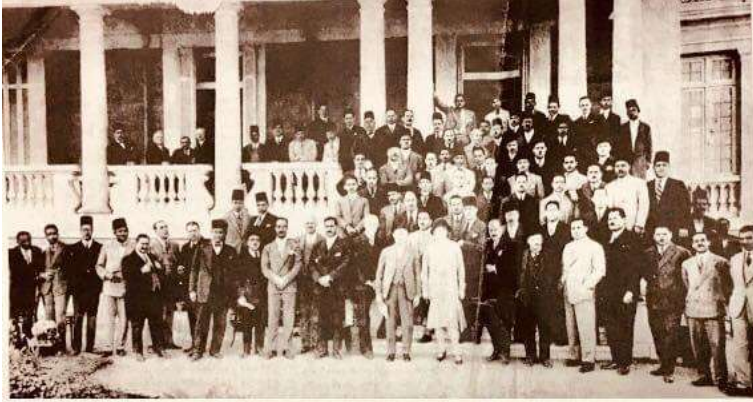


26/3/1930

MIOR



القاهرة - 22 أبريل 1930
عقد في القاهرة يوم
الجمعة 28 مارس / آذار
الماضي أول مؤتمر لأطباء
العيون المصريين والأجانب
من العاملين في مختلف
المستشفيات، وذلك في
المعمل الرمدي الكبير
بمنطقة الجيزة، وحضره
نحو 100 طبيب. وقد تم
خلال المؤتمر مناقشة أهم
أمراض العيون المنتشرة
في مصر ومنها الرمد،
ووسائل العلاج المتوفرة
في دول العالم. كما تم
خلال المؤتمر التأكيد على
بث الوعي بين المواطنين
للوفاية من أمراض العيون،
التي شهدت ارتفاعاً في
السنوات الماضية.

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المؤتمر السنوي الدولي للجمعية الرمدية المصرية
INTERNATIONAL CONGRESS OF THE
EGYPTIAN OPHTHALMOLOGICAL SOCIETY

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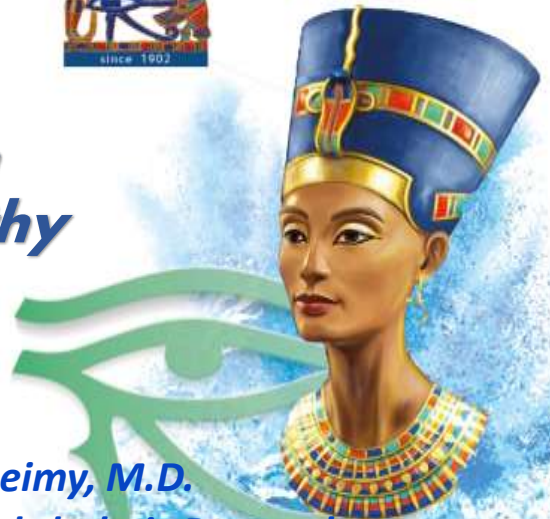
**Retinal imaging in
Diabetic retinopathy
OCT/FFA**



Hanan El-Ghoneimy, M.D.

Memorial Institute for Ophthalmic Research

MIOR



Lecture Scheme

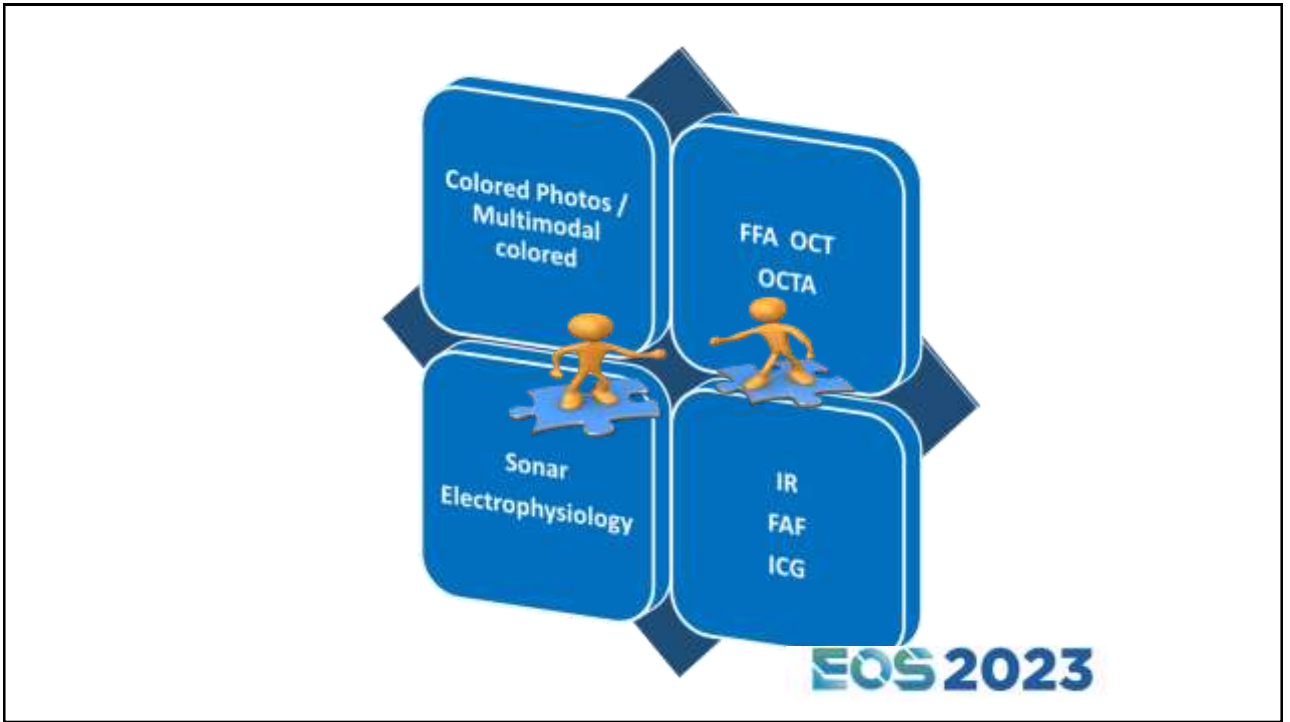
- *Retinal Imaging Modalities*
- *Basic principles of FFA and OCT*

- *Diabetic Retinopathy*

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- DM affects millions of adults all over the world
- DR is one of the major microvascular complications
- DME and PDR are the most common causes of vision loss in DR
- The main predictors of retinopathy progression are duration of diabetes and hemoglobin A1c
- Strong genetic factors have been studied

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Imaging modalities play an important role:

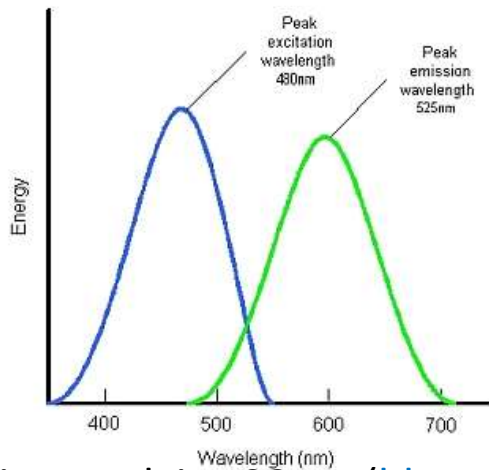
- Screening diabetic patients to detect any features of DR at an early stage
- Deciding the treatment protocol
- Prognosis

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Fundus Fluorescein Angiography



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Excitation peak is 490nm (blue part of spectrum) ,

Emit light of about 530nm (yellow green)

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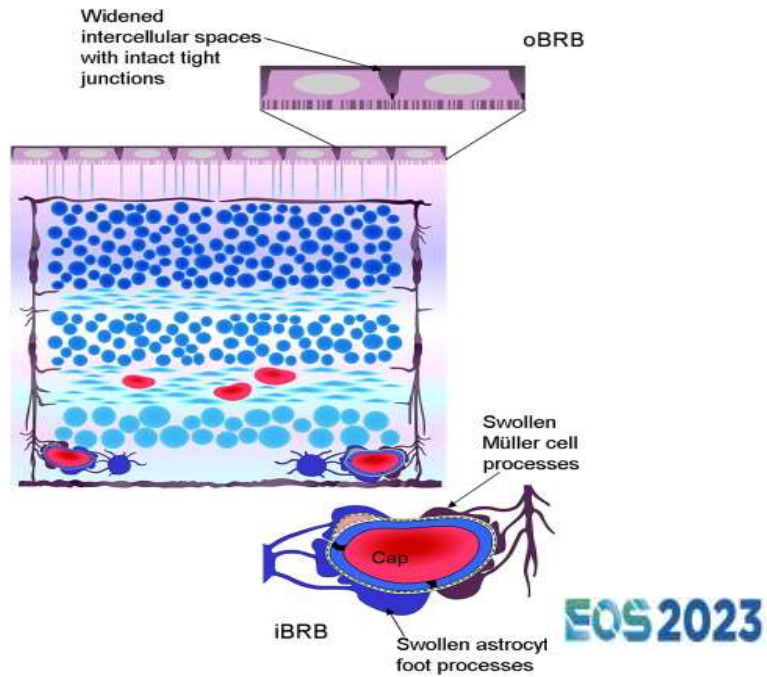
Two filters

- **Excitation** to ensure ONLY **blue** light enters the eye
- **Barrier** to ensure ONLY **yellow green** light enters the camera

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- 70-85% of fluorescein molecules bind to serum proteins
- **Outer blood retinal barrier** :Tight junctions , zonula occludentes
- **Inner blood retinal barrier**: Tight junctions between retinal capillary endothelial cells, basement membrane and pericytes.

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Hyper fluorescence
Increased **PERMEABILITY**

LEAKAGE

POOLING

STAINING

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Hyper fluorescence
Increased **TRANSMISSION**

*Hypopigmentation
of RPE*

Atrophy of RPE

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Hypofluorescence

*Masking/
Blocking*

Filling defects

Haemorrhage

Vascular occlusion

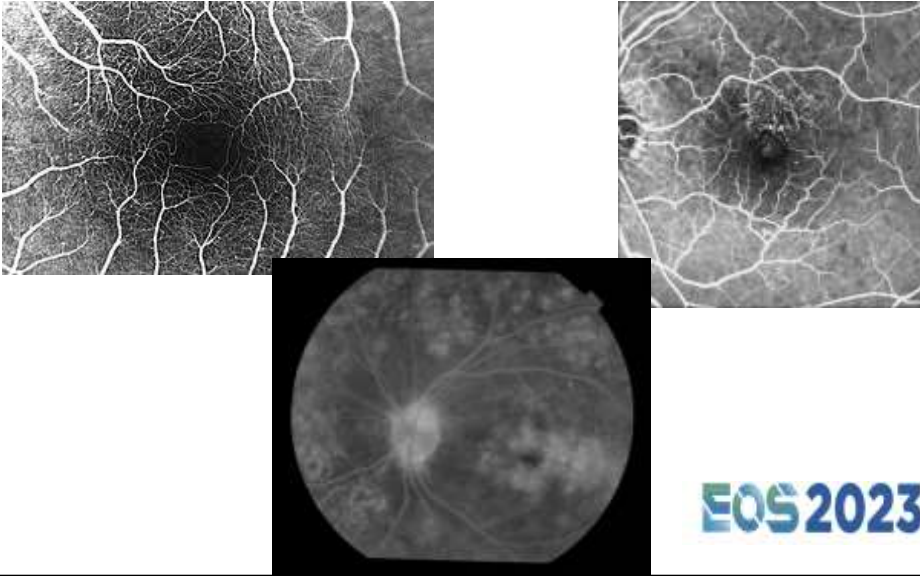
Pigments

Loss of vascular bed

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Diabetic Retinopathy

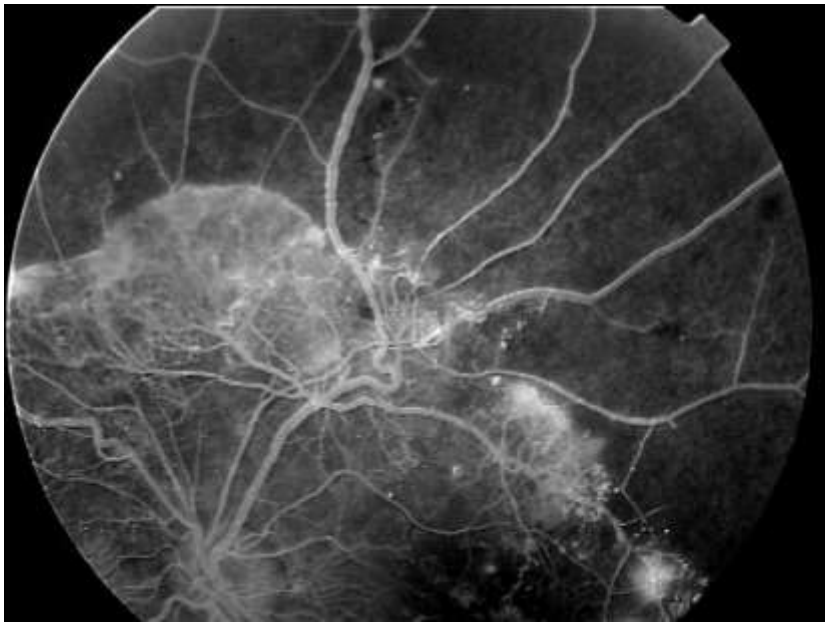
Detailed structure and damage to FAZ



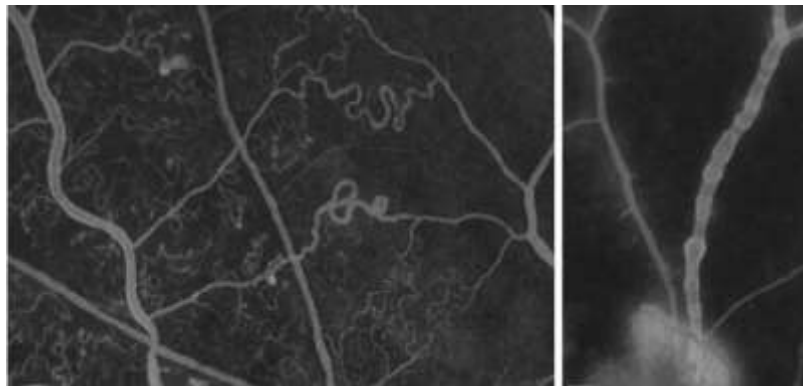
Diabetic Retinopathy

Topographic localization of neo vessels



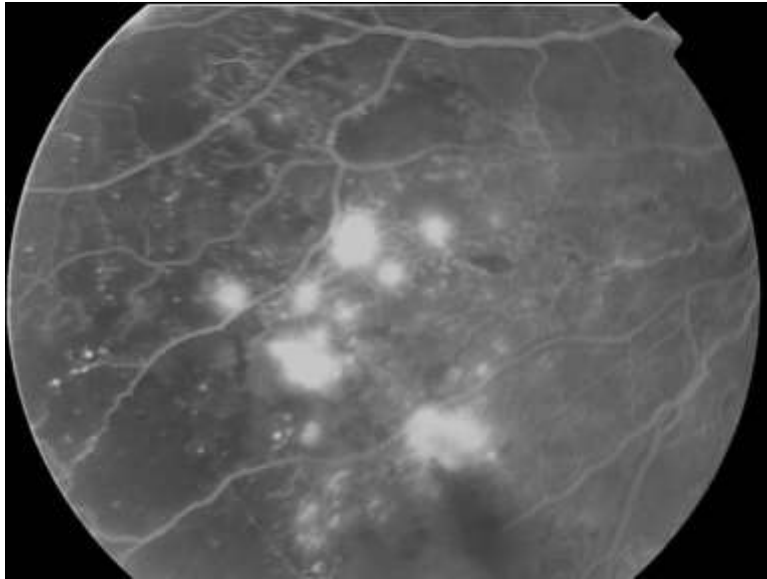


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Assessment of retinal capillary perfusion



Biomarkers on FFA

- The earliest signs of DR, microaneurysms
- Macular ischemia
- NVEs NVDs IRMA
- Leakage pattern :Microaneurysms result in focal leakage, which cause focal macular edema, whereas diffuse capillary bed leak due to disruption of blood–retinal barrier causes diffuse macular edema.

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Optical Coherence Tomography OCT



Non-contact

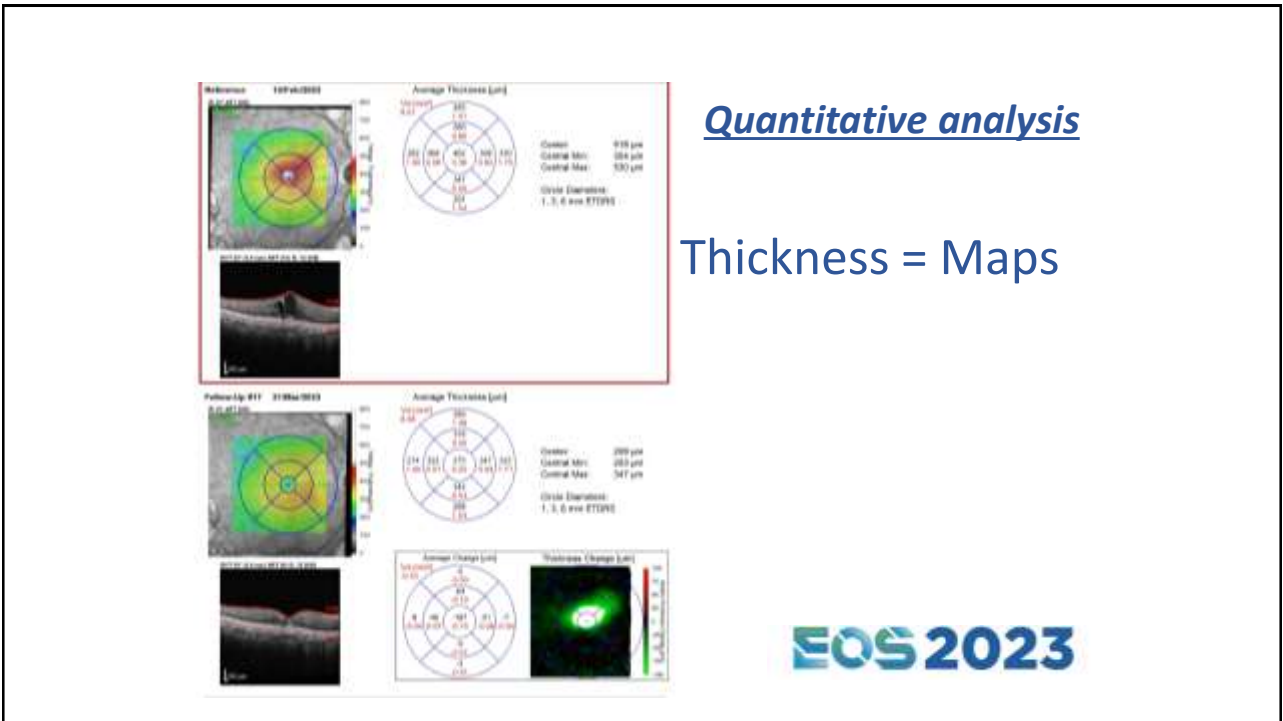
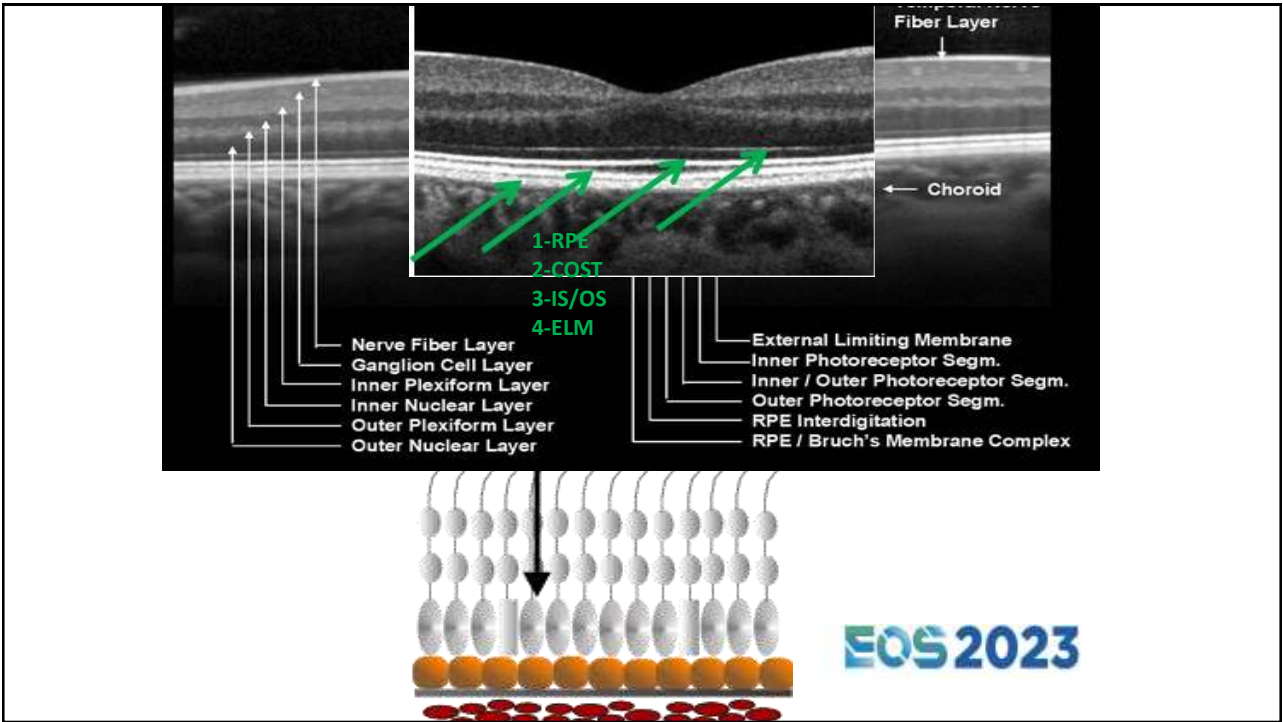
OCT

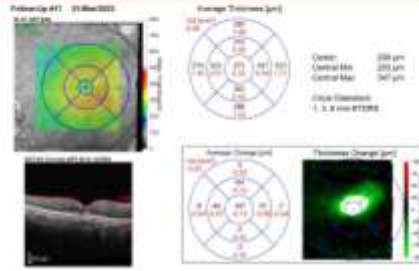
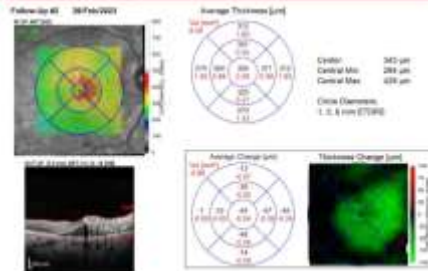
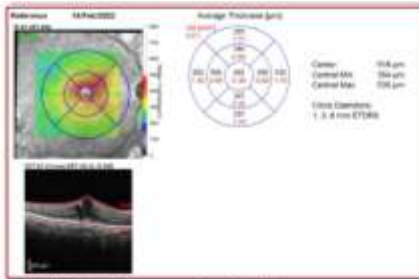
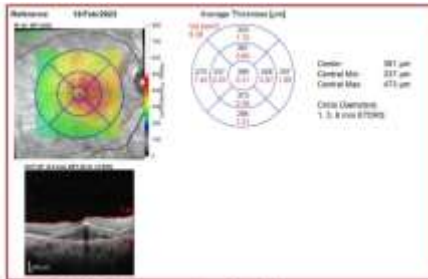
Non-Invasive

Analogous to US

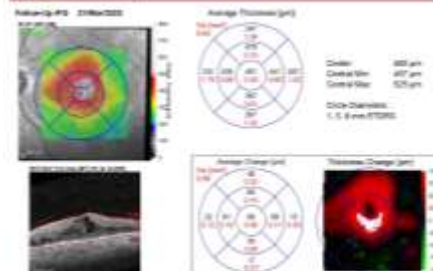
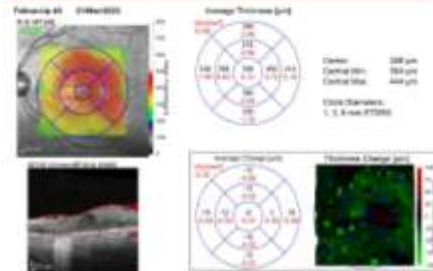
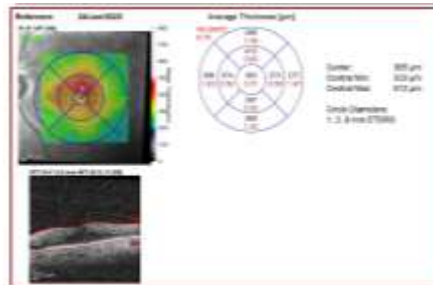
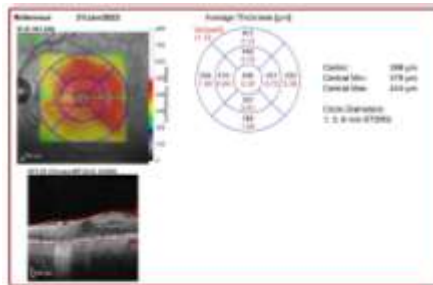
840-1060 nm

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Qualitative analysis

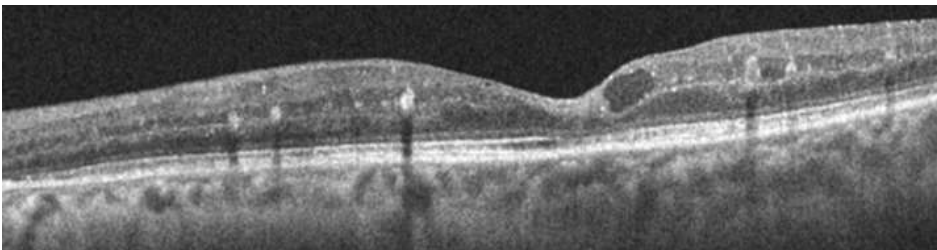
Morphological changes and anomalous structures in the retina

- Hyperreflective

- Hyporefelctive

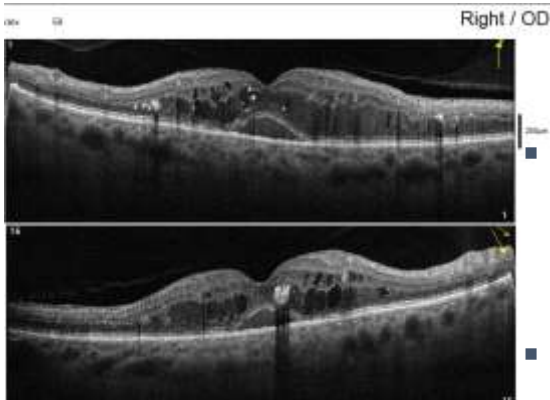
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Reflectivity *Hyperreflective*



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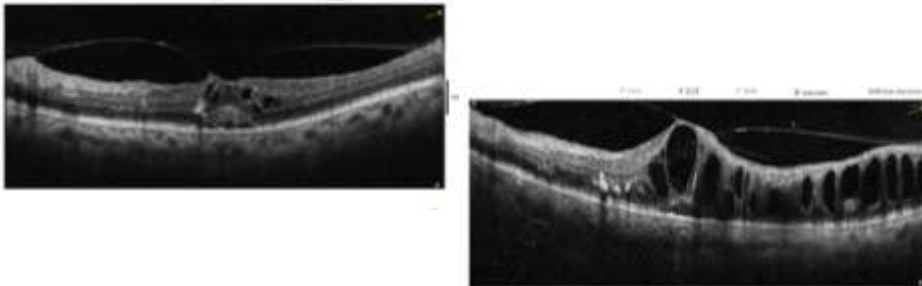
Hyporeflective



- Macular oedema is a leading treatable cause of vision loss in diabetics.
- OCT has an important adjunctive role.

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OCT patterns

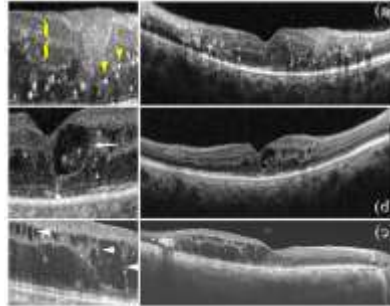


- Sponge like retinal thickening
- CME
- Subfoveal serous retinal detachment
- Presence of traction from taut posterior hyaloid

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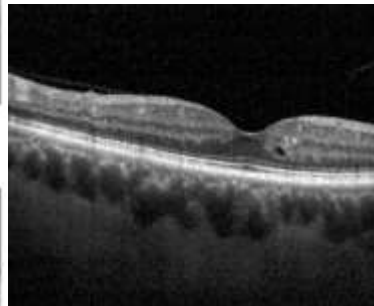
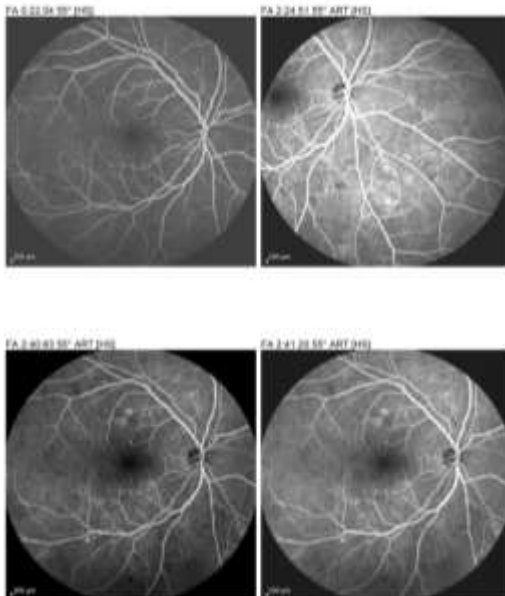
Diabetic retinopathy biomarkers

- DRIL
- HRF
- Intraretinal cystoid spaces
- Bridging retinal processes
- Central subfield thickness (CST)
- Hard exudates
- Subfoveal neurosensory detachment

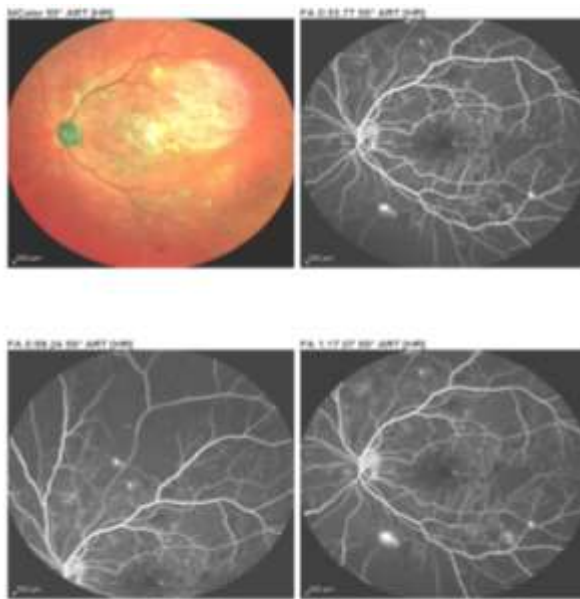


Novel imaging biomarkers in diabetic retinopathy and diabetic macular edema Markan A Et al
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7475787/?report=reader#>

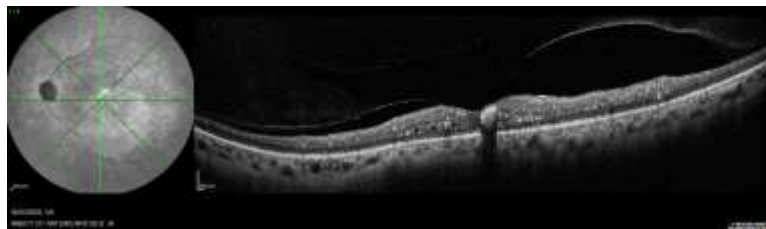
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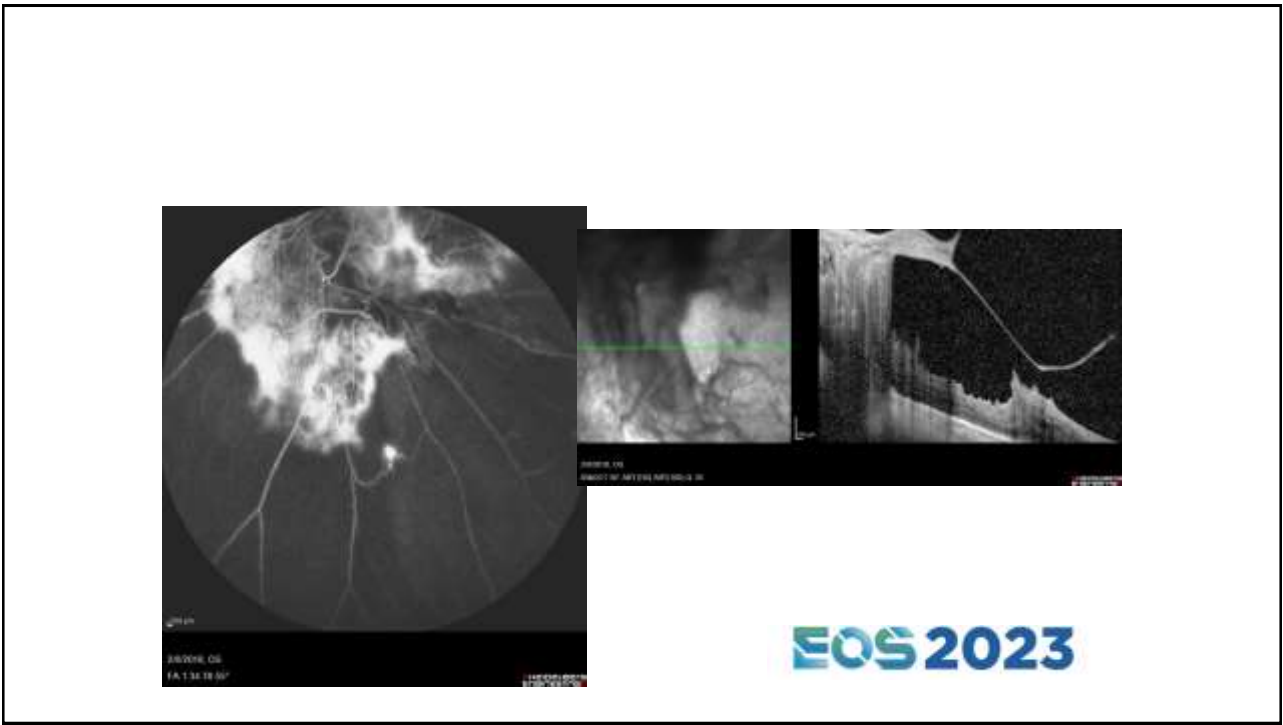
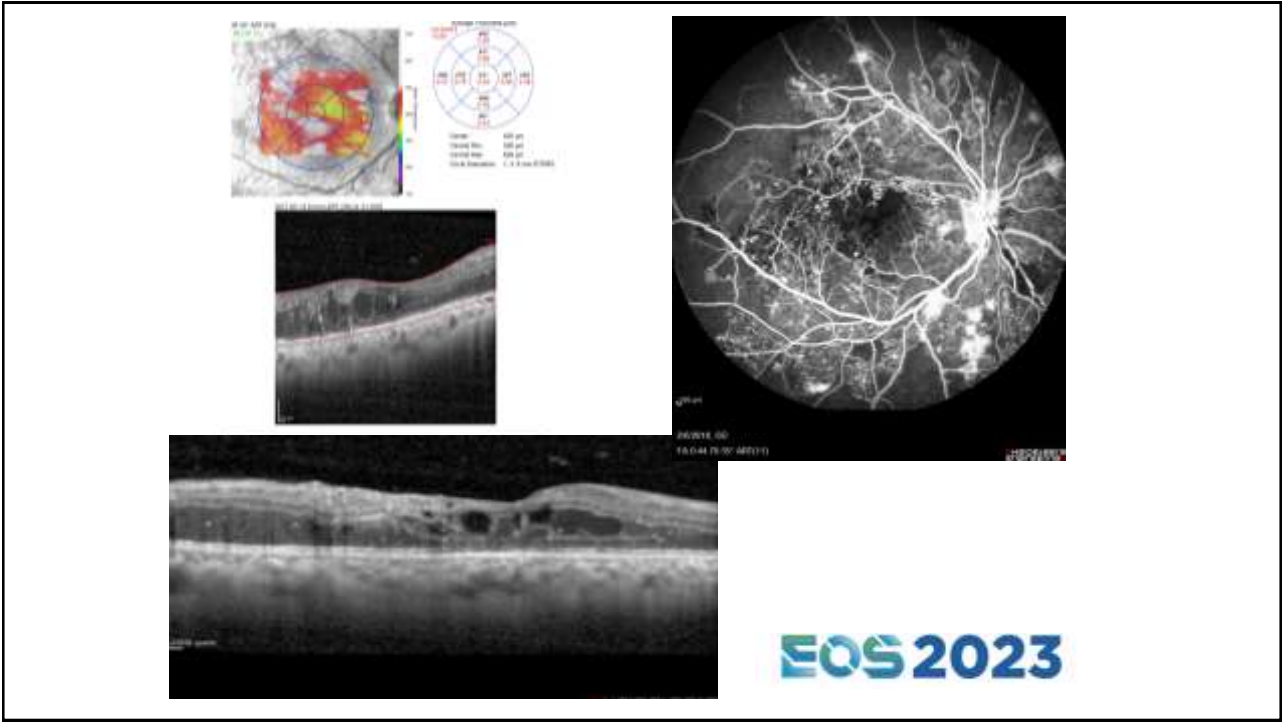
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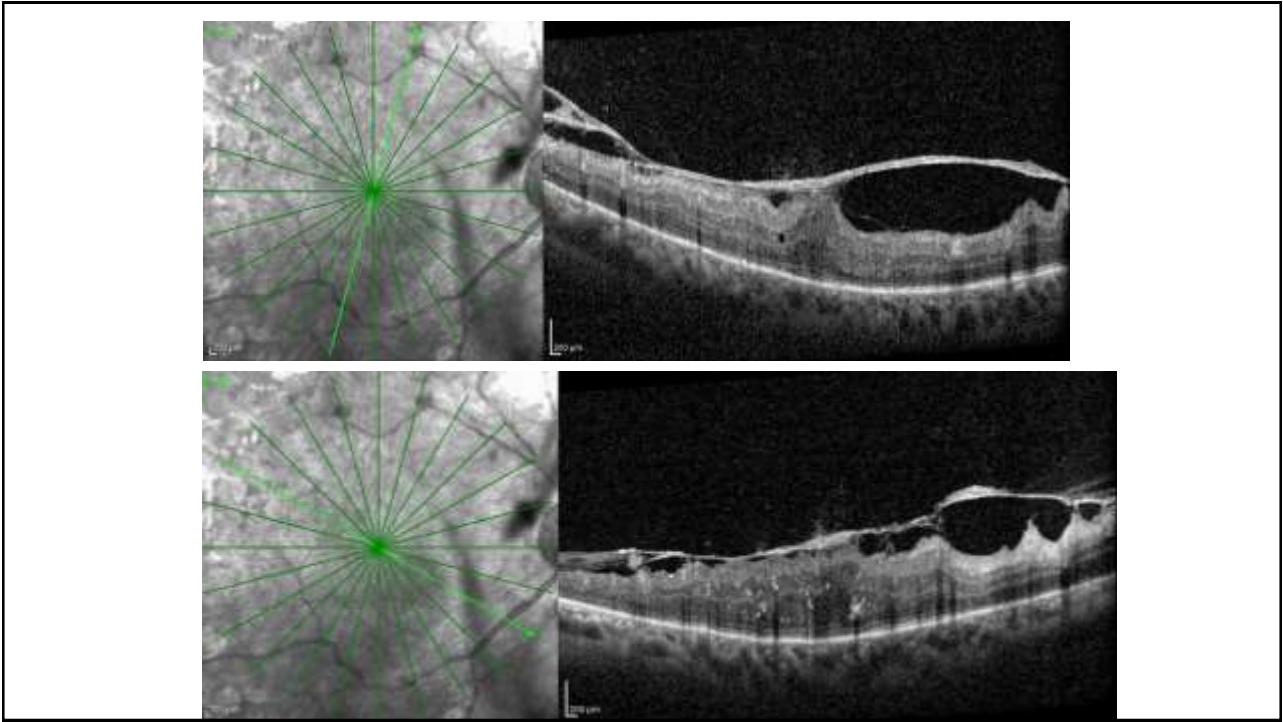
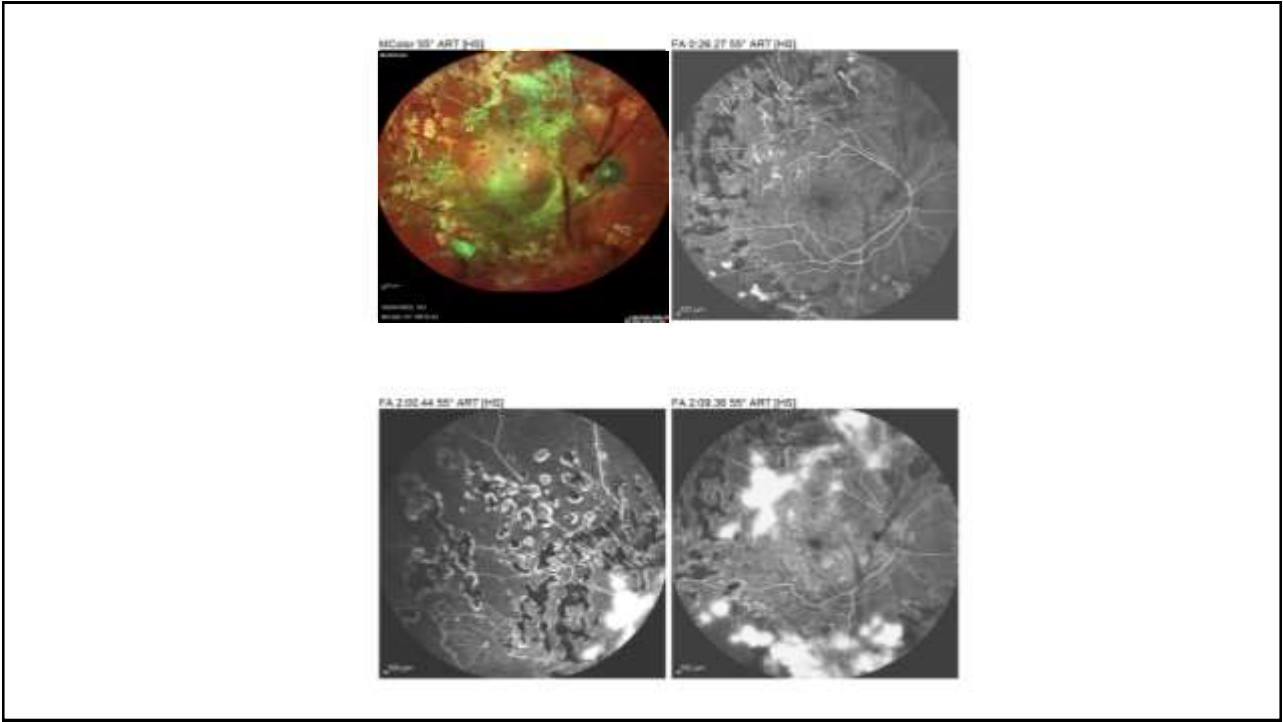


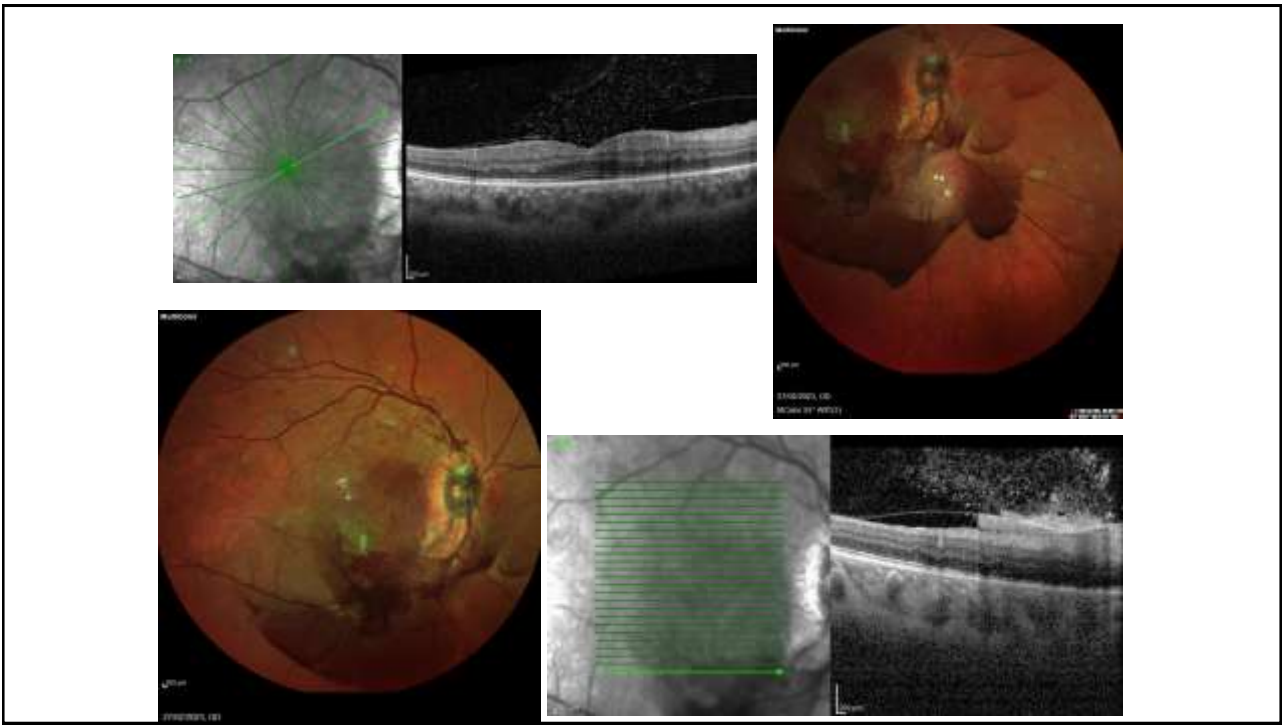
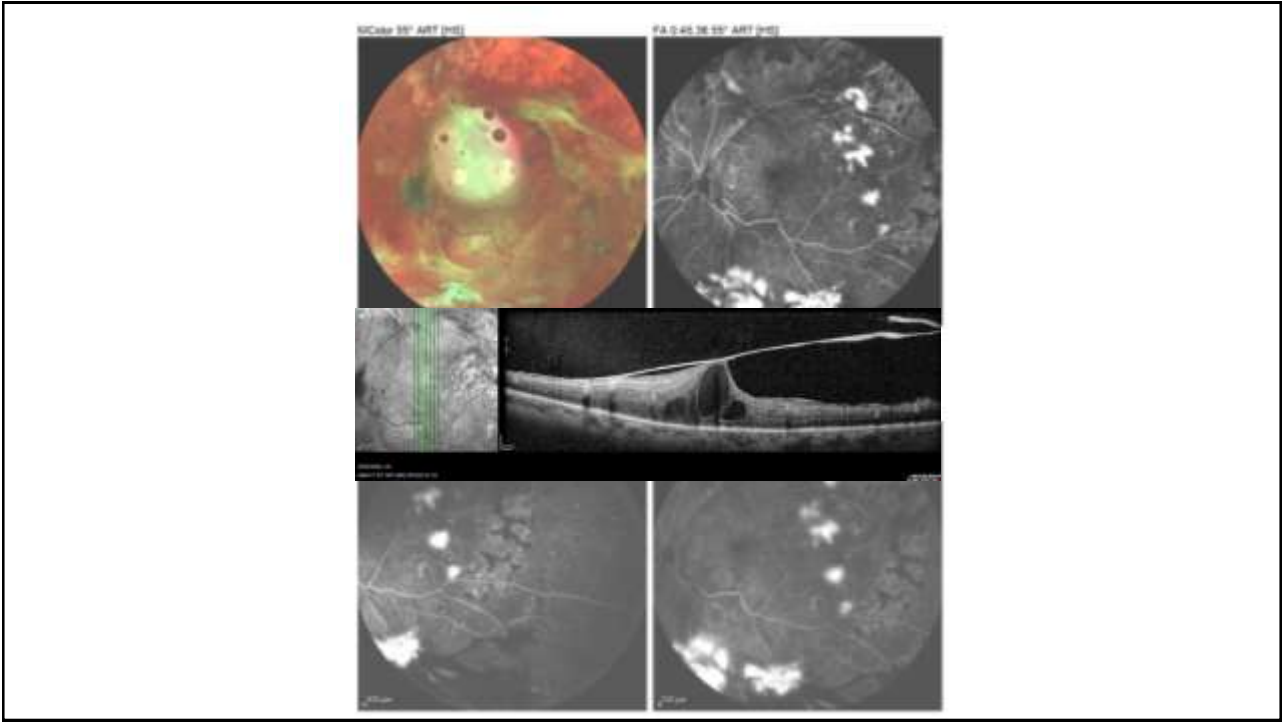
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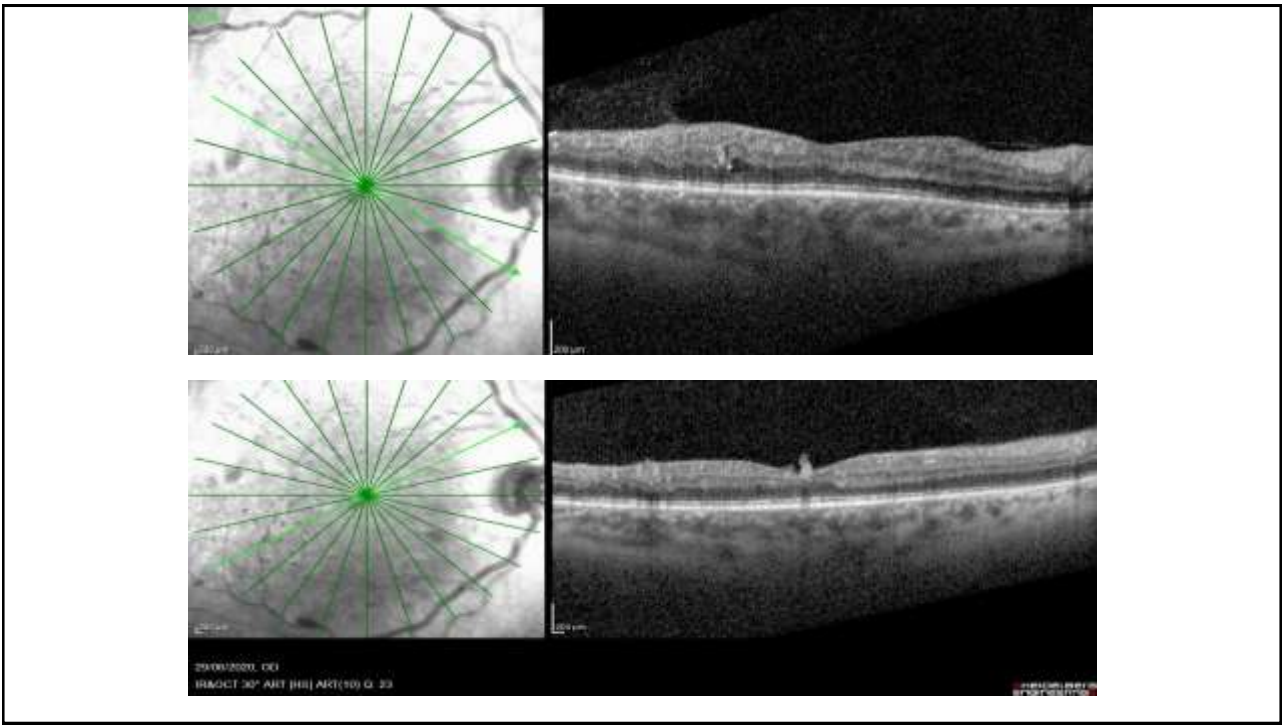
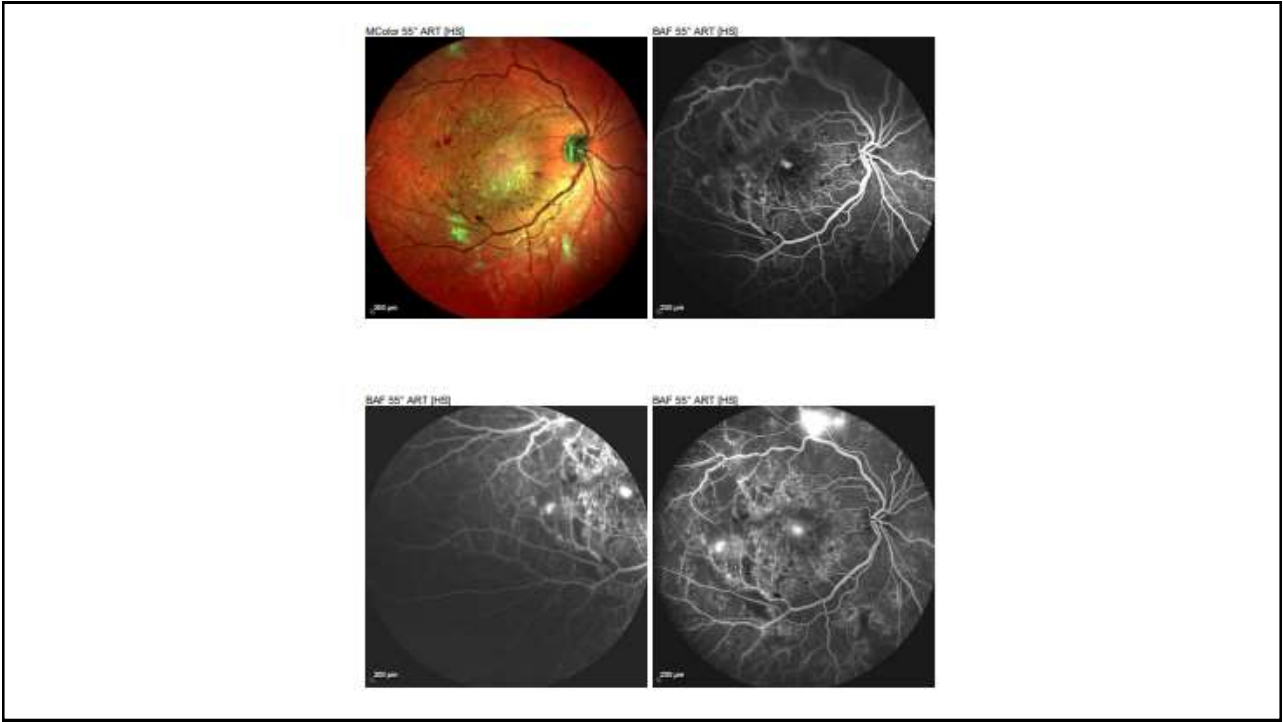


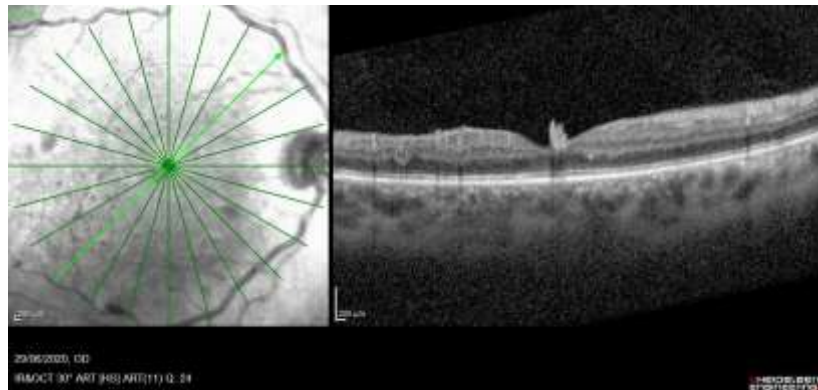
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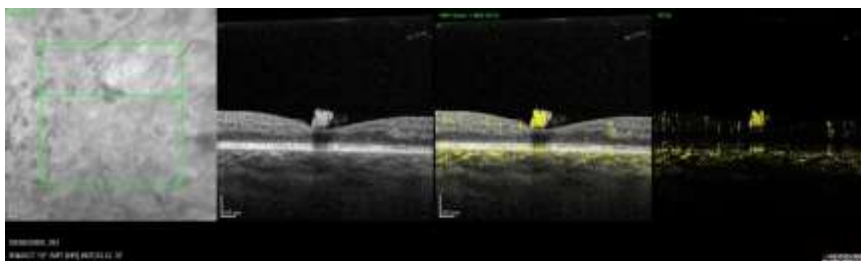
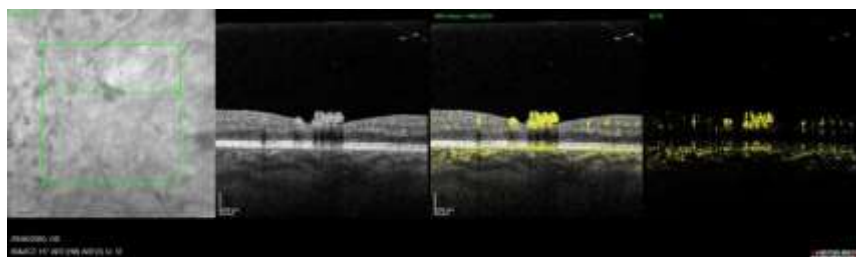


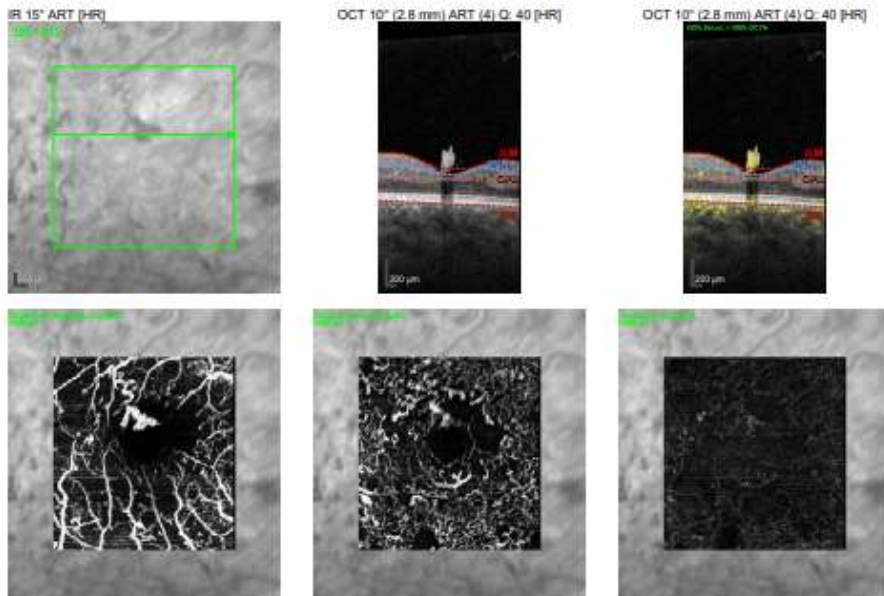






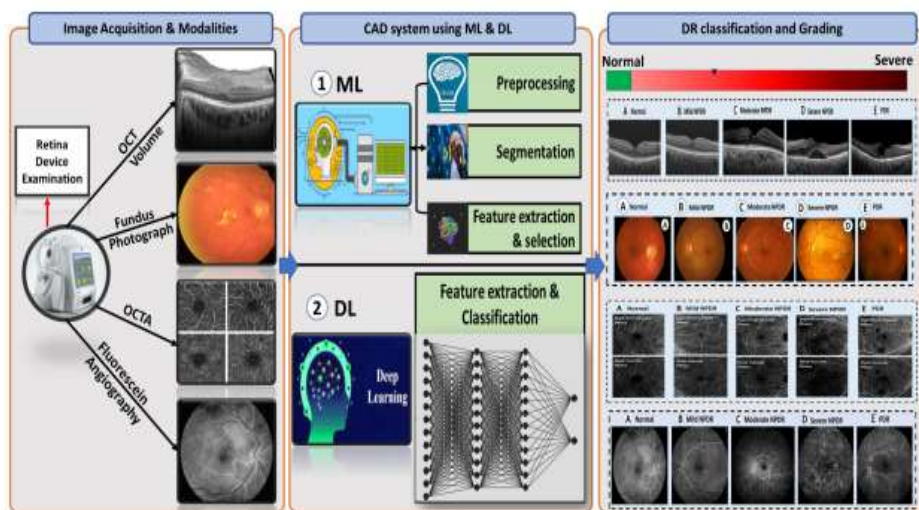
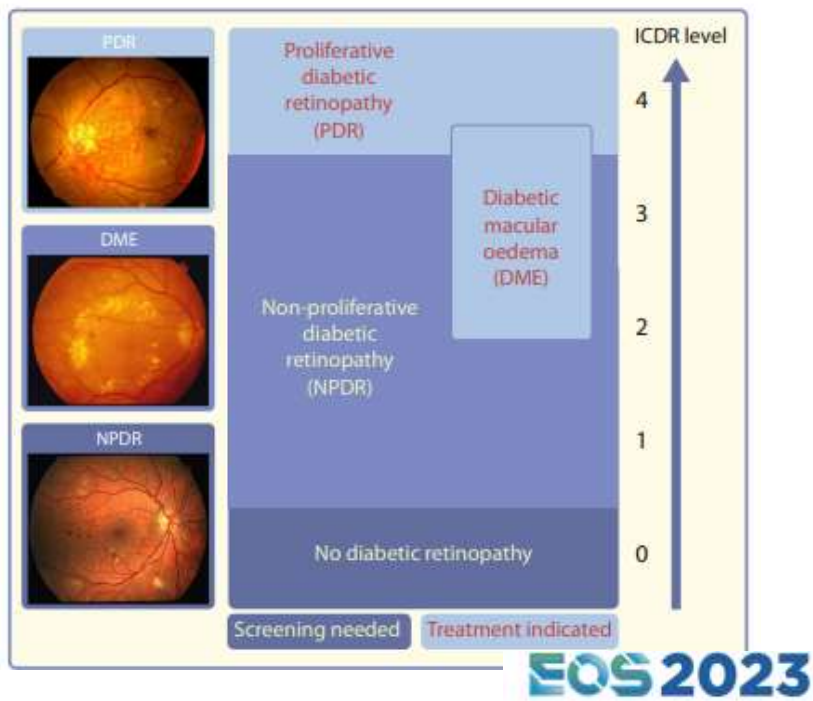
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- Foveal neovascularisation is a rare finding in cases of PDR and it is suggestive of a severely compromised choroidal supply.
- Can be obscured in a background of leakage due to diabetic macular oedema by routine investigative modalities like fundus photo or fluorescein angiography.
- OCT A is an important non-invasive imaging modality to identify cases of foveal neovascularisation

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FFA

- Microaneurysms
- IRMAs
- Neovessels
- Vascular changes
- Ischemia
- Peripheral perfusion
- Edema, focal and diffuse leakage

OCT

- Quantitative and qualitative analysis of macular edema
- Traction
- Monitoring of disease progression
- Assessment of treatment response
- Prediction of visual outcomes



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Thank You

