SESSION 8 : 10.AM - 11.15 AM - STRABISMUS (8 MIN EACH)

CHAIRPERSONS : DR. B. S. GOYAL; DR. ANKUR SINHA; DR. KALPIT SHAH

KEY-NOTE ADDRESS : "OCT IMAGING". DR. MASOUD AGHASEI FARD (IRAN) : (10 MIN)

INTRODUCTION : DR. B. S. GOYAL

1	Different Conjunctival Incisions In Strabismus Surgery	Dr. Amitava
2	IDS- Case Based Management	Dr. Reena Gupta
3	Superior Oblique Palsy	Dr. P. K. Pandey
4	Surgical Treatment Of 6th Nerve Palsy	Dr. Masoud Aghasii (Iran)
5	Prism Adaptation Test In Acquired Non-accom. Esotropia	Dr. Mohammad Reza Akbari (Iran)
6	Management Of Consecutive Strabismus	Dr. A. K. Khurana
7	Blepharophimosis Syndrome-Manegement	Dr. Shreya Shah

DISCUSSION - 10 MIN

TEA BREAK 11.00 am 11.15 am

SESSION 9 : INTERESTING CASES & VIDEO PRESENTATION (COMPETETIVE) 8.0 MIN EACH. - 11.30 AM - 12.30 PM.

CHAIRPERSONS : DR. A. K. KHURANA; DR. A. K. AMITAVA; DR. SUMA GANESH

KEY-NOTE ADDRESS : DR. MASOUD AGHASEI FARD (IRAN) : (10.MIN)

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OCT IN NEUROOPHTHALMOLOGY

Macular optical coherence tomography angiography in ischemic optic neuropathy compared to glaucoma

Authors: Masoud Aghsaei Fard[1]

[1] Farabi Eye Hospital, Tehran University of Medical science, Iran

Section: Neuro-Ophthalmology

PURPOSE: Both primary open-angle glaucoma (POAG) and non-arteritic anterior ischemic optic neuropathy (NAION) cause damage to the retinal ganglion cell axons which are perfused by macular vessels. This study compares macular and parafoveal vasculature in patients with primary open angle glaucoma and atrophic NAION.

METHODS: Nineteen eyes with atrophic NAION, 28 eyes with moderate and advanced POAG, and 34 eyes of normal subjects were imaged using optical coherence tomography angiography (OCT-A). Macular ganglion cell complex (GCC) and peripapillary retinal nerve fiber layer (RNFL) thicknesses were measured in addition to macula choriocapillaries, macular and parafoveal superficial and deep vasculature after projection removal using custom software.

RESULTS: Linear models showed that while averaged peripaillary RNFL were not different between NAION and POAG eyes, macular GCC were significantly was thinner in NAION eye than glaucoma eye. Whole image macular superficial vessel density were significantly lower in NAION and glaucoma eye (P=0.003 and <0.001, respectively) than normal eyes, with lower vessel density of glaucoma than NAION eyes (P=0.01). In contrast, parafoveal superficial vasculature density values was significantly lower only in glaucoma eyes relative to control eyes (P=0.02) without any significant difference between NAION eyes and control eyes (*P* =0.16). Whole image and parafoveal deep macular vessels using Matlab software for projection removal in glaucoma eyes (17.7% ± 6.0%, 31.7% ± 10.3%) were significantly lower than in control eyes (27.2% ± 8.4%, 31.73% ± 10.3%) (*P* = 0.001 and *P* = 0.008, respectively). No significant differences in deep macular and parafoveal vessels were observed between NAION and control eyes. All macular choriocapillary vessel density values were not statistically different among NAION, glaucoma eyes and control eyes.

CONCLUSIONS: In NAION and POAG with similar RNFL and optic nerve damage, macular OCT-A shows sparing of parafoveal superficial and deep vascular plexus in NAION in contrast to POAG, which might provide comparative insight into the pathophysiology of these two diseases.

Supported by

OCT in neuro ophthalmology

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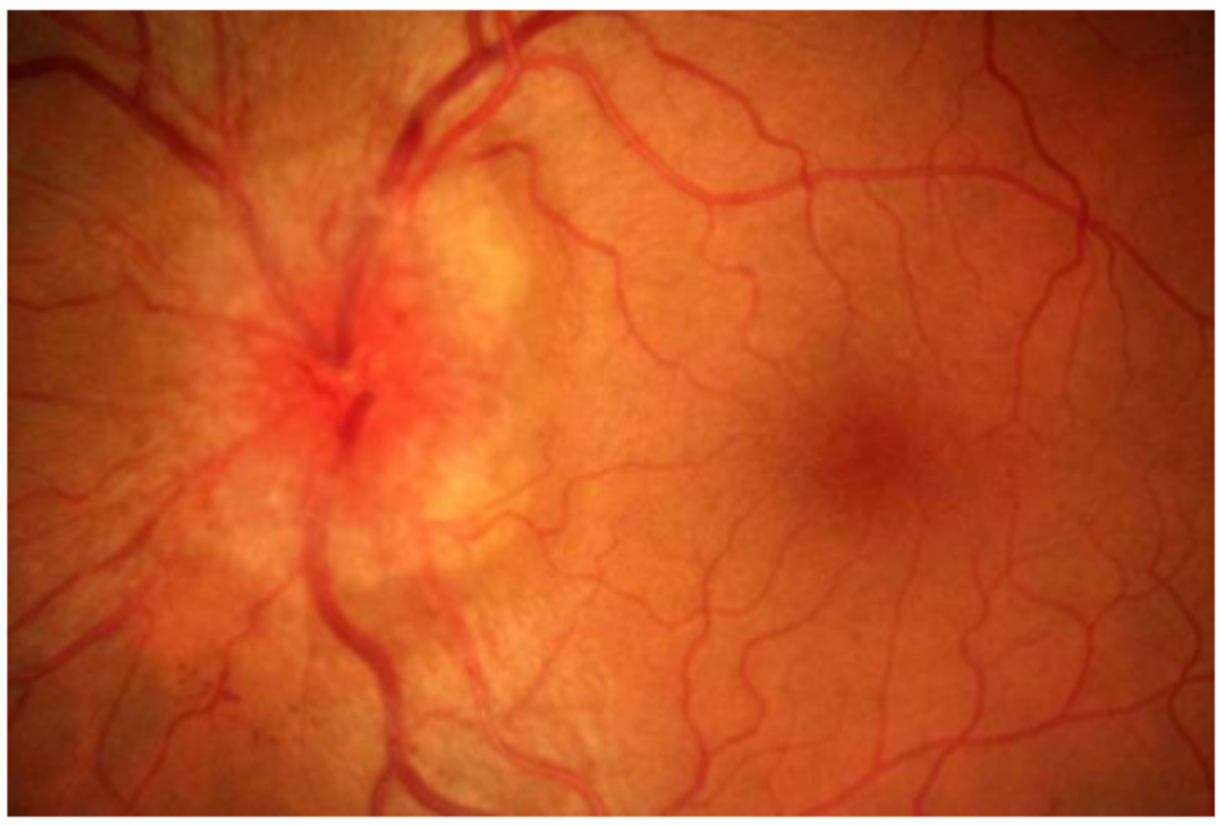
Associate professor of ophthalmology
Farabi Eye Hospital
Tehran University of Medical Science

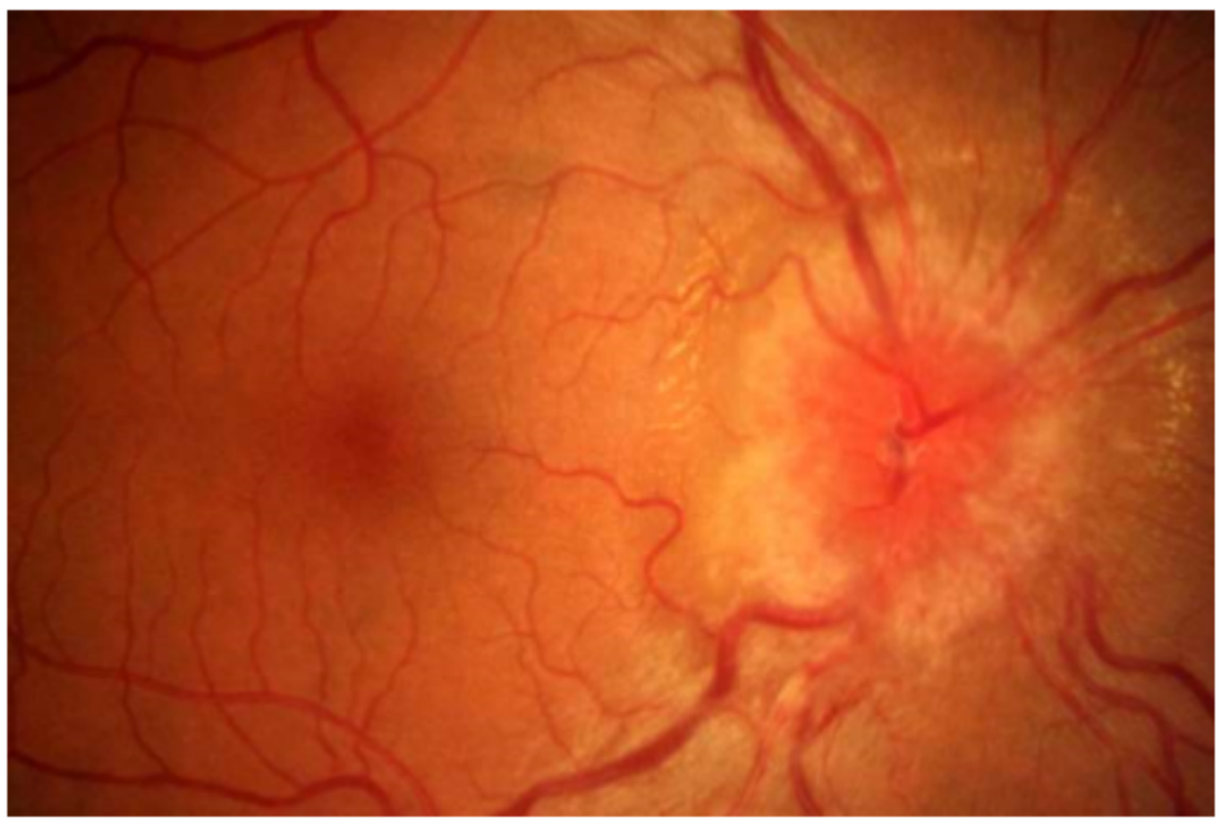
- I have no financial interest to disclose.

Outlines:

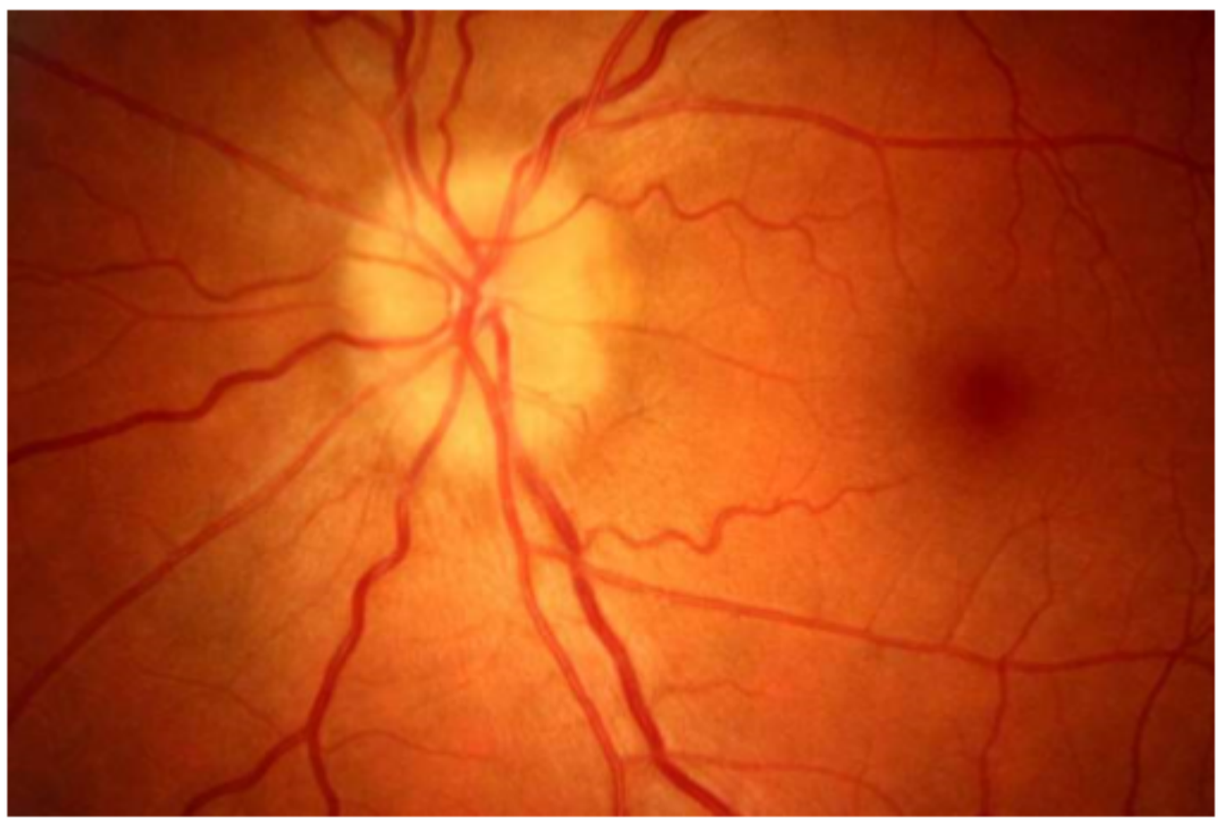
1. Pseudopapilledema vs true papilledema
2. Macular imaging in optic neuropathy
3. Ganglion cell imaging in optic neuropathy
4. Optic nerve head imaging in optic neuropathy
5. Peripapillary choroid imaging
6. OCT angiography

Acoustic schwanoma:

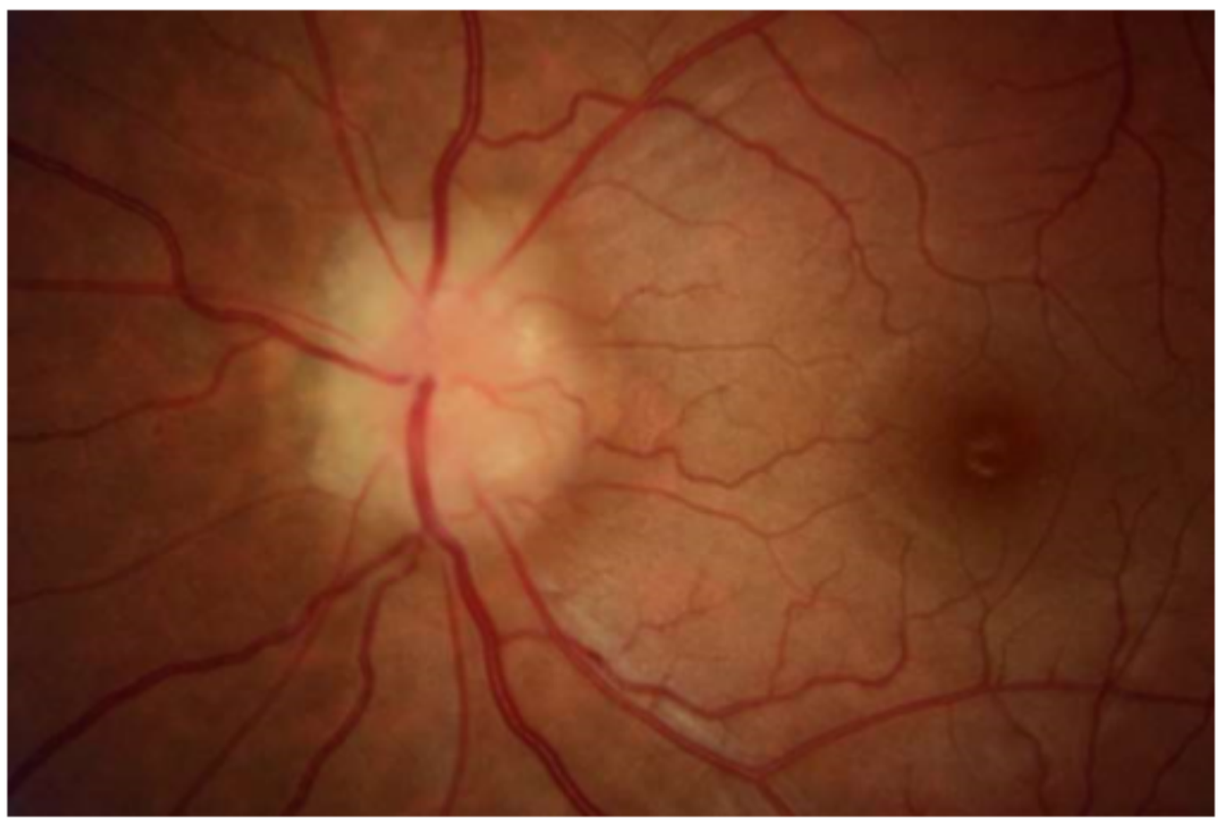


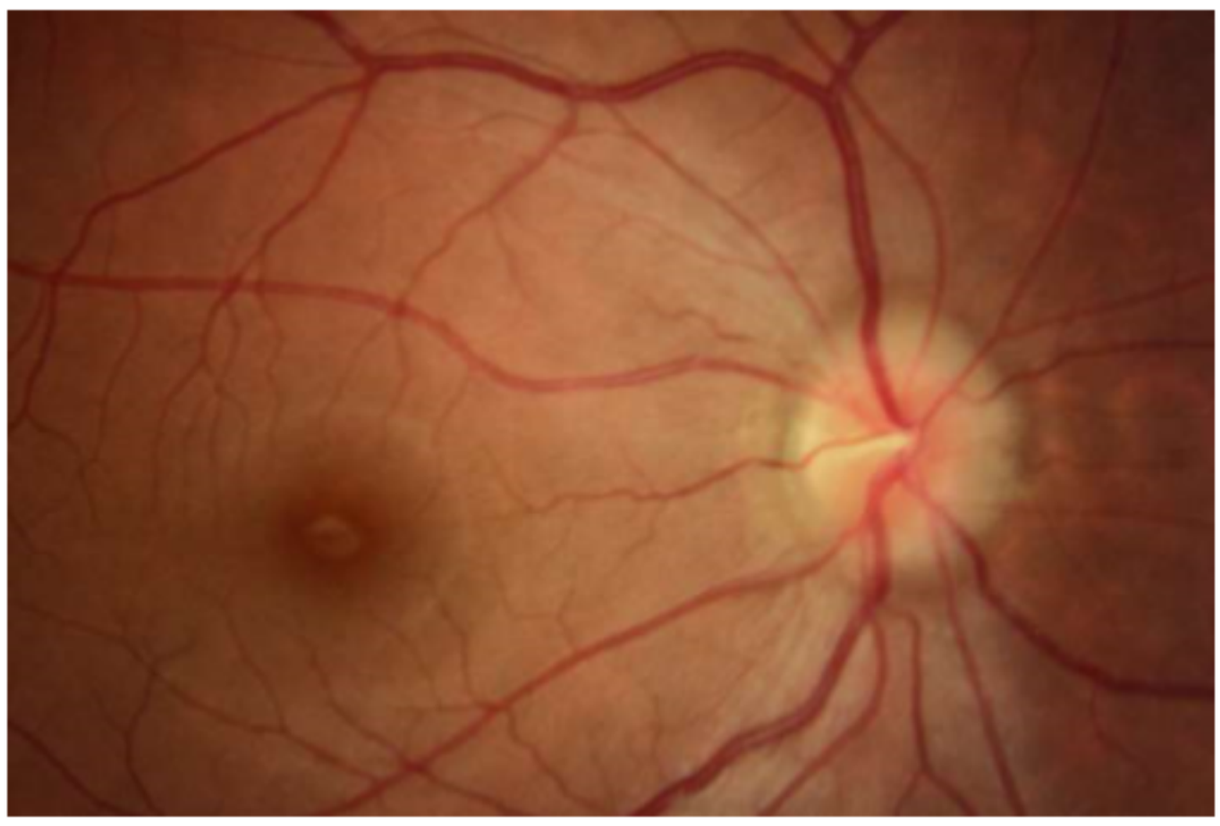


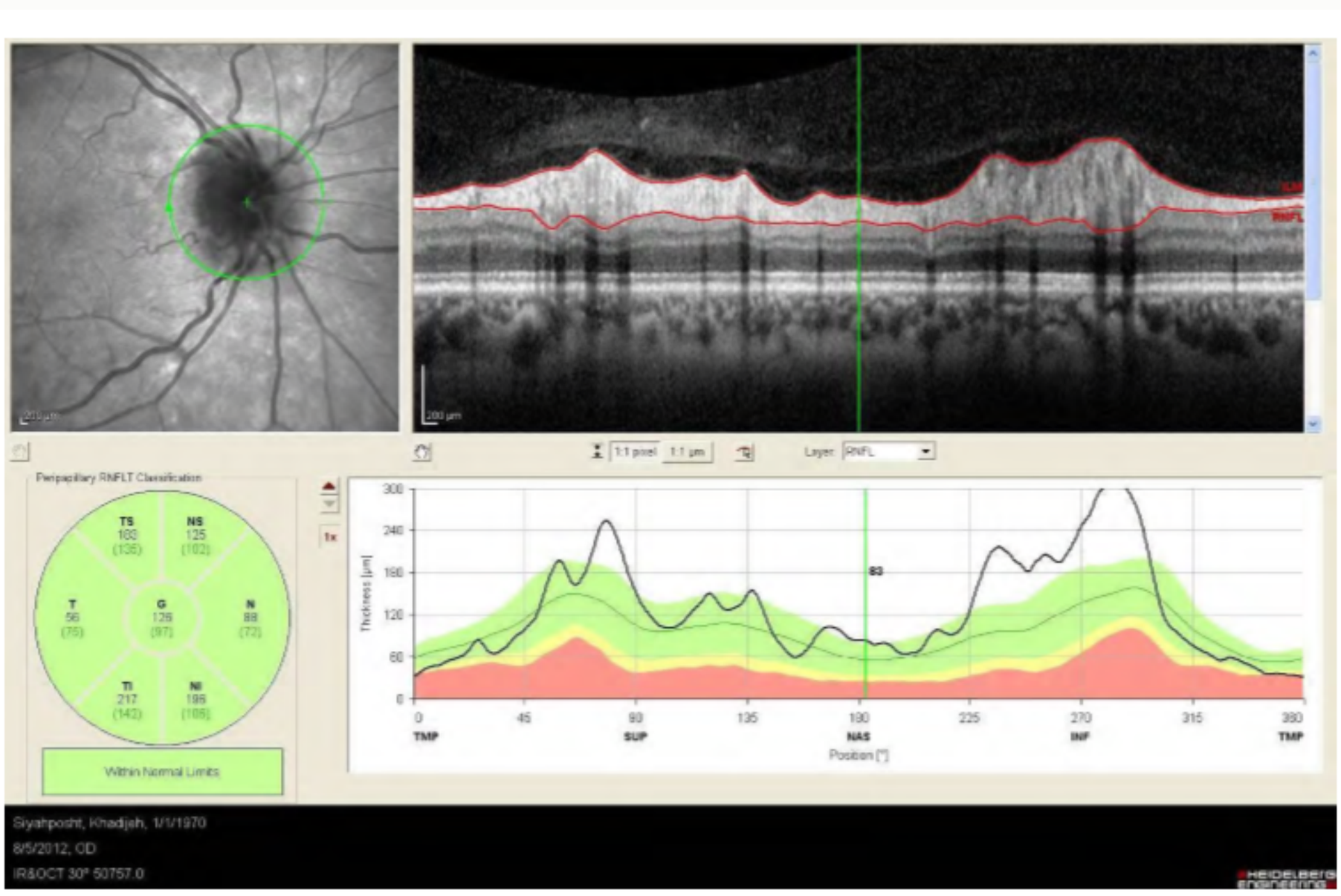
Pseudoedema

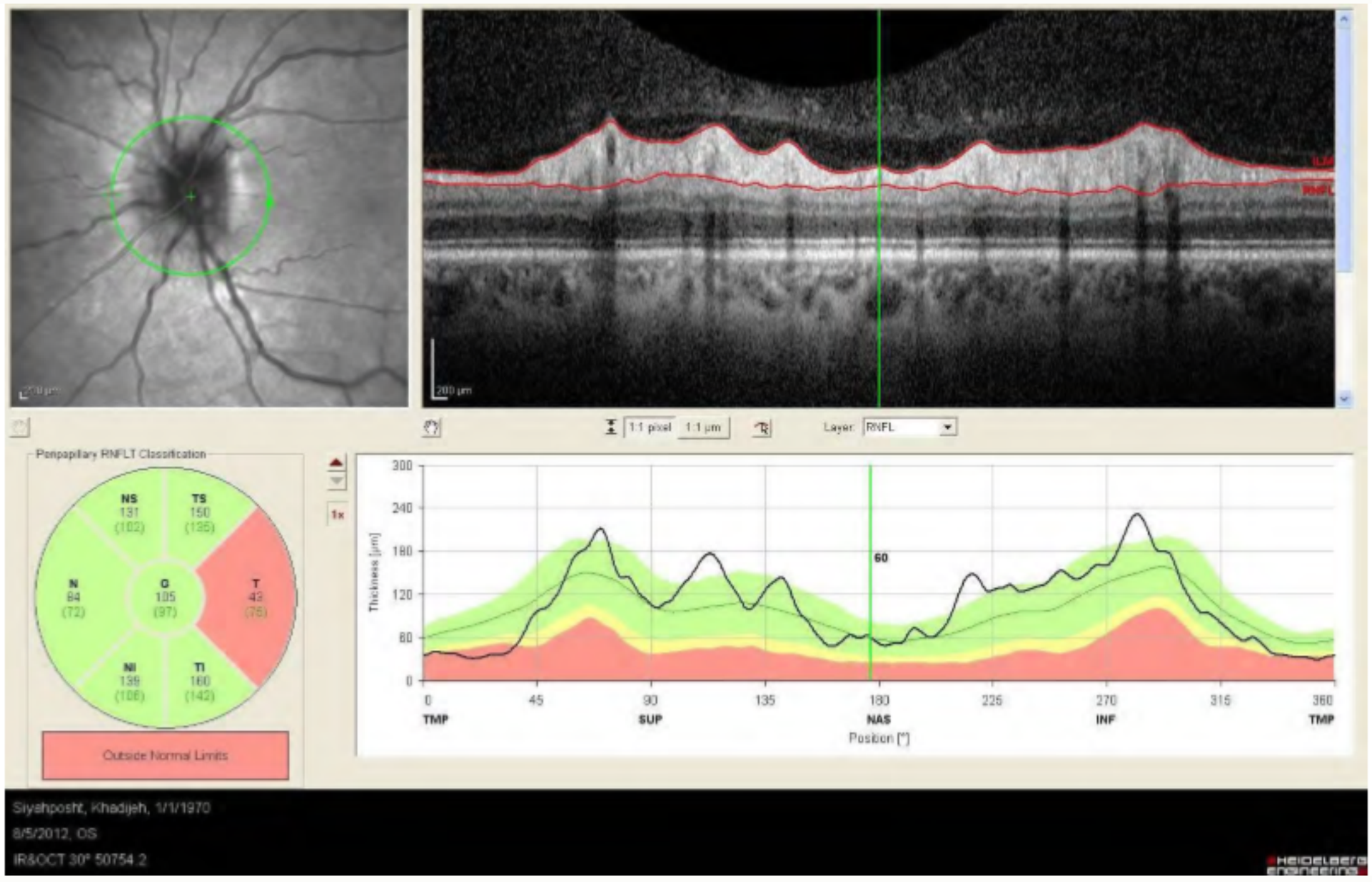


Pseudo papilledema



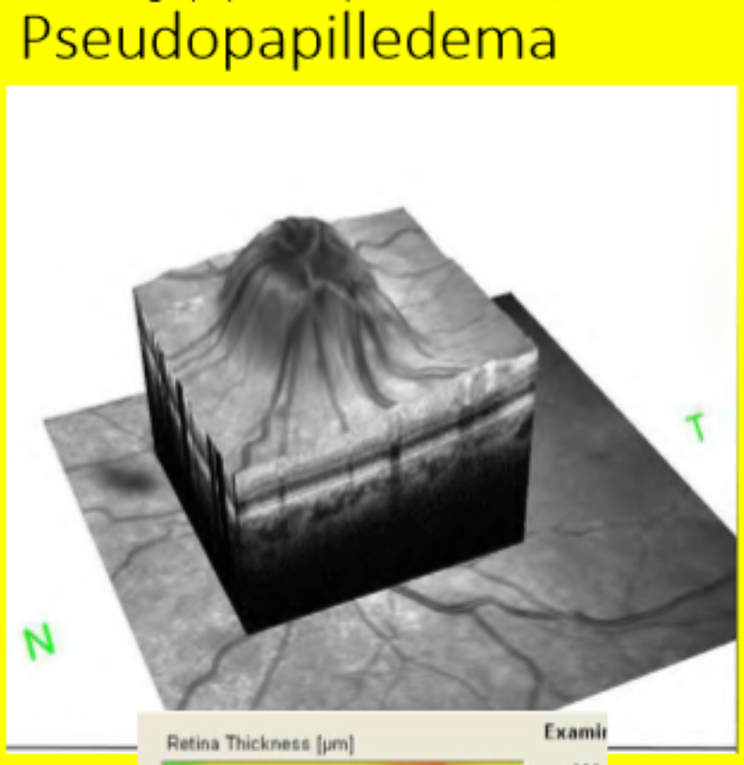


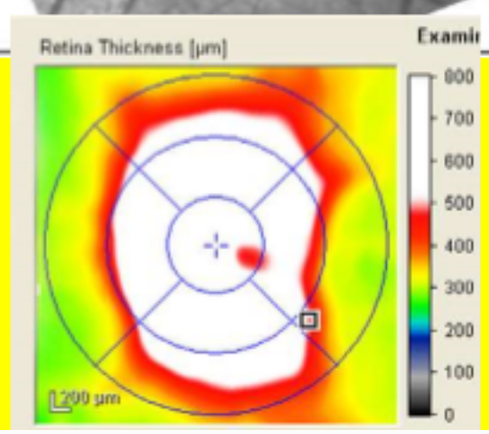

Peripapillary RNFLT Classification
TS 103 (136)
NS 125 (102)
T 56 (75)
G 126 (97)
N 88 (72)
TI 217 (142)
NI 196 (106)
Within Normal Limits
1:1 pixel
1:1 µm
Layer: RNFL
Thickness [µm]
300
240
180
120
60
0
83
0 TMP
45
90 SUP
135
180 NAS
225
270 INF
315
360 TMP
Position [°]
Siyahposht, Khadjeh, 1/1/1970
8/5/2012; OD
IR&OCT 30° 50757.0
HEIDELBERG ENGINEERING


Peripapillary RNFLT Classification
NS 131 (102)
TS 150 (135)
N 84 (72)
G 105 (97)
T 43 (76)
NI 139 (106)
TI 160 (142)
Outside Normal Limits
Thickness [µm]
Position [°]
TMP
SUP
NAS
INF
TMP
Layer: RNFL
Siyahposht, Khadijeh, 1/1/1970
8/5/2012, OS
IR&OCT 30° 50754 2
HEIDELBERG ENGINEERING

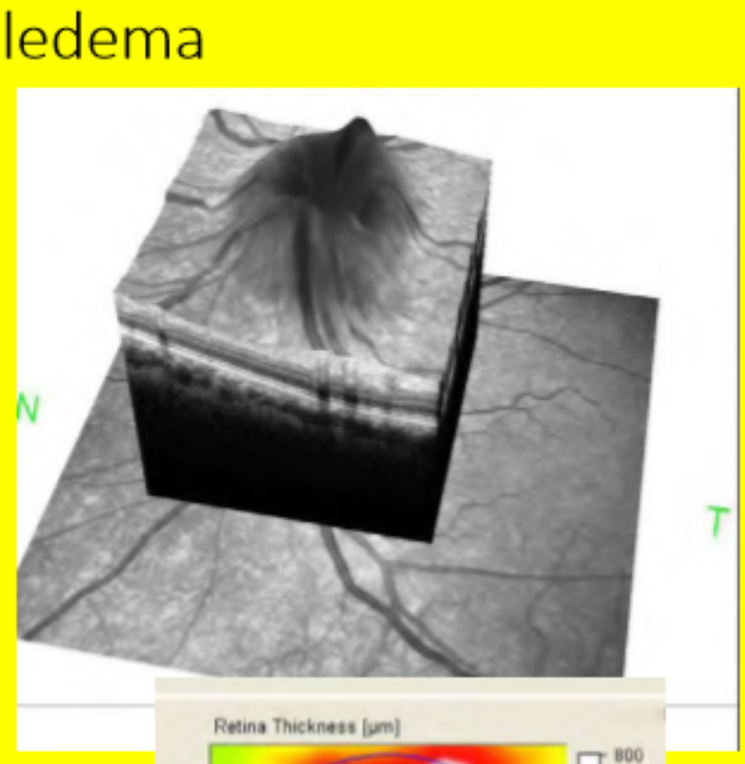
Fard MA. Quantification of Peripapillary Total Retinal Volume in Pseudopapilledema and Mild Papilledema Using Spectral-Domain Optical Coherence Tomography. Am J Ophthalmol 2014;158

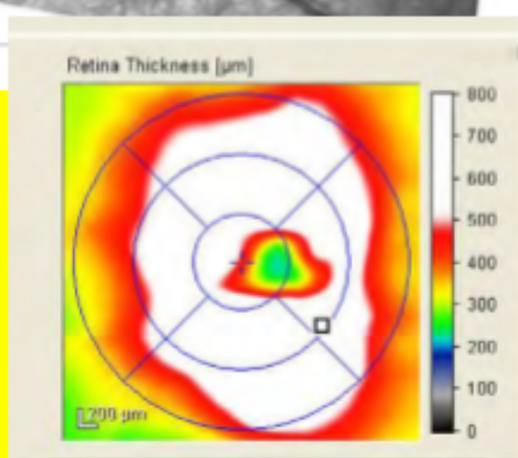
Pseudopapilledema





Papilledema

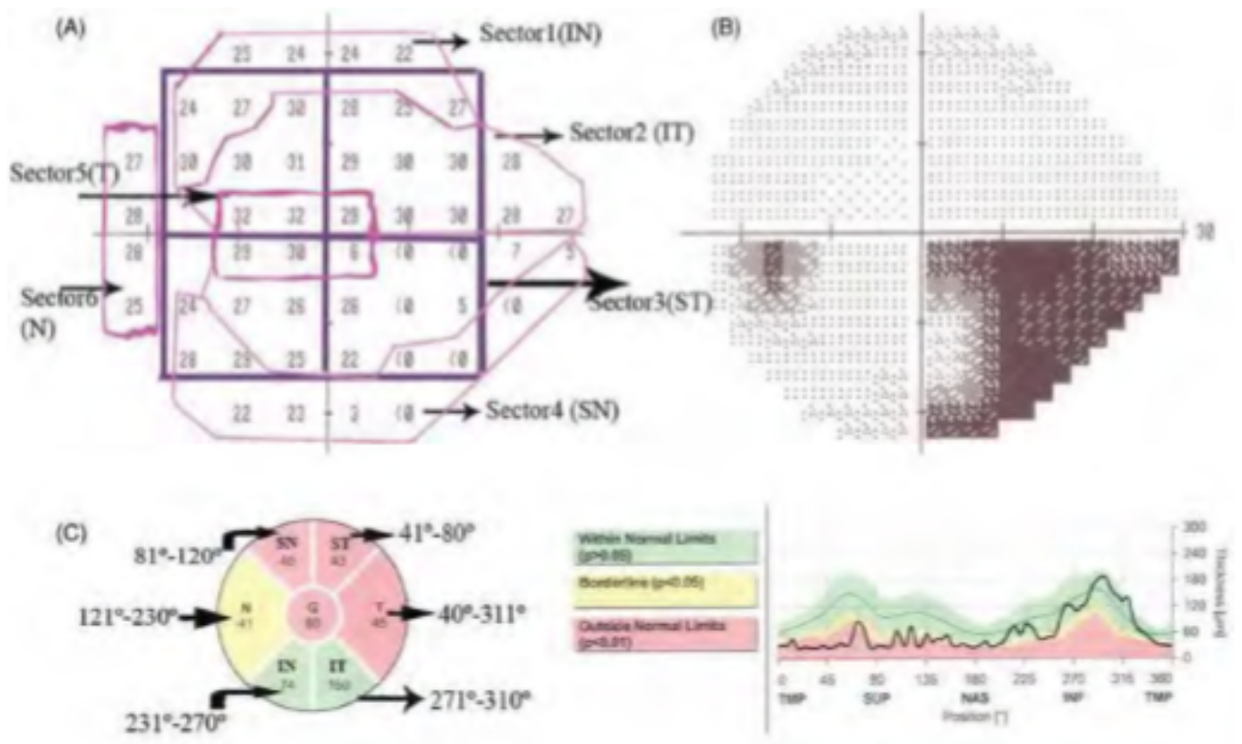




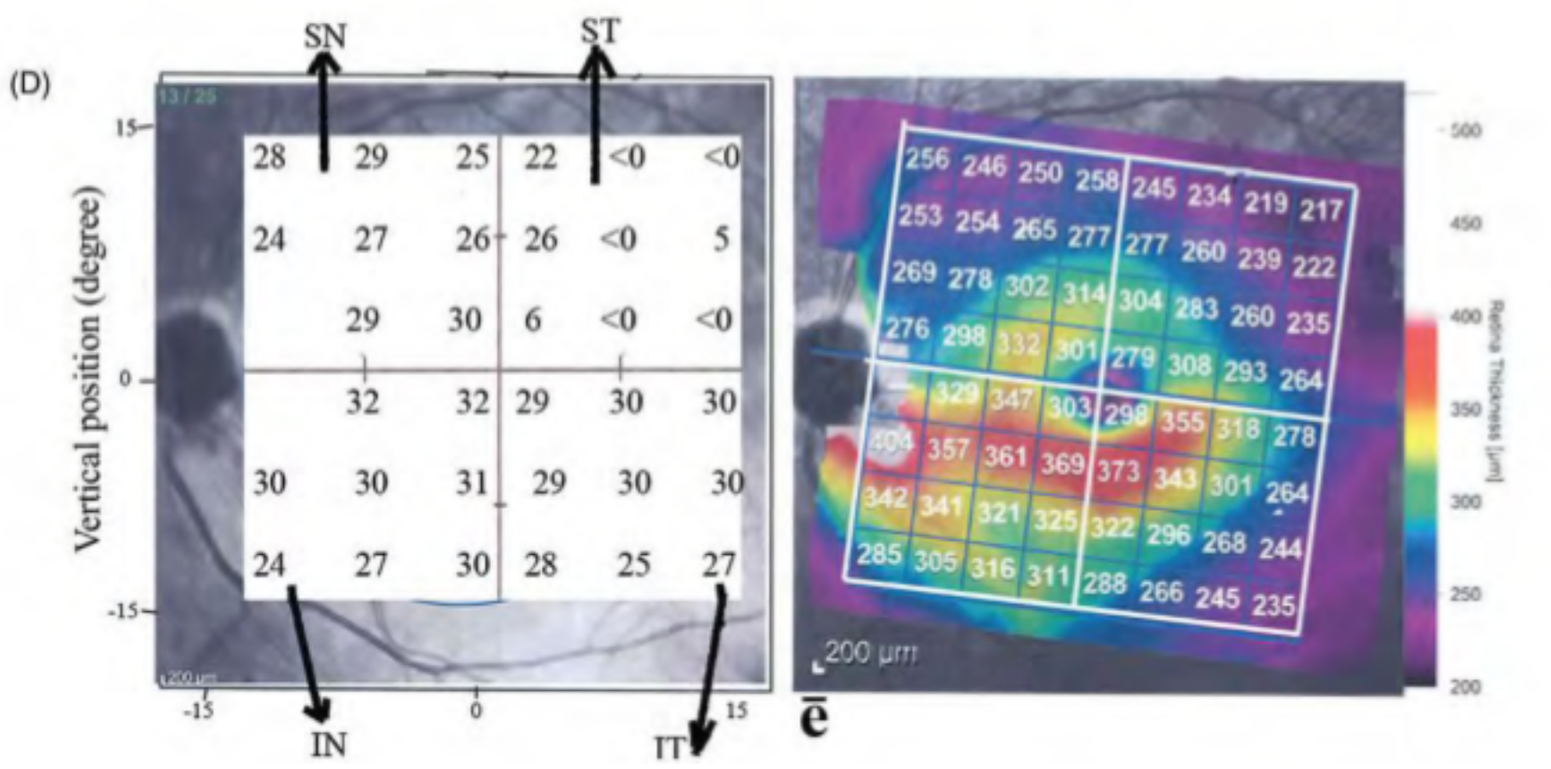
.2Macular imaging in optic neuropathies

- .1Mapping of VF to corresponding nerve fiber layers is more complicated than with retinal locations .

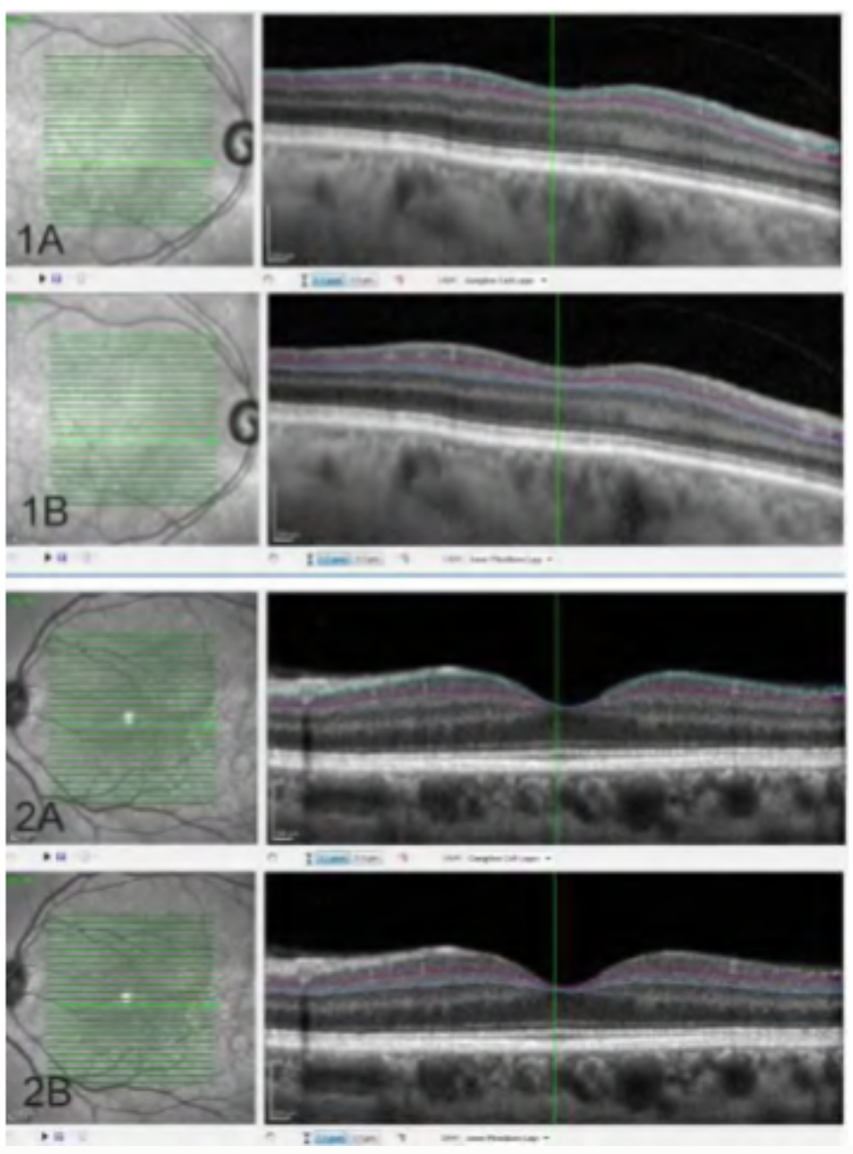
- .2 The retinal nerve fiber layer is composed of the RGC axons, and therefore assessment of the RGC and macula may be a more direct method for measuring optic nerve damage than circumpapillary RNFLT.


(A)
Sector1(IN)
Sector2 (IT)
Sector5(T)
Sector6
(N)
Sector3(ST)
Sector4 (SN)
(B)
(C)
81°-120°
41°-80°
121°-230°
40°-311°
231°-270°
271°-310°
SN
ST
N
G
T
IN
IT
Within Normal Limits
Borderline
Outside Normal Limits
TMP
SUP
NAS
INF
TMP
Position [°]

Fard MA. Posterior Pole Retinal Thickness for Detection of Structural Damage in Anterior Ischemic Optic Neuropathy. Neuro-Ophthalmology, 2013; 37(5): 183–.191

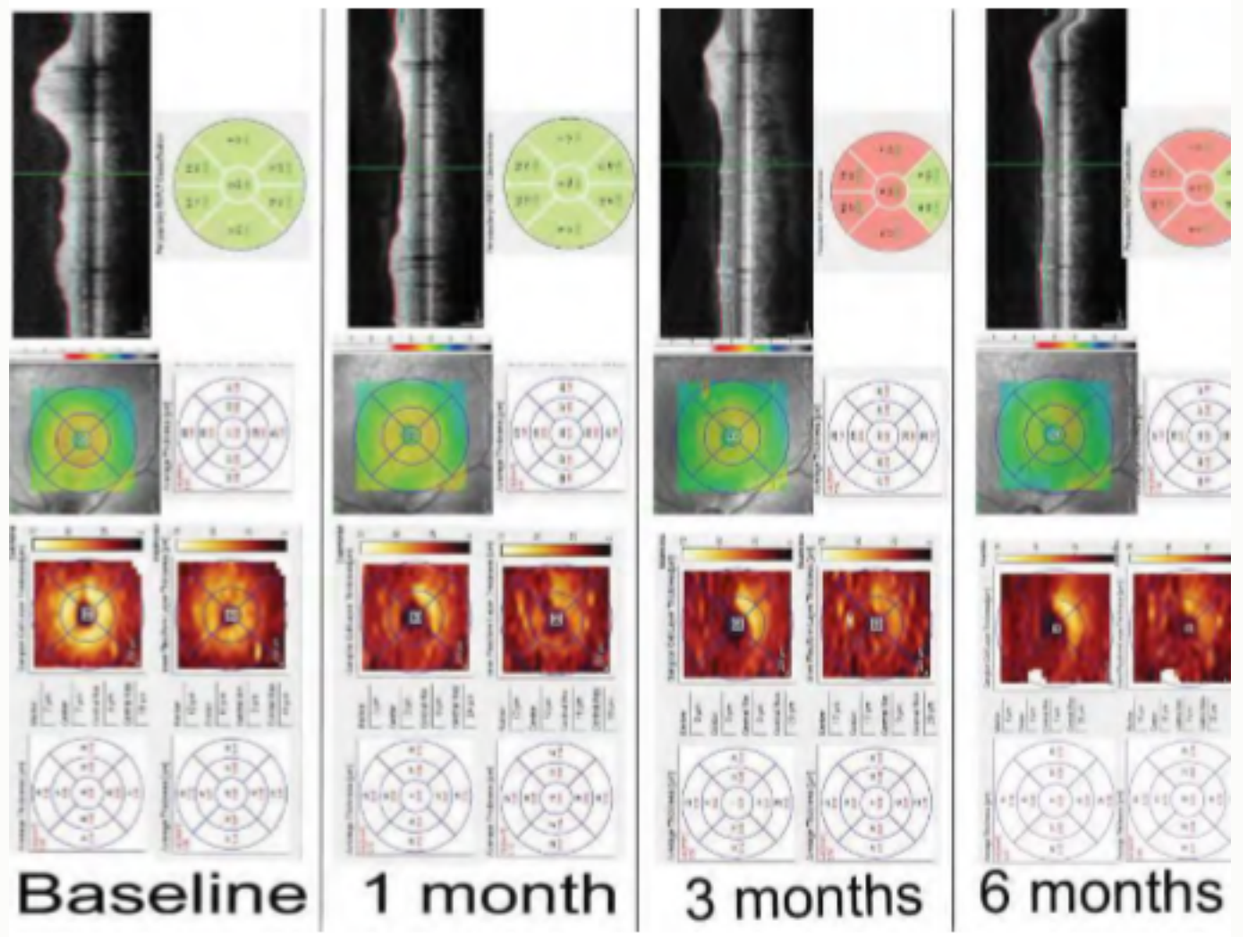


Retinal layer segmentation in ischemic optic neuropathy


1A
1B
2A
2B

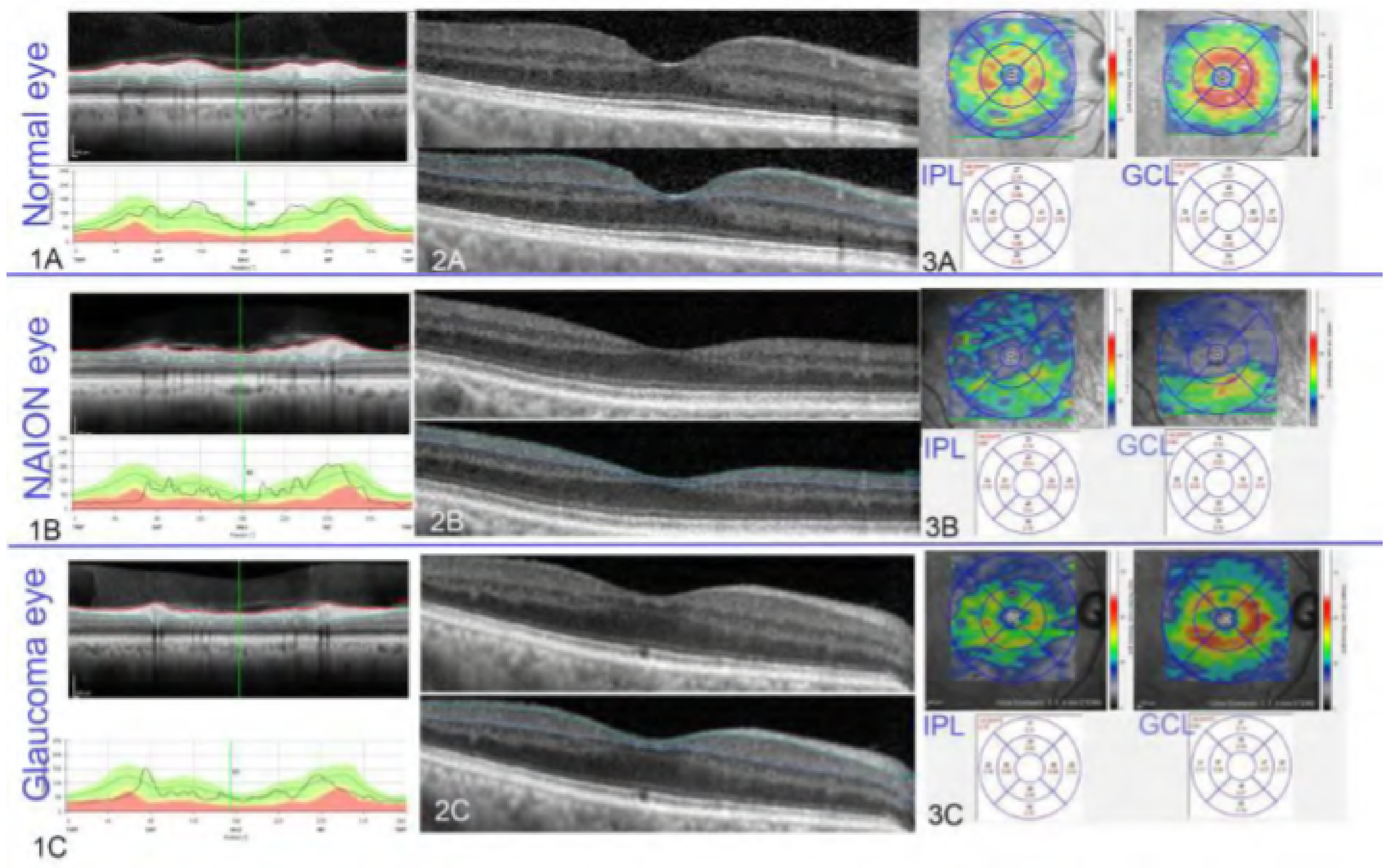
Retinal Ganglion Cell Loss Precedes Retinal Nerve Fiber Thinning in Nonarteritic Anterior Ischemic Optic Neuropathy. J Neuroophthalmol. 2016 Jun;36(2):.141-6

- Thinning of the GCIPL was evident in the affected NAION eyes at 1 month.


Baseline
1 month
3 months
6 months

Comparison of the Pattern of Macular Ganglion Cell-Inner Plexiform Layer defect Between Ischemic Optic Neuropathy and Open-Angle Glaucoma .

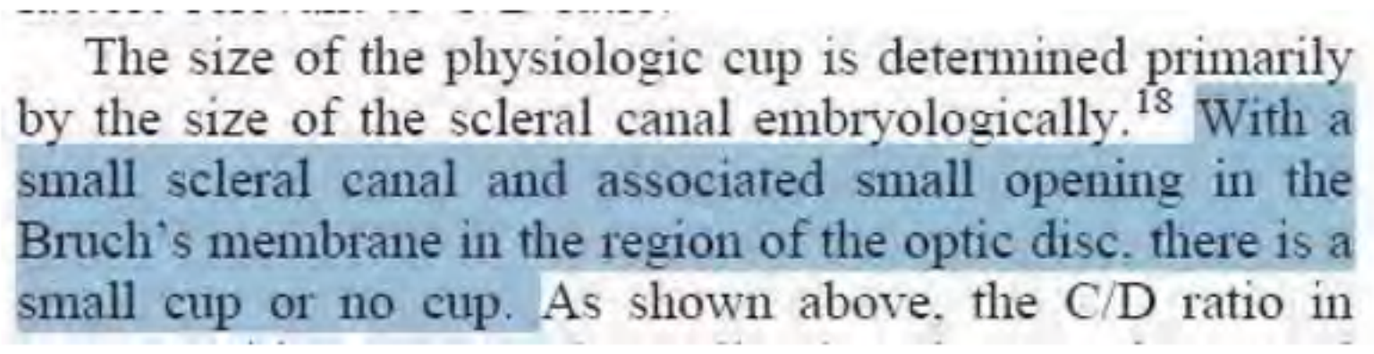
Fard MA, et al. Invest Ophthalmol Vis Sci. 2016 Mar;57(3):.1011-6



Normal eye
NAION eye
Glaucoma eye
1A
1B
1C
2A
2B
2C
3A
3B
3C
IPL
GCL
IPL
GCL
IPL
GCL

.3Optic nerve head morphology optic neuropathy

Ophthalmology 2008;115:2275–.2281



The size of the physiologic cup is determined primarily by the size of the scleral canal embryologically.[18] With a small scleral canal and associated small opening in the Bruch's membrane in the region of the optic disc. there is a small cup or no cup. As shown above. the C/D ratio in


Normal eye
BMO
AION eye
BMO
Fellow eye

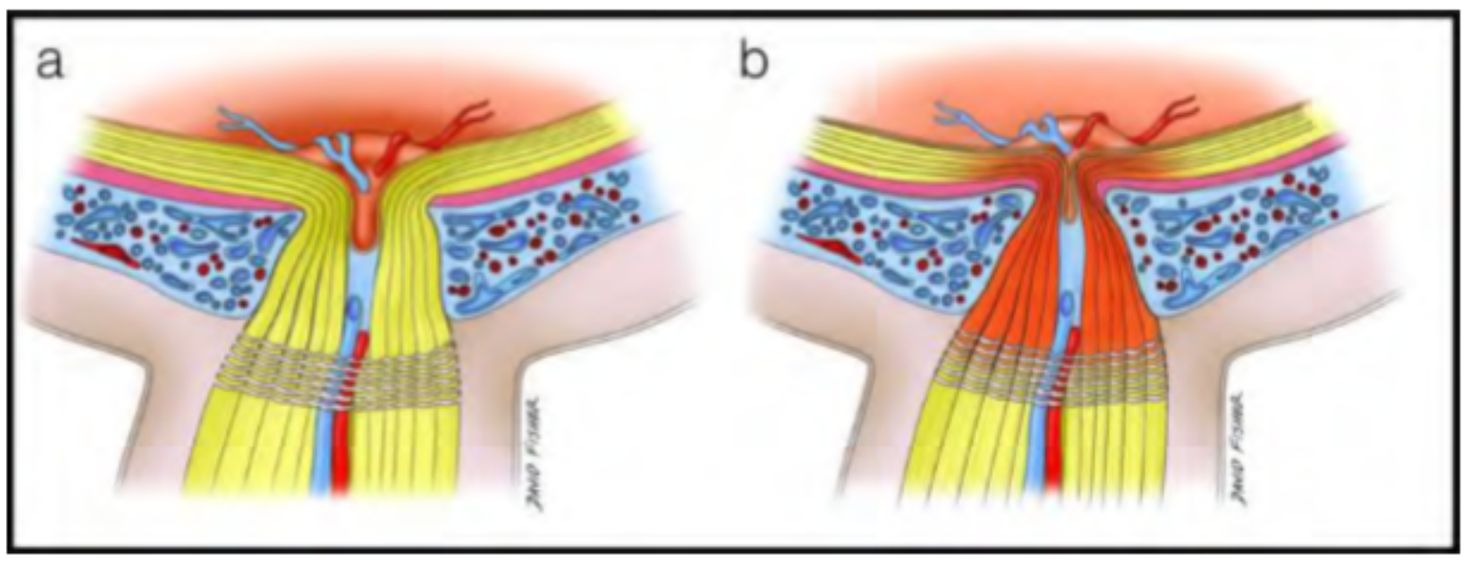
Peripapillary Pachychoroid in Nonarteritic Anterior Ischemic Optic Neuropathy. IOVS.2016

The mean area of the BMO in NAION eyes was 1.656 $\mu m^2 \times 10^6$, compared to 1.708 $\mu m^2 \times 10^6$ in normal eyes (P = .(0.5793

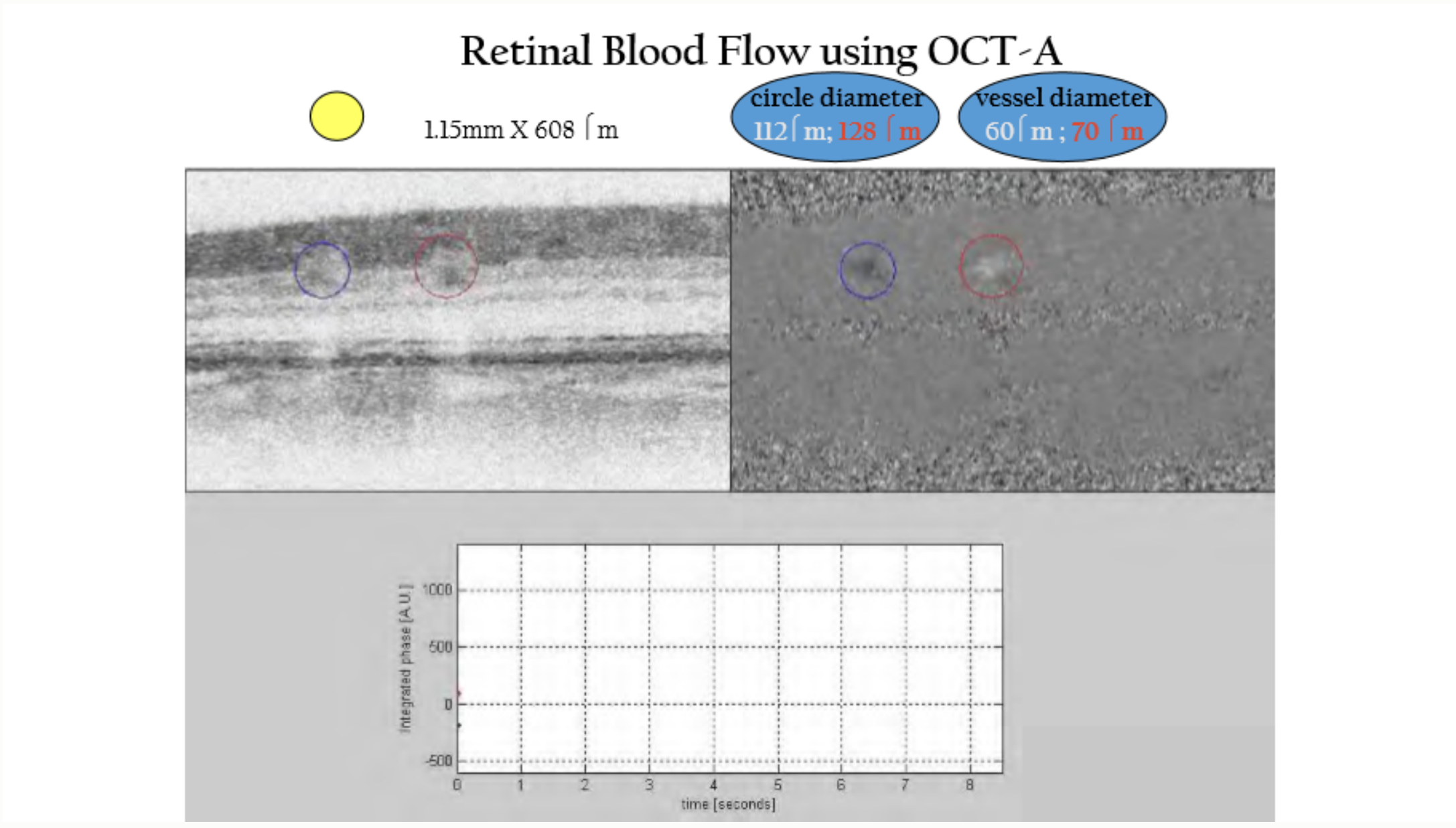
Fard MA et al. Peripapillary Choroidal Thickness in Nonarteritic Anterior Ischemic Optic Neuropathy. IOVS.2015

Peripapillary Pachychoroid in Nonarteritic Anterior Ischemic Optic Neuropathy.

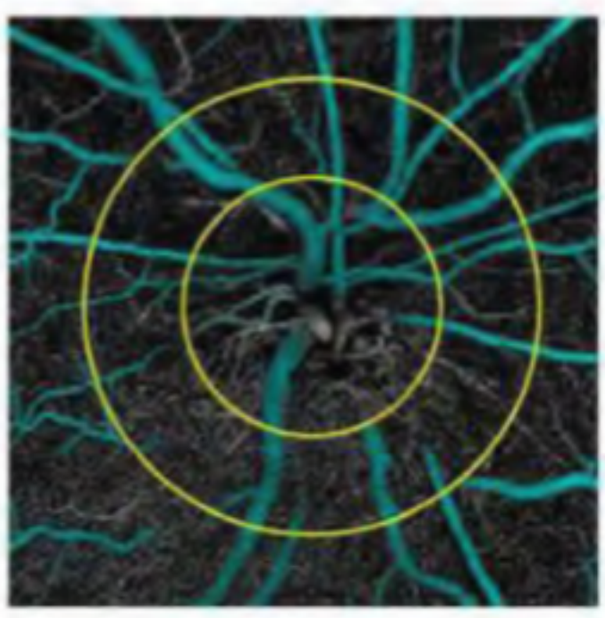
Invest. Ophthalmol. Vis. Sci. 2016;57(11):.4679-4685



Conceptual images illustrating the hypothesis of compartment syndrome as a result of alterations in choroidal volume in an eye with thick peripapillary choroid. (a) Thick peripapillary choroid in an eye predisposed to nonarteritic optic neuropathy. (b) Expansion of the peripapillary choroid in this eye in response to positional changes, causing a compartment syndrome in the laminar, prelaminar, and retrolaminar optic nerve with resultant ischemia.

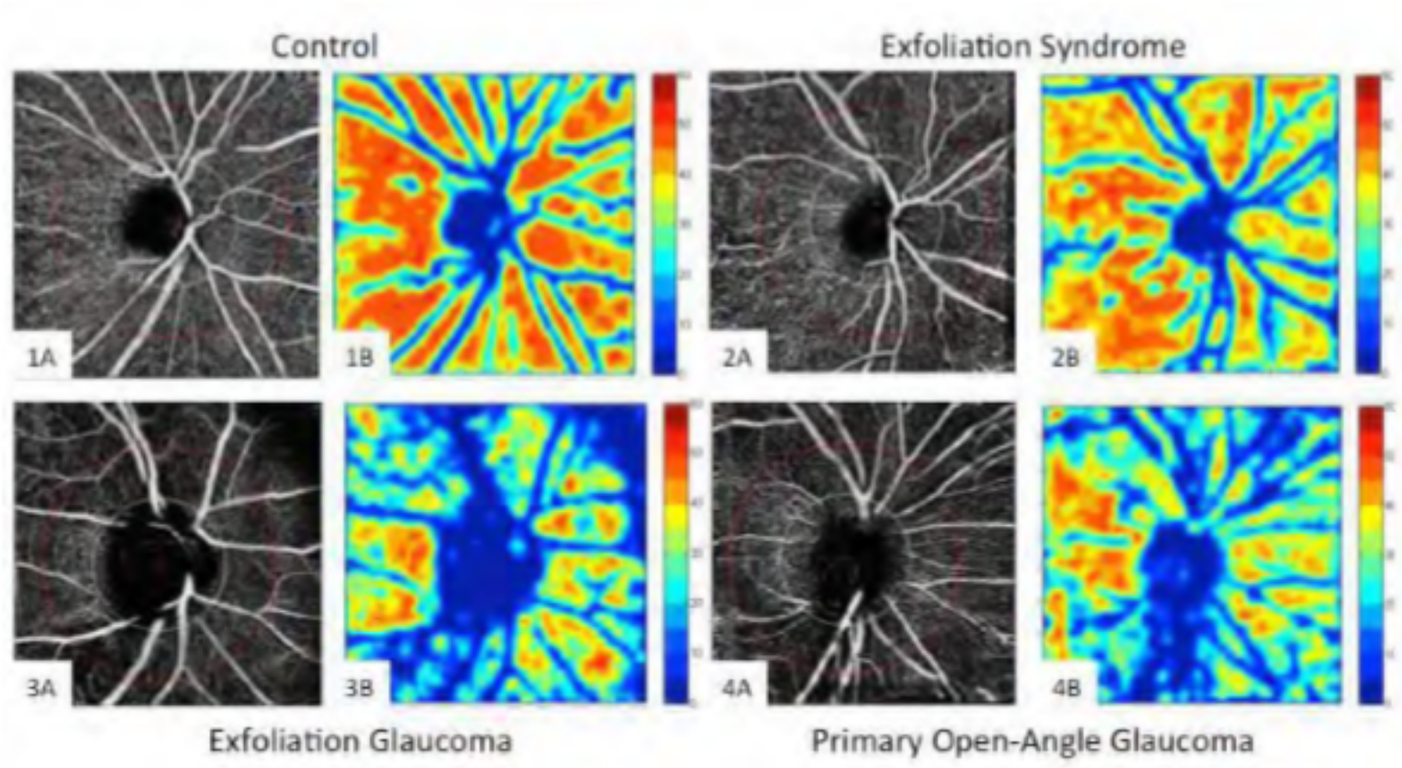

Retinal Blood Flow using OCT-A
1.15mm X 608 ⌈m
circle diameter
112⌈m; 128 ⌈m
vessel diameter
60⌈m ; 70 ⌈m
Integrated phase [A.U.]
1000
500
0
-500
0
1
2
3
4
5
6
7
8
time [seconds]

-

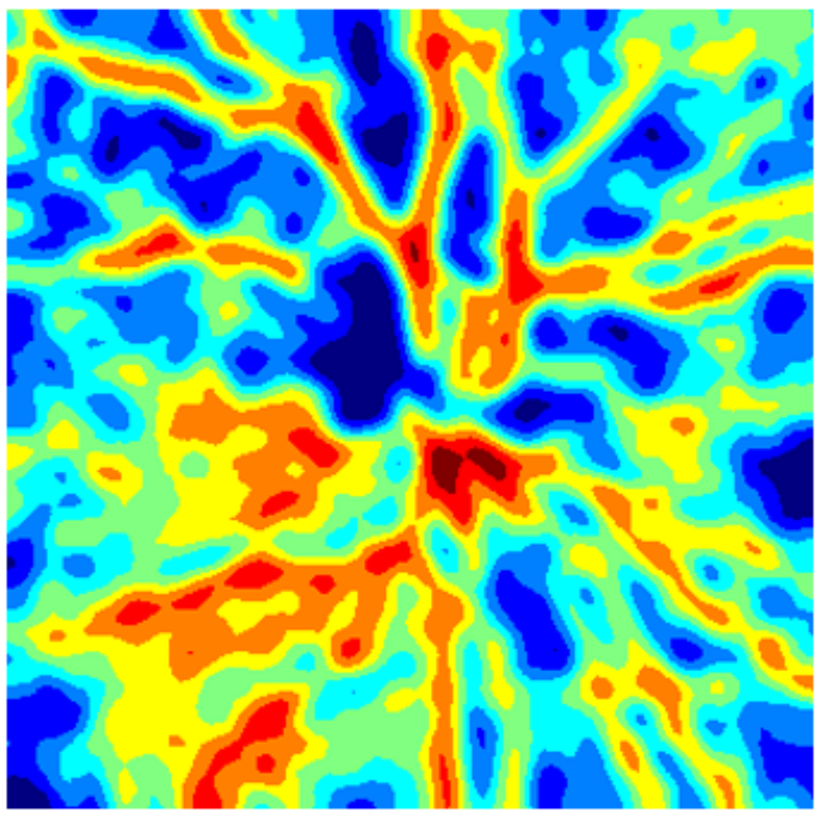


OCT angiography

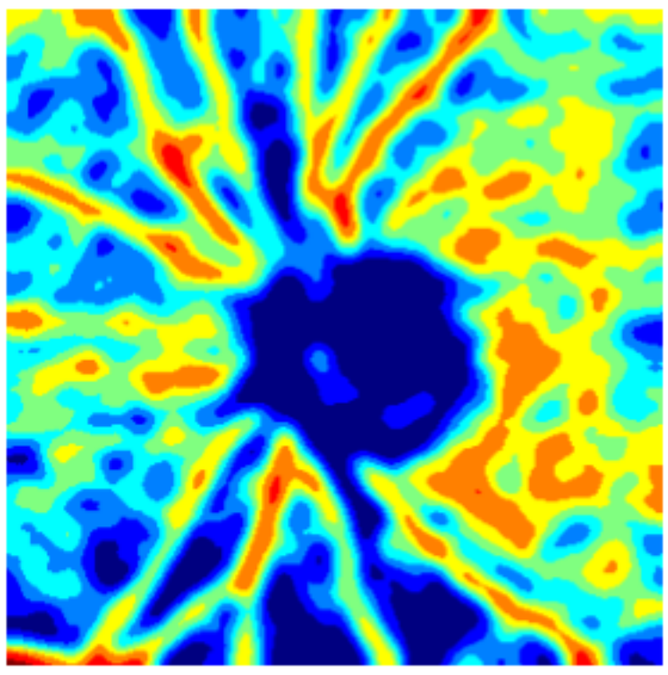
Yanin Suwan, Lawrence S. Geyman, Masoud A.Fard. Peripapillary Perfused Capillary Density in Exfoliation Syndrome and Exfoliation Glaucoma versus Primary Open-Angle Glaucoma and Healthy Controls: an Optical Coherence Tomography Angiography Study. ARVO May .2017



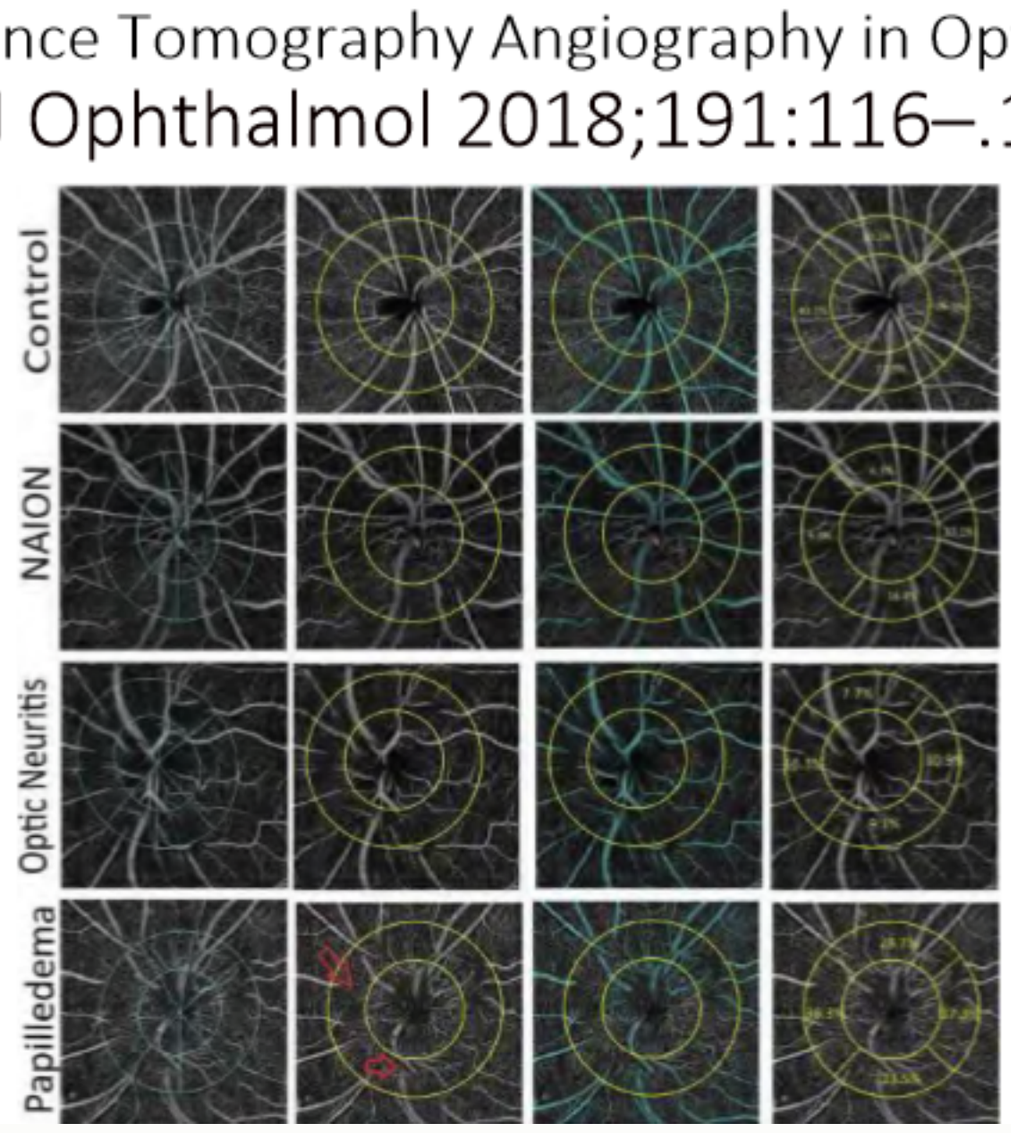
NAION with inferior altitudinal defect



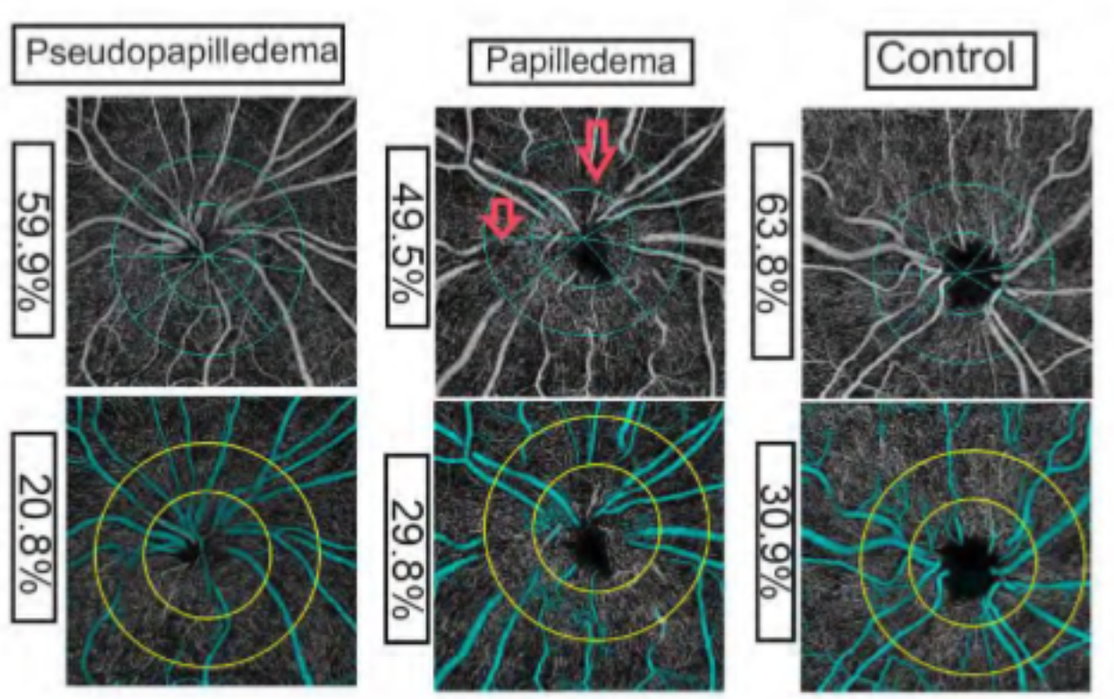
Severe POAG



Optical Coherence Tomography Angiography in Optic Disc Swelling. Am J Ophthalmol 2018;191:116–.123



OCT-A is helpful to distinguish NAION and papillitis from papilledema . Whole-image capillary density had the greatest diagnostic accuracy for differentiating disc swelling.


Pseudopapilledema
Papilledema
Control
59.9%
49.5%
63.8%
20.8%
29.8%
30.9%

Thanks for your attention

.1Pseudopapilledema vs true papilledema
.2Macular and GC imaging in optic neuropathy
.3Deep Optic nerve head imaging in optic neuropathy
.4Peripapillary choroid imaging
.5OCT angiography