

*Pre-Congresso  
Corso Teorico - Pratico  
di Semeiotica Strumentale*

**Resp. Scientifico  
Amedeo Lucente**

**2 Ottobre 2015**  
Grand Hotel Balestrieri



*6 crediti ECM*

# **Angio-Oct e fluorangiografia**

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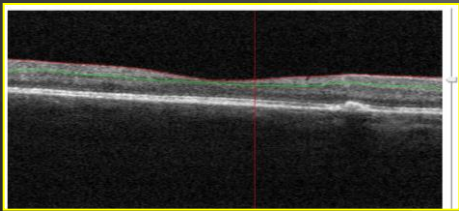


Department of Ophthalmology  
University of Insubria, Varese - Italy  
Chairman: Claudio Azzolini MD

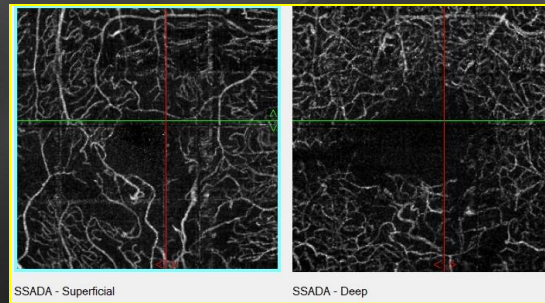
# Due metodi a confronto

- Due approcci diversi

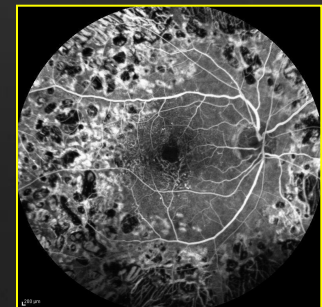
- OCT

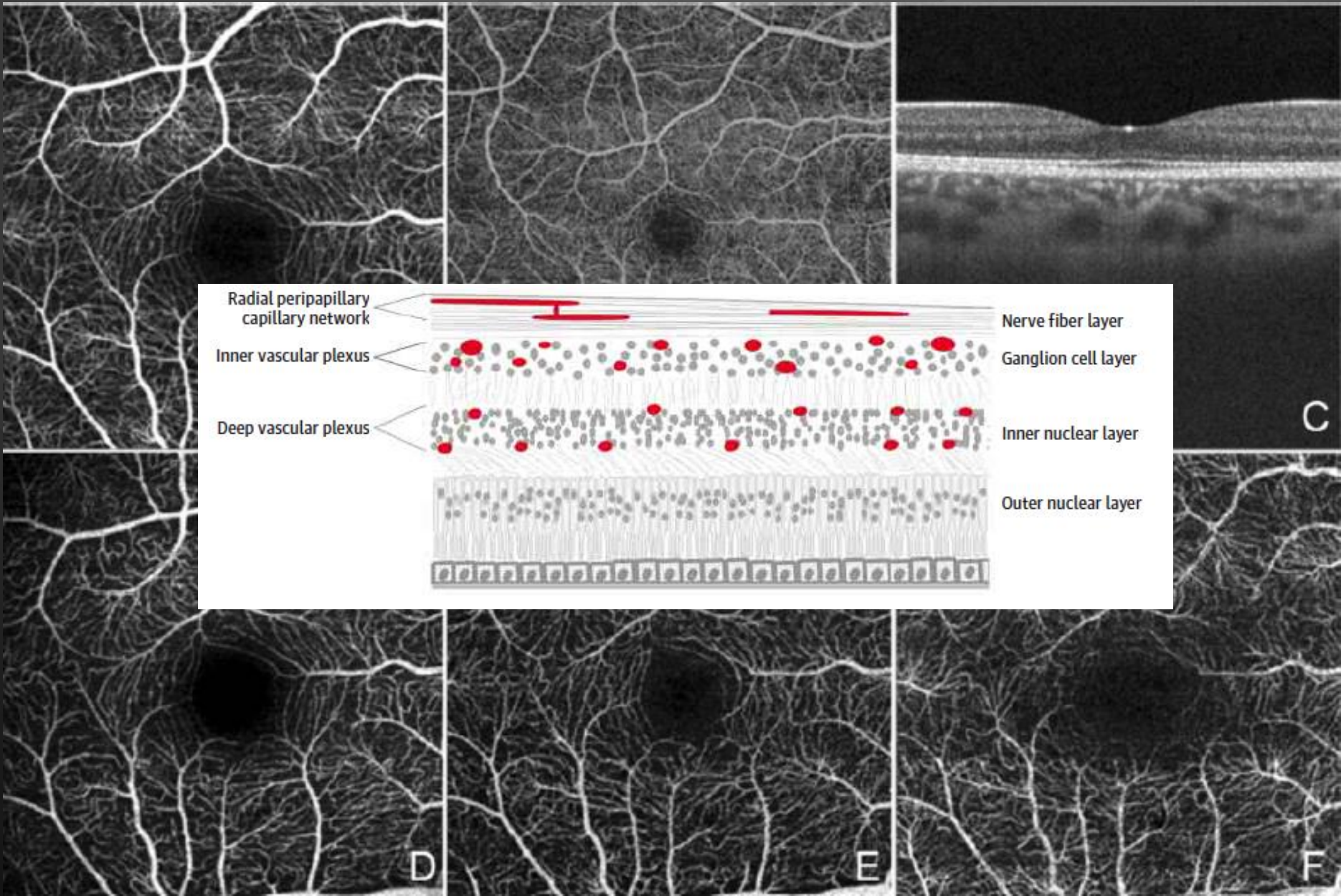


- ANGIO OCT



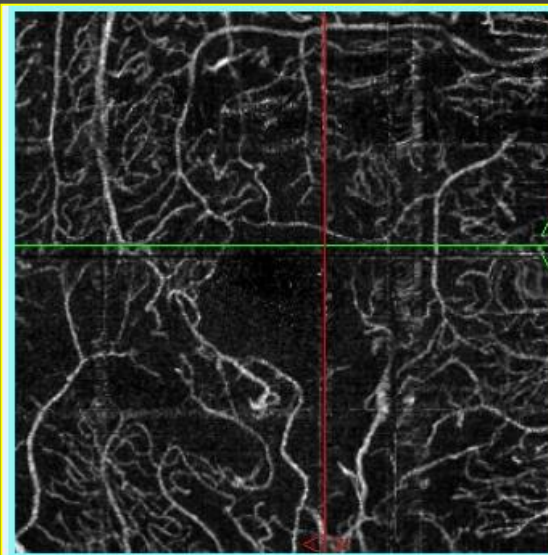
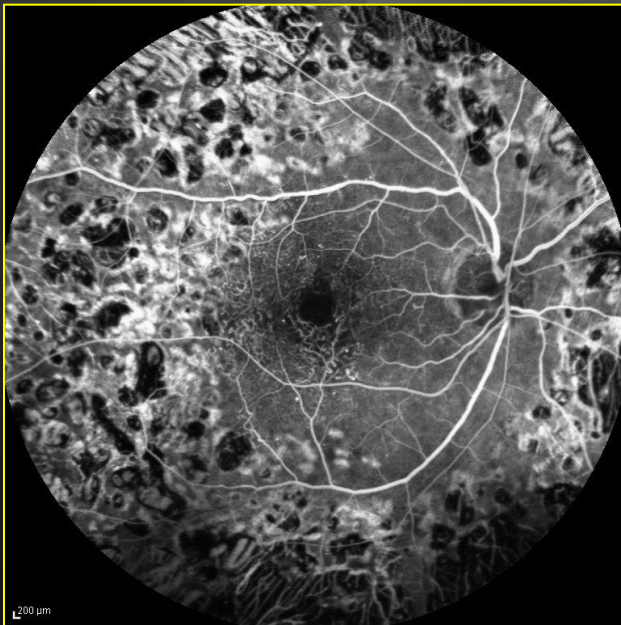
- FAG



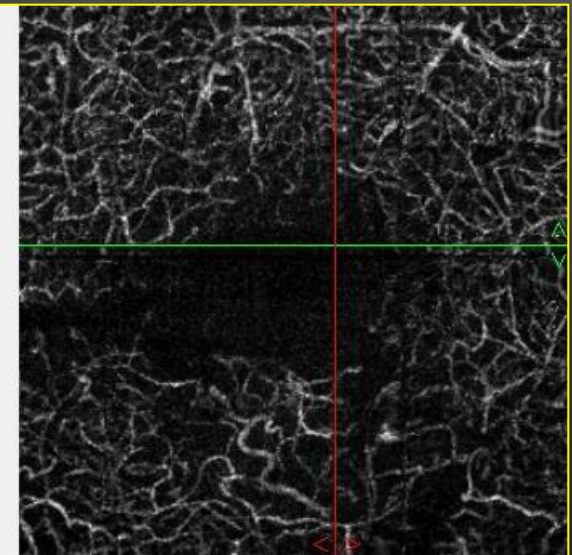




- Fotografia del fundus con colorante
- Stratigrafia retinica senza mezzo di contrasto



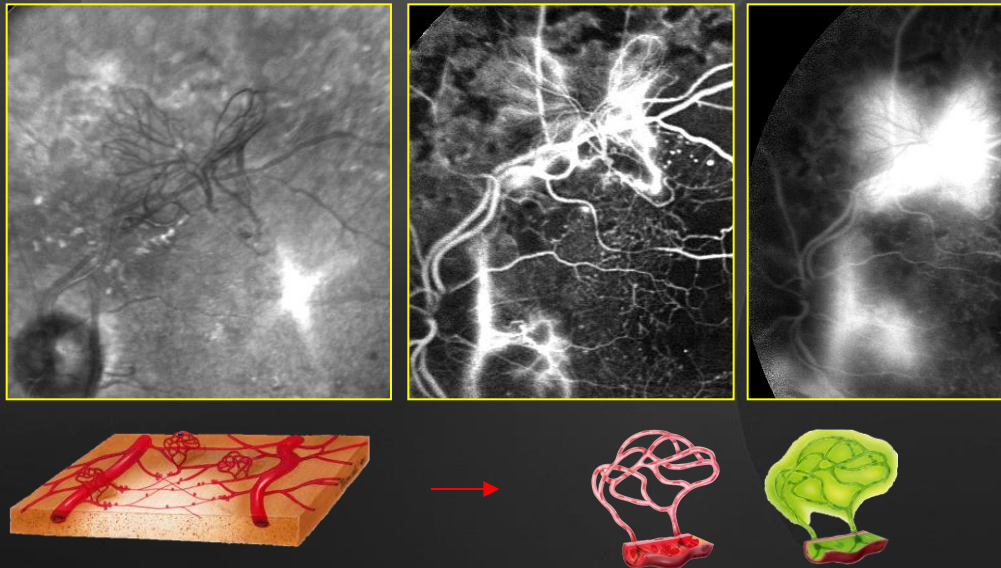
SSADA - Superficial



SSADA - Deep

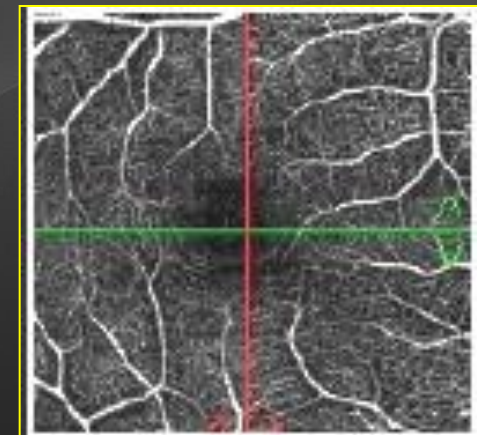
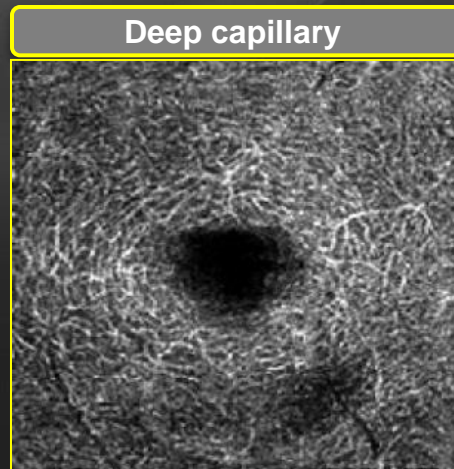
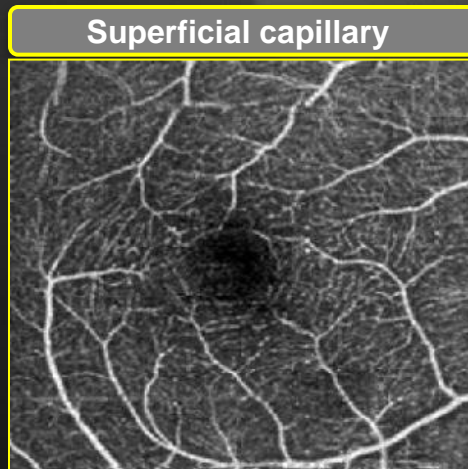
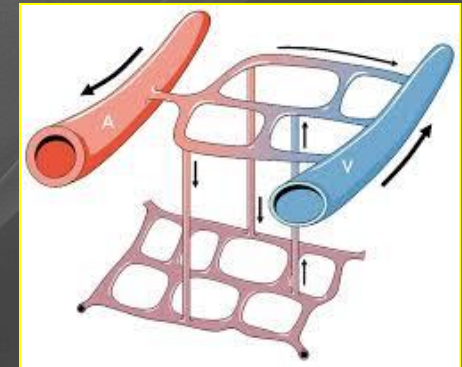
# Due metodi a confronto

- Fluorangiografia retinica
  - Cosa mostra
  - Anatomia vascolare retinica



# Due metodi a confronto

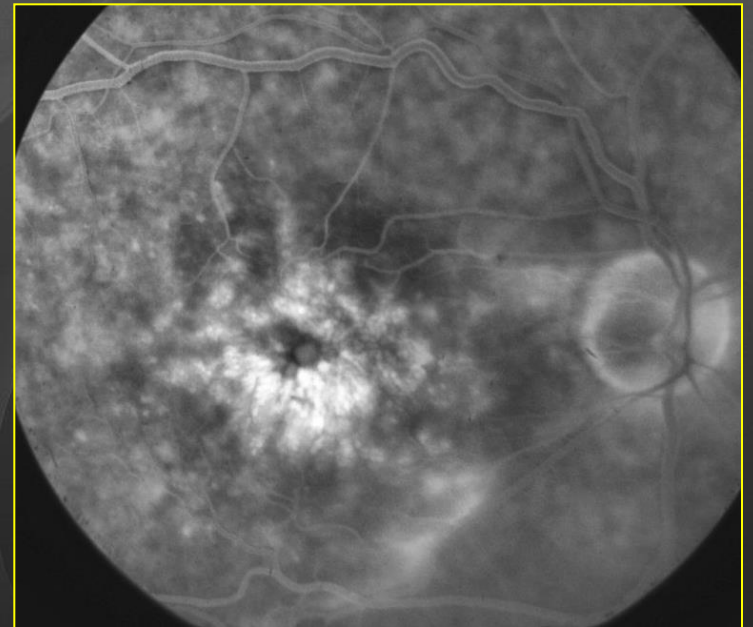
- Angio OCT
  - Cosa mostra
  - Anatomia retinica diversa





# Approccio al paziente: differenze

- Colorante
- Collaborazione
- Velocità dell'esame
- Fasi dell'esame



# Operatore: come analizzare l'esame

- **FAG**

- Fasi dell' esame
- Leakage, Staining e Pooling
- Ipoperfusione

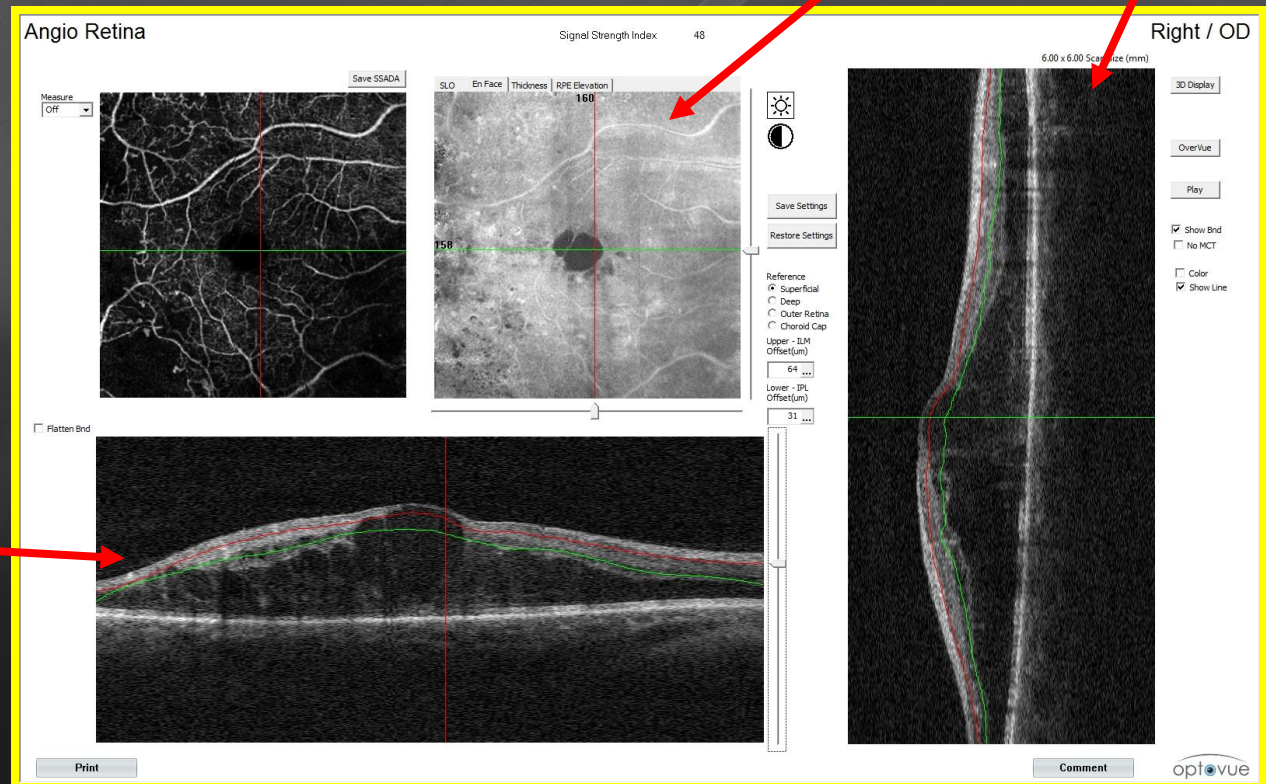
- **ANGIO OCT**

- Morfologia dei vasi - Decorso dei vasi
- Livello di scansione
- Ipo-ipereflettività
- Perfusione



# Abbinamento con altri esami

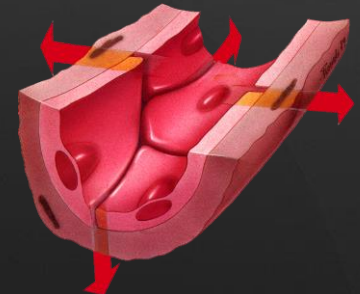
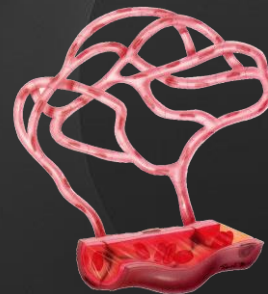
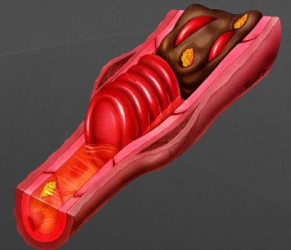
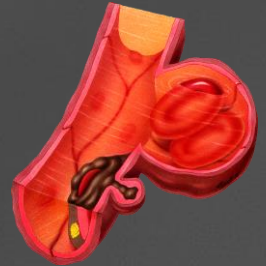
- B scan OCT
- En face OCT



# Esempio di patologia

# Diabetic retinopathy: a vascular pathology

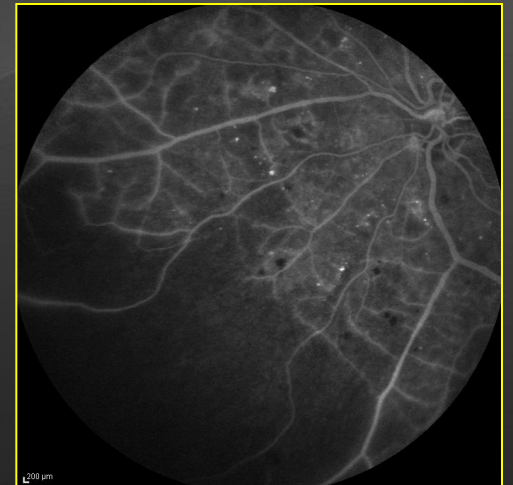
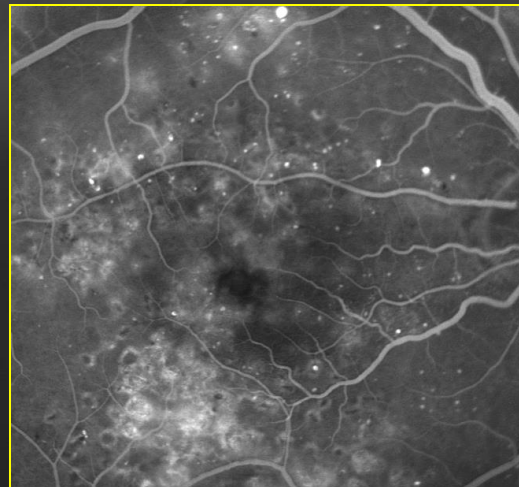
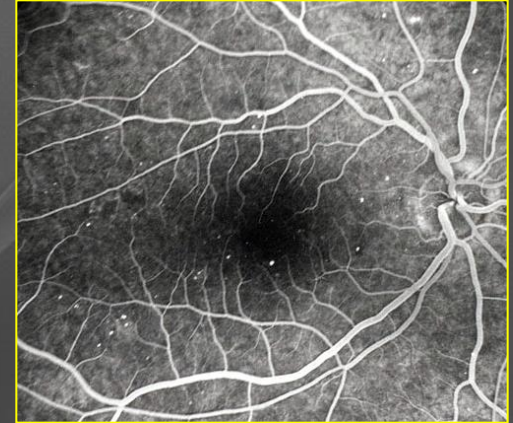
- Early vascular alterations
- Superficial and deep layers
  - Vascular dilatation
  - Vascular occlusions
  - New vessels
- Alterations on the vessels wall
  - Fluid leakage





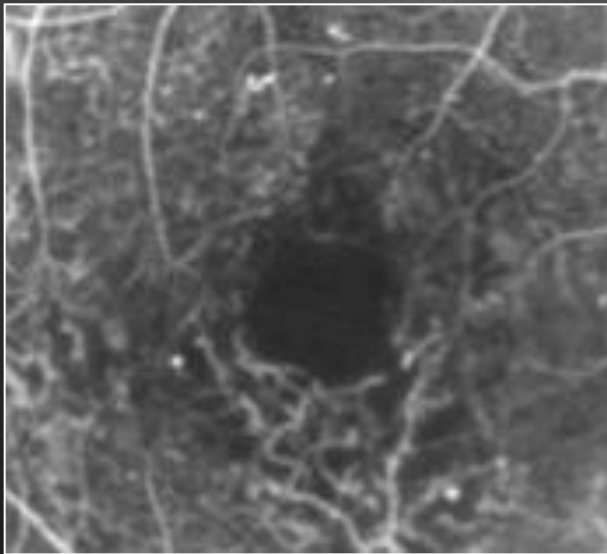
# Diabetic retinopathy follow up

- Fundus imaging
  - Screening and pathology follow up
- OCT B scan
  - Intraretinal and epiretinal lesions
- Fluorescein angiography
  - Vascular alterations on flow and leakage
- Today: Angio OCT
  - All previous elements

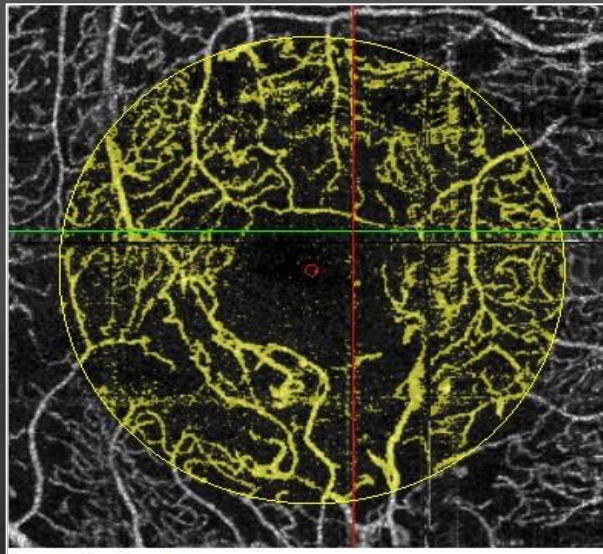


# Angio OCT and FAG on RD

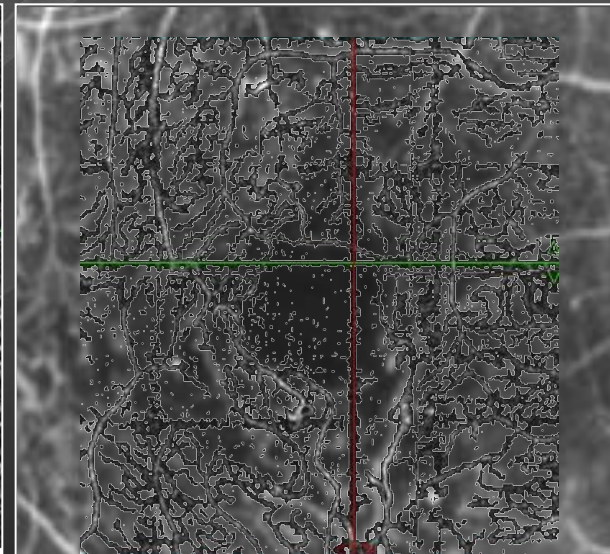
- Correspondence of different imaging



Angiography in a diabetic eye: reduction of vascular network



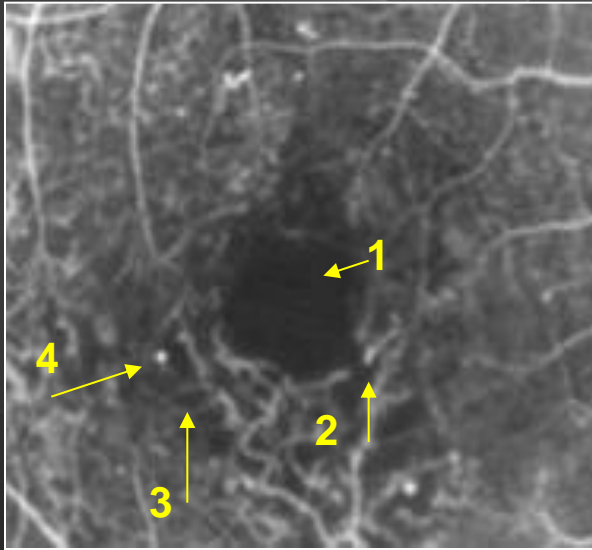
Angio OCT: vascular network definition (yellow)



Angio OCT- FAG overlapping: correspondence of retinal vascular network

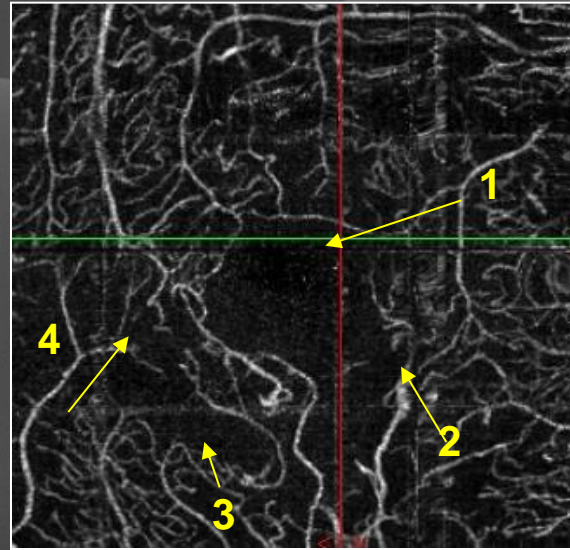


# Angio OCT and FAG on RD



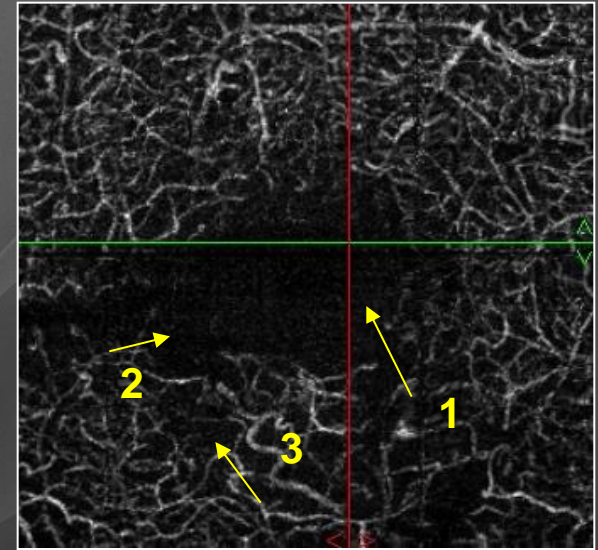
FA of diabetic retinopathy:

- 1) enlargement of FAZ,
- 2) vascular occlusion,
- 3) hypoperfusion area,
- 4) microaneurism



Angio OCT of the same patient, superficial vascular network:

- 1) enlargement of FAZ,
- 2) vascular occlusion,
- 3) hypoperfusion area,
- 4) microaneurism



Angio OCT of the same patient, deep vascular network:

- 1) enlargement of FAZ,
- 2) vascular occlusion,
- 3) hypoperfusion area



# Ischemia extension

Grey scale: *threshold*

Angio Retina

Measure: NonFlow

Use Left Mouse Btn to Drop Seed

Undo

Clear

Non Flow Area (mm<sup>2</sup>): 6.129

Flatten Bnd

Print

Angio Retina

Measure: Off

Save SSADA

Signal Strength Index 48

SLO En Face Thickness RPE Elevation 160

158

Reference:  
 Superficial  
 Deep  
 Outer Retina  
 Choroid Cap

Upper - ILM Offset(um) 64

Lower - IPL Offset(um) 31

Right / OD

6.00 x 6.00 Scan Size (mm)

3D Display

Overview

Play

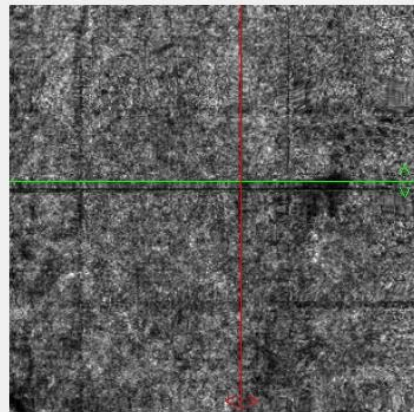
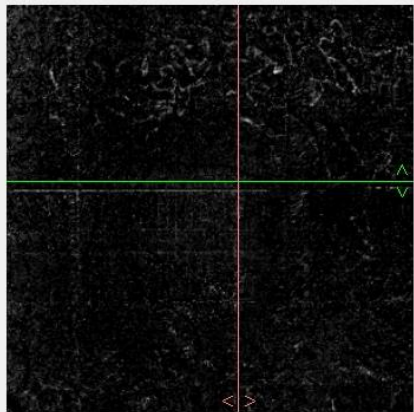
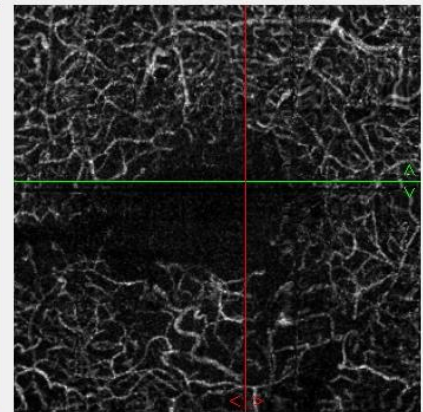
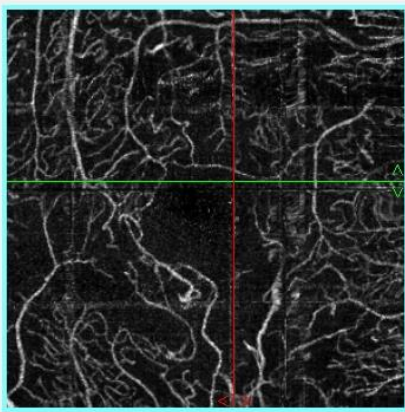
Show Bnd  
 No MCT

Color  
 Show Line

Comment

optovue





Exit  
Print

Reset View

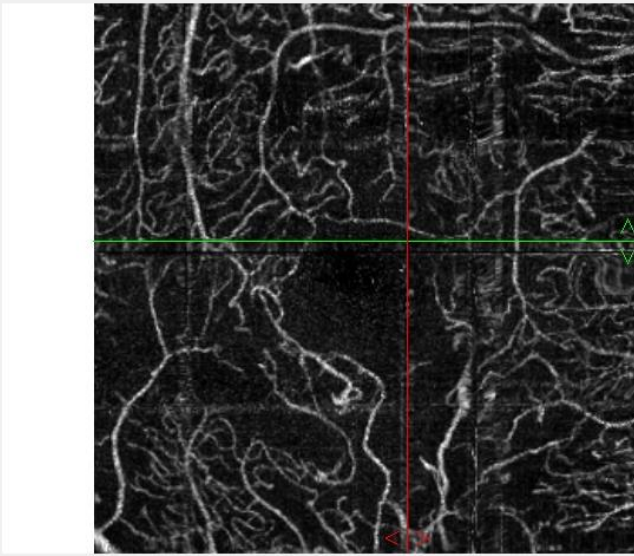
- Invert
- Color
- Overlay
- Show Bnd
- SSADA
- OCT
- SSADA/OCT

SSADA - Superficial

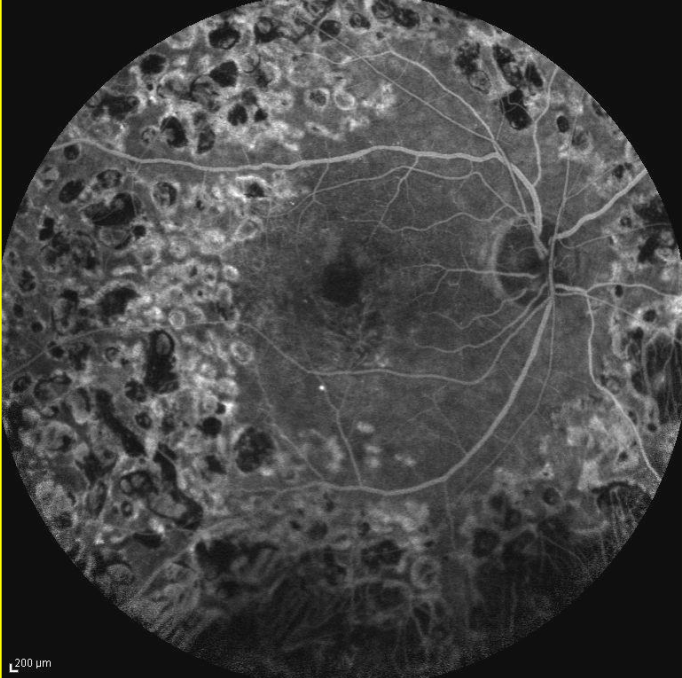
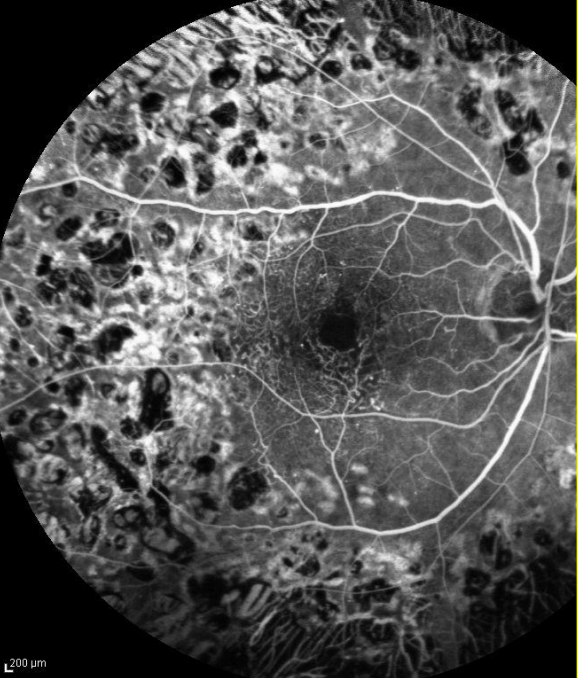
SSADA - Deep

SSADA - Outer Retina

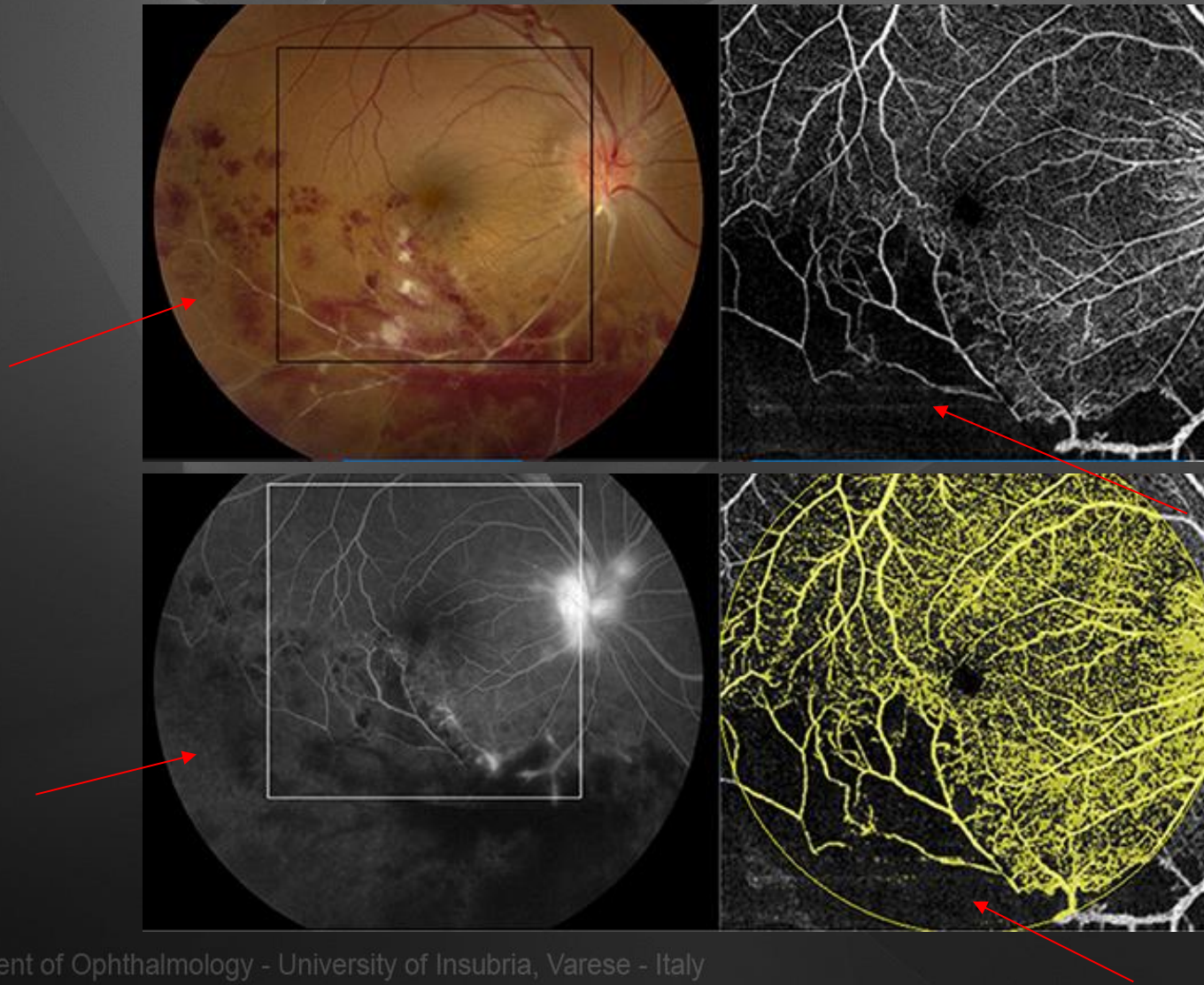
SSADA - Choroid Capillary



Static

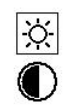
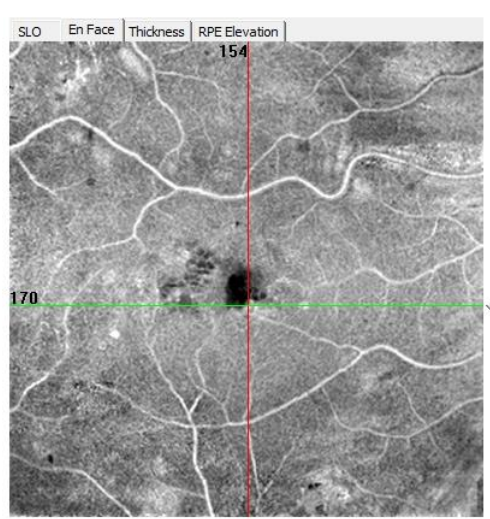


# Confronto su diverse tecniche





6.00 x 6.00 Scan Size (mm)



Save Settings

Restore Settings

Reference

- Superficial
- Deep
- Outer Retina
- Choroid Cap

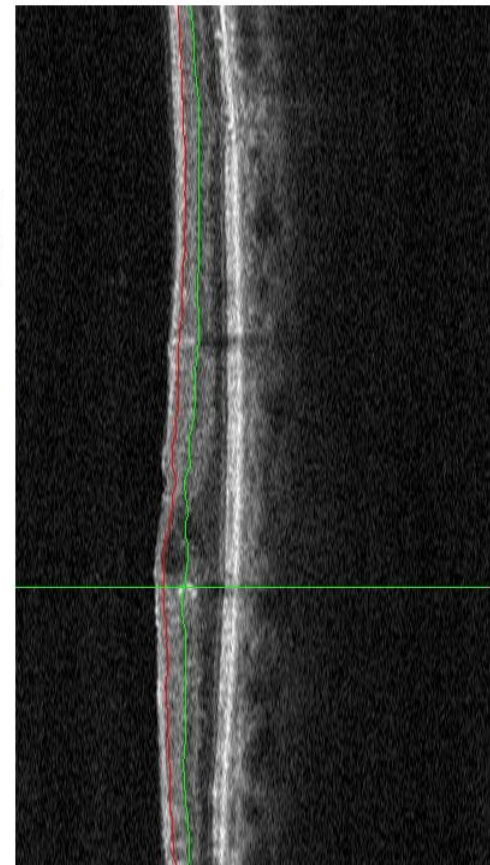
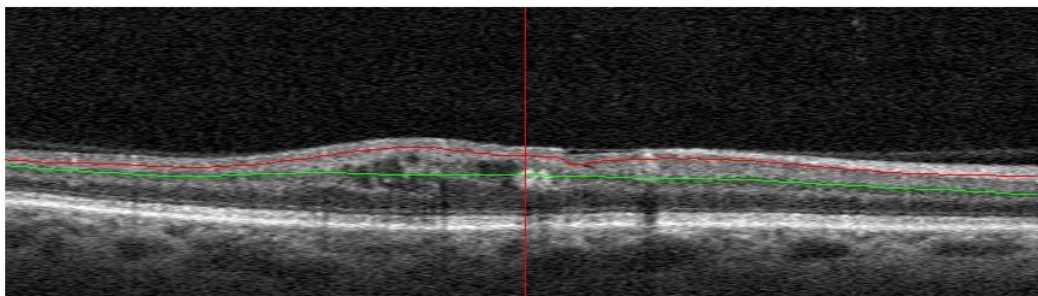
Upper - ILM Offset(um)

40 ...

Lower - IPL Offset(um)

7 ...

Flatten Bnd



3D Display

OverVue

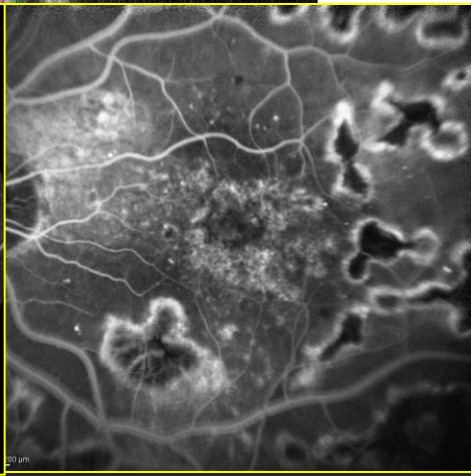
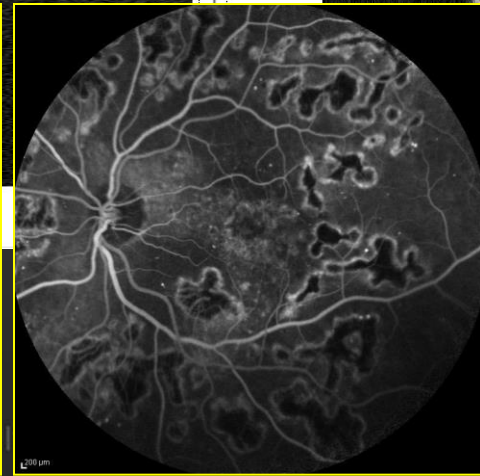
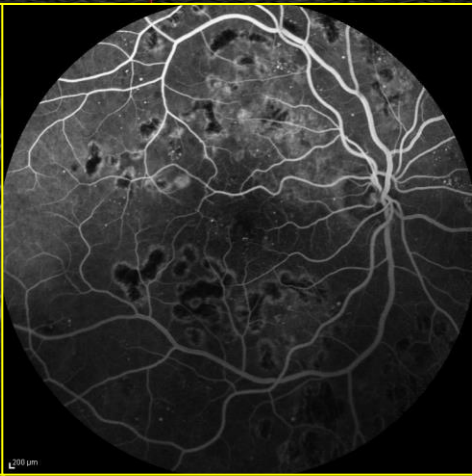
Play

Show Bnd

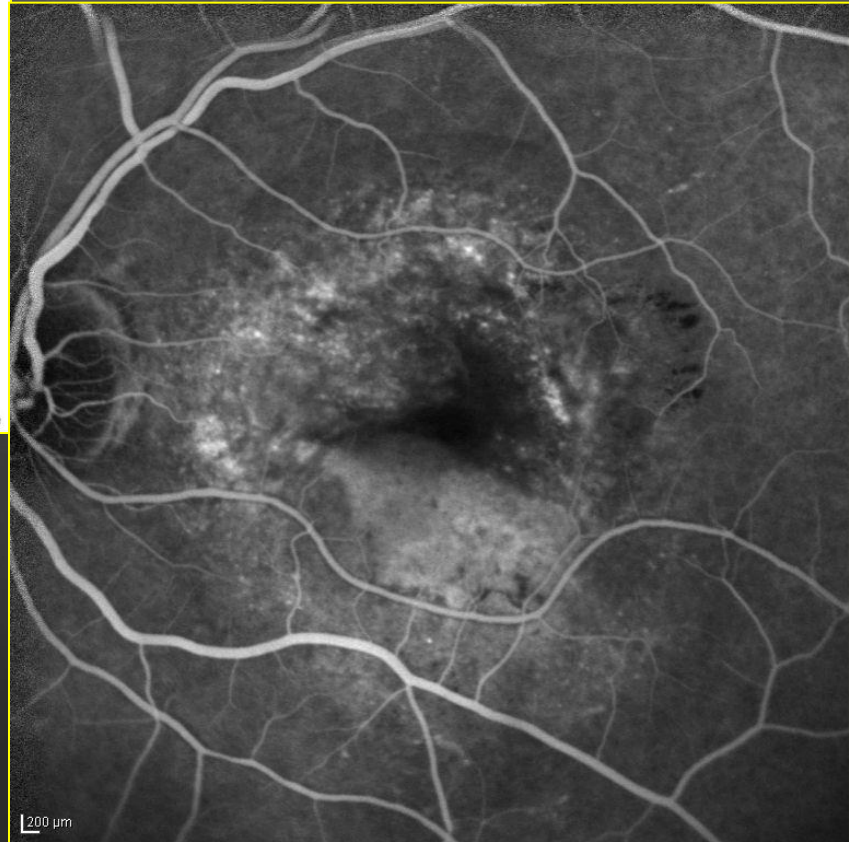
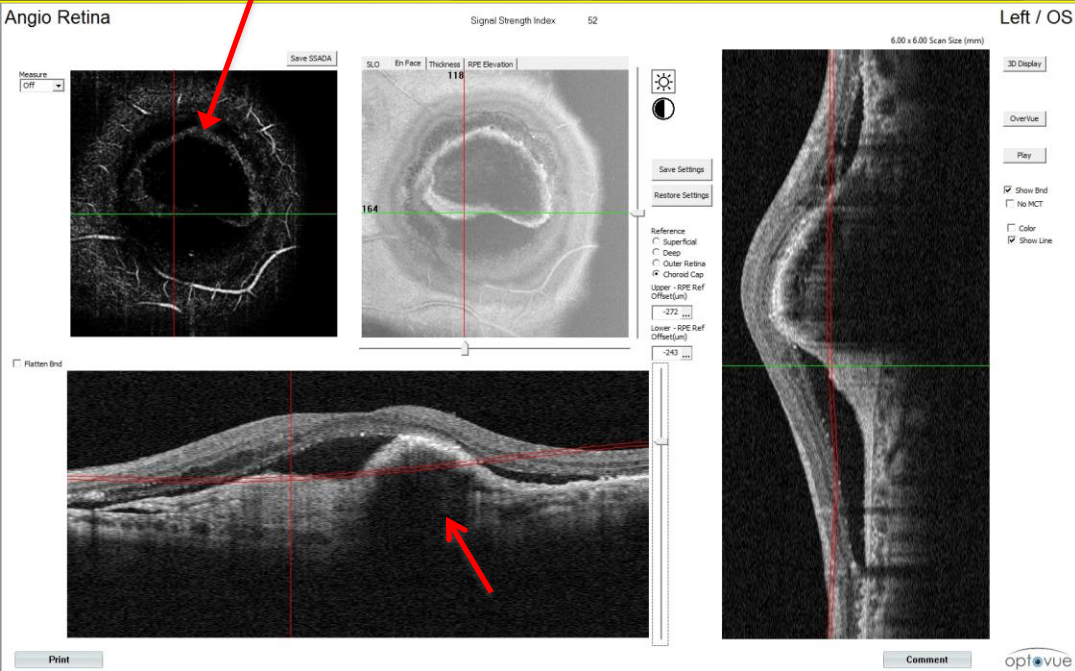
No MCT

Color

Show Line



# Altri esempi





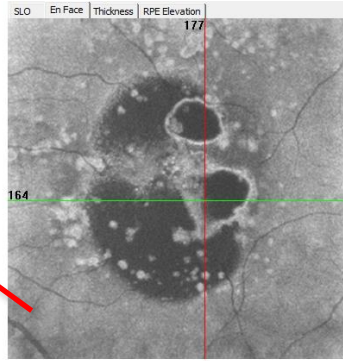
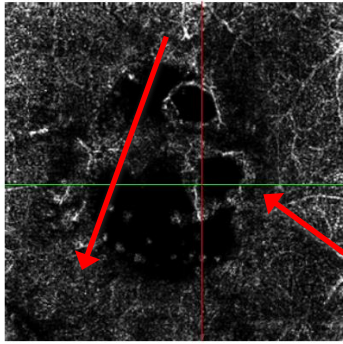
# Angio Retina

Signal Strength Index 59

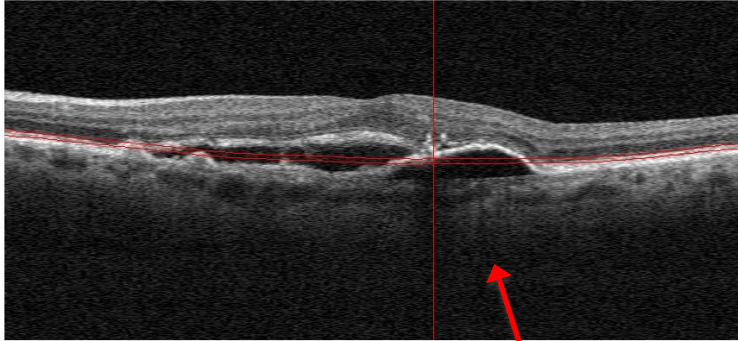
Left / OS

Save SSADA

Measure  
Off



Flatten Bnd



Print



Save Settings

Restore Settings

Reference

Superficial

Deep

Outer Retina

Choroid Cap

Upper - RPE Ref

Offset(um)

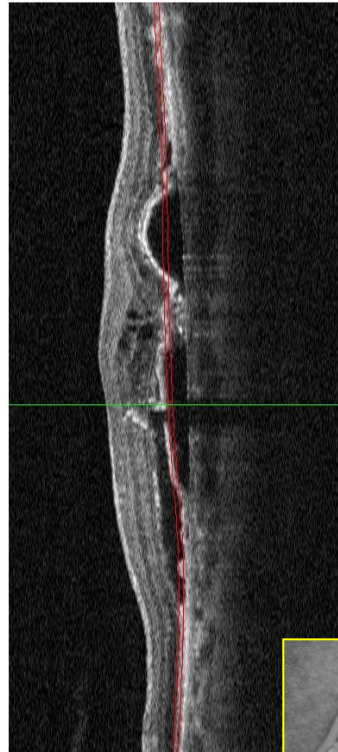
-52 ...

Lower - RPE Ref

Offset(um)

-23 ...

6.00 x 6.00 Scan Size (mm)



3D Display

OverVue

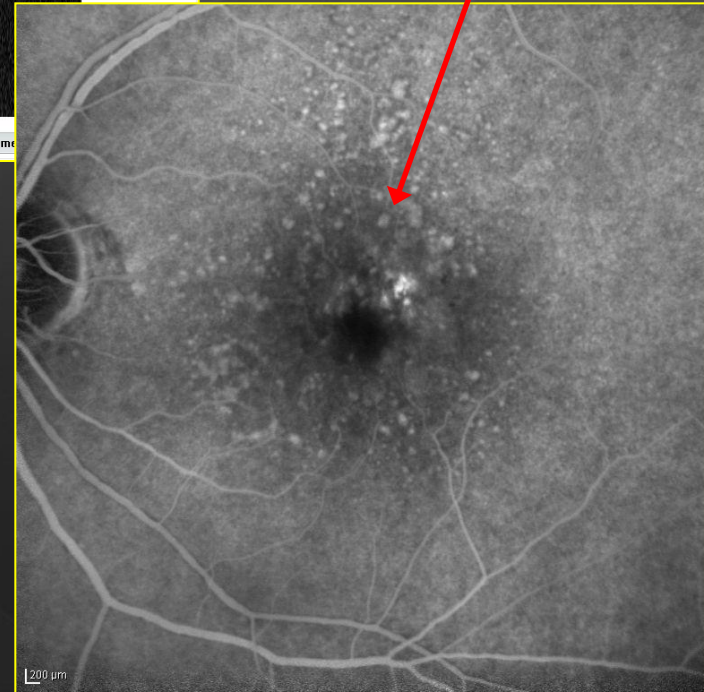
Play

Show Bnd

No MCT

Color

Show Line

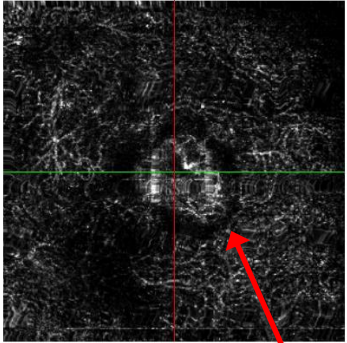


200 um

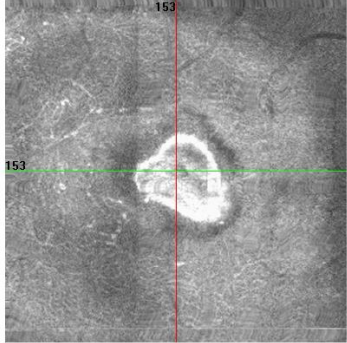


Save SSADA

Measure: Off



SLO En Face Thickness RPE Elevation 153



3.00 x 3.00 Scan Size (mm)

3D Display

OverView

Play

Show Bnd  
 No MCT

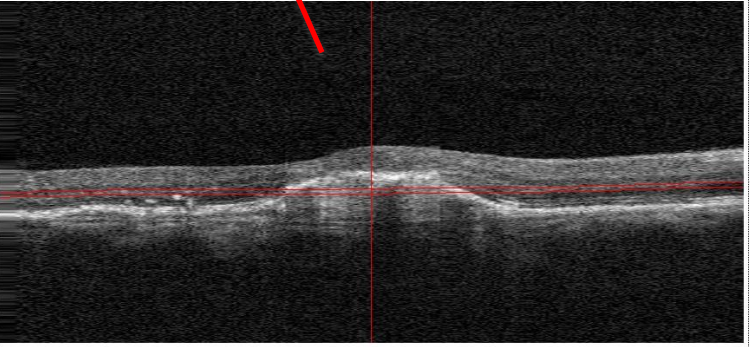
Color  
 Show Line

Reference:  
 Superficial  
 Deep  
 Outer Retina  
 Choroid Cap

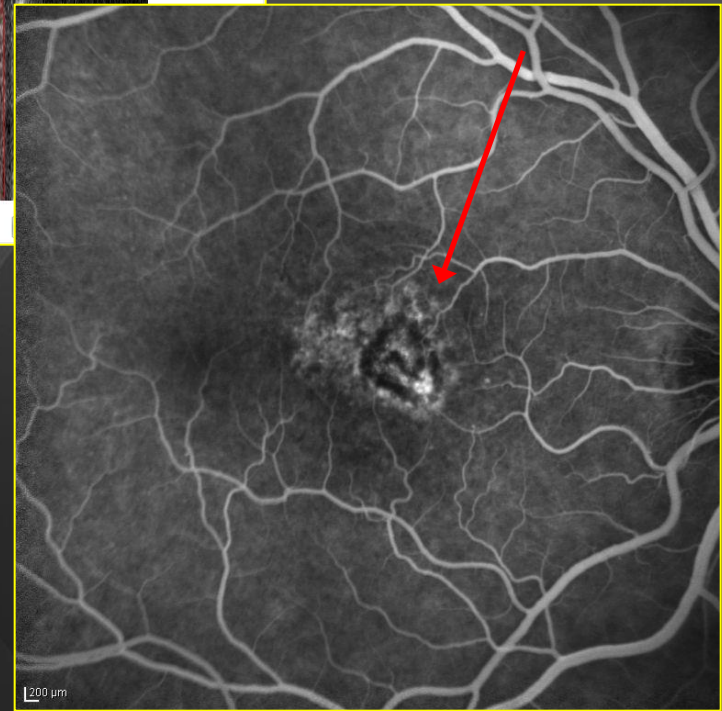
Upper - RPE Ref Offset(um) -126

Lower - RPE Ref Offset(um) -97

Flatten Bnd



Print

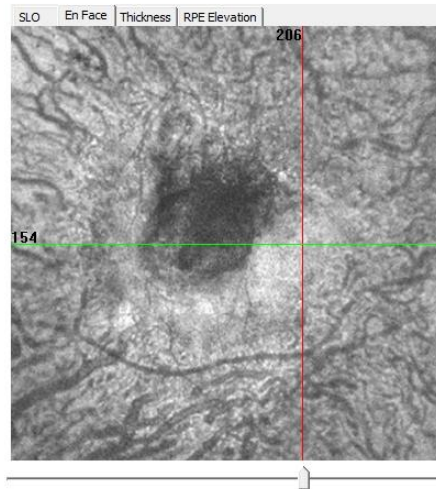
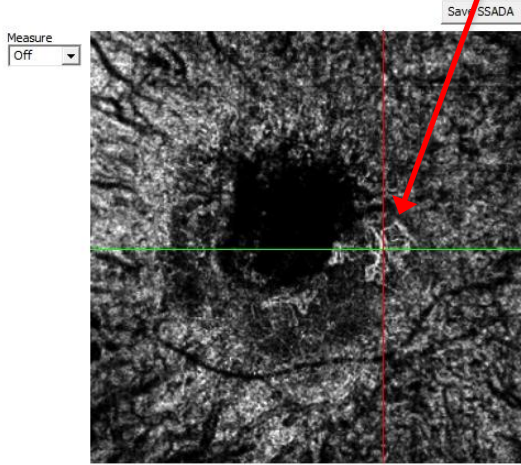


# Angio Retina

Signal Strength Index 54

Right / OD

6.00 x 6.00 Scan Size (mm)



Save Settings

Restore Settings

Reference

- Superficial
- Deep
- Outer Retina
- Choroid Cap

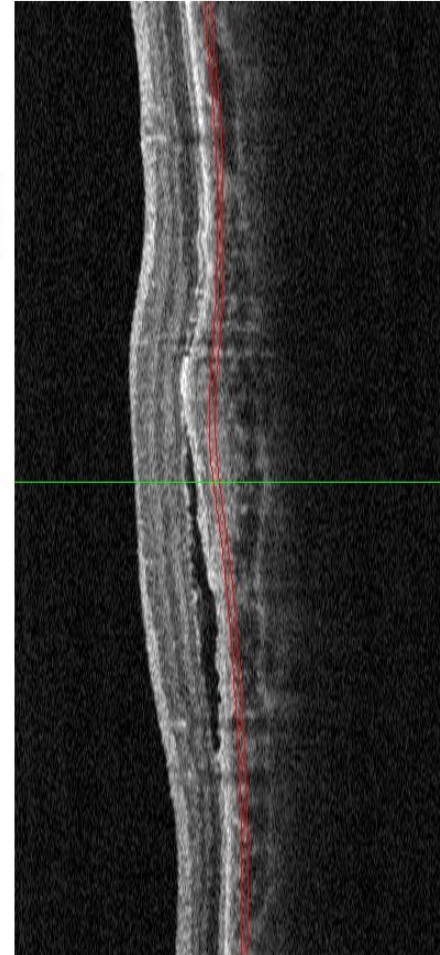
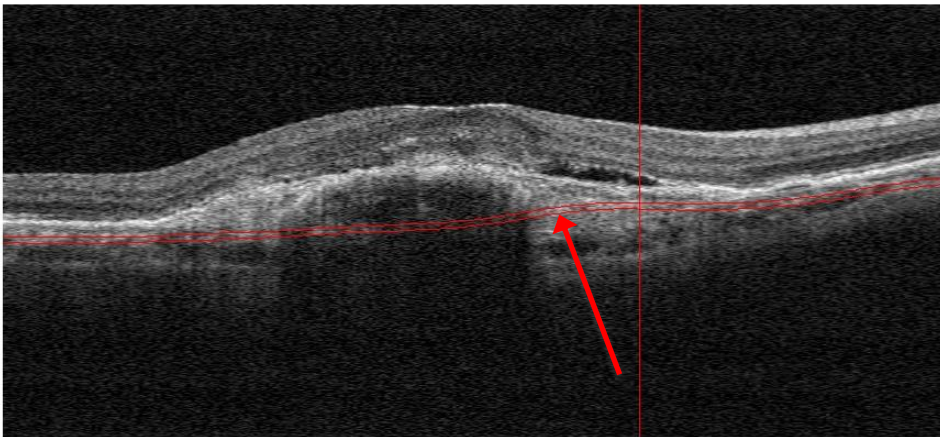
Upper - RPE Ref Offset(um)

64 ...

Lower - RPE Ref Offset(um)

94 ...

Flatten Bnd



3D Display

OverVue

Play

Show Bnd  
 No MCT

Color  
 Show Line

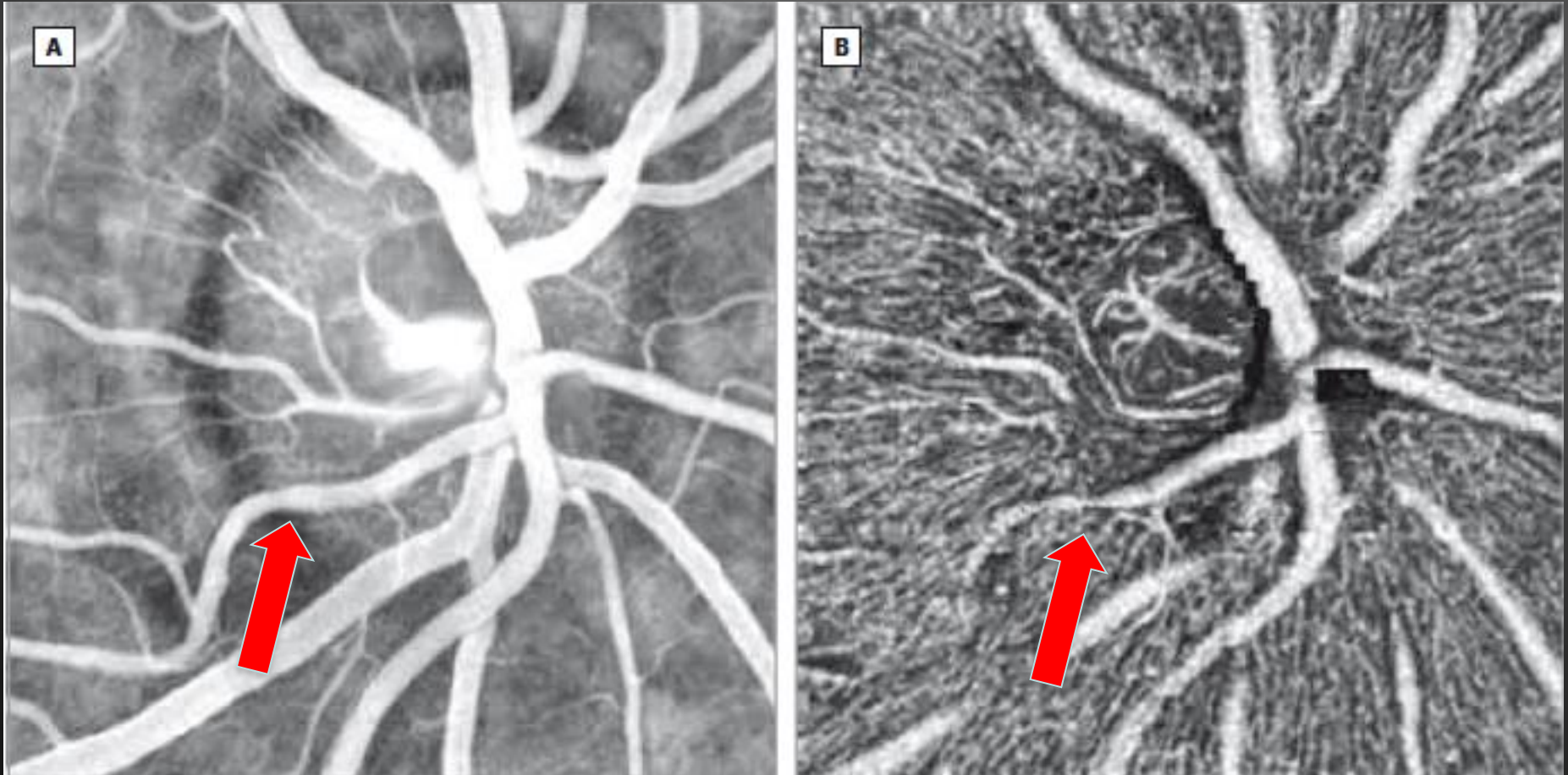
Print

Comment





# Optic Nerve





# What's good and what's wrong

# What's good and what's wrong

- Not invasive
- Modification of intra layer network
- Detections of early vascular modifications
- Not seen means does not exist?
- Patients collaboration
- Leakage?
- Peripheral ischemia?

# Dove si colloca oggi

## FAG

- RDP e studio periferia
- CNV con fibrosi
- CNV occulte
- Vasculiti


## Angio OCT

- Fasi iniziali RD
- Studio perfusione vasculopatie retiniche
- CNV tipo 2-3
- Mac Tel

- Occlusioni venose retiniche
- DEP
- PCV





An aerial photograph of a scenic landscape. In the foreground, a small town with red-tiled roofs is nestled among lush green trees and fields. A large, calm lake occupies the middle ground, reflecting the sky. In the background, a range of mountains with snow-capped peaks stretches across the horizon under a clear blue sky. The text "Grazie per l'attenzione" is overlaid in a large, bold, red font across the center of the image.

**Grazie per l'attenzione**