



TEHRAN UNIVERSITY
OF
MEDICAL SCIENCES



Farabi Eye Hospital

Weekly Case Presentation

Elias Khalilipour, MD

ASSOCIATED PROFESSOR OF OPHTHALMOLOGY

A.Khaleq Rasoli, MD

FELLOWSHIP OF RETINA

CASE - 1

63 Y-O man with decrease of VA in the OS since 3 months ago
No history of DM or HTN

BCVA OS:2/10







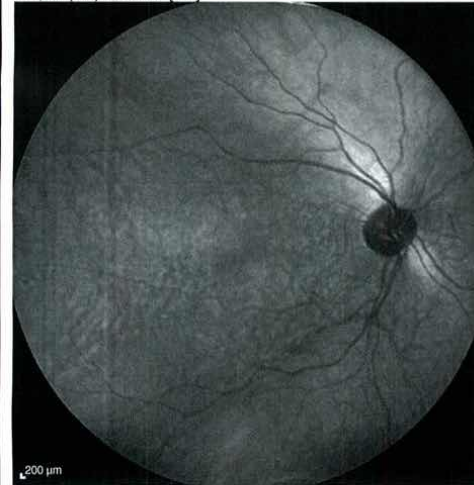


Patient: Shamsnejad, Karim
Patient ID: ---

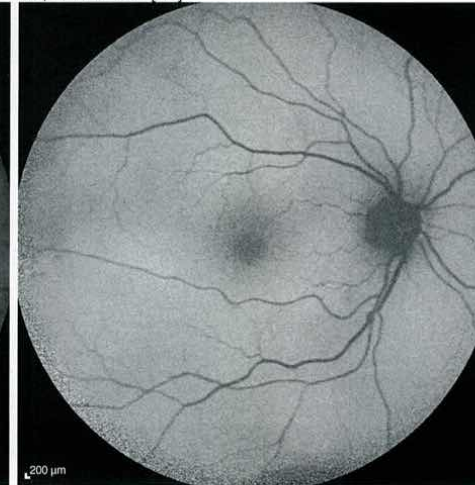
DOB: Jun/13/2021
Exam.: Jun/13/2021

Sex: M

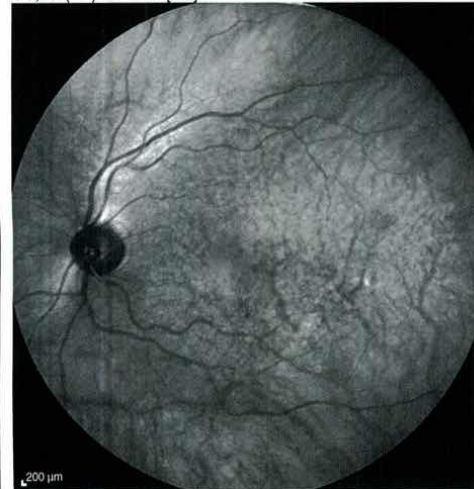
OD, IR (XP) 55° ART [HS]



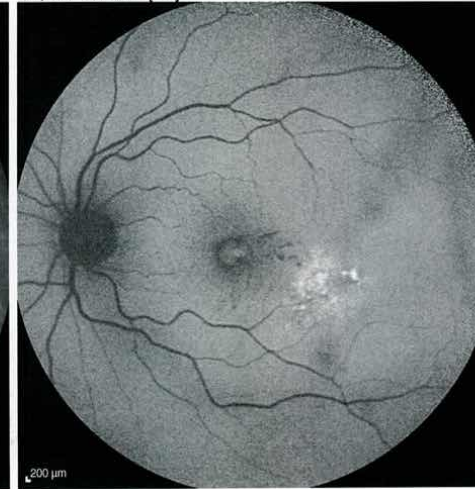
OD, BAF 55° ART [HS]



OS, IR (XP) 55° ART [HS]



OS, BAF 55° ART [HS]



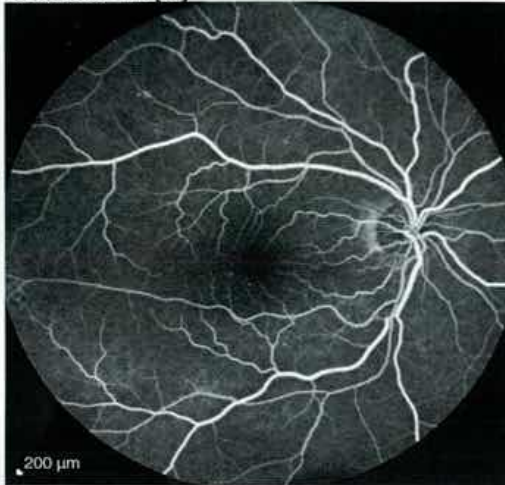
Patient: Shamsnejad, Karim
Patient ID: ---

DOB: Jun/13/2021
Exam.: Jun/13/2021

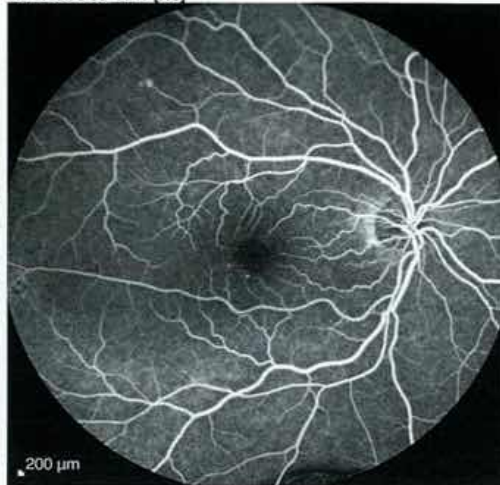
Sex: M

OD

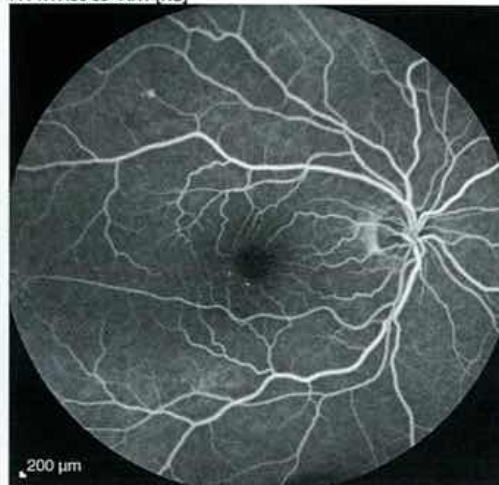
FA 0:32.80 55° ART [HS]



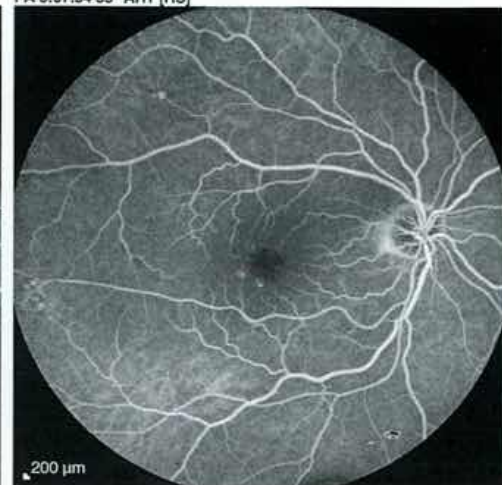
FA 0:43.78 55° ART [HS]



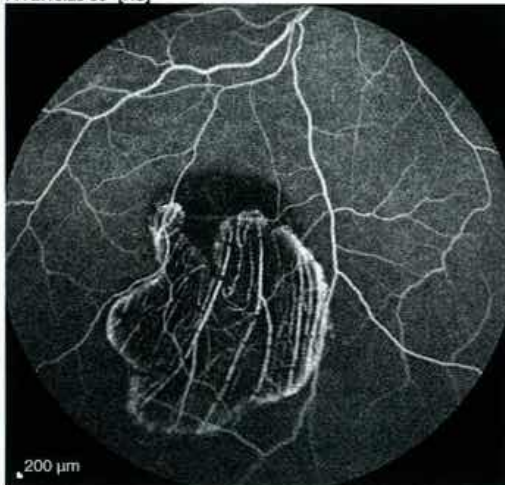
FA 1:17.30 55° ART [HS]



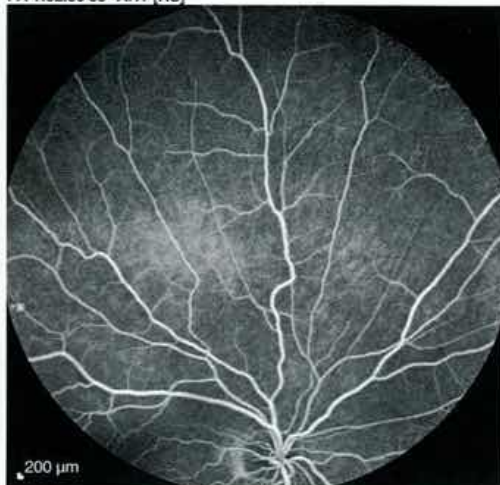
FA 5:07.54 55° ART [HS]



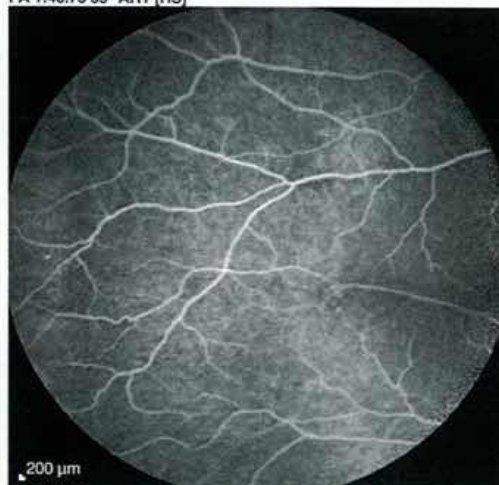
FA 2:15.29 55° [HS]



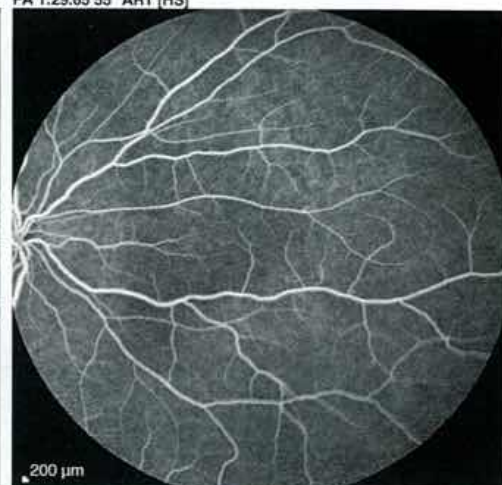
FA 1:52.86 55° ART [HS]



FA 1:40.75 55° ART [HS]



FA 1:29.65 55° ART [HS]



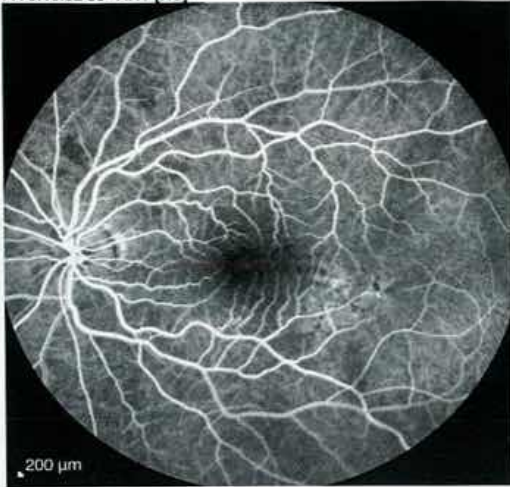
Patient: Shamsnejad, Karim
Patient ID: ---

DOB: Jun/13/2021
Exam.: Jun/13/2021

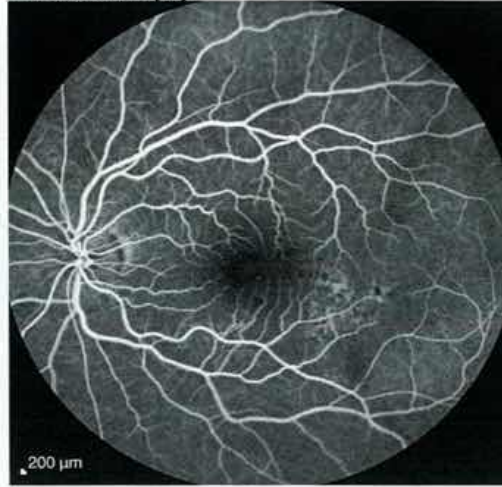
Sex: M

OS

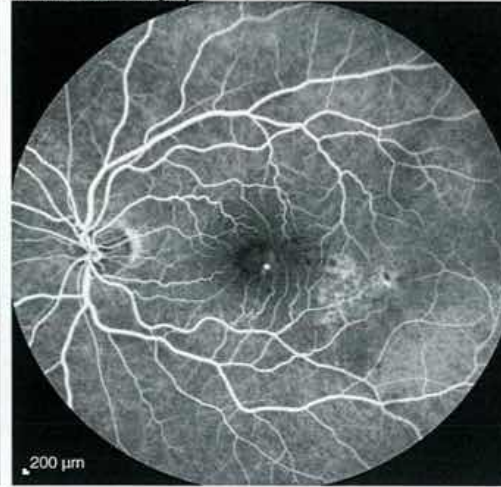
FA 0:19.32 55° ART [HS]



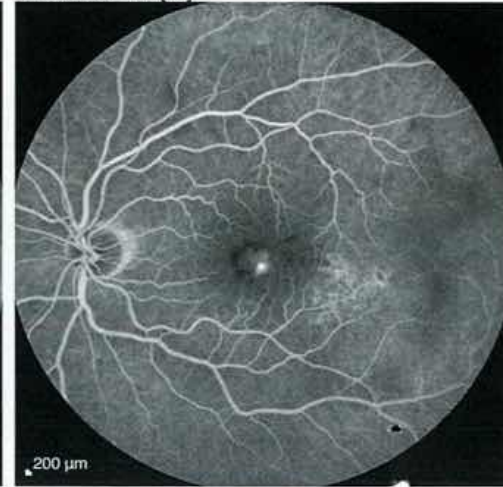
FA 0:22.38 55° ART [HS]



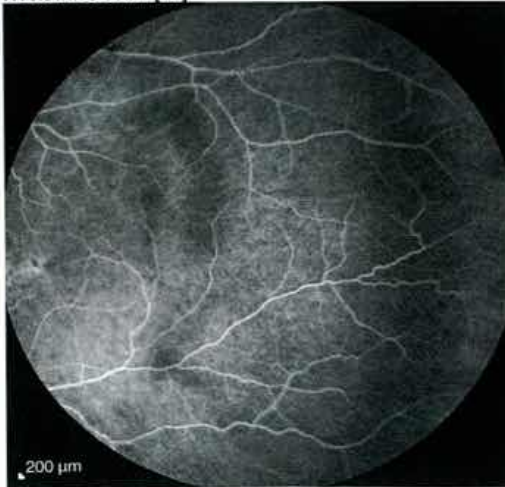
FA 1:09.49 55° ART [HS]



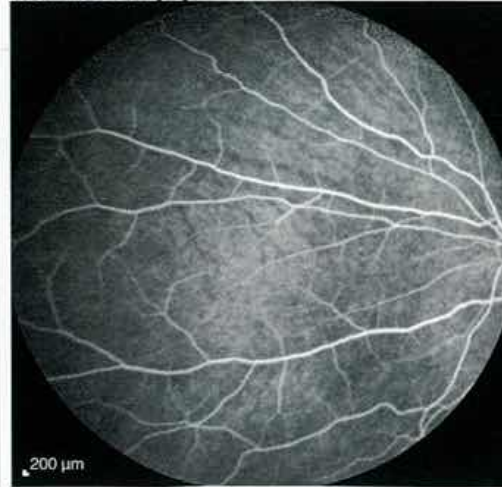
FA 4:58.48 55° ART [HS]



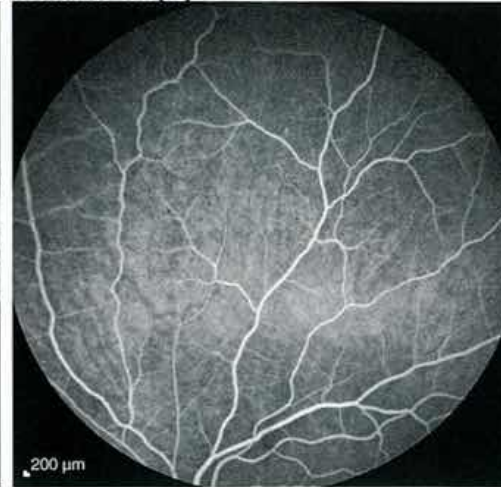
FA 3:34.12 55° ART [HS]



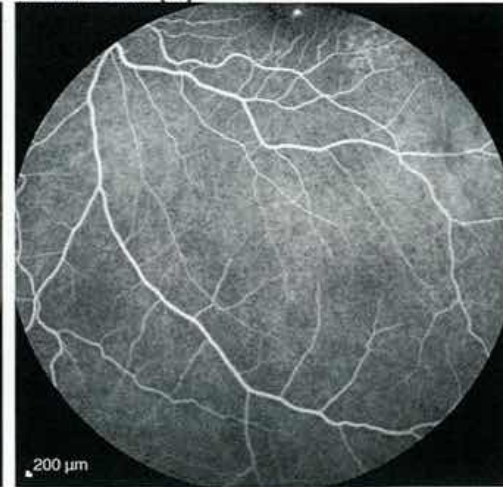
FA 3:14.29 55° ART [HS]



FA 3:00.25 55° ART [HS]



FA 2:46.10 55° ART [HS]

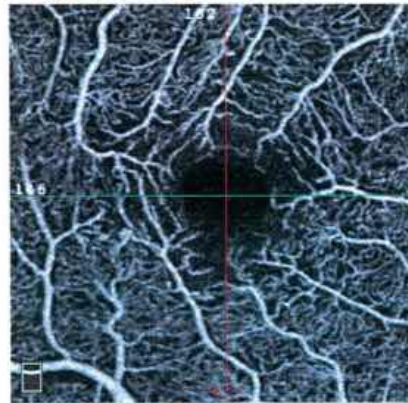


Angio Retina QuickVue

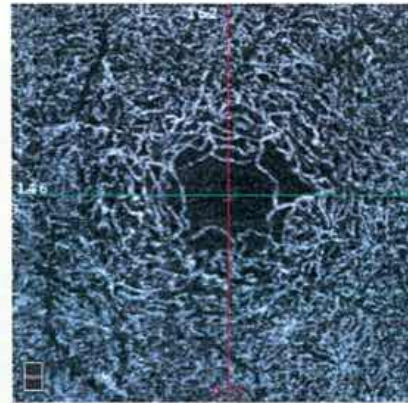
Scan Quality 8/10

3.0 x 3.0 Scan Size (mm)

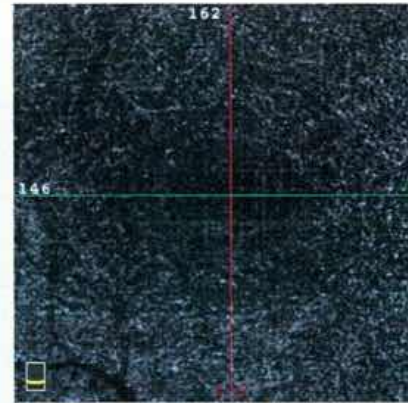
Right / OD



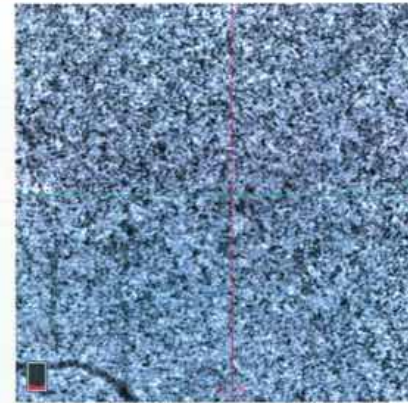
Superficial (ILM - IPL)



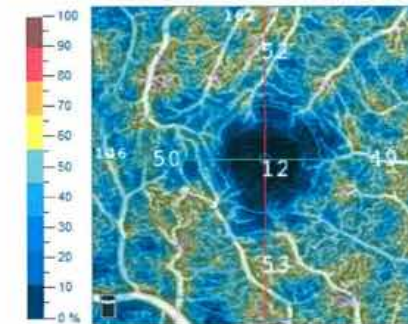
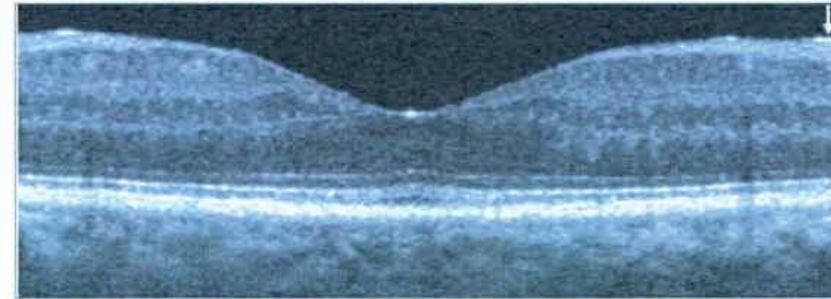
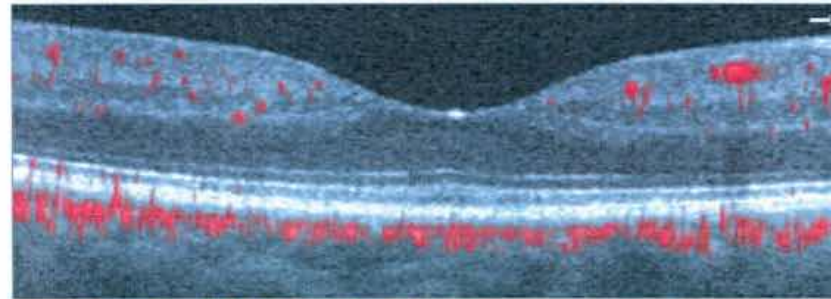
Deep (IPL - OPL)



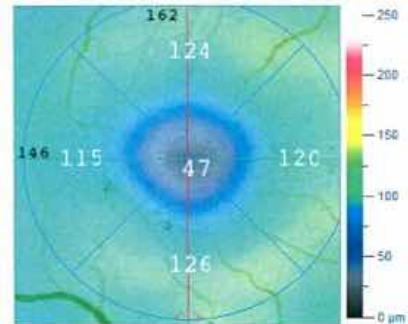
Outer Retina (OPL - BRM)



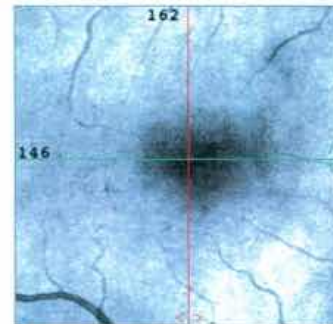
Choriocapillaris (BRM - BRM+30µm)



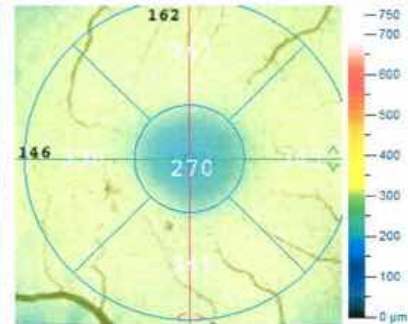
Vessel Density (Superficial)



Inner Thickness (ILM - IPL)



SLO



Full Thickness (ILM - RPE)

- Exit
- Print
- OverVue

Show Lines

Show Bnd

Angio Overlay

Auto Zoom



Thickness

Full

Overlay

Patient: shamsnezhad, karim
Physician:
Operator:
Disease:

Farabi Eye Hospital
Ghazvin Square - Kargar Street - Tehran - Iran
Gender: Male
ID:

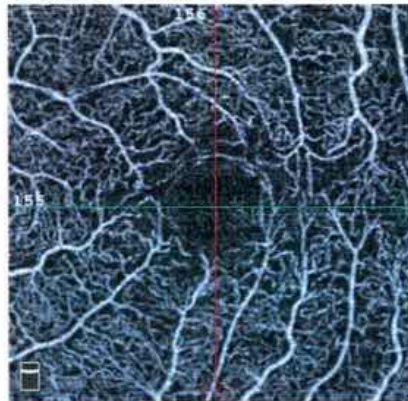
Exam Date: 06/13/2021
DOB(age): 01/01/1958 (63)
Ethnicity:
Algorithm Ver: A2018,0,0,18

Angio Retina QuickVue

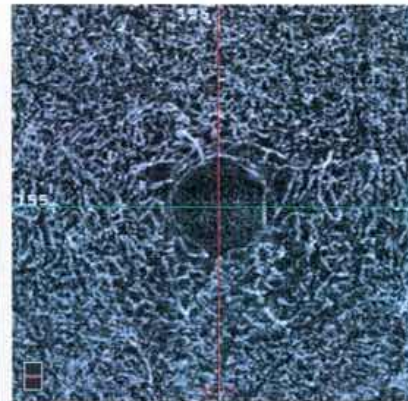
Scan Quality 8/10

3.0 x 3.0 Scan Size (mm)

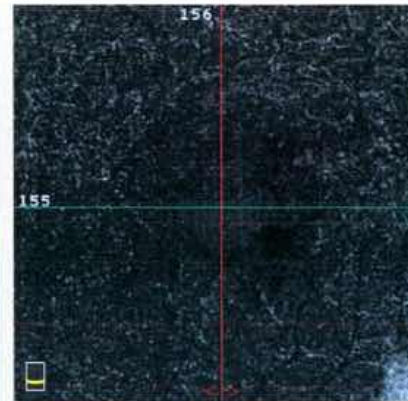
Left / OS



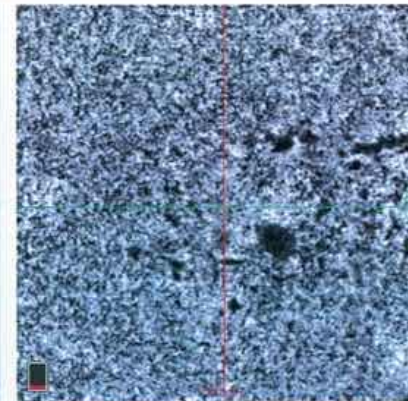
Superficial (ILM - IPL)



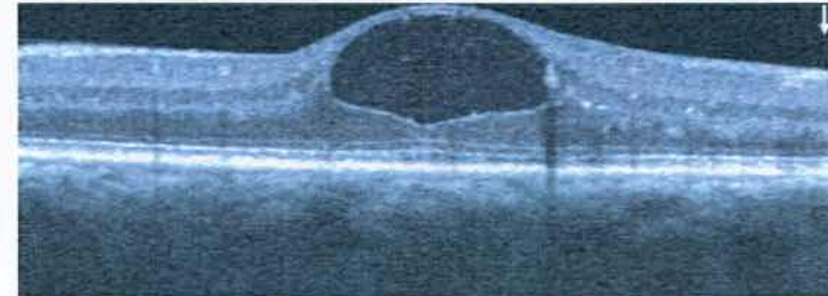
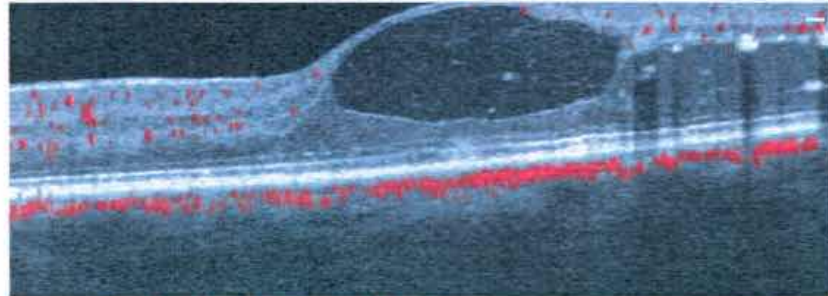
Deep (IPL - OPL)



Outer Retina (OPL - BRM)



Choriocapillaris (BRM - BRM+30µm)



Exit
Print
OverVue

Show Lines

Show Bnd

Angio Overlay

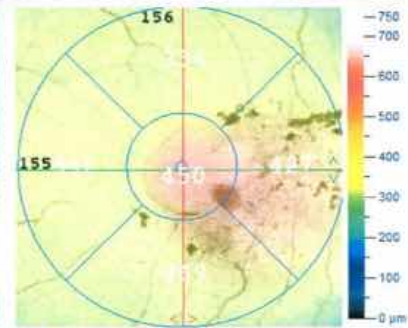
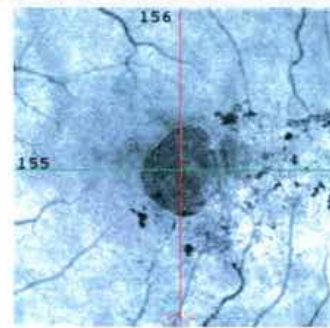
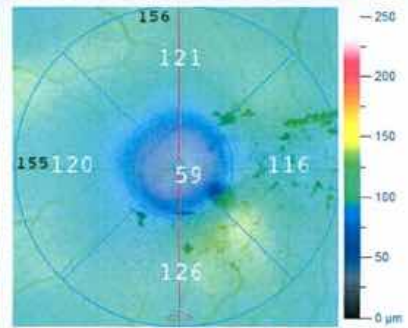
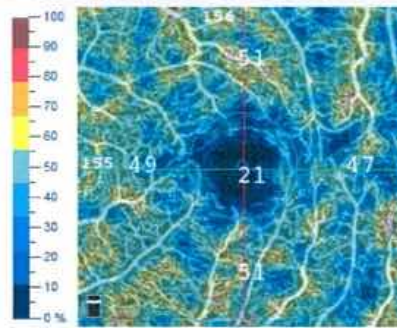
Auto Zoom



Thickness

Full

Overlay



Report Date: Sunday 06/13/2021 15:55:57

Software Version: 2018,0,0,18

Comment:

Signature:



Patient: shamsnezhad, karim
Physician:
Operator:
Disease:

Farabi Eye Hospital
Ghazvin Square - Kargar Street - Tehran - Iran
Gender: Male
ID:

Exam Date: 06/13/2021
DOB(age): 01/01/1958 (63)
Ethnicity:
Algorithm Ver: A2018,0,0,18

HD Angio Retina

Scan Quality 8/10 SSI 69

Left / OS

Export Angio

Measure: Off

6.00 x 6.00 Scan Size (mm)

3D Display

En Face Thickness RPE Elevation Color Overlay

230

230

224

OverVue
QuickVue

Edit Bnd

Restore Settings

Play

En Face Slab

- Superficial
- Deep
- Outer Retina
- Choriocapillaris
- Retina
- Custom

Upper - OPL Offset(um) -173

Lower - BRM Offset(um) -192

Show Bnd

Color

Show Lines

Remove Projections

Angio Overlay

Large Angio

Large Oct

Auto Zoom

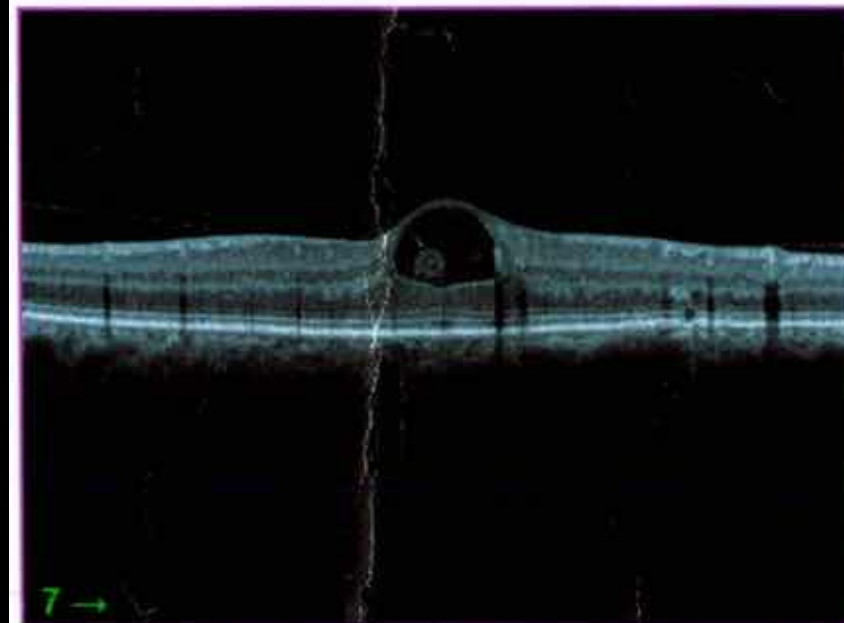
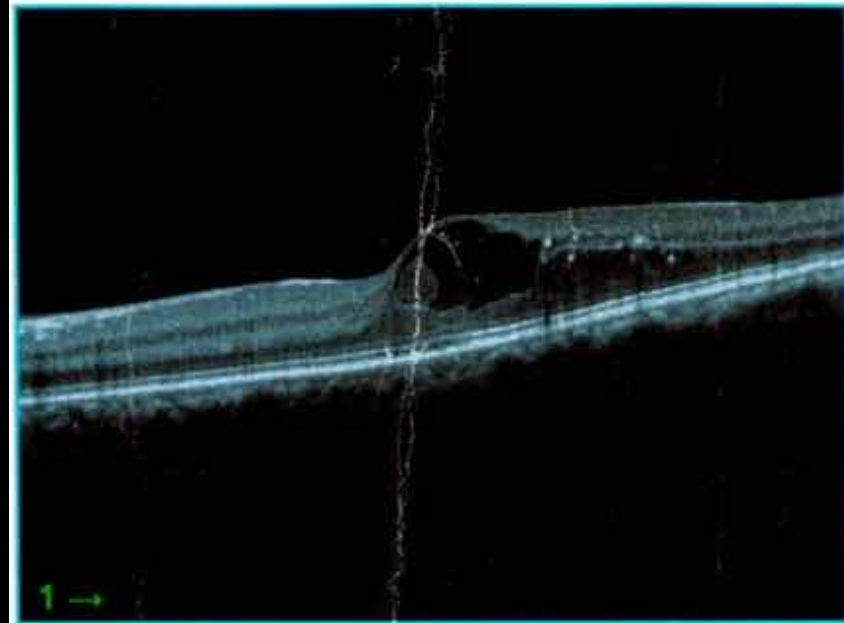
Report Date: Sunday 06/13/2021 15:58:28

Software Version: 2018,0,0,18

Comment:

Signature:





CASE - 2

68 Y-O man with decrease of VA in the OS since 4 months ago
No history of DM or HTN

BCVA OS : 5/10







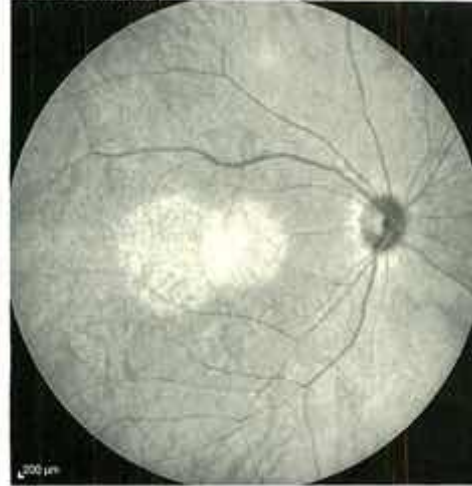


Patient: darehzareshki, davood
Patient ID: ---

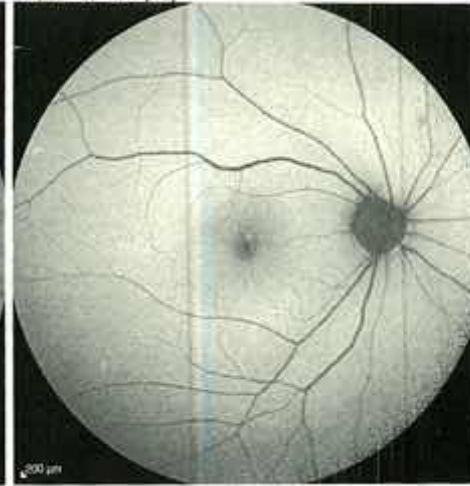
DOB: Dec/1/2020
Exam.: Dec/1/2020

Sex: M

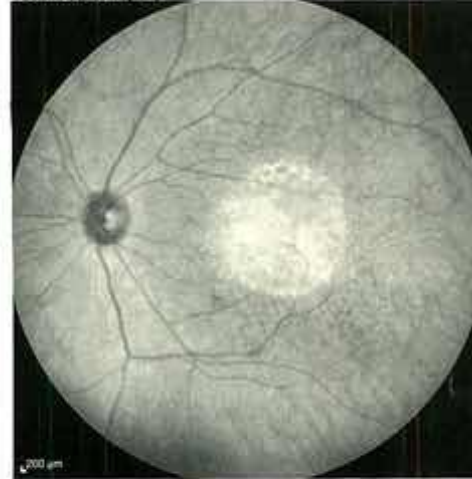
OD, IR 55° ART [HS]



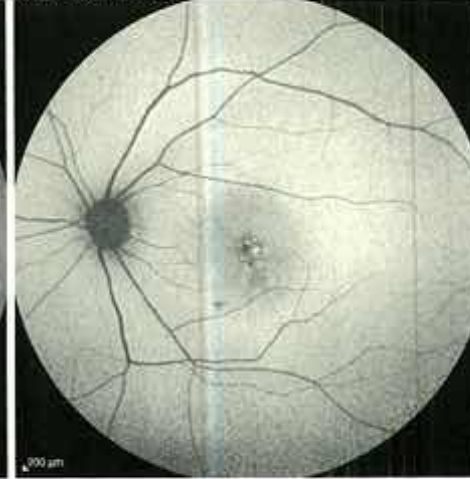
OD, BAF 55° ART [HS]



OS, IR 55° ART [HS]



OS, BAF 55° ART [HS]



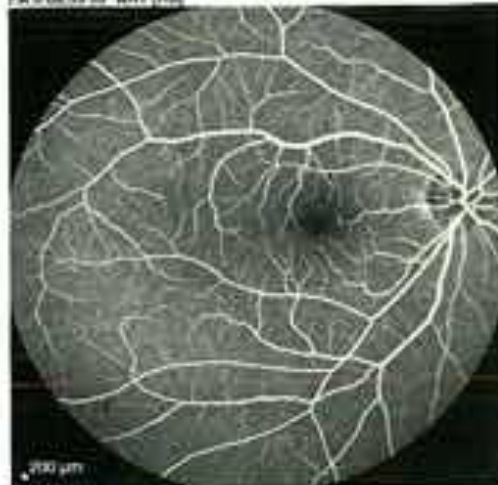
Patient: darehzereshki, davood
Patient ID: ---

DOB: Dec/1/2020
Exam.: Dec/1/2020

Sex: M

OD

FA 0-08:53.55° ART [HS]



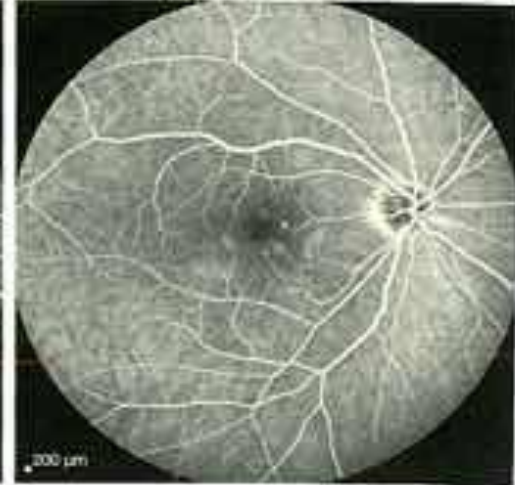
FA 0-25:52.55° ART [HS]



FA 1-02:56.55° ART [HS]



FA 4-45:57.55° ART [HS]



FA 2-26:13.55° ART [HS]



FA 2-45:09.55° ART [HS]



FA 2-59:09.55° ART [HS]



FA 2-23:35.55° ART [HS]



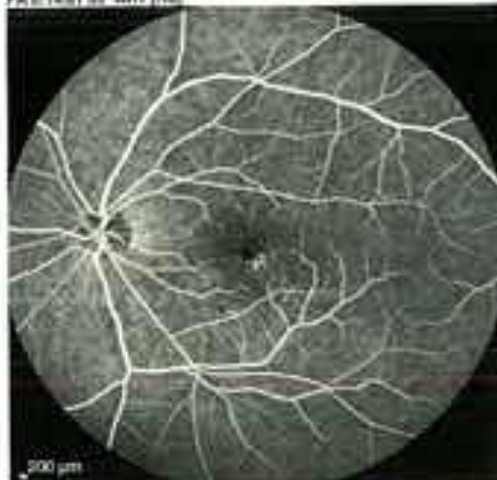
Patient: darehzereshki, davood
Patient ID: ---

DOB: Dec/1/2020
Exam.: Dec/1/2020

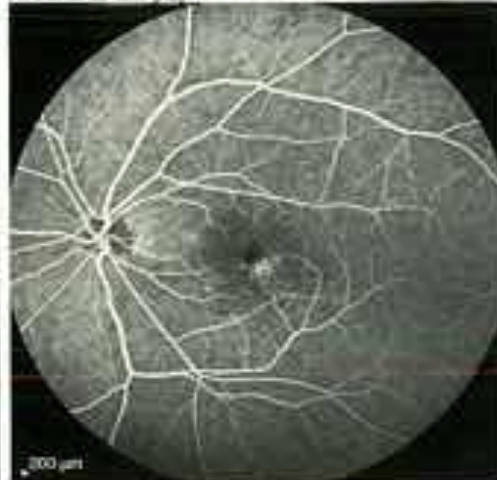
Sex: M

OS

FA 0:14:81 55° ART (HS)



FA 0:39:39 55° ART (HS)



FA 1:09:48 55° ART (HS)



FA 5:03:09 55° ART (HS)



FA 1:28:03 55° ART (HS)



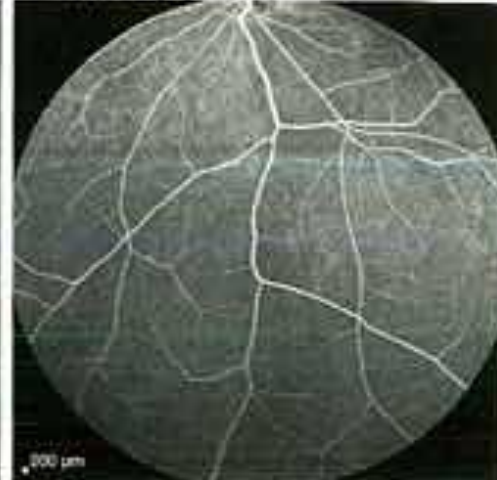
FA 1:38:48 55° ART (HS)



FA 1:45:30 55° ART (HS)



FA 2:15:51 55° ART (HS)



Patient: darezereshki, davood
Physician:
Operator: rajabi, maryam
Disease:

Ferabi Eye Hospital
Ghazvin Square - Kargar Street - Tehran - Iran
Gender: Male
ID:

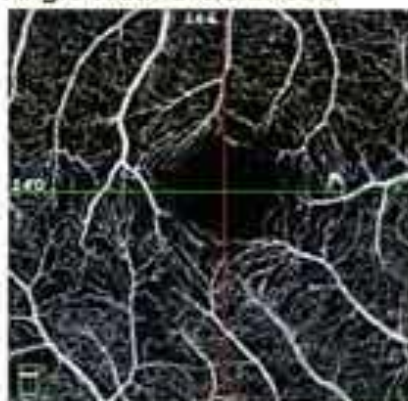
Exam Date: 12/06/2020
DOB(Age): 01/01/1971 (49)
Ethnicity:
Algorithm Ver: A2018.0.0.18

Angio Retina QuickVue

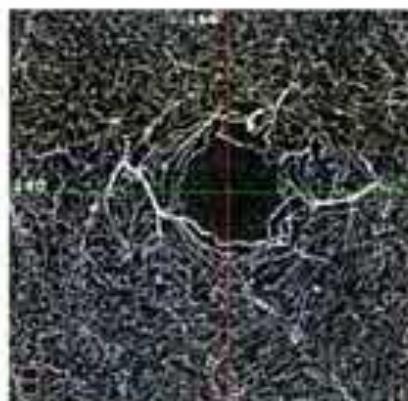
Scan Quality 7/10

3.0 x 3.0 Scan Size (mm)

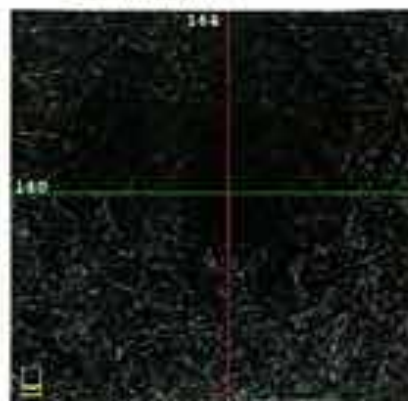
Right / OD



Superficial (ILM - IPL)



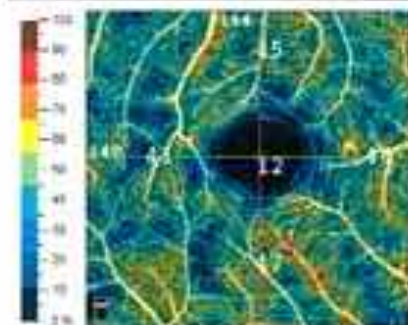
Deep (IPL - OPL)



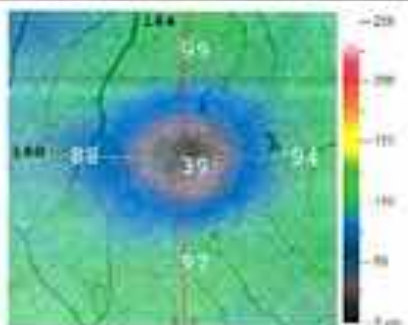
Outer Retina (OPL - BRM)



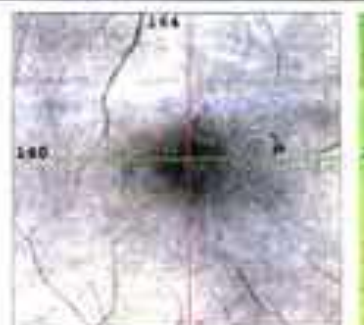
Choriocapillaris (BRM - BRM+30um)



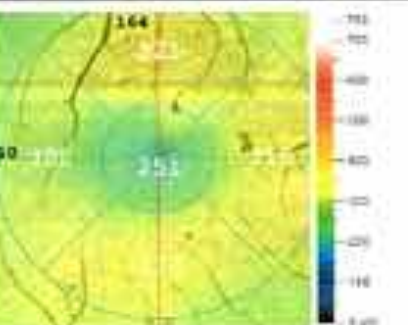
Vessel Density (Superficial)



Inner Thickness (ILM - IPL)



SLO



Full Thickness (ILM - RPE)

Exit

Print

Overview

Show Lines

Show Font

Angle Overlay

Auto Zoom

Thickness

4 Tab

Overlay

Report Date: Sunday 12/06/2020 09:56:31

Software Version: 2018.0.0.18

Comment:

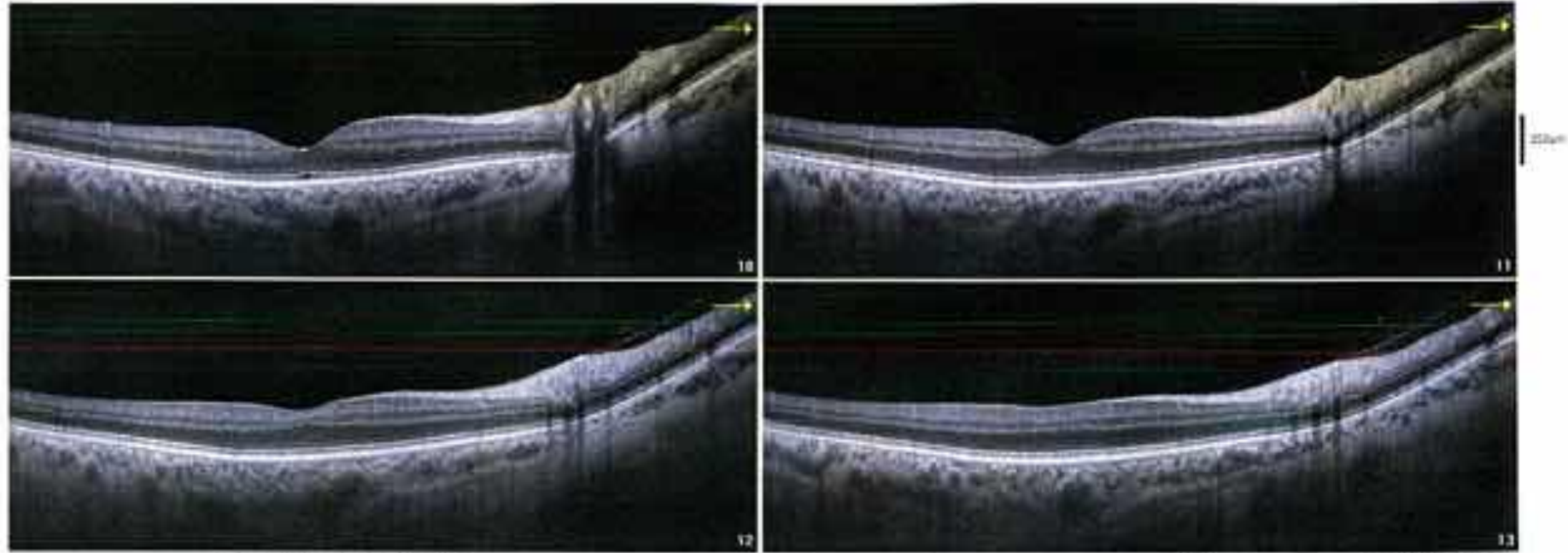
Signature:



Raster

Signal Strength Index 58

Right / OD



Select images for second print page.



Angio Retina

Scan Quality 8/10 SSI: 71

Left / OS

Eye/Angle SS Thickness DRG Review Color Scale

Fiducial OverView QuickView Retina Setting Flow

In-line View Superficial Deep Duke Retina Choroidplexus Vessel Capillary

Upper - DRG Offset(Lin) Lower - DRG Offset(Lin)

A to B Scan

Report Date: Tuesday 01/26/2021 10:27:41

Software Version: 2018.0.0.18

Comment:
Signature:

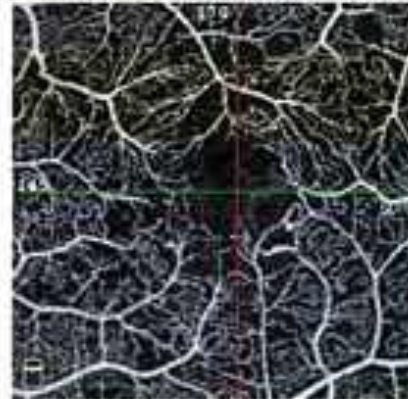


Angio Retina QuickVue

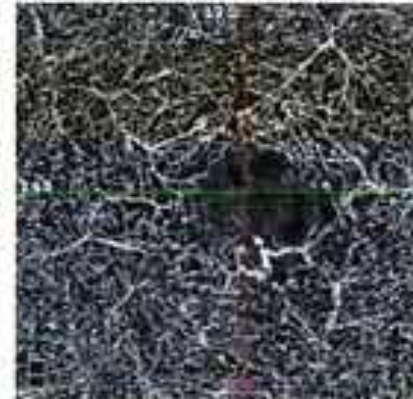
Scan Quality 9/10

30 x 30 Scan Size (mm)

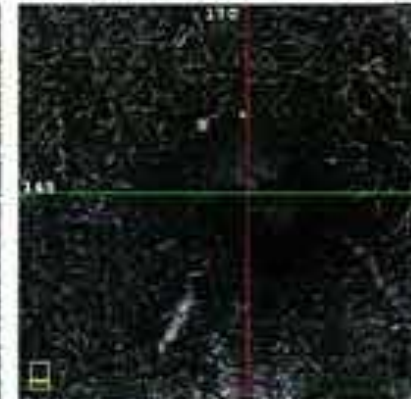
Left / OS



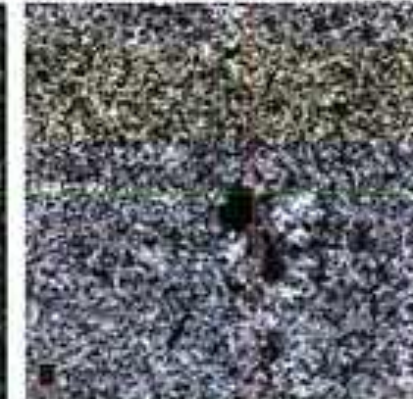
Superficial (ILM - IPL)



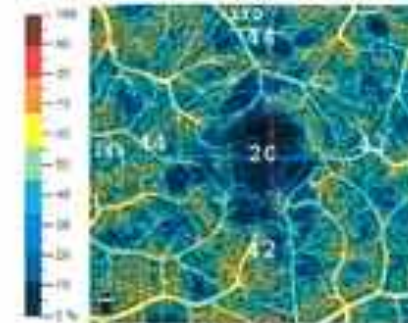
Deep (IPL - OPL)



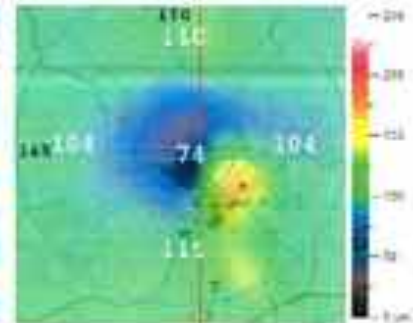
Outer Retina (OPL - BRM)



Chorocapillaris (IIRF - BRM+30um)



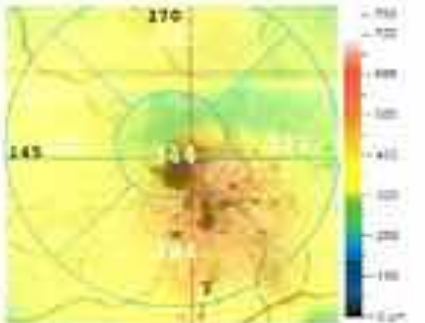
Vessel Density (Superficial)



Inner Thickness (ILM - IPL)



SLO



Full Thickness (ILM - IRPE)

Exit
Find
Overview

Show Lines

Show Find

Angio
Overlay

Auto Zoom



Thickness

Full

Overlay



Patient: darozafeshki, javood
Physician:
Operator:
Disease:

Farabi Eye Hospital
Ghazvin Square - Kargar Street - Tehran - Iran
Gender: Male
ID:

Exam Date: 01/20/2021
DOB(age): 01/01/1971 (50)
Ethnicity:
Algorithm Ver: A2018.0.0.18

Angio Retina QuickVue

Scan Quality 8/10

3.0 x 3.0 Scan Size (mm)

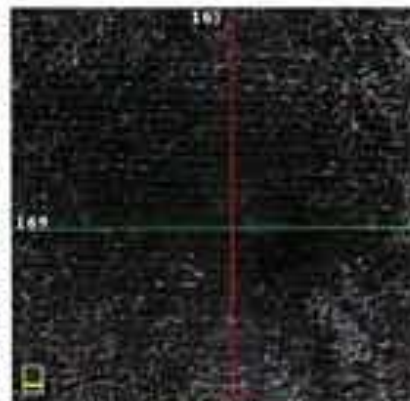
Left / OS



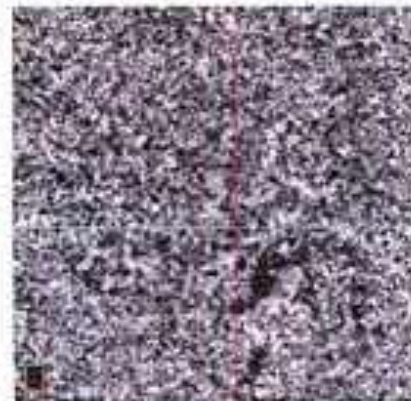
Superficial (ILM - IPL)



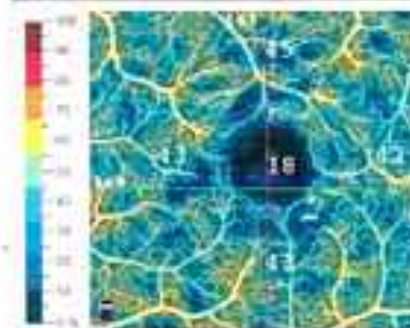
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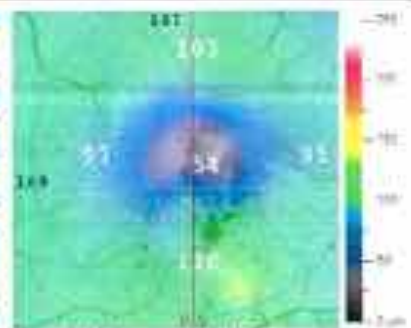
Outer Retina (OPL - BRM)



Choriocapillaris (BRM - BRM+30µm)



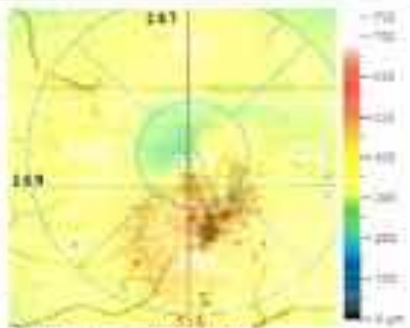
Vessel Density (Superficial)



Inner Thickness (ILM - IPL)



SLO



Full Thickness (ILM - BRM)

Edit
Print
Overview

Show Lines

Show Grid

Angio Overlay

Auto Zoom

Thickness

Full

Overlay

Report Date: Tuesday 01/26/2021 10:29:14

Software Version: 2018.0.0.18

Comment

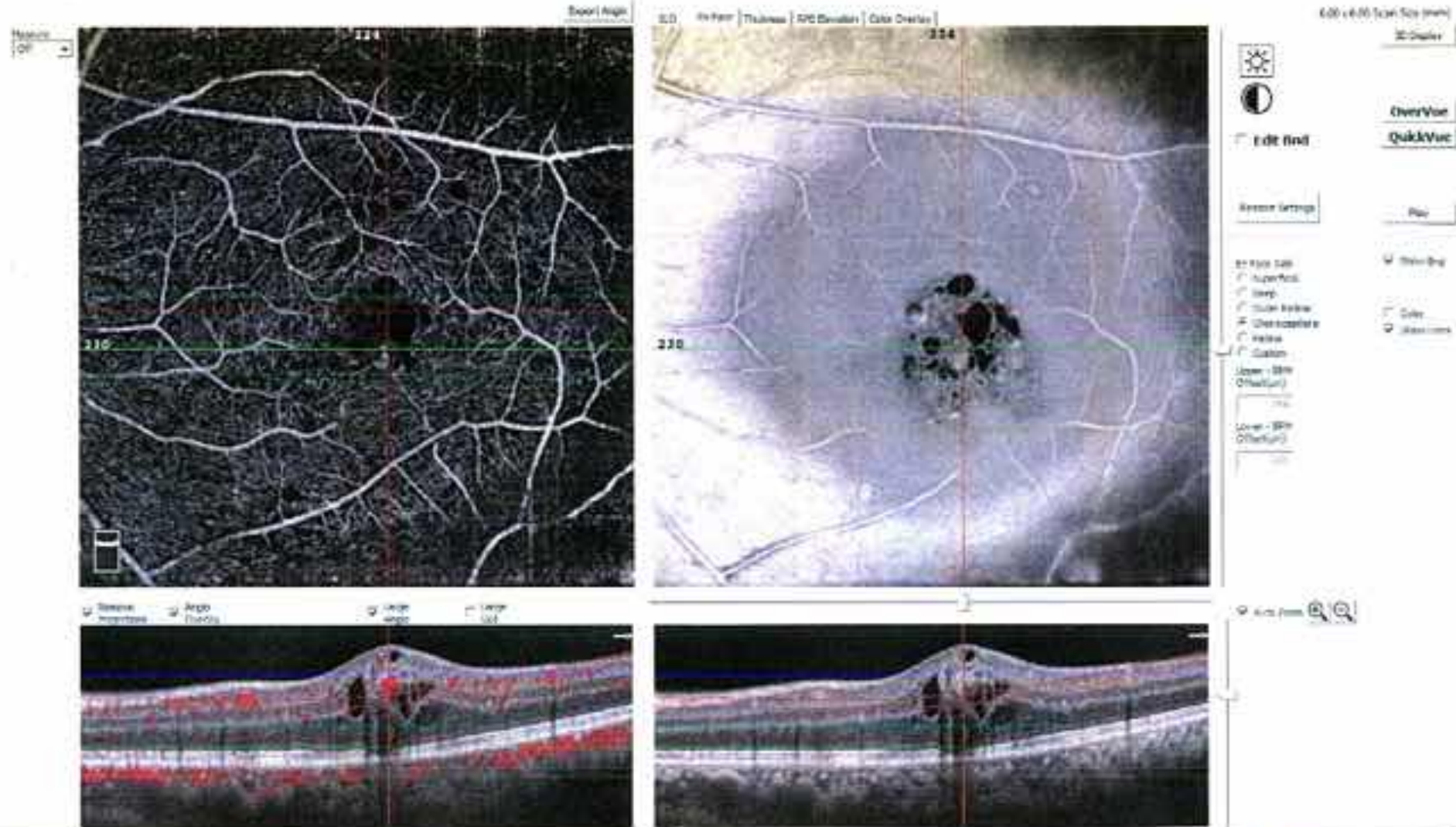
Signature



HD Angio Retina

Scan Quality 9/10 551 77

Left / OS



Report Date: Sunday 12/06/2020 10:01:59

Software Version: 2018.0.0.18

Comment:

Signature:



Patient: darezereshki davood
Physician:
Operator: rajabi maryam
Disease:

Farab Eye Hospital
Ghazvin Square - Kargar Street - Tehran - Iran
Gender: Male
ID:

Exam Date: 12/06/2020
DOB(age): 01/01/1971 (48)
Ethnicity:
Algorithm Ver: A2018.0.0.18

HD Angio Retina

Scan Quality 9/10 SSI 77

Left / OS

6.00 x 6.00 Scan Size (mm)

3D Debris

OverVue

QuickVue

Fill Best

Map

Image Settings

4- Eye Side

Superficial

Deep

Outer Retina

Outer Sulfur

Retina

Caples

Upper - Min Offset(Lin)

Lower - Min Offset(Lin)

Auto Zoom

Report Date: Sunday 12/06/2020 10:01:46 Software Version: 2018.0.0.18

Comment:
Signature:

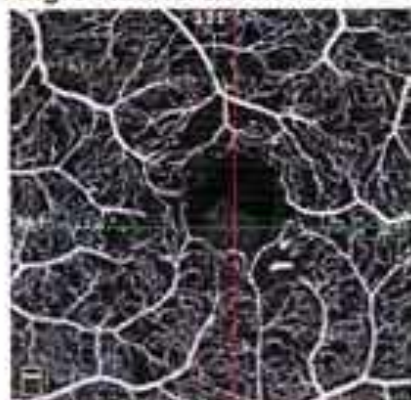


Angio Retina QuickVue

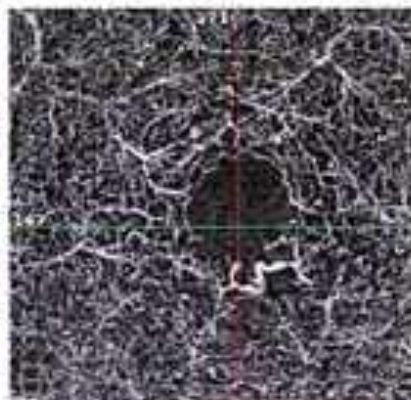
Scan Quality 8/10

3.0 x 3.0 Scan Size (mm)

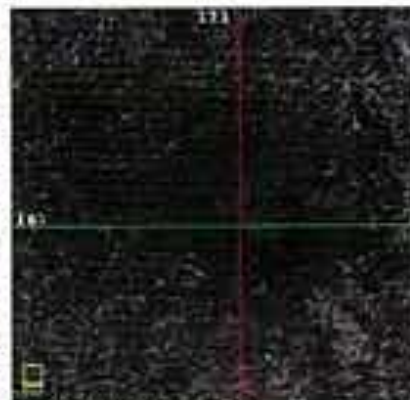
Left / OS



Superficial (ILM - IPL)



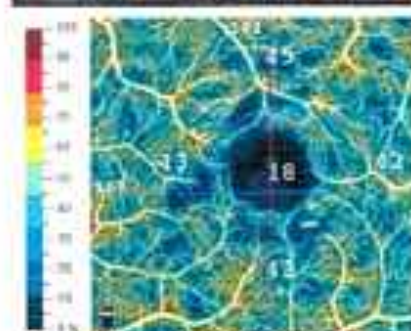
Deep (IPL - OPL)



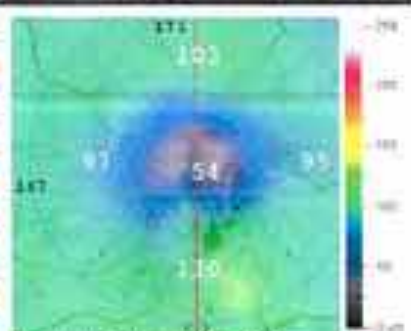
Outer Retina (OPL - BRM)



Choriocapillaris (BRM - BRM+30µm)



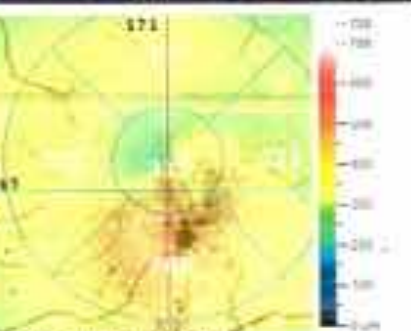
Vessel Density (Superficial)



Inner Thickness (ILM - IPL)



SLO



Full Thickness (ILM - RPE)

Exit

Print

Describe

Show Lines

Show End

Angio Overlay

Auto Zoom



Thickness

Full

Overlay



Background

it appears as perifoveal isolated aneurysm, appearing similar to a large microaneurysm, associated with small retinal hemorrhages, intraretinal exudation, and in some cases hard exudates

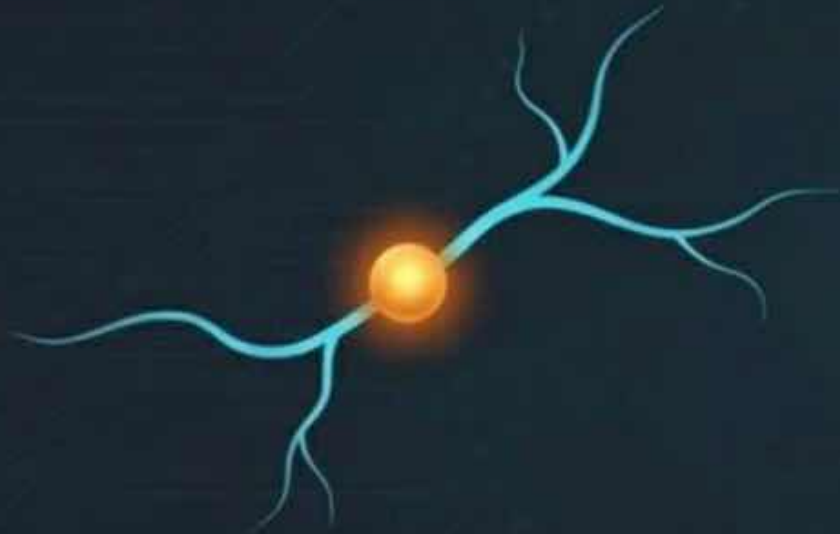
PEVAC was first described in 2011 as a unilateral, isolated perifoveal aneurysm in otherwise healthy patients.

Sacconi et al. (2017): expanded PEVAC spectrum PEVAC also seen with AMD, myopia, multiple myeloma

A 2025 Delphi consensus established the unified term **Large Retinal Capillary Aneurysm (LRCA)** — defined as a capillary aneurysm $\geq 100 \mu\text{m}$ in diameter on OCT with a hyperreflective wall and hyporeflective lumen — replacing inconsistent prior terminology.

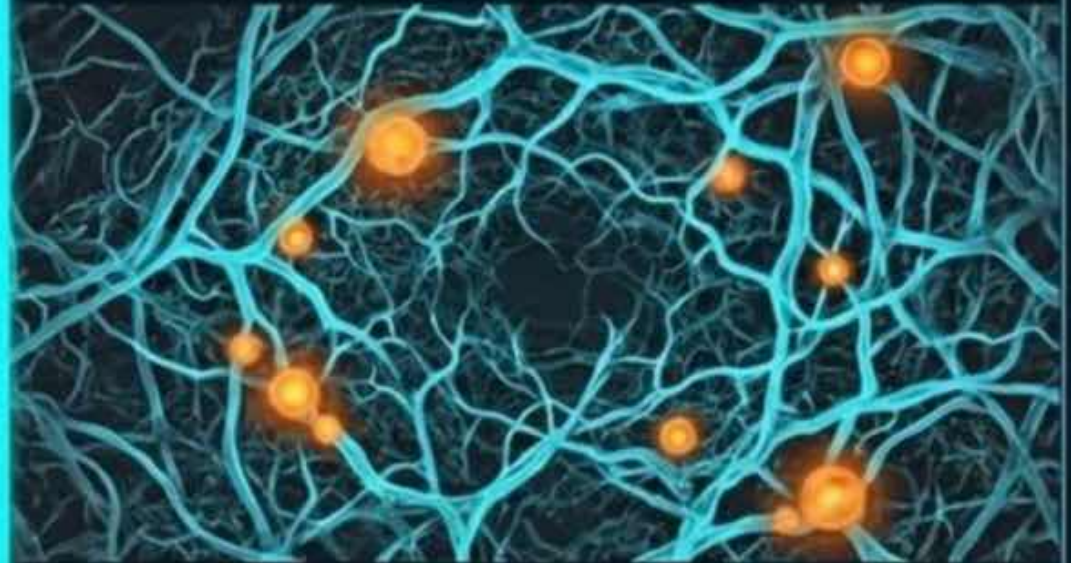
Diverging Contexts: Primary vs. Secondary Pathogenesis

Primary LRCA



(Historically PEVAC): An isolated, idiopathic structural failure occurring in patients with no history of retinal vasculopathy.

Secondary LRCA



(Historically TelCaps): A stress-induced dilation occurring against a backdrop of widespread ischemic or diabetic microangiopathy.

Diagnostic Differentiators at Presentation

	Primary LRCA	Secondary LRCA
Systemic Profile	Older, mean age 69 , healthy	Younger, mean age 64 , high incidence of DM/Hypertension
Laterality	100% Unilateral	Bilateral in ~19% of cases
Focality	Predominantly Unifocal (71%)	Highly Multifocal (48% present with multiple lesions)
Exudative Profile	Intraretinal fluid only	Intraretinal fluid, with Subretinal fluid present in 18.5% of cases

LARGE RETINAL CAPILLARY ANEURYSM

Clinical Features, Multimodal Imaging Characteristics, and Treatment Outcomes of Primary and Secondary Lesions

KEMAL TEKIN, MD, FEBO, MEHMET ALI SEKEROGLU, MD, SIBEL DOGUTZI, MD,
CEMILE UCGUL ATILGAN, MD, MERVE INANC, MD, MEHMET FATIH KAGAN DEGIRMENCI, MD,
HILAL KILINC HEKIMSOY, MD, MEHMET YASIN TEKEL, MD

Epidemiology of LRCA

- According to the Tekin 2026 study and prior literature, PEVAC is an extremely rare condition.
- The study included only 7 primary LRCA cases, reflecting its low prevalence.
- The mean age at presentation is approximately 70 years (range 55–79 years), making it a condition of the elderly.
- There is a slight female predominance (5 of 7 cases in Tekin’s series were female).
- The condition is almost always unilateral; bilateral PEVAC is exceptionally rare and, when reported, should raise suspicion for secondary causes or another diagnosis.
- No specific racial or geographic predilection has been identified, although most cases have been reported from European and Asian populations

Lesion Type	Origin	Typical Size	Threshold/Range	Notes
Microaneurysm	Capillaries	15–100 μm (mean ~35–50 μm)	Usually <100 μm	Smallest; tiny red dots
LRCA	Capillaries	$\geq 100 \mu\text{m}$	$\geq 100 \mu\text{m}$ (often >200 μm)	"Large" capillary type; unified term for previously variable names
Macroaneurysm (RAM)	Arterioles	100–250 μm	100–>500 μm	Largest; from bigger vessels

Clinical Presentation and Symptoms

- Patients with PEVAC typically present with gradual, painless, mild to moderate vision loss over weeks to months.
- The visual acuity at presentation is often relatively preserved compared to the degree of macular edema.
- Some patients may report metamorphopsia (visual distortion) or a small paracentral scotoma.
- Interestingly, despite significant intraretinal fluid on OCT, many patients do not experience severe vision loss, possibly because the foveal center is often spared until late stages.
- Acute vision loss is rare and suggests associated hemorrhage or progression of edema



OCT Findings: The Hallmark of Diagnosis

The classic OCT finding is a round or oval hyperreflective lesion located in the inner nuclear layer or outer plexiform layer

The lesion has a well-defined, highly reflective wall surrounding a central hyporeflective lumen (dark core)

Around the lesion, there are invariably intraretinal cystic spaces, which may be large and confluent

Posterior shadowing beneath the lesion is common due to the dense wall blocking light transmission

The horizontal and vertical diameters of the lesion can reach up to 320 micrometers





Fig. 1. Optical coherence tomography scans of affected and fellow eyes from patients in the primary and secondary LRCA groups. In a case from the primary group, B-scan images show no pathology in the right eye, whereas the left eye demonstrates a round hyperreflective lesion, having a reflective wall surrounding a dark lumen, with intraretinal cyst and hard exudates with posterior shadowing (superior figures). In a case with diabetic retinopathy from the secondary group, B-scan images reveal two round hyperreflective perifoveal aneurysmal lesions associated with small retinal hemorrhages in the right eye with intraretinal cystic spaces and hard exudates in both eyes (inferior figures).

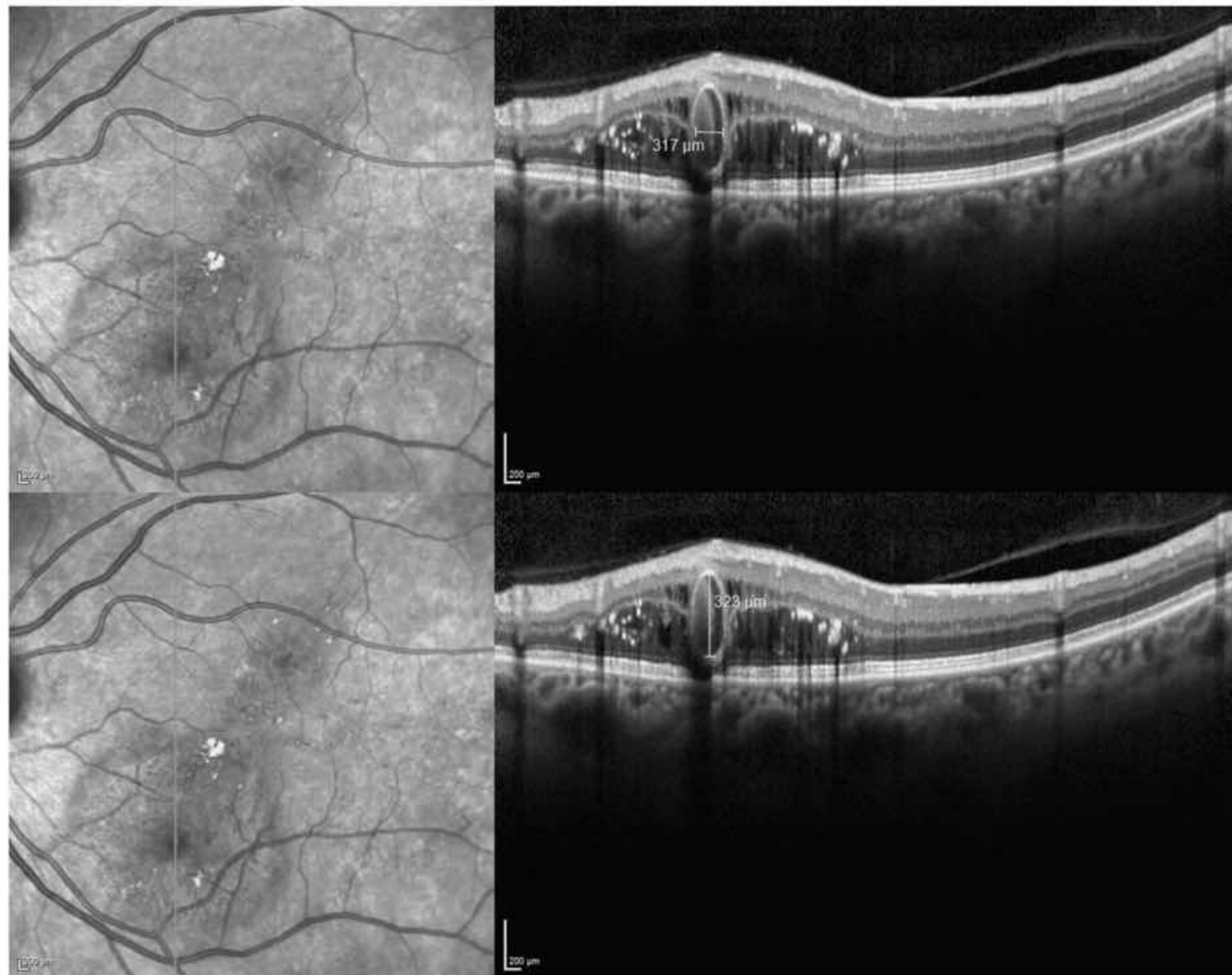
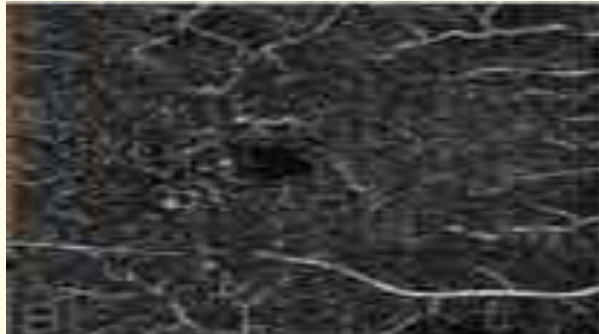


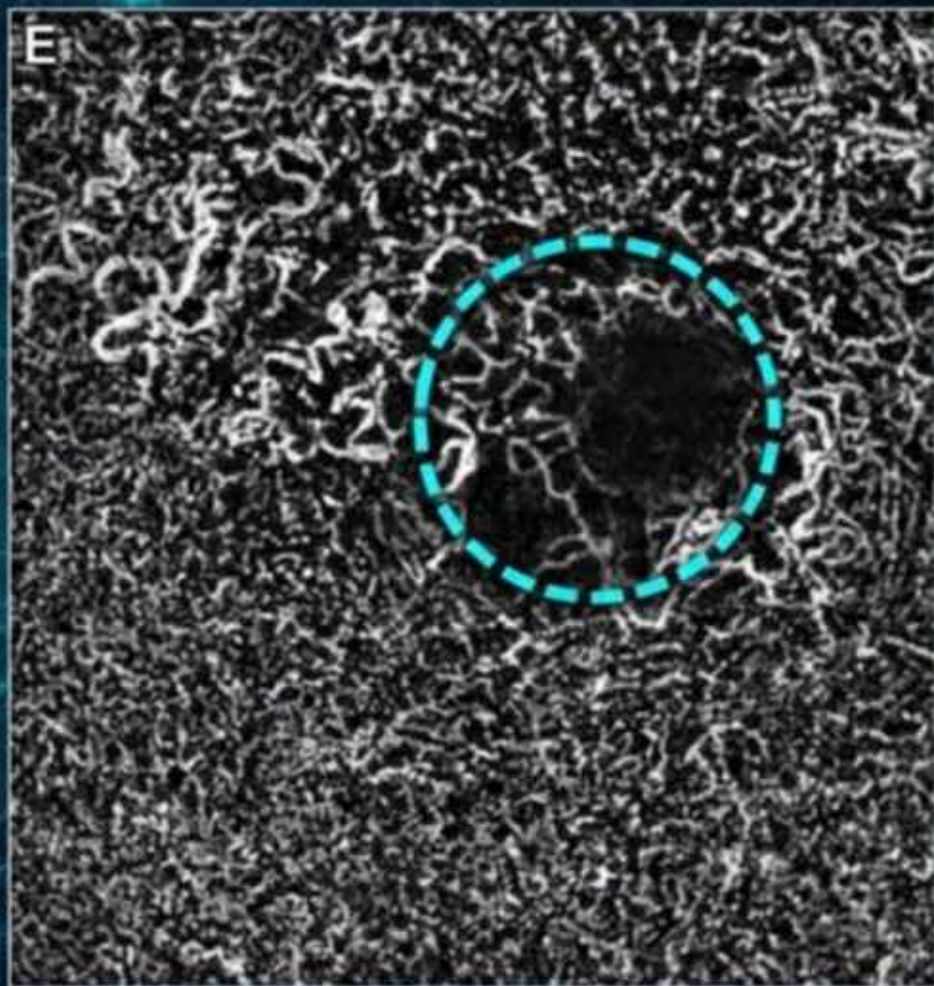
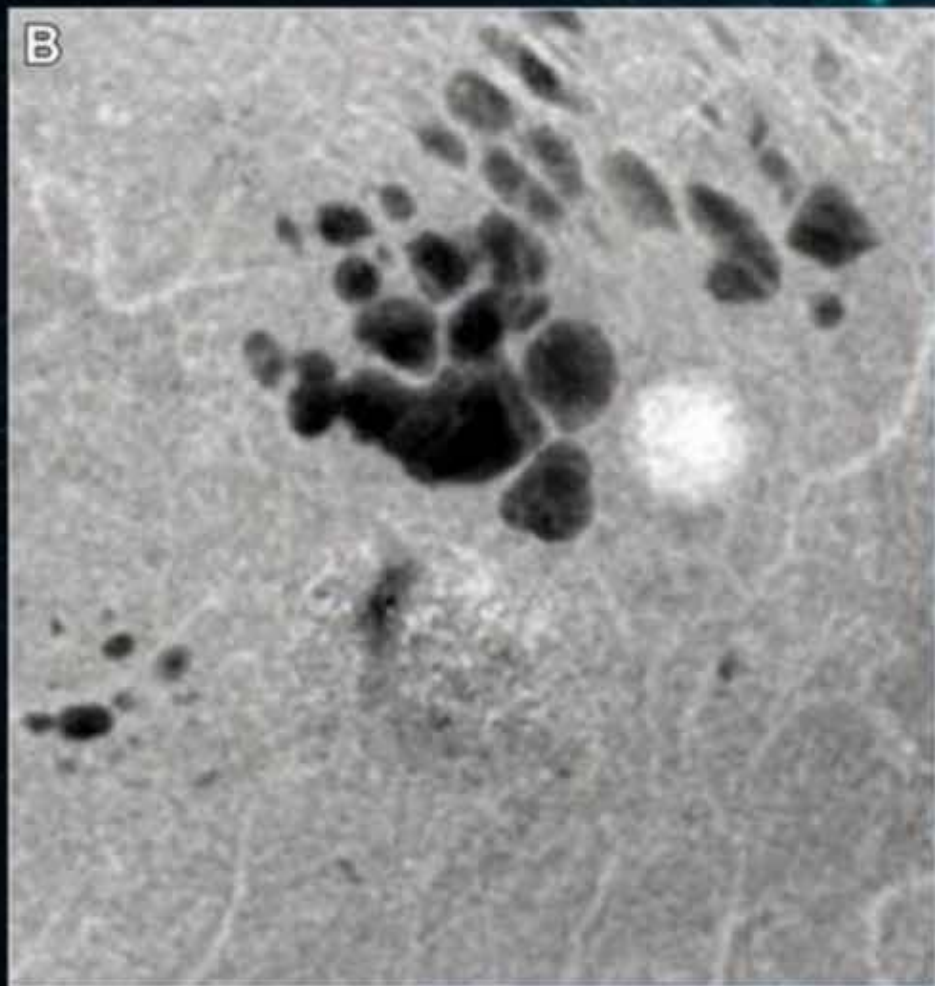
Fig. 2. Representative images showing horizontal and vertical diameter measurements of an aneurysmal lesion on B-scan using the internal caliper software of the Heidelberg Spectralis device. In this case, the horizontal diameter measured $317\ \mu\text{m}$, and the vertical diameter measured $323\ \mu\text{m}$.

OCTA Findings

- OCTA provides information about blood flow within the PEVAC lesion without dye injection.
- In the Tekin study, OCTA was performed in 5 primary LRCA cases. All showed detectable flow signals inside the aneurysmal lumen, confirming that the lesion is not thrombosed or avascular.
- The flow is most often localized to the deep capillary plexus (DCP) , although some lesions show involvement of both the superficial and deep plexuses.
- The surrounding capillary network may appear normal or show mild rarefaction.
- The en-face OCTA view shows the lesion as a well-circumscribed, round flow signal.



The Decorrelation Blindspot in OCT-Angiography



- **The Limitation:** OCTA relies on detecting red blood cell motion (decorrelation) above a specific velocity threshold.
- **The Reality:** Due to the massive dilation of the LRCA, internal flow becomes highly turbulent, stagnant, or virtually absent.
- **The Takeaway:** The motion of blood within the LRCA falls below the OCTA sensitivity threshold. **Do not use OCTA as a rule-out tool for these aneurysms.**

Fluorescein Angiography (FFA) Characteristics

- On FA, PEVAC appears as well-defined, round, focal hyperfluorescence
- visible during the early arterial or arteriovenous phase
- It represents filling of the aneurysmal lumen with dye
- In the late frames, there is minimal to no leakage of dye
- This "non-leaky" or "low-leakage" pattern is a key distinguishing feature
- No capillary non-perfusion is seen in the surrounding macula
- No neovascularization or other vascular abnormalities are present

Indocyanine Green Angiography (ICGA) Findings

- ICGA reveals the same hyperfluorescent lesion seen on FFA
- There is no late leakage on ICGA either
- ICGA confirms that the lesion is a true vascular aneurysm, not a tumor or inflammatory granuloma
- No associated choroidal vascular abnormalities are present
- The surrounding choroidal circulation appears completely normal

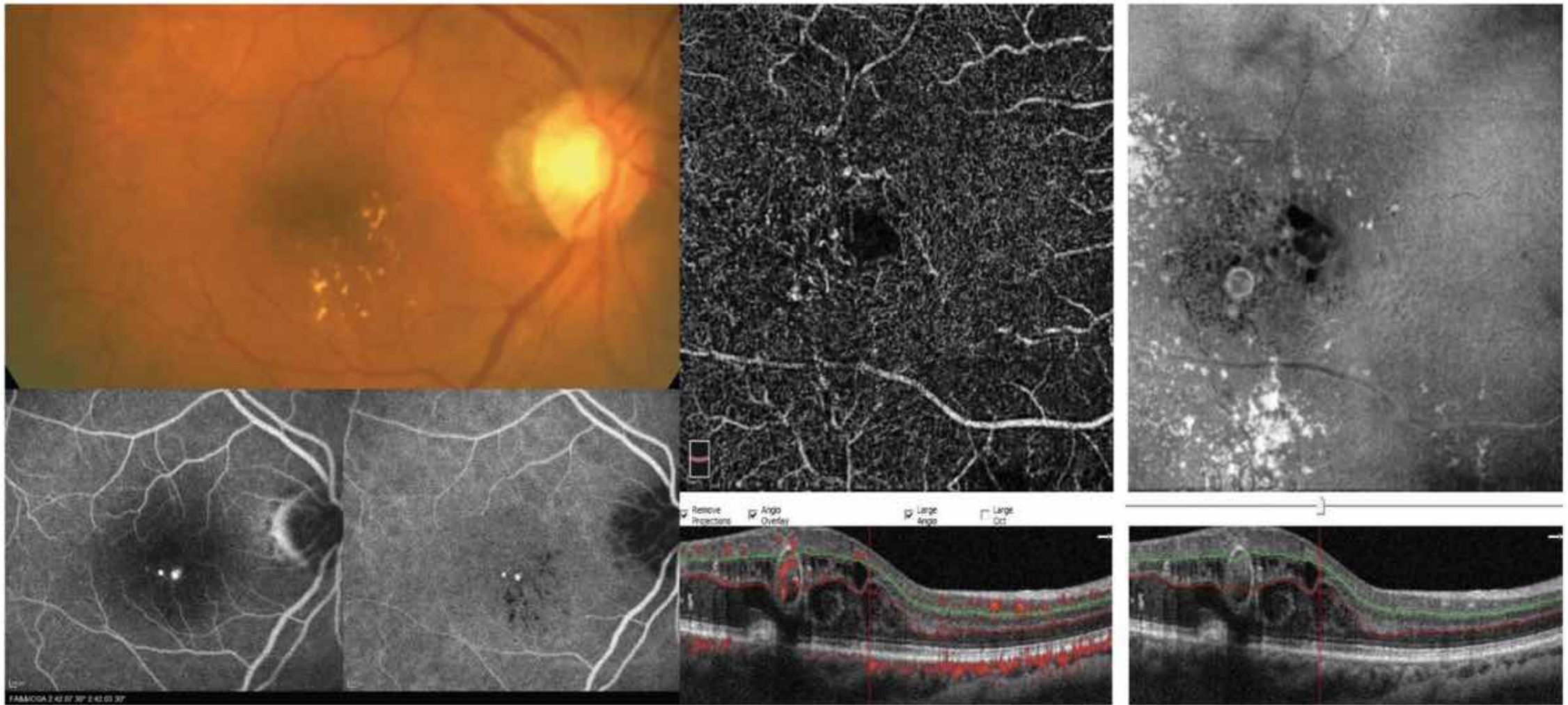
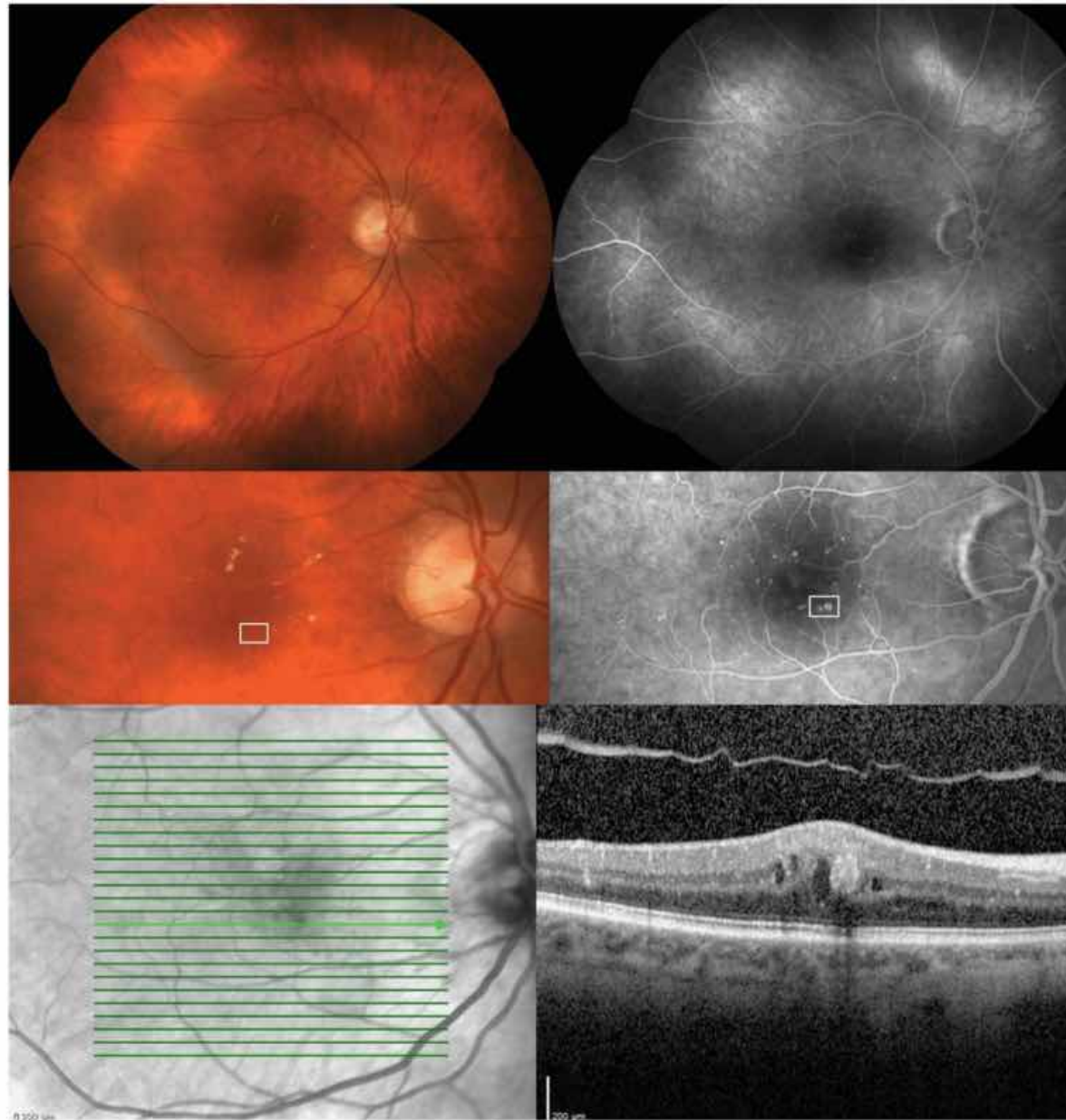


Fig. 3. Multimodal imaging including color fundus photography, fundus fluorescein angiography, indocyanine green angiography, and optical coherence tomography angiography characteristics of a case with primary LRCA. The color fundus image shows two perifoveal aneurysmal lesions with hard exudates. Fundus fluorescein angiography and indocyanine green angiography images clearly demonstrate two well-defined, round hyperfluorescence suggesting perifoveal aneurysmal lesions with no leakage. These perifoveal aneurysmal lesions are well visualized on the deep capillary plexus slab of en-face optical coherence tomography angiography. The corresponding optical coherence tomography B-scan reveals flow that is present inside the aneurysmal lesion with intraretinal cystic spaces nearby.

Fig. 4. Multimodal imaging including color fundus photography, fundus fluorescein angiography, and optical coherence tomography characteristics of LRCAs in a patient with non-proliferative diabetic retinopathy. The composite fundus image shows microaneurysms and hard exudates consistent with nonproliferative diabetic retinopathy, along with two larger inferior perifoveal aneurysmal lesions visible in the macular inset (boxed area). Fundus fluorescein angiography exhibits widespread dot hyperfluorescence suggesting microaneurysms and two well-defined, round hyperfluorescence indicating the perifoveal aneurysmal lesions (boxed area). Optical coherence tomography angiography scan passing through the perifoveal aneurysmal lesions reveals two round hyperreflective lesions with intraretinal cystoid spaces.



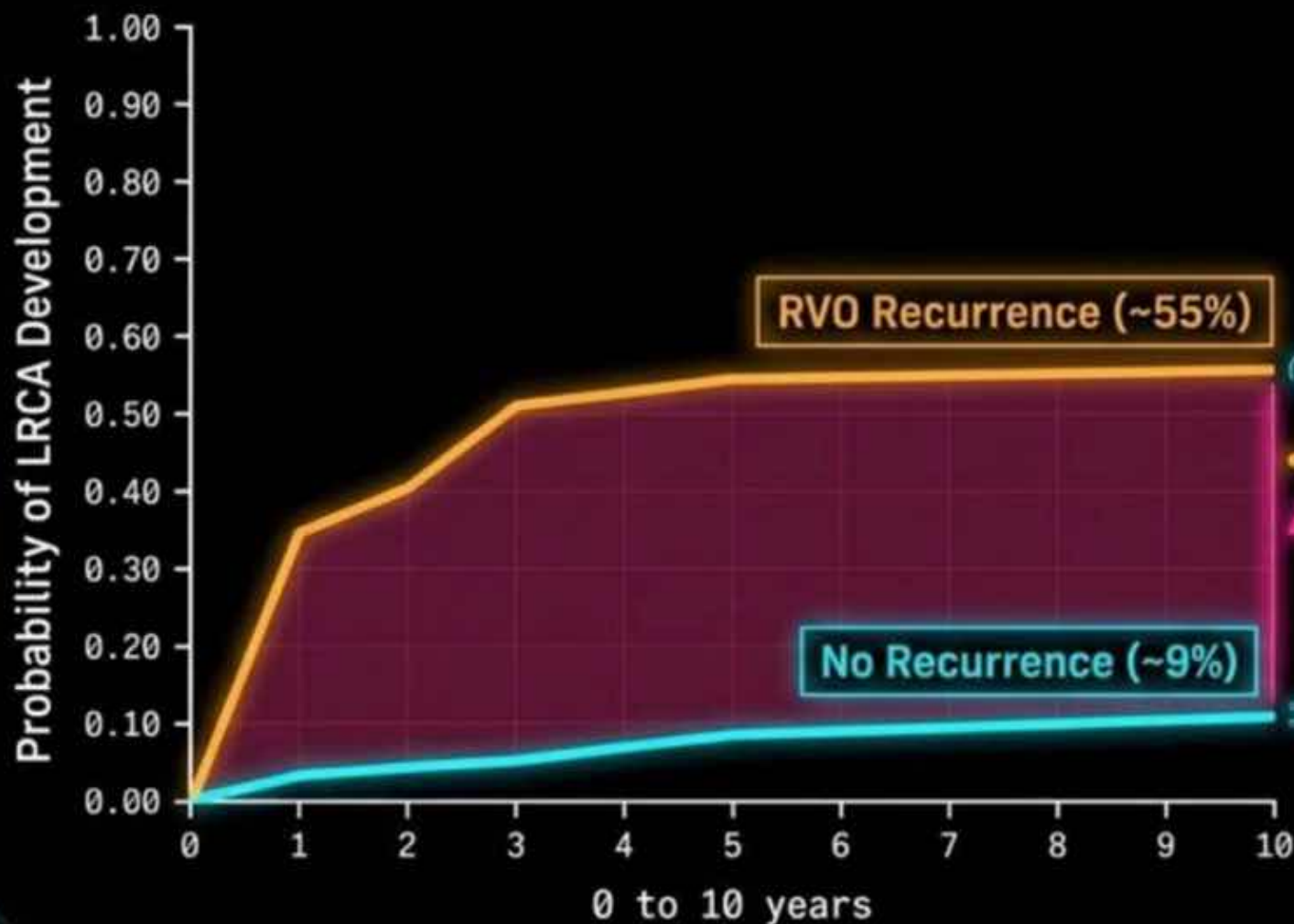
Pathophysiology: What is Known?

- The exact pathophysiology of PEVAC remains incompletely understood
- The leading hypothesis involves focal and progressive pericyte loss and endothelial cell damage
- Pericytes are cells that wrap around retinal capillaries and maintain vascular stability
- Pericyte loss leads to weakening of the capillary wall and aneurysmal dilatation
- There is no associated retinal ischemia or significant inflammation

Pathophysiology: The MMP Hypothesis

- Spaide and Barquet proposed that larger capillary aneurysms may have increased expression of MMP-9
- MMP-9 is an enzyme responsible for degrading basement membrane proteins
- Degradation of the basement membrane leads to decreased pericyte coverage
- Pericyte loss then leads to focal weakening and aneurysmal dilatation
- This process is progressive and localized to the affected capillary segment
- The absence of ischemia explains the lack of VEGF-driven leakage
- This hypothesis is still under investigation and not yet proven

The Recurrence Trigger: Venous Pressure Spikes Drive Formation



The Precipitating Event:

An exacerbation of the venous occlusive event causes localized pressure spikes that balloon pre-existing dilated capillaries.

The Data:

At a 5-year follow-up, the risk of developing an LRCA is ~9% in stable patients.

The Danger Zone:

If a patient experiences an RVO recurrence, their 5-year risk of developing an LRCA skyrockets to ~55% (Hazard Ratio 8.74).

Treatment Landscape

Anti-VEGF Agents

Bevacizumab, ranibizumab, aflibercept — typically minimal or no response. Pathogenesis involves pericyte loss and endothelial injury, not VEGF upregulation.

Intravitreal Steroids

Dexamethasone implant and triamcinolone show improvement in secondary LRCA (particularly DR-associated). Corticosteroids may stabilize tight junction integrity.

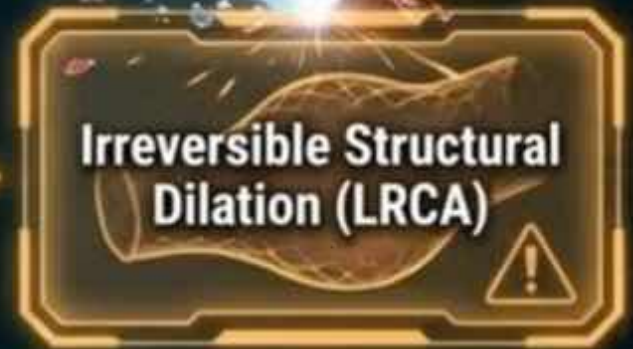
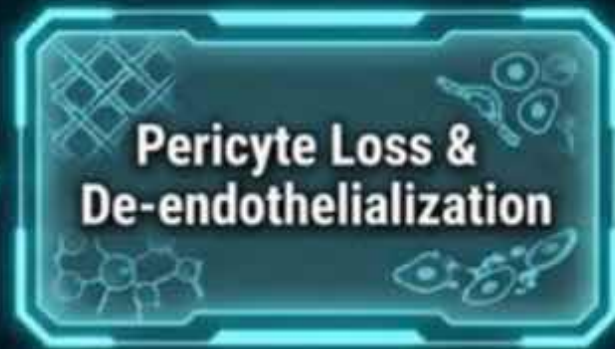
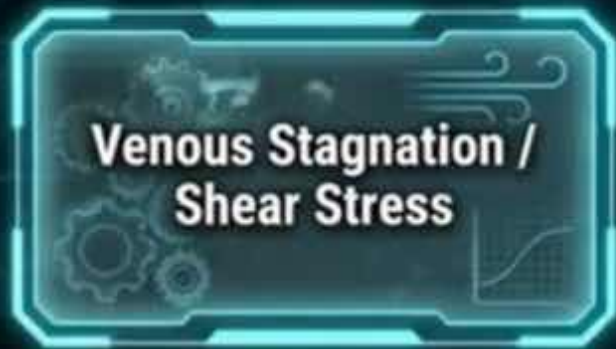
Laser Therapy

Conventional thermal laser risks paracentral scotomas. Subthreshold micropulse laser is a promising, safer alternative with no detectable RPE or photoreceptor damage.

Topical NSAIDs

Topical diclofenac 0.1% twice daily used in one primary LRCA case — no significant change in BCVA or CMT observed.

The Anti-VEGF Resistance Pattern



• **Structural, Not Chemical:**
Anti-VEGF therapy targets endothelial hyperpermeability and neovascularization.

• **The LRCA Reality:**
LRCA are physical, acquired de-endothelialized dilations driven by pericyte loss and mechanical wall breakdown.

• **The Result:**
Because focal leakage from an LRCA is largely VEGF-independent, standard anti-VEGF monotherapy consistently fails to resolve the exudation or collapse the macroaneurysm.

Treatment Outcomes Hinge on the Underlying Pathology

Primary LRCAs



Response to Treatment

- Idiopathic Origin** **Highly Refractory**
Follow-up studies show near-zero anatomical or visual acuity improvement following anti-VEGF or Dexamethasone implants. Lesions persist completely unchanged.



Secondary LRCAs



CMT (Central Macular Thickness) Reduction

- Diabetic/RVO Origin** **Modestly Responsive**
While resistant to anti-VEGF monotherapy, these lesions show significant anatomical improvement and reductions in CMT following a switch to intravitreal corticosteroid implants (Dexamethasone).



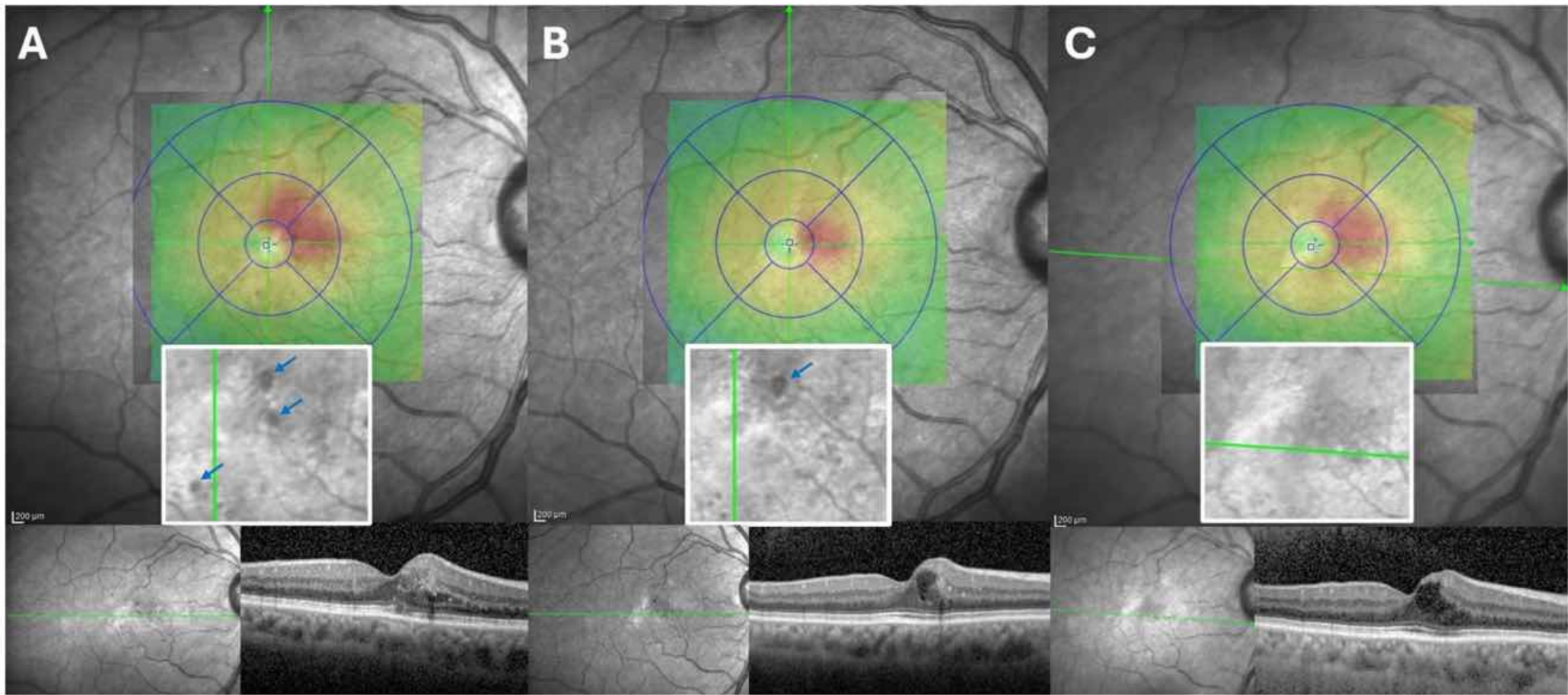


Fig. 2 Demonstrative case of telangiectatic capillaries (TelCaps) remodeling over time. At presentation (A), three TelCaps were noted on infrared reflectance (IR), two superonasal to the fovea (126 and 114 μm), and one infero-temporal (104 μm) to it (blue arrows). On corresponding B-scans, there was center-involving diabetic macular edema (central subfield thickness [CST]=321 μm). After 12 months of follow-up and three intravitreal injections of aflibercept (B), the last

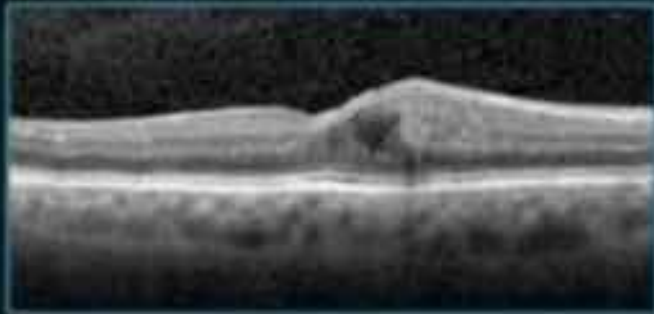
being 2 months prior, two TelCaps disappeared, and one remained with stable diameter on IR (121 μm). On B-scans, intraretinal fluid was now arranged in a chronic cystic appearance (CST: 338 μm). At the final follow-up of 21 months and after 2 more aflibercept injections (C), the last being 4 months prior, no TelCaps were detected on IR, and B-scans showed breakdown of the hyperreflective TelCap wall, with enlargement of the chronic cystic space (CST=328 μm)

Month 0



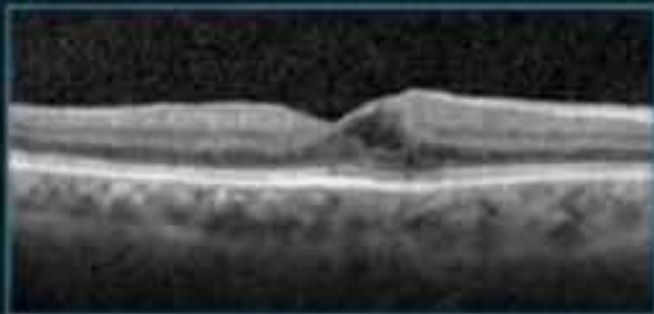
CST: 321 μm

Month 12



CST: 338 μm

Month 21



CST: 328 μm

- **Dynamic Remodeling:**

Over an average 44-month follow-up, 44% of LRCAs naturally disappear or shrink in size following early, intensive treatment.

- **The Edema Trap:**

Paradoxically, anatomical resolution of the aneurysm does not equate to clinical recovery. Mean CST increased from 325 μm to 355 μm despite the disappearance of the TelCaps.

- **Conclusion:**

LRCAs act as an aggressive trigger for chronic, intractable edema that persists long after the structural aneurysm has collapsed.

The Future Standard of Care Protocol

Step 1: Non-Invasive Screening



Step 2: Gold-Standard Confirmation



Step 3: Targeted Intervention



Screen (Months 12–36):

Actively monitor RVO/DME patients using Infrared Reflectance (IR) and high-density structural OCT, especially following any recurrence event.

Confirm: If an ≥ 100 μm lesion is suspected, utilize ICGA to confirm parietal wall and luminal staining. Do not rely on OCTA.

Intervene: Pivot away from anti-VEGF monotherapy. Consider Dexamethasone implants for secondary inflammatory edema, or utilize ICGA-guided / subthreshold micropulse laser for direct structural targeting of the aneurysm.

The Clinical Blueprint

1

Unified Nomenclature



PEVAC and TelCaps are functionally identical structures; utilize the consensus term LRCA for $\geq 100 \mu\text{m}$ capillary aneurysms.

2

The Modality Trap



Infrared Reflectance and ICGA are required for accurate sizing and confirmation; slow blood flow renders them invisible on OCT-Angiography.

3

The Recurrence Danger



A single RVO recurrence catapults the 5-year risk of developing an LRCA from 9% to 55%.

4

The Treatment Pivot



LRCA's represent structural pericyte failure, not just VEGF over-expression. Shift treatment strategies toward targeted laser or steroids when anti-VEGF regimens stall.

THANKS