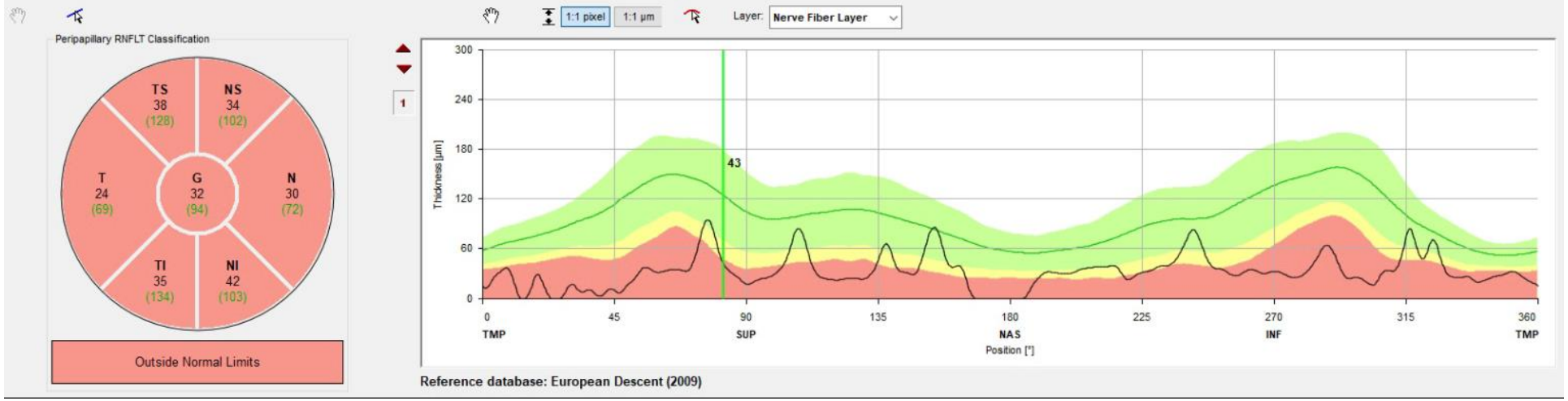
Diagnosis: **Congenital Optic Disc Pit**

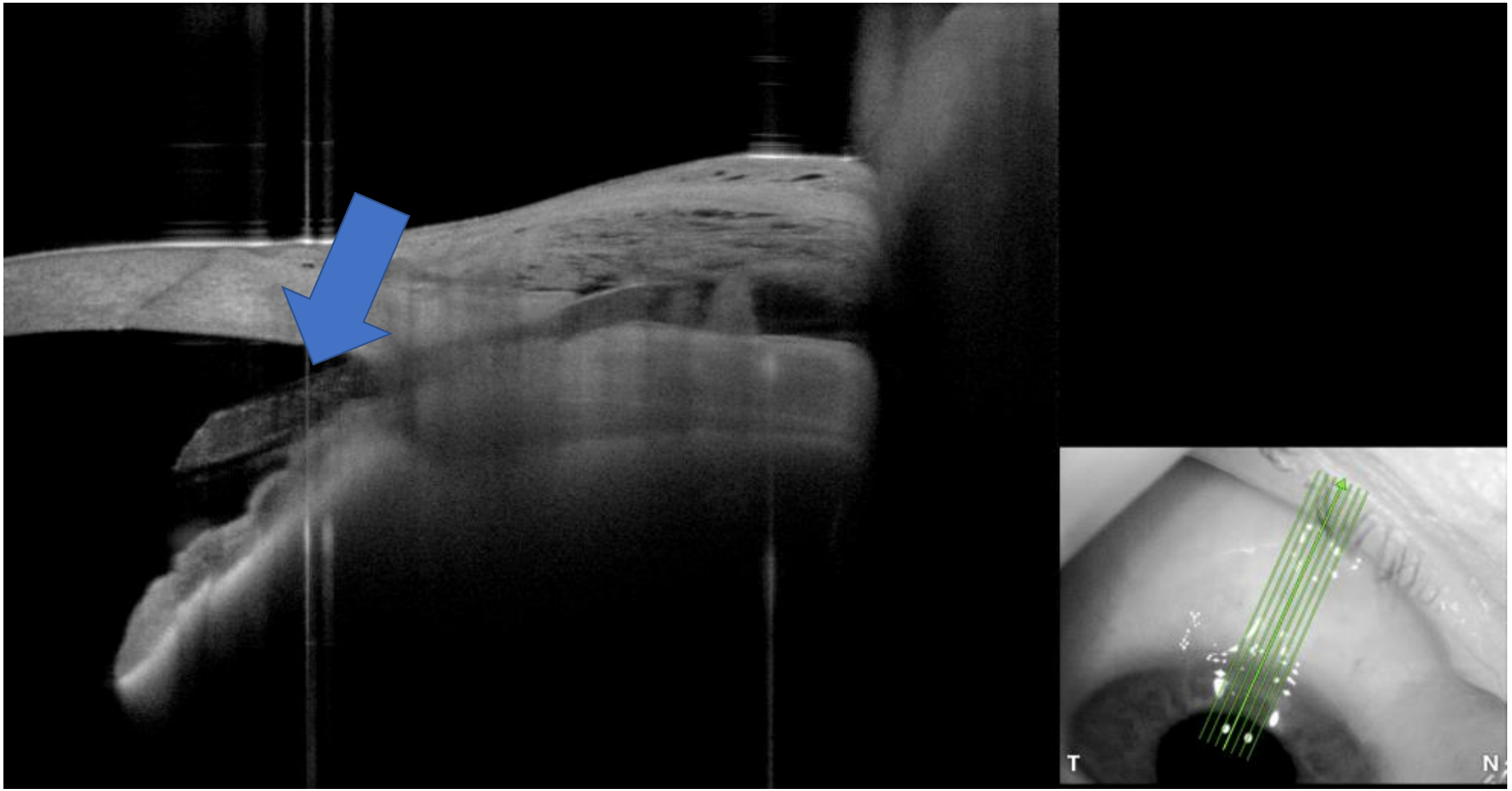
Optic Disc Pits Secondary to Advanced Glaucoma










T
N

Clinical Pearls: Optic Disc Pits

- Small, round or oval excavation in the optic nerve head
- Congenital defect from failed fetal fissure closure
- Inferotemporal
- May be Acquired
- May have macular edema, detachment, or schisis.
- 15% bilateral.

BRAD “PITT”

Case 5. Miss NT - 24yo female

Thank you for seeing Miss NT, who I am referring for further assessment regarding a suspicious right optic nerve appearance with an accompanying right visual field defect.

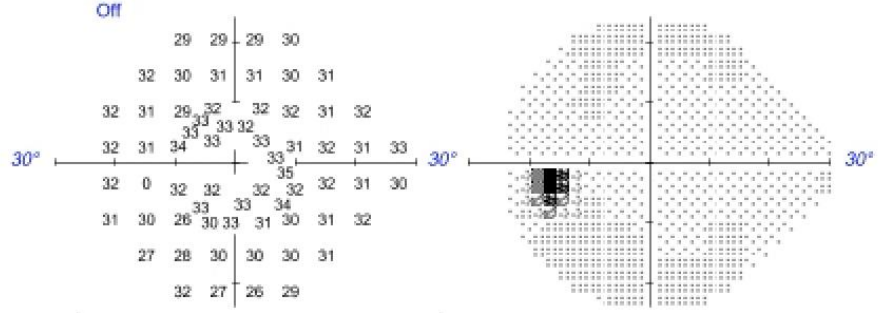
She reports no known family history of glaucoma.

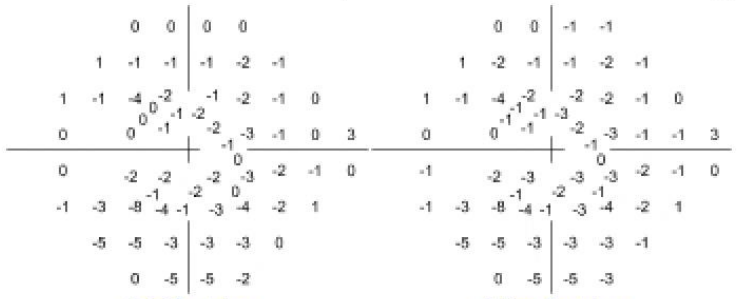
- Low myope
- “right eye weaker eye”
- IOP 14/16


11/27/24 | 2:44 PM | COLOR
OD
11/27/24 | 2:42 PM | COLOR
OS

OS Single Field Analysis — Central 24-2C Threshold Test

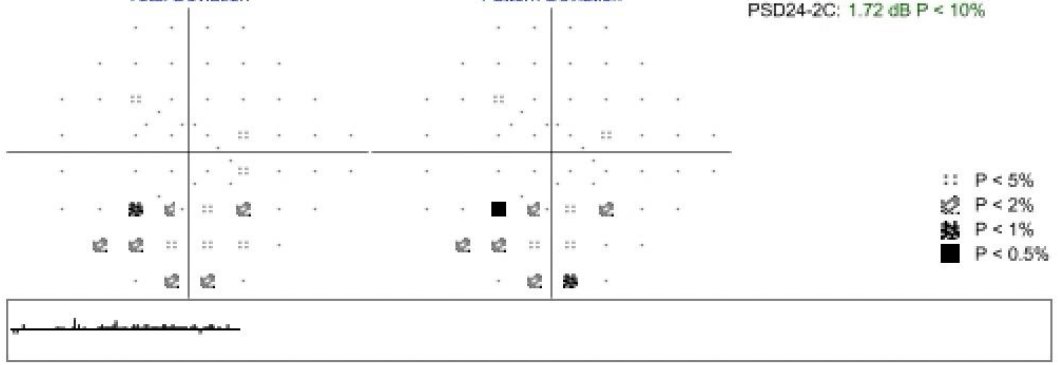
Fixation Monitor:	Gaze Monitor	Stimulus:	III, White	Date:	Nov 27, 2024
Fixation Target:	Central	Background:	31.5 asb	Time:	2:32 PM
Fixation Losses:	0/0	Strategy:	SITA Faster	Age:	24
False POS Errors:	6%	Pupil Diameter:			
False NEG Errors:	Off	Visual Acuity:			
Test Duration:	02:07	Rx:	+0.00 DS		
Fovea:	Off				





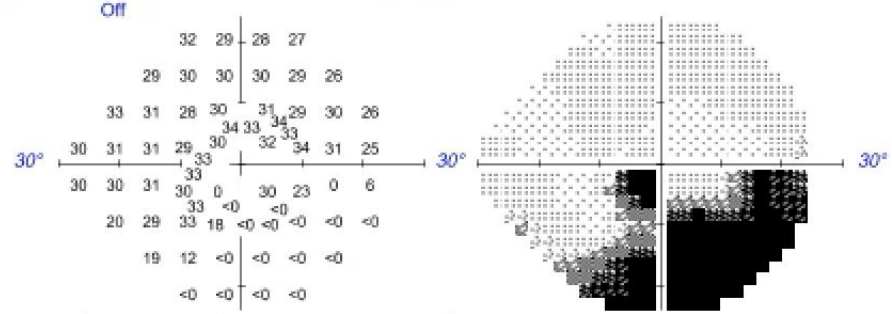
GHT: Outside Normal Limits

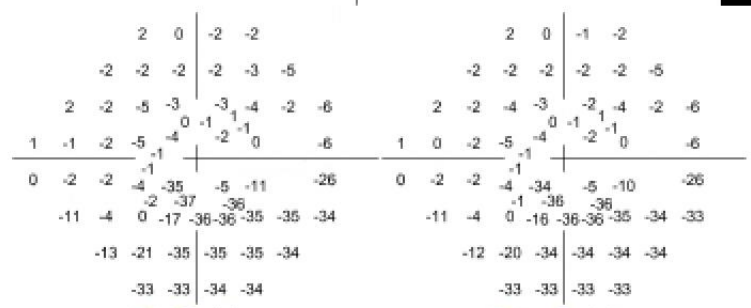
VFI24-2C: 98%
MD24-2C: -1.66 dB P < 10%
PSD24-2C: 1.72 dB P < 10%



OD Single Field Analysis — Central 24-2C Threshold Test

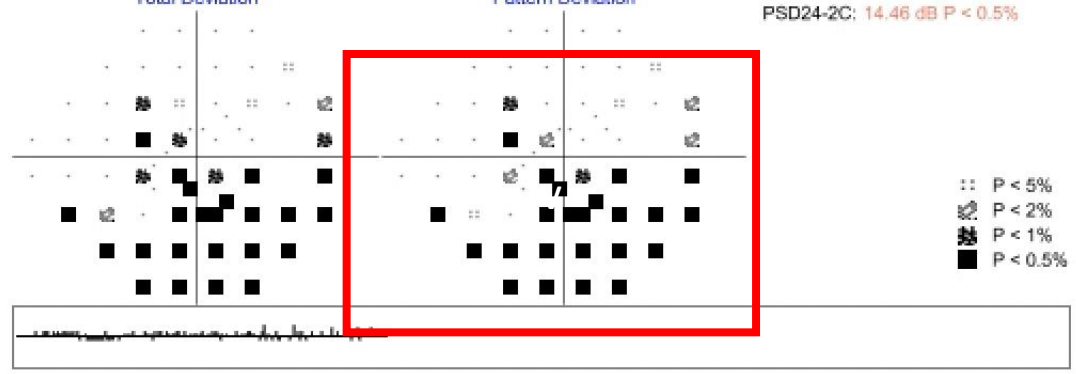
Fixation Monitor:	Gaze Monitor	Stimulus:	III, White	Date:	Nov 27, 2024
Fixation Target:	Central	Background:	31.5 asb	Time:	2:27 PM
Fixation Losses:	0/0	Strategy:	SITA Faster	Age:	24
False POS Errors:	3%	Pupil Diameter:			
False NEG Errors:	Off	Visual Acuity:			
Test Duration:	04:01	Rx:	+0.00 DS		
Fovea:	Off				

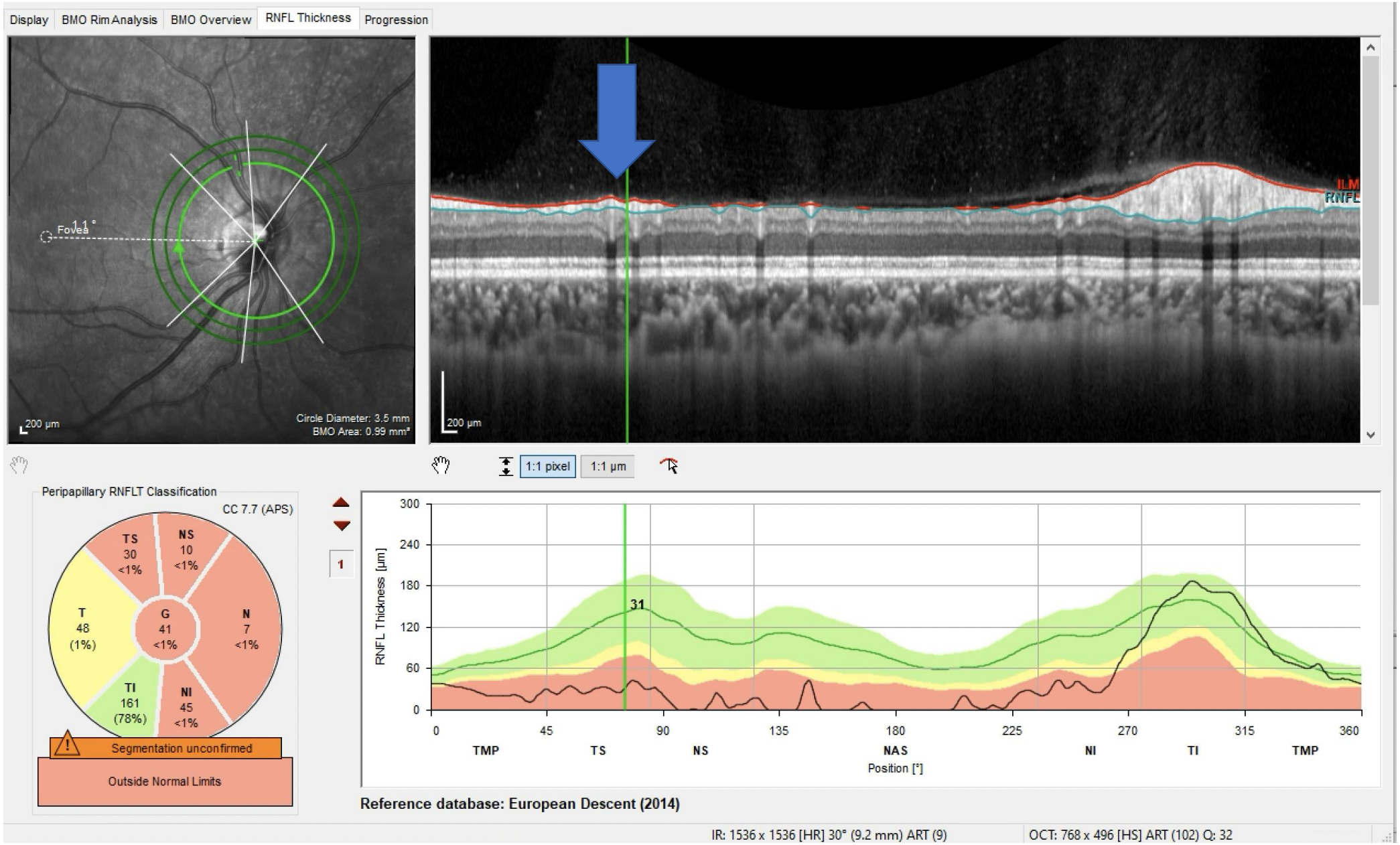




GHT: Outside Normal Limits

VFI24-2C: 69%
MD24-2C: -11.26 dB P < 0.5%
PSD24-2C: 14.46 dB P < 0.5%




Display
BMO Rim Analysis
BMO Overview
RNFL Thickness
Progression
11 °
Fovea
200 µm
Circle Diameter: 3.5 mm
BMO Area: 0.99 mm²
ILM
RNFL
200 µm
1:1 pixel
1:1 µm
Peripapillary RNFLT Classification
CC 7.7 (APS)
TS
30
<1%
NS
10
<1%
T
48
(1%)
G
41
<1%
N
7
<1%
TI
161
(78%)
NI
45
<1%
Segmentation unconfirmed
Outside Normal Limits
1
RNFL Thickness [µm]
300
240
180
120
60
0
31
0
45
90
135
180
225
270
315
360
TMP
TS
NS
NAS
NI
TI
TMP
Position [°]
Reference database: European Descent (2014)
IR: 1536 x 1536 [HR] 30° (9.2 mm) ART (9)
OCT: 768 x 496 [HS] ART (102) Q: 32

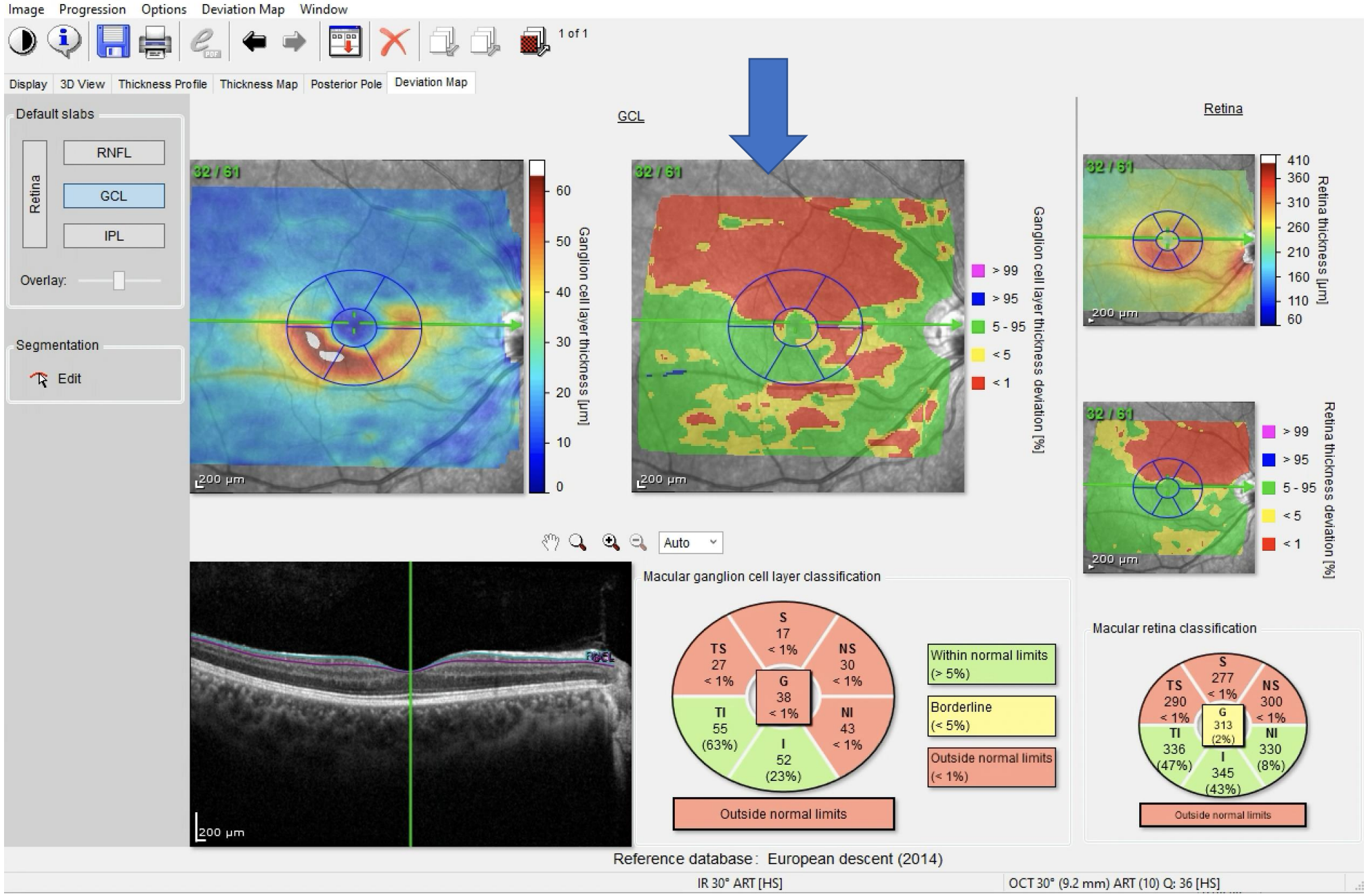
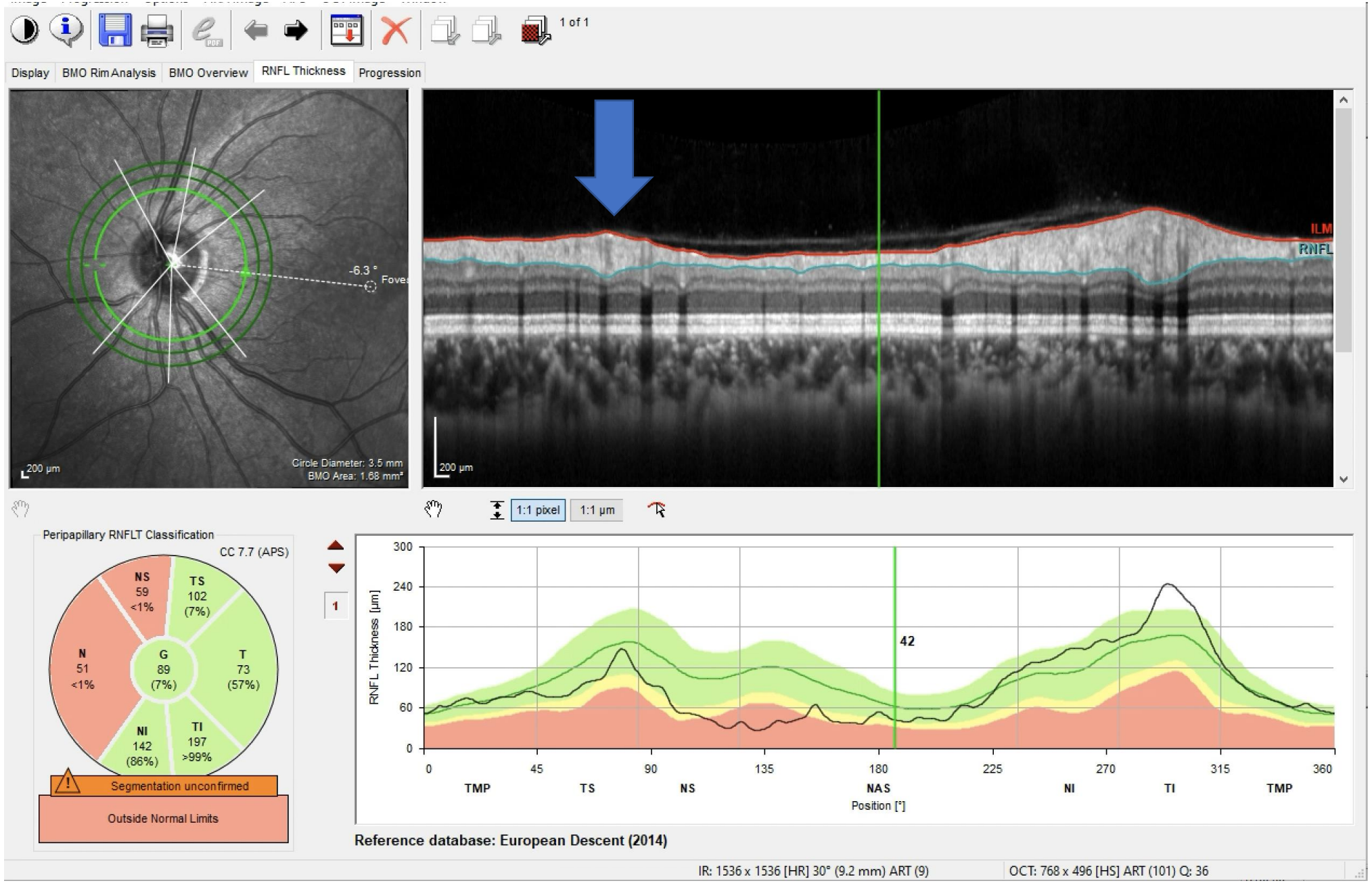
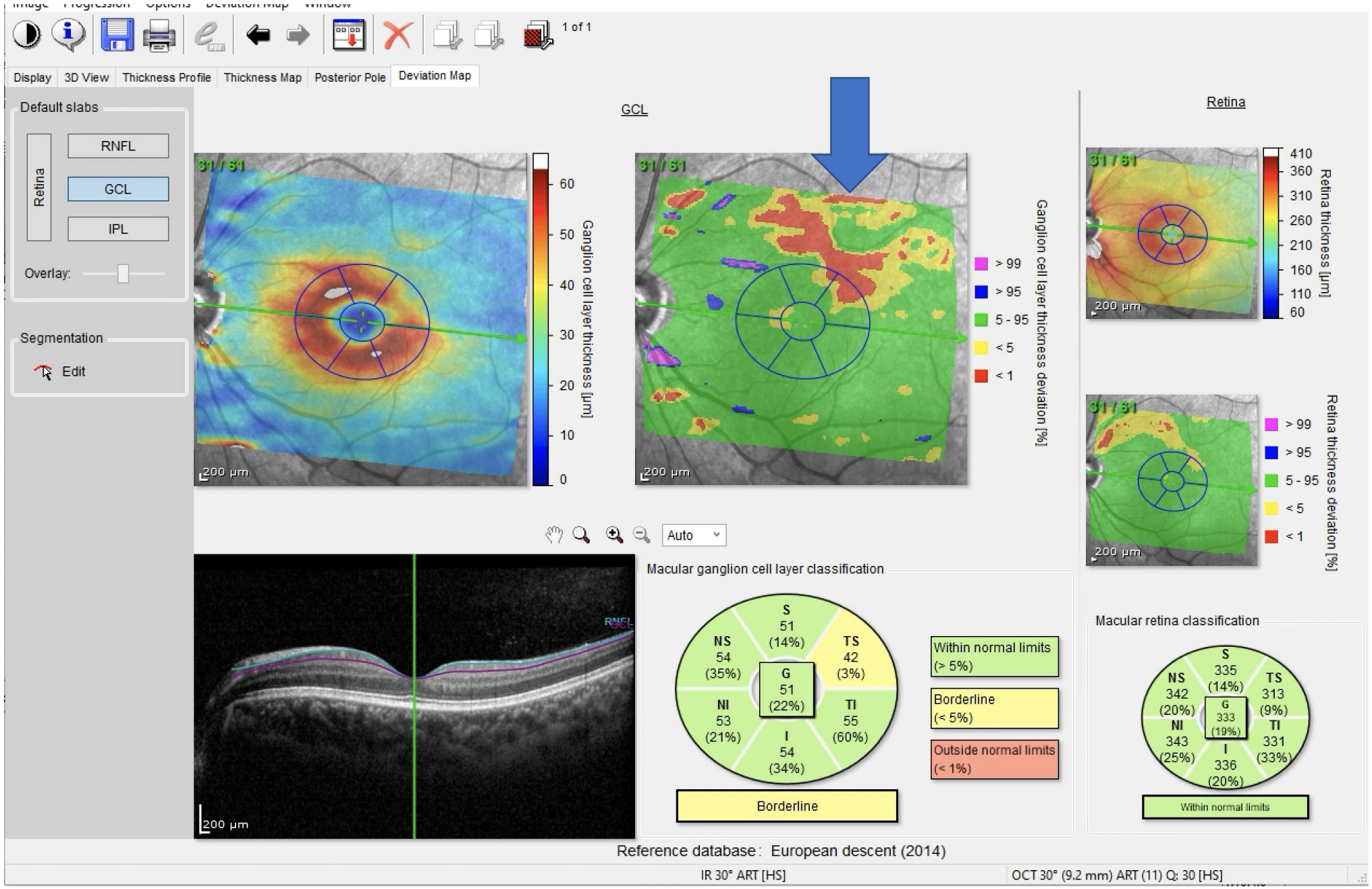


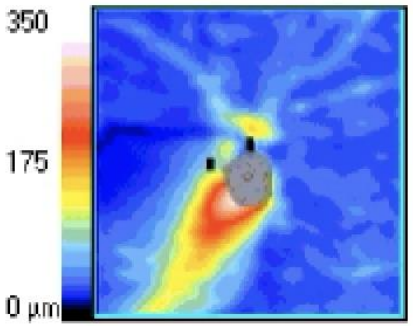
Image Progression Options Deviation Map Window
1 of 1
Display 3D View Thickness Profile Thickness Map Posterior Pole Deviation Map
Default slabs
Retina
RNFL
GCL
IPL
Overlay:
Segmentation
Edit
GCL
Retina
32 / 61
200 µm
Ganglion cell layer thickness [µm]
Ganglion cell layer thickness deviation [%]
Retina thickness [µm]
Retina thickness deviation [%]
> 99
> 95
5 - 95
< 5
< 1
Auto
Macular ganglion cell layer classification
S 17 < 1%
TS 27 < 1%
NS 30 < 1%
G 38 < 1%
TI 55 (63%)
NI 43 < 1%
I 52 (23%)
Outside normal limits
Within normal limits (> 5%)
Borderline (< 5%)
Outside normal limits (< 1%)
Macular retina classification
S 277 < 1%
TS 290 < 1%
NS 300 < 1%
G 313 (2%)
TI 336 (47%)
NI 330 (8%)
I 345 (43%)
Outside normal limits
Reference database: European descent (2014)
IR 30° ART [HS]
OCT 30° (9.2 mm) ART (10) Q: 36 [HS]


1 of 1
Display
BMO Rim Analysis
BMO Overview
RNFL Thickness
Progression
-6.3 °
Fovea
200 µm
Circle Diameter: 3.5 mm
BMO Area: 1.68 mm²
ILM
RNFL
200 µm
1:1 pixel
1:1 µm
Peripapillary RNFLT Classification
CC 7.7 (APS)
NS
59
<1%
TS
102
(7%)
N
51
<1%
G
89
(7%)
T
73
(57%)
NI
142
(86%)
TI
197
>99%
Segmentation unconfirmed
Outside Normal Limits
1
RNFL Thickness [µm]
300
240
180
120
60
0
42
0
45
90
135
180
225
270
315
360
TMP
TS
NS
NAS
NI
TI
TMP
Position [°]
Reference database: European Descent (2014)
IR: 1536 x 1536 [HR] 30° (9.2 mm) ART (9)
OCT: 768 x 496 [HS] ART (101) Q: 36


1 of 1
Display
3D View
Thickness Profile
Thickness Map
Posterior Pole
Deviation Map
Default slabs
Retina
RNFL
GCL
IPL
Overlay:
Segmentation
Edit
GCL
Retina
31 / 61
200 µm
Ganglion cell layer thickness [µm]
60
50
40
30
20
10
0
Ganglion cell layer thickness deviation [%]
> 99
> 95
5 - 95
< 5
< 1
Retina thickness [µm]
410
360
310
260
210
160
110
60
Retina thickness deviation [%]
Auto
RNFL
GCL
Macular ganglion cell layer classification
S 51 (14%)
TS 42 (3%)
NS 54 (35%)
G 51 (22%)
TI 55 (60%)
NI 53 (21%)
I 54 (34%)
Borderline
Within normal limits (> 5%)
Borderline (< 5%)
Outside normal limits (< 1%)
Macular retina classification
S 335 (14%)
TS 313 (9%)
NS 342 (20%)
G 333 (19%)
TI 331 (33%)
NI 343 (25%)
I 336 (20%)
Within normal limits
Reference database: European descent (2014)
IR 30° ART [HS]
OCT 30° (9.2 mm) ART (11) Q: 30 [HS]

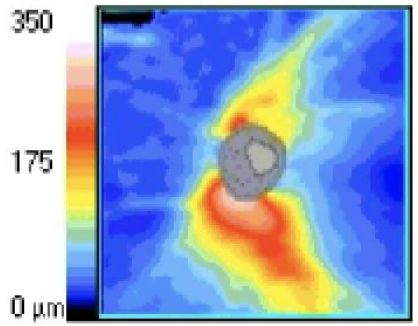
ONH and RNFL OU Analysis:Optic Disc Cube 200x200 OD ● | ● OS

RNFL Thickness Map

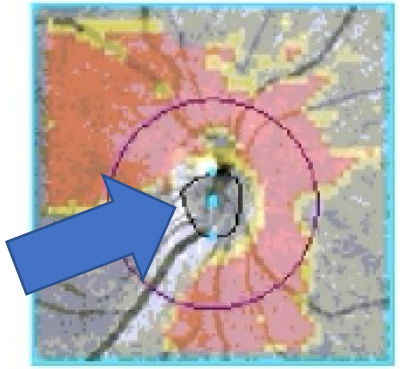


	OD	OS
Average RNFL Thickness	52 µm	83 µm
RNFL Symmetry	43%	
Rim Area	0.83 mm²	1.31 mm²
Disc Area	0.83 mm²	1.55 mm²
Average C/D Ratio	0.10	0.39
Vertical C/D Ratio	0.08	0.40
Cup Volume	0.000 mm³	0.050 mm³

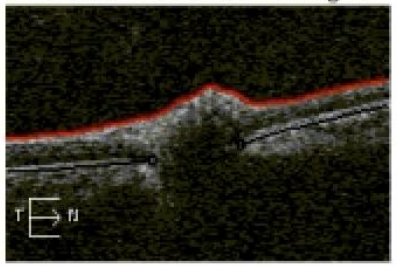
RNFL Thickness Map



RNFL Deviation Map

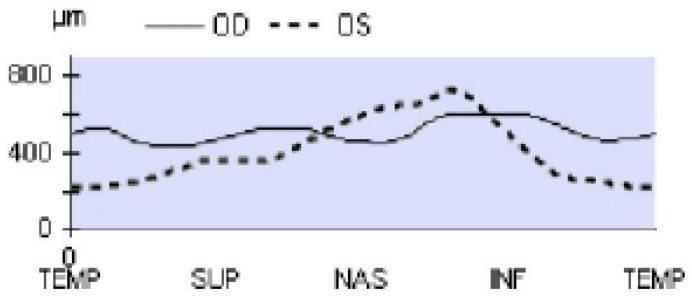


Disc Center(-0.03,-0.30)mm
Extracted Horizontal Tomogram

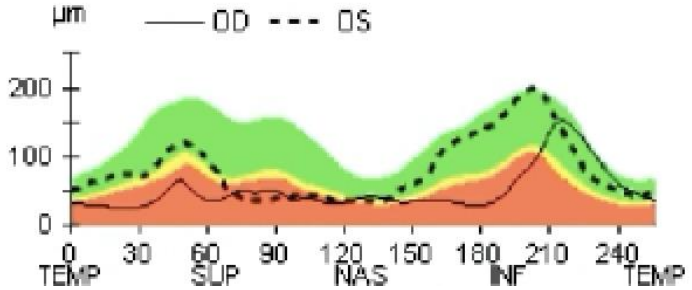


Extracted Vertical Tomogram

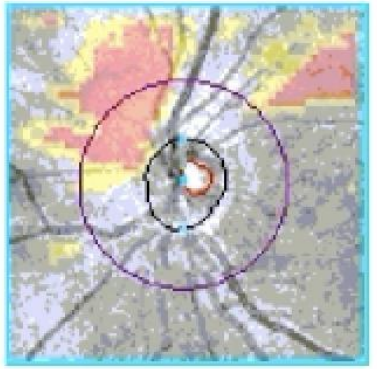
Neuro-retinal Rim Thickness



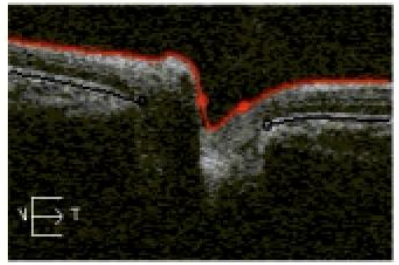
RNFL Thickness



RNFL Deviation Map



Disc Center(-0.09,0.03)mm
Extracted Horizontal Tomogram



Extracted Vertical Tomogram

Clinical Pearls: Superior Segmental Optic Nerve Hypoplasia (SSON)

Distinguished from glaucoma by typical pattern:

- Thinning of the superior retinal nerve fiber layer (RNFL).
- Superior entrance of the central retinal artery.
- Pallor of the superior optic disc.
- Superior peripapillary scleral halo.

Associations:

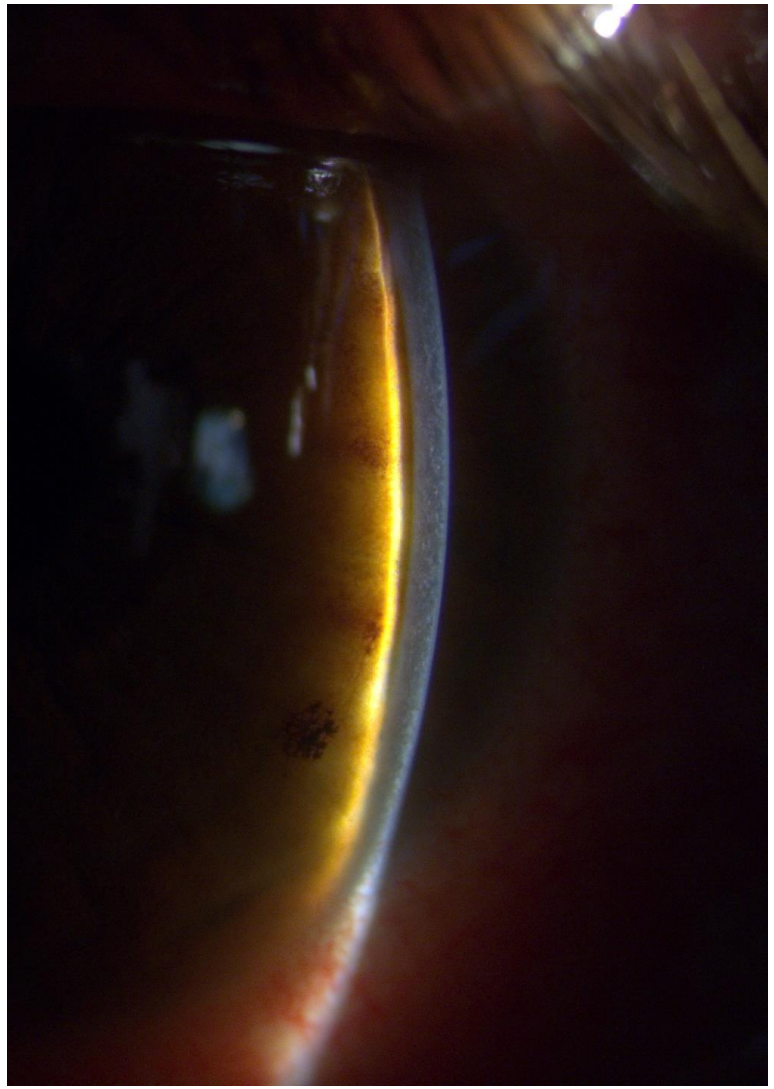
- Strong link to maternal diabetes.
- Other risk factors: Female sex, short gestation, low birth weight.

Case 6. Mrs EC – 52yo female

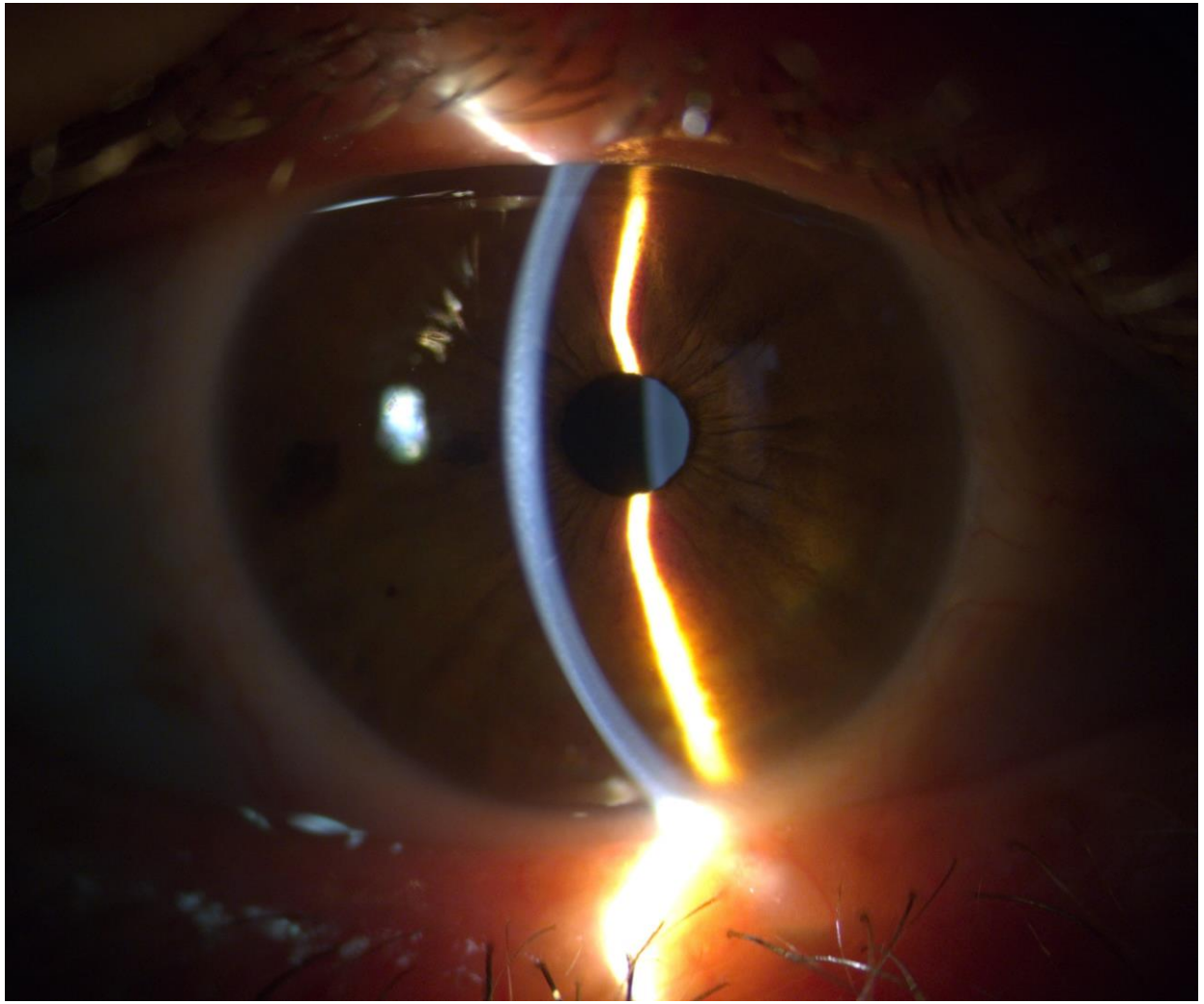
ED presentation with acute angle closure

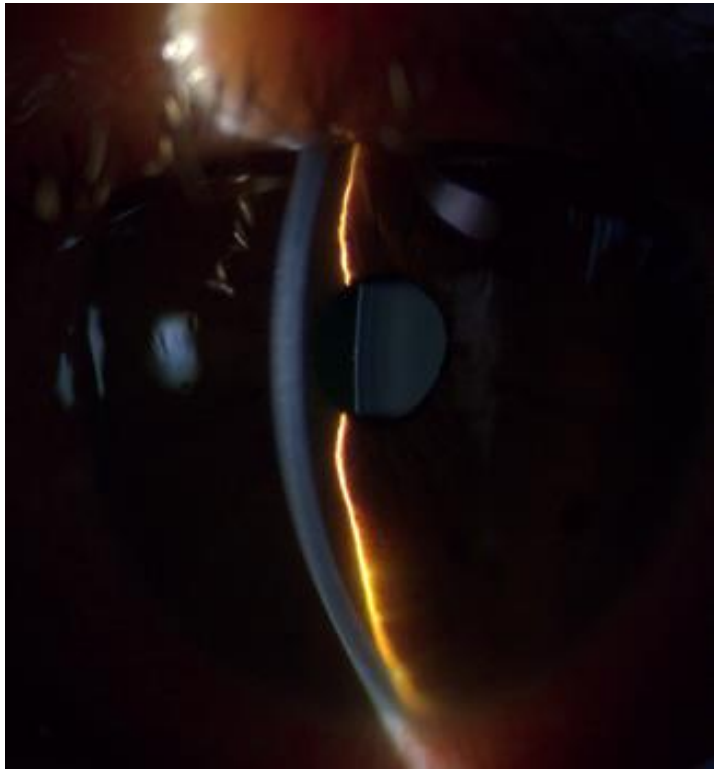
- Methamphetamine user – fell asleep ‘on eye’ ? Woke up with acute vision loss
- VA R) 6/6 L) 6/12
- IOP 10/**37**
- Left shallow angles noted – commenced on timolol, brinzolamide and pilocarpine QID. YAG PI Performed.

OS

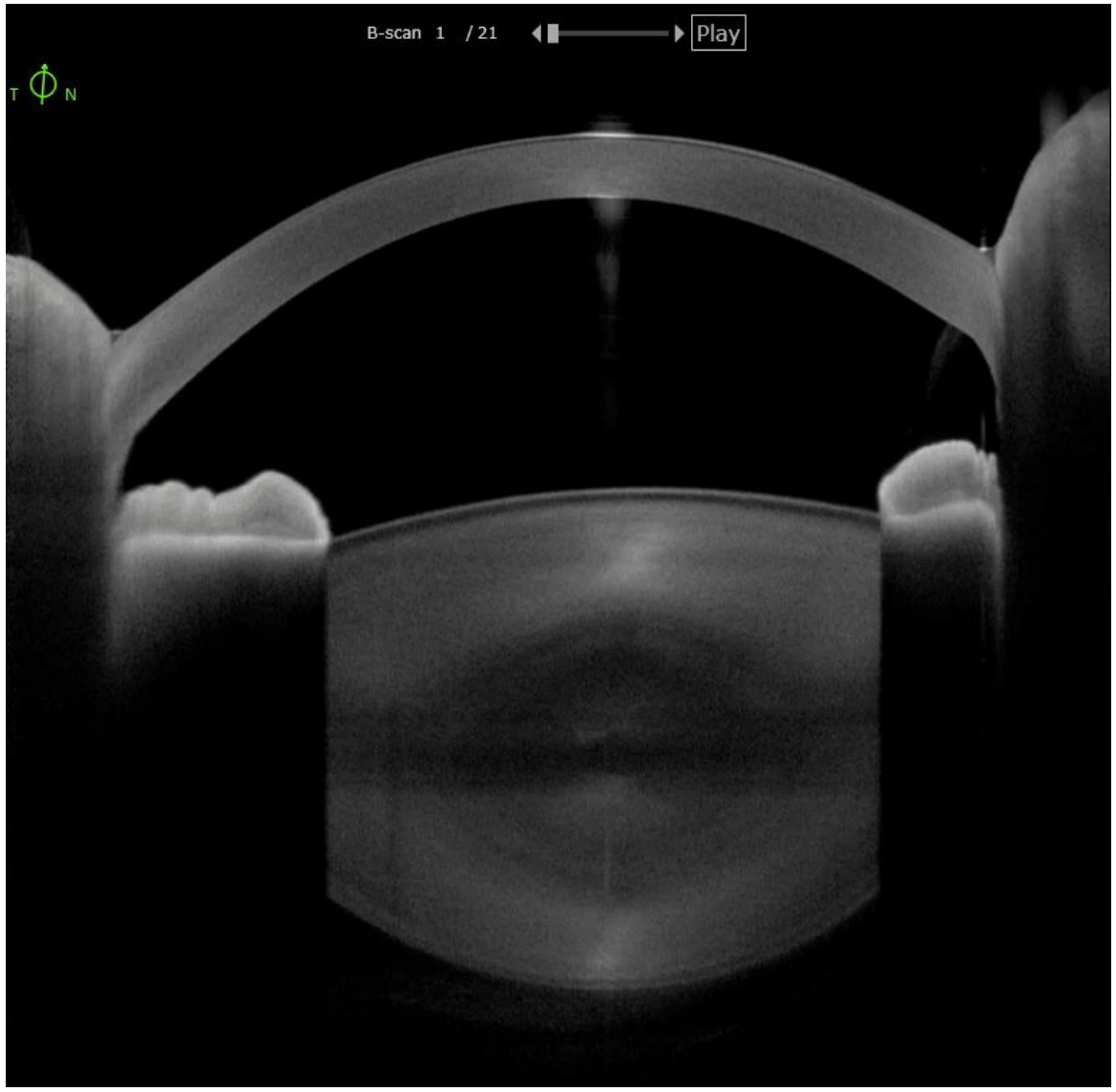


OD

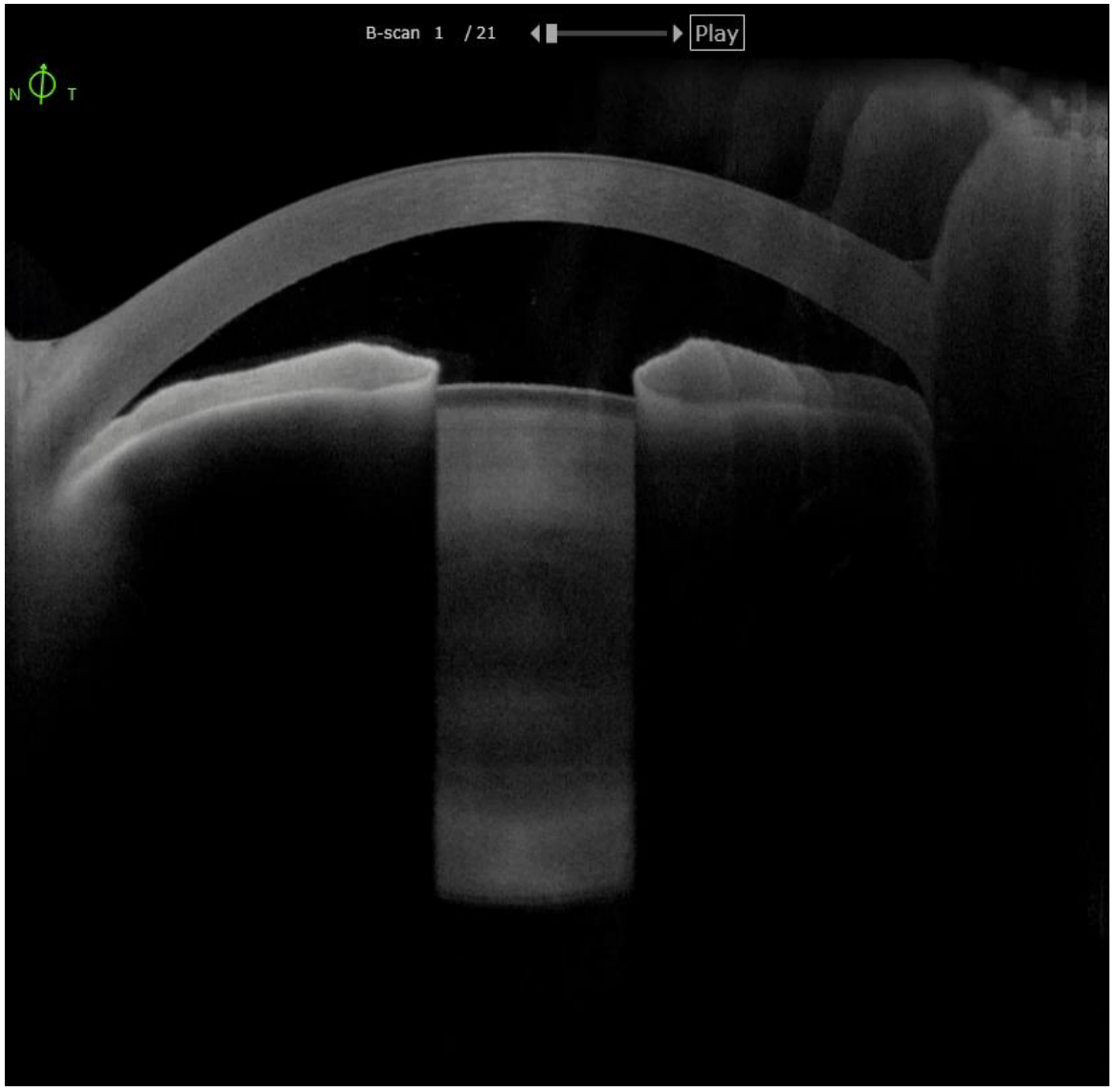


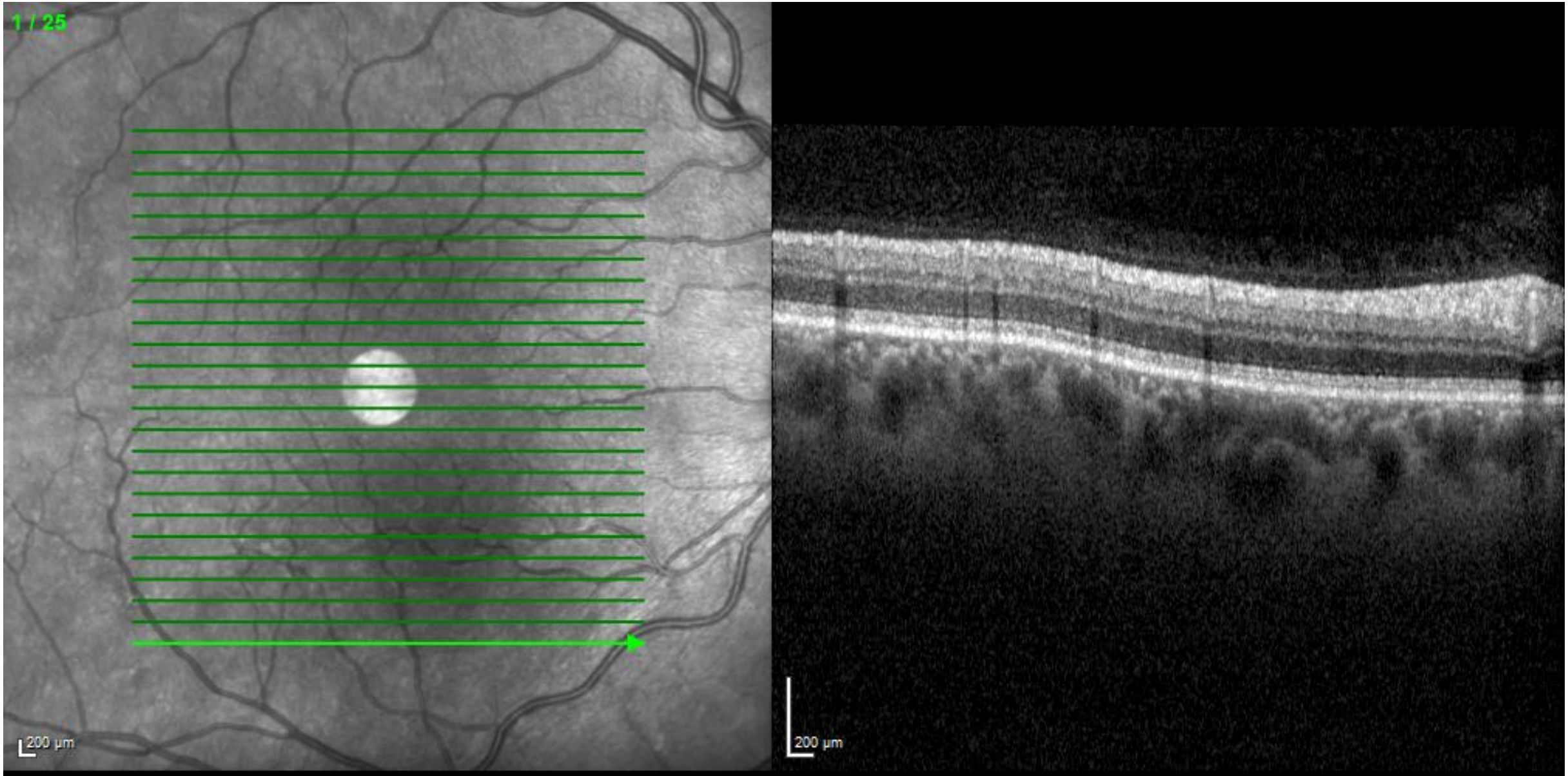


OD



OS

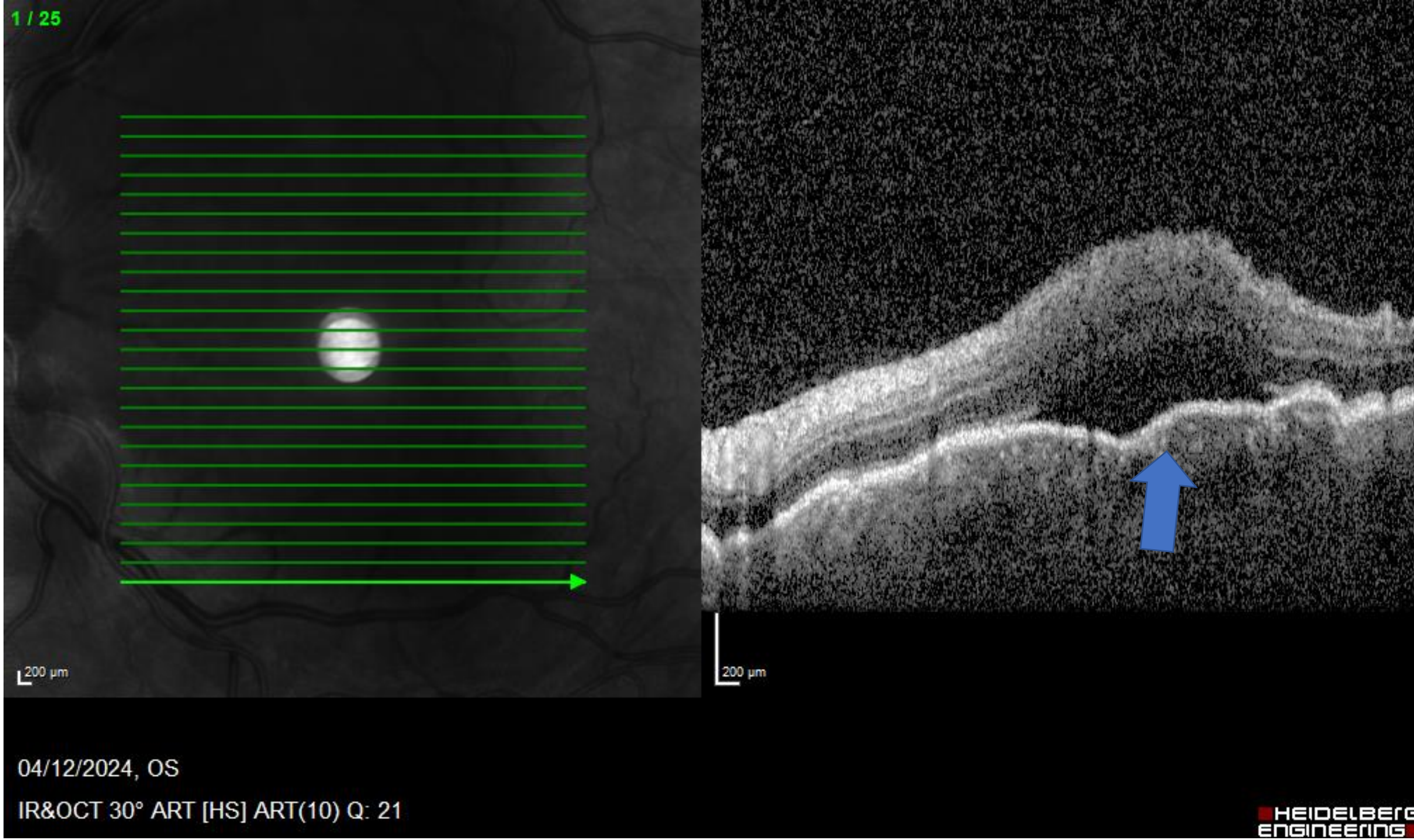


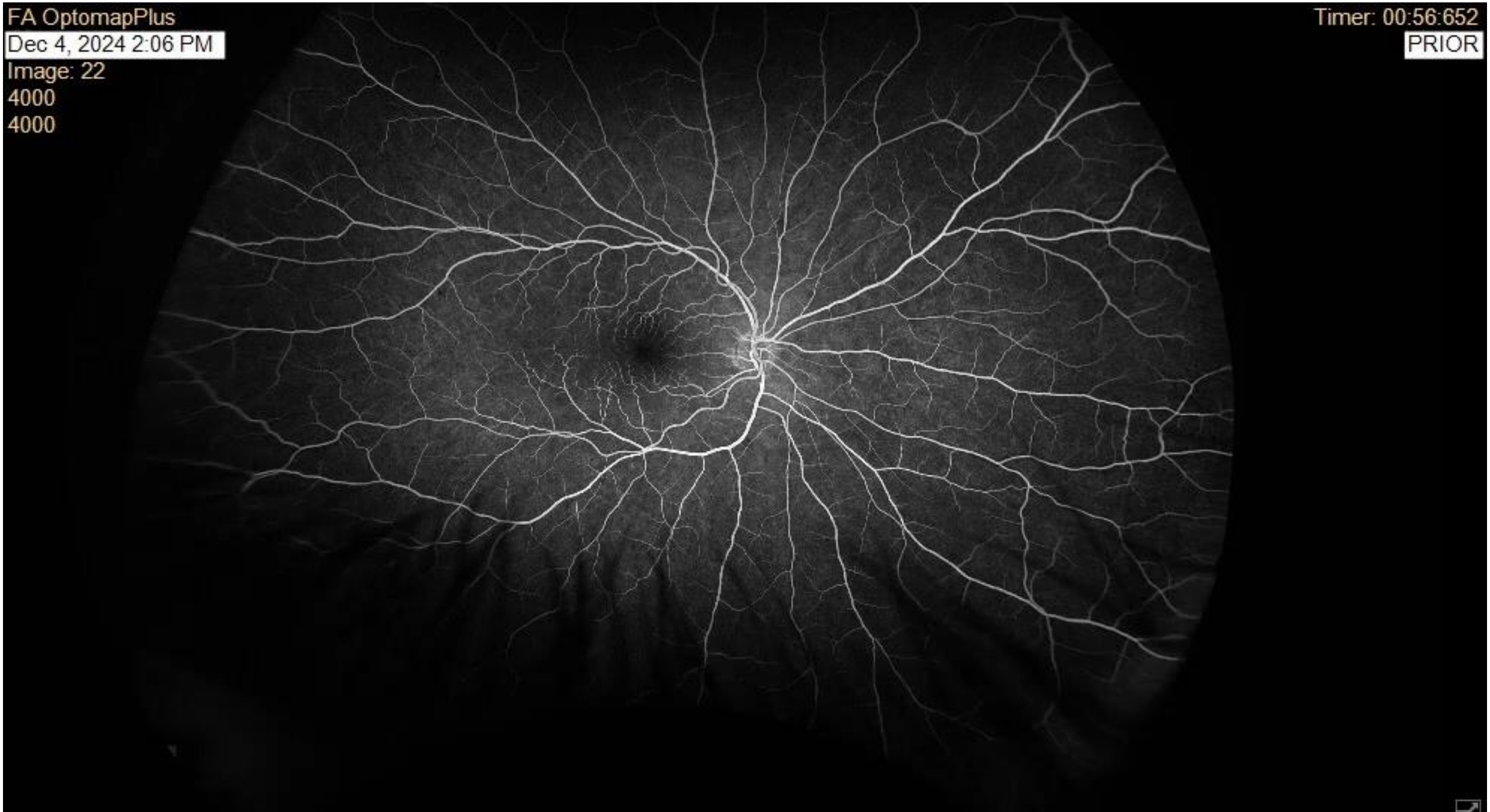


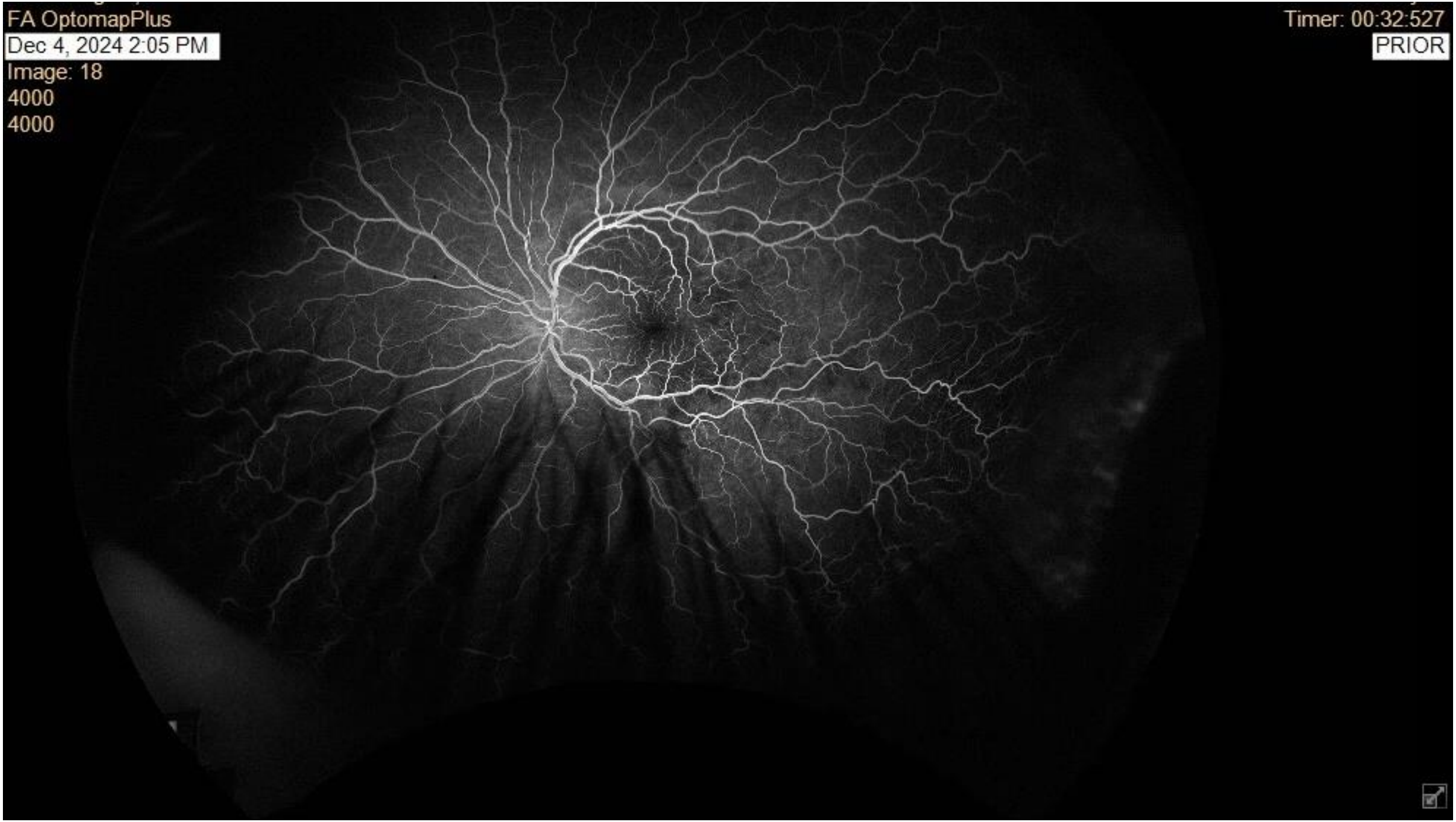
04/12/2024, OD

IR&OCT 30° ART [HS] ART(10) Q: 32

HEIDELBERG ENGINEERING


1 / 25
200 µm
200 µm
04/12/2024, OS
IR&OCT 30° ART [HS] ART(10) Q: 21
HEIDELBERG ENGINEERING


FA OptomapPlus
Dec 4, 2024 2:06 PM
Image: 22
4000
4000
Timer: 00:56:652
PRIOR


FA OptomapPlus
Dec 4, 2024 2:05 PM
Image: 18
4000
4000
Timer: 00:32:527
PRIOR

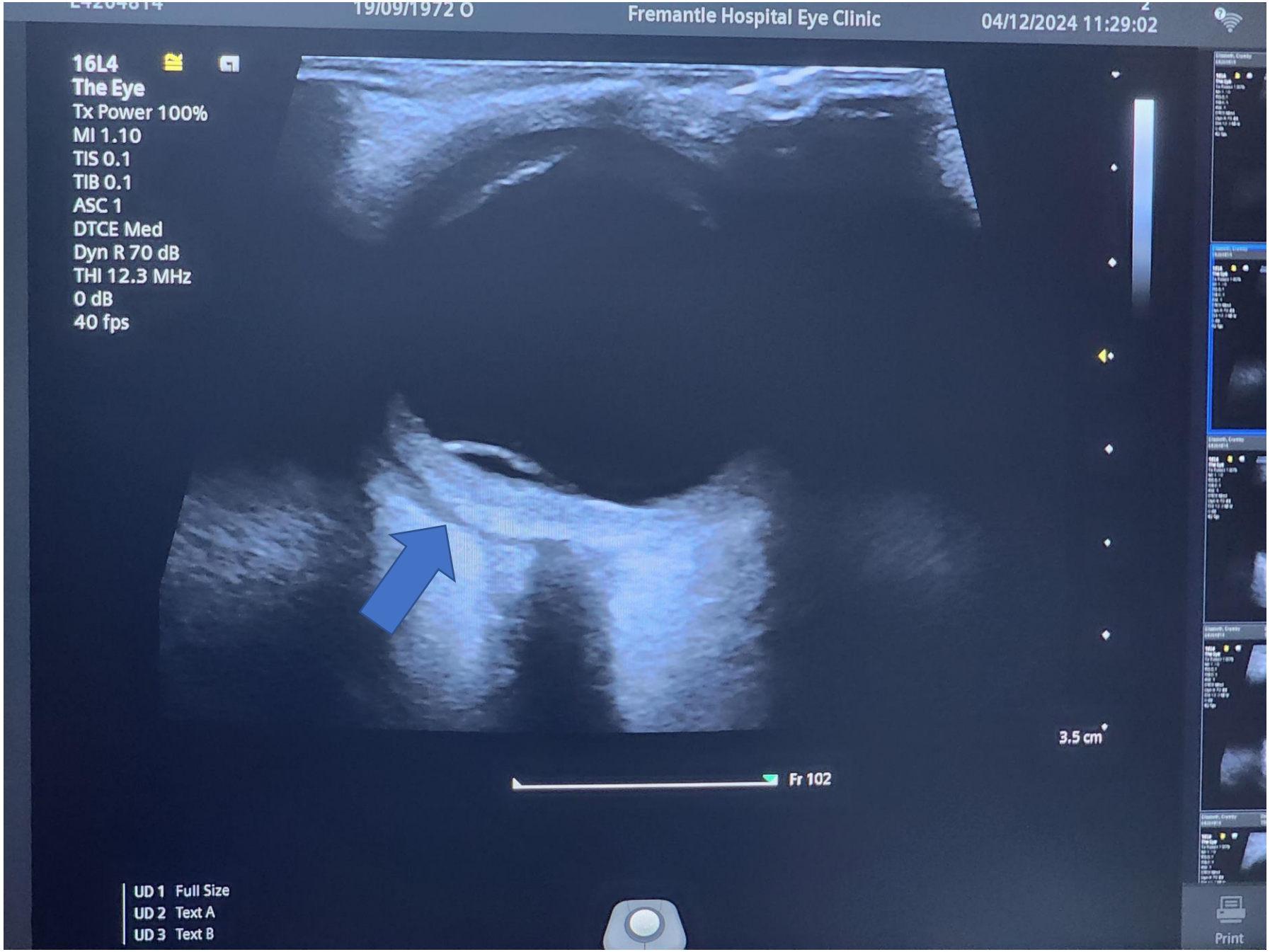

4000
4000

Diagnosis?

Methamphetamine Scleritis and Secondary Angle Closure

The vasoconstrictive effect of methamphetamine interferes with ocular perfusion, causing vasculitis, which may manifest as:

- Conjunctivitis
- Episcleritis
- **Scleritis** (Isaak and Liesegang, 1983; Hazin et al., 2009).

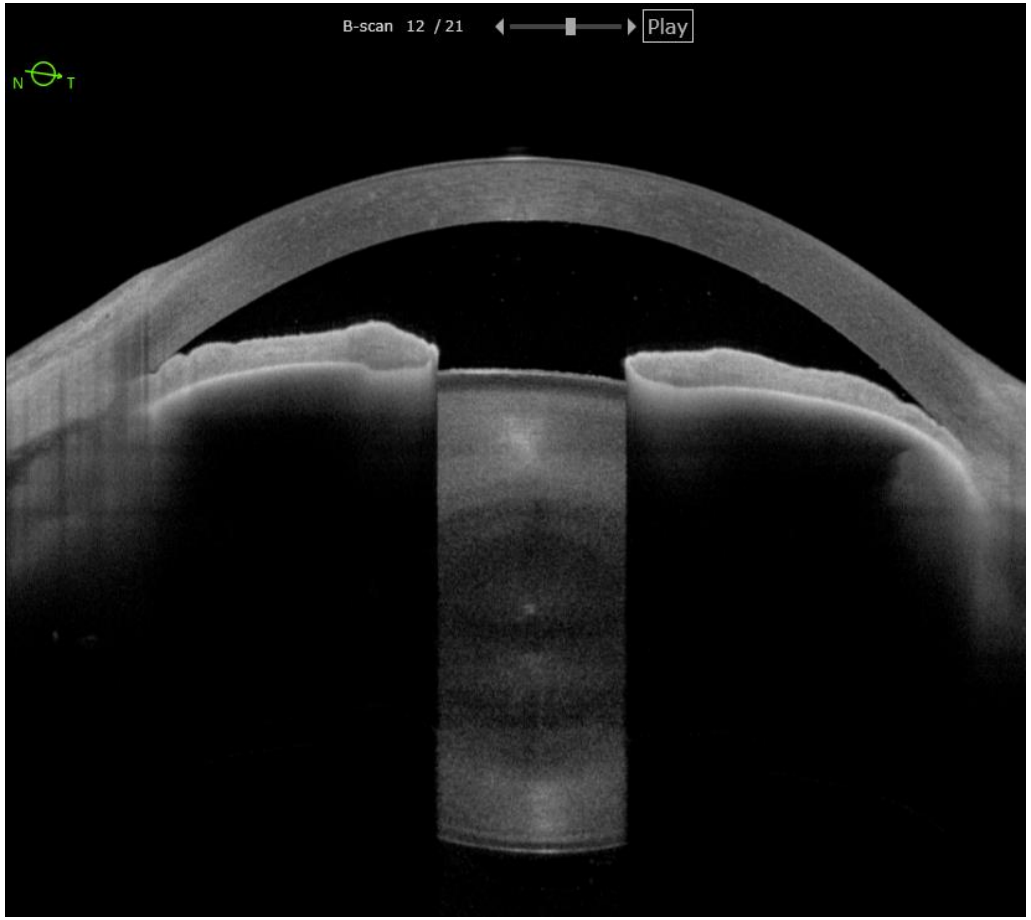

19/09/1972 O
Fremantle Hospital Eye Clinic
04/12/2024 11:29:02
16L4
The Eye
Tx Power 100%
MI 1.10
TIS 0.1
TIB 0.1
ASC 1
DTCE Med
Dyn R 70 dB
THI 12.3 MHz
0 dB
40 fps
3.5 cm
Fr 102
UD 1 Full Size
UD 2 Text A
UD 3 Text B
Print

Management

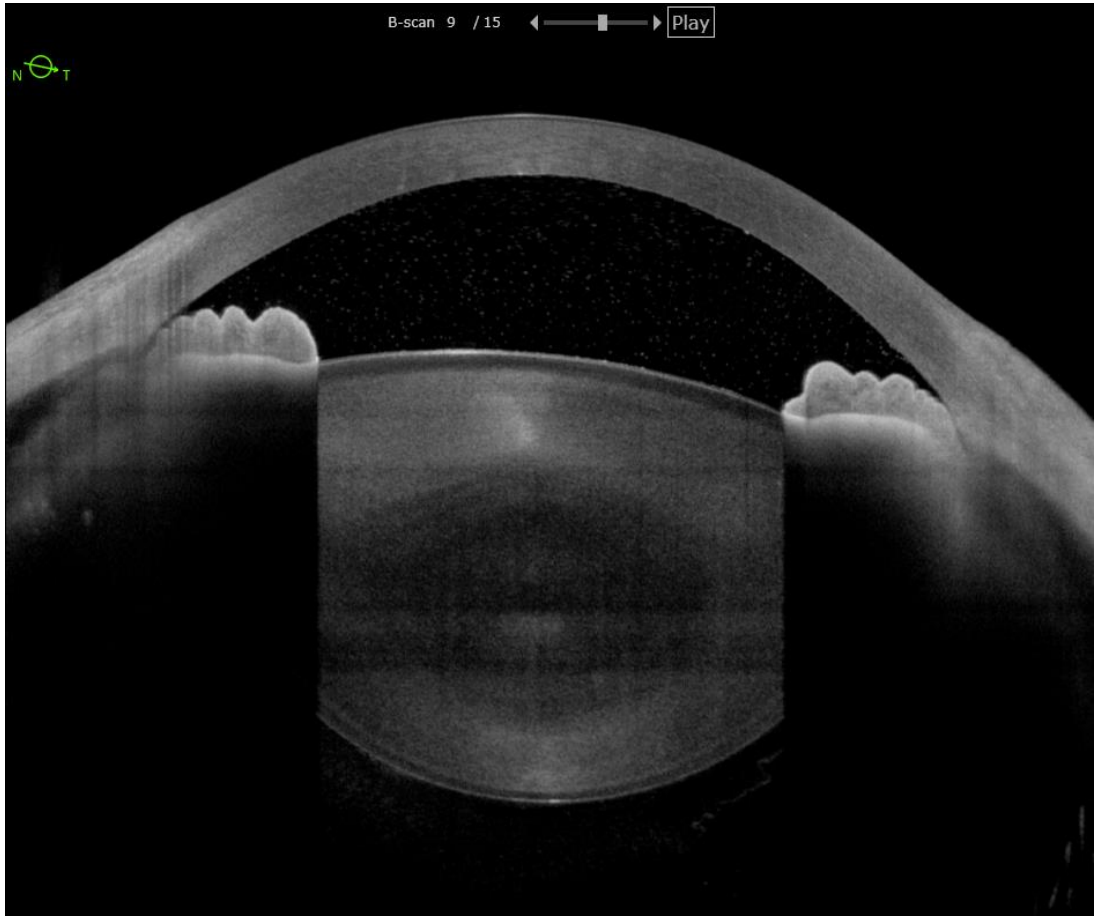
- Continued:
  - Timolol BD
  - Brinzolamide BD
  - Diamox 250mg QID (reduced to TDS D2)
- Stopped:
  - Pilocarpine QID
  - MXD QID
- Admission:
  - IVMP 1g 3/7
  - Atropine BD
  - PF q1h day

- Uveitis screening bloods
  - FBC, UEC, LFT
  - ACE, HLA-B27
  - HIV, Hep B & C
  - TB, Syphilis
  - ANA, ENA, ANCA, RF, anti-CCP, anti-dsDNA
- HRCT

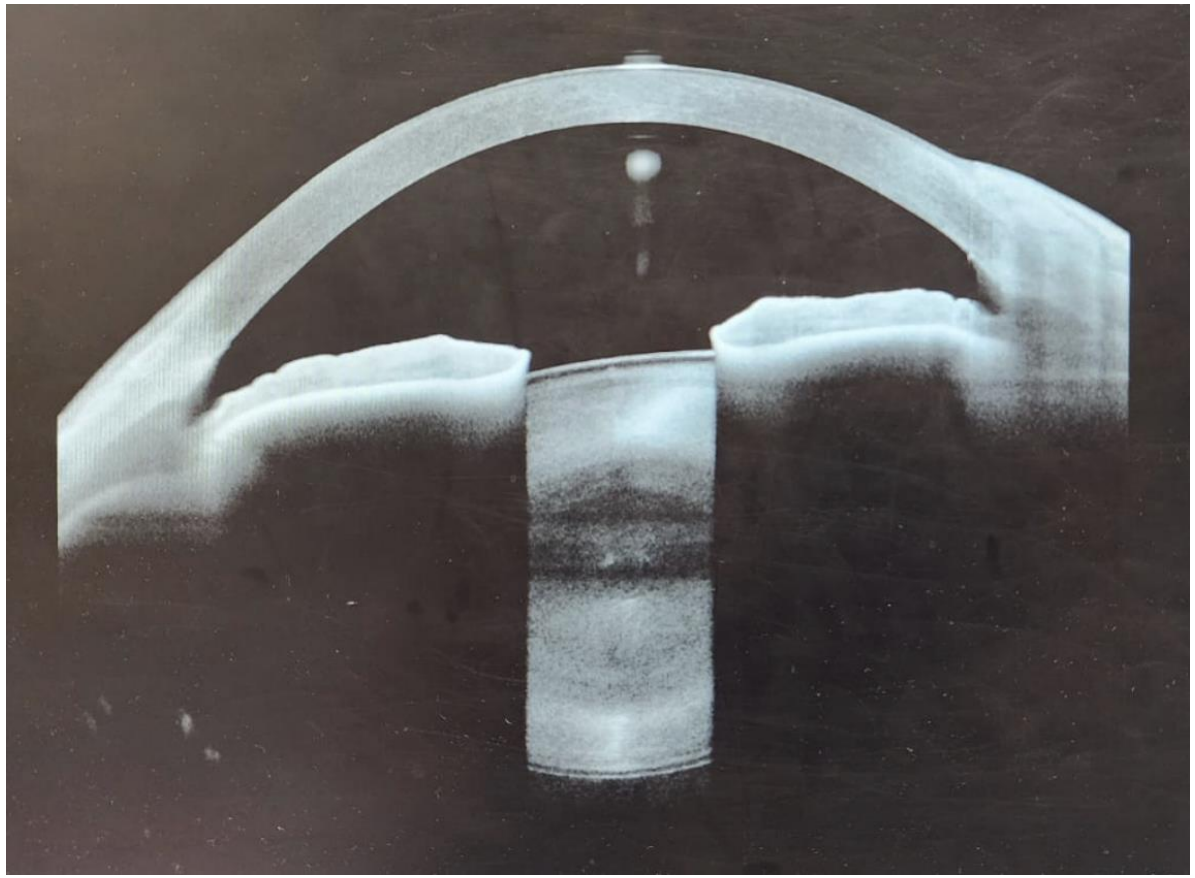
Day 1

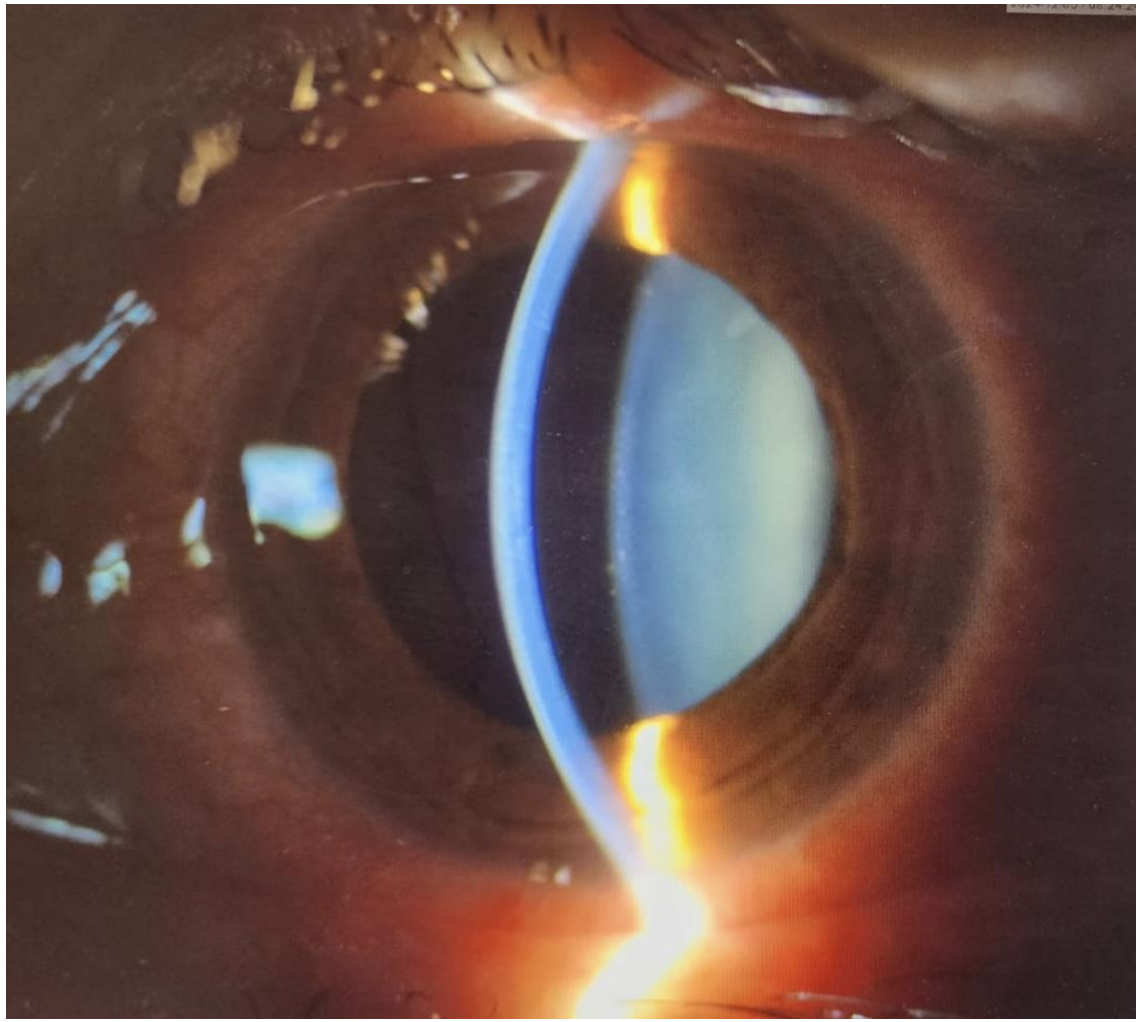


Day 2



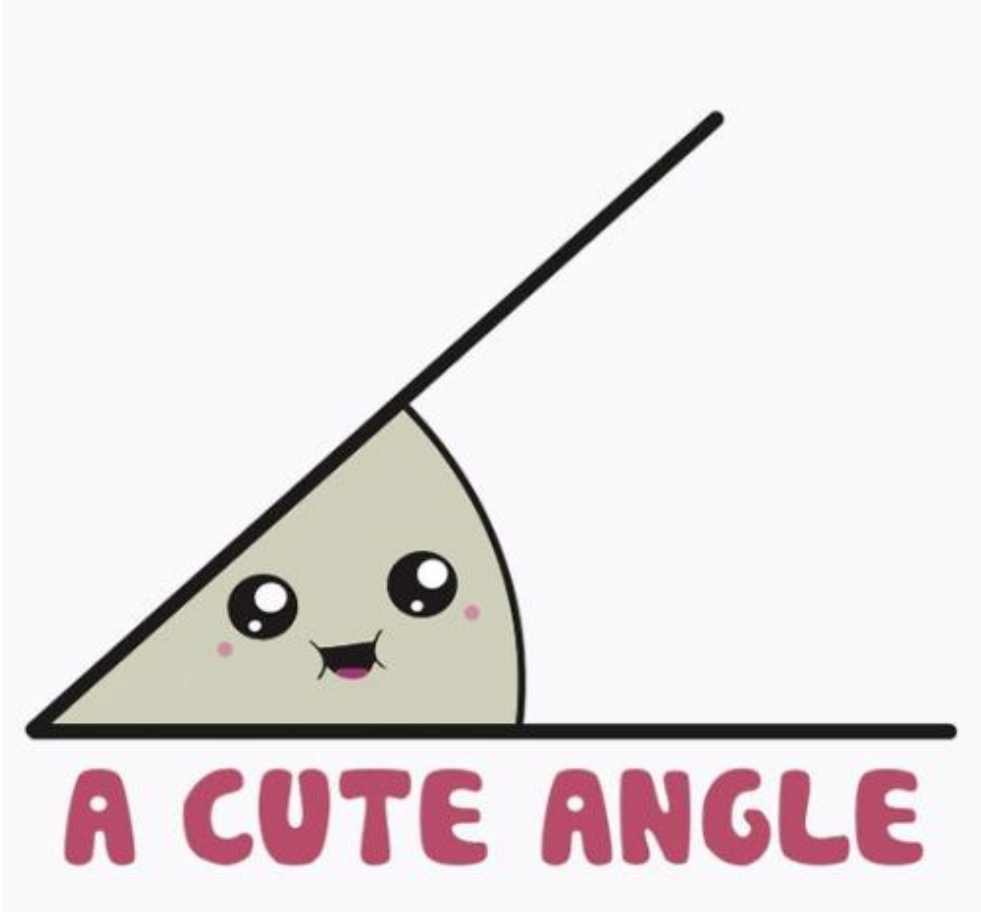
Day 3





Clinical Pearls: Angle Closure Masquerades

- Always check other eye!
- Anatomical predisposition
- Rule out recent or newly initiated medications (especially sulfa-derived)
- Angle closure may stem from ciliary body swelling or effusion
  - look at the posterior segment



Summary of Glaucoma Masquerades

A Systematic Approach is key:

- **Diagnosis of Exclusion:** Rule out other causes first!
- **Masquerades Present Earlier:** Congenital anomalies often present at a younger age
- **Central Vision:** Early *severe* central vision loss is less likely to be glaucoma.
- **RNFL vs. Rim Discrepancy:** Investigate any mismatches
- **Neuroimaging Helpful:** Identify masquerades
- **Genetic Risk Stratification:** May help risk stratify glaucoma suspects

Questions?

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